Excavations at Sitagroi

A Prehistoric Village in Northeast Greece
Volume 1

Edited by
Colin Renfrew, Marija Gimbutas, and Ernestine S. Elster

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Volume 1

Contributors

DR. BRIAN BLOUET
Department of Geography, Texas A & M University

DR. SÁNDOR BÖKÖNYI
Institute of Archaeology, Hungarian Academy of Science, Budapest

DR. DONALD DAVIDSON
Department of Geography, University of Strathclyde, Glasgow, Scotland

DR. ERNESTINE S. ELSTER
Institute of Archaeology, University of California, Los Angeles

DR. ROBERT K. EVANS
Jefferson Patterson Park and Museum, St. Leonard, Maryland

DR. MARIJA GIMBUTAS
Department of Slavic Studies, University of California, Los Angeles

MR. JAMES R. A. GREIG
Department of Plant Biology, University of Birmingham, England

MR. ERIC HIGGS
Formerly Department of Archaeology, Cambridge University, England

DR. D. JÁNOSSY
Hungarian Natural History Museum, Budapest

DR. JENIFER MARRIOTT KEIGHLEY
West Yorkshire County Council, Archaeology Unit, Yorks, England

DR. OLIVER RACKHAM
Botany School, Cambridge University, England

DR. COLIN RENFREW
Department of Archaeology, Cambridge University, England

DR. ANDREW SHERRATT
Department of Antiquities, Ashmolean Museum, Oxford, England

DR. BARRY THOMAS
Department of Geography, University of Strathclyde, Glasgow, Scotland

DR. JUDITH TURNER
Department of Botany, Durham University, England

DR. CLAUDIO VITA-FINZI
Department of Geography, University College, London, England

with further contributions from
MR. PETER MORLEY, photography
MR. ROBERT WAKEHAM, plans

Preface

Archaeological excavation of the prehistoric settlement mound at Sitagroi near Drama, East Macedonia, was completed in 1970 by the editors and the excavation team. Since the conclusion of fieldwork, a number of preliminary reports and discussions have been published (Renfrew and Gimbutas 1970; Renfrew 1970a, 1970b, 1971, 1973, 1975). The present volume, and its companion volume *(Excavations at Sitagroi*, volume 2, forthcoming, UCLA Institute of Archaeology), both contain specialist studies which are presented in full with extensive documentation. Volume 1 introduces the project, its nature and development, the environmental studies—geomorphology, vegetational history, and the faunal report (the paleobotany will appear in the second volume)—studies of the settlement pattern, the culture sequence, and the figurine and pottery finds from phases I through V. Volume 2 continues the specialist studies with contributions focusing on the paleobotany, the ceramic technology and petrology, the chipped stone tools, the metal objects and evidence of metallurgy, and the weaving equipment. Also reported on in volume 2 are the many other finds such as shell remains, worked bone, ground and polished stone, beads of clay, stone, and shell, and miniature clay furniture, worked sherds, cylinder seals, *pintaderas* and counters, and miscellaneous clay objects. Concluding chapters of this second volume will review the internal and interregional links of prehistoric sites on the Drama Plain and will examine the Sitagroi settlement as it reflects prehistoric society. The account of the excavation itself is set out concisely in this first volume. Detailed descriptions of every level are not presented herein but can be found in the excavation notebooks deposited in the library of the British School of Archaeology at Athens along with a complete card inventory of the finds, while the original material is at the Philippoi Museum.

The excavations, which took place during the summers of 1968 and 1969 with a study season during 1970, were organized jointly by Dr. Marija Gimbutas, Professor of European Archaeology, University of California, Los Angeles, and Dr. Colin Renfrew, then of the University of Sheffield and now Disney Professor of Archaeology, Cambridge University; the latter directed in the field. Dr. Ernestine S. Elster, Director of Publications, UCLA Institute of Archaeology, served as registrar during the field seasons. The project was financed by grant GS-1949 from the National Science Foundation and by the University of Sheffield and the British Academy, sponsored by the British School of Archaeology at Athens, and authorized by the Greek Archaeological Service, whose representative, Dr. Chaido Koukouli-Chrysanthaki, Ephor of Antiquities for East Macedonia, offered much help and encouragement.

The excavation project is indebted to many individuals who assisted in the field or in the laboratory. Prominent among these must be the administrative director, Dr. David Hardy, who brought energetic organizational ability, linguistic fluency, and unflagging good humor to the field seasons. The excavation foreman in both field seasons, Giannis Papadopoulos, brought to the site many skills from his native Nea Nikomedeia.

We are grateful to our able excavation personnel, including the original owner of the site, Stoimenos Toutsios, Eleutherios Adelphidis, Savvas Georgiadis, Chrysostomos and Nikos Karapetis, Giorgos Konstantiniadis, Dimitris Koulidis, Andonis Lambrakis, Giannis and Giorgos Rendizis, Miltiades Simeonidis, Byron and Kostas Sotiriadis, Dimitrios Tachmatzidis,

Athanasios Toutsios, Angelios Toutsios, Stelios Toutsios, Giannis Tzerzelidis, and others from the villages of Sitagroi and Alistrati. The work of the vase menders Petros Petrakis and Stelios Giapetzopoulos was particularly important in view of the wealth of the material discovered. We are grateful not only for the participation of all these individuals but also for much hospitality and conviviality, not least on the annual feast at Argyroupolis to commemorate the Decapitation of John the Baptist.

Our site and finds assistants in 1968 included: Graeme Barker, Harriet Elster Berger, Ann Brown, Joan Carpenter, Richard Chambers, Robert K. Evans, Gillian Evans, Pat Forsyth, Elizabeth Gardner, John Hedges, Roger Howell, Jenifer Marriott Keighley, Michael Norton, Jane M. Renfrew, Cressida Ridley, Charles Schwartz, Andrew Sherratt, Elizabeth Slater, and Ken Wardle.

The site and finds assistants in 1969 were: Jo Berrand, Nancy Brandt, Bridget Cam, Joan Carpenter, Nancy Chao, Robert K. Evans, Anthea Ewbank, John Hedges, Roger Heydon, Marna Jones, John Leggatt, Jan Moore, Jenifer Marriott Keighley, Ann Mummery, Christine Pendleton, Jane M. Renfrew, Cressida Ridley, David Rudkin, Susan Rudkin, Stephen Shennan, Susan Lathbury Shennan, Andrew Sherratt, Bert Smoor, and Eugene Sterud.

During the 1969 excavation season the following participated in the sieving experiment organized by Sebastian Payne in collaboration with the late Eric Higgs: Matthew Alexander, Ben Bland, Rose Buxton, Mary Cunningham, Stephen Davies, Susan Davies, Helen Higgs, David Keighley, Daphne Lumley, Rosemary Payne, and Ursula Seton-Watson.

The finds assistants in 1970 included: Bridget Cam, Judy Campbell, Phil Catherall, Robert K. Evans, John Hedges, David Keighley, Jenifer Marriott Keighley, Lorraine Lightbody, and Ursula Seton-Watson.

A special debt of gratitude is due to those who produced the illustrations for this volume: the excavation architect, R. J. C. Wakeham, assisted by Alexander Forster; our indefatigable and gifted draftswoman, Gayle Wever, assisted by Daphne Hart; and our excavation photographer in 1969 and 1970, Peter Morley, assisted by his wife Zena and (in 1969) by Nancy Brandt. Kalman Konya is responsible for the figurine plates. In the 1968 season, photography was undertaken by David Plunket-Green. The Hon. Mrs. Cressida Ridley merits special mention, among other site supervisors, for her skillful supervision of the excavation of the deep sounding ZA.

In addition, nearly all the specialists who have contributed reports to this volume participated in at least one excavation season, as did also Judith Shackleton, Dr. Nicholas Shackleton, Dr. and Mrs. John Dixon, and Barry Thomas.

Among the visitors with a specialist knowledge who offered valuable comments were: Prof. George Bakalakis, Dr. Ida Bognar-Kutzian, Prof. John Cook, the late Prof. Jean Deshayes, Dr. David French, Sinclair Hood, Prof. G. I. Georgiev, Dr. Robert Rodden, Dr. Katerina Romiopoulou, Dr. Hans Suess, Dr. Joan Thompson, Dr. and Mrs. Peter Warren, the late Theodore Wertime, the late Dr. David Zimmerman, and the late R. W. Hutchinson, whose extensive knowledge of perhistoric Macedonia and cheerful encourgement were most welcome. The site survey was much aided by the participation of Demetrios Chariskos, Phylax for the plain of Drama, representing the Greek Archaeological Service.

We hope this excavation volume faithfully reflects the corporate nature of this project, something no mere listing of names can express. Our friends and co-workers in Alistrati and Sitagroi (with particular mention of the Adelphides, Mystrides, Photiades, Piperides, and Toutsios families) made fieldwork with them a truly enjoyable and interesting experience.

The preparation of this report, like the excavation, was made possible through the efforts of many groups and individuals. The editors are proud to recognize the National Endowment for the Humanities (grant no. RO-20566-83); the National Science Foundation (grant no. BNS-8303775); the J. Paul Getty Trust; and contributions from private donors: Sandy and Ernestine S. Elster, Los Angeles; I. D. Robertson, Texas; Louis and Paula Savett, Los Angeles; Malcolm Wiener, New York; and the Fellows of the Institute of Archaeology, UCLA.

As we neared the production stage, Frederick R. Waingrow, president of Petersen Publishing Company, Los Angeles, offered to contribute the typesetting capabilities of that company, without any of us realizing just how complicated was the undertaking. Our very special thanks to him for his generous offer and subsequently for his enormous patience, and that of James Krenek. During the typesetting process, we received expert guidance from members of the Petersen organization: Jean Kissell, Erwin Rosen, and Ralph Stevens. Mr. Stevens shepherded the work through to completion with unflagging good humor and also interested Kevin Walker of Anitec into making an in-kind contribution of considerable value to

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Finally, grateful acknowledgment is extended to those involved in the manuscript editing: at the University of Southampton, Todd Whitelaw, and our first organizer at UCLA, Elizabeth Jane Foster, who provided a diplomatic expertise which became a continuing guide. The final editing, copy marking, proofing, design, and layout have been the responsibility of the publications unit of the Institute of Archaeology at UCLA. Carol Leyba, Senior Editor, made the task manageable and frequently exciting; her involvement has been pivotal. Three remarkable editors joined us for this project: Beverly Godwin (an editor at Hughes Corporation, Los Angeles), Patricia Campbell Healy (out of retirement for *Sitagroi*), and Patricia Oliansky (editor, Undena Publications, Malibu); their contribution to this volume is inestimable. And finally, thanks to the editorial and production staff: Kimberly Borges, Christine Choe, Joseph Copado, Patricia Hickey, Brad Hwang, Matthew Jaffe, Gregory Oehler, and Timothy Seymour.

Colin Renfrew
Marija Gimbutas
Ernestine S. Elster

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Part 1

Cultural Sequence and Prehistoric Environment

1.
Northeastern Greece: The Archaeological Problem

Colin Renfrew

The excavations at Sitagroi were conceived in response to two major problems in European prehistory. For many years the rich "copper age" cultures of southeastern Europe—notably of Bulgaria, Romania, and Yugoslavia, that is, the region termed by Prof. Marija Gimbutas (1974b) "Old Europe"—were a particular focus of study (Gimbutas 1956; Renfrew 1969). It became clear that this region had been the home of prosperous farming cultures whose sedentary villages had, by a process of accretion, formed those conspicuous settlement mounds known in the Near East as *tells* and in Greece as *toumbas* or *maghoulas*. Not only did the pottery and other products suggest a measure of craft specialization, but the rich repertoire of figurines indicated a relatively developed cult practice. In addition, it was clear that copper metallurgy had developed early in this region, and its precocious emergence was of interest for the study of metallurgy in general. Yet, other than the systematic excavations of Dr. G. I. Georgiev at the great Bulgarian tell of Karanovo (Georgiev 1961), no major excavation bearing upon this period had been adequately published in recent decades. What was the basis, in terms of subsistence and local production, of this flourishing group of chalcolithic cultures, whose variety and accomplishment seemed more impressive not only than that of their neolithic predecessors but also of their bronze age successors? The first problem, then, was to investigate the nature of the cultures of this period at some suitable site where finds would be sufficiently abundant and where a coherent context could be established.

The second problem was chronological. Early excavations by Vasić at Vinča and the studies of Gordon Childe had established that the chalcolithic cultures in question—that is, the Vinča-Pločnik culture of Yugoslavia, the Gumelnitsa culture of Romania, and the Karanovo V-VI culture of Bulgaria—could be dated by virtue of their contacts with the Aegean world to the south. The first substantial use of metal in the Aegean was in the Aegean early bronze age, conventionally dated as beginning around 2700-2500 BC. It could therefore be concluded that the chalcolithic cultures in question were to be dated after that time. This was the view of such established authorities as Milojčić (1949) and Garašanin (1958) and such, indeed, remains the view of many scholars in central and southeastern Europe (e.g., Makkay 1975) to this day.

But a close examination of the supposed similarities in the pottery and other materials from the two regions did not support this equation (Renfrew 1965). Nor did the results of Georgiev's excavations at Karanovo, where it was the succeeding early bronze age levels that could be most appositely compared with Aegean early bronze age sites such as Troy. Finally, the emerging radiocarbon evidence from the two areas strengthened these doubts, reinforcing the suspicion that one of the major and basic interconnections sustaining the framework of European prehistory was altogether in error. I had

reached this conclusion on the basis of visits made to Bulgaria, Romania, and Yugoslavia in 1962 and 1966 (cf. Renfrew 1969), and Gimbutas had become increasingly impressed by the dynamism and originality of the cultures in question.

The case for ascribing a "long" chronology to the Balkan copper age, implying its temporal priority over the Aegean bronze age, was set out in a paper to the Prehistoric Society, delivered before the excavations at Sitagroi began (Renfrew 1969). There, the two alternative views of the chronological relationships were set out in tabular form (fig. 1.1), with the conventional view on the left. The alternative position, seen on the right, implied the autonomy and independence from Aegean or Near Eastern influence of many of the processes observed in the Balkan chalcolithic, including perhaps the development of copper metallurgy.

It was desirable to test the chronological equation by direct stratigraphic means, and the existence within the Aegean basin of materials characteristic of the Balkan copper age cultures seemed to offer the opportunity. Ever since the early excavations in East Macedonia, undertaken during and after World War I (cf. Heurtley 1939), it had been clear that materials related to those of the Balkans were to be found in north Greece. The site of Akropotamos had been excavated by Bakalakis and Mylonas in 1938 (Mylonas 1941), and Bakalakis had been active in recording a number of sites along the north Aegean coast (Bakalakis 1961), while Romiopoulou (1967) had recorded a number of sites including Laphrouda. Deshayes was at this time reopening investigations at Dikili Tash in the plain of Drama (Deshayes 1968, 1970, 1973; Daux 1968), and Garašanin and Dehn (1963) had published sherds from a number of sites in Macedonia and Thrace, drawing attention to their Balkan affinities. The existence of such material in the plain of Drama had indeed been known since the article by Welch (1919), but it was the careful work of French (1964) that first fully documented the nature and extent of the material observable on the surface of settlement mounds in the area.

During the summer of 1965 I had the opportunity to conduct a survey with Dr. Jane M. Renfrew of a number of sites in the area, including most of those visited and described by French. Graphite-painted ware with designs similar to those of the Bulgarian and Romanian Gumelnitsa culture was found at a site near Drama and at the location listed by French (1964:31) as Photolivos, also known as Toumba Alistratiou. The same site also yielded sherds, including the cylindrical leg of a footed bowl, resembling those of the rather earlier Veselinovo culture of Bulgaria and, in addition, several fragments which appeared to be of early bronze age date. There was clearly, then, the hope of a significant culture sequence at this prominent mound, which is most easily reached from the village of Sitagroi, by which name it was subsequently designated.

Here, then, was a site within the Aegean basin with seemingly abundant finds characteristic of the chalcolithic cultures of the Balkans. The possibility of a substantial stratigraphic succession suggested that excavation might directly resolve the chronological problem, with significant consequences for European prehistory. Radiocarbon samples from the site might, it was hoped, cast light on the apparent problems of the radiocarbon chronology. The prospect of abundant material from the copper age period suggested that good environmental and other evidence might be forthcoming to illuminate that interesting and problematical period of Balkan and Aegean prehistory.

The possibility of a major excavation of a prehistoric site in East Macedonia received warm encouragement from Greek colleagues, notably Prof. George Bakalakis, Dr. Katerina Romiopoulou, and Dr. Chaido Koukouli-Chrysanthaki. The possibility of a joint excavation involving students from the University of California, Los Angeles and from the University of Sheffield had already been raised by Prof. Gimbutas, and we therefore resolved to organize a project based on Sitagroi, where I would direct the excavation in the field. Following receipt of major support from the National Science Foundation, I was able to negotiate with the owner of the greater

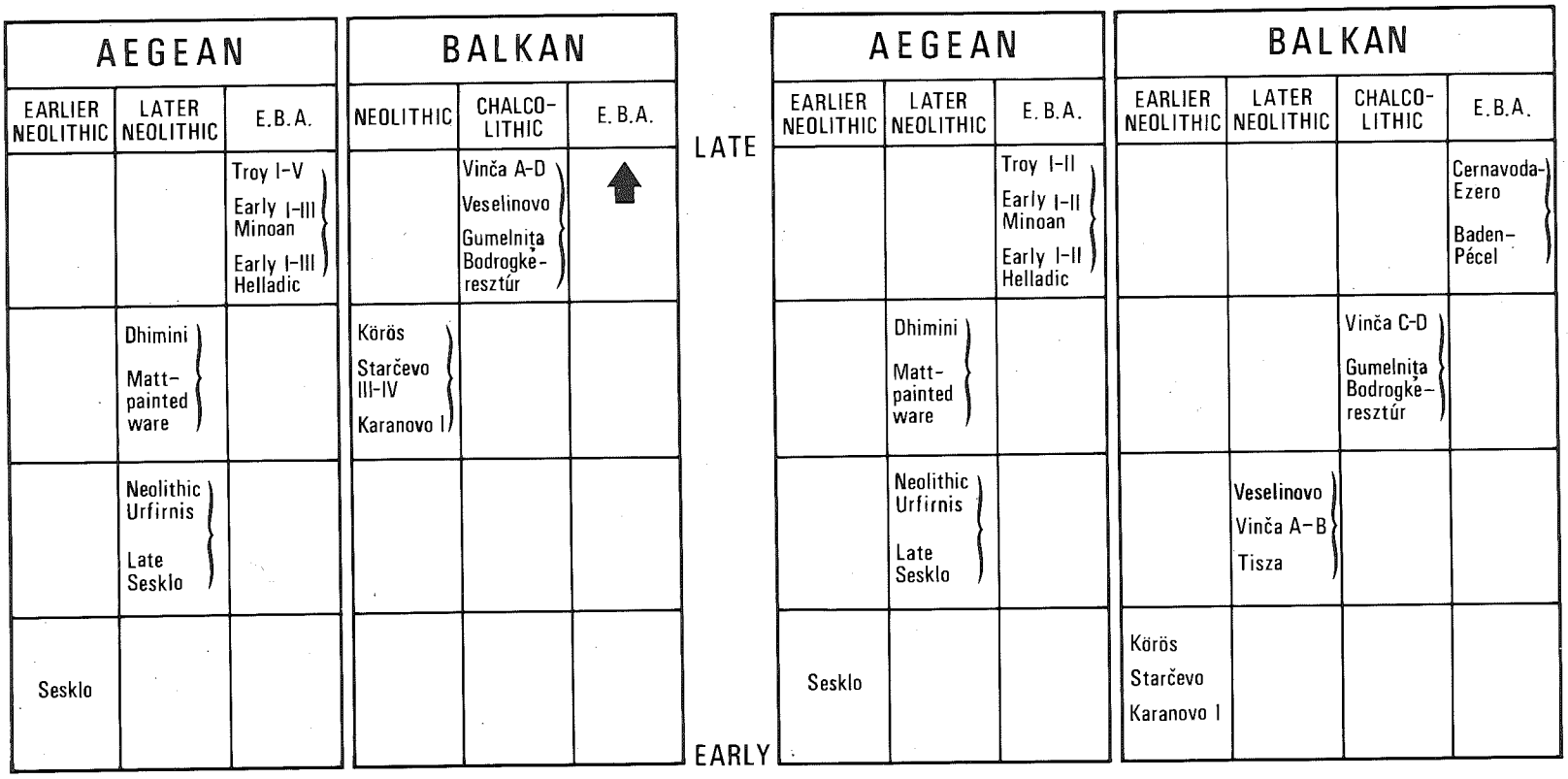


Figure 1.1. Relative chronology of the Aegean and the Balkans: (*left*) as conventionally represented in the traditional "diffusionist" view; (*right*) as advocated by the protagonists of autonomous Balkan development in the copper age, whose views the excavations at Sitagroi were designed to test.

part of the site, Stoimenos Toutsios of Alistrati, for its purchase (a necessary preliminary to excavation under Greek law). Excavations began on July 16, 1968, ending on August 30, and were resumed in 1969 (July 15 to September 2), followed by a study season in the summer of 1970. The development and progress of the project is outlined in the next chapter. Preceding that, here I will introduce some of the themes which were to preoccupy us in our work and which determined both the progress of the excavation and consequently the form of this report.

PREHISTORIC SETTLEMENT IN THE PLAIN OF DRAMA

Central and East Macedonia and Thrace (using these terms in the modern Greek administrative sense) constitute the fringe of the Balkan peninsula for over half its breadth, forming a narrow territory, on average some 70 km wide, separating the Aegean Sea from the Balkan lands to the north.

This land of the north Aegean seaboard is the terrestrial link between Anatolia and the Greek lands to the south, including Thessaly, Central Greece, and the Peloponnese. Likewise, it is the link area between these lands, together with the whole Aegean world, and the rich farmlands of the Lower Danube and of the Maritsa Valley. It is in the valley of the Maritsa (which empties into the Aegean as the Evros) that such important sites as Karanovo and Tell Azmak are found, although the area represented by the Gumelnitsa culture extends up to the Danube to cover effectively all the former Roman province of Thracia and, indeed, north into Romania where the type site itself is located.

The way from the Greek lands of the Aegean north to the Balkans is blocked by the Rhodope Mountains, and the prominent relief divides southeast Europe into a number of relatively small valleys and plains, a circumstance that partly explains the "Balkanization" of the area in the political history of the nineteenth and early twentieth centuries. This region constitutes an important crossroads of human communication and occupation, as it has since early prehistoric times. It is an area where east meets west (as the centuries of Ottoman domination remind us) and where north meets south, and whose climate and vegetation are transitional between the Mediterranean and central European types.

A main line of communication from the Aegean to the Danubian basin is the valley of the Axiós River, which empties into the gulf headed by the modern city of Thessaloniki. In its upper reaches, within Yugoslavia, the river is known as the Vardar, and its tributaries reach to within 20 km of those of the Morava, which runs north to join with the middle Danube some 50 km east of modern Belgrade and prehistoric Vinča. The Vardar-Morava route, followed by modern rail and road communications, was recognized by Gordon Childe as a key thoroughfare through which prehistoric influences passed from the Aegean to the Danube Valley. His insights have been followed by several more recent discoveries, including the early neolithic site of Nea Nikomedeia in the plain of the Aliákmon River in Central Macedonia (Rodden 1965) and several early sites in Yugoslavia, including Anza (Gimbutas 1976), which more clearly document the connections between south and north (Nandris 1970). Another route north is farther east, running from modern Serrai up the valley of the river Strymon (in Bulgarian, the Struma) toward Sofia. There are several other paths over the mountains, long used by transhumant herdsmen, the nomads of the Balkans (cf. Wace and Thompson 1914).

The plain of Drama lies in this relatively narrow strip of land where the Balkans and the Aegean meet (fig. 1.2). It is one of many well-defined geographical units (British Naval Intelligence Division 1945:111) in this region of mountains and plains, sharply defined by the fractures which separated the various blocks in very recent geological times (fig. 1.3). Somewhat analogous, small natural subregions are common in Yugoslavia, the *polje* (British Naval Intelligence Division 1944:50), and such areas make very suitable units of analysis for the archaeologist, focusing his attention upon the settlement

Figure 1.2. The position of Sitagroi in southeast Europe.

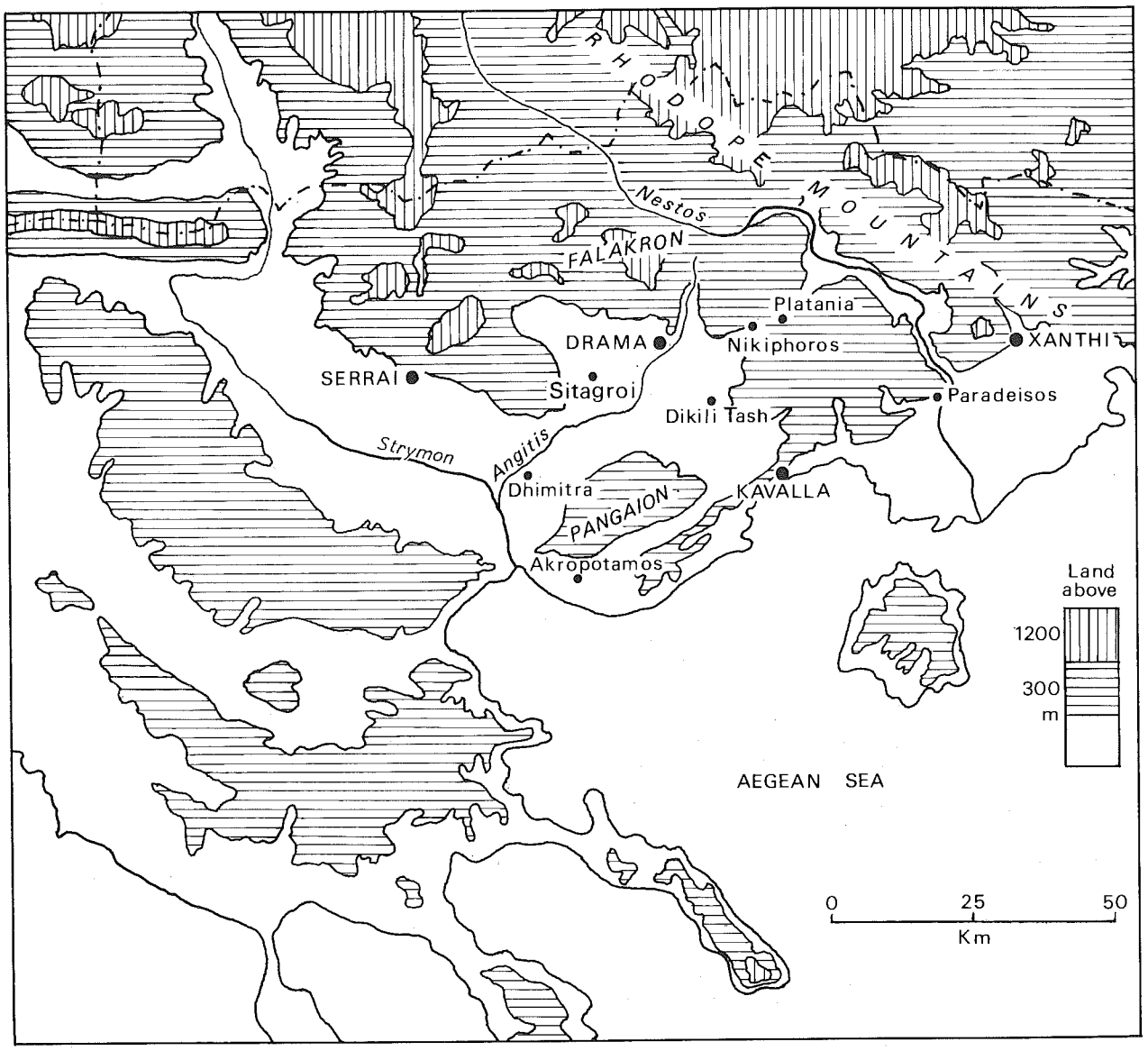


Figure 1.3. Local subregions of the north Aegean and southern Balkans.

and subsistence system within the plain and upon the inputs and outputs following the lines of communication between it and its neighbors.

The plain of Drama is seen in plate I:1, looking east from the foothills below Alistrati. It is enclosed by a frame of mountains and hills: to the north by the Rhodope Mountains, to the south by Mount Pangaion, to the east behind the seaport of Kavalla by the hills which shut off the plain from the sea, and to the west by the steep hills on which sits the modern town of Alistrati and through which the river Angitis, which drains the plain, has cut to join the Strymon. The plain thus makes a logical unit of study, and it was resolved to carry out a site survey to examine the changing patterns of settlement upon it and its foothills in the prehistoric period. The results are set out by Dr. Donald Davidson in chapter 3; the locations of the sites recognized are seen in figure 3.2. The nature of the settlement pattern is considered by Dr. Brian Blouet in chapter 6.

The question of geomorphological change in geologically recent times is of great importance for our understanding of early settlement patterns. A major step in understanding the chronology of such changes was taken by Dr. Claudio Vita-Finzi with his recognition of an Older and a Younger Fill. His comments on the plain of Drama as well as on the exploitative potential of the site of Sitagroi itself, written in collaboration with the late Eric Higgs, form the appendix to chapter 6. It was in part the work of Vita-Finzi that encouraged us to invite Davidson to undertake further geomorphological work and to examine the locations of a number of the prehistoric sites.

THE TELL OF SITAGROI AND ITS FORMATION

The tell of Sitagroi lies on the left bank of the Angitis River some 2 km south of the bridge that carries the road from Alistrati to Drama. Its location is seen in figures 3.2 and 3.4, and the mound is seen before excavation in plate I:2. The factors that led to its positioning are implicit in the discussion by Higgs and Vita-Finzi and are brought out in more detail in Davidson's analysis, which is based on observations in the excavation trenches and in additional soundings carried out to establish the geomorphological relationships.

One very basic question presented by this and other tells is, quite simply, how was it formed? Unlike many Near Eastern tells, those of southeastern Europe do not yield traces of mud bricks, and the evidence is clear that the houses were built with a timber frame, plastered with mud in the technique called by the Arabs *tauf* and by the French *pisé*. Clearly the tell was in part formed by the collapse of such structures. But to what extent was the result a product of erosion and to what degree formed by aggradation, perhaps in part from windblown dust? It is remarkable that such questions appear never to have been discussed in detail before now. Thus for the first time, then, a detailed geomorphological analysis of such a site was undertaken by Davidson using the sections through the mound at Sitagroi (with the stratigraphy described by B. Thomas in chap. 3).

ENVIRONMENT AND SUBSISTENCE

At first sight the fertile plain of Drama today resembles the great plains of Thessaly and Central Macedonia. Moreover, the density of settlement mounds clearly indicates that like these plains, and like the Maritsa Valley of Bulgaria, Drama was densely settled in prehistoric times. Its recent history has not been so happy, however, because of the prevalence of malaria. The marshy lands surrounding the lake of Philippoi, and the lake itself, were easy breeding grounds for the *Anopheles* mosquito whose attentions were so effective as to hospitalize 37% of the British army in Macedonia in the campaign of 1918 and to kill in the first two or three years an estimated 10% of the refugees who settled in the area after 1922.

Today, however, the plain is well drained, the irrigated fields are producing abundant tobacco, and malaria is no longer a serious problem. Until this drainage took place in the years following World War I, much of the population exploiting

the western end of the plain lived high above it in the town of Alistrati, descending to cultivate it in their characteristic Macedonian carts. Many of our workmen came down daily in this way, including the former owner from whom we acquired the site. The settlement at the village of Sitagroi itself dates from the time of the great exchange of population in 1922, most of the inhabitants being refugees from the Greek settlements of Asia Minor. Their Pontiac dialect, songs, and dances are characteristic of village life today, just as are those of the village of Nea Nikomedeia in Central Macedonia.

The lake of Philippoi, whose drainage has so much improved health in the area, offers a major resource for understanding the changing environment. It contains levels of peat and sediment suitable for pollen analysis to a depth of no less than 100 m (Wijmstra 1969). So great a depth is the result of tectonic downward movement of the block supporting the plain, this downward movement roughly keeping pace with sedimentation in the lake and manifesting itself in earthquakes like that which liberated Saint Paul from his prison at Philippoi.

One major aim of the environmental project associated with our excavations was the reconstruction of the recent (i.e., post-Pleistocene) vegetational history. The very informative results of the palynological researches of Dr. Judith Turner and James Greig are reported in chapter 4; informative also is the analysis of the charcoal remains by Dr. Oliver Rackham (app. A) as it reflects intriguingly on timber technology.

A second objective was to relate the long sequence of human occupation, represented by the 11 m of deposit at the mound of Sitagroi, to the pattern of environmental change by a thorough study of early subsistence. This was made possible by a flotation program undertaken by Dr. J. M. Renfrew for the recovery of plant material (forthcoming in vol. 2), by Dr. Sándor Bökönyi's study of the faunal remains, with the identification of the bird bones by Dr. D. Jánossy (chap. 5), and from the supplementary information yielded by Sebastian Payne's use of water sieving (Payne 1975) on a sample column of material from the site. Together these offer a clear picture of the changing subsistence base at Sitagroi over some three millennia of occupation.

EARLY TECHNOLOGY AND CRAFT SPECIALIZATION

The developing technology representing man's adaptation to his environment is always an important theme of prehistoric archaeology. This aspect of the work at Sitagroi was made doubly important by the clear suggestion, indicated earlier, that the precocious copper working of the Balkans might be a local development. If this were so, indications of the relevant innovations and processes might be reflected at Sitagroi. On the other hand, if the basic metallurgical techniques were transmitted to the Balkans from the Near East via the Aegean, as most European scholars have argued since the work of Montelius and Childe, a site such as Sitagroi, located in the Aegean basin yet with clear Balkan links, should yield crucial evidence.

In any event, evidence of metalworking was found from early levels. Dr. Elizabeth Slater's specialist comments on this are presented in volume 2. Yet metallurgy is only one aspect of the developing pyrotechnology of the later neolithic, as other findings indicate. Several bread ovens were exposed which, like those at contemporary sites in the Balkans, show great sophistication in construction. Then, too, pyrotechnology is seen in the pottery itself, which is abundantly represented in all levels of the site. From the outset of the excavation Dr. Elizabeth Gardner was concerned with the technical aspects of pottery production at Sitagroi, and her findings are set out in volume 2. Evidence for the organization of pottery manufacture is contained also in the design motifs which, in the painted wares especially, show great variability. These have been considered by the specialists reporting on the pottery: Jenifer Marriott Keighley (chap. 11), Dr. Robert K. Evans (chap. 12), and Dr. Andrew Sherratt (chap. 13).

Other aspects of the technology of the inhabitants are touched upon in nearly every chapter,

including those dealing with subsistence. The weaving equipment and especially the very early textile impressions from the site (reported on in vol. 2) document the development of another craft and must be considered in the context of Bökönyi's comments on the animal bones (chap. 5).

EXCHANGE MECHANISMS

The internal economy of Sitagroi is represented above all by the subsistence remains. The bulk of the food produced would have come from the plain of Drama and the surrounding hills, although the possible importance of transhumance should not be overlooked. At the same time, fishbones and marine molluscs are a reminder that the sea was only some 50 km distant down the Angitis River, or southeast across the plain and over the hills to the bay of Kavalla.

A major focus of the excavation, as discussed above, was the question of contacts between the Aegean and the Balkans, and perhaps of both with the Near East. The whole question of imported or exported materials was therefore of special interest, as was the extent to which the material culture reflected cultural interactions with neighboring or more distant areas.

The latter consideration is of course a traditional one in the study of prehistoric archaeology, but we were setting out to consider it without some of the diffusionist preconceptions of many of our predecessors. So the clay "cylinder seals" found are not automatically regarded as the result of contacts with the Near East, any more than the variety of figurines discussed in chapter 9 by Dr. Gimbutas are considered of Oriental inspiration. In the pottery, however, certain fabrics undoubtedly shared much with their neighbors both in form and decoration. This is most evident in the pottery discussed by Evans in chapter 12 in which he demonstrates that the affinities of phase III pottery lie mainly with the north. This relationship is also reflected in Dr. Ernestine S. Elster's study of the tripods (chap. 10); the earliest artifacts in this shape are of a style first observed in Karanovo I-II (Georgiev 1961). Pottery of the succeeding periods, discussed in chapter 13 by Sherratt, reflects in part affinities with the cultures of northwestern Anatolia to the east.

Two materials offer more precise information by means of characterization study. The few finds of obsidian allowed an ascription to source, and the abundant finds of *Spondylus* shell used for pendants and bracelets prove, like those found in Bulgaria, to be of certain Aegean origin (Shackleton and Renfrew 1970). For Sitagroi itself, that is not an unexpected conclusion. The quantity of shell finds at Sitagroi (discussed by Dr. Nicholas Shackleton in vol. 2)—greater than at any other Aegean site yet excavated—offers a hint at the source of the *Spondylus* which found its way north, by some exchange mechanism, into the Balkans.

ART AND CULT

One of the most remarkable features of the Balkan copper age cultures is the wealth of artistic expression. This is clearly seen in the pottery, already mentioned, whose great variety suggests the hope of conclusions about the organization of production, since it may ultimately prove possible to recognize the work of individual hands. The great range of forms offered by the terracotta figurines is likewise of considerable interest to the student of art, and the close similarity between many of the Sitagroi examples and those of the Gumelnitsa (Karanovo VI) culture is at once obvious.

Clearly, however, these small objects were not merely toys or playthings or objets d'art created purely for aesthetic reasons. As Gimbutas persuasively argues in chapter 9, they can be interpreted as objects used in cult observances (as perhaps can several other classes of artifact). If it is accepted that some of them represent deities or other objects of veneration, then the close analysis of their forms has much to offer for our understanding of the cult or religion of the time. Moreover, comparison of the Sitagroi material with that from neighboring sites such as Dikili

Tash, and with more distant locations of the Karanovo VI culture such as at Căscioarele and at Gumelnitsa, may hint at patterns of shared belief across quite wide areas, as well as at local variations.

The great wealth of finds of this class at Sitagroi, nearly all in well-stratified contexts (although unfortunately not in informative *functional* contexts), greatly adds to the repertoire of such material both from Greece and from the Balkans. Ultimately, our understanding of the adaptation of these people will only prove satisfactory when something is learned of their intellectual and cognitive equipment for dealing with the world, in addition to such activities as subsistence production. The great variety in the repertoire of sites such as Sitagroi, along with others of the period in the Balkan peninsula, offers unusual scope for such investigations.

AIMS OF THE REPORT

The previous paragraphs indicate some of the concerns that led to the conception of the Sitagroi project and the initiation of the activities reported on here. The project design thus comprises objectives that were essentially historical—investigating the largely unknown culture sequence of the area and establishing chronological relationships with neighboring areas—and others that were broadly processual. In particular, we were concerned to trace the relationship between changing environment—both climatic/vegetational and geomorphological/pedological—and the exploitation of that environment by the human population as seen in the pattern of settlement, and the changing spectrum of subsistence as reflected in plant crops and animal husbandry. A second processual concern was to investigate the developing technology of the area, with particular reference to pyrotechnology (including metallurgy), in relation to subsistence and exchange.

One ideal objective, which should here be acknowledged although it was scarcely attained, was prompted by the success of Bulgarian archaeologists in excavating entire village settlements at sites such as Tell Azmak. There, during 1962, I had the privilege of visiting Georgiev's excavation and seeing the complete settlement plan of a village of the early neolithic period (Karanovo I-II) laid out, with the lower walls and interior fittings (oven, grindstones, etc.) of each house clearly visible. If the contents of each house could be recovered in situ and published in detail, this would for the first time yield valuable information about the social structure of village society of the period. The opportunities would be commensurately great in the copper age, for here the variety in the pottery and the possibility of recognizing the handiwork of individual potters would allow researchers to assess the organization of production and the degree of craft specialization on a house-to-house basis. As discussed below, structures at Sitagroi proved very difficult to recognize except in cases, such as that of the Burnt House, where they had been destroyed by fire. Such is likewise the experience of Bulgarian excavators. Moreover, the considerable overburden of early bronze age material at Sitagroi was not conducive to the area excavation of the underlying copper age levels. That ideal objective, therefore, remains to be fulfilled. We did not attain it, nor have excavators elsewhere, who, while more fortunate in the preservation of structures at their sites, have not fully exploited the opportunity by the complete recording and publication of the finds.

In general, it would not be accurate to say that we dug "to test hypotheses," fashionable though that undertaking may be. One major hypothesis—that the Balkan copper age cultures antedated their supposed Aegean predecessors—was, as will be seen below, amply confirmed. There, perhaps, is as clear a piece of hypothesis verification as one may hope an excavation to produce. But the more interesting questions, some of them indicated above, could not at the outset be formulated in the context of a ready-made proposition to offer for verification. That we operated within a specific conceptual framework will be seen from the foregoing, and in one area of the site we deliberately implemented an excavation strategy that would maximize the recovery of figurines in view of the potential infor-

mation to be extracted from that class of material: a deliberate and localized sampling strategy. Our intention was to gather data falling within a range of categories of information and to present a well-documented record of our finds.

The very wealth of material found has considerably delayed publication. It should be noted that many of the chapters here, notably those dealing with environmental matters, were completed shortly after the excavation and have not been substantially altered during the editorial process. It seems appropriate to conclude this introduction with a firm statement of belief in the need to give a well-documented account, appropriately illustrated, of the finds of an excavation. Hypothesis testing is a valuable undertaking, but it must be preceded by hypothesis formulation, which in turn can only be undertaken on the basis of data relating to the field in question. Such data only become available, to allow interpretation or hypothesis formation, when they are published in sufficient detail that others may become familiar with and hence use them. The problem of collecting and presenting evidence that will prove useful in the future, allowing the formulation and even testing of theories not yet imagined, remains an unsolved one. At what point does the publication and illustration of yet further finds amount to no more than the repetition of redundant data? This was a question raised during our work by the enormous bulk of sieved residue awaiting sorting; a measure of sampling inevitably imposed itself upon the sieving project.

A necessary first step must certainly be the publication of a representative selection of the material found, which becomes an inescapable duty at a site such as Sitagroi where the culture sequence was unknown before we began and the material assemblages were suspected only on the basis of surface finds. We went to the site with a number of problems, solved some and left others unresolved. But it may well be that a more lasting contribution than a list of hypotheses either rejected or provisionally verified will be the clear account of the material found, which is here reported for the north Aegean area for the first time.

2.
Development of the Project
Colin Renfrew

The Site

The general aims of the Sitagroi project may be described as both historical and processual. A key historical problem concerned the chronological relationship between the cultures of the Aegean and the Balkans. This could only be convincingly resolved by establishing reliable stratigraphic relationships in this important intermediate area of East Macedonia. Some of the processual questions, notably those focusing on change and hence requiring a diachronic perspective, likewise demanded a sound stratigraphic sequence in order to yield a series of well-dated samples giving environmental as well as cultural information. Other questions demanded a contextual approach: the study of relationships within structures of a single time period and between different sites of the same period.

The broad geographical factors described earlier determined the choice of East Macedonia, where material related to the copper age cultures of Bulgaria and Romania—the Karanovo VI, Gumelnitsa complex—could be found situated within the Aegean basin. Earlier site surveys and my own fieldwork in 1965 showed the plain of Drama to be richest in the relevant material, notably in graphite-painted ware. Moreover, the plain offered itself as a suitable subunit for environmental study and for settlement survey.

The toumba near Sitagroi, which French (1964:31) had termed "Photolivos" (a designation followed during our first season and for the marking of finds) seemed the most promising on the basis of my 1965 sherd collection. It yielded abundant material of Gumelnitsa type; and plain wares with tunnel lugs resembling material of the Macedonian early bronze age published by Heurtley (1939), which should be later; and also indications of an earlier phase, perhaps related to the Bulgarian Veselinovo culture.

In the spring of 1968 I visited the site to negotiate the purchase of land where excavation was to take place. Under Greek law an excavation permit is issued by the Greek Archaeological Service only when the land to be excavated belongs to the state. When the land is in private hands, the excavator must purchase the land and transfer it to the state. Thus a tract of land was purchased measuring 130 m east-west and 40 m north-south and running westward from a point east of the summit of the mound down to the foot of the slope at the west, to a point close to the bed of the Angitis River as it was prior to its dredging in about 1939. This tract was chosen since it would allow us to investigate a section of the mound from the center to the perimeter.

The first excavation season began on July 16, 1968. The excavation base had been established in the village of Sitagroi, and accommodations were obtained in village houses available for rent. The excavation workroom was established (through the kindness of the headmaster of the school) in an unoccupied building, formerly the cookhouse, adjacent to the school. As the quantity of finds requiring storage increased, a large building designed for drying tobacco was rented as an *apotheke*, and further small rooms were

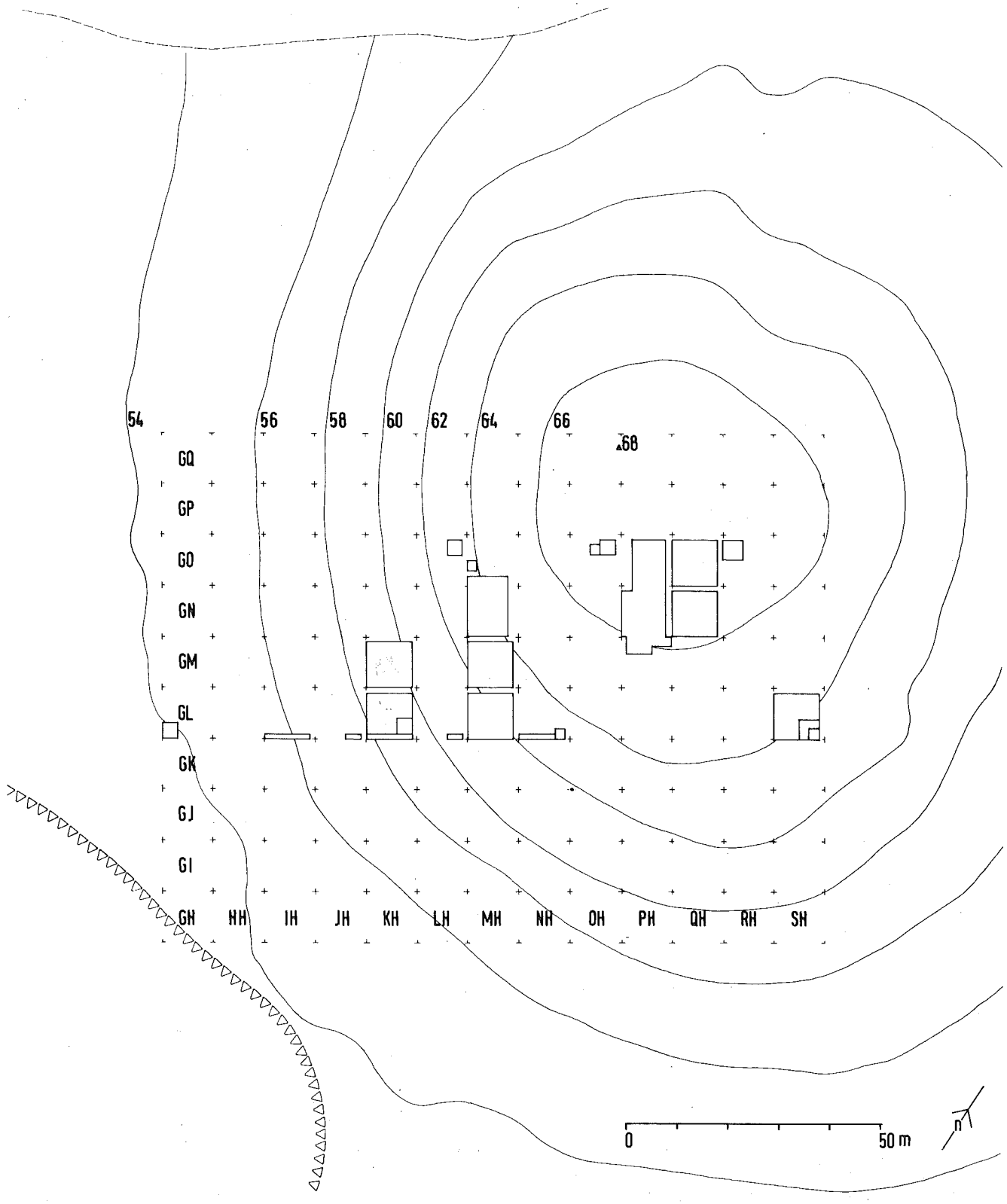


Figure 2.1. Contour plan of the mound at Sitagroi (height in meters above sea level) showing the grid of 10 m squares and the excavated areas.

rented for study of the faunal and botanical remains and the processing of sieved residues.

Since the mound had been under cultivation for several seasons, we thought it desirable to derive the maximum information from surface indications. The surface of our tract was therefore shallow-plowed, and a grid of 10-m squares was set up. A surface collection was then taken of all visible material (sherds, shells, bones, etc.). The collection was made in 5-m squares within the overall grid. It became clear at once that the ceramic finds at the top of the site were predominantly of plain burnished ware, resembling known material of the Macedonian early bronze age. In squares ML and MM of the grid, abundant Graphite-painted ware characteristic of the Balkan chalcolithic complex was found.

A contour plan of the mound (fig. 2.1) was prepared. It indicates the grid of 10-m squares, orientated to lie along the major axis of the land purchased. Grid north (in general, designation north refers to grid north) was consequently, in 1969, 32° west of magnetic north (approximately 30° west of true north). An arbitrary origin, square AA, was designated to the southwest of the site, and 10-m squares were designated by a two-letter code, the first letter indicating distance east and the second distance north from the origin. The summit of the mound with its triangulation column, at a height of 68 m above sea level, lies in grid square OQ, approximately 9.0 m east and 5.5 m north of its southwest corner.

The land purchased by the Sitagroi project runs 130 m east and 40 m north from the southwest corner of square GL. It thus comprises squares GL to SL, GM to SM, GN to SN, and GO to SO.

EXCAVATION STRATEGY

The first objective was stratigraphic: to obtain as full a record as possible of the culture sequence represented by the site. The second was areal: to undertake area excavations in levels of as many phases as possible in order to locate structures with their contents in situ.

The strategy to fulfill the first objective was simple. First, a vertical sounding was to be excavated from the summit of the mound down to the natural soil at its base. The highest point of the land acquired by the project lay in square OO, and a stratigraphic sounding measuring 3 m x 3 m was begun here. It was found convenient to have a separate designation for excavation trenches, such as soundings, which were not simply area excavations following the 10-m grid. These trenches were given a designation prefixed by the letter Z. The deep sounding was therefore designated ZA.

The excavation of ZA was one of the major undertakings of the first season, and it was completed before that season ended on August 30. One could not, of course, assume that the record it would give would be a complete one for the sequence of occupation at the site, but its 11-m succession of levels was a valuable first indication of the stratigraphy.

In order to have a second and independent record of the stratigraphic sequence, deep soundings were undertaken along a line running east-west at the southernmost extreme of the project's land, that is, along the south side of squares IL, JL, etc., up to OL (fig. 2.2; pl. II:1). Natural soil was reached in squares JL and KL, as it had been in ZA. The later phases of the site were not represented in the lower, more westerly trenches but were better represented to the east in OL, although even here materials of the late phase, well seen in ZA, were missing.

It was hoped that the sequence of trenches running up the mound would offer a sequence against which that of ZA could be correlated, and so indeed it proved. Of course, the assumption is not warranted that a series of trenches running up the slope of a tell gives an adequate reflection of the stratigraphic succession at the interior; many earlier tell excavations have been justly criticized for acting on an a priori belief that this must be so. However, at Sitagroi, the levels of each major phase do in general run approximately horizontally (fig. 2.3), and the ZA sequence correlates well with that from trenches IL to OL.

A major effort was made in the 1968 season to ensure that the finds from these stratigraphic

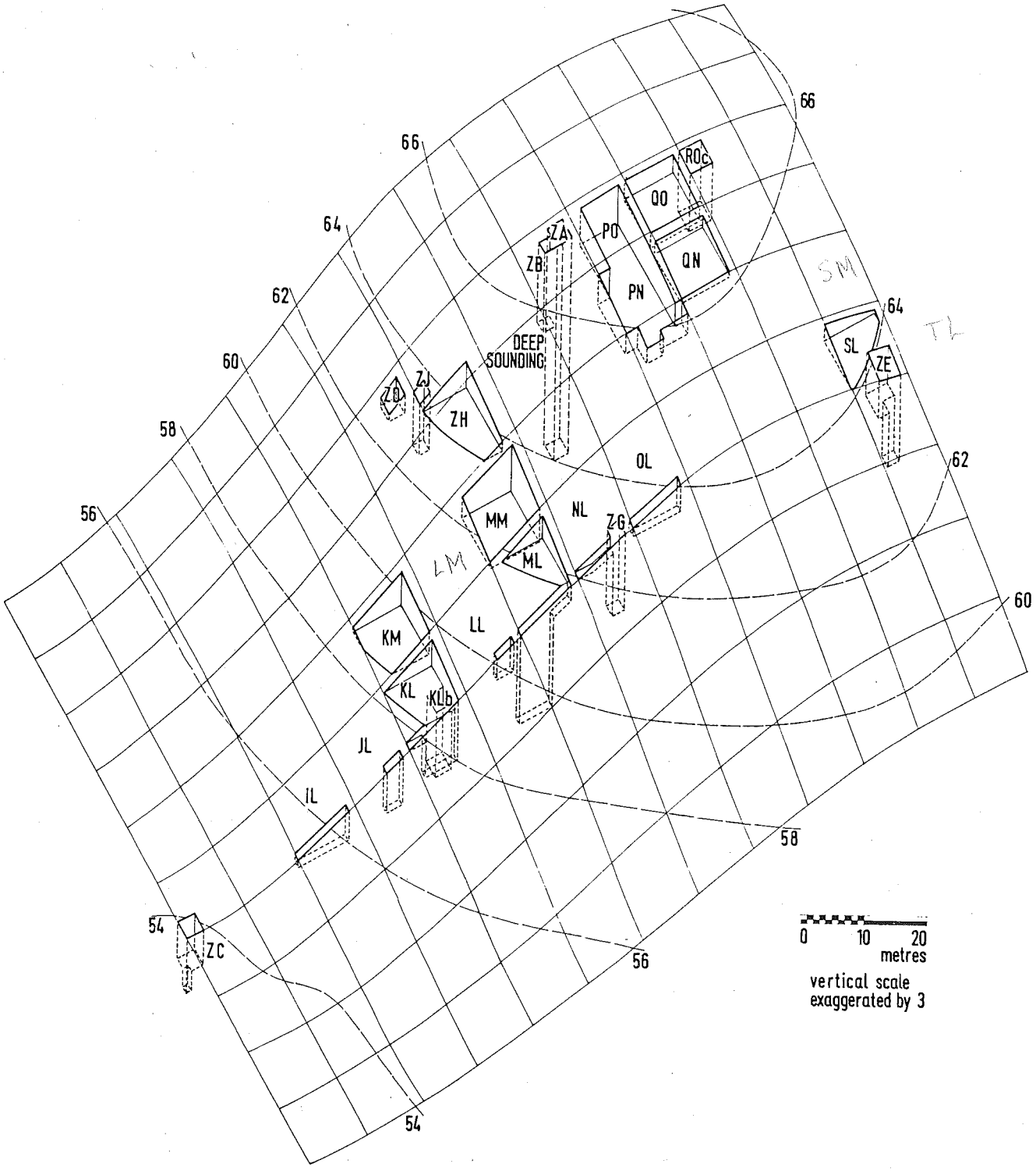


Figure 2.2. Axonometric view of the excavation area at Sitagroi indicating nomenclature of the excavated trenches.

soundings, particularly the pottery, were rapidly washed and studied. The study was a quantitative one, based both on fabrics and shapes, and it rapidly allowed a division of the sequence into five major phases. The material resembling that of the Balkan Gumelnitsa culture fell within phase III. The division into phases, as well as the absolute chronology, is discussed in chapter 7. Phase V was subsequently subdivided into phases Va and Vb.

In figure 2.3 the distribution of strata from these five phases in different excavation areas of the site is shown diagrammatically. The upper part of the drawing shows a diagrammatic section of the tell along the south side of squares IL to SL, seen from the north, with the vertical scale exaggerated by a factor of two. Vertical relationships are accurately represented, and ZA is projected onto this line from its position some 40 m to the north (trench ZG is within grid square NL). The disposition of strata of the successive phases, as defined by their ceramic contents, is shown. In the lower part of the drawing the same trenches are shown at a larger scale (which is now the same vertically as horizontally). Their horizontal positions are rearranged for the drawing, but vertical relationships are accurately maintained. This presents the structure of the mound in an effective way. The stratigraphic objective was thus satisfactorily fulfilled.

The aim of recovering structural remains and their associated materials over a fairly wide area obviously required a sufficiently large horizontal space to permit an area excavation. This could only be obtained, in levels near the surface, at the summit of the mound. The four 10-m squares PN, PO, QN, and QO were therefore opened, and their investigation occupied a large proportion of the project's resources during the 1968 and 1969 seasons. The remains of a long house with apsidal end could be discerned in the strata assigned to phase Vb. Beneath these a further, shorter, apse-ended house was found. It had been destroyed by fire with its contents, and the walls and floor were very clear. This Burnt House of phase Va was the principal structure recovered from the Sitagroi excavations.

Burials assignable to the first millennium AD were found in graves cut into the levels of phase V in this area. They are described in chapter 8.

Two further areas near the summit, SL and ZH, were opened in order to expose more material from phases IV and early V. In addition, a 4-m square within RO was opened to provide better stratigraphic control for phases IV and V.

To open fairly large expanses of earlier phases without completely removing a deep overburden of later material, it was necessary to move lower down the mound, to levels indicated from the results of soundings in the narrow trenches at the south side of squares KL and ML. Excavation was therefore undertaken in squares MM and ML to reveal levels pertaining to phase III, and in squares KM and KL for levels in phase II. In these areas it was difficult to recognize features with sufficient facility to permit the coherent excavation of complete structures such as houses. Indeed, we were only entirely successful in the case of the Burnt House of phase Va, in square PO, and it became clear that structures made of pisé or tauf could only be recognized with ease when they were burned. This point is further discussed below.

A third requirement was to obtain well-dated samples for environmental and other studies, and this was in part fulfilled by the strategy of stratigraphic excavation described above. Different collection techniques were required, however, for different classes of sample, and these are discussed under the heading of "Excavation Procedure" which follows. Like the first objective, this one was amply fulfilled. The absolute chronology was established by a long series of radiocarbon dates, with samples from every phase on the site. Considerable care was taken with the collection of samples and the selection of suitable and well-stratified material. The cooperation of the radiocarbon laboratories of Berlin and of the British Museum was assured through the collaboration of Dr. G. Kohl with Dr. Hans Quitta, and Richard Burleigh, respectively, and a measure of statistical control was made possible by the dating of divided samples, half going to each laboratory. The results, which were promptly published (Renfrew 1971), are presented in chapter 7, with the addition of two unpublished analyses from the La Jolla laboratory, due to the kindness of Dr. Hans Suess.

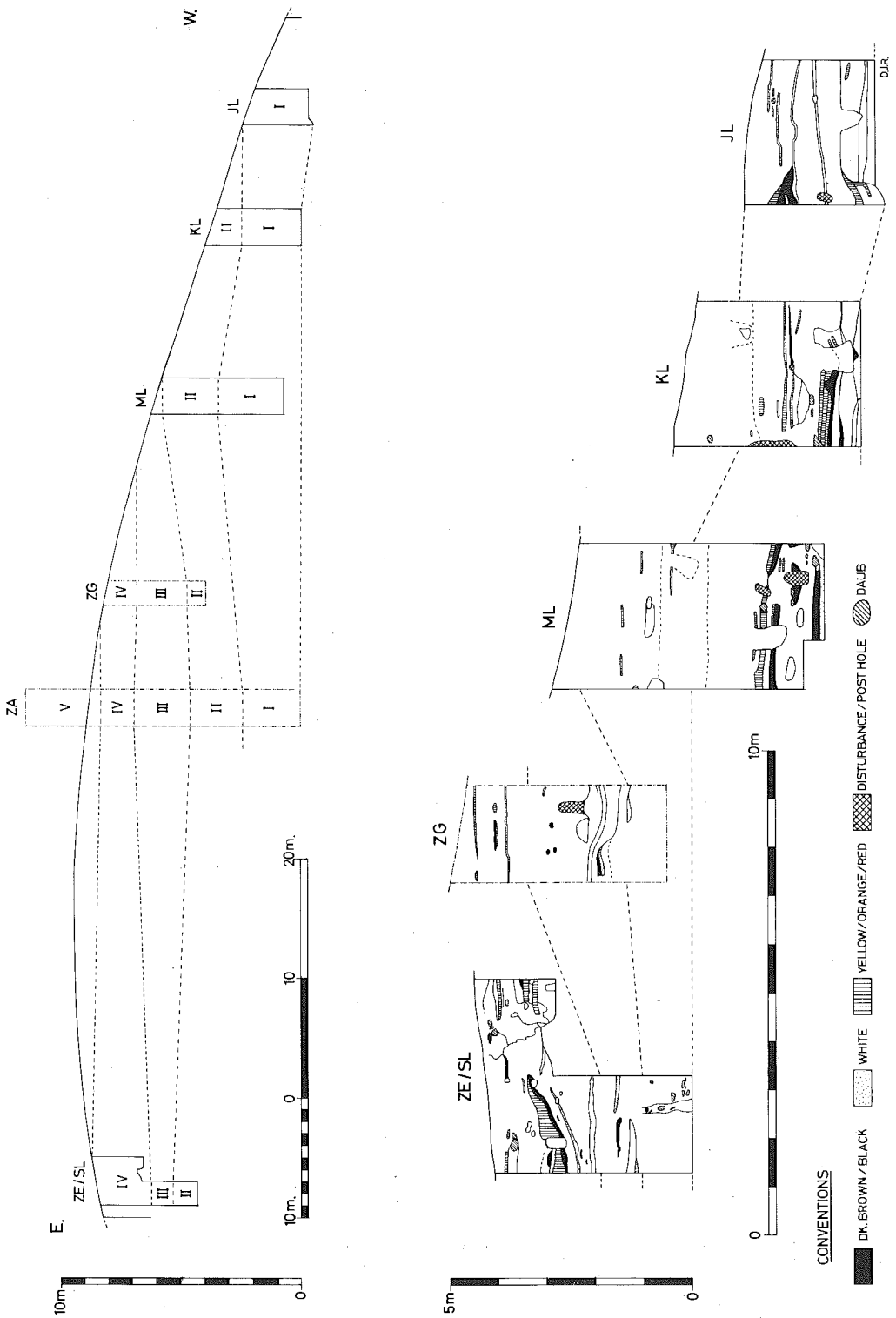


Figure 2.3. Absolute vertical relationships in the excavation trenches along the east-west transect SL to JL. On the upper diagram, the trenches are shown with indications of the chronological phases established in chapter 7. In the lower diagram, sketch sections are shown of the excavated trenches, with the absolute vertical relationships preserved.

EXCAVATION PROCEDURE

The grid layout has been described above, and detailed information concerning the position of individual squares and trenches is given in chapter 8. Initially, the intention was to work in 10-m squares, leaving a balk of 1 m at the north and east sides and thus an excavated area 9 m square. In some cases it was convenient to work within a smaller area, and in such cases the 10-m square was divided into four 5-m squares. These were designated "a," "b," "c," and "d," so that KLa represented the southwestern quarter of square KL, KLb the southeastern quarter, KLc the northwestern quarter, and KLd the northeastern. One-meter balks were again left at the north and east sides so that the actual excavated area was 4 m x 4 m in each case.

As referred to above, a series of trenches of other dimensions was also excavated, designated ZA, ZB, and so on; the prefix Z does not indicate grid position but rather sounding (or other) trench.

The essential principle of stratigraphic excavation is of course to excavate in natural layers or strata, which need not necessarily run horizontally. This principle entails that later layers be removed in their entirety before earlier ones are begun, except when special procedures are being followed for a particular feature. Thus a pit cutting into deeper levels will be excavated before any of those strata are removed, even though they are much higher (in vertical position) than most of the pit filling. At the same time, it proved in some cases very difficult to recognize distinctions between layers, and it was occasionally necessary to excavate in arbitrary levels of between 5 cm and 10 cm in depth.

The basic recording unit for the site is the stratigraphic layer within the relevant square or trench. KLc layer 23, or ZA layer 57, are thus specific stratigraphic units, recorded in the trench supervisor's notebook; pottery and bone were recorded in this fashion, the layer number being enclosed within a triangle on labels and in marking finds. Every new excavated stratum, however restricted in area and whether observed or arbitrary, received a new level (layer) number.

At the same time, a three-dimensional recording system was used for structural features and for finds in the category of "special find." For each excavated square, the datum point lies at its southwest corner, and the three-position coordinates refer to distance east of the peg x, distance north from the peg x, and depth below an arbitrary point on the peg (whose depth below the site datum was separately recorded). Such depths within the trench were in practice measured using a version of the *alfadi* water level, the builders' level in common use in Greece whose principal constituent part is a long length of flexible transparent tubing.

Finds were divided in the field into four categories: pottery, bone (with shell), special finds (generally artifacts of interest other than pottery), and samples.

Each trench supervisor was assigned a unique block of numbers for the numbering of special finds. These numbers were retained in all subsequent processing and are used also in this publication. The pottery bags carried a pottery bag number, in addition to the square designation and level number, bags being numbered sequentially for a given trench. This apparent redundancy proved useful on a number of occasions, and in addition it was convenient to distinguish between the different pottery bags of single prolific layers.

Three different sampling procedures were in operation. First was the normal hand recovery of bone, pottery, and special finds from the trenches. To ensure some standardization, all the soil was passed through a 3-cm mesh, although inevitably most artifacts of so large a size were recovered in the trench. Second, for every excavated level in every trench, two large polyethylene bags were filled with soil to be used for flotation to recover plant materials. This resulted in a satisfactorily large number of samples of botanical significance, discussed by J. M. Renfrew in volume 2. Third, a sieving project directed by Sebastian Payne was undertaken to experiment with the efficiency of different recovery methods and to yield samples of smaller objects and materials. (Artifacts coming from sieving were indicated by "s" following the square designation and level number.) Earlier, wet sieving

during the Saliagos excavations (Evans and Renfrew 1968:10) suggested that it might be more efficient to use the nearby Angitis River. Payne supervised the excavation of a small sounding, ZB, immediately adjacent to trench ZA, and the soil from this meticulously excavated stratigraphic column was transported to the river, placed in a container with narrow mesh (3 mm), and agitated in the water until all but pebbles and other residues had been washed away. This procedure proved very valuable for certain categories of small objects. Environmental remains were recovered in this way, as were small artifacts (beads, small figurine heads, a gold bead).

Payne has argued (1972, 1975) that the quantitative picture obtained for almost all categories of object or material was significantly modified by this procedure. This may not have been the case for ceramic finds, and Dr. Sándor Bökönyi did not feel it necessary to use the sieved residues for his study of the mammalian fauna. But there is no doubt that for some classes of environmental data, as well as for small artifacts, the method was indispensable. As a result of our experience at Saliagos, Sitagroi, Quanterness in Orkney (Renfrew 1979), and Phylakopi in Melos (Cherry 1975), I regard water sieving of a sample of appropriate size an essential adjunct to any systematic excavation.

Each excavation area was under the immediate control of a site supervisor, who generally had an assistant. The actual digging was undertaken by workmen from Sitagroi and Alistrati under the general supervision of the foreman, Gianni Papadopoulos, whose experience with excavating pisé structures at Nea Nikomedeia (where he was excavation foreman) was of great value. Digging was with the hand pick (*skalistiri*), supplemented by trowel and knife, with the pickax in use where very rapid digging was needed.

As reported below, a great problem was encountered in recognizing structures (house walls, floors, etc.) before they had been entirely dug away. Flat shovels, which had been used effectively by Dr. Robert Rodden at Nea Nikomedeia (inspired by Dutch excavations of Bandkeramik settlements), did not overcome the problem; nor did spraying with water from a stirrup pump prove effective except on occasion for bringing out colors in vertical sections.

One innovation, which did help greatly in recognizing features, was introduced late in the 1968 season. This was the *randistiki michani*, a portable spraying machine used locally for spraying tobacco and other crops with insecticide. Powered by a small motor and carried on the back, the machine projects air at high pressure and velocity from a narrow nozzle. It was this blowing action rather than the addition of water as spray (which also helped on occasion) that proved particularly effective. Differences in soil texture, rather than of color, were rapidly and effectively revealed in this way (pl. II:2), and the appliance proved an important addition to the excavator's tool kit. It did not, however, altogether overcome the difficulties of recognizing structures other than those that had been burned, nor has this problem been solved in the large area excavations of comparable sites in Bulgaria, where the published structures were almost invariably destroyed by fire. This was certainly the situation at Nea Nikomedeia also, where the house plans were most readily recovered by the indentification of foundation trenches and postholes and could only rarely be recognized above the floor level through the preservation of the pisé walls.

At the conclusion of the excavation the deep trenches were backfilled.

Mention should also be made of several soundings undertaken for geomorphological reasons at the periphery of the site in order better to understand the formation of the tell. These are reported in chapter 3.

ENVIRONMENTAL WORK

The sampling procedures described above yielded a range of materials in addition to artifacts. Bones and shells were routinely collected and are the subject of reports by Bökönyi (chap. 5) and Shackleton (vol. 2). Unworked stone was routinely collected, examined by Dr. John E.

Dixon, the excavation's petrologist, and discussed in volume 2.

Carbonized plant remains were sought in every level by flotation of soil samples. In addition, in numerous cases recognizable and collectable deposits of carbonized grain or other plant remains were found, and these were important for J. M. Renfrew's paleoethnobotanical work, as well as for providing useful carbon samples. Carbonized wood was recovered in a number of cases, and the samples taken have been the subject of special study by Rackham (app. A). The sieving residues contained environmental data under several further headings, and the specialist reports by Payne and his colleagues are expected in volume 2.

Two principal activities were undertaken beyond the immediate environment of the site (in addition to the search for comparative botanical material by J. M. Renfrew). The first of these, undertaken by Turner and Greig, was the systematic search within the framework of our project for localities suitable for pollen analysis. Naturally, the most important of these were in the low-lying areas of the plain of Drama, one of them only a couple of kilometers from the site itself. This important work is discussed in chapter 4.

The second was a systematic site survey organized and carried out in the field mainly by Dr. David Hardy, accompanied by Demetrios Chariskos as representative of the Greek Archaeological Service. This was not an area-intensive survey carried out by systematic field walking. Rather, only two classes of site were sought (in addition to visiting all previously recorded prehistoric sites in the area). The first type was represented by mounds, recognizable as low prominences rising a meter or two above the plain. Several of these proved of great interest. Second, among the hill slopes surrounding the plain, promising locations (thinking primarily in terms of defensibility) were systematically visited with useful results. Other classes of site were overlooked in the survey, which was exploratory rather than comprehensive, but the results were certainly enough to set our Sitagroi findings in a broader context, at least in a preliminary way.

THE STUDY OF THE MATERIAL

Almost all study of the material took place in the field during the 1968 and 1969 seasons and in the final study season in the summer of 1970. One initial problem, inevitably, was presented by the very large quantities of finds, particularly of pottery and bone.

Pottery was washed within one or two days of its excavation, and as soon as practicable was strewn by the vase mender in order to detect joins. Each batch of pottery (that is, each unit representing the contents of one layer in a given excavation trench) was weighed as the first step in a quantitative procedure that followed Evans's procedure at Saliagos (Evans and Renfrew 1968). In trenches selected for quantitative treatment (which included the stratigraphic soundings ZA, JL, KL, and ML) the pottery from each unit was strewn and sorted into fabrics and shapes following a classification developed early in the 1968 excavation season. This procedure was undertaken by Keighley, assisted by R. Howell, Drs. Graeme Barker, R.K. Evans, and A. Sherratt. To establish some uniformity of criteria, I personally inspected each unit, making decisions (sometimes of a somewhat arbitrary nature) about the ascription of individual pieces. The different categories were then counted. The results, notably for ZA, were synthesized by Keighley (Marriott 1969). This activity, which for ZA was completed during the 1968 season, provided the principal basis for the division of the sequence at the site into phases.

The pottery was then divided for more specialized study, and the report on phases I and II was undertaken by Keighley (chap. 11), for phase III by Evans (chap. 12), and for phases IV and V by Sherratt (chap. 13).

The bone recovered was brushed and stored for subsequent study by Bökönyi, aided by Charles Schwartz. The soil samples for flotation were processed and the residues studied by J. M. Renfrew, as indicated above.

In three cases samples for study were exported from Greece, with the permission of the Greek Archaeological Service. The metal objects

and slag residues were studied in the field by Slater, and small samples were selected by her for further laboratory study. Stone samples and thin-sections of pottery for petrological examination were taken in the field by Dixon, using a portable saw. Technological aspects of the manufacture of the Sitagroi pottery were the subject of special study by Gardner, and small samples were taken by her for study at the University of California, Los Angeles (Gardner 1979).

Other categories of artifact were the subject of specialist examination. The lithic artifacts were studied microscopically in the field for indications of use-wear by Dr. Ruth Tringham. Elster studied the cult vessels. Gimbutas studied the figurines, and a number of these were the subject of special photography by Kalman Kónya. In general, the photographs of finds as well as most of those on site were taken by Peter Morley, and the pottery and objects were drawn at Sitagroi by Gayle Wever and Daphne Hart.

The field study of the material was completed in the 1970 summer season. It was not practicable to keep all the pottery found. The feature sherds were therefore retained, together with all the pottery from ZA, in order to give a representative sample of the whole. The remaining sherds were discarded, being placed at the bottom of ZA prior to back filling. The remaining pottery, all bone, and all the special finds, together with the material from the site survey, were placed in the custody of the Greek Archaeological Service at the Philippoi Museum in 1970, and a selection of the material is there on display.

SUMMARY OF THE SITAGROI PHASE SEQUENCE

One important result of the 1968 season was the division of the Sitagroi sequence into five phases or periods, the latest of which was subsequently subdivided (table 2.1). This division, extrapolated from the stratigraphy of the deep sounding ZA and from the sherd count made of the pottery from it (see chap. 7), allowed us to synchronize material from other areas of the mound (which were not, of course, directly linked stratigraphically with ZA), within these broad periods. These divisions then served as a broad chronological framework for the other sites in the plain of Drama, whose occupation could be approximately dated by means of the surface finds.

Table 2.1. Summary of Phase Divisions

Phase	ZA levels	Other areas relevant	Approximate calendar date BC
Vb	2 - 10 + 14	PO, PN, QN, ROc (Long House)	2700 - 2200
Va	15 - 20 + 11 - 13	PO, PN, QO, QN, ROc (Burnt House)	3100 - 2700
IV	21 - 32	MM, SL/ZE, ROc, ZH	3500 - 3100
III	38 - 49	ML, MM, ZE, ZG, ZJ	4600 - 3500
II	50 - 59	KL, ML, KM, ZE, ZG	5200 - 4600
I	60 - 77	IL, JL, KL	5500 - 5200

The divisions were similarly useful in offering a broad chronological framework for the environmental data considered in chapters 3, 4, and 5, and in volume 2. Of course, for some purposes it would have been desirable to use the unextrapolated chronology offered by the ZA stratigraphic sequence itself. As explained in chapter 7, however, this would not have permitted reliable comparison with the other areas, as the ZA pottery alone did not reveal sufficiently the variability within each phase. Moreover, for the environmental data it was necessary in some cases to amalgamate the finds from several successive strata to achieve a sample large enough for meaningful discussion. This amalgamation could most conveniently take place on the basis of these same phase divisions.

3.
Geomorphological Studies

Donald A. Davidson
with a contribution by Barry Thomas

Geomorphology and Prehistoric Settlement[1]

The plain of Drama is a striking topographical feature. The immediate impression at the crest of the ridge behind Kavalla is of a flat plain abruptly encircled by rather spectacular mountains—the crystalline mountains of Menokion and Falakron to the north and northwest and Pangaion to the southwest. The plain is a limestone-floored graben which has sunk relative to the surrounding uplands (fig. 3.1). It is roughly ellipsoidal in shape, the longer axis being about 50 km, aligned northwest to southeast, and the maximum width about 15 km. The altitude of the plain is about 50 to 80 m, but the fringing alluvial fans rise to over 200 m above sea level.

The plain lies within the drainage basin of the Angitis River which enters the plain by a spectacular spring. The source of water for this spring is the Kato Nevrokopion basin. The Angitis exits west from the plain through a dramatic gorge; other tributaries join the river near the entrance to this gorge. The drainage of the plain was greatly altered during the interwar years when population resettlement took place. The rivers were partly canalized, an irrigation system was constructed, and the malarial marsh and lakes were drained (British Naval Intelligence Division 1944-1945).

One can only analyze the terrain of an area if significant characteristics of the terrain are recognized. Terrain can be defined as the sum of the form, soil, and water characteristics of an area. Immediately, certain problems are evident if the objective is to recognize terrain types considered to have been of significance to prehistoric communities (Davidson 1972). Recognition of terrain elements which were of behavioral significance to people in the past is very difficult; certain assumptions must first be stated. Access to a dependable water supply was of undoubted importance to prehistoric settlements, yet sites subject to flooding would have been avoided. If the people who occupied the tells on the plain of Drama were peaceful, primitive farmers, then it can be suggested that land easy to clear and work would have been an attraction. Thus a terrain analysis of the plain of Drama relevant to prehistoric settlement ought both to establish hydrological characteristics of the area and delimit areas of different land capability.

The geomorphological map (fig. 3.2) is a terrain inventory describing these terrain characteristics and was compiled as a result of interpretation of aerial photographs and field survey.[2] Five terrain types are distinguished on this geomorphological map.

FOOTHILLS. Foothills surround the plain and merge into the mountains which rise to over 2,000 m. The lower limit of these foothills, whose pattern and character are strongly influenced by faulting, is marked by the junction with alluvial fans. The distribution of foothills can be seen to reflect the fault pattern, while in certain

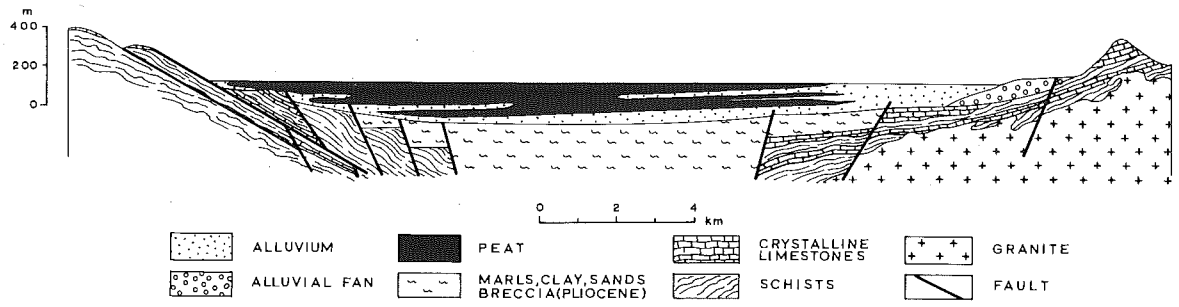


Figure 3.1. Geological cross-section (northeast to southwest) across the old lake of Philippoi, plain of Drama.

localities distinct inward-facing fault escarpments are evident (pl. I.1). The slopes of the foothills are steep and inhospitable with thin, rubbly, poorly developed soils; the lowermost parts of the foothills are mantled with angular scree, while further upslope rock outcrops and scree chutes are common. Active gullying is a very real process, especially in the northwest. Only the gorge area of the Angitis is distinctly different from the other foothills. There is a major fault escarpment (not in the study area) about 8 km southeast of and running parallel to the gorge. Many fans debouch from this escarpment, and since the area of the gorge has been uplifted relative to the plain, the streams from these fans have dissected this zone. On the foothills, surface water is completely absent; sporadic streams function only after rainfall.

ALLUVIAL FANS. The geomorphology of the plain is dominated by a complex, coalescing series of alluvial fans which are most extensive in the north and northwest and of limited extent in the south. The distribution of these fans is illustrated in figure 3.2; the dot shading increases in density in the upper parts of fans to indicate the steeper angle of slope and the concomitant coarser texture of material.

These fans tend to slope from a maximum of 5° toward the center of the plain. The areal extent of the fans is a reflection of the size of the catchment basins. In Death Valley, California, an area physically analogous to the plain of Drama in terms of tectonic structure, relief, and alluvial fans, the size relationship between fan and catchment basin has been shown to be a power function (Hooke 1968). In general, the composition of the fans grades from poorly sorted, stratified, heterogeneous material, even in cobble size[3] at the fan-head (pl. III), to stratified sands at the foot of the fans. Inspection of material is difficult since the fans are usually cemented by lime.

In detail, the fans are complex in themselves since entrenchment of the larger fans is common. A secondary fan frequently debouches from the fan-head trench in the primary fan; the incision slopes of the trench are indicated in figure 3.2. Fans which have incised channels on their upper parts are most common along the northern side of the plain, while the fan which debouches from the Xeropotamos catchment basin in the northeast is the largest and most intricate on the plain. The two remnants of the primary fan, between which is located a large secondary fan, are heavily dissected by old incised channels. The Xeropotamos River flows across this secondary fan and past the Dhoxaton tell.

Many old channels are discernible on the fans from the aerial photographs, yet surface water is absent on the fans for most of the year since many channels function only in winter. Springs are quite common toward the foot of the fans and are also found where underground streams in the limestone emerge at the surface of fans.

OTHER ALLUVIAL AREAS. Alluvial areas flank the major streams, and an extensive area of alluvium is also found in the southeastern area of the plain associated with the former lake of Philippoi. The lacustrine and riverine alluvia vary from

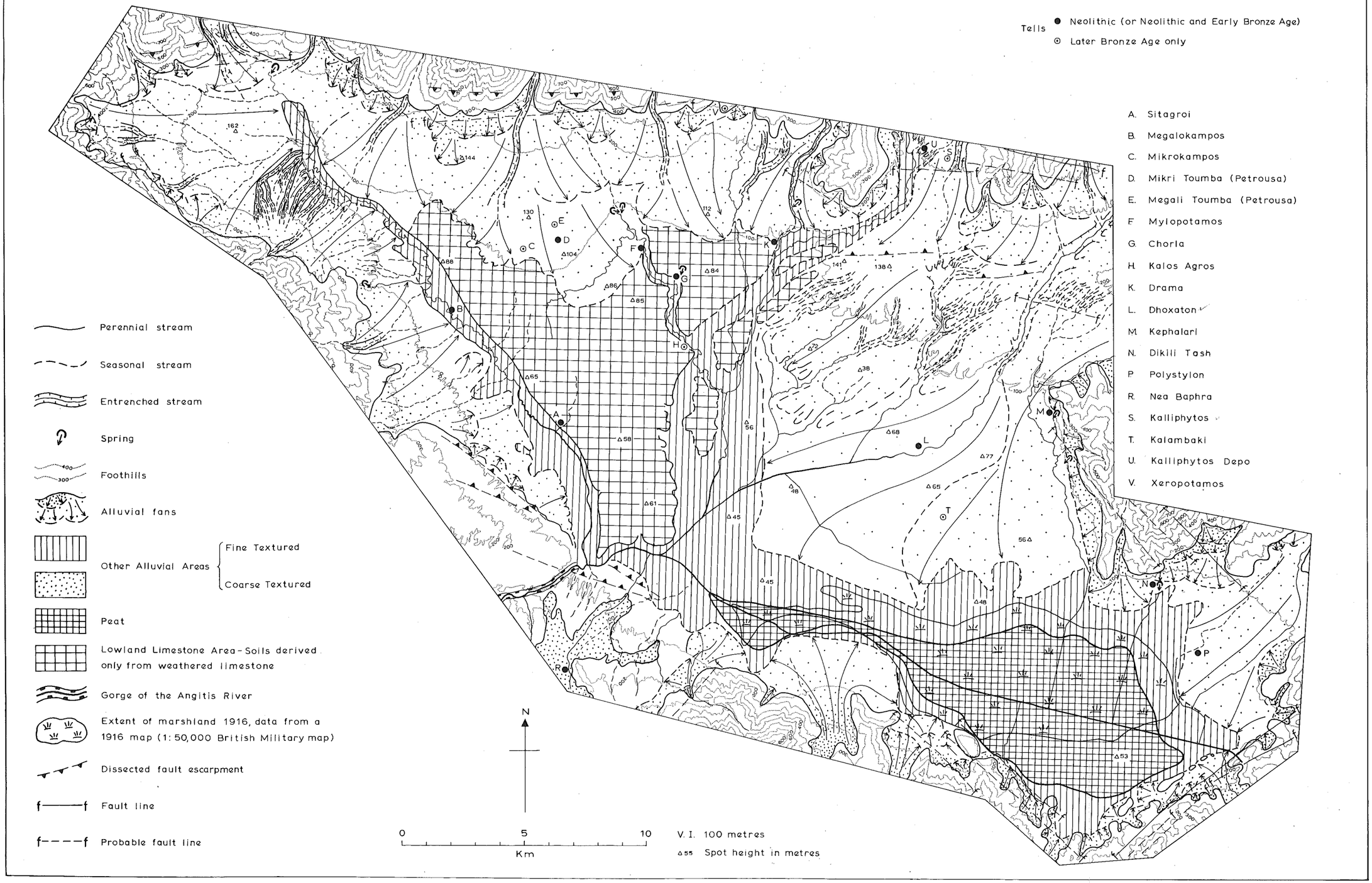


Figure 3.2. Geomorphology and tells of the plain of Drama.

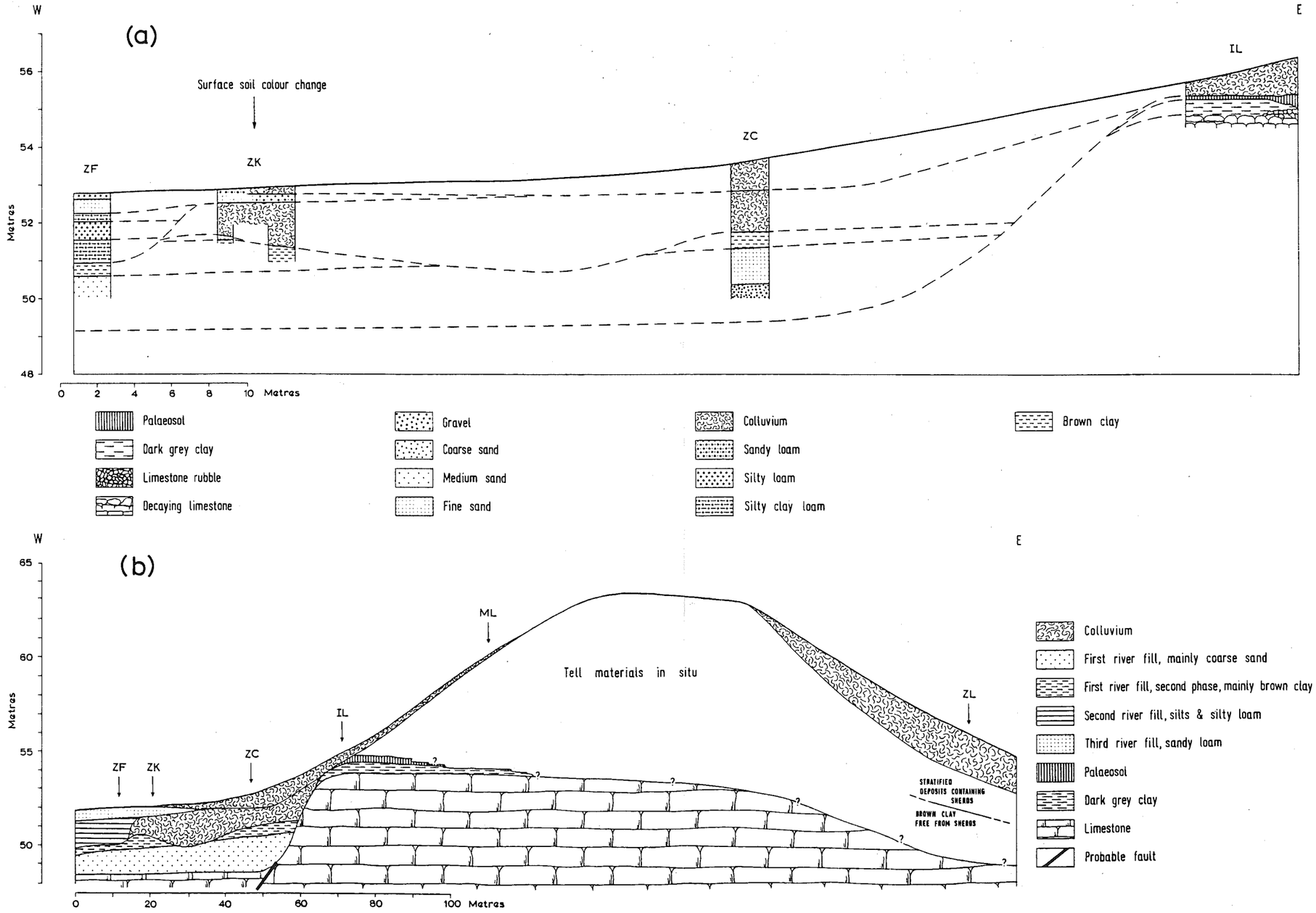


Figure 3.3. Stratigraphy of (*a*) lower parts of the Sitagroi tell; (*b*) general cross-section.

sands to clay. A small alluvial area occurs along the streams in the extreme southwest at the Nea Baphra tell.

LOWLAND LIMESTONE AREA. In the center of the plain is a virtually flat area which has largely escaped burial by alluvial fans. Exposures of the underlying bedrock are few; a soft white limestone was located at the base of the deep sounding of Sitagroi tell, and this limestone was overlaid by about a meter of clay derived from weathering of the underlying limestone. A soil exposure immediately to the west of Sitagroi reveals decomposed limestone within half a meter of the surface. The texture of the top horizon of the exposure is clay;[4] the particle size distribution of a sample from this top horizon is illustrated in figure 3.8, labeled *terra rossa*. The soils in this lowland limestone area which are derived from weathered limestone appear as variants of terra rossa as defined by Kubiena (1953); these range in color from light to dark reddish-browns, generally with a very fine (clay, clay loam) surface texture. The depth of soils varies greatly, as is characteristic of soils developed on limestone. Occasionally, plowing brings limestone cobbles and boulders to the surface.

PEAT AND MARSHLAND. An extensive area of peat occurs in the southwestern part of the plain. Wijmstra (1969) has shown that the uppermost 30 m of this peat contain a pollen record through to the last interglacial, and the geological cross-section (fig. 3.1) illustrates an alternation of peat and alluvia to a depth of 170 m. The extent of marshland in 1916 is shown in figure 3.2. At that date two lakes also were present in this area, but these were drained in the interwar years and a system of drainage ditches was constructed.

ALLUVIAL CHRONOLOGY

Before discussing the prehistoric settlement pattern in its relation to terrain types, consideration must be given to the age of the alluvial deposits. Most of the alluvial fans were in existence before middle neolithic times (ca. 4600-4100 bc in radiocarbon years). The primary alluvial fans on the plain seem similar in form and material to the Red Beds of Epirus (Dakaris et al. 1964; Higgs and Vita-Finzi 1966). Higgs and Vita-Finzi related these beds to erosion on hills and resultant valley aggradation during the last glaciation. Dating of the fans in the plain of Drama is difficult, and certain observations can only be made with reference to the distribution of tells. Some of the tells are situated on alluvial fans, and clearly the fans are older than the tells—for example, the tell at Kalambaki and the large primary fan. Dhoxaton tell, located on the secondary fan, is asymmetric in profile because it was undercut by the river at a later stage. Thus the primary fans were formed before the settlement period, though some of the secondary fans were still in active evolution during or after the period of prehistoric settlement. A discussion of soil erosion in Greece during the later prehistoric period is given by Davidson (1980).

In contrast to the alluvial fans, most of the other areas of alluvium seem younger than the tells.

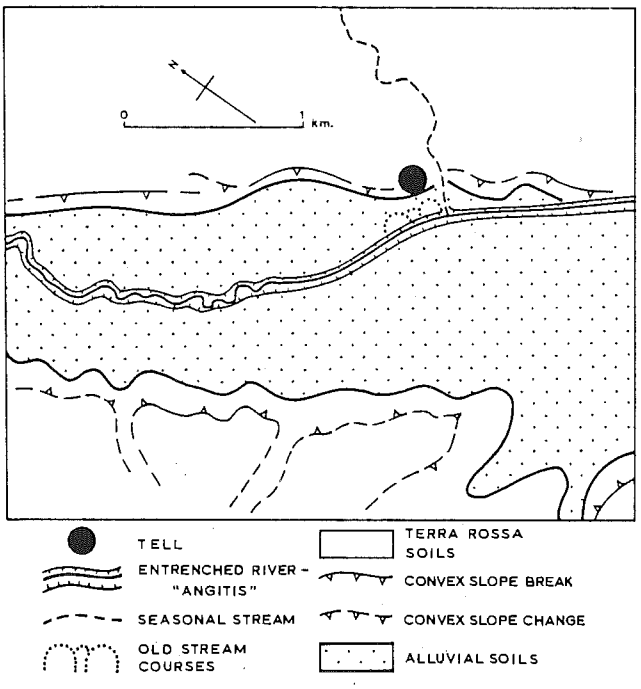


Figure 3.4. Situation of the tell at Sitagroi.

The tell at Sitagroi is situated at the junction of the lowland limestone area with the alluvium flanking the Angitis River (fig. 3.4). The general lineation to this junction, especially to the northwest, suggests that it may be controlled by a fault. The edge of the lowland limestone is

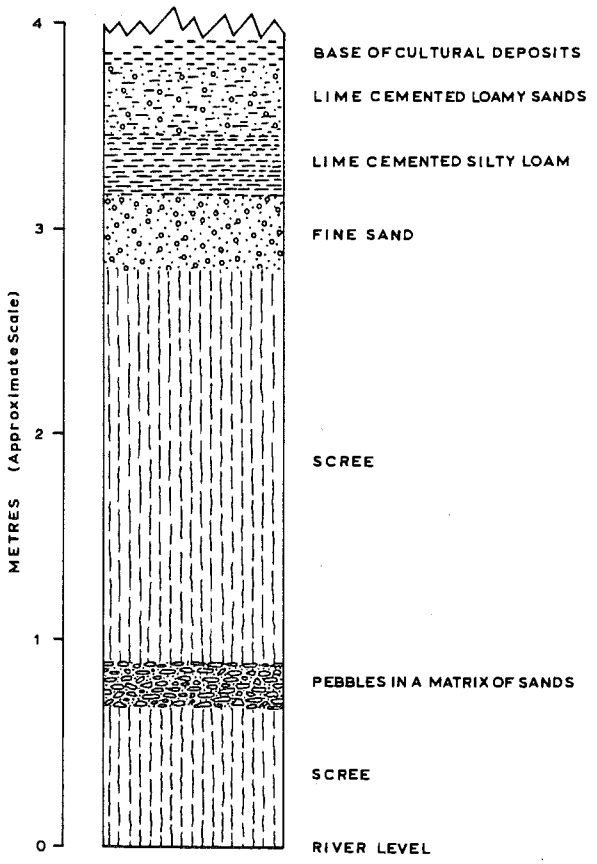


Figure 3.5. Alluvial stratigraphy below the tell at Megalokampos.

marked by a convex slope break or change giving way to a slope of about 3–5° down to the river terrace where the Angitis is incised into the alluvium to a depth of about 5.5 m. The alluvium consists of a well-stratified series of deposits ranging in texture from clay to pebbles in a sand matrix. Part of the course of the Angitis as shown on figure 3.4 has been straightened in recent times, and this may account for the short abandoned channels near the site. There is also the possibility that a spring once existed at the slope change between the alluvium and the limestone area a few hundred meters northwest of the site. The important point about the alluvial stratigraphy is that a stratum about 2.5 m above the river contains classical sherds, dating to around 300 BC. The conclusion must be that the alluvium, at least this stratum and above, is much younger than the tells.

Farther upstream from the tell at Sitagroi is the tell at Megalokampos, situated on alluvial deposits. The Angitis River is actively undercutting this tell to reveal a section of the underlying material (fig. 3.5). The obvious conclusion is that the alluvium is older than the cultural deposits. There is thus the problem that there is alluvium at Sitagroi which is younger than the tell, while at Megalokampos this young alluvium is absent. One explanation for such an apparent contradiction in evidence is that the alluvium below the tell at Megalokampos is a down-faulted remnant of an alluvial fan. The existence of a fault to the east of the site has already been noted; the tell is also near the fans on the northern part of the plain. Other hypotheses are also possible: slow aggradation may have taken place from before the fourth millennium BC to after 300 BC, or one or more cut-and-fill sequences may have intervened between these two dates. Older alluvium at Sitagroi occurs below colluvial deposits from the tell; this alluvium may be contemporaneous with the alluvium below Megalokampos tell where younger alluvium has never been deposited or has been deposited and removed. In general, the contrast between the Older and Younger Fill of Vita-Finzi (1964, 1969) and Higgs and Vita-Finzi (1966) is illustrated in the plain of Drama.

Figure 3.6 describes the distribution of alluvium according to age. The apparent anomaly of the tell at Megalokampos is explained in the preceding discussion. The important point to emerge is that tell sites could have been completely removed on the areas of younger alluvium and on the secondary fans; the sites at Megalokampos and Dhoxaton have only been partially eroded. Sites on the old lake area may have been buried by recent alluvium.

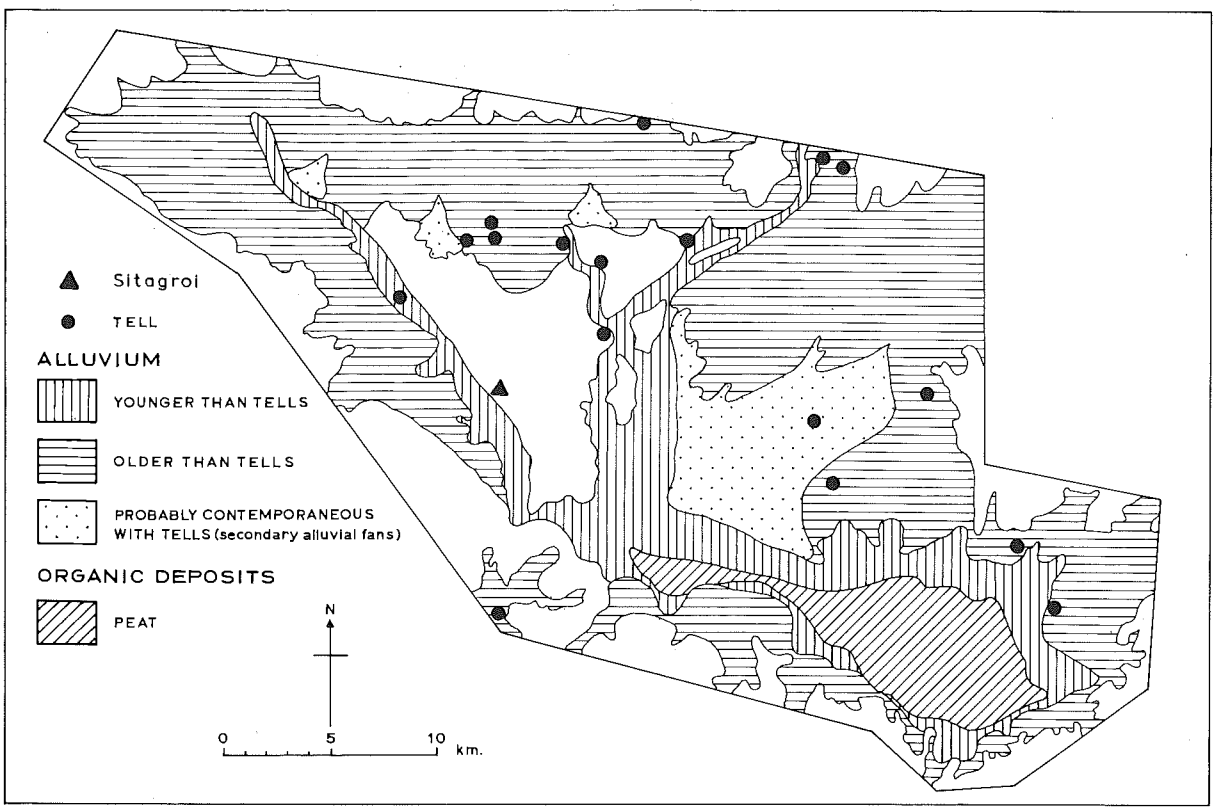


Figure 3.6. Distribution of alluvium and organic deposits in the plain of Drama.

DISTRIBUTION OF TELLS

Of the eighteen tells on the plain, thirteen are situated on alluvium, three on the lowland limestone area, one (Drama) at the junction of these areas, and one (Xeropotamos) at the base of the foothills. The tells on alluvium tend to be located on the middle and lower parts of large alluvial fans where the slope is less than 1°. The major exceptions to this pattern are the tells at Kalliphytos Depo and Kalliphytos. On the middle and lower parts of the fans the alluvium is better sorted and finer—predominantly sands and silts. Soil moisture conditions are also more favorable to plant growth in these lower areas. Hence, these sections of the fans offered attractive areas for primitive cultivation from the point of view of suitable soil and moisture conditions. The present land-use pattern also reflects variations in land workability on different parts of the fans: the upper reaches tend to be utilized for grazing or left as waste.

All the tells on the lowland limestone area are situated on its margins and close to alluvial terraces. The soil on the limestone is fine in texture, productive but less easily worked than alluvial soil. Therefore, it can be suggested that the alluvial areas along the river were agriculturally attractive, though the neighboring limestone area offered dry sites, free from floods. The type of alluvial terrace land contemporaneous with prehistoric settlement is unknown since the present terrace is of historical age. During the prehistoric settlement period, the streams had a history of alternating deposition and erosion. At certain phases, soil-water relationships on an alluvial area would have resulted in land favorable to primitive methods of cultivation. At other phases the alluvium may have constituted an extensive area of marshes of contrasting resource value.

Until very recently, water for most villages on the plain came only from wells or springs. No direct evidence of water sources for the prehistoric settlements is available. Since the tells were permanent settlements accommodating perhaps several family groups, a reliable and accessible

water supply must have been associated with each site. The association of river land and sites can be noted, and one possibility is that water was extracted from the rivers. Another possibility is that sites made use of springs; today three tells have a spring nearby. During the early settlement period the plain was forested (see chap. 4; and Wijmstra 1969); surface runoff must have been relatively less than it is today. Infiltration, however, must have been greater and springs would have been more common, occurring near the base of the foothills, toward the foot of the fans, and on the lowland limestone area.

Consideration of the prehistoric settlement in relation to the terrain of the plain of Drama suggests a preference for particular alluvial areas, the general pattern of prehistoric settlement evolving where light alluvial soils and a good water supply were coincident.

EVOLUTION OF THE TELL AT SITAGROI

The question of how a tell about 11 m in depth and about 180 m in diameter is formed presents a major problem and has been discussed by Davidson (1973, 1976). It is clear that many processes of formation were in operation during the approximately 2,700 years of occupation and that the tell has also been subjected to severe modification since the abandonment of the site. A specific problem is the formation of thick strata of "soil" between the distinct concentrations of floor levels. To tackle the problem of tell evolution, two approaches were adopted: examination of the stratigraphy with special reference to the junction of the terrace with the tell, and analysis of soil samples taken from the ZA deep sounding.

Stratigraphy (by Barry Thomas)

Soundings ZF, ZK, ZC, IL, ML, and ZL were used to construct a section along line L of the 10 m planning grid. (fig. 2.2) Within each sounding various horizons were recognized on the basis of boundaries, color, texture, structure, sherds, and secondary minerals. The main stratigraphic divisions recognized between ZF and IL are shown in figure 3.3a. Figure 3.3b is a generalized interpretation of the stratigraphy on the flanks of the tell. A relative chronology of twelve phases is proposed:

1. Faulting of the limestone in the western part of the section, suggested from the aerial photographs; limestone weathering to a dark gray clay; the formation of the palaeosol.
2. Angitis River, fault-guided, cuts broad valley in the limestone.
3. Extensive deposition of coarse sand by the Angitis, probably with greater discharge than at present.
4. Continuing deposition; brown clay succeeds sand; perhaps the main channel moving laterally westward or a fall in stream velocity.
5. Renewed but weak down-cutting by the Angitis. The stream may have been braided, accounting for the small cross-sectional area of the channel between ZK and ZC at this phase and the deposition of the sand bar in ZK.
6. Foundation of the tell separated from the river by a bluff 3 m high, cut into limestone. The flood plain was probably marshy, and at certain times there may have been no terraces of well-drained land.
7. Accelerated erosion of the tell by wash and creep. The amount of material removed can be estimated by an attempt to reconstruct the accumulation at the base of the tell from the section along grid line L. Since the slope of the top of the colluvium can be defined within narrow limits but the nature of the riverbed is not known beyond ZF, only likely maximum and minimum values for the total accumulation at this phase are possible. These values suggest that erosion removed a mass of material from the western side, equivalent to between 8% and 14% of the present mass of the tell in situ. It is not possible to attribute erosion on the eastern margin to specific phases.

8. Incision by the river into the colluvium and brown clay.
9. Aggradation fills channel in classical times with silts and silty loams. A small amount of colluvium removed, probably when river is in flood.
10. Colluvium again trimmed by river.
11. Deep incision (about 5.5 m) by the river to the west of the section.
12. Accelerated erosion of material from the tell, deposited at the base, but not reaching the river.

The alluvial stratigraphy confirms that some alluvium postdates the tell by a considerable period. As at Megalokampos, there is also alluvium which predates the tell. There is no evidence for accelerated erosion during occupation of the tell since no colluvium characterized by sherds of a particular phase or phases is present. The large amount of material removed from the tell is a measure of how the tell was modified in form.

A speculative reconstruction of the form of the tell at abandonment can be made from the section by returning upslope the material accumulated at the base, including material since removed by the river. The accelerated erosion of phase 7 again requires a maximum and minimum estimate; erosion at phase 12 can be more accurately defined. Tell material was not laid down in situ to the west of the limestone bluff, and thus the total colluvial deposit to the west is the product of the decline of the slope above the bluff. Assuming that the height of the tell has not appreciably decreased, the total mass at the base represents an angle of between 25° (maximum) and 18° (minimum) for the western side of the tell at abandonment, compared with 7.5° at present. Assuming an 18° minimum slope on the eastern side and the colluvium returned upslope, it is suggested that the top was formerly about 33 m more extensive along the line of section (fig. 3.3). A similar reconstruction all around the tell gives an area of 1.5 ha for the gently sloping top at abandonment, compared with 0.62 ha at present.

Soil Analysis: Methods and Results

Soil samples were collected from apparently homogeneous layers between occupation levels. Sampling points were chosen subjectively, but the number of points was proportional to the thickness of the layers. Samples of between 700 and 800 g were extracted from 10 cm x 5 cm sample quadrats on the face of the ZA section. Only the material which passed through a 2 mm sieve was used for particle size analysis (by Davidson), total phosphate (by Macaulay Institute for Soil Research), and organic matter determinations (by Thomas). This was necessary in order to remove the larger fragments of pottery. Particle size analysis was carried out to describe variation in material through the tell; organic matter and total phosphate content were measured to reveal occupation levels not recognizable by archaeological techniques. Total phosphate analysis is especially useful because phosphate is readily "fixed," especially in a carbonate-rich medium (Cornwall 1958). This type of test has been used in archaeology to recognize settlement sites (for example, Lutz 1951; Dauncey 1952; Dietz 1957; Cook and Heizer 1965).

The hydrometer method of particle size analy-

Table 3.1. Comparison of Results of Particle Size Analysis

Sample	Clay 8-10 ø	Fine and very fine silt 6-8 ø	Coarse and medium silt 4-6 ø	Fine and very fine sand 2-4 ø	Coarse and medium sand 0-2 ø	Percent loss on pretreatment
37a	19 (18)	19 (16)	27 (27)	26 (32)	7 (6)	38
37b	19 (18)	18 (16)	28 (27)	26 (31)	7 (7)	38
32	28 (12)	23 (33)	24 (24)	18 (23)	6 (7)	42
30	24 (13)	21 (24)	23 (28)	23 (27)	8 (7)	37

Note: Results expressed as percentages. Figures in parentheses indicate results after pretreatment.

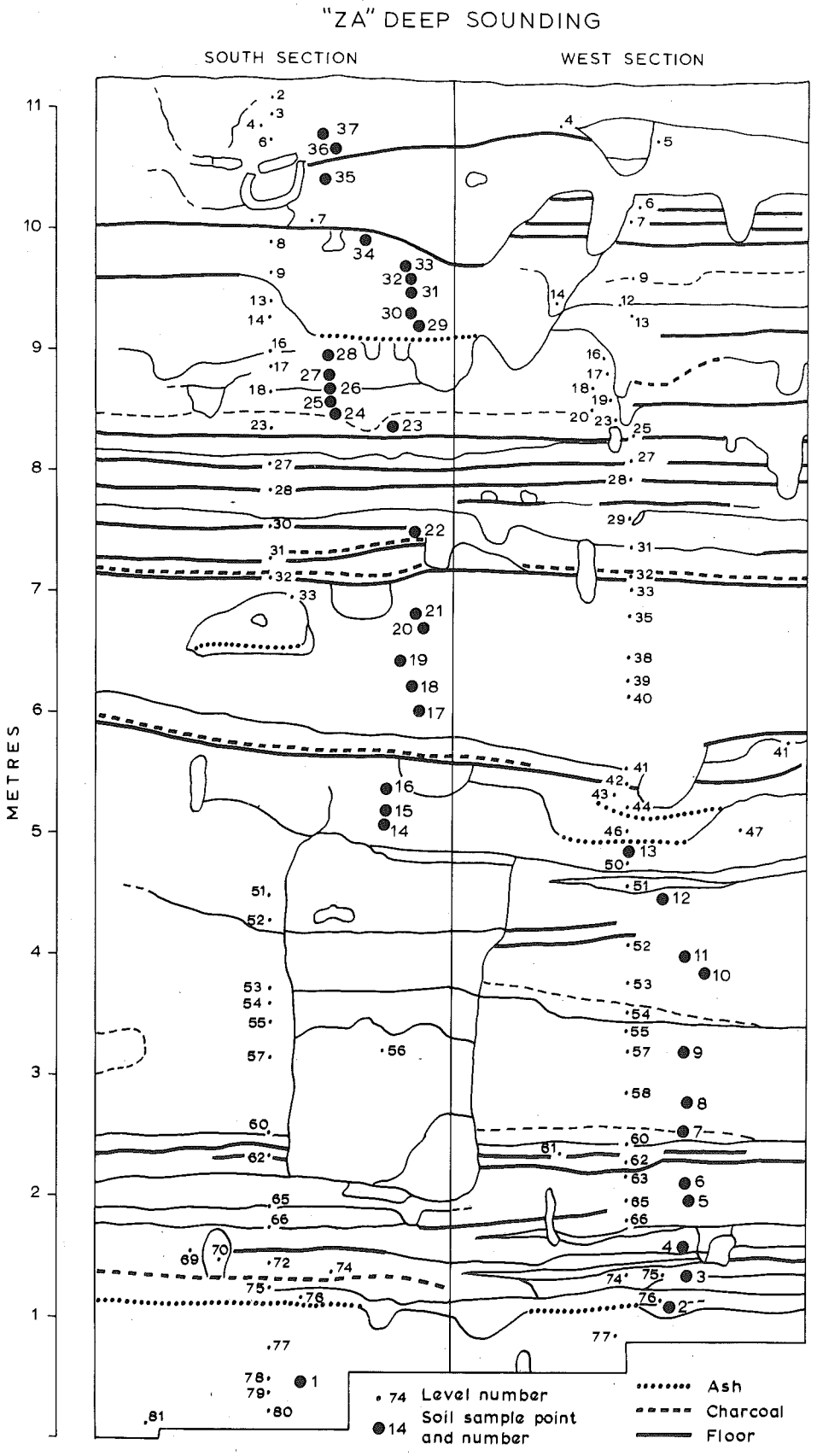
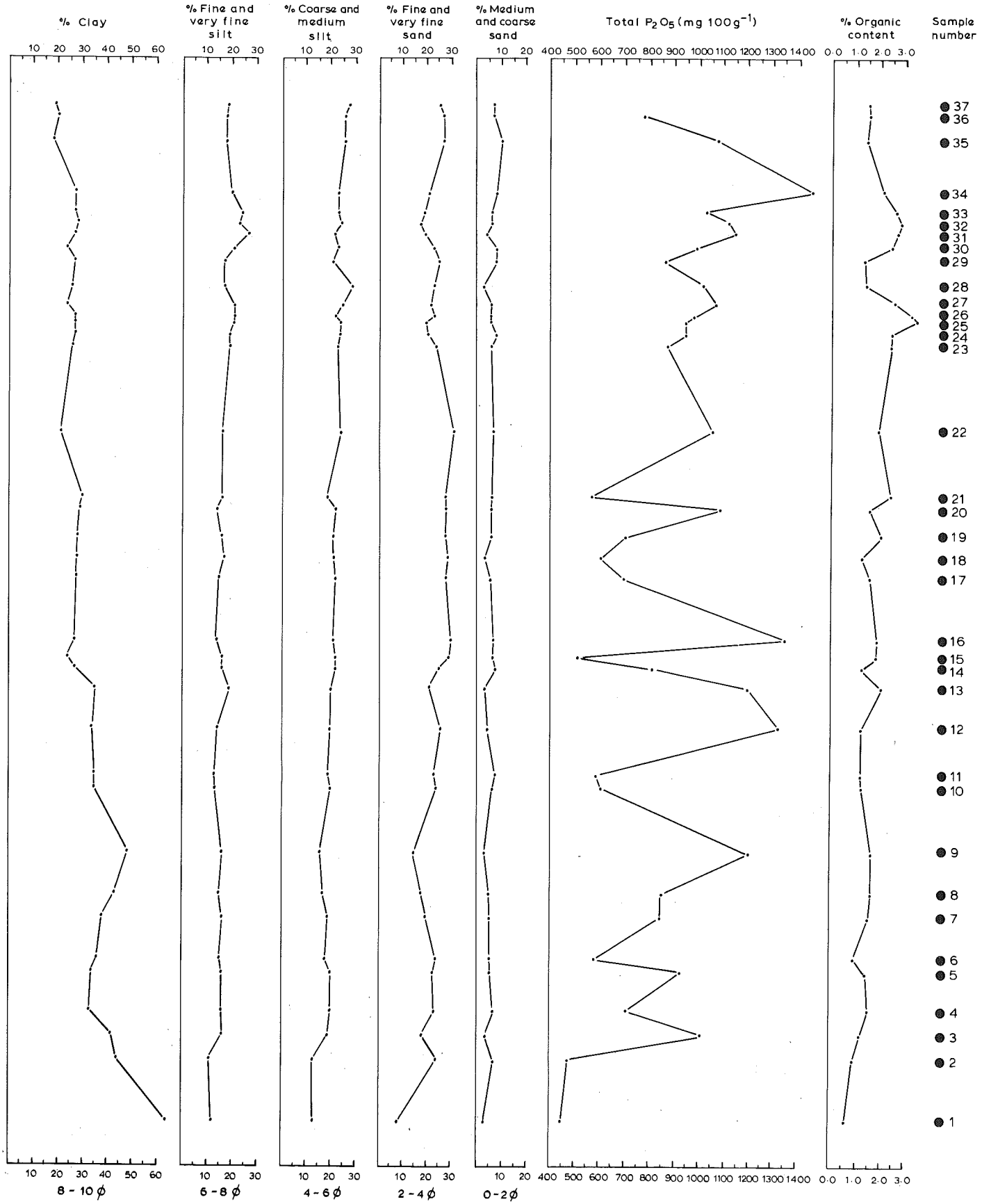


Figure 3.7. (On facing pages): Result of soil analyses from the ZA deep sounding.


% Clay
% Fine and very fine silt
% Coarse and medium silt
% Fine and very fine sand
% Medium and coarse sand
Total P_2O_5 (mg $100g^{-1}$)
% Organic content
Sample number
8 - 10 ϕ
6 - 8 ϕ
4 - 6 ϕ
2 - 4 ϕ
0 - 2 ϕ

sis was used (British Standard 1377, 1967), but several important modifications were made. The complete sample was placed in the sedimentation cylinder following the method of the American Society for Testing Materials (1961); also, a plunger was used to obtain dispersion in the cylinder, and a density of 2.65 mg ml^{-1} was assumed (Day 1956). Pretreatment of the samples presented problems, especially because of lime cementation. Three samples (nos. 37, 32, and 30) were analyzed with and without pretreatment of 100 ml 30% HCl; analysis of sample 37 was carried out twice. Pretreatment losses of 38% were obtained twice for sample 37, while losses of 37% and 42% were recorded for samples 30 and 32, respectively. The results are presented in table 3.1.

Both methods on sample 37 proved to be internally consistent with differences of only ± 1%. The effect of pretreatment on sample 37 was to decrease the fine and very fine silt content and to increase the fine and very fine sand content. In contrast, pretreatment of samples 32 and 30 resulted in a halving of the clay content and increases in the fine and very fine silt and the fine and very fine sand. Because of these varying results and the high pretreatment losses, all the samples were again analyzed, but without pretreatment. The problem was further complicated by the fact that many primary particles were limestone. Day (1966) and Cornwall (personal communication) both agree that a high carbonate content does not invalidate the analysis, provided flocculation of the suspension does not take place.

Determination of the organic matter content was by titration (British Standard 1377, 1967); the organic matter of each sample was determined twice and the mean taken. The results from the total phosphate analyses are presented as mg $100g^{-1}$.

The results from all the soil analyses are plotted in figure 3.7 opposite the corresponding sampling points of the ZA section.

Discussion

In order to examine the origin of the soil between the floor levels, consideration must first be given to the type of building material used. Possible local sources were river alluvium or the clay-rich terra rossa material overlying the limestone. A sample of the wall of the Burnt House (phase Va) was subjected to particle size analysis (fig. 3.8). The surprising result is the low clay content (22%) and the high silt (41%) and sand (37%) contents. The particle size distribution of sample 15 is also seen in figure 3.8 showing that the distribution is very similar to that of the Burnt House sample. The implication of this observation is that the material between floor levels is similar to the wall material in particle size distribution. It can thus be inferred that the 1.5 m of material between floors (levels 32 and 41) are the result of the disintegration of walls.

The low clay content of the Burnt House wall means that cohesion of the material must have been poor, necessitating the frequent rebuilding of walls. Such a hypothesis is in accord with the observations on the origins of the thick material between certain floor levels.

Two other particle size distributions are included in figure 3.8. A sample from the topsoil of the terra rossa soil exposure near Sitagroi is marked by a high clay content. The particle size distribution of this sample is markedly different from the Burnt House sample, implying that material from the area of terra rossa soils was not used for wall construction. The particle size distribution of an alluvial sample, collected from the uppermost alluvial stratum exposed by the Angitis River beside the tell, is more similar to the sample of the Burnt House. The alluvium is much younger than the site, and it can be suggested as typical of a fine alluvial deposit—perhaps similar in particle size distribution to that which existed during the period of occupation of the site. The conclusion which thus emerges is that river alluvium was most likely the building material; it had the advantage of local availability but the disadvantage that houses required frequent rebuilding.

The clay content of samples 1 to 13 is greater than that of samples 14 to 37. The clay content of the lowest three samples rises abruptly to 64%, a reflection of the chemical weathering of the limestone. Local irregularities in this general trend are apparent: samples 22 and 15 have less

clay than other local samples, while sample 9 is marked by a high clay content. The general trend of the fine and very fine silt content is a decrease with depth: samples 31, 32, and 33 are marked by a higher content of this fraction. A similar trend is evident with the medium and coarse silt, with only sample 28 a major exception. A more complex pattern can be observed with variation in fine and very fine sand. Samples 35, 36, and 37 and samples 15-22 contain more than 15% of this fraction while other samples generally contain less than 15%. No trend can be noted in coarse and medium sand.

The striking characteristic of the total phosphate analyses is the variability in the values, a result also reported from sites in Mexico (Cook and Heizer 1965). Even with this variability there is a suggestion of a slight general decrease in phosphate content with depth. The inference from this result is that the occupation of the tell increased in intensity with time, possibly owing to a steadily increasing population or to a tendency for greater numbers of livestock to be enclosed on the tell. Organic matter content appears also to decrease with depth, but again there are departures from this trend. The most marked variations in organic matter occur between the uppermost twelve soil samples. The trend in organic matter may be a reflection of increasing oxidation and occupation with time.

It is difficult to explain the various trends and anomalies in particle size, total phosphate, and organic matter. It is more relevant to select certain observations which appear to offer evidence on the evolution of the tell. Examination of the total phosphate results is the most rewarding (fig. 3.7), but first, consideration must be given to the total phosphate content of "natural" soil in the local area. Three soil samples from the terra rossa soil exposure were analyzed for total phosphate; these samples were collected at depths of 4, 30, and 60 cm from the surface and yielded total phosphate values of 104, 104, and 134 mg $100g^{-1}$ respectively. These values may be

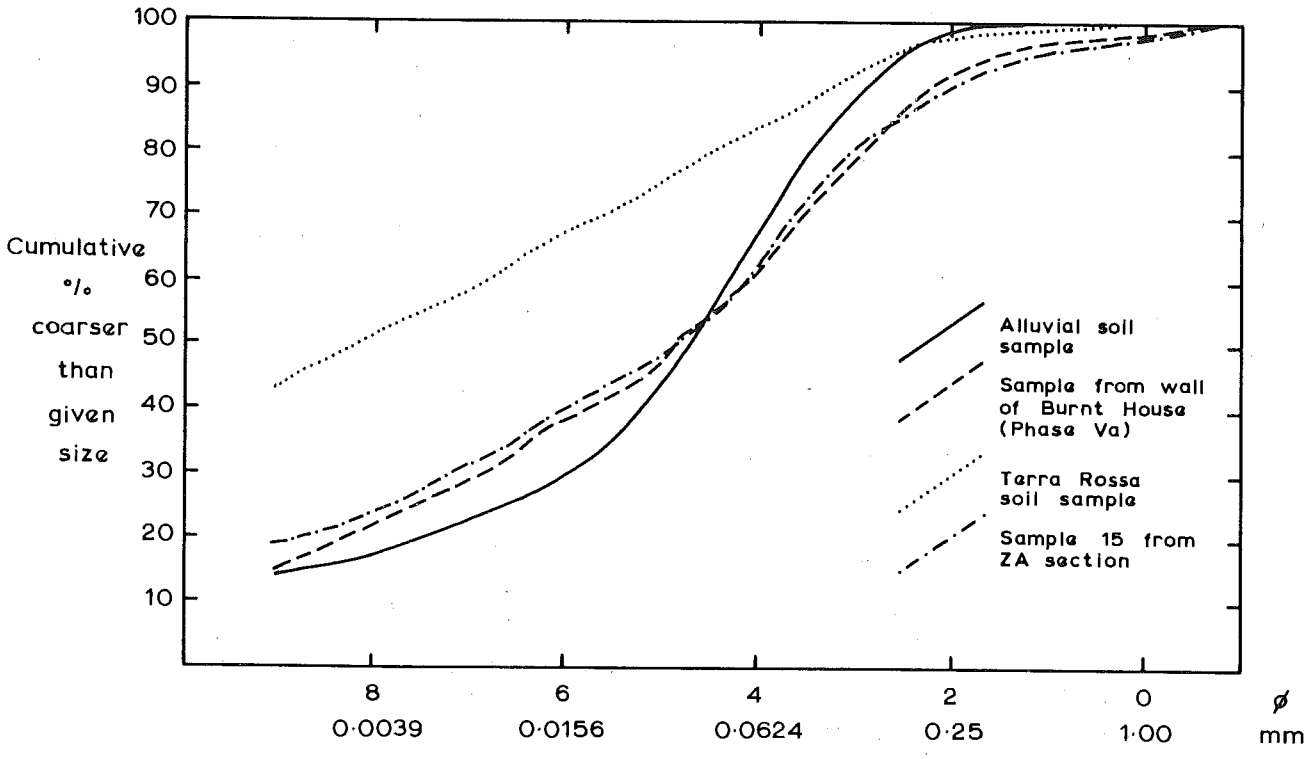


Figure 3.8. Particle-size distribution of soil samples from Sitagroi.

excessively low since terra rossa, if mature, is decalcified and thus may have lost phosphorus. Apostalakis and Douka (1970) report phosphate values for another area in northern Greece. Practically all their phosphate values for soils developed on different bedrocks and under different vegetation covers are less than 400 mg $100g^{-1}$. It can thus be suggested that soil in the plain of Drama which contains more than 400 mg $100g^{-1}$ total phosphate has been subject to occupation. The complete ZA section was thus produced by occupation of the tell; it can even be suggested that the meter of "sterile" clay at the base of the section has sufficient total phosphate to reveal human occupation in that layer, though limestone fragments could also cause a high phosphate measure. There are virtually no archaeological features such as walls or floors documenting occupation between levels 41 and 33, but the total phosphate values from the samples suggest that the tell was not abandoned during the formation of this layer. A similar argument can be presented for the other thick layers between occupation levels. The variation in phosphate content could not have occurred by the normal processes of weathering and translocation of soil components, an argument also used by Cook and Heizer (1965) in explaining the formation of Mexican mounds by human effort.

It is interesting to note that about one-half meter to the north of soil sample point 9 is a concentration of large sherds. High total phosphate and clay contents were obtained for sample 9; thus a very distinct occupation level is revealed by these results while the only archaeological record is an occurrence of sherds. The particular advantage of total phosphate analysis is the indication of occupation. The recognition of floor levels by archaeological techniques alone can present a misleading view of the occupation of a site.

The results from the phosphate analyses indicate that the tell increased in height because of occupation, which is to be expected. The next problem is to establish whether the tell was occupied continuously during its long history or if phases of abandonment occurred. It has already been observed that there is a change in the clay content trend between samples 13 and 14, and such change coincides with the transition from phase II to phase III. Other trends in most of the particle size fractions (fig. 3.7) suggest that a comparison of the particle size distributions might reveal a coincidence between some particle size groups and occupation phases.

One method of comparing particle size distributions is to fit curves mathematically to the size grades for each sample and then to examine the equations. The adopted method was based on the system of curves described by Elderton and Johnson (1969), and the computer program written by Dawson (1972) was used. Each sample was tested for several types of curve, but it was found that a Pearson Type I frequency curve fitted in every case. The equation for this type of curve (Elderton and Johnson 1969) is as follows:

$$y = y_o \left(1 + \frac{x}{a_1}\right)^{m_1} \left(1 - \frac{x}{a_2}\right)^{m_2}$$

The results can be examined by comparing the coefficients of the equations in particular m_1, m_2, a_1, and a_2. The coefficient y_0 was ignored. In effect, the form of the curve is summarized by these coefficients. For example, if m_1 and m_2 are approximately equal, the curve is nearly symmetrical (Elderton and Johnson 1969).

An attempt was made to recognize particle size groups on the basis of variability in m_1, m_2, a_1, and a_2. These groups are labeled A to G in figure 3.9. For example, the results from samples 17-21 inclusive seem very similar and have been grouped as D. The distinctions between certain groups are not very clear and these are indicated by broken vertical lines. The interesting result is that a certain degree of coincidence can be recognized between particle size groups and the occupation phases. Group A coincides with the weathered material at the base of the section, group B approximately with phases I and II, groups C and D approximately with phase III, group E roughly with phases IV and Va, and G and F roughly with phase Vb.

It has been argued that the material on the tell was derived from a local alluvial source. Thus a change in tell material could reflect a lateral

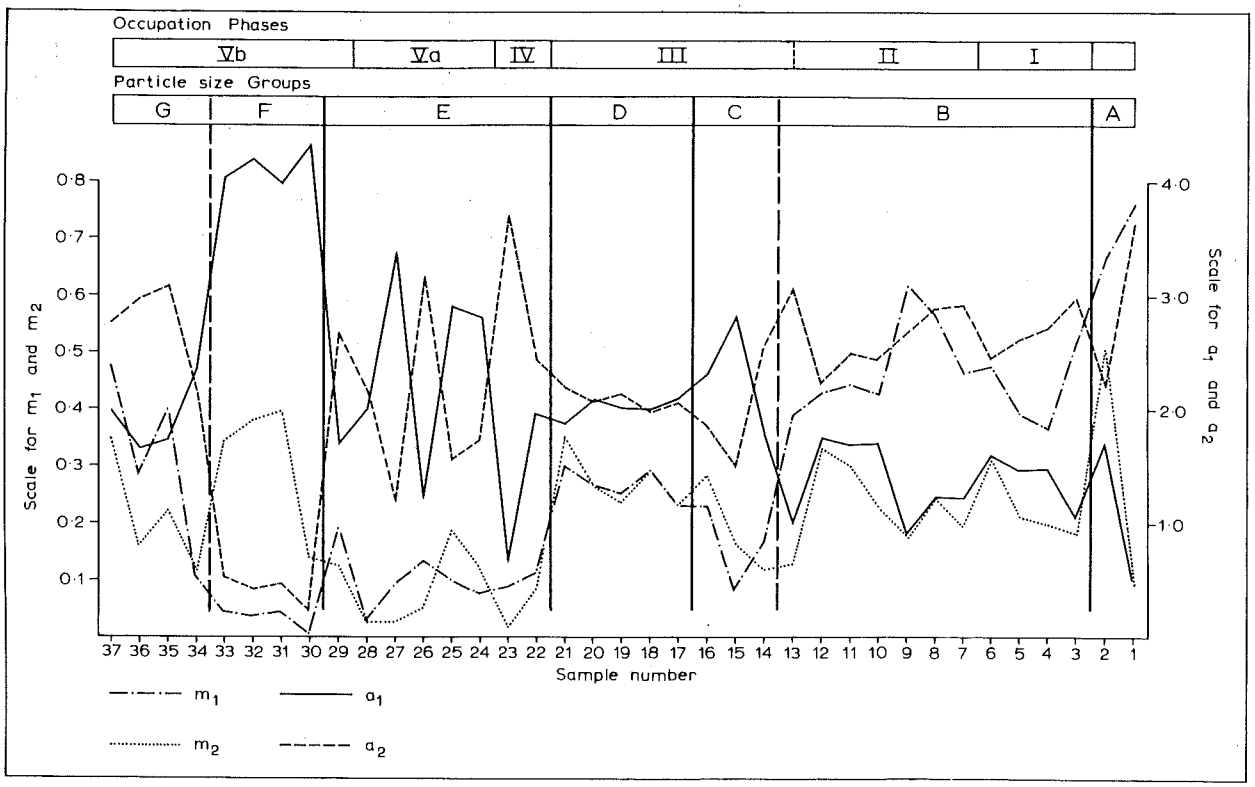


Figure 3.9. Particle-size groups for soil samples from Sitagroi: variation in coefficients (m_1, m_2, a_1, a_2) of the equation for the Pearson Type I frequency curve.

change in alluvial source or a break in time and the utilization of a new alluvial source. The dynamic nature of the Angitis has already been indicated by the alluvial stratigraphy. The coincidence of particle size group B with phases I and II suggests that little change took place in the alluvial source for building material during these phases. The changes from phase II to III, III to IV, and Va to Vb are to varying extents paralleled with changes in particle size groups. In other words, new alluvial sources were utilized as occupation phases changed. The influx of new techniques and ideas may have encouraged the exploitation of a new alluvial source; another explanation, however, is that the changes from phase II to III, III to IV, and Va to Vb were associated with abandonment of the site. Particle size groups C and D, and F and G, in occupation phases III and Vb, respectively, can be interpreted in a similar way, indicating either changes in source of alluvial building material or abandonment phases. There is little evidence to support either of these hypotheses, and it can only be suggested that the differences between certain occupation phases may result from abandonment while the differences within occupation phases may reflect only a change in alluvial source. It is interesting to observe that the total phosphate contents of samples 21 and 29 are relatively low, which supports the suggestion of abandonment between phases III and IV and between Va and Vb. The phosphate values do not indicate any abandonment between phases II and III.

Conclusion

The formation of the tell is solely the result of site occupation, and the process of accumulation seems to have been largely due to house collapse. This means that the tell had to be occupied in order for the thick layers to develop between the major occupation levels. The sites of

houses on the tell must have varied, and the processes of collapse and surface wash must explain the occurrences of thick colluvial layers. The building material was derived from the alluvium of the Angitis River. The particle size groups indicate the changes in source of alluvium and illustrate the association between particle size and occupation phase.

NOTES

1. A summary of this section has been published (Davidson 1971). The author is grateful to the cartographers in the Department of Geography, Sheffield University, for drawing the illustrations. He wishes to acknowledge the assistance of the Greek military authorities and the Hellenic Army Geographical Service. The Macaulay Institute for Soil Reasearch, Aberdeen, carried out the phosphate analyses. Margaret Wilkes assisted with particle size analyses in Sheffield. The author is also grateful to Dr. I. W. Cornwall and R. Grant for their help with the project. Financial support for this geomorphological work was obtained from the University of Sheffield Research Fund, the Sir Ernest Cassel Educational Trust, and from the funds of the UCLA–Sheffield University Archaeology Research Project.

2. Information was also extracted from a 1:50,000 geological map of the Philippoi area published by the Institute for Geology and Subsurface Research, Athens.

3. Cobbles: -6.0 to -8.0 ϕ (64 to 256 mm) (Inman 1952:127).

4. United States Department of Agriculture (1951) classification of soil texture.

4.
Vegetational History

Judith Turner and James R. A. Greig

Present Vegetation

There is very little natural vegetation on either the plain of Drama or the surrounding hills. From a good vantage point the plain looks like a patchwork of fields broken only by small scattered villages and groups or lines of trees. The trees are mainly acacias, which have been planted along the sides of the busier roads to give shelter to passing traffic, and poplars and willows which are growing along the tributaries of the Angitis River which drain the area.

The major crops are wheat and tobacco. The wheat is planted in late autumn, and in early spring it gives a fresh green color to the plain which contrasts vividly with the mosaic of yellow and rich brownish-red seen after the June harvest. After the wheat harvest, attention is focused on the tobacco. It is ready for picking by July and is gathered and dried throughout the hottest part of the summer. Every family has its tobacco field, and the women and children spend many hours threading the individual leaves on long strings of wire which are then set on wooden frames to dry. Drying takes several weeks, and a careful eye is kept on the weather so that the crop may be taken under shelter during the heavy summer storms which can blow up quite suddenly. A little cotton is grown, and this is harvested later in the year, during October and November. In a few of the damper parts of the plain near the rivers, alfalfa and millet are also grown. Most families have a patch of maize and also one of sunflowers, the seeds of which are known as "poor man's nuts." Fruit and vegetables for home consumption—tomatoes, cabbages, aubergines, peppers, and watermelons, for example—are grown on most allotments. There are very few vines on the plain although more are grown on the hills to the west. To those familiar with the Greek landscape, however, the most surprising feature about the Drama region is the absence of olive groves. This is because the climate is not truly Mediterranean. Only along the coast, south of the Pangaion range of mountains where the sea has an ameliorating influence, can olive trees be found. They grow on the flat land next to the sea.

Northwest of the plain near the village of Alistrati the land rises gradually to an area of gently rolling hills. On the better soils of this higher ground, crops similar to those of the plain are grown; the poorer soils are not cultivated. The same is true of the gently rising slopes to the east of the plain. To the north, however, the hills rise steeply from the plain and their slopes are quite unsuitable for cultivation. Similarly, the lower slopes of Pangaion to the south, although less steep, are not suitable for cultivation. These stony hills carry only low-growing xerophilous shrubs which form a pseudomacchie vegetation. *Pseudomacchie* is here used in the sense that Turrill used it (1929), to denote a xerophilous evergreen brushwood often dominated by a single species and occurring in regions of transitional as well as true Mediterranean climate. Southern Macedonia has such a transitional climate.

Pseudomacchie

Over most of the region *Quercus coccifera* (kermes oak) is the dominant species in the pseudomacchie (pl. IV:1), although the extent to which it dominates varies over quite short distances. For example, on the steep, lower, south-facing slopes behind the village of Petrousa on the northern edge of the plain, it forms almost pure stands. Only an occasional plant of the vicious-looking *Paliurus-spino-Christi* (Christ's thorn) or *Juniperus oxycedrus* (juniper) or *Crataegus monogyna* (hawthorn) is mixed with the oak, although higher up the same hillside the juniper becomes more abundant and, on the west-facing slope of the hill which borders the Brus Lakkas Valley, juniper is almost as abundant as the oak. On the alluvial fans to the south of the plain beneath Pangaion, the pseudomacchie consists of a mixture of these four plants. On Pangaion itself, however, it is richer still in species, containing in addition: *Fraxinus ornus* (manna ash), *Pistacia terebinthus* (terebinth or turpentine tree), *Ruscus aculeatus* (butcher's broom), *Phillyrea media*, *Colutea arborescens* (bladder senna), *Carpinus orientalis*, and *Asparagus acutifolius*. Near the source of the Angitis, *Olea oleaster* (wild olive), *Punica granata* (pomegranate), and *Ficus carica* (fig) are also found in the pseudomacchie. Near the coast it contains a higher proportion of the more exclusively Mediterranean species including the tree heather, *Erica arborea*, and the broom, *Calycotome villosa*; on the higher slopes of Pangaion it grades into woodland with such species as *Ostrya carpinifolia*, *Fagus sylvatica*, *Corylus avellana*, *Acer monspessulanum*, *Ilex aquifolium*, and *Hedera helix*. The pseudomacchie is not exclusively dominated by *Quercus coccifera*, however, and in places (there is a fine example of this in the hills south of Serrai) it consists of almost pure stands of *Paliurus*. Associated with the *Paliurus* in that area are *Quercus coccifera* and *conferta*, *Asparagus acutifolius*, and *Ruscus aculeatus*.

Woodland

There is very little woodland in the Drama region. The true Mediterranean *Pinus halepensis* woods are restricted to the Chalkidiki peninsula and there they only occur near the coast where the climate is warmer (pl. IV:2). Growing with the pine in those woods are *Arbutus unedo* and *andrachne*; the *Cistus* species, *salvifolius*, *incanus*, and *monspeliensis*; *Erica verticillata*, *Rhus cotinus*, and *Spartium junceum*.

On the north-facing slopes of Pangaion above 600 m are fir woods of *Abies cephalonica*, and on the very steep, again north-facing slopes to the south of the small plain of Lekani at 700 m is a beech wood with *Corylus avellana*, *Juniper communis*, and *Cornus mas* growing along its lower margin. These are the nearest to natural woodland in the region, the *Abies cephalonica* being the natural climax species above 800 m in the Mediterranean region (pl. V:1) and the *Fagus sylvatica* being the natural climax species between 1,000 and 1,500 m in the central European zone (Turrill 1929).

The natural climax below the fir and beech zones is a mixed deciduous wood, with species such as *Acer monspessulanum*, *Corylus avellana*, *Fraxinus ornus*, and *Ostrya carpinifolia* growing with the deciduous oaks. These species can still be seen among the upper reaches of the pseudomacchie, for example on the slopes of Pangaion and on the hills between the plain of Drama and the plain of Lekani.

Below this comes a zone of deciduous oak wood, and although there is very little of it in the immediate environs of the Drama plain where the *Quercus coccifera* pseudomacchie is abundant, it does occur more widely to the west near Thessaloniki in otherwise similar country. There are several species of oak in this zone including *Quercus frainetto* (pl. V:2), *Quercus pubescens*, and *Quercus petraea*, and they often form almost pure stands. Associated species include the evergreen kermes oak and *Juniperus oxycedrus* and, on the moister, cooler north-facing slopes, *Carpinus orientalis*. Many of these oak woods were felled during World War II and afterward left to regenerate naturally from the old stumps. They are now even-aged stands with a uniform structure; we were assured, however, by Johannes Papaioannou, Professor Emeritus of Forest Botany, University of Thessaloniki, that their species composition is the same as before the war.

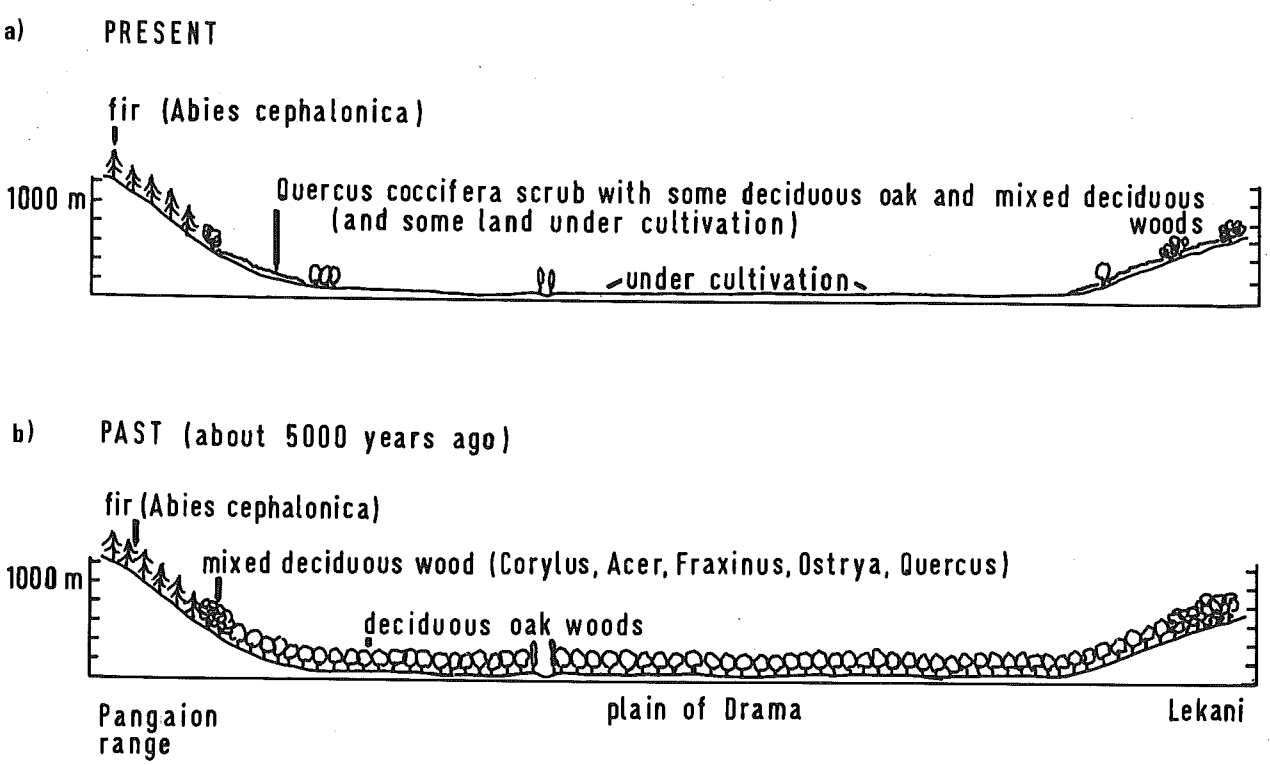


Figure 4.1. Diagrammatic sections across the Drama Plain showing (*a*) present-day distribution of vegetation; and (*b*) probable distribution of woodland 5,000 years ago.

The balance between these deciduous oak or mixed deciduous woods and the pseudomacchie is interesting. There is very little woodland close to the villages; it appears to be prevented from growing there by the grazing animals. But in a few places farther from the villages, where the pseudomacchie has recently been protected from goats, deciduous oaks can be seen overtopping the *Quercus coccifera* and growing well. It would seem, therefore, that in the absence of cultivation and grazing, pseudomacchie would pass into woodland in this region, and that on the low-lying plain of Drama one could expect such woodland to consist mainly of oak. Oak species would be able to grow on all the major soils within the plain, on the deep reddish-brown terra rossas and the thin rocky soils of the lower mountain slopes, and also on the coarse-textured or silty alluvial fans which have aggregated around the edges of the plain, and on the strips of riverine alluvium which border the Angitis and its tributaries.

The distribution of the various kinds of vegetation is shown diagrammatically in figure 4.1.

PAST VEGETATION

There is substantial evidence to suggest that the natural vegetation of the area before man's arrival was oak woodland. Indications include the present vegetation, in which oak woodland exists even while seriously modified by man, and the fact that such woodland tends to replace pseudomacchie when the latter is left ungrazed. Plant ecologists have never seriously doubted the area's oak woodland past, and it is supported by evidence from classical writers such as Horace, Plato, and Thucydides. In addition, recent positive evidence for this has emerged from studies of the subfossil pollen grains preserved in the local lake muds, pollen grains which were produced by the vegetation of former times. Such evidence is now available from several different parts of Greece: from Ioannina and other sites in the northwest (Bottema 1967, 1974; Athanasiadis 1975), from near Pylos in the Peloponnese (Wright 1968), and from the former lake of Philippoi, which occupies the southeastern part of

the plain of Drama (Van der Hammen et al. 1965; Wijmstra 1969). The results from Philippoi are so relevant to our area that it is worth considering them in some detail.

Van der Hammen et al. (1965) thought the lake an ideal place for studying the vegetational history of Macedonia because for a very long time it has been slowly subsiding relative to the surrounding hills, thus providing suitable conditions for the continuous deposition of organic sediments in which pollen is normally preserved. Their boring, which did not reach the bottom of the lake, showed the sediments to be at least 77 m deep, and the preliminary pollen diagram indicated that these sediments had been accumulating since the last interglacial. The sediments recovered from depths between 5 and 27 m were laid down during the Würm or last glaciation, and the pollen showed that during that period the area was covered with a practically treeless steppe vegetation with *Artemisia* and members of the Chenopodiaceae family as well as grasses and sedges. The sediments above 5 m were laid down during the Holocene.

The details of the Holocene vegetation are given most clearly in Wijmstra's (1969) detailed pollen diagram. He has shown that toward the end of the Würm glaciation the *Artemisia*-Chenopodiaceae vegetation was replaced by one in which *Quercus*, together with several other thermophilous trees, was important. These trees contribute between one-half and one-third of the total pollen. Wijmstra calls this pollen zone Y2 equating it with the warm phase of the Allerød climatic oscillation of northwest Europe. However, the development of trees, as in the northwest, was short lived because Y2 is followed by a pollen zone, Y3, in which the *Artemisia*-Chenopodiaceae steppe vegetation regained its former dominance. Pollen zone Y3 is succeeded by zone Z, and in this period the trees expanded until they were contributing 90% of the total pollen. The Y/Z pollen zone boundary has been radiocarbon dated to 10,300 BP and clearly corresponds with the beginning of the postglacial period in northern Europe.

Wijmstra recognized five major subdivisions of the Holocene vegetation, pollen zones Z1 through Z5. The characteristic features of each are as follows, Z1 being the oldest and Z5 the youngest zone:

Z1, Z2 Total tree pollen rises from under 20% to over 80%. *Quercus* is the most important tree genus. *Pistacia*, *Juniperus*, *Sanguisorba*, and *Betula* are also present in significant quantities.

Z3 Total tree pollen reaches its maximum, 90%. *Quercus* is the most important tree genus. *Corylus* and *Fraxinus* are present in significant quantities. Toward the end of this zone *Abies* and *Ostrya* become important.

Z4 As in zone Z3, but *Fagus* and Ericaceae species increase and total tree pollen decreases.

Z5 Total tree pollen continues to decrease; *Pistacia*, Ericaceae, and other non-tree pollen frequencies increase.

By the end of zone Z5 the tree pollen frequency has only dropped to 70%, and it is obvious that the whole area was still well wooded in much the same way it had been throughout the earlier part of the postglacial. The forests were dense and were dominated by oak. There was some pine, a little lime, elm, fir, hornbeam, hazel, ash, and *Ostrya carpinifolia*. This much is clear. What is not so clear is exactly when period Z5 ended.

Unfortunately, there are insufficient radiocarbon dates to establish a detailed chronology for these five postglacial pollen zones, Z1-Z5, and it is this chronology which is vital for reconstructing the state of the vegetation while the tell of Sitagroi was occupied. The only indication of a date for these pollen zones comes from a sample dated in association with the preliminary pollen diagram, a level which corresponds with the top of Z1 on the more detailed diagram (Wijmstra, personal communication). The date is 5850 ± 50 bc. This means that the oak forest was well established in the area by the sixth millennium, although how much earlier it became so we do not at present know. Neither is it apparent from the

diagram how much longer it remained in the area, although Wijmstra suggests that zones 3 and 4 probably correspond with 4600 to 1800 bc, the time when the tell was occupied. This would mean that throughout the occupation the area was well wooded and man was having comparatively little effect on his wooded environment.

The need for a well-substantiated correlation between the time the tell was occupied and the later postglacial zones of the pollen diagram was clear. Thus in the summer of 1970 we decided to collect, for closer pollen analysis and radiocarbon dating, samples of the upper few meters of the lake sediments at Philippoi, despite the fact that it might mean duplicating the upper part of Wijmstra's interesting diagram (Greig and Turner 1974; Turner and Greig 1975).

The New Pollen Diagrams

Recent samples satisfactory for radiocarbon dating and pollen analysis are not easily obtained from an area like the old lake at Philippoi, which has been drained in the past and is now used as agricultural land. The uppermost peats have been disturbed both by the draining itself and by having served as soil for the maize and other crops which have been grown on it for a number of years. They are dry and crumbly down to depths varying from 50 to 100 cm, and only the damper, less disturbed peats below this constitute reliable material for analysis. Also, at any one place there is no way of knowing, short of constructing a full pollen diagram, how recently these upper layers were formed. We therefore collected samples from three places within the

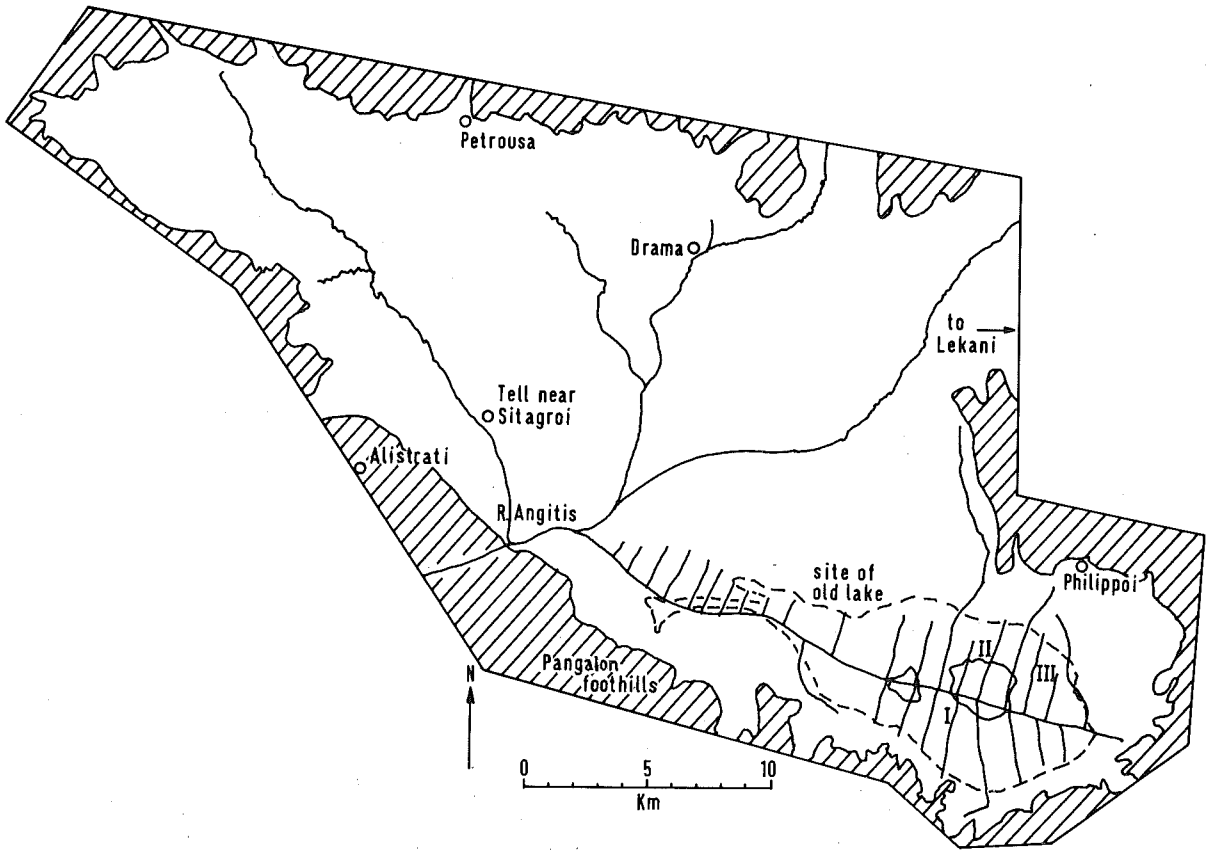


Figure 4.2. Map of the Drama Plain showing site of the old lake as deduced from the presence of peat and the amount of marshy ground marked on the 1916 (1:50,000) British military map. Areas shown as open water in 1916 are marked. The three sites from which pollen samples were collected are indicated as I, II, and III. (Map is based on Davidson's geomorphological map, fig. 3.2).

old lake basin in the hope that at least one of the diagrams would cover the five millennia with which we are particularly concerned. The three sites chosen are shown on figure 4.2.

Site I was approached from the south side of the old lake from the village of Amisiana. The surface of the ground did not appear to have been cultivated in the past. A pit was dug a meter back from the side of a drainage ditch for collecting the samples.

Sites II and III were approached from the north side of the old lake. At both locations the surface peat had been disturbed by cultivation.

Preliminary pollen samples from these sites indicated, as might have been expected, that Site I contained the youngest peat; the detailed diagram (fig. 4.3) was prepared from the samples collected there. A second diagram was subsequently prepared from Site III (fig. 4.5).

THE POLLEN DIAGRAM FROM SITE I. Samples were collected to a depth of 150 cm from the side of the freshly excavated pit and below that down to 200 cm with a Russian peat borer of the type described by Jowsey (1966).

Three samples of the peat, those from 90 cm, 120 cm, and 145 cm, were submitted for analysis to the radiocarbon dating laboratory at the Deutsche Akademie der Wissenschaften zu Berlin. Samples from the top meter were considered unsuitable for dating because of the penetration of modern roots; those from below 150 cm could not be dated because the organic material contained in the samples was insufficient for the Berlin laboratory to date. The results are as follows:

Sample from 90 cm	
Bln 953	3255 ± 100 BP
Bln 953a	3320 ± 100 BP
Mean	3288 ± 100 BP
Bln 965 (humic fraction)	3053 ± 100 BP
Sample from 120 cm	
Bln 954	3722 ± 100 BP
Sample from 145 cm	
Bln 955	4193 ± 120 BP

Subsequently a sample from 200 cm was submitted to the Scottish Research Reactor Centre at East Kilbride for dating by Dr. D. D. Harkness. This laboratory uses a scintillation counter and can process smaller quantities of carbon than the Berlin laboratory. The result is as follows:

Sample from 200 cm	
SRR 83	5031 ± 180 BP

From these dates it is possible to estimate the rate at which the peat was accumulating. For this purpose the dates given above in radiocarbon years were first converted into sidereal years by using the Suess calibration curve (Suess 1970). The converted dates are:

3288 BP = 1630 BC
3722 BP = 2140 BC
4193 BP = 2945 BC

The date 5031 ± 180 falls on a part of the calibration curve which is based on very few dates and so cannot be converted to sidereal years with a comparable degree of probability. It could lie anywhere between 3750 and 4200 BC.

Between 2945 and 2140 BC, therefore, the peat was accumulating at a mean rate of 1 cm in 32 years, and between 2140 BC and 1630 BC at a mean rate of 1 cm in 17 years. Between 145 and 200 cm the mean rate was of the order of 1 cm in 14.6 to 22.8 years. The rate of peat accumulation, therefore, varied by a factor of approximately two; this makes it difficult to extrapolate from the results of the radiocarbon determinations to obtain a time scale for the upper part of the diagram. All we can be reasonably confident about is that the top of the diagram corresponds to a period substantially later than 1630 BC (1338 bc, uncorrected). If one uses the mean of the two more accurate rates, that is, 1 cm in 24.5 years, as a very rough estimate for the peat from 0 to 90 cm, then the diagram could be considered to cover the period up until AD 452 (ad 744, uncorrected). But these dates are speculative in the sense that the rate of 1 cm in 24.5 years is little more than a guess at the actual rate.

Looking at the pollen diagram, however, it is clear that it is remarkably similar to the top few subzones of Wijmstra's diagram. In other words, the results indicate that the vegetation of the period was remarkably uniform throughout, consisting mainly of deciduous woodland. The con-

clusion is unequivocal. During the time the tell was occupied, the plain of Drama and the hill country around were not deforested as they are today but carried an oak woodland and, as mentioned previously, this would have been growing not only on the reddish-brown soils derived from the limestone but also on the stony alluvial fans and on much of the alluvium which borders the rivers. The people living in the area were living in a forested environment.

One must not imagine, however, that the woods were pure deciduous oak woods, though clearly they were dominated by oak species. The pollen of other trees is present although only in low frequencies: *Abies*, *Acer*, *Alnus*, *Betula*, *Carpinus*, *Corylus*, *Fagus*, *Fraxinus excelsior*, *Juniperus*, *Ostrya*, *Picea*, *Ulmus*, and *Tilia* were all in the neighborhood. Low frequencies of *Quercus ilex* type, *Buxus*, *Phillyrea*, and *Pistacia*, together with the *Pinus*, indicate that true Mediterranean woodlands were not all that far away—as indeed is the case today.

Nor must one imagine that trees were not being used for fuel, for building, or even being cleared so that crops could be grown. It is rather that such practices were not taking place on a large enough scale to disturb the wooded environment. Over the area as a whole the regeneration of trees was probably keeping pace with their removal and an equilibrium being maintained.

One can, however, detect some short-term variations in the amount or density in the forest during the period. This is not very clear on the pollen diagram as plotted in figure 4.3 which has all pollen frequencies calculated as a percentage of total pollen. But when the pollen of lake and lakeside species is excluded from the total pollen sum, the tree pollen frequencies do vary significantly. In figure 4.4 the tree pollen is shown as a percentage of the total pollen, excluding aquatic plant and Cyperaceae pollen, together with the 95% confidence interval for each pollen frequency. The occupation phases of Sitagroi, insofar as they overlap with this diagram, are also given. Phases IV and V, and possibly also the earlier ones, correspond with the lower part of the diagram.

The tree pollen frequency is high, with 85-90% in the bottom half of the diagram. At 160 cm there is a small but significant decrease after which it slowly recovers. This is at the beginning of Sitagroi phase IV.

Although occurring later than the period with which we are concerned, it is worth noting that slightly bigger changes appear between 90 and 5 cm, with a series of significant falls and rises in the tree pollen frequency. The low values in this upper part of the diagram are much lower than those in the lower half—between 65 and 70% instead of 75%—although the high values are almost comparable. This can only mean that there were a number of short periods when the pressure on the woods was considerably more than before, followed by periods when there was less pressure and the trees were able to regenerate. Low frequencies of olive pollen have been recorded between 30 and 60 cm and 80 and 100 cm, indicating that trees were being cultivated during these two periods, namely, about 500–1000 BC and 1350–1900 BC. It is interesting that the vegetation was always capable of regaining its climax form and that the increasing human pressure on it was at no time represented on the diagram as sufficient to bring about a permanent and irreversible change.

THE POLLEN DIAGRAM FROM SITE III. The results from Site III are indicated in the same way as for those from Site I. Figure 4.5 shows all the individual pollen frequencies as a percentage of the total pollen. Figure 4.6, with selected frequencies, shows the tree pollen as a percentage of the total pollen, excluding that of aquatics and Cyperaceae, and the Cyperaceae frequency as a percentage of the total pollen.

Before any radiocarbon dates were available for Site III the diagram was correlated with that from Site I by means of (a) the first low tree pollen frequency at 64 cm, which resembles that at 80 cm on the first diagram—shown as horizon A on figures 4.4 and 4.6; and (b) the first high value for Cyperaceae pollen at 130 cm, which resembles that at 130 cm on the first diagram—shown as horizon B on figures 4.4 and 4.6.

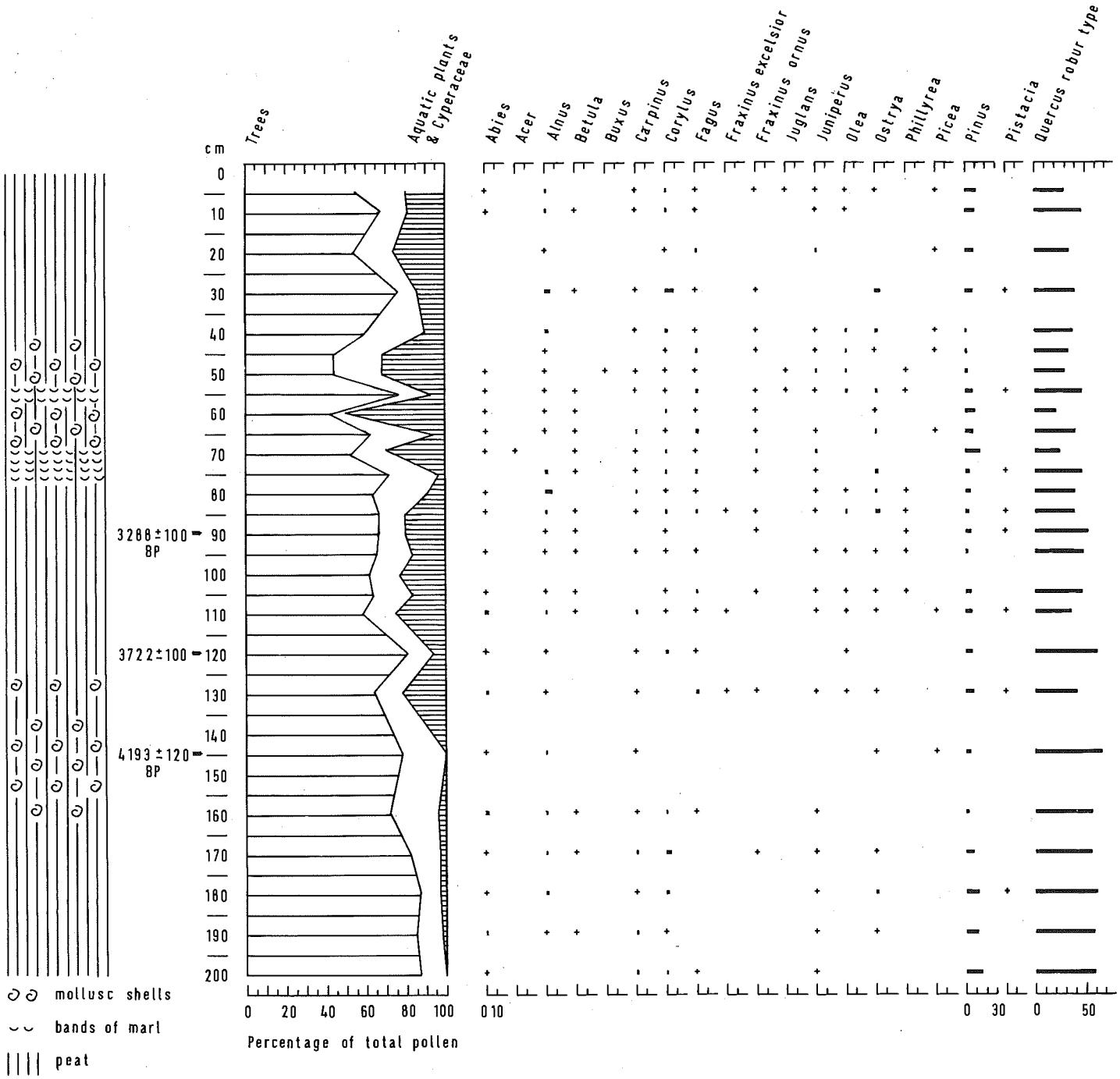
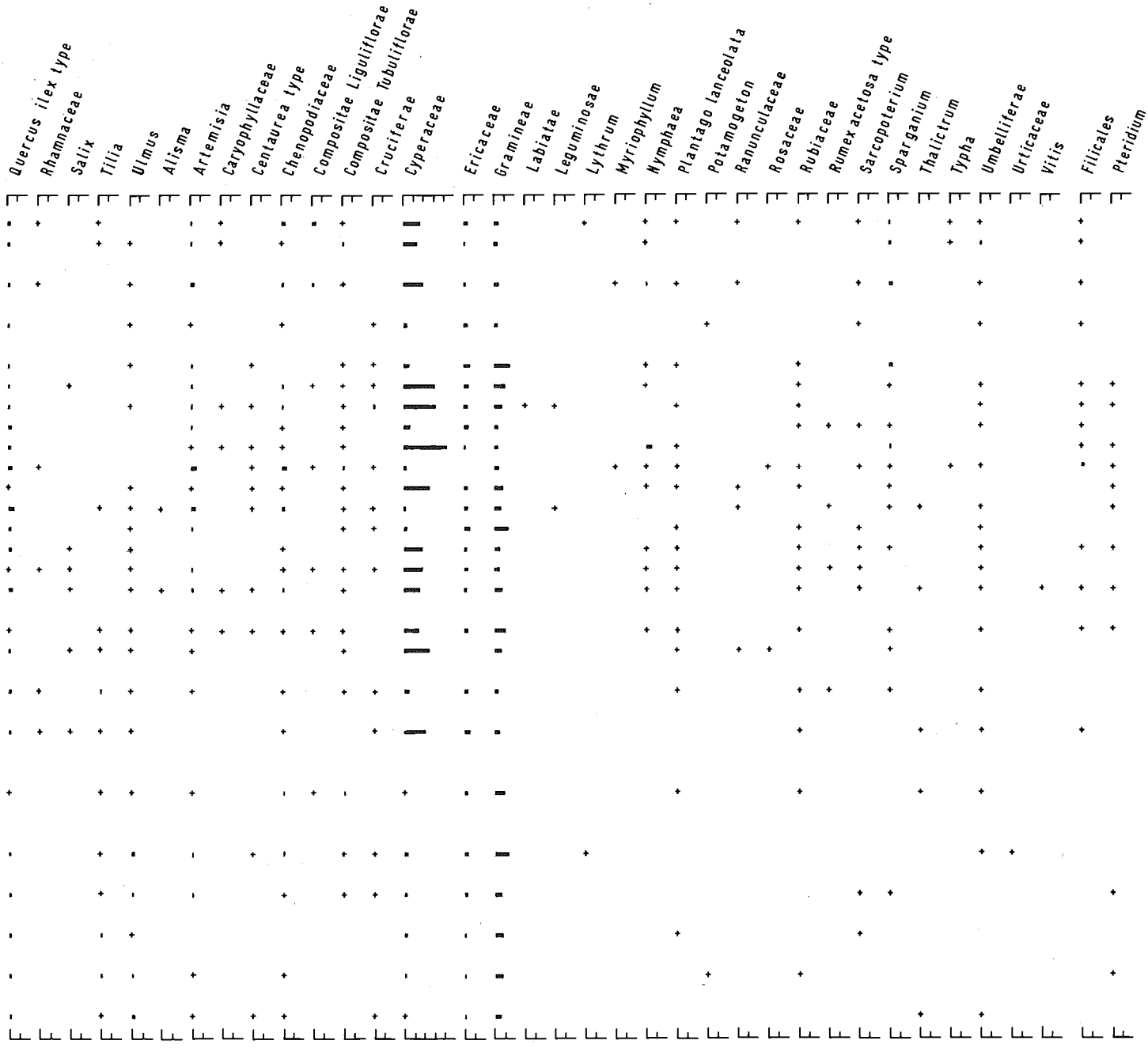


Figure 4.3. (On facing pages):
Full pollen diagram from the Philippoi I site with pollen frequencies plotted as a percentage of total pollen and the ratio between tree pollen, sedge, and aquatic pollen and other herbaceous pollen shown on the left side. Results of the radiocarbon determinations (uncorrected) are given in years BP. Tree pollen taxa are in alphabetical order, as are the non-tree pollen taxa.


Quercus ilex type
Rhamnaceae
Salix
Tilia
Ulmus
Alisma
Artemisia
Caryophyllaceae
Centaurea type
Chenopodiaceae
Compositae Liguliflorae
Compositae Tubuliflorae
Cruciferae
Cyperaceae
Ericaceae
Gramineae
Labiatae
Leguminosae
Lythrum
Myriophyllum
Nymphaea
Plantago lanceolata
Potamogeton
Ranunculaceae
Rosaceae
Rubiaceae
Rumex acetosa type
Sarcopoterium
Sparganium
Thalictrum
Typha
Umbelliferae
Urticaceae
Vitis
Filicales
Pteridium

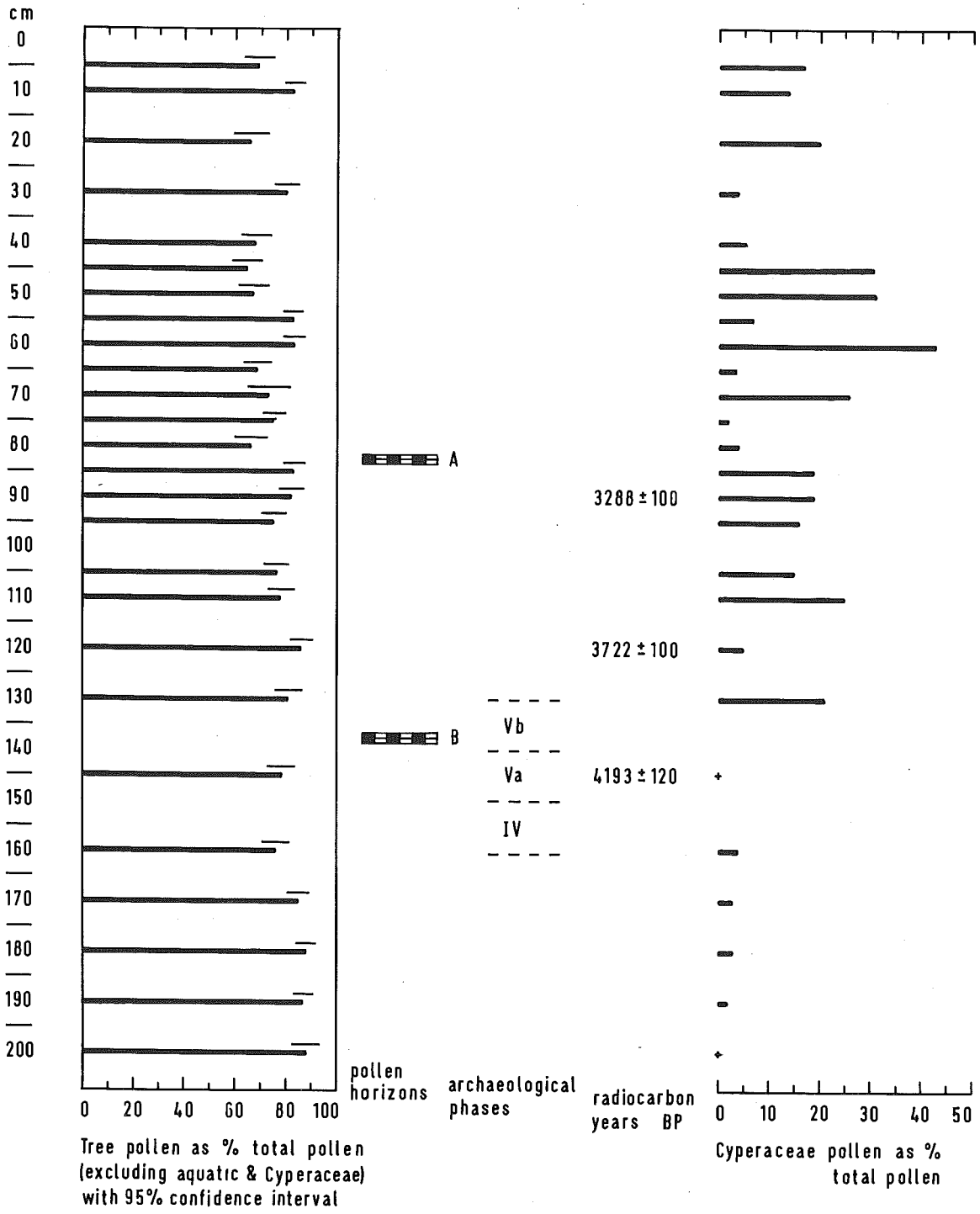


Figure 4.4. Selected pollen frequencies from the Philippoi I site. The tree pollen is plotted as a percentage of total dry land pollen (excluding Cyperaceae and aquatic plant pollen) together with the 95% confidence limit and Cyperaceae frequency as a percentage of total pollen. Radiocarbon dates and the archaeological phases are shown for correlation.

The radiocarbon ages which were subsequently determined by Harkness are as follows:

RR 84 peat from 70 cm	2867 ± 60 BP
SRR 85 peat from 140 cm	3740 ± 60 BP
SRR 86 peat from 345-350 cm	7556 ± 85 BP

This means that the top of the diagram from Site III overlaps the diagram from Site I and extends it in depth; the date 7556 ± 85 BP for 345-350 cm, the bottom of the Site III diagram, confirms that it covers the whole of Sitagroi phases III, II, and I. The dates also confirm that, within the limits of accuracy imposed by our sampling interval, both horizons A and B are synchronous, indicating that the changes in pollen frequency at the two horizons represent real changes in the vegetation over a wide area. The sites are some kilometers apart and would hardly show the same changes in pollen frequencies unless the changes were occurring over quite large areas.

It will be seen from figure 4.6 that during Sitagroi phases III, II, and I, the tree pollen frequency had values similar to those of phase IV. In other words, we can detect no significant variation in the amount or density of the forest cover during the earlier phases.

DISCUSSION

What the slight variations in the tree pollen frequency mean in terms of the activities of the prehistoric people is difficult to say from the palynological evidence. Presumably the wood they used in their buildings and burned in their hearths was obtained from the forests; their cereals were almost certainly grown where trees had been cleared for this purpose. These activities appear to have had little effect on the regional tree pollen rain which remained almost constant during Sitagroi phases I, II, and III.

The decrease in tree pollen at the beginning of Sitagroi phase IV, seen at Site I, could have been caused by a slight change in any of the above activities. If, for example, the population had increased between the time of the Dikili Tash and final neolithic cultures, this could have led to more wood being collected from the forests and larger areas being cleared for crops, and hence to a decrease in the tree pollen; similarly, a subsequent decrease in population could have led to an increase in the tree pollen frequency. Alternatively, new economic factors could have affected the frequency independent of any change in population. If, for example, crops had been grown less extensively and acorns used instead as a source of food, as J. M. Renfrew suggests (vol. 2), less ground would have been required for crops, that which had been used previously would have reverted to woodland, and the tree pollen frequency would have increased. The cultivation of olives would also have affected the frequency as olive trees produce less pollen than do oak trees. But these are only examples of how man's activities could have affected the tree pollen frequency, and although it is interesting to speculate about this, it must be remembered that the variations are small and the area was well wooded all the time.

Evidence for Climatic Change

We had hoped that these palynological studies would produce decisive evidence about the climate and whether it changed during the neolithic and early bronze age. As the prehistoric woods were similar to those one would expect to find in the area today if grazing pressure were removed, the climate must always have been suitable for oak forest and therefore within the range that supports such forest today. The evidence that olives were cultivated does indicate, however, that it might have been marginally more Mediterranean during those periods than it is today.

Evidence for a Change in Lake Level

The pollen frequency that varies more than any other is that of the Cyperaceae. Above horizon B a zone can be recognized in which the Cyperaceae frequency is often very high. The fact that this occurs on both diagrams makes it likely that

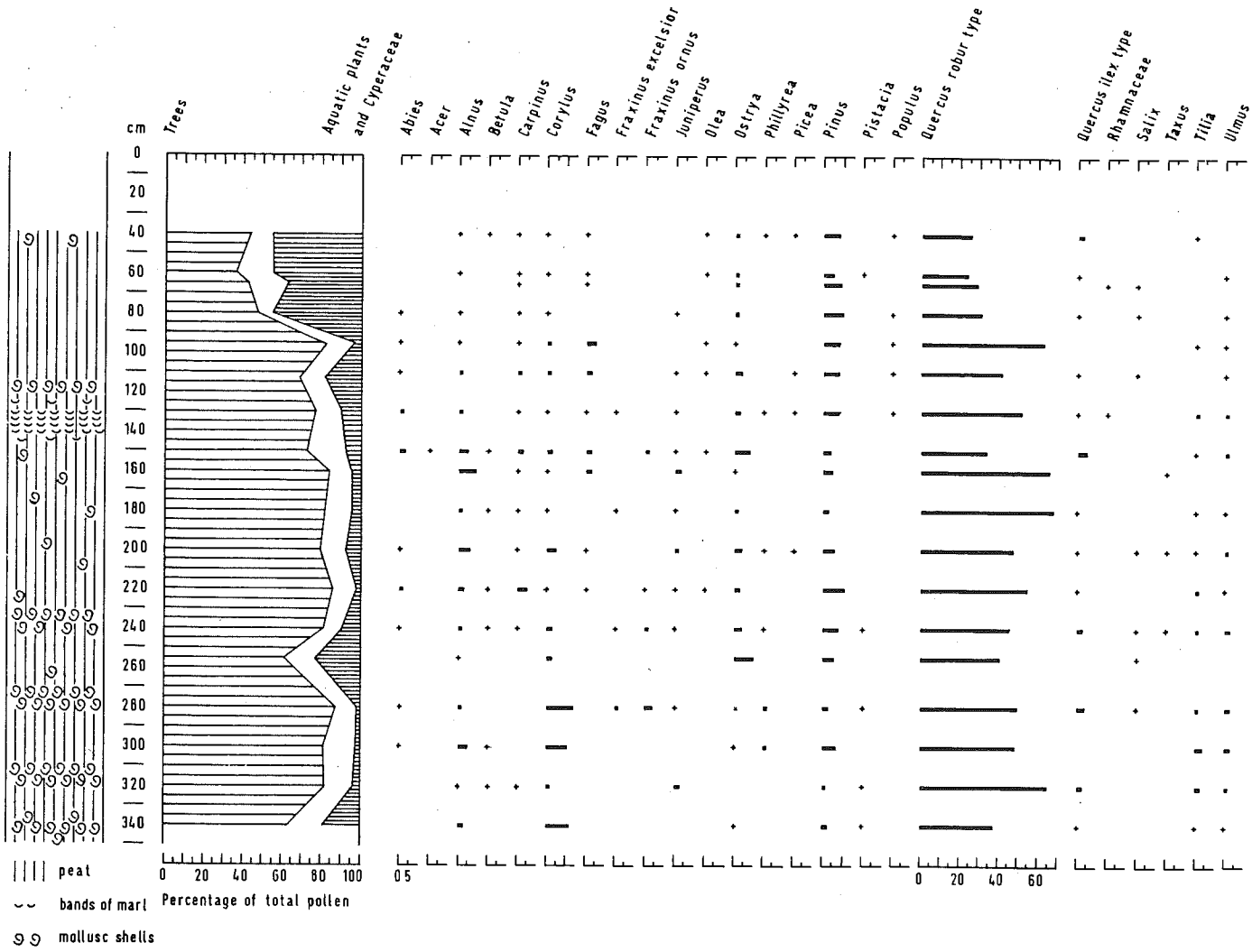
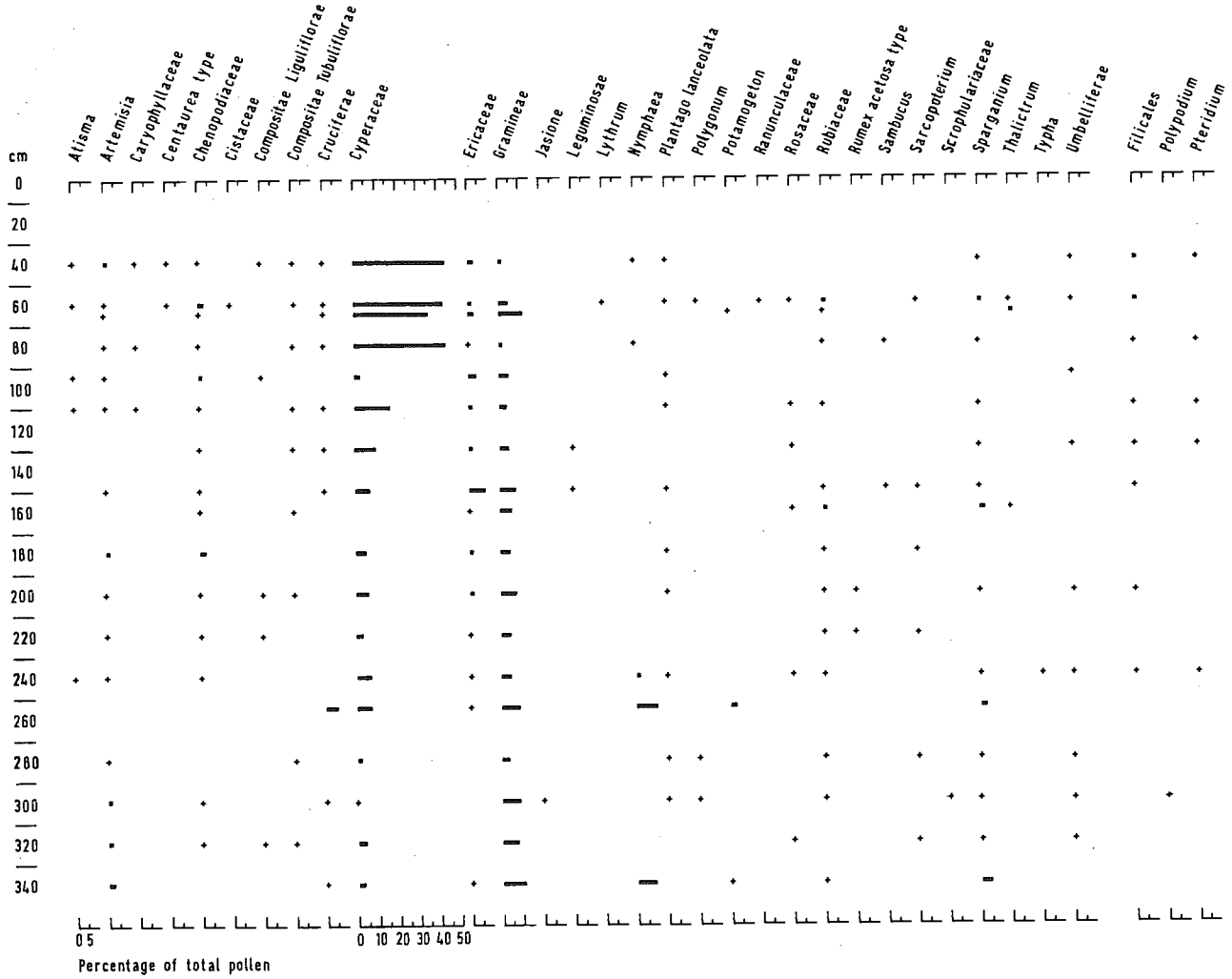


Figure 4.5. (On facing pages):
Full pollen diagram from the Philippoi III site with pollen frequencies plotted as a percentage of total pollen and the ratio between tree pollen, sedge, and aquatic pollen and other herbaceous pollen shown on the left side. Tree pollen taxa are in alphabetical order, as are the non-tree pollen taxa.

it is a regional rather than an extremely local phenomenon. It indicates an extension of the lakeside sedge communities and therefore in all probability a slight change in the lake level. There is independent evidence for such a change from Davidson's observations (chap. 3). For example, the tells at Sitagroi and Dhoxaton are undercut by streams which at Dhoxaton were thought to have been some 2-3 m higher than at the present time.

It is also interesting to note that Payne reports (1975) an increased number of tench bones during phases IV and V. Tench is a fish of muddy, shallow water and sedgy habitats, and an increase at that time might well be associated with a gradual rise in lake level which by the end of phase V had increased the number of habitats available for sedges around the enlarged lake.



CONCLUSIONS

The results of these studies, particularly the radiocarbon dates associated with our diagram from Site I, confirm beyond any reasonable doubt that the oak woodland already described by Wijmstra (1969) existed throughout the time that the tell at Sitagroi was occupied. The woods did contain other species but only in very small amounts. Most of the trees on the plain and on the surrounding foothills were oak. It seems that the people lived in the area without destroying its wooded character and what small areas they did clear at various times easily reverted to woodland; and this was so for a long time after the end of phase V. We have no evidence that the climate changed but it is likely that the lake level rose during the period and that by the end of phase V this had resulted in an increase in sedge communities around its edge.

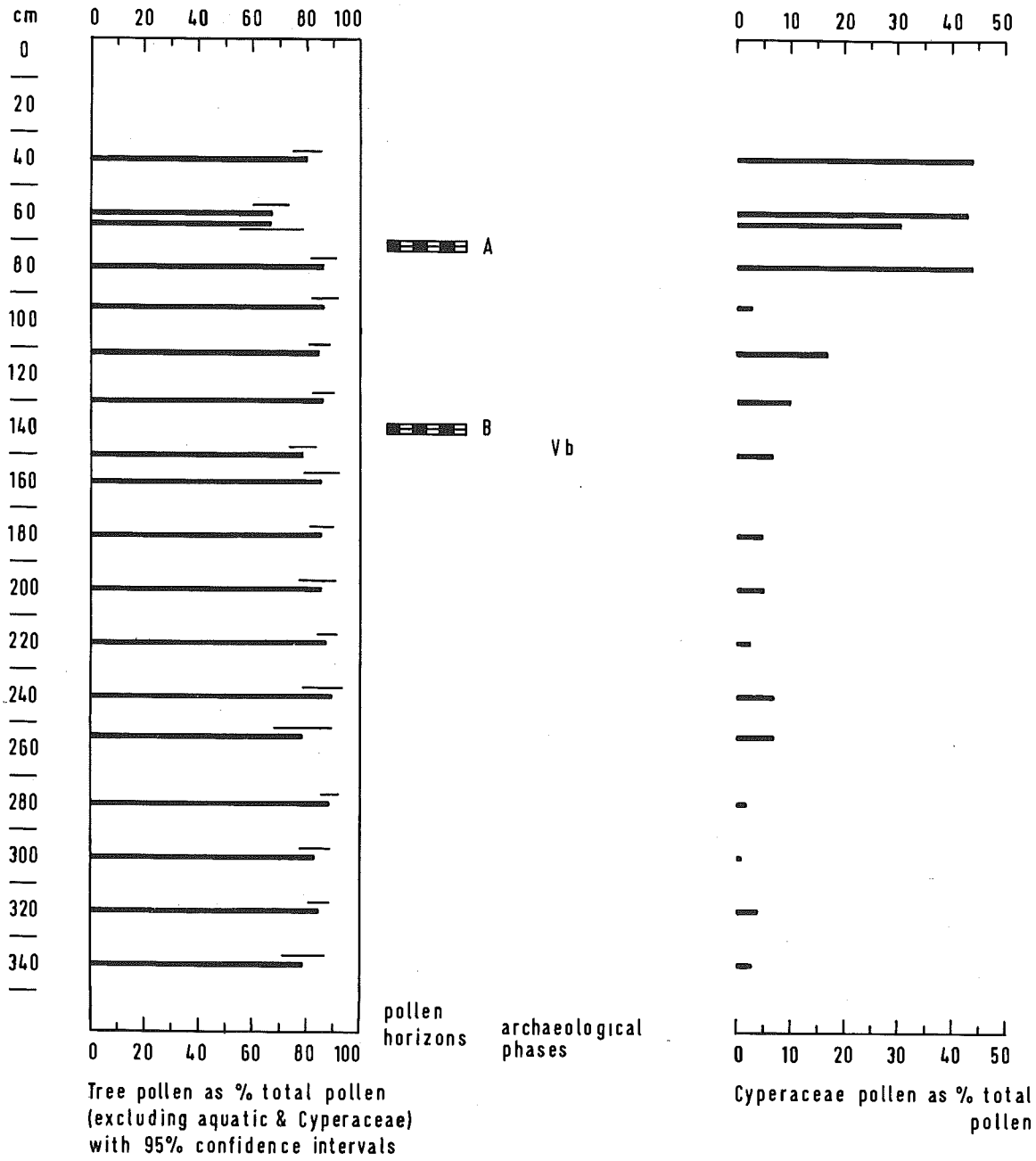


Figure 4.6. Selected pollen frequencies from the Philippoi III site. The tree pollen is plotted as a percentage of total dry land pollen (excluding Cyperaceae and aquatic plant pollen) together with the 95% confidence limit and the Cyperaceae frequency as a percentage of total pollen. The archaeological phases are shown for correlation.

APPENDIX A
Charcoal
Oliver Rackham

SAMPLING

Over 100 collections of charcoal were made by the excavators at various levels in different parts of the site. In a few cases a substantial part of a large timber was found, but most of the collections consisted of a number of pieces related only by their context. It was impossible to examine this enormous bulk of material; thus all the large timbers were looked at in detail and the remainder was sampled. Collections were chosen to represent every phase of the site. Within each selected collection, a sample of at least ten pieces was taken if possible, including all the larger pieces and some of the smaller.

The charcoals, broken if necessary to get suitable faces, were examined as opaque objects under a stereomicroscope with a magnification up to 50x. One timber which survived as recognizable wood, though macerated and extremely fragile, was embedded in wax and sectioned (for this I am indebted to R. D. Whybrow).

IDENTIFICATION

There are many adequate books and keys which make it a straightforward matter to identify common commercial timbers from the cellular structure of their charcoals. Two factors, however, greatly complicate the present case. First, archaeological charcoals are liable to include species other than timber trees, and to include branches and roots as well as wood from the trunk. Second, Thrace probably has more tree and shrub species than any other part of Europe; few of these are adequately described, reference material for many is virtually unobtainable, and some are variable.

The charcoals have been classified into types, for most of which generic identifications are proposed with some confidence. There is normally no known means of distinguishing species within a genus. Species identifications would greatly assist ecological inference, but they are often impossible even with better-known trees and could not be attempted here without a major research program on wood anatomy and its variation in the local trees and shrubs.

A note is given on the present-day distribution of the species which might be involved. "Central European" plants reach their southern limit in Thrace and are usually confined to the higher altitudes there. "Mediterranean" species, characteristic of regions with a true Mediterranean climate, reach their northern limit in Thrace and are often restricted to the coastal plain, though some ascend the Axiós Valley. "Sub-Mediterranean" plants occupy intermediate latitudinal and altitudinal zones. "Oriental" species have their main distribution in western Asia but extend into the Balkans, usually in the sub-Mediterranean zone.

Oak Type

SUBTYPE A. Dicotyledonous. Strongly ring-porous. Vessels nearly all solitary, in two (occasion-

ally three) sharply defined size classes: those of early wood elliptical, very large (350 x 250μ, occasionally up to 520 x 440μ), in one or more tangential rows, containing tyloses; those of late wood angular, thin-walled, 20-50μ in diameter, in broad, irregularly radial flames. Parenchyma in prominent masses forming the matrix of the late-wood flames. Remainder of matrix chiefly fibers. Rays of two distinct sizes: large ones up to 0.6 mm wide, several centimeters high; small ones including some uniseriates.

SUBTYPE B. Differs in the smaller early-wood vessels (230 x 185 μ maximum); late-wood vessels few, restricted to the tips of the rather narrow parenchyma flames; and a more gradual transition between the two sizes of vessel.

Both subtypes have the complex and unmistakable structure of oak. Sixteen oaks could occur in the region (*Flora Europaea* 1964), and the three subdivisions of the genus (Jane 1956) are all represented. The evergreen oaks, *Quercus coccifera* L. and *Q. ilex* L., can be ruled out since they are weakly ring-porous, their aggregate rays (where present) are even wider, and they lack definite parenchyma flames. The red oaks, *Q. cerris* L. and probably a few related species, are excluded by their thick-walled, rounded, late-wood vessels (Brazier and Franklin 1961). Oaks A and B therefore both belong to the ten to twelve possible species of deciduous white oaks, which have a variety of distributions but are not common in the true Mediterranean (except Crete; Bottema 1980). They probably represent at least two different species.

Ash Type

SUBTYPE A. Dicotyledonous. Strongly ring-porous. Vessels elliptical; up to 290 x 190 μ in early wood, down to 29 x 21 μ in late wood, transition gradual; equally numerous in early and late wood and in both cases mainly in radial pairs or threes which tend to occur in oblique tangential lines. Parenchyma in sheaths around vessels, especially in late wood. Rays numerous, (1-)2-3(-4)-seriate, low, homogeneous (procumbent cells only).

SUBTYPE B. Differs in the circular vessels in two very distinct sizes, those at the beginning of each ring 44-104 μ in diameter, the remaining few 20-40 μ in diameter, only the late-wood vessels often in pairs or threes; parenchyma sheathing late-wood vessels only; rays (1-)2-seriate.

SUBTYPE C. Only in small sizes with narrow growth rings. Differs from A in the sub-angular vessels in two rather distinct sizes, range 150 x 100 μ to 21 x 21 μ, often in radial threes; parenchyma around late-wood vessels and at end of growth ring; rays (1-)2(-3)-seriate, weakly heterogeneous with one marginal row of semicubical cells and the rest procumbent.

These are certainly ash (*Laurus* has many of the microscopic details but is not ring-porous). The four Balkan ashes are *Fraxinus excelsior* L. (north and central Europe), *F. ornus* L. (sub-Mediterranean), *F. oxycarpa* Willd. (Mediterranean), and *F. pallisae* Wilmott (nowadays confined to Balkan river deltas); there are isolated records of certain other species. There is some information on species differences in their anatomy. That of *F. excelsior* is well known (e.g., Brazier and Franklin 1961); *F. oxycarpa* and *F. pallisae* are described by Metcalfe (1938). Subtype A is a close fit to *F. excelsior* (e.g., in having some of its rays 4-seriate). Subtype B is probably a different species, perhaps *F. ornus*. Subtype C cannot safely be determined: it has the characters of *F. oxycarpa* or *F. pallisae*, but coming from a slow-growing stem it might be a deviant form of one of the other two species.

Elm Type

Dicotyledonous. Bark 3.5 mm thick (on a stem 8.7 cm in diameter). Strongly ring-porous. Early-wood vessels solitary, elliptical, about 210 x 140 μ; late-wood vessels sharply demarcated, much smaller, closely packed in obliquely radial "ulmiform" tracts separated by fibers. Rays mostly small multiseriate.

The structure is highly characteristic of the Ulmaceae. The material is presumably elm, *Ulmus* (though the local and little-known genera *Celtis* and *Zelkova* cannot entirely be discounted). Elm species are numerous and taxonomically diffi-

cult; they have a variety of distributions but rarely extended into the true Mediterranean. The present material has too abrupt a transition from early to late wood to be the central European *U. glabra* Hudson, the only species anatomically defined (Jane 1956).

Chestnut Type

Variable. Dicotyledonous. Ring-porous. Vessels all solitary, often elliptical; in early wood usually 180 x 140 μ or less, sometimes to 300 x 280 μ; in late wood variable in size and frequency, always in oblique to nearly radial flames; transition gradual or abrupt. Rays nearly all 2-3-seriate.

This has most of the features of a deciduous oak without its aggregate rays and is almost certainly sweet chestnut, *Castanea sativa* Miller, the only European species of its genus, with a sub-Mediterranean distribution.

Cistus Type

Only in small sizes. Dicotyledonous. Diffuse porous: growth rings marked by a change in the wall thickness of fibers and by slight changes in vessel size. Vessels all solitary, slightly angular; 50 x 44μ to 20 x 16μ, largest in middle of growth ring; perforations simple, oblique; pits large, conspicuous. Parenchyma scanty, apotracheal, in nests at end of growth ring. Fibers small, regular, square in section. Rays many, very small, 1-2(-4)-seriate, heterogeneous; uniseriates consisting mainly of upright cells.

Metcalfe and Chalk (1950) give several shrubby genera with wood structures similar to this type, but they cannot yet be distinguished with certainty. The probable diagnosis is *Cistus*, with four to five possible species, all Mediterranean or sub-Mediterranean. Possible alternatives are *Lonicera* (said to have homogeneous uniseriate rays) and certain Rosaceae (a family which on the whole has few uniseriates).

Hornbeam Type

An 8-cm length of a cylindrical pole 9.8 cm in diameter. Dicotyledonous. Bark smooth. Semi-ring-porous, with thicker-walled fibers and fewer vessels in the late wood. Vessels nearly circular; usually in large, irregularly radial multiples and chains, which are often 2 vessels wide in the tangential direction; about 56 x 44μ, a few in the late wood down to 20 x 20μ; perforations simple, oblique; pits many, large. Fibers irregular, angular, thin-walled. Rays 1-2(-3)-seriate, apparently heterogeneous; some of them combined into aggregates up to 0.3 mm wide and several centimeters high, most of the substance of which consists of fibers.

The peculiar aggregation of vessels and rays is characteristic of Betulaceae and Corylaceae. The simple vessel perforations and other details narrow the identification to hornbeam, of which the possible species are *Carpinus betulus* L. (central European) and *C. orientalis* Miller (sub-Mediterranean).

Styrax Type

Dicotyledonous. A contorted parenchymatous mass (apparently enlarged rays) in which occasional vessels are embedded. Vessels very few, often in radial rows of 2-4, rather angular, 55-30μ in diameter. Parenchyma apparently absent apart from rays. Rays mainly multiseriate; highly heterogeneous, chiefly of large, cubical, thin-walled cells, but also containing procumbent and erect cells.

This type, of which two small pieces were found, is evidently a pathological tissue, and only a tentative determination can be suggested. It much resembles the "degenerate" callus tissue of olive, *Olea europaea* L. (Rackham 1972). Although this is a possible identification, the present specimens have thinner-walled ray parenchyma and lack the paratracheal parenchyma usually, though not always, present in olive. A more likely determination is *Styrax officinalis* L. (cf. Metcalfe and Chalk 1950) which is sub-Mediterranean and noted on Crete.

Spruce Type

Coniferous. Growth rings prominent, consisting merely of a few rows of flattened tracheids. Longitudinal resin ducts frequent but small (30 μ) and very inconspicuous; epithelial cells visible.

Table 4.1. Identifications of the Sitagroi Charcoal

Phase	Collection reference[a]	Destruction context	Number of pieces examined	Oak *Quercus*	Ash *Fraxinus*	Elm	Chestnut *Castanea*	*Cistus*	Hornbeam *Carpinus*	*Styrax*	Spruce *Picea*	*Liquidambar*	Birch *Betula*	Poplar *Populus*	Rosaceae	*Abices*
Destruction	ZA 29	XX	10	100BW	-	-	-	-	-	-	-	-	-	-	-	-
Vb	PO 23 (C-14)		-	++	-	-	-	-	-	-	-	-	-	-	-	-
Va	PN/D 80	XX	10	20A	-	-	40	40W	-	-	-	-	-	-	-	-
Va	PN/F 60	XX	11[c]	-	100A	-	-	-	-	-	-	-	-	-	-	-
Va	PO 158 (C-14)		-	++	-	-	-	-	-	-	-	-	-	-	-	-
V	PN/C 81	X	10	10?	-	90W	-	-	-	-	-	-	-	-	-	-
V	PN/E 62	X	4	100A?	-	-	-	-	-	-	-	-	-	-	-	-
IV	ROc 59 (C-14)		-	-	++	-	-	-	-	-	-	-	-	-	-	-
IV	ZA 31 (C-14)		-	++	-	-	-	-	-	-	-	-	-	-	-	-
IV	ZE 59	XX	3[d]	67A	-	-	-	-	33W	-	-	-	-	-	-	-
IV	ZE 73	XX	1	-	-	++[e]	-	-	-	-	-	-	-	-	-	-
IV	ZE 75	XX	1	++A[f]	-	-	-	-	-	-	-	-	-	-	-	-
III	MM 52 (C-14)		-	++	-	-	-	-	-	-	-	-	-	-	-	-
III	MMb 69 (C-14)		-	-	+	-	-	-	+[b,g]	-	-	-	-	+	-	-
III	ZB 112R (C-14)		-	-	++	-	-	-	-	-	-	-	-	-	-	-
III	ZB 125R (C-14)		-	+	+	-	-	-	+[b]	-	-	-	+	-	-	+
III	ZE 86	0	12	100A[c]	-	-	-	-	-	-	-	-	-	-	-	-
II	KL 107	XX	10	-	100CDW	-	-	-	-	-	-	-	-	-	-	-
II	KL 117	O	1	++B[h]	-	-	-	-	-	-	-	-	-	-	-	-
II	KM 20	O	5	40A[i]	20A	-	20	-	-	-	20	-	-	-	-	-
II	ZA 50 (C-14)		-	-	++	-	-	-	-	-	-	-	-	-	-	-
I	JL 105	O	10	-	100A	-	-	-	-	-	-	-	-	-	-	-
I	ZA 63 (C-14)		-	-	-	-	-	-	-	-	-	-	-	-	++	-
I	ZA 62	O	10	70A	-	-	-	20	-	-	-	10	-	-	-	-
I	ZA 63		20	55A	-	-	15	20	-	10	-	-	-	-	-	-

Note: Where appropriate, the number of pieces of each wood type is expressed as a percentage of each collection.

Other symbols:

+ = The type is present.
++ = The only type reported from the collection.
XX = Definite evidence of destruction.
X = Less definite evidence.
O = Evidence is against destruction.
W = Worm-eaten material.
A,B,C,D = Subtypes.

[a] Collections identified in the course of C-14 dating are indicated.
[b] Hornbeam said to be *Carpinus betulus.*
[c] Probably all from one tree.
[d] Large timbers including oak plank.
[e] Large timber.
[f] Large timber with very slow growth.
[g] With *Triticum monococcum.*
[h] Large timber preserved as wood.
[i] Includes one-year-old oak twig.

Common rays up to 10 cells high; pits between rays and tracheids comparatively large, 1-3 per cross field. Fusiform rays few, with small resin ducts.

The presence of resin ducts restricts the possible European genera to pine, larch, and spruce. Pine is ruled out by the small, well-defined resin ducts, and larch by the lack of thick-walled late wood. The spruce species of the Balkans (though apparently not in modern Thrace) are *Picea abies* (L.) Karsten (central Europe) and the endemic *P. omorika* (Pančić) Purkyně. These cannot be distinguished: the differential characters of Greguss (1955) are ambiguous on the one charcoal specimen available.

Liquidambar Type

Dicotyledonous. Diffuse porous; growth rings marked by a slight change in the frequency of vessels. Vessels numerous (about half the total volume), angular or squarish, solitary, uniformly small (28-34μ in diameter). Rays regularly spaced about 40μ apart, (1-)2-3-seriate, weakly heterogeneous.

Only one small and poorly preserved fragment was found. It corresponds to no known European genus but resembles the North American *Liquidambar styraciflua* L. (Jane 1956); the latter differs in details (larger vessels and more strongly heterogeneous rays) of the kind which differentiate species within a genus. I therefore suggest tentatively that the present specimen is the Asian *L. orientalis* Mill., which now extends to western Anatolia (Boissier 1872) and Rhodes (Rechinger 1943), and whose occurrence in neolithic Thrace would not be unreasonable.

Table 4.2. Present-day Distribution of Species Proposed for the Wood Types

Type	Identification	Cent. Eur.	Sub-Medit.	Medit.	Orient
Oak A and B	*Quercus* spp. (white oaks)	+	+	(+)	+
Ash A	*Fraxinus excelsior*	+	-	-	-
Ash B	*F. ornus**	-	+	-	-
Ash C	*F.* sp.	+	+	+	+
Elm	*Ulmus* sp.	+	+	+	+
Chestnut	*Castanea sativa*	-	+	-	-
Cistus	*Cistus* spp.*	-	+	+	-
Hornbeam	*Carpinus* spp.	+	+	-	-
Styrax	*S. officinalis**	-	+	(+)	-
Spruce	*Picea* spp.	+	-	-	-
Liquidambar	*L. orientalis**	-	-	-	+
Birch	*Betula* spp.	+	-	-	-
Poplar	*Populus* spp.	+	+	+	-
Rosaceae		+	+	+	+
Abies	*Abies* spp.	+	-	-	-

*Identification uncertain.

Additional Types

The identifications of material from Sitagroi undertaken in the course of radiocarbon dating include birch (*Betula*), poplar (*Populus*), Rosaceae, and *Abies*.

Proportions of Wood Types

The identifications are summarized in table 4.1. Oak is the most frequent type, found in 16 of the 25 collections and dominant in 12 of them. Ash was found in 9 and dominant in 6. Chestnut, *Cistus*, and hornbeam occurred in 3 collections each; elm in 2; and the others in only 1. Of the 22 collections which consisted of more than one piece, 8 contained two or more species.

The frequency of a species in a charcoal assemblage is liable to depend on its occurrence in the natural vegetation, on modification of the latter by agriculture or silviculture, on selection of materials by the inhabitants, and on differential preservation.

Ecological Inferences

From Species Present

Table 4.2 gives the present-day geographical range of the species proposed for each of the wood types. There is positive evidence of specifically central European trees (*Fraxinus excelsior*, birch, and the conifers). Evidence of specifically sub-Mediterranean trees is also clear, though some of the identifications are less certain.

There is no evidence of specifically Mediterranean trees, and *Liquidambar* is the only Oriental type found.

Assuming that the bulk of the material is of local origin, the evidence points definitely to a transition between the central European and sub-Mediterranean vegetation zones, with the former perhaps predominating and the latter restricted to low altitudes near the coast. The Mediterranean element fround widely in modern Thrace is conspicuously absent. The evergreen oaks, for instance, would surely have been recognized among the charcoals had they been available. The climate is likely to have been less Mediterranean than it is now, with less severe summer drought and probably more frequent frost.

There is no evidence of any ecological change during the period of settlement (table 4.1).

From Sizes and Growth Rates of Trees

The growth rings in this material are usually well marked and can confidently be treated as annual; rarely is there a possibility of false or missing rings. Interpretation is limited by the size and shape of the specimens and by the difficulty of determining what part of the tree they come from. In only four pieces does the presence of both bark and pith define the diameter and age of the log; where the bark is missing only minimum figures can be given for these, although if the pith is missing the minimum size of the log can sometimes be estimated from the curvature of the growth rings remaining. No opportunities arose for dendrochronological cross-dating; the only timbers with sufficiently long sequences of growth rings all came from phase IV.

Table 4.3. Summary of Log Sizes and Growth Rates

Wood type	Diam. of largest log, cm	Range of growth ring widths, mm	Longest ring sequence encountered
Oak, *Quercus* A	>40	<0.3-8.5	109
Oak B	>6	0.3-4.2	7
Ash, *Fraxinus* A	>12	0.2-6.2	9
Ash C	>3.0	0.2-1.5	11
Elm, *Ulmus*	8.7	0.6->5	28
Chestnut, *Castanea*	-	0.5-5.5	8
Cistus	>2	0.34-2.0	4
Hornbeam, *Carpinus*	9.8	0.4-4.8	19
Liquidambar	>1.0	1.4-2.8	4

Table 4.3 summarizes the range of log sizes and ring widths for those wood types for which there is sufficient information. The oak material ranged from a one-year-old twig, 4 mm in diameter, to part of a large tree. Rings more than 5 mm wide (found in 3 of the 21 pieces in which rings could be measured) indicate comparatively rapid growth for the Mediterranean region; but this occurred in only a few years, as illustrated by figure 4.7a, which probably represents the trunk of a youngish, very well-grown tree. Figure 4.7b, also representing the outer part of a large log, shows similar fluctuations superimposed on a general decline in width which indicates that the tree had reached full size at an age of at least a century. The fluctuations of the two logs appear to be correlated, which suggests that they result from the weather of individual years rather than from factors of woodland structure which might affect single trees. Figure 4.7c, in contrast, shows most of the radius of a log which had reached only 19 cm diameter in about 130 years. It responded to seasonal variation when young but then became "complacent" over several decades of very slow growth; it may represent the trunk of a suppressed tree whose growth was restricted by competition.

Other oak sequences (none more than 18 years) are mainly of the responsive type. Figure 4.7d, one of two sequences for Oak B, represents a complete log seven years old, with rapid growth particularly in the first year, and probably represents the top of a young tree or coppice pole. The unusually narrow last ring under the bark is probably incomplete owing to felling in early summer. Sustained low rates of growth near the middle of small logs (fig. 4.7e) are frequent and suggest small branches.

The evidence for ash also includes variable and sometimes high growth rates; figure 4.8a illustrates a responsive sequence. Fast-growing poles or trunks and slow-growing branches were both used.

Elm exhibits a similar variation in growth rates; figure 4.8b shows a complete log 28 years

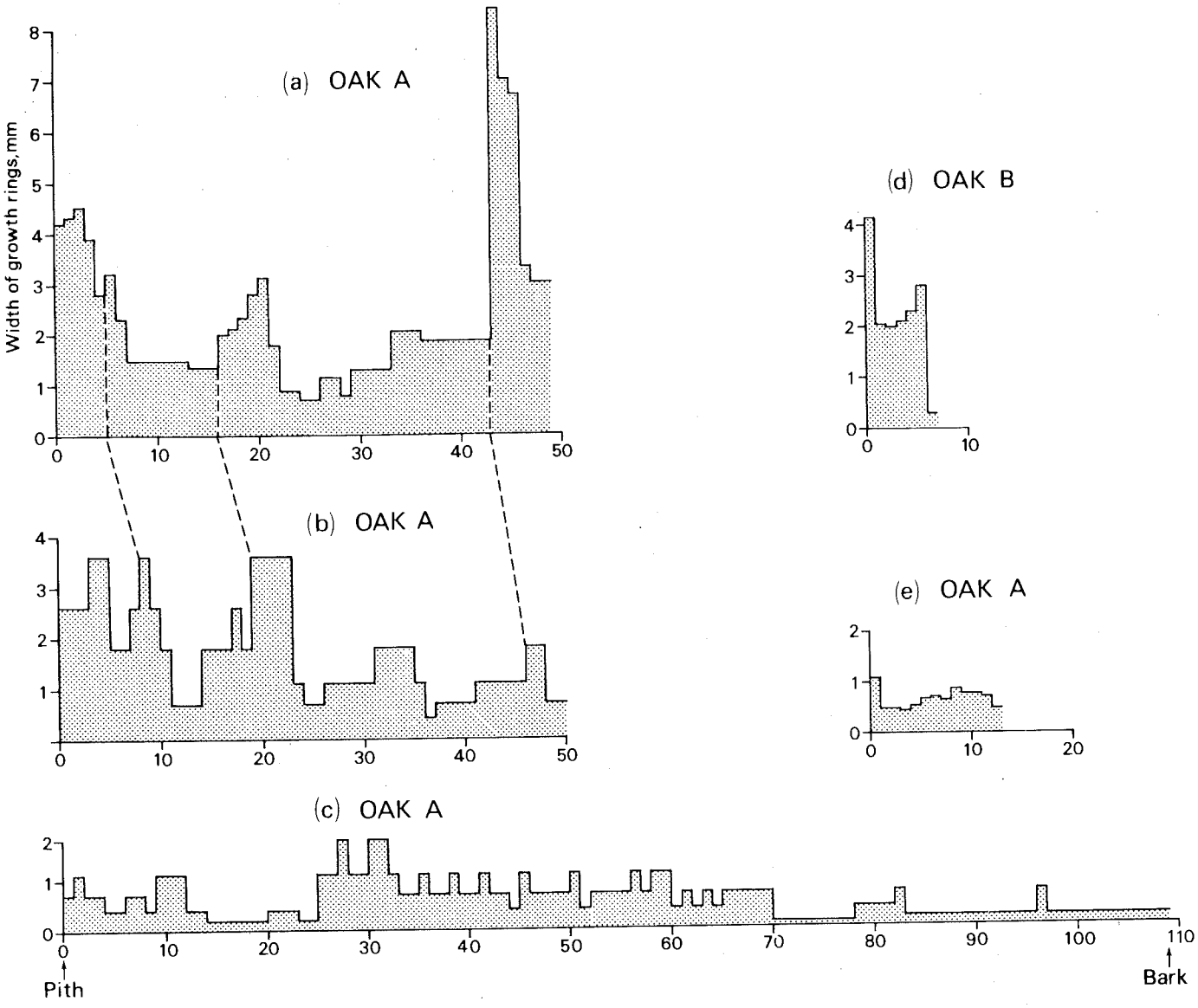


Figure 4.7. Growth ring sequences in transverse sections of oak (*Quercus*). (*a*) Outer two-thirds of radius of a log approximately 40 cm in diameter (ZE 59). (*b*) Plank split radially from a log at least 40 cm in diameter; less than half of log radius represented (ZE 59). (*c*) Log 19 cm in diameter; whole radius represented except for 1.7 cm in the middle (ZE 75). (*d*) Entire pole 4.2 cm in diameter under bark (ZA 29). (*e*) Part of branch approximately 5 cm in diameter (ZA 63).

old, probably representing the trunk of a young tree very responsive to weather.

For chestnut, both trunk and branch material appear to be present.

The single hornbeam specimen (fig. 4.8c) was a complete log. It showed rapid and responsive growth in the early years but declined to a very slow rate at only sixteen years. This growth pattern is characteristic of adventitious stems resulting from artificial coppicing, pollarding, or pruning.

Spruce was a fragment with very close rings, probably a branch.

The main broad-leaved trees—oak, ash, elm, chestnut, hornbeam—all show quite high growth rates in a minority of years. This is to be expected of a central European type of plant community approaching a limit set by drought and

confirms the phytogeographical evidence of the species present.

There is little evidence of the structure of the plant communities. The presence of at least one suppressed tree suggests woodland rather than some more open tree cover. Much of the material is from trees less than a century old. There is an indication (but from a single specimen) of coppicing, the practice of allowing tree stumps to sprout and yield crops of poles.

ARCHAEOLOGICAL INFERENCES

Some degree of timber technology may be inferred in a community which felled and worked large oaks and did so from choice, since more easily handled trees were available. The only technique for which the charcoals give evidence is that of splitting planks radially from the log with wedges. ZE 59 contained what appears to be part of such a plank, 2.5 cm thick and at least 8.6 cm wide, split from the outer part of an oak at least 40 cm in diameter. This is the only method (short of adzing away the rest of the tree) of making a plank without saws; oak is the easiest European hardwood to split accurately.

Large timbers are likely to be structural members of buildings, especially as they are associated with major destructions. The smaller material may come from furniture or firewood; but the possibility that some of it, too, may be structural is supported by the frequent wormholes (of three different sizes) in material of all diameters, but only in destruction contexts (table 4.1). Worm-eating implies a considerable time between felling and carbonization, such as would happen if the tree branches, and shrubs such as *Cistus*, had a structural function as wattles or the like.

Although the evidence for coppicing or pollarding is scanty, such a practice is not implausible. Coppicing is reported from the British neolithic of 2800 bc (Coles, Hibbert, and Clements 1970). Anyone in the habit of felling suitable trees would soon discover it; nevertheless, it represents the beginning of organized silviculture.

ADDENDUM

This report was prepared in 1971; since then two pollen diagrams have been published from places which now have more strongly "Mediterranean" climates than Sitagroi. A pollen diagram from Ayia Galini shows that there were deciduous, even northern trees in the pre-neolithic on what is now the extremely arid south coast of Crete (Bottema 1980). Similar but less extreme changes appear in a pollen diagram from Lake Copais (Greig and Turner 1974).

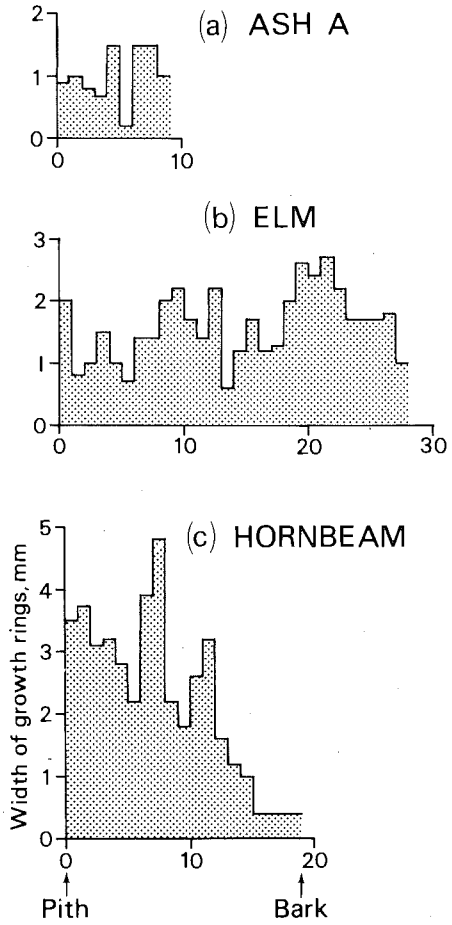


Figure 4.8. Growth ring sequences in transverse sections of other trees.
(*a*) Ash (*Fraxinus*). Outer third of radius of a log about 6 cm in diameter (KM 20).
(*b*) Elm (*Ulmus*). Entire log 9 cm in diameter under bark (ZE 73).
(*c*) Hornbeam (*Carpinus*). Entire pole 10 cm in diameter under bark (ZE 59).

5.
Faunal Remains

Sándor Bökönyi
with a contribution by D. Jánossy

INTRODUCTION

Sampling Techniques

The study of animal remains unearthed from prehistoric settlements provides the zoologist and the archaeologist with valuable data about the fauna living in and around the settlements. The first and most important problem posed by the bone samples is how reliably they reflect the fauna of a specific area in given prehistoric periods (Bökönyi 1968b:277-278).

Before answering that question, an essential point should be stated. The animal bone sample found in a prehistoric settlement does not represent the whole fauna of the region but only that part represented by human activities: species eaten by man; species which served religious (sacrificial) purposes; those killed for their fur, antler, horn, and the like; and/or species of domestic animals that died and were buried in the settlement.

The answer has both qualitative and quantitative aspects. With regard to the qualitative, the remnants of an animal species found in a settlement bone sample signify that the species lived in or around the site, being kept or hunted by the inhabitants. Nevertheless, if the remains of a species cannot be found in the sample it does not necessarily follow that it was missing from the local fauna but only that it did not have any of the contacts with man described above.

Quantitatively, bone samples adequately reflect species ratios in the domestic fauna, particularly in prehistoric times. During prehistoric food shortages man ate all domestic animals. Therefore, every individual among the domestic fauna, independently of its original use (milking, wool, draft animal), was consumed by man at the end of its life, with its bones going into the rubbish pit. The situation changed in later times when certain domestic species were no longer used for meat. Because hardly any of the small mammals have ever been hunted by man, the presence of their bones can be attributed to dogs. The bones of small rodents represent a special category since they live in burrows, sometimes dying there; these are generally not of the same time period as the site, but later.

The ratios of the hunted species depend not only on their relative frequencies in the wild fauna living around the site but also on man's preferences and on the aims and possibilities of hunting itself. For example, in the Carpathian basin at the inception of the neolithic, man hunted all species except the very small animals. After this earliest neolithic phase, hunting served domestication; man tried to kill the adult and mature individuals of the domesticable species so that he could then capture and domesticate their young. Animals most frequently sought for these purposes were aurochs during the neolithic and wild swine during the bronze age (Bökönyi 1968b:278; 1969:222-223).

A second problem concerns how the excavated bone samples reflect the meat quantity consumed by the inhabitants of a given prehistoric settlement. This is certainly a more difficult problem than the first since its solution depends mainly on sampling techniques and methods of sample evaluation. Previous work shows that one of two bone sampling techniques is usually emphasized: either only the largest, whole, conspicuous bones are collected, or all excavated soil is screened or even sieved and all faunal materials saved.

With cave excavations, screening or sieving techniques are indispensable since cave deposits contain, in addition to small artifacts, large quantities of small animal bone, primarily mammal. These bones come from animals carried into the cave by predatory birds. They are from roughly the same period as the archaeological finds and therefore provide very useful information about the prehistoric fauna and the environment and their changes.

In contrast, open air sites contain bones obtained through human activities. Here, the remains of small animals, however, belong to an age that is generally later than the settlement itself and are not relevant to the prehistoric fauna. Some portion of the fish bones discarded in settlement middens can certainly escape the excavator's attention. However, archaeologists with appropriate digging techniques and careful observation will discover and collect most of them. A fine example of successful recovery is Polgár-Basatanya (northeast Hungary) where a neolithic pit contained remains, including teeth, from seven fish species. It is significant that the adult individuals of the smallest species measured only 70-80 mm and that these remains had been collected without any special techniques. Nevertheless, there is no doubt that a bone sample collected with screening and sieving provides the most detailed data about the fauna. Results of experiments conducted during excavations of prehistoric sites in Hungary show that the number of all bone specimens recovered and of the species identified was increased by the application of sieving. This method, however, indicated only a slightly larger quantity of meat because the fragments were extremely small. Screening or sieving has a somewhat greater importance when a settlement is fully excavated; then the meat quantity consumed by the entire human population during the whole occupation can be more precisely determined. In addition, knowing the approximate number of inhabitants and the time span of the settlement can even yield a rough estimate of caloric intake from animal products.

There are several approaches to determining the quantity of meat from the bone samples. Most zoologists attempt to determine the probable number of individuals, based on the minimum number, and then to compute from these figures the amount of meat consumed. This estimation is far from precise in most cases. More exact figures can be obtained from a method that also considers the age and size of the animals (Bökönyi 1970a:291-292). The figures derived in this way are generally higher than the minimum numbers of individuals although even they do not represent the actual numbers. Using these figures one can also roughly estimate the quantity of consumed meat by calculating from the number of animals and their average weight.

A simpler method determines the quantity from the bone weight by noting that there is a certain ratio between the weight of the bones and the weight of the meat belonging to them. This method was applied by White (1952:337-338) to animal remains of New World sites and by Kubasiewicz (1956:235-244) to those of Old World sites. This procedure has since been used by only a few investigators.

The main difficulty which can arise with these methods involves variation in the bone-meat ratio among the different animal species. Since only a portion of the bones can be identified as to species, a majority of the sample can only be very roughly estimated. Another limiting factor is the impossibility of recovering all the bones from animals killed, even in the case of a fully excavated settlement where the most refined methods are used. In some instances bones are eaten or carried away by dogs or taken away by men working or hunting farther from the settlement; many decay through exposure to the destructive

powers of nature. Therefore, estimation by this method always will be lower than the actual quantity of consumed meat. The best solution would be a combination of the two methods described above, taking us a step closer to the real situation.

Settlement

Today zoologists tend to study vertical series, since modern research does not consider species or even breeds as unchanged systematic units. Hence, the animal remains from sites occupied over a long time span and with several phases are always more interesting that those from sites having a short duration. It is possible to study chronologies by taking vertical series from various sites of different ages. However, studying the sample of a single site with several phases is superior because the animals have the same geographical environment. The geographical environment can undergo certain changes during the life of a settlement—although these changes are small-scale in the post-Pleistocene—and the effect can be observed on the animals directly.

It is true that settlements with several occupation periods are at a disadvantage because of intrusive pits which make distinctions among animal remains difficult. This requires careful consideration of species or breeds whose appearance would be unusual in a given period or geographical area, but it does not play an important role in statistical investigations.

An excellent example of a settlement site of long duration, with several comparable phases, is Sitagroi. Initially, the occupation phases were determined by one sounding (ZA) which profiled the entire deposit; subsequently, additional soundings yielded relatively large amounts of bone material. Throughout the excavation, animal remains were collected and recorded by level, furnishing an ideal basis for studies of the whole faunal development and of individual species.

The comparatively long time span affords interesting radiocarbon dates. As seen in table 7.3, calibrated radiocarbon dates indicate that the settlement occupation began as early as 5500 BC and ended as late as 2200 BC, thus including the periods between the end of the early neolithic and the early bronze age. Because there is a long occupation, changes occurred not only in the domestic fauna but also in the wild fauna. The speed of evolutionary change is notably faster in domestic fauna. Moreover, the five settlement phases, as well as differences observable within the faunal sample, are easily distinguishable.

Among the five phases, phase I (middle neolithic, related to the Veselinovo culture, ca. 5500-5200 BC) is represented by a relatively small amount of animal remains. Even so, its identified sample (1,848 specimens) is far above the statistically safe limit (500 specimens) necessary for reliable conclusions (Bökönyi 1968b: 281). The animal remains of the other phases are evenly distributed and far more numerous. Particularly, phase III, the Dikili Tash culture (ca. 4600-3500 BC), related to Gumelnitsa, yielded a very rich animal bone sample of more than 13,000 specimens.

The Sitagroi fauna is of particular importance because of special geographical site features. Situated on the border between the Mediterranean and the Balkan regions, Sitagroi furnishes valuable data on the early wild fauna connections between the two areas and also on the advance of animal husbandry and domestication of animals from the eastern Mediterranean to the north.

THE DATA BASE

The animal remains are representative of settlement kitchen middens; the sample is large and does not contain whole skeletons or larger skeletal parts in anatomical order. Only one large skull fragment and a few whole horn-cores and measurable horn-core fragments were recovered. Similarly, the bone sample contained only 122 whole long bones (table 5.1).

Though fragmentary, the bones are well preserved; they are not damaged by soil acids or alkalis and show only slight traces of human activities (butchering) and chewing by dogs. As a result, a large proportion of them can be identified, based on morphological features. Wild and

Table 5.1 Distribution of Whole Long Bones

	Cattle	Sheep	Goat	Pig	Dog	Red Deer	Roe Deer	Brown Bear	Wolf	Fox	Beaver	Hare	Total
Humerus	-	4	-	-	4	-	-	-	-	-	2	-	10
Radius	-	11	1	1	4	-	1	-	-	-	-	-	18
Metacarpal	8	24	10	-	8	1	-	2	-	-	-	6	59
Femur	-	2	-	-	-	-	-	-	-	-	-	-	2
Tibia	-	-	-	-	2	-	-	-	-	-	-	-	2
Metatarsal	3	6	4	-	5	1	-	3	1	1	-	7	31
Total	11	47	15	1	23	2	1	5	1	1	2	13	122

domesticated forms are also easily distinguishable. Preserved articular ends supplied additional data beyond species identification, providing conclusions as to size and size variations within species.

Undoubtedly, there are some bones in the Sitagroi sample which come from later, undeterminable periods. These bones include small rodent and tortoise remains which are intrusive in the comparatively soft archaeological midden; tortoises are especially abundant since they hibernate there during the winter. The inference that small rodent and tortoise remains belong to the settlement is a tenuous one. Generally speaking, the whole skeletons are certainly later, though bones with human alterations (cut marks, breaks, burned areas, etc.) are likely to be of the same age as the settlement.

Fauna

Among Sitagroi's 34,473 bones, at least 32 species have been identified, with 5 belonging to the domestic fauna (fig. 5.1). Table 5.2a contains the identified species and their frequencies in different occupation periods. Table 5.2b estimates the number of individuals by phase.

The five domestic species are diagnostically found in the fully developed neolithic of southwest Asia and the temperate European belt. Bronze age sites including early phases usually have domestic horse as a sixth species, but it is absent in the early bronze age of Sitagroi. This supports the view that the domestic horse did not arrive in Greece before the Middle Helladic period (Hančar 1956:28; Anderson 1961:2) and is in keeping with the results of Boessneck (1962:39) which show that it did not appear in Argissa Magoula before the middle bronze age. Moreover, it seems that in the Balkan peninsula, as in the Carpathian basin (Bökönyi 1968a:340), wild horses did not survive the drastic climatic changes at the end of the Pleistocene. Therefore, indigenous horse domestication could not have taken place. Domestic horses arrived, according to our recent knowledge, from the oldest center of horse domestication, the southern Ukraine. Because of the greater distance, it is logical to assume that these horses reached Greece sometime after they entered the Carpathian basin. Romanian faunas sometimes include bones of horses coming from neighboring areas (Bibikova 1967:106), reported as the earliest domesticated horses in Romania.

Sitagroi contains a domestic fauna similar to that of other areas in southwest Asia or temperate Europe; its species richness is attributed to the many wild species. At least 27 wild species represent a considerable number, particularly where there are relatively few species of birds and fishes. The artiodactyl species are predominant among the ungulates with two, the chamois and the fallow deer, unexpectedly appearing. Both initially occur as subfossils from Greece, with the fallow deer being conspicuously absent from the European mainland (except for a small number of bones from an aeneolithic site in southeast Bulgaria [S. Ivanov 1949-50:345]), proving that the species survived the end of the Pleistocene in the southeastern Balkans and thus is autochthonous to Europe.

The quantitative composition reveals interesting changes in the fauna during the site occupation. Phase I (ca. 5500-5200 BC) is similar to, but does not mirror, the Greek early neolithic sites Argissa Magoula (Boessneck 1962:28) and Nea Nikomedeia (Higgs 1962:271f.). Quite similar, however, is the extremely low wild animal ratio coexisting with a high domestic species frequency dominated by caprovines. Generally in the Greek early neolithic, caprovines represent about 70 to 80%; at Sitagroi, under 50%. Correspondingly, cattle and pig ratios increase. The dog has little economic importance, and its bones are recovered infrequently.

During phase II (ca. 5200-4600 BC) the wild animal ratio decreased to less than half its number in phase I. The sheep/goat ratio, and particularly that of pig, increased, offsetting the decrease in wild animals and cattle. Generally, ungulates decreased sharply in the wild fauna.

During phase III (Dikili Tash culture related to Gumelnitsa, ca. 4600-3500 BC) the wild fauna increased again, reaching the frequency of phase I. The domestic animals also had about the same ratios as in phase I.

In phase IV (final neolithic to early bronze age new culture, ca. 3500-3100 BC) rather fundamental changes took place. First, the wild animal ratio increased, reaching nearly double the percentage in phase III. Second, in the domestic fauna the caprovine ratio decreased by more than one-third and cattle by more than one-half of their former percentages. Third, pig more than doubled its ratio from phase III, becoming the most frequent domestic species.

During phase V (early bronze age with early bronze age Troy connections, ca. 3100-2200 BC) wild animals decreased again, dropping to a figure below that of phase III. In the domestic fauna caprovines slightly surpassed the decreasing pig frequency, thus regaining their leading position. Cattle also increased but still remained below its frequency in the first three periods.

How can these changes be interpreted? The differences between the domestic fauna of the Greek early neolithic and of Sitagroi's phase I lie essentially in adaptation to the local zoogeographical conditions found everywhere in central and southeast Europe. Animal husbandry, with its origins directly or indirectly in southwest Asia, is based on sheep and goat, whose domesticable wild forms came from that area. With no apparent evidence for domesticable wild forms in the Balkans, the development of sheep and goat ceased; under primitive animal keeping conditions the domestic fauna could not support the human population with meat and simultaneously increase in number (Bökönyi 1968b: 284). Excluding dog, which is economically insignificant in southeast and central Europe, there are two additional domestic species, cattle and pig, which had locally domesticable wild forms directly resulting in their noticeable increase from the middle neolithic.

Why is it, then, that the ratios of wild and domestic animals of phase I do not differ from those of the Greek early neolithic? Most likely, unchanged environmental conditions in the middle neolithic and a lack of increase in animal husbandry productivity resulted in man's continued dependence on hunting as a complementary source for obtaining food.

This reasoning also applies in comparing the productivity of animal husbandry with the relative importance of hunting during the Greek and Hungarian early neolithic (Bökönyi 1968b:301). Hunting is of minor importance in early neolithic Greece where caprovines, which became the leading element of animal keeping, found an ideal geographical environment. Brought to the Carpathian basin, however, this early neolithic domestic fauna entered a swampy environment which represented an unsuitable biotope. It was very natural for the yield of animal husbandry to decline, forcing man to hunt much more than in Greece. As a result, the ratios of wild animals sharply increased and nearly reached those of the domesticated fauna.

The only difference between the two early phases of Sitagroi is in the probable increase in the productivity of animal breeding in phase II, with a concomitant decrease in the wild bone ratio. This is substantiated by the substitution of pig as a source of meat in place of a wild fauna composed mostly of ungulates.

The increasing wild animal ratio in phase III

Table 5.2a. Distribution of Domestic and Wild Animal Species: Total Faunal Recovery

Domestic Animals	Phase I Spec.	%	Phase II Spec.	%	Phase III Spec.	%	Phase IV Spec.	%	Phase V Spec.	%	Total
Cattle (*Bos taurus* L.)	503	27.22	1527	25.050	3553	27.160	557	12.860	1472	16.140	7612
Sheep (*Ovis aries* L.)	206		341		631		153		319		1650
Goat (*Capra hircus* L.)	11	48.54	75	49.280	156	46.960	28	29.400	106	39.810	376
Sheep/Goat (*Ovis/Capra*)	680		2588		5355		1092		3205		12920
Pig (*Sus scrofa* dom. L.)	260	14.07	1239	20.320	2056	15.720	1654	38.200	3254	35.680	8463
Dog (*Canis familiaris* L.)	29	1.57	115	1.880	267	2.040	81	1.870	169	1.850	661
Total Bone Recovery	1689	91.40	5885	96.530	12018	91.880	3565	82.330	8525	93.480	31,682
Wild Animals											
Aurochs (*Bos primigenius* Boj.)	29	1.57	47	0.770	85	0.650	61	1.410	12	0.132	234
Chamois (*Rupicapra rupicapra* L.)	-	-	-	-	1	0.008	-	-	1	0.011	2
Red Deer (*Cervus elaphus* L.)	59	3.20	84	1.380	480	3.670	286	6.600	142	1.557	1051
Fallow Deer (*Dama* sp.)	2	0.11	1	0.017	15	0.116	95	2.190	149	1.634	262
Roe Deer (*Capreolus capreolus* L.)	10	0.54	8	0.130	38	0.290	41	0.950	26	0.285	123
Wild Swine (*Sus scrofa* fer. L.)	40	2.17	33	0.540	249	1.904	100	2.310	163	1.788	585
Wild Cat (*Felis silvestris* Schreb.)	-	-	-	-	3	0.023	-	-	2	0.022	5
Marten (*Martes* sp.)	-	-	-	-	1	0.008	2	0.046	-	-	3
Badger (*Meles meles* L.)	1	0.05	1	0.017	3	0.023	1	0.023	-	-	6
Brown Bear (*Ursus arctos* L.)	-	-	2	0.033	4	0.030	18	0.420	5	0.055	29
Wolf (*Canis lupus* L.)	1	0.05	-	-	3	0.023	5	0.116	13	0.142	22
Fox (*Vulpes vulpes* L.)	1	0.05	4	0.066	6	0.046	5	0.116	13	0.142	29
Carnivora	-	-	-	-	1	0.008	-	-	-	-	1
Lesser Mole Rat (*Spalax leucodon* Nordm.)	-	-	-	-	2	0.015	3	0.069	1	0.011	6
Beaver (*Castor fiber* L.)	-	-	-	-	7	0.054	5	0.116	11	0.121	23
Hare (*Lepus europaeus* Pall.)	10	0.54	18	0.300	41	0.313	1	0.023	10	0.110	80
Hedgehog (*Erinaceus europaeus* L.)	-	-	-	-	-	-	-	-	1	0.011	1
Gray-leg Goose (*Anser* cf. *anser* L.)	-	-	-	-	3	0.023	-	-	-	-	3
White-fronted Goose (*Anser* cf. *albifrons* Scop.)	-	-	-	-	1	0.008	-	-	-	-	1
Mallard (*Anas platyrhynchos* L.)	1	0.05	-	-	2	0.015	-	-	-	-	3
Goosander (*Mergus merganser* L.)	-	-	-	-	3	0.023	-	-	-	-	3
Griffon Vulture (*Gyps fulvus* Habl.)	-	-	-	-	1	0.008	-	-	-	-	1
Quail (*Coturnix coturnix* L.)	-	-	-	-	1	0.008	-	-	-	-	1
Great Bustard (*Otis tarda* L.)	-	-	1	0.017	-	-	-	-	-	-	1
Birds (Aves)	4	0.22	9	0.149	36	0.274	4	0.092	6	0.066	59
Turtle (*Chelonia* sp.)	1	0.05	2	0.033	38	0.290	94	2.170	29	0.318	164
Pike (*Esox lucius* L.)	-	-	-	-	1	0.008	-	-	-	-	1
Cyprinidae	-	-	1	0.017	-	-	2	0.046	-	-	3
Fishes (Pisces)	-	-	-	-	37	0.283	42	0.970	10	0.110	89
Total Bone Recovery	159	8.60	211	3.469	1062	8.121	765	17.667	594	6.515	2791
Total of Both Domestic and Wild Specimens	1848		6096		13080		4330		9119		34,473

Note: Identification and frequency given for each phase.

Table 5.2b. Distribution of Domestic and Wild Animal Species: Estimated Number of Individuals

Domestic Animals	Phase I Indiv.	%	Phase II Indiv.	%	Phase III Indiv.	%	Phase IV Indiv.	%	Phase V Indiv.	%	Total
Cattle (*Bos taurus L.*)	80	29.85	126	25.51	265	29.19	56	14.40	139	16.95	666
Sheep/Goat (*Ovis/Capra*)	116	43.28	218	44.13	362	39.87	105	26.99	313	38.17	1114
Pig (*Sus scrofa* dom. L.)	41	15.30	100	20.24	148	16.30	138	35.47	277	33.78	704
Dog (*Canis familiaris L.*)	4	1.50	12	2.43	14	1.54	7	1.80	10	1.22	47
Total Number of Individuals	241	89.93	456	92.31	789	86.90	306	78.66	739	90.12	2531
Wild Animals											
Aurochs (*Bos primigenius* Boj.)	4	1.50	7	1.41	9	0.99	7	1.80	3	0.37	30
Chamois (*Rupicapra rupicapra* L.)	-	-	-	-	1	0.11	-		1	0.12	2
Red Deer (*Cervus elaphus* L.)	6	2.24	8	1.63	38	4.19	22	5.66	15	1.83	89
Fallow Deer (*Dama* sp.)	1	0.37	1	0.20	3	0.33	9	2.32	17	2.08	31
Roe Deer (*Capreolus capreolus* L.)	3	1.12	3	0.61	7	0.77	6	1.54	5	0.61	24
Wild Swine (*Sus scrofa* fer. L.)	5	1.87	5	1.01	21	2.31	12	3.09	17	2.08	60
Wild Cat (*Felis silvestris* Schreb.)	-	-	-	-	2	0.22	-	-	1	0.12	3
Marten (*Martes* sp.)	-	-	-	-	1	0.11	1	0.26	-	-	2
Badger (*Meles meles* L.)	1	0.37	1	0.20	2	0.22	1	0.26	-	-	5
Brown Bear (*Ursus arctos* L.)	-	-	1	0.20	2	0.22	4	1.03	2	0.24	9
Wolf (*Canis lupus* L.)	1	0.37	-	-	2	0.22	2	0.51	2	0.24	7
Fox (*Vulpes vulpes* L.)	1	0.37	2	0.41	2	0.22	2	0.51	3	0.37	10
Carnivora	-	-	-	-	1	0.11	-	-	-	-	1
Lesser Mole Rat (*Spalax leucodon* Nordm.)	-	-	-	-	1	0.11	1	0.26	1	0.12	3
Beaver (*Castor fiber* L.)	-	-	-	-	2	0.22	2	0.51	3	0.37	7
Hare (*Lepus europaeus* Pall.)	2	0.75	4	0.81	5	0.55	1	0.26	2	0.24	14
Hedgehog (*Erinaceus europaeus* L.)	-	-	-	-	-	-	-	-	1	0.12	1
Gray-leg Goose (*Anser* cf. *anser* L.)	-	-	-	-	2	0.22	-	-	-	-	2
White-fronted Goose (*Anser* cf. *albifrons* Scop.)	-	-	-	-	1	0.11	-	-	-	-	1
Mallard (*Anas platyrhynchos* L.)	1	0.37	-	-	2	0.22	-	-	-	-	3
Goosander (*Mergus merganser* L.)	-	-	-	-	2	0.22	-	-	-	-	2
Griffon Vulture (*Gyps fulvus* Habl.)	-	-	-	-	1	0.11	-	-	-	-	1
Quail (*Coturnix coturnix* L.)	-	-	-	-	1	0.11	-	-	-	-	1
Great Bustard (*Otis tarda* L.)	-	-	1	0.20	-	-	-	-	-	-	1
Birds (Aves)	1	0.37	3	0.61	4	0.44	2	0.51	2	0.24	12
Turtle (*Chelonia* sp.)	1	0.37	1	0.20	3	0.33	5	1.28	4	0.49	14
Pike (*Esox lucius* L.)	-	-	-	-	1	0.11	-	-	-	-	1
Cyprinidae	-	-	1	0.20	-	-	1	0.26	-	-	2
Fishes (Pisces)	-	-	-	-	3	0.33	5	1.28	2	0.24	10
Total Number of Individuals	27	10.07	38	7.69	119	13.10	83	21.34	81	9.88	348
Total of Both Domestic and Wild Individuals	268		494		908		389		820		2879

Note: Identification and frequency given for each phase.

can probably be explained by the premonitory signs of a climatic change which begins in phase IV and continues in Phase V. Animals of the dense forest (red deer) and those of the wet, swampy environment (wild swine) tripled their frequency in this phase. There are no essential changes in the domestic fauna with the ratios reverting back to those of phase I.

There is an interesting similarity between the fauna of phase III and that of the Romanian Gumelnitsa culture, this being paralleled in archaeological materials, e.g., pottery. In Tangîru the wild animal ratio is a low 3% (Necrasov and Haimovici 1959a:563), reflecting a certain southern contact for this Romanian neolithic culture. Among the domestic fauna, cattle is the most frequent species, just exceeding the caprovines. This feature is also characteristic of the northern Balkans and central Europe. Pig is far less frequent than the other species; dog is unimportant. A single horse was recovered; it has not been identified as domesticated. In essence, the differences between this fauna and that of Sitagroi phase III can be attributed to differences in geographical environments.

In the wild and domestic faunas of phase IV the most significant changes occurred. There is a suggested increase in forestation, based on the considerable increase in the ratio of domestic pig and the decrease in caprovines. This is supported by the great increase in wild animals, particularly the forest species. This could be the result of a different climate; the dry, warm climate changed to a wetter, possibly colder one. It is known that such a climatic change took place in central Europe through the bronze age, although it seems to have started somewhat earlier in southeast Europe. Because the zoological and botanical data are rather discontinuous during prehistoric times in most parts of Europe, this hypothesis should remain open for further study and elaboration.

The sudden increase in wild animal ratios can certainly be seen in the late neolithic of Bulgaria and Romania. Yasa Tepe, at Plovdiv in Bulgaria, a late neolithic-aeneolithic settlement, shows a wild animal ratio of 17.7% (S. Ivanov 1959: 81ff.). In Romanian sites of about the same age the increasing importance of hunting is even more conspicuous. In Traian Dealul Viei (pre-Cucuteni culture), about 30% of the bones are from wild animals (Necrasov and Haimovici 1962:262), and in the upper layers (Cucuteni A-B) the ratio of wild animals exceeds that of domestic ones (Necrasov and Haimovici 1959b: 179). The same proportions also occur in Truşeşti, Cucuteni A period (Haimovici 1960:table 1). In all the preceding sites red deer and wild swine represented at least two-thirds of the wild fauna. These changes are similar to those in phase IV of Sitagroi and support a climatic and environmental change beginning earlier than the bronze age. In the domestic fauna of these Bulgarian and Romanian sites, unlike at Sitagroi, cattle are characteristically the most frequent species. The increase of pig, which exceeds the caprovines, demonstrates a similarity with the final neolithic of Sitagroi.

Nevertheless, it seems very unlikely that a climatic change alone could cause such essential changes in the domestic fauna. Animal husbandry can also be heavily affected by cultural (ethnic) changes, as reflected by the archaeological data.

A third factor also plays a role here: the sudden increase in local pig domestication. As has been observed in central and eastern Europe, large-scale cattle domestication terminated at the end of the neolithic with pig as its replacement. This process is demonstrated in phases IV and V at Sitagroi. The transitional individuals which appear between the wild and domestic forms are the best evidence for pig domestication as may be seen on the scattergrams below (figs. 5.14-5.17). Thus the rapid growth of domestic pig stock contributed to the changes that occurred in the domestic fauna.

Changes, including climate, are significant in phase V. The climate continues to be somewhat wetter than in the earlier periods, as evidenced by similarities to other areas of central and eastern Europe and by the high ratio of forest elements in the fauna. Hunting may have lost much of its importance. This is hinted at by the slightly higher percentage of remains of domestic stock. Of a different nature is the sudden caprovine in-

crease without benefit of any wild stock from which to accomplish local domestication. Also in evidence is a new, large sheep type, clearly of southwest Asian origin, suggesting a cultural change in this phase.

Environment

There is little doubt that the fauna identified from the animal remains of a prehistoric site reflects the environment which surrounded the site. Each animal species can only exist in a strictly determined habitat. If the remains of a species occur in a given site, it is evident that an ecological habitat had to exist in or around the site for that species.

This is particularly so for wild animals, but it is also true to a certain extent for domestic animals in prehistoric times. Under primitive animal keeping, natural forces (geographic and climatic conditions) are reflected in the species composition of the domestic fauna. This can be observed if the climate has changed, because the domestic fauna will adapt to the changes (Bökönyi 1952:108).

The wild species of Sitagroi are found in at least three different habitats. The aurochs and fallow deer are forest steppe (*Parklandschaft*) animals which seldom occupy a wet environment, although fallow deer can live in semi-swampy forests along rivers. The roe deer lives between this group and true forest animals. It exists in the culture steppe (land used for agriculture) when there are small stands of trees, although it can also find good living conditions in larger, sparsely forested areas. The much larger red deer furnishes strong competition (Boessneck 1956:121) in a similar environment. These three species lived in the drier parts of the Drama Plain, probably in the foothills close to the mountains. Fallow deer and roe deer could have existed in smaller numbers in the mountains but aurochs, being a poor climber (Szalay 1915:70), probably was extremely rare there.

Red deer, wild swine, wild cat, marten, badger, brown bear, and beaver are animals of the dense forest; all prefer a wet, swampy environment. Most of these species were hunted in the mountains. Some were killed, of course, when they invaded the settlement vicinity seeking prey among the grazing domestic herds. Some could have lived in the Drama Plain, but they certainly needed a wet, marshy terrain (wild swine), or rivers with moderately running streams and plenty of wood (beaver). With the supposed increased forestation in the second half of the occupation, other species arrived on the plain as indicated by their occurrence in greater numbers in the sample.

The chamois is an animal of the medium or high mountains and prefers the open forests. It is very likely, however, that it withdrew into the high mountains only in recent times since its remains have been found in several prehistoric sites located in medium range mountains.

In summary, the wild fauna identified at Sitagroi suggests an environment very similar to the rest of the Balkans, proved by the high ratio of forest animals in the sample. Nevertheless, the occurrence of fallow deer, a typically southern species, speaks for a somewhat drier climate than that of the inner Balkans. And yet most parts of the Drama Plain were certainly wetter than in recent times as can be judged from the beaver's presence.

Species

DOMESTIC CATTLE AND AUROCHS. There is little doubt that for Sitagroi's inhabitants, domestic cattle (*Bos taurus* L.) was the most important meat animal. In a comparison of individuals, caprovines outnumbered cattle in all phases, exceeded only by pig in phases IV and V; but in total meat quantity, cattle dominated.

The occurrence of aurochs (*Bos primigenius* Boj.) is well supported in all phases. However, the most typical finds, skulls and adult horncores, are not present. The other wild cattle species, bison (*Bison bonasus* L.), is not identified at Sitagroi. Aurochs bones could be distinguished from those of domestic cattle based on the works of Koch (1927:446ff.), Hescheler and Rueger (1942:479ff.), Degerbøl (1942:130), Boessneck (1957:56ff.), Bökönyi (1962:189ff.), Stampfli (Boessneck et al. 1963:159ff.), and Imhof

(1964:153ff.). In most cases the bones were identified by their large size, thick walls, and huge muscle insertion surfaces, though particular difficulties arose in distinguishing bones of young, subadult individuals and "transitional" forms. The latter are represented by aurochs domestic cattle crossings and by newly domesticated individuals. Recently domesticated cattle are the best indicators of local aurochs domestication (Bökönyi 1962:204; 1969:223), and their measurements border the domestic and wild cattle variations on the scattergrams, representing similar ties that occurred during their lives.

The bones of animals produced by crossings between wild and domestic cattle and those of newly domesticated individuals can be distinguished only with whole skeletons and skulls, larger skull fragments and horn-cores (Bökönyi 1962:205). Unfortunately, none were found at Sitagroi; however, it can be assumed, on the basis of the fauna of other neolithic sites of southeast Europe, that crossings would occur between domestic and wild cattle with the neolithic style of animal keeping.

Most of the transitional individuals are found in the first three phases with only a minimal occurrence in the two later phases. It is suggested from the presence of mostly adult and mature aurochs individuals (app. B: table 5.17) that man tried to capture the immature wild cattle—since only they could be tamed and domesticated—and killed the adults that were attempting to protect their young.

The domestication of aurochs is common to the neolithic of central and southeast Europe. In Greece, transitional individuals occurred in the neolithic of Argissa Magoula in Thessaly (Boessneck 1962:31) and Lerna in the Peloponnese (Gejvall 1969:31), and they also occur in the upper, early neolithic phase (Starčevo culture) of Lepenski Vir, Yugoslavia (Bökönyi 1970b:1704). They are particularly frequent in the Carpathian basin where hunting served aurochs domestication in the middle and late neolithic (Bökönyi 1959:80f.).

In Sitagroi, newly domesticated individuals influenced cattle population very much; being larger than cattle that were in an advanced stage of domestication, they increased the average size of the Sitagroi cattle. Unfortunately it is not reflected in withers height because there are no whole metapodials from transitional individuals (withers height is calculated from the length of metapodials). However, faunal remains of early domesticated individuals occur in abundance among the fragments.

In general, the number of intact metapodials preserved is very small: 11 metacarpals and 3 metatarsals. Lengths and withers heights are found in table 5.3.

Table 5.3. Cattle Metacarpal Lengths and Withers Heights

Bone	Phase	Length (mm)	Withers height (mm)
Metacarpal	I	193	1192.7
Metacarpal	II	206	1273.1
Metacarpal	II	208	1285.4
Metacarpal	III	191	1180.4
Metacarpal	III	200x	1236.0x
Metacarpal	IV	208	1285.4
Metacarpal	V	183x	1130.9x
Metacarpal	V	185x	1143.3x
Metatarsal	V	202x	1104.9x
Metatarsal	V	204x	1115.9x
Metatarsal	V	226x	1236.2x

Note: Calculated by Matolsci's method (1968:3; 1970:113). Measurements coded "x" are approximate.

These withers heights are undoubtedly not very high. Boessneck (1958:115) determined the average withers height of neolithic cattle of central Europe at about 1,250 mm; that of neolithic-copper age cattle was 1,268 mm (Bökönyi and Kubasiewicz 1961:53).

Bones of large cattle, including transitional individuals, occur often in the sample (figs. 5.2-5.4). As seen in the scattergrams, large cattle predominate in the early periods, whereas the majority of phase V cattle are in the lower half of the size variation. Among the small-sized cattle, three dwarf individuals appear with withers heights of 1,104.9, 1,115.9 and 1,130.9 mm; the dwarf cattle of phase I are probably the earliest recorded in Europe. To this point the earliest

dwarf forms had been known from middle neolithic Hungary, with withers heights of 1,077 mm from Győr-Pándzsa dülö, Linear Pottery culture, and of 1,126 mm from Polgár-Basatanya, Szilmeg culture (Bökönyi and Kubasiewicz 1961:53). As there is an insignificant time difference between the appearance of dwarf cattle in the Greek and the Hungarian neolithic, it can be assumed that cattle keeping developed similarly in these areas.

The size of Sitagroi cattle fell within the variation of prehistoric cattle development in central and southeast Europe, which progressively decreased in size from the neolithic to the iron age (Boessneck 1958:115ff.; Bökönyi and Kubasiewicz 1961:53ff.).

Sexual dimorphism is comparatively well expressed in the cattle of Sitagroi; the metacarpals of bulls are generally much larger and more massive than those of cows (fig. 5.2). It is more difficult to distinguish sex by the metatarsals (fig. 5.4); aurochs cow measurements overlap even the upper variation range of bulls. The six large bull astragali recovered either represent a separate group or are from transitional individuals.

Positive evidence of bull castration is lacking although a few large horn-core fragments with extremely thin walls may come from oxen. Occurrence of oxen, particularly in the site's later phases, would not be surprising since the castration of bulls is certain from the neolithic and copper age of central and eastern Europe (Krysiak 1950-51:228; 1952:289; Nobis 1954:160).

In the entire domestic cattle bone sample there are only a few specimens suitable for the investigation of craniological characteristics. No whole skulls occur, and there is only one large fragment (ZA 43, phase III). It is an upper frontal skull fragment of an adult domestic cattle, probably bull, including the proximal part of the left horn-core (fig. 5.5). Characteristically it is similar to those of aurochs skulls with a wide, even forehead, a wide, straight intercornual ridge, and a long, large horn-core. But it has thin walls and a smaller, almost circular cross-section at its base; it is simply a domestic cattle of *primigenius* type. To the same type belong two recovered whole horn-cores, both phase III, from ZA 41 (pl. VI:1) and MM 27. The *primigenius* type is distinguishable from the aurochs horn-core fragments by their thin, furrowed walls. A few horn-cores are too fragmented for the latter differentiation, but none are representative of the brachyceros (longifrons) cattle type.

The *primigenius* cattle type seems to be the first stage following initial domestication, after which some are transformed into brachyceros type. The latter type occurred in the earliest neolithic (Körös culture) site of Nosza, northeast Yugoslavia (Bökönyi 1969:221).

Craniologically, the most interesting cattle find of Sitagroi is the skull fragment of a hornless cattle from QO 8 phase V (fig. 5.6). Except for a missing median splinter, the skull form can be reconstructed with a comparatively narrow, uneven forehead and wavy frontal ridge. Only two small, bone pearl clusters indicate where the horn-cores should be located.

In comparison with hornless sheep, hornless cattle occurred rather late, with the first appearance in Egypt around 2500 BC. In the northern half of central Europe they are described from the end of the neolithic or the beginning of the copper age (David 1897:38; Hoyer 1923:14; Müller 1963:149ff.). A Sitagroi radiocarbon date from the same phase (Vb) as the hornless cattle fragment gave an absolute age of 2135 bc ± 150 (Bln 781). This find, therefore, is as early or earlier than the previous finds from central Europe and certainly is the oldest found in the Balkans.

The age group composition of the Sitagroi cattle bone (table 5.4) is extremely interesting. Ascending from the lowest site level, the ratio of immature animals tends to decrease while mature forms tend to increase.

Table 5.4. Domestic Cattle Bone Sample: Ratios of Age Groups

Phase	Immature (%)	Mature (%)
V	26.0	74.0
IV	31.2	68.8
III	37.4	62.2
II	43.8	56.2
I	38.2	61.8

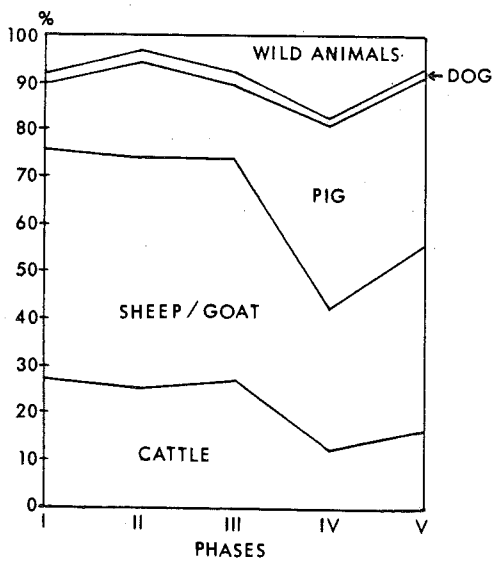


Figure 5.1. Ratios of the most important species and species groups in the different phases of Sitagroi.

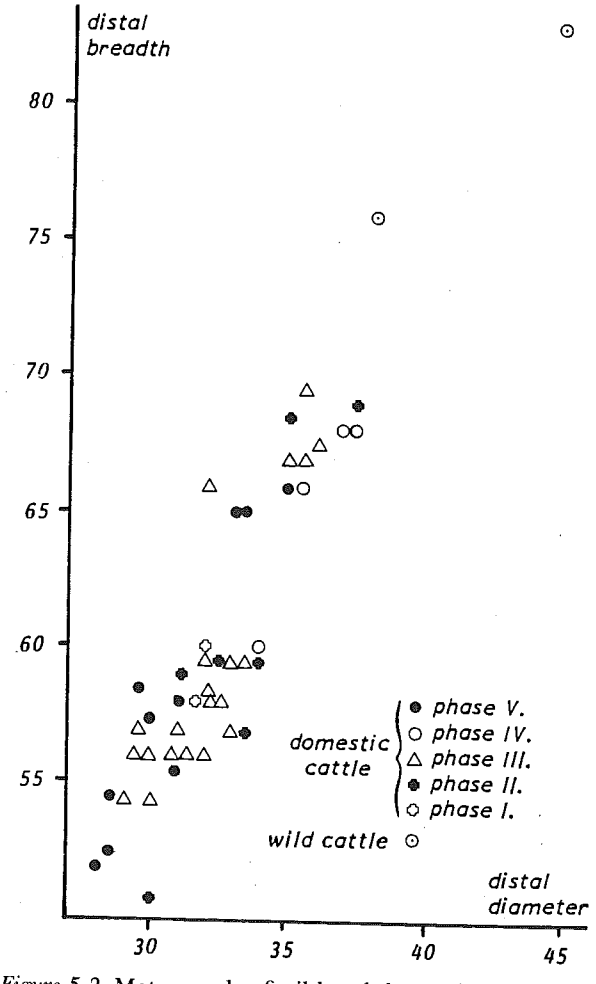


Figure 5.2. Metacarpals of wild and domestic cattle (*Bos taurus* L.): scattergram of distal breadth and diameter.

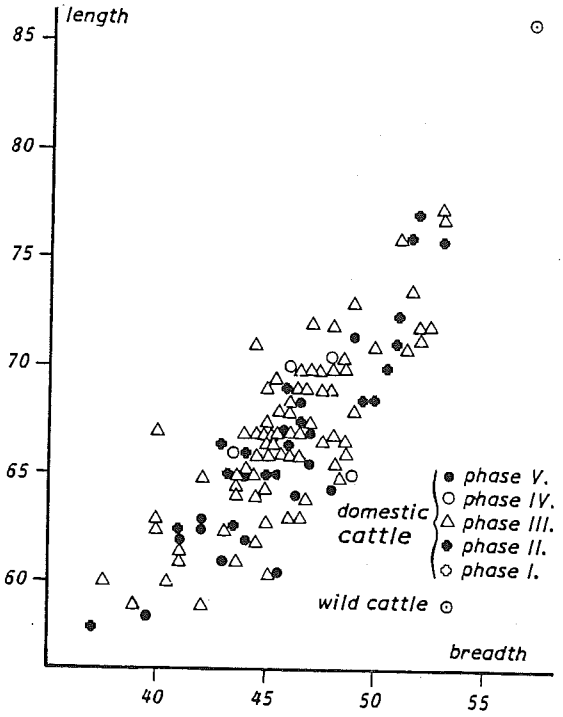


Figure 5.3. Astragali of wild and domestic cattle (*Bos taurus* L.): scattergram of length and breadth.

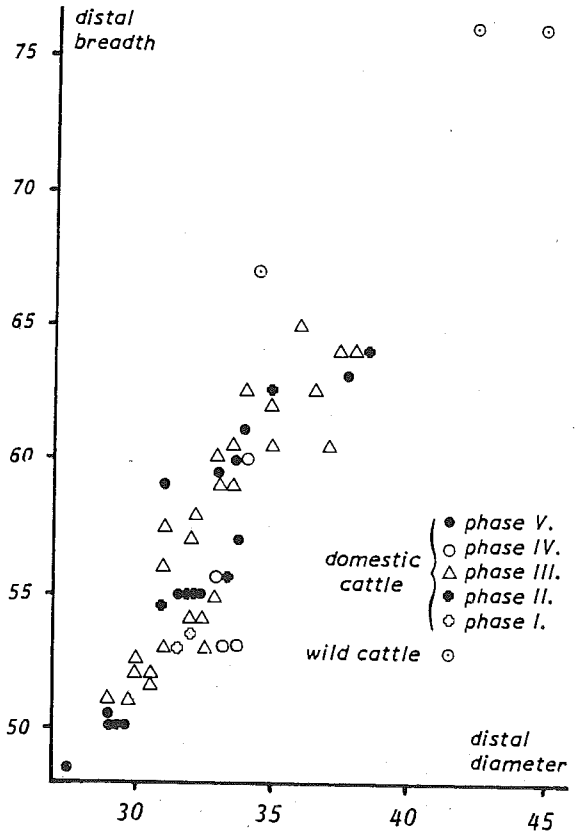


Figure 5.4. Metatarsals of wild and domestic cattle (*Bos taurus* L.): scattergram of distal breadth and diameter.

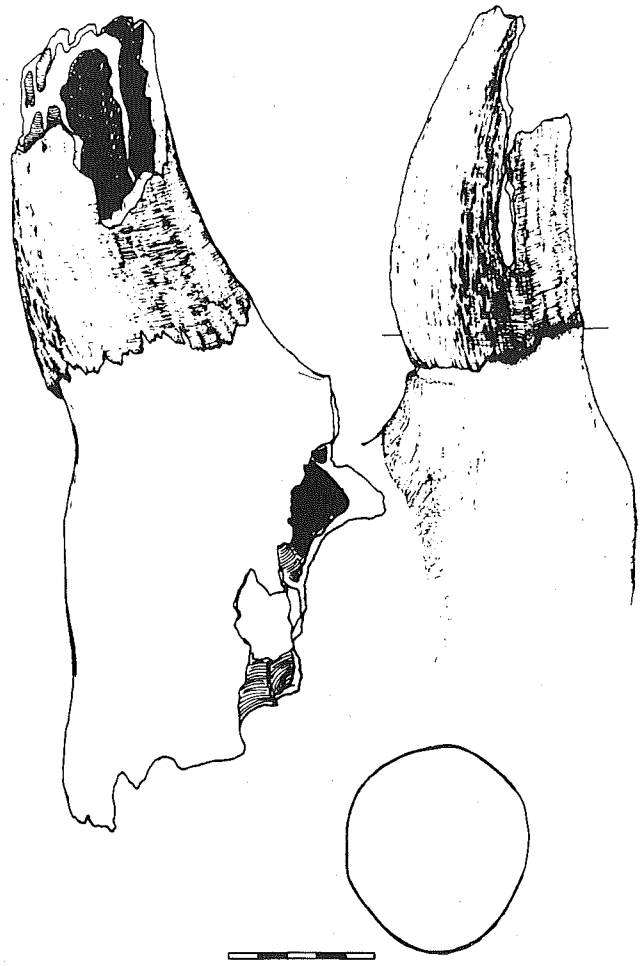


Figure 5.5. Skull fragment of *primigenius* type domestic cattle (ZA 43, phase III).

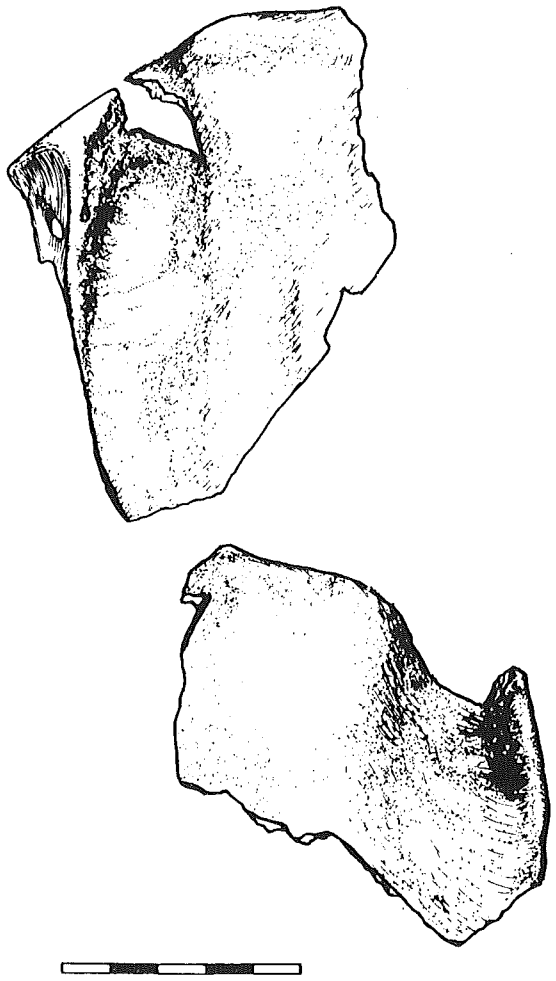


Figure 5.6. Skull fragments of hornless cattle (QO 8, phase V).

This development is probably attributable to the change in use of domestic cattle during settlement life. All species domesticated in the first wave of domestication were used as meat animals, and only after the development of other uses were they exploited further for milking and as draft animals. During the fodder shortage of prehistoric times, man slaughtered most of his meat animals in the autumn when they were still immature, keeping only the breeding stock through the winter. Probably this situation obtained in the early phases of Sitagroi, and essential changes took place only in phase IV, observed in the decrease in the number of immature animals killed. Based on Near Eastern analogies, the first secondary use was milking, but the use of the draft power of cattle cannot be excluded, particularly in phase V.

The aurochs from Sitagroi resemble in size prehistoric aurochs which lived under poor environmental conditions. Ecologically, the Drama Plain was a little too wet and too small, and the neighboring mountains did not furnish them a desirable habitat. It is understandable, therefore, that the majority are smaller in size than the large aurochs of the great plains in Hungary. Larger individuals do occur: for example, a distal metacarpal fragment (ML 34, phase I) with a distal breadth of 83 mm; a lower third molar (MM 10, phase IV) with a length of about 48 mm; and

a strong, juvenile horn-core from the same provenience as the molar.

SHEEP. In southwest Asian mountains, the first domestication center of caprovines, goats were generally more prevalent than sheep; but in the plains and hilly areas, and in all central and southeast Europe, sheep exceeded goat. This was the case at Sitagroi (table 5.5).

Table 5.5. Caprovine Bone Sample: Ratios of Sheep and Goat

Phase	Sheep (%)	Goat (%)
V	75.1	24.9
IV	84.5	15.5
III	80.0	20.0
II	82.0	18.0
I	94.9	5.1

Because the caprovine bones are highly fragmentary, their identification proved difficult even with the aid of the studies of Gromova (1953) and Boessneck et al. (1964).

The absence of post-Pleistocene wild sheep on the Balkan mainland establishes without doubt that the sheep from Sitagroi are domesticated. Domestication is also proven by the occurrence of hornless sheep and by the high ratio of immature animals, those under two years (table 5.8). Given a high number of immature bones in the sheep/goat category and, although young sheep and goat bone fragments are practically indistinguishable from each other, given that 80% of the caprovine bones are from sheep, it can be inferred that the number of sheep killed at an immature age is much higher than represented in table 5.8.

Whole skulls cannot be found in the sheep sample either, but there are several large skull fragments, whole horn-cores, and large horn-core fragments. The horn-cores show a large variation at Sitagroi (fig. 5.7), necessitating their division into three main types, as follows:

1. Long, massive horn-cores in the form of a two-thirds or three-quarters circle, with a triangular cross-section at the base and a slight outward twisting. These are the so-called Copper sheep type (fig. 5.8).
2. Short, flat, non-twisted horn-cores, resembling those of goat but much shorter. These are the so-called Turbary sheep type (fig. 5.9).
3. Rudimentary horn-cores, 5-30 mm in length with a nearly circular cross-section at the base (pl. VI:2).

A single horn-core was found which is massive but very short, with a triangular cross-section at its base (fig. 5.10). Hornless sheep skull fragments having many different degrees of hornlessness also accompany the above-mentioned types (fig. 5.11).

These variations are solely the result of domestication and sexual dimorphism and do not, therefore, represent separate breeds. Previously it was thought that these were independent

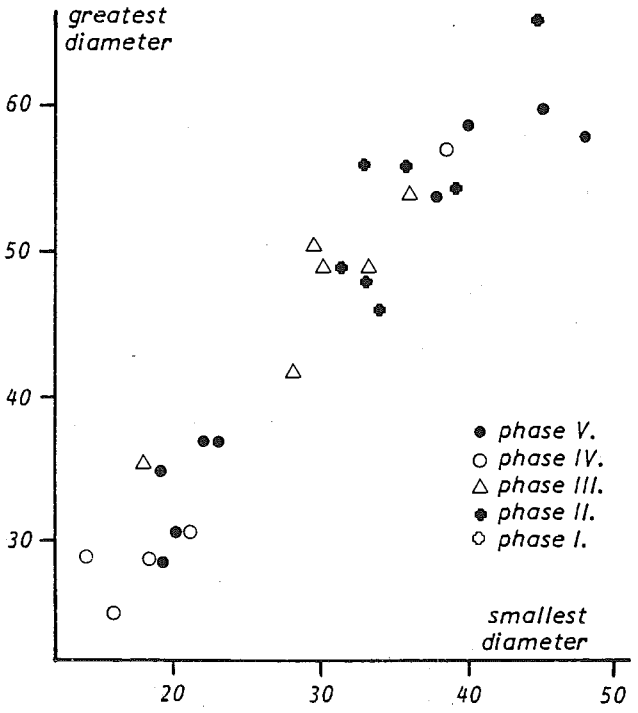


Figure 5.7. Horn-cores of sheep (*Ovis aries* L.): scattergram of greatest and smallest diameters.

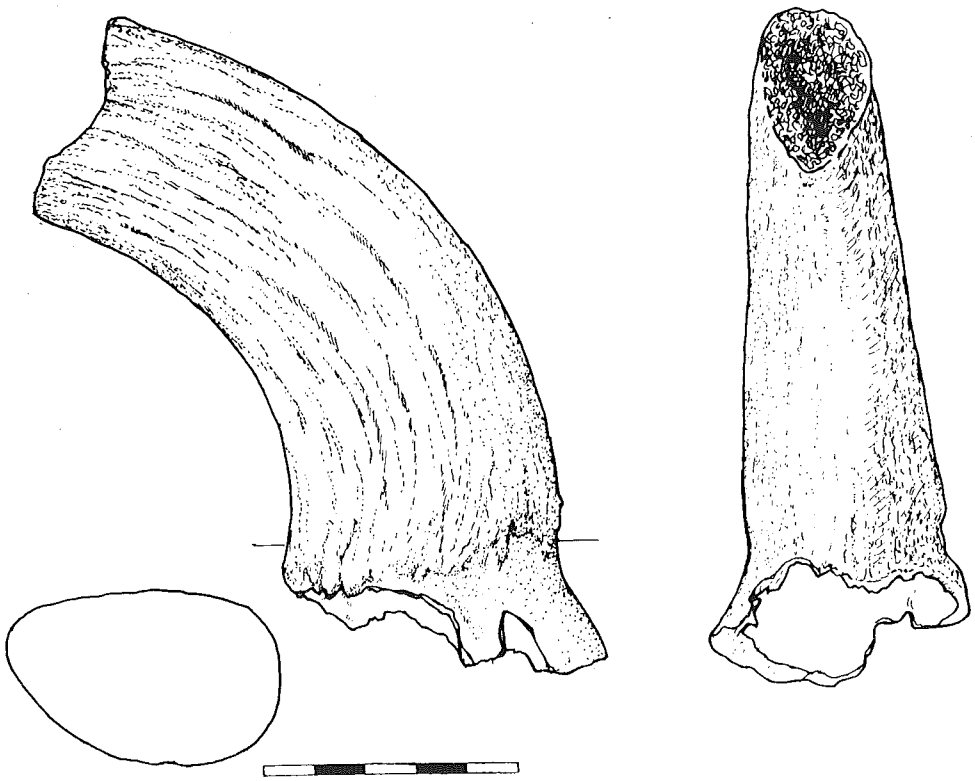


Figure 5.8. Horn-core fragment of Copper sheep type (ZA 47, phase III).

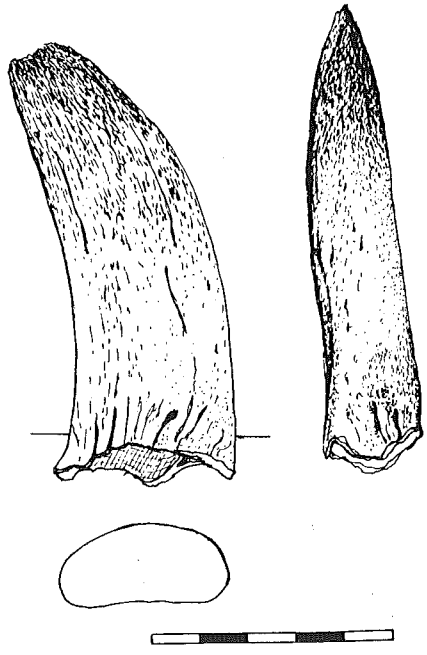


Figure 5.9. Horn-core of Turbary sheep type (MM 15, phase III/IV).

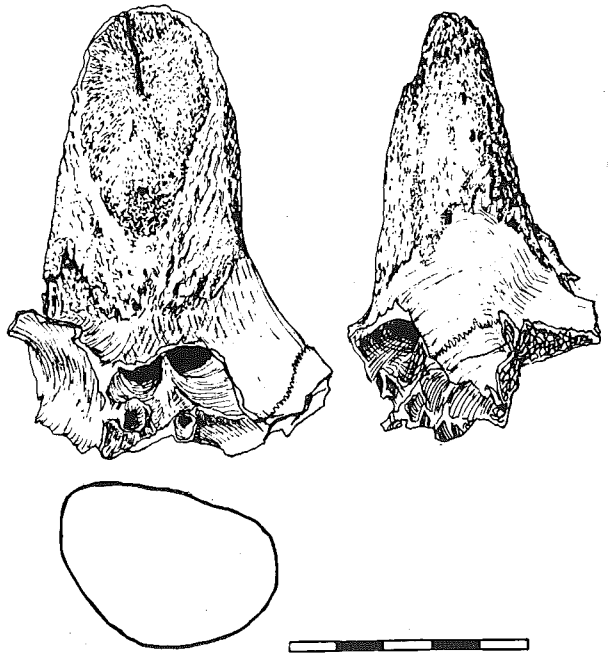


Figure 5.10. Sheep horn-core with unusual form (ZA 55, phase II).

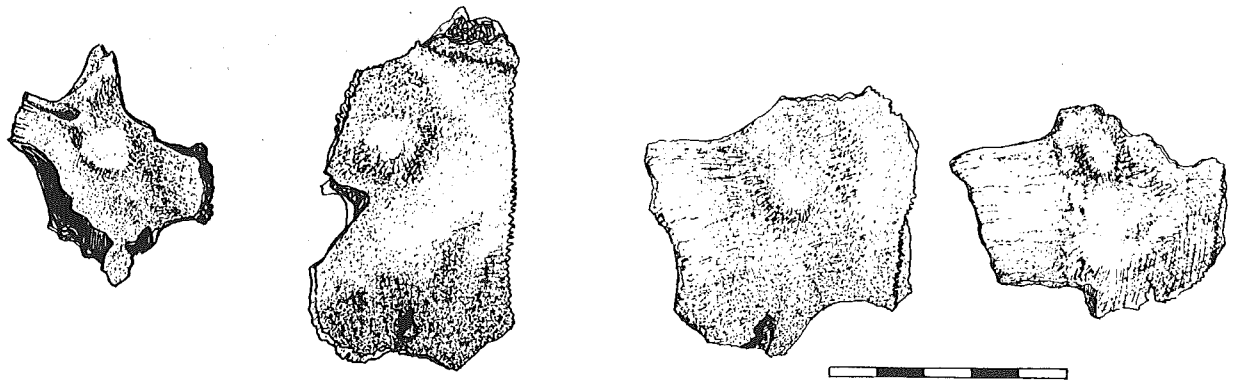


Figure 5.11. Skull fragments of hornless sheep (phases I and II).

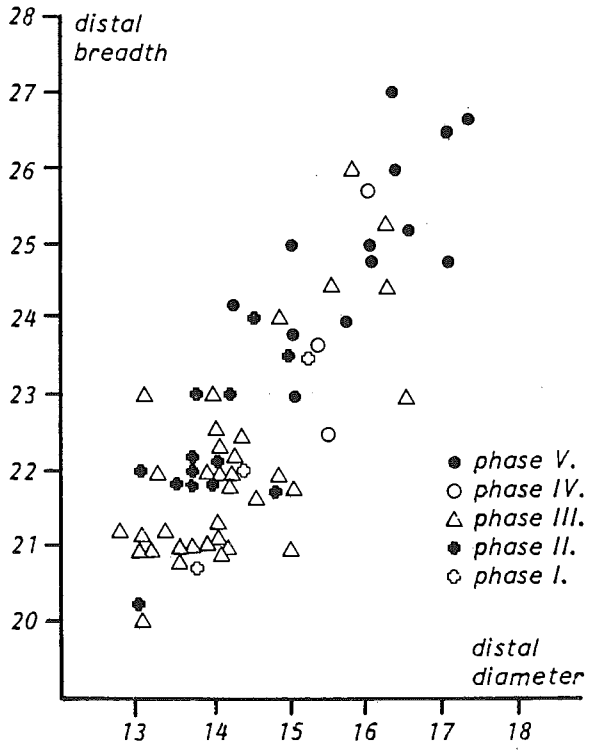


Figure 5.12. Metacarpals of sheep (*Ovis aries* L.): scattergram of distal breadth and diameter.

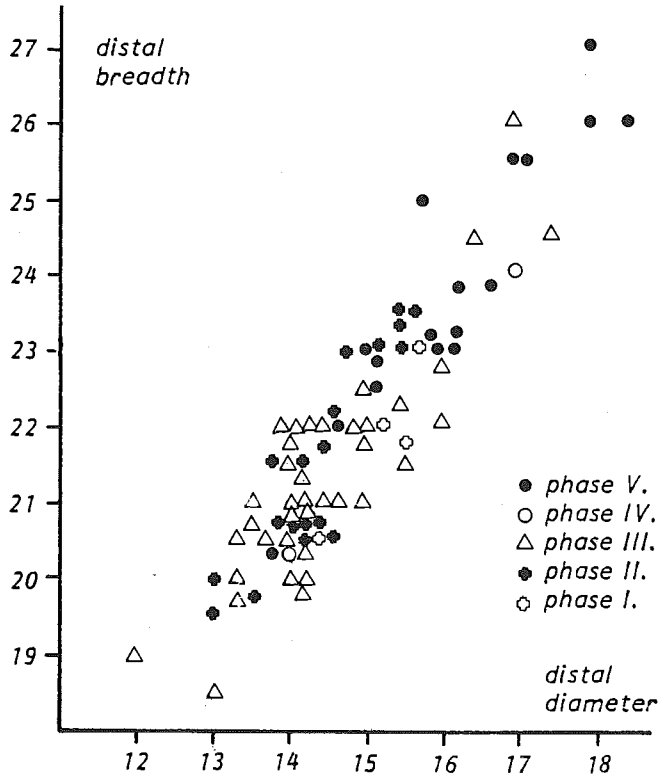


Figure 5.13. Metatarsals of sheep (*Ovis aries* L.): scattergram of distal breadth and diameter.

Table 5.6. Horn-core Types: Distribution by Phase

	Phases					
	I	II	III	IV	V	Totals
Hornless	6	9	5	15	7	32
Rudimentary horn-core	0	0	2	1	2	5
Turbary sheep	2	1	3	12	14	32
Copper sheep	4	23	10	6	6	49
Unidentifiable horn-core type	2	0	3	1	1	7
Totals:	14	33	23	25	30	125

sheep types originating from different wild forms. However, since Eugster (1921) and, in particular, Reitsma (1932) proved from primitive breeds that Copper sheep horn-cores occur exclusively in males and those of Turbary sheep only in females, they are no longer considered independent types.

At Sitagroi, therefore, the first horn-core type is undoubtedly from rams, and it is highly probable that the unusual horn-core from ZA 55 (fig. 5.10) is also male. The horn-cores and hornless fragments of the second and third types are from females. The whole latter group may contain castrates as well, but there is no direct evidence for this.

According to the data (table 5.6), the bone sample contains 49 male horn-cores and 69 female horn-cores. Since the ratio among newborn lambs is about 1:1, it can be inferred that either the second group also contains horn-cores of castrated males or that a great number of the males were slaughtered while young. Both cases are plausible, though the latter is supported by the high ratio of young individuals in the sample.

An interesting change occurred during the settlement life span. In the first four phases, a population of small sheep, corresponding to sheep in neolithic sites of the Balkans and the Carpathian basin, is in evidence. They are smaller than the early domestic sheep in southwest Asia (Boessneck 1956:28f.; 1962:30; Jarman and Jarman 1968:257; Bökönyi 1964:911; 1971). Occasionally, among these sheep larger individuals are seen, as exemplified by a metatarsal (ZA 50, phase II) whose length is 158 mm, indicating an individual with a withers height of 740 mm. Suddenly, in phase V (bronze age), there appeared a large sheep, together with an increase in the caprovine ratio which made caprovines again the most frequently domesticated group. Phase V yielded few whole metapodials and these, in most cases, are larger than those of earlier phases (table 5.7). Much larger individuals can be recognized by bone fragment measurements in the scattergrams (figs. 5.12, 5.13).

At the end of the copper age and the beginning of the bronze age, large sheep and the development of sheep keeping can be observed throughout southeast and central Europe. This resulted in an increase in withers heights of as much as 100 mm. At this time 700 mm was the average withers height in the southern half of

Table 5.7. Sheep Metapodial Lengths and Withers Heights

Bone	Phase	Length (mm)	Withers height (mm)
Metacarpal	V	129	626.9
Metacarpal	V	124x	602.6x
Metacarpal	V	124x	602.6x
Metacarpal	V	117	568.6
Metacarpal	V	117	568.6
Metacarpal	IV	121.5	590.5
Metacarpal	III	120	583.2
Metacarpal	III	117	568.6
Metacarpal	III	115	558.9
Metacarpal	III	113.5	551.6
Metacarpal	III	113	549.2
Metacarpal	III	111x	539.5x
Metacarpal	III	110	534.6
Metacarpal	III	109.5	532.2
Metacarpal	III	109	529.7
Metacarpal	III	105x	510.3x
Metacarpal	III	104	505.4
Metacarpal	III	102x	495.7x
Metacarpal	III	101	490.9
Metacarpal	III	98.8	408.2
Metacarpal	II	116.5	566.2
Metacarpal	II	115.5	561.3
Metacarpal	II	114	554.0
Metacarpal	I	117.8	572.5
Metatarsal	V	126	589.7
Metatarsal	III	123	575.6
Metatarsal	III	116.5	545.2
Metatarsal	III	116	542.9
Metatarsal	III	113.5	531.2
Metatarsal	II	158x	739.4x

Note: Calculated by Zalkin's method (1961:132). Measurements coded "x" are approximate.

Russia and the Ukraine (Zalkin 1961:26); 696 mm was the average in Hungary (Bökönyi 1971).

A question arises as to the origin of these large domestic sheep. The answer can be found through study of prehistoric sheep keeping. In the early phases of animal keeping, size increase happened only through local domestication. This process was unintentional inasmuch as man simply attempted to increase the number of domestic stock, not to improve the quality. There were no wild forms present around Sitagroi; therefore, this problem can be approached in terms of trade or contact with migrating peoples, and their herds, from southwest Asia. Boessneck (1962:47) entertained an idea based on the size increase and large horn-cores of sheep in the bronze age of Argissa Magoula. Since he was unfamiliar with the domestic sheep of the third millennium of southwest Asia, he based his theory on the fact that the large horns of female wild sheep in the Near East would also manifest themselves in their descendants. Studies on domestic sheep of the third to second millennium BC in southwest Asia suggest that such an import seems likely. At Tell al-Rimah (3rd-2nd millennium BC, northeast Iraq, excavation of D. Oates, 1967-68) domestic sheep are found with 636-730 mm withers heights. Sheep of approximately the same size from Böghazköy (14th-13th century BC, Anatolia) are described by Vogel (1952:147). In southwest Asia these large sheep developed from purposeful animal breeding and not from a new wave of domestication. Purposeful animal breeding, a combination of breeding selection and satisfactory feeding, is first applied to sheep, both qualitatively and quantitatively, in third millennium Mesopotamia. These changes resulted in greater sheep size and an increase in the amount and quality of wool. Since little fieldwork has been done until recently, there is sparse osteological evidence for the size increase, but written sources do verify the changes in wool. Kraus (1966) published shearing lists for sheep from Old Babylonian Larsa at the turn of the third to the second millennium. There are also several figurines representing wool sheep in this period.

Sheep at the turn of the third to the second millennium certainly increased in size while keeping their ancestral body proportions. However, Hittite sheep, second millennium BC, seem to have had body proportions similar to those of improved breeds from the beginning of modern animal breeding. The best evidence is their very short but wide metapodials (Vogel 1952:147) which show extraordinary resemblances to those of recent cultural breeds. The bronze age sheep of Sitagroi are probably somewhat smaller than those found in southwest Asia, and their metapodials resemble those of archaic forms. In comparison with sheep in earlier phases, they probably had the advantage of increased quality and quantity of wool. There is no direct evidence to support these ideas, but material from central Europe clearly demonstrates that the first wave of sheep with really good wool arrived during the bronze age (Bökönyi 1971).

Proportionate age groups show that sheep were not merely meat animals in the earliest occupation layers. As already discussed, the ratio of immature sheep is probably higher than listed in table 5.8. Even so, they are essentially less frequent than immature pigs and their frequency is close to that of immature cattle. In phases II and III the ratio of mature individuals increased, implying an increase in uses other than for meat. Phase IV found a strong decline followed by an increase again in mature forms.

Table 5.8. Ratios of Immature and Mature Sheep

Phase	Immature (%)	Mature (%)
V	33.6	66.4
IV	42.3	57.7
III	24.7	75.3
II	45.0	55.0
I	49.2	50.8

Since there is strong evidence that wool sheep appeared in the Near East in the sixth millennium, it is likely that both meat- and wool-producing individuals were kept in the early phases of Sitagroi. Milking could be considered a tertiary use; Zeuner (1963:219) determined the presence of cow milking in southwest Asia, ca. 2900 BC. It is highly probable that the milking of capro-

vines is earlier, not only because they were domesticated first but also because early milking techniques applied to cows can be derived from those used with caprovines.

GOAT. As with sheep, wild ancestors of goats are absent from the European mainland; thus the remains at Sitagroi are of domesticated forms. This is corroborated by the lack of wild characteristics in the horn-cores.

Goat is represented craniologically by 4 whole horn-cores and 73 horn-core fragments, some of which can be typed. One whole horn-core (fig. 5.18) and 3 fragments are from scimitar-horned goats or *aegagrus* type. Three other whole horn-cores and 28 fragments represent goats with twisted horns, termed *prisca* type. The remaining 42 fragments are too small for type determination (table 5.9).

The *aegagrus* and *prisca* types are used only to determine horn-core form and are not meant to denote differences in origin as is supposed by earlier authors. Scimitar horn-cores are closer to the wild form (*Capra aegagrus* Erxl.) than are the twisted ones and therefore imply an earlier stage of domestication. They are small in number compared with the twisted ones, although even in recent times primitive forms exhibit this characteristic. Recent scimitar-horned individuals are always female. At Sitagroi, too, the scimitar horn-cores and the smaller twisted ones are obviously female; the larger *prisca* type horn-cores represent males. Among the males two large cores appear with base circumferences of 127 mm and 128 mm. Both are from phase III (ZA 42 and 43) and demonstrate that if goats had been permitted to live longer, their size would have increased appreciably.

Among Greek neolithic sites Lerna is the only one where the ratio of *aegagrus* type cores is conspicuously high (Gejvall 1969:27-28). In all other sites *prisca* type goats represent the overwhelming majority.

Generally, Sitagroi goats are of small-to-medium sizes, as indicated from extremity bone measurements. Three bones, a metacarpal (ZG 43, probably phase II), a metatarsal (KL 108, phase II), and another metacarpal (ZG 18, phase III) are from large individuals, probably strong bucks. The last bone, with its greatest length 130 mm and its smallest breadth 18.7 mm, represents one of the largest prehistoric goats found in central and southeast Europe. Plate VI:3 compares it with an average goat metacarpal from the site. Notably, goats of similar size appear mostly in the Roman Imperial period as a result of the purposeful animal breeding manifested at that time. Unfortunately, the goat sample at Sitagroi is too small to determine any change in size during settlement life.

Goat age group ratios indicate two functions (app. B:table 5.19): first, their use as meat, and second, their use for milk. Other uses are indeterminable since the sample size is small.

Table 5.9. Goat Horn-core Frequencies by Phase

Phase	Whole horn-cores		Horn-core fragments		Unidentifiable	Total
	aegagrus (scimitar)	*prisca* (twisted)	*aegagrus* (scimitar)	*prisca* (twisted)		
V	0	0	2	8	16	26
IV	0	0	0	2	2	4
III	1	2	0	14	13	30
II	0	1	0	3	9	13
I	0	0	1	1	2	4
Total	1	3	3	28	42	77

DOMESTIC PIG AND WILD SWINE. In all phases domestic pig is an important meat source for the inhabitants of Sitagroi, particularly in phases IV and V. Domestic pig, like cattle, had its wild form living around the site, and its local domestication can be proven. Wild swine, one of the three most hunted animals, appears in all phases, especially in phase V where it is the most frequent of all wild animal remains.

"Transitional individuals," specifically newly domesticated pigs, connect wild and domestic variations and are noted in the scattergrams (figs. 5.14-5.17). Their occurrence is common also among unmeasurable fragments, particularly in phase V. Domestic and wild pigs can be distinguished easily from each other on the basis of

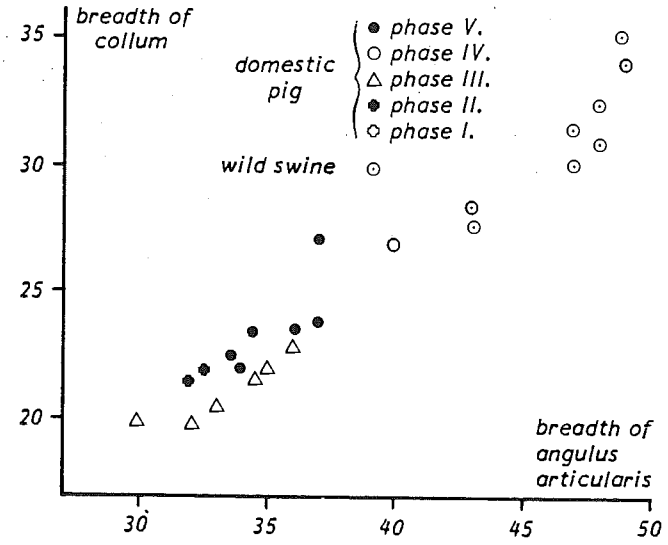


Figure 5.14. Scapulae of wild and domestic pigs (*Sus scrofa* L.): scattergram of breadth of collum and of angulus articularis.

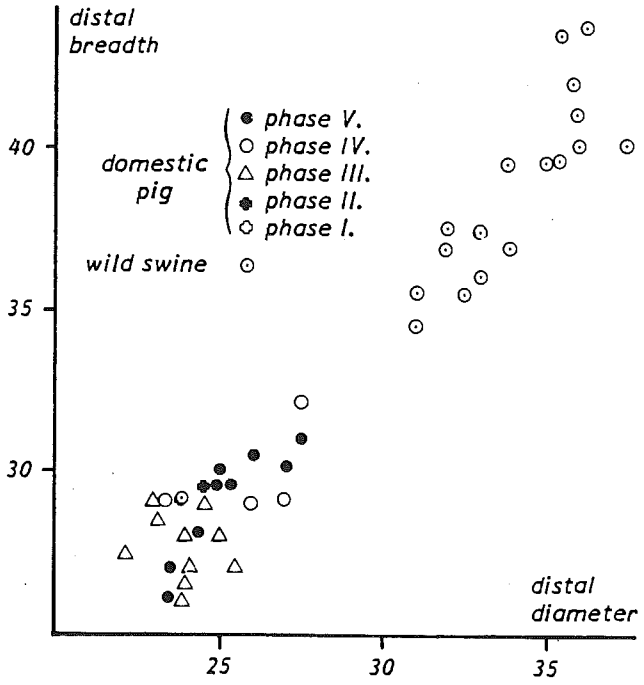


Figure 5.16. Tibiae of wild and domestic pigs (*Sus scrofa* L.): scattergram of distal breadth and diameter.

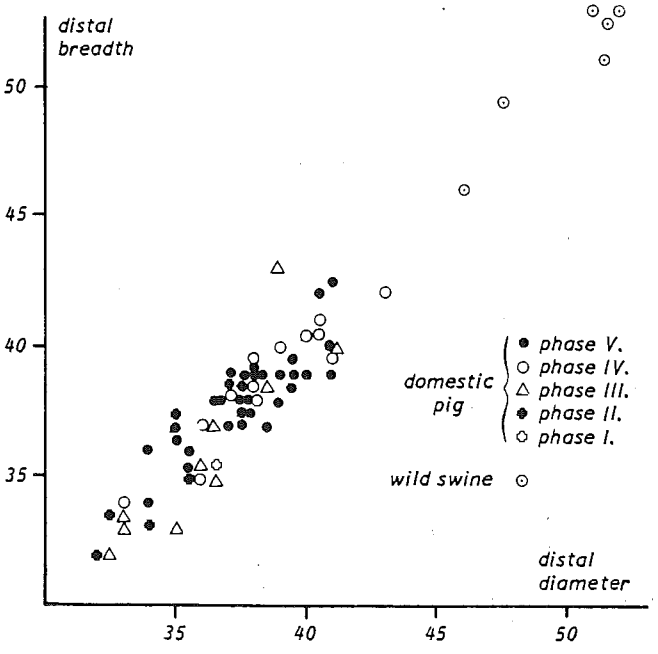


Figure 5.15. Humeri of wild and domestic pigs (*Sus scrofa* L.): scattergram of distal breadth and diameter.

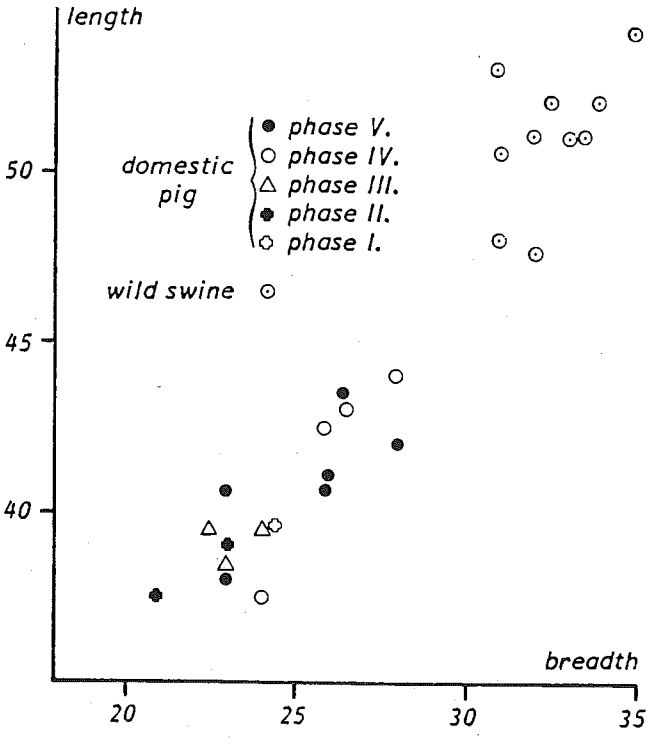


Figure 5.17. Astragali of wild and domestic pigs (*Sus scrofa* L.): scattergram of length and breadth.

size, the former being a much smaller representation of the wild form.

The pig sample is particularly fragmentary, containing a conspicuously small number of measurable specimens and no whole skulls or large skull fragments. Therefore, further morphological evidences of domestication are demonstrated from the lachrymal bones (table 5.10) and the dentition. The wild swine of central Europe has an elongated lachrymal bone with a lachrymal index (ventral length/greatest breadth) always above 2.0. The Mediterranean wild swine is classified by Ulmansky (1914:17ff.) as an independent species, *Sus mediterraneus*. However, this is only a geographical subspecies (Kelm 1938:505), having a somewhat shorter lachrymal bone. The lachrymal bone of domesticated pig is shorter yet, with a lachrymal index around 1.0, going hand in hand with the general shortening of the skull under domestication. At Sitagroi there is only one elongated lachrymal bone, probably from a "transitional individual" (PO/C-D 129, phase V). Unfortunately, it is damaged and unmeasurable. All other lachrymal bones are very short (four are represented in figs. 5.19, 5.20; pl. VI:4, 5), their indexes being at 1.0 or just above. It can be said with assurance that these come from pigs domesticated over several generations.

Table 5.10. Domestic Pig: Lachrymal Bone Measurements

Phase	Ventral length (mm)	Greatest breadth (mm)	Lachrymal index	Illustration
V	31.5	27.0	1.17	
V	28.0	24.0	1.17	Fig. 5.20
V	26.5	26.0	1.02	
IV	27.0	23.5	1.15	
IV	22.0	22.0	1.00	Fig. 5.19
III	25.5	21.0	1.21	Pl. VI:5
II	26.0	23.0	1.13	Pl. VI:4

A decrease in skull size in pigs as a direct effect of domestication can be seen also in small size dentition. This decrease in tooth size is preceded by a decrease in skull size, resulting in a shortened maxilla or mandible with large teeth. Since the large teeth become crowded in the small maxilla or mandible, they either overlap or settle in a crosswise position. Material from Sitagroi provides some excellent examples but, oddly, always in the upper tooth row (pl. VII:1-4).

Table 5.11. Wild and Domestic Swine Lower M_3 Lengths: Distribution by Phase

	Length (mm)	Phases I	II	III	IV	V	Total
Wild	48	-	-	1	1	3	5
	47	-	-	-	-	2	2
	46	-	-	-	-	-	-
	45	-	-	1	1	-	2
	44	-	-	2	1	2	5
	43	-	-	1	-	1	2
	42	-	-	1	-	2	3
	41	-	-	1	-	3	4
Domestic	40	-	-	-	-	1	1
	39	-	-	-	-	1	1
	38	-	-	-	-	1	1
	37	-	-	1	1	-	2
	36	-	-	-	-	1	1
	35	-	-	2	1	1	4
	34	-	1	3	1	2	7
	33	-	-	3	4	4	11
	32	1	-	4	4	1	10
	31	-	2	2	3	3	10
	30	-	2	2	-	1	5
	29	-	3	1	-	2	6
	28	-	1	-	1	-	2

Domestic pigs from Sitagroi resemble those from neolithic and bronze age sites in central and southeast Europe. Small pigs found in the lower phases are similar to pig remains at Greek neolithic sites (Boessneck 1956:30; 1962:30f.; Jarman and Jarman 1968:260; Gejvall 1969: 22ff.). An increase in domestic pig size from phase IV is simply attributed to variations caused by newly domesticated individuals together with small pig survivals from an early domestication. This is well demonstrated by the scattergrams (figs. 5.14-5.17). Frequency diagrams of the lower M_3 also provide information about size relations in different periods and the occurrence of transitional forms between the domestic and wild swine (table 5.11).

Among the European domestic mammals, pig is the only one that has been used solely as a meat animal since first being domesticated. The age distribution in Sitagroi demonstrates that

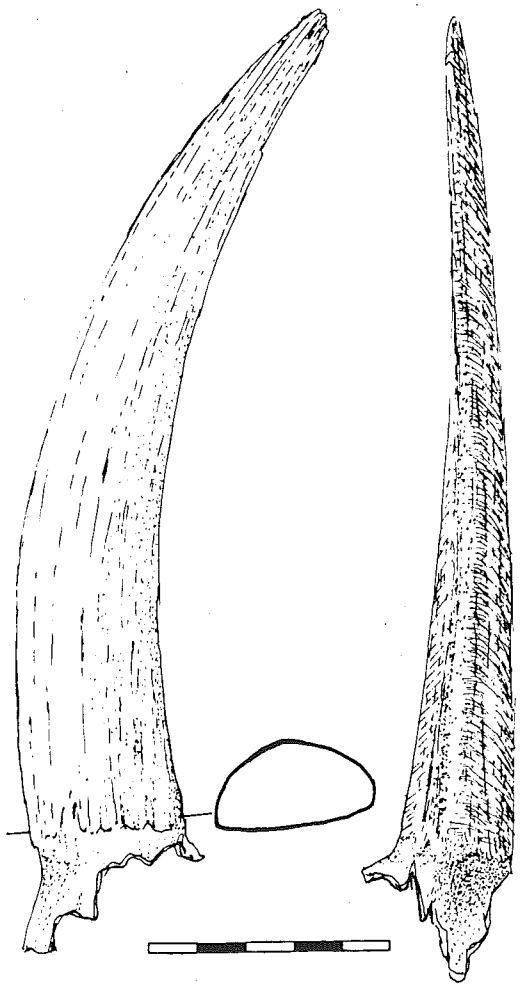


Figure 5.18. Goat horn-core (ZA 43, phase III).

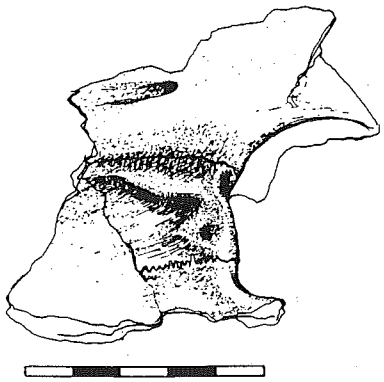


Figure 5.19. Skull fragment of pig with lachrymal bone (MM 7, phase IV).

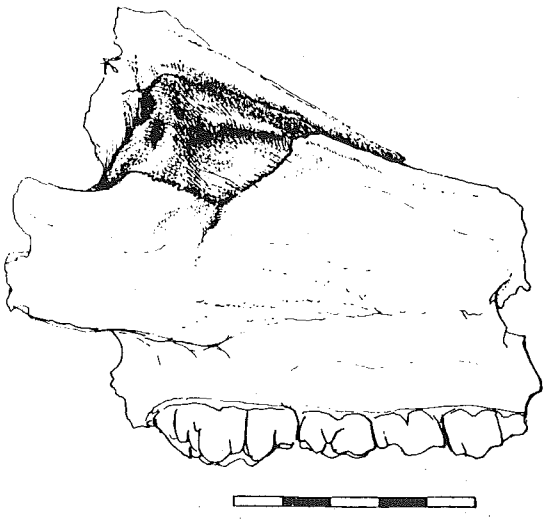


Figure 5.20. Skull fragment of pig with lachrymal bone (ZA 19, phase V).

the overwhelming majority are from animals killed before reaching the end of their second year (table 5.12).

These figures demonstrate that approximately 90% of the pigs were killed in their immature stage. In phase IV the ratio is much lower, with a concomitant rise in numbers of wild animals hunted for their meat. Domestic cattle and sheep/goat supplemented the use of pigs. Phase V returned to the initial situation.

The fact that only 10% of the pig bones are from mature animals suggests that the breeding stock was very limited. This is a conspicuously small percentage even when it can be supposed that it consisted mostly of females. There is direct evidence from prehistoric sites that most males were castrated or killed at an immature age. A 10% breeding stock is small even if sows in their second year farrow before they are slaughtered.

Given a breeding stock of about 10% and knowing that primitive domestic animals bring forth their young once a year as did their wild ancestors, then one can roughly determine the average number of piglets per litter necessary to maintain the pig population. Example: 100 pigs inhabit the settlement at a given time. Ten of them are adult individuals—2 boars and 8 sows. Let us suppose that 25 of the 50 subadult individuals (we take these figures from the kill-off pattern of pigs at the site) also manage to reach farrowing age, and 80% (20 individuals) are again sows. There are now 28 breeding sows. Sterility is uncommon with primitive domestic animals kept under comparatively natural circumstances. Nevertheless, let us assume that 3 sows miscarry yearly, leaving 25 breeding sows. Moreover, mortality reduces the number of viable individuals by 20% to 20 sows. Therefore, 80 piglets, or 4 piglets per litter, are needed to maintain the pig population at this estimated level of approximately 100 pigs. Recent European wild swine studies report that 4 to 12 piglets occur in a litter (Haltenorth 1957:208f.). It must be assumed that Sitagroi's pigs had larger litters—to increase the domestic stock and at the same time supply meat to the inhabitants.

The wild pigs from Sitagroi are similar in size to those of the Mediterranean form and therefore are smaller than central and western European subspecies and larger than those of Asia. However, some large individuals do occur: an unmeasurable mandible fragment (ZA 65, phase I), a large lower canine (ZG 20, phase III), and a mandible fragment (ZJ 9, phase IV) are all from large boars.

Most of the wild pig bones are from mature individuals, in sharp contrast to the low ratio in mature domestic forms (app. B:tables 5.20, 5.21). The scattergrams demonstrate a high proportion of males reflecting local domestication of pig (figs. 5.14-5.17).

A simple evolutionary abnormality appears in an adult swine mandible fragment from phase V (PO/C-D 129). The mandible shows no pathological alterations or other aberrations to explain a gap of 10 mm between P_2 and P_3 or another of 9.5 mm between P_3 and P_4.

Table 5.12. Ratios of Immature and Mature Pig Bones

Phase	Immature (%)	Mature (%)
V	90.32	9.68
IV	81.64	18.36
III	88.08	11.92
II	89.55	10.45
I	89.12	10.88

DOG AND WOLF. A third domestic animal of Sitagroi which had a local wild ancestor is the dog. Several authors concur that wolf is the ancestor of dog (Herre 1958:32; Degerbøl 1961:46; Nobis 1963:306ff.). However, at Sitagroi there is a lack of transitional individuals between wolf and dog, the variations in the two forms do not overlap, and there is a considerable size difference between the bones of the two species. Thus, dogs arrived at Sitagroi in a domesticated form.

Little variation occurs among dogs, which range between small and medium forms. From the frequency diagram of the lower M_1 (table 5.13) one can see the clustering around domestic dog.

The lower M_1's with a length of 14 or 15 mm fall within the upper variation limits of fox, but

Table 5.13. Dog and Wolf: Distribution of Lower M_1 Length

Length in mm	Number of Specimens	
14	1	
15	2	
16	5	
17	10	
18	16	Domestic Dog
19	11	
20	11	
21	6	
22	1	
23	0	
24	0	
25	0	
26	0	
27	0	
28	1	
29	0	
30	0	Wolf
31	1	

can be differentiated morphologically. They could be jackal, though jackals have not been identified in the Balkans from the early Holocene.

The craniological features of dogs are even less variable than their M_1 size. Although the excavation yielded no whole skulls, six large and several smaller skull fragments provide an idea of their form. The skull is small, with a wide, arched braincase, a broad-to-medium forehead, and a medium-to-narrow nasofacial part. Generally the skull is reminiscent of Rütimeyer's "Turbary dog." The mandibles are somewhat more variable (with two extremes seen in pl. VIII:1). They are usually slender with a low horizontal part; even in this respect the smallest one is larger than fox. As a result of overcrowded dentition caused by an advanced stage of domestication, the oral half of P_2 slips to the lateral side of P_1; M_2 and M_3 sometimes move to the ascending ramus (pl. VIII:2).

Extremity bones are the least fragmentary in the whole sample; 23 are whole, mostly metapodials. On the basis of the whole long bones, it is determined that the smallest dogs of the site are Spitz size (one humerus, phase II, with a greatest length of 115.5 mm, is from a dwarf dog). The largest are the size of Airedale terriers.

Small dogs are also found in the neolithic at Argissa and Arapi in Thessaly. Two dogs are similar in size to the dwarf of phase II of Sitagroi (Boessneck 1956:34). Large dogs also appeared in the neolithic and bronze age levels of Lerna (Gejvall 1969:14ff.) and in the bronze age of Argissa (Boessneck 1962:49). Nea Nikomedeia yielded only an atypical radius fragment (Higgs 1962:272). With the beginning of the pottery-neolithic (Starčevo culture), medium-size domestic dogs are found in the northern Balkans (Bökönyi 1970b:1703). Mostly small dogs lived in the neolithic of the Carpathian basin, with medium-size individuals present during the earliest neolithic (Bökönyi 1971:650).

The fact that the majority of dog bones are broken suggests that they were eaten in Sitagroi as they were during the neolithic and bronze age in the Old World. Use of the dog as a hunting companion is unsupportable, since hunting itself is not an important aspect of Sitagroi life. Moreover, when hunting increased in phase IV, the popularity of dogs decreased. It is likely that, in addition to being a food source, the animal was used for herding or as a watchdog.

CHAMOIS. The occurrence of chamois is an interesting phenomenon in the wild fauna of Sitagroi. It is represented by two bones: a right frontal bone with a large horn-core fragment from a subadult (pl. VIII:3) and a right horn-core fragment from a young individual. The first was recovered from MMb 65 (phase III) and the second from PO/B 38 (phase V). The horn-cores are undoubtedly chamois, because the forms are straight, forward leaning, with an almost circular cross-section at the base, and with typically spongy walls. It is possible that some chamois remains, particularly the bones of large individuals, are among the very fragmentary sheep/goat material.

Although the size relationships of the subfossil chamois are unknown, the subadult horn-core of Sitagroi probably belongs to a weak buck. Nothing can be said of the other horn-core because it is too young. In comparison, the subadult core is close to examples at Lepenski Vir and Obre II, both in Yugoslavia (table 5.14).

Chamois bones are extremely rare among the animal remains of prehistoric sites. The few that have been found are mostly from Switzerland and southern France. In the Balkans this species is identified only in the uppermost phase (Starčevo culture) of Lepenski Vir (Bökönyi 1970b:1703) and from the middle neolithic of Obre II.

It is interesting that this species lived in medium-range mountains during prehistoric times and now is confined to the high mountains. Its previous adaptation resembles the Pleistocene habitat, suggesting that this animal retreated as a result of man's presence.

The chamois found in Sitagroi lived in the mountain range surrounding the Drama Plain; the inhabitants had to go long distances to hunt them. Thus it can be inferred that chamois is regarded as a "noble" animal, highly prized for its horn-cores (trophies) rather than as a supplementary meat source.

Table 5.14. Chamois Horn-Core Measurements: Balkan Neolithic Sites

Site	Greatest length (mm)	Greatest diameter (mm)	Smallest diameter (mm)	Circumference of the basis
Sitagroi	-	25	22	77
Lepenski Vir	-	23	20	71
Obre II	87x	23	19	70

Note: Measurement coded with x is approximate.

RED DEER. Red deer is quite often the most common wild animal in prehistoric sites of temperate Europe. This is true also at Sitagroi where it is the most frequent wild species in phases I through IV, and only in phase V does it decrease to third place. Its high frequency results from the following: first, the dense forest environment that surrounded the site in the initial phase of agriculture provided an ideal habitat for the species; second, the large quantity of meat that a red deer yields was an incentive for the hunter; third, the antlers served as excellent raw material for making tools. Antlers were collected by inhabitants of prehistoric sites all over Europe.

The red deer sample is highly fragmented, with only two whole long bones: a metacarpal and a metatarsal. Even the antlers are broken into small pieces, probably for tool making.

It is true that sexual dimorphism is a diagnostic trait in red deer, and consequently there is an essential bone size difference between bulls and cows at Sitagroi. Environmental differences may have played a role in the variation. Unfortunately, the sample is too small to distinguish subgroups. The two whole metapodials are certainly from cows. A large atlas and epistropheus represent strong bulls. Their size suggests the carrying of heavy antlers.

It seems that the red deer variation at Sitagroi disagrees with that of other prehistoric sites of Greece and agrees with that of the northern Balkans (figs. 5.21, 5.22). The size reduction of the prehistoric red deer of Lerna which is described by Gejvall (1969:46) is not observable in this sample. The Sitagroi area belongs to an ecologic region more Balkan in nature and so provides a more favorable environment for this dense forest species.

From the fragments recovered it is estimated that the majority of the antlers were small. With the exception of two large antlers (phase III) and the atlas and axis suggesting two strong bulls, the ratio of good trophies (from a modern viewpoint) is very low. The only antler fragment with measurable burr (shed) has a circumference of 173 mm. Thus, it seems that the inhabitants practiced the hunting of red deer to procure meat rather than as a sport.

The red deer age distribution tentatively suggests the same idea: man killed deer of all ages but principally the adults. A comparatively high ratio of immature individuals occurs in the three early phases, though this could be attributed to the small sample.

FALLOW DEER. The fallow deer is the second most frequent cervid of Sitagroi. Mostly extremity bones occur among its 262 remains. However, maxilla and mandible fragments, loose teeth, and an antler fragment were found. Possibly another antler fragment came from this species. It is very simple to separate fallow deer remains from either red or roe deer as there are

essential size differences among them, and their variations never overlap in a given area (figs. 5.21, 5.22; pl. IX:1). The only problem is whether these medium-size cervid bones represent some small *Cervus* type deer. But the fragment (fig. 5.23) that is from the upper, flat, palmated part of a typical *Dama* antler provides a clear answer to this question.

This particular deer belongs to those species of the European wild fauna whose origin and Pleistocene occurrence is rather clear but whose early Holocene history has not yet been solved. Haltenorth (1959) summarized the fallow deer finds of the Old World. According to him the *Dama* subgenus occurred with other subgenera of deer in Eurasia at the end of the Pleistocene. More accurate details are known about *Dama* from the last interglacial of the Pleistocene. In that period the European fallow deer (*Cervus* [*Dama*] *dama* L.) is already developed and is common in those lightly forested regions (parklands) of Europe with a mild climate. However, it is pushed out of the whole European mainland after the Würm interglacial. Thus from the Early Holocene there are no authentic *Dama* finds.

Ringe (1959:122) came to the same conclusion after re-evaluating the data of the previous studies: "Das Quellenstudium ergab, dass das autochtone nacheiszeitliche Vorkommen des *Cervus (Dama) dama* L. in Europa bisher durch kleinen einvandfreien Beleg erwiesen ist."

Hilzheimer (1927) is the first who thought that

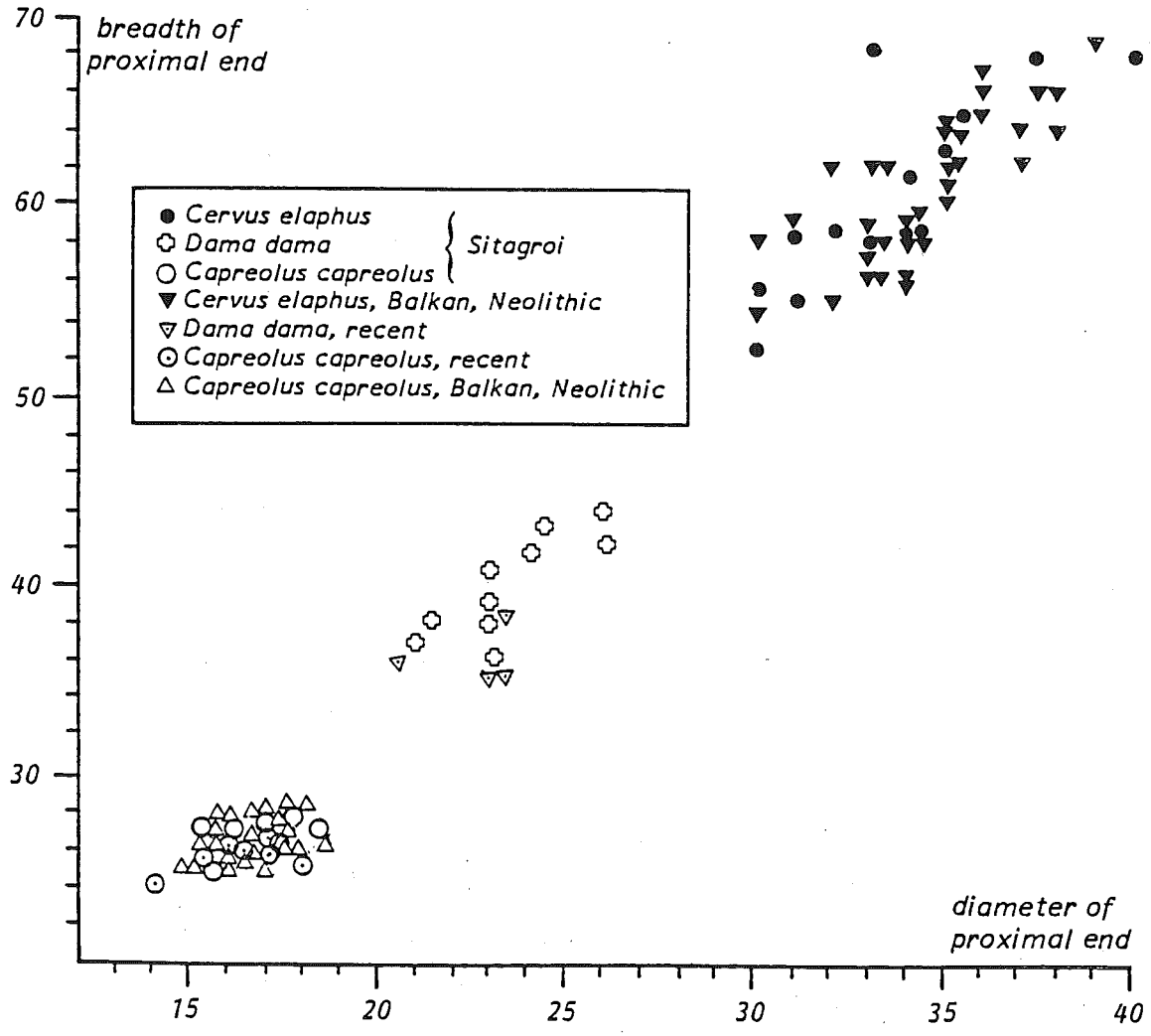


Figure 5.21. Radii of red deer, fallow deer, and roe deer: scattergram of proximal breadth and diameter.

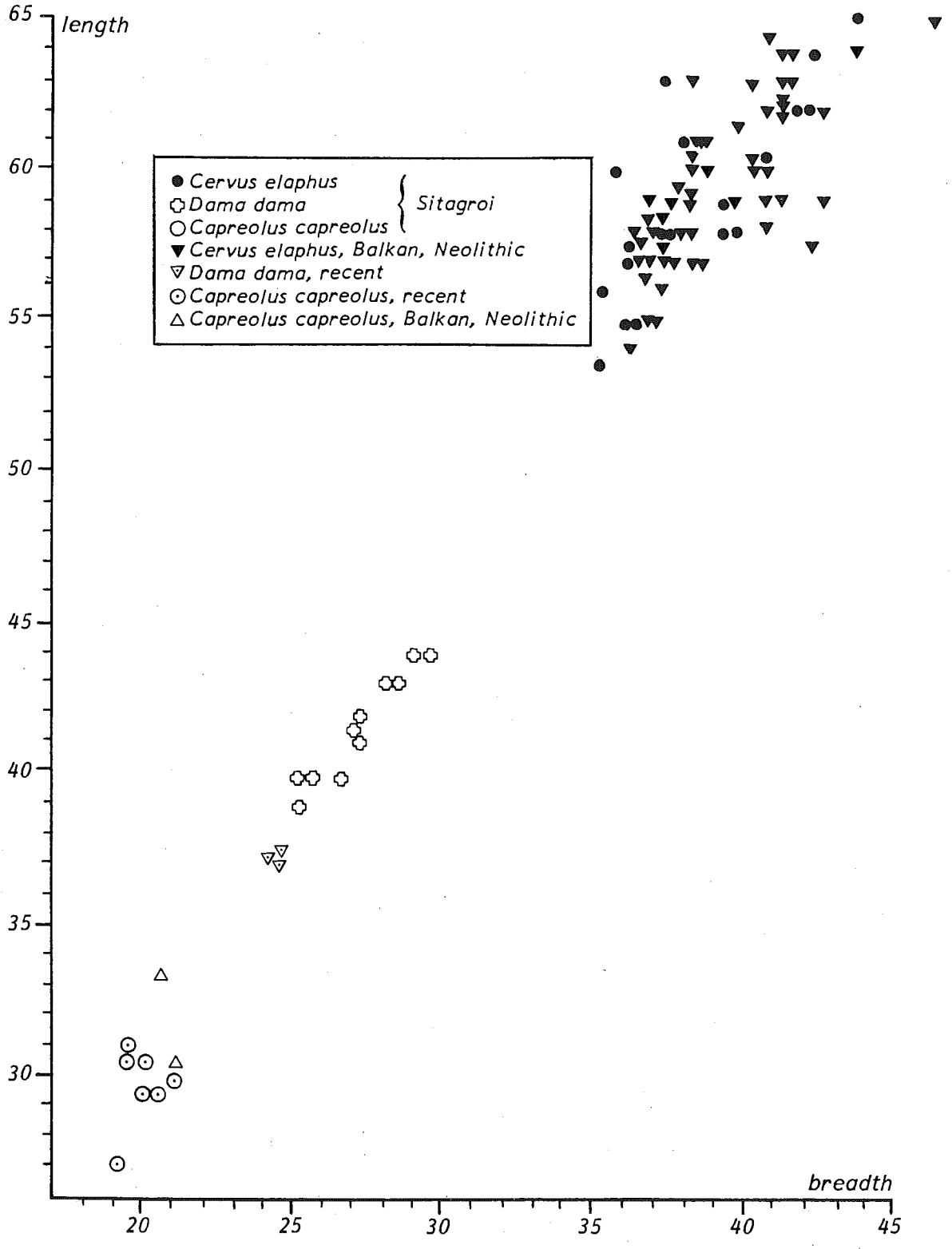


Figure 5.22. Astragali of red deer, fallow deer, and roe deer: scattergram of length and breadth.

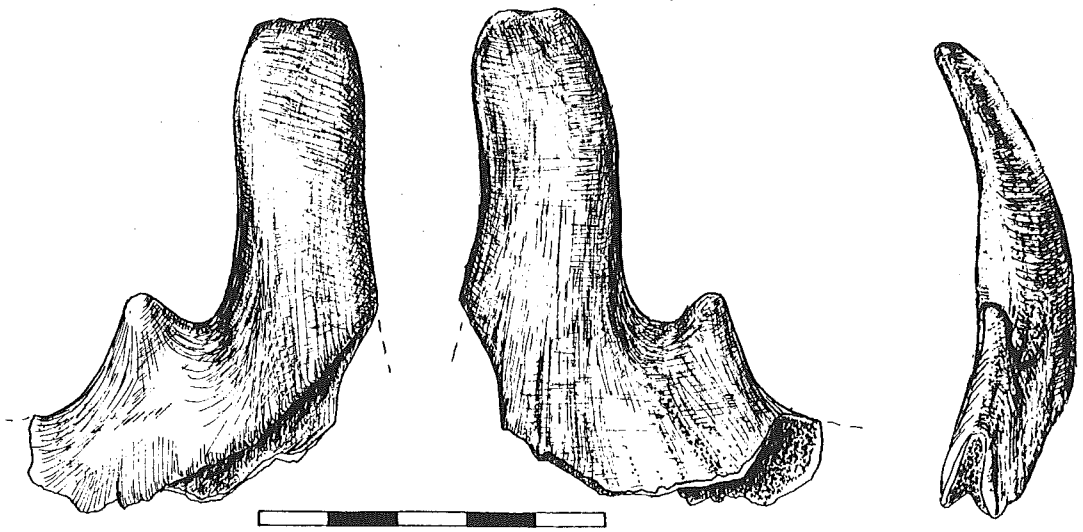


Figure 5.23. Fallow deer antler fragment (QO 5, phase V).

fallow deer had been initially introduced into Europe by the Romans, and when Schmid (1965) actually found *Dama* remains in the Roman Imperial period of Switzerland, Hilzheimer's opinion became widely accepted.

Unfortunately, little is known about the Early Holocene deer of the Balkans, although that region lies very close to the southwest Asian main distribution area where fallow deer could be identified from the post-Pleistocene. From this viewpoint, the Balkan peninsula is particularly interesting in that animal species which had receded from the last glacial of the Pleistocene returned through the Balkans to central Europe in the climatic optimum of the Early Holocene. There are several examples of this process, e.g., the *Hydruntinus* wild ass (Bökönyi 1954:19ff.; 1957a:66ff.; 1959:78ff.; Necrasov and Haimovici 1959b:180f.; 1965:239ff.; Necrasov 1964:141ff.) or the water buffalo (Botez and Necrasov, in Matesa 1946:42; Bökönyi 1957b:43f.).

The first Early Holocene fallow deer was found at Mihalich, Bulgaria, a late neolithic site (S. Ivanov 1949-50:345ff.). Though the site yielded only a few fallow deer remains, these (particularly an antler fragment) did characterize the species well enough. However, since Ivanov's data were published in Bulgarian in the *Annals of the Veterinary Faculty*, Sofia University, the zoological world has not taken notice of them.

The considerable amount of fallow deer bones found in Sitagroi undoubtedly provides strong evidence that in southeast Europe *Dama* survived the end of the Pleistocene and is therefore an autochthonous species. It is also possible that the conspicuously small cervid found by Boessneck (1962:32) in Argissa is a *Dama*.

The prehistoric fallow deer of the mainland of southeast Europe are clearly connected with those of southwest Asia. The neolithic and bronze age *Dama* remains of Cyprus (Ducos 1965:1ff.) have been known for some time, and recently the species was identified also from the neolithic (ca. 4500 BC) in Saliagos of the Cyclades. In the original report (Higgs et al. 1968:250) they are not mentioned. However, upon reexamination of approximately half of the bone sample, five *Dama* bones were recognized among the remains. The fact that fallow deer bones could be found even in the earlier neolithic of Greece clearly speaks for an autochthonous species, not for an imported one for sacrificial purposes as some authors earlier supposed.

Although the fallow deer bones of Sitagroi are rather fragmentary, the measurable bones provide some idea of the size of the animals. Comparing their measurements with those of recent European and Mesopotamian fallow deer, it can be stated that those of Sitagroi are certainly larger than the recent European deer and reach the size of the Mesopotamian form (figs. 5.21, 5.22). The prehistoric fallow deer of Cyprus and Saliagos also represent the same size group, but on

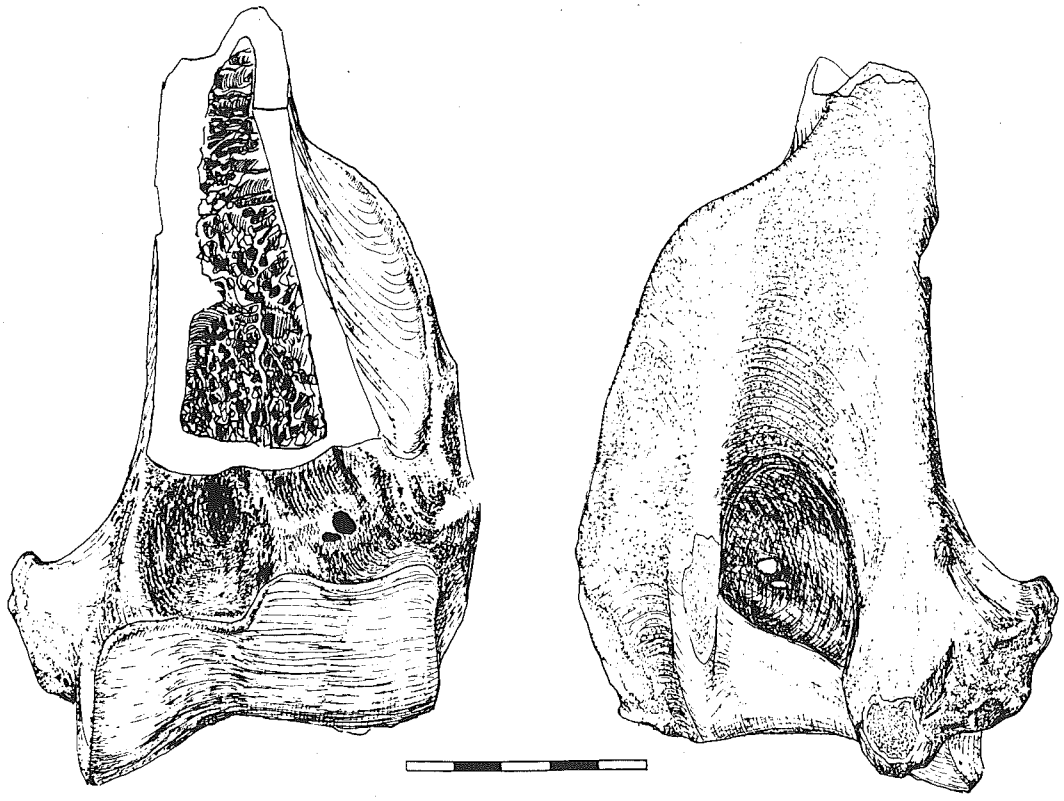


Figure 5.24. Brown bear distal humerus fragment (MM 7, phase IV).

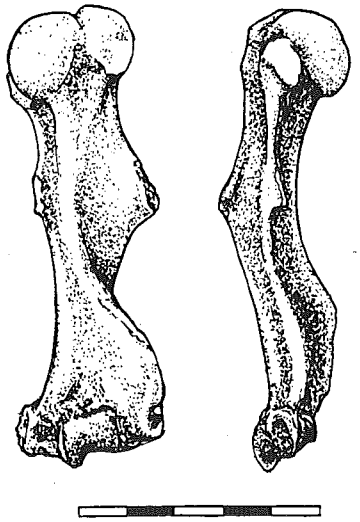


Figure 5.25. Beaver humerus (ZA 28, phase IV).

this basis alone they and the Sitagroi deer cannot be identified as the westernmost members of the Mesopotamian form. It is known that most of the European wild mammals were larger in the Early Holocene than now, and this seems valid also for the fallow deer.

ROE DEER. A third cervid, roe deer, is less frequent than red deer in practically all prehistoric sites of the temperate zone in Europe. Among Sitagroi's roe deer remains there are antler fragments, sometimes even whole antlers, in comparatively high numbers. Among these are shed antlers (pl. IX:2), proving that roe deer antlers were used as important raw material for tool making. The antlers show a very wide variation, with most small or medium size, although some large ones and one exceptionally large one (ZA 39, phase III) have been recovered. In two cases the circumference of the burr is measurable to about 122 mm (MM 21, phase III) and 118 mm (ROc 34, phase V). Both antlers are of medium size.

In contrast to the antlers, the bone remains of roe deer do not show a wide variation. The length of the lower premolar row (P_1-P_3) is 25.5–30 mm ($n=8$), mean 28.2 mm; that of the lower molar row (M_1-M_3) is 35–41 mm ($n=6$), mean 38.1 mm; and the length of the lower M_3 is 15–17 mm ($n=6$), mean 16.0 mm. The same holds for the extremity bones. For example, the proximal breadth of the radius is 25–27.5 mm ($n=7$), and that of the metacarpal is 21–22 mm ($n=4$). These measurements resemble those of Balkan prehistoric roe deer, surpassing those of recent roe deer from central Europe but smaller than prehistoric forms from the latter area.

It is interesting that only mature roe deer are represented in all phases, except phase IV in which immature individuals also occur. One should attach little importance to this, however, since the roe deer sample is very small.

Among the roe deer remains the bone elements occur in about their normal distribution. This clearly shows that the killed animals were taken to the settlement in their entirety, which is quite understandable since a roe deer seldom weighs, on average, more than 50 pounds.

WILDCAT. The wildcat is represented by only five bones in the total sample. Phase III yielded two left mandible fragments and a left pelvis fragment, and phase V yielded a right mandible fragment and a left ulna fragment. All bones are from adult individuals.

Wildcat remains occur in almost every prehistoric site of temperate Europe having a large bone sample. Almost without exception, only adult wildcat bones are found, indicating that they were killed by herders protecting the young of their domesticated animals.

Subfossil wildcats are sometimes very large though never exceeding the lynx in size. Only medium-size animals are present at Sitagroi.

MARTEN. There are three marten bones in the sample: a left mandible fragment belonging to phase III and two others from phase IV. All three are from adult animals.

Marten bones often occur in prehistoric sites, but it is generally hard to determine whether they are from pine marten or beech marten. Basically these two species are very close to each other in size, and their area of distribution overlaps, particularly in the northern half of the Balkans.

On the basis of their small measurements, the marten bones from Sitagroi probably belong to the beech marten. The pine marten's recent distribution area does not extend to Greece (Van den Brink 1957:125); nevertheless, since the site lies on the border between the Mediterranean and the true Balkans, it is possible that the latter species lived in that area. The beech marten certainly inhabited southern Greece in prehistoric times; it has been identified from level IV of Lerna (Gejvall 1969:41).

BADGER. Six badger bones could be identified from Sitagroi: a left mandible fragment (phase I); a brain skull fragment (phase II); a left mandible fragment, a right distal humerus fragment, a left femur diaphysis (phase III); and a left mandible fragment (phase IV). The femur diaphysis is from a juvenile, the brain skull fragment is from a subadult, and all other bones are from adult animals. The humerus fragment is from a large

individual, the mandible fragments from small ones. The lower carnassials (M_1) are especially small in comparison to those of Lerna (Gejvall 1969:89) or to those of Lepenski Vir and Obre.

Badger is a well-known species of the recent Greek mammal fauna (Ondrias 1965:122) which also often occurs prehistorically in archaeological sites. It is probable that prehistoric man hunted the badger for its fur as well as for its meat. In southeast and east Europe today, peasants living in forests use its fat. The presence of a whole humerus and femur indicates that badgers were eaten at Sitagroi. If the whole carcass were not taken to the settlement it would obviously be skinned at the kill site.

BROWN BEAR. The brown bear, along with the fox, is the most common wild carnivore present. Its distribution is as follows: skull fragment (1), mandible fragment (2), upper molar (1), canine (1), humerus fragment (1), radius fragment (1), ulna fragment (4), tibia fragment (1), calcaneus (2), metapodial (8), phalanx (4), phalanx II (2), phalanx III (1). Among these the calcaneus is from a juvenile, 1 of the mandible fragments is from a subadult, 21 other bones represent adult animals, and 6 are indeterminable. Only the adult mandible fragment, the canine (phase III, pl. IX:3), a left distal humerus fragment (phase IV, fig. 5.24), and some metapodials and phalanges are from large individuals, with the majority of the bones representing small ones.

Brown bear bones commonly occur in prehistoric sites in mountainous regions of the Balkans. Dense forest surrounding the sites provided an excellent habitat. However, close contact with man led to the killing of this large carnivore probably to protect domestic stock, tentatively shown by our finding remains of only two immature animals. Moreover, bear bone element distribution shows that bears were killed in the vicinity of the settlement. Its meat was consumed by man and its fur was valuable, particularly since "it is to be supposed that in early and middle neolithic times here (in Lerna), as for instance in Troy, brown bears were held in captivity and that furs may sometimes have been merchandise" (Gejvall 1969:40).

FOX. The 29 fox remains recovered have the following distribution: skull fragment (2), mandible (9), canine (3), scapula fragment (1), humerus fragment (2), radius fragment (3), ulna fragment (4), pelvis fragment (1), femur fragment (1), tibia fragment (2), metapodial fragment (1). All bones are from adult individuals.

Since all the bones are fragmentary it can be supposed that fox was killed not only for fur but also for meat. This is supported by Gejvall's (1969) observation that in Lerna the same cut marks are found on fox bones as on dog bones (dog undoubtedly being eaten there).

On the basis of small measurements from Lerna, Gejvall (1969:39) very cautiously supposed a local fox race or type. According to their lower carnassial measurements, however, the Sitagroi foxes entirely agree with those of Lerna and with other prehistoric foxes of the Balkans. Therefore, the existence of a local race or type in the Peloponnese cannot be proposed, but rather a uniform group among foxes of the Balkans (table 5.15) that differed from those of central Europe. It would be impossible, however, to deter-

Table 5.15. Prehistoric Fox: Lower Tooth Row Measurements

Site	P_1-P_3 (mm)	M_1-M_3 (mm)	Length of M_3 (mm)
Sitagroi, Phase I	34.5	25.5	15
Phase II	32	-	13.3
	32	-	15
Phase III	-	25.5	14.5
	-	26	14
Phase IV	31.5	27	15
Phase V	30.5	28	15.5
	31.6	26.5	14.5
	32	27	14.5
Lerna (Gejvall 1969:87)	33	25	14.1
	35	26.5	14.6
	35	26.5	-
Obre II (Yugoslavia)	32	24.5	14.5
	33	25.5	14
	34	24	14
	34	25.5	15
	34.5	26	14.5
	-	26	14.5
Divostin (Yugoslavia)	37	25.5	14.5
Anzabegovo (Yugoslavia)	-	26.5	15
	-	27	15
Lepenski Vir (Yugoslavia)	33	26	15
Vlassac (Yugoslavia)	36	-	-

mine from the scarce material whether the uniformity and differences could be reflected in the systematics.

CARNIVORE. From phase III (ZA 38) a fragmentary small carnivore, *os priapi*, is represented. The species is indeterminable.

LESSER MOLE RAT. The lesser mole rat is represented by two mandible halves (phase III) plus a skull and two mandible halves (phase IV, pl. X) from two adult individuals. This species is easily identified by its characteristic skull and specific teeth. The skull is well preserved although the zygomatic arches are broken off and most of the teeth are missing. Also well preserved are the mandibles.

This mole rat is common to fertile steppes and valleys having agriculture (Van den Brink 1957:106). Its distribution area extends to the eastern belt of Greece. It is possible that the other *Spalax* species, the greater mole rat (*Spalax microphthalmus* Güldenstädt), lives, or at least lived, in Greece although it is larger than the Sitagroi specimens.

It is also possible to suppose that the *Spalax* finds of Sitagroi are later than the settlement itself, thereby implying their intrusive nature. This species spends most of its life in the soil where it burrows as deep as 180 cm. It may be that these animals dug themselves into the loose soil and died there. The presence of an almost intact skull with mandible and another whole mandible pair provides some evidence for this.

BEAVER. Twenty-three beaver bones recovered have the following distribution: mandible fragment (5), teeth (5), humerus (2), humerus fragment (3), radius fragment (1), ulna fragment (1), femur fragment (2), tibia fragment (3), fibula fragment (1). A left humerus fragment and a right tibia fragment are from subadult animals; all other bones of determinable age are from adults.

Occurrence of beaver in Sitagroi is a good indication of a well-watered environment. Complete absence of beaver in phase I can possibly be associated with a low statistical faunal sample. Conclusions should therefore remain tentative. It is peculiar, however, that beaver is not present in the large bone sample of phase II during which it may well have been hunted for its fur and meat.

In recent mammal fauna of Greece the beaver is absent (Ondrias 1965), but it is found in the neolithic site of Argissa in Thessaly (Boessneck 1962:37) and in almost every prehistoric site of the Balkans. Therefore, it is not surprising from an environmental standpoint that it also lived in the Drama Plain.

The beaver from Sitagroi are generally of medium size, except for a mandible fragment with a 41.5 mm tooth row length, a humerus, and a femur fragment from large individuals. A humerus from phase IV is shown in figure 5.25.

BROWN HARE. The brown hare is the most common rodent of the site. Its 80 identifiable remains have the following distribution: skull fragment (1), mandible fragment (3), teeth (4), vertebrae (3), scapula fragment (6), humerus fragment (10), radius fragment (5), ulna fragment (6), pelvis fragment (11), femur fragment (6), tibia fragment (4), fibula fragment (2), astragalus (1), calcaneus (1), metapodial (17). Only one bone is from a juvenile animal; all others are from adult individuals.

This species is represented in all published prehistoric sites on the Greek mainland containing animal bones and in almost all prehistoric sites of the Balkans. It was hunted in Sitagroi for its meat, as inferred from the fragmentation of the long bones, although its fur could have been an additional motivation.

The hare bone measurements from Sitagroi are within the variations for Greece and other parts of the Balkan peninsula.

HEDGEHOG. The hedgehog is represented by a highly fragmented right mandible from an adult individual (PO/E 66, phase V). With the exception of the hedgehog, which occurs a little more frequently, insectivore remains are extremely rare in prehistoric sites of Europe because man had no practical use for this animal. The hedgehog lives today in Greece, but there is subfossil

evidence of it only from Lerna (Gejvall 1969:37). Interestingly, a mandible from Lerna shows cut marks, and Gejvall (1969:38) considers them evidence of skinning. However, he asks what the skin of hedgehog could be used for and whether its meat was eaten. On the Sitagroi mandible, there are no cut marks but there are marks made by dog teeth. It seems very likely that hedgehog did not arrive at the site through human activity, and it is probable that this is true of other hedgehog finds at other prehistoric sites.

REPTILE. Reptiles are represented at Sitagroi only by turtles. A large part of the numerous remains are intrusive; during the winter season turtles hibernate by digging into the soil and, since winter is a critical period, a great number of them die there. In all probability those turtle remains which consist of skulls, whole skeletons, or large body parts with bones in anatomical order are from hibernating turtles. Those with cut marks or signs of burning are most certainly remains of animals consumed by the site inhabitants. There is good evidence of turtle consumption from prehistoric sites of central Europe. From Greece a *Clemmys* species (probably *Clemmys caspica*) was found in Argissa Magoula (Boessneck 1962:37), and the *Testudo hermanni* was identified from Lerna (Gejvall 1969:49). Unfortunately, the very fragmentary turtle remains from Sitagroi could not be identified for lack of proper comparative bone material.

FISH. From the poorly preserved fish bones only two species, the pike and a cyprinid (possibly carp), could be identified. Other fishes may be present but are unidentifiable due to the fragmentation of the bones.

The pike is represented by a mandible fragment (ZG 28, phase III) from a small individual. This species is present today in the fresh waters of Greece, and it is not rare among the fishes of prehistoric sites in central and southeastern Europe.

A fragment of the throat tooth row (ZJ 43, phase II) and two heavily damaged opercula (ZE 55 and 56, phase IV) are from the cyprinid. Cyprinids, particularly carp, are the most frequently found fish in prehistoric sites of central and southeastern Europe.

BIRDS (by D. Jánossy). Bird bones are extremely fragmentary, and therefore only a very small percentage could be identified.

Gray-leg goose (*Anser* cf. *anser* L.)
- MMb 63 (phase III): right carpometacarpus (length: 96 mm).
- MMb 65 (phase III): distal end of right humerus.
- ZA 42, floor 15 and below (phase III): furcula.

White-fronted goose (*Anser* cf. *albifrons* Scop.)
- ZA 42, floor 15 and below (phase III): left carpometacarpus (length: 83 mm).

Mallard (*Anas platyrhynchos* L.)
- KL 15 (phase I): right coracoid (length, from acrocoracoid to apex medialis: 50 mm).
- MM 12 (phase III): right ulna (length: 79 mm).
- MM 19 (phase III): left humerus, distal fragment.

Goosander (*Mergus merganser* L.)
- MM 16 (phase III): two left coracoidei (length, from the acrocoracoid to the apex medialis: 67 mm and 69 mm); right femur without caput femoris (length: about 57 mm).

Griffon vulture (*Gyps fulvus* Habl.)
- ZA 42 (phase III): left phalanx I anterior (length: 54 mm).

Quail (*Coturnix coturnix* L.)
- MM 16 (phase III): left distal tibiotarsus fragment.

Great bustard (*Otis tarda* L.)
- KL 109 (phase II): right coracoid (length, from the acrocoracoid to the apex medialis: 66 mm; size of a female).

This list of species indicates that the subfossil avifauna of Sitagroi was very similar to the present-day ornithofauna of the same territory (Makatsch 1950; Kanellis 1969). Some of the species (i.e., the white-fronted goose) are very frequent winter visitors; others are scattered (i.e., gray-leg goose, griffon vulture); others are breeding species (i.e., mallard, quail) in Greece. The great bustard is rare; this is clearly the effect of modern civilization in the last century.

A remarkable fact is the presence of the goo-

sander, which is chiefly a circumpolar, boreal species, although there are today some breeding populations in southern Europe, especially in the high mountains of Greece (Lake Presba, northwest Greece). From an archaeological point of view it may be of interest that the locality of Sitagroi was in all probability the territory of winter visitor populations of the goosander.

APPENDIX B

Age Group Ratios of the Most Common Domestic and Wild Animal Species

Sándor Bökönyi

Table 5.16. Domestic Cattle

Phase		Newborn	Juvenile	Subadult	Adult	Mature/ Senile
V	specimen	0	47	65	314	4
	%	0	10.9	15.1	73.0	1.0
IV	specimen	0	28	37	141	2
	%	0	13.4	17.8	67.8	1.0
III	specimen	3	69	171	406	2
	%	0.5	10.6	26.3	62.3	0.3
II	specimen	5	110	98	270	3
	%	1.0	22.6	20.2	55.6	0.6
I	specimen	0	29	34	101	1
	%	0	17.6	20.6	61.2	0.6

Table 5.17. Aurochs

Phase		Newborn	Juvenile	Subadult	Adult	Mature/ Senile
V	specimen	0	0	0	5	0
	%	0	0	0	100.0	0
IV	specimen	0	1	3	19	1
	%	0	4.2	12.5	79.1	4.2
III	specimen	0	0	1	16	0
	%	0	0	5.9	94.1	0
II	specimen	0	1	1	25	0
	%	0	3.7	3.7	92.6	0
I	specimen	0	0	2	7	0
	%	0	0	22.2	77.8	0

Table 5.18 Sheep

Phase		Newborn	Juvenile	Subadult	Adult	Mature/ Senile
V	specimen	0	10	30	75	4
	%	0	8.4	25.2	63.0	3.4
IV	specimen	0	15	21	48	1
	%	0	17.6	24.7	56.5	1.2
III	specimen	0	18	35	157	5
	%	0	8.4	16.3	73.0	2.3
II	specimen	0	24	52	91	2
	%	0	14.2	30.8	53.8	1.2
I	specimen	0	12	21	34	0
	%	0	17.9	31.3	50.8	0

Table 5.19. Goat

Phase		Newborn	Juvenile	Subadult	Adult	Mature/ Senile
V	specimen	0	8	9	29	0
	%	0	17.4	19.6	63.0	0
IV	specimen	0	3	4	17	0
	%	0	12.5	16.7	70.8	0
III	specimen	0	5	13	38	1
	%	0	8.8	22.8	66.7	1.7
II	specimen	0	3	11	19	0
	%	0	9.1	33.3	57.6	0
I	specimen	1	4	1	5	0
	%	9.1	36.4	9.1	45.4	0

Table 5.20. Domestic Pig

Phase		Newborn	Juvenile	Subadult	Adult	Mature/ Senile
V	specimen	11	236	667	95	3
	%	1.1	23.3	65.9	9.4	0.3
IV	specimen	6	147	625	167	8
	%	0.6	15.4	65.6	17.5	0.9
III	specimen	15	162	259	59	0
	%	3	32.7	52.4	11.9	0
II	specimen	12	175	233	45	4
	%	2.6	37.3	49.7	9.6	0.8
I	specimen	5	61	73	16	1
	%	3.2	39.1	46.8	10.3	0.6

Table 5.21. Wild Pig

Phase		Newborn	Juvenile	Subadult	Adult	Mature/ Senile
V	specimen	0	3	13	108	11
	%	0	2.2	9.6	80.0	8.2
IV	specimen	0	0	9	51	3
	%	0	0	14.3	80.9	4.8
III	specimen	0	1	4	30	2
	%	0	2.7	10.8	81.1	5.4
II	specimen	0	0	2	10	0
	%	0	0	16.7	83.3	0
I	specimen	0	0	1	10	0
	%	0	0	9.1	90.9	0

Table 5.22. Domestic Dog

Phase		Newborn	Juvenile	Subadult	Adult	Mature/ Senile
V	specimen	0	2	9	50	0
	%	0	3.3	14.8	81.9	0
IV	specimen	0	8	6	36	1
	%	0	15.7	11.8	70.5	2.0
III	specimen	0	9	5	56	0
	%	0	12.9	7.1	80.0	0
II	specimen	0	3	4	28	0
	%	0	8.6	11.4	80.0	0
I	specimen	0	0	1	17	0
	%	0	0	5.6	94.4	0

Table 5.23. Red Deer

Phase		Newborn	Juvenile	Subadult	Adult	Mature/ Senile
V	specimen	0	3	4	49	0
	%	0	5.4	7.1	87.5	0
IV	specimen	0	9	12	106	3
	%	0	6.9	9.2	81.6	2.3
III	specimen	0	13	10	53	1
	%	0	16.9	13.0	68.8	1.3
II	specimen	0	3	4	8	0
	%	0	20.0	26.7	53.3	0
I	specimen	0	3	2	14	1
	%	0	15.0	10.0	70.0	5.0

Table 5.24. Fallow Deer

Phase		Newborn	Juvenile	Subadult	Adult	Mature/ Senile
V	specimen	0	3	10	104	1
	%	0	2.5	8.5	88.1	0.9
IV	specimen	0	4	10	61	1
	%	0	5.3	13.2	80.2	1.3
III	specimen	0	0	0	3	0
	%	0	0	0	100.0	0
II	specimen	0	1	0	0	0
	%	0	100.0	0	0	0
I	specimen	0	0	0	1	0
	%	0	0	0	100.0	0

APPENDIX C
Measurements
Sándor Bökönyi

Table 5.25. Cattle Measurements

Horn-core

Context	Phase	(1)	(2)	(3)	(4)	d/w
ML 110	III	-	73.5	54	210x	d
ML 116	III	-	85	58	230	d
MM 27	III	175x	49	41.5	145	d
		-	55	39	158	d
		-	54	42	157	d
PN/E-F balk Bb 3	V	-	72.5	55	205	d
PO B 39	V	-	54	43	151	d
ZA 41	III	245x	52	-	-	d
ZA 43	III	-	77	59	221	d
		-	72	52	203	d
		-	50.5	39	144x	d
ZA 52	II	-	64	52.5	181	d
ZJ 29	III	-	55.5	41	-	d

Note: Numbered columns represent, in mm; (1) greatest length, (2) greatest diameter, (3) smallest diameter, (4) circumference of basis. Lettered column = domestic or wild. x indicates approximation.

Mandible

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	d/w
ROc 7	V	38	44	244	14	100	50	86	35	d

Note: Numbered columns represent, in mm; (1) height at P_1, (2) height at M_1, (3) length of row of teeth, (4) length of incisor row, (5) length of diastema, (6) P_1-P_4, (7) M_1-M_3, (8) length of M_3. Lettered column d/w = domestic or wild.

Lower Row of Teeth

Context	Phase	(1)	(2)	(3)	d/w
JL 4	I	-	-	38	d
KL 151	I	-	-	39	d
KM 6	II	-	-	38	d
KM 8	II	-	-	37	d

Lower Row of Teeth (cont.)

Context	Phase	(1)	(2)	(3)	d/w
KM 20	II	-	-	35	d
		-	-	37	d
ML 112	III	-	85	36	d
ML 151	III	-	92	36	d
MM 3	IV	53	-	-	d
MM 10	IV	-	-	40	d
		-	-	48x	w
MM 11	III	-	-	39	d
MM 13	III/IV	-	-	37	d
MM 20	III	-	-	33	d
MM 27	III	51	-	-	d
		56	-	-	d
		-	-	39	d
		-	-	39	d
MM 30	III/IV	-	-	40.5	d
MM 34	III/IV	-	-	40	d
MM 38	III	51	-	-	d
MM 47	III	-	-	41x	d
MM 50	III	49.5	-	-	d
MM 51	III	-	92.5	37	d
MM 53	III	50	88.5	37	d
MMc 65	III	-	-	40	d
MMd 66	III	-	-	34.5	d
		-	-	40	d
MMb 60	III	50	-	-	d
MMd 61	III	-	-	37	d
PN 15	V	-	-	37.5	d
PN/C 88	V	-	-	37	d
PN/C 90	V	-	95	41	d
PO 3	V	46.5	-	-	d
PO 5	V	-	-	38	d
PO 13	V	52	-	-	d
PO 23	V	-	-	40	d
PO/D 37	V	-	-	33	d
QN 6	V	53.5	-	-	d
QN 8	V	-	-	34	d
		-	-	34	d

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Table 5.25. Cattle Measurements

Lower Row of Teeth (cont.)

Context	Phase	(1)	(2)	(3)	d/w
ROc 61	IV	-	83	34.5	d
		-	-	40.5	d
ROc 64	IV	-	-	40	d
SL 9	IV	51	89	39.5	d
ZA 41	III	45	-	-	d
ZA 42	III	47	88	37.5	d
ZA 44	III	52	-	-	d
ZA 44	III	-	-	36	d
ZA 45	III	-	-	39	d
		-	-	40	d
ZA 51	II	-	-	40	d
ZA 50	II	-	85	35	d
ZA 51	II	-	84	36	d
		-	-	38.5	d
ZA 56	II	-	-	40.5	d
ZA 57	II	-	-	41	d
ZA 62	I	-	-	38	d
ZG 42	II	-	-	40	d
		-	-	40	d
ZE 59	IV	-	-	38x	d
ZE 68	IV	-	-	40	d

Note: Numbered columns represent, in mm: (1) P_1-P_3, (2) M_1-M_3, (3) length of M^3. x indicates approximation. Lettered column d/w = domestic or wild.

Atlas

Context	Phase	(1)	(2)	(3)	(4)	(5)	d/w
KL 124	I	36	38	95	86	75	d
ML 155	III	38.5	39	87	90	70	d

Note: Numbered columns represent, in mm: (1) length of ventral arch, (2) length of dorsal arch, (3) breadth of cranial articular surface, (4) breadth of caudal articular surface, (5) greatest height. Lettered column d/w = domestic or wild.

Epistropheus

Context	Phase	(1)	(2)	(3)	(4)	(5)	d/w
KL 106	II	-	27	41.5	97.5	54	d
KL 117	II	-	25	42.5	95	55	d
KL 120	II	93	21	40	87	45	d

Note: Numbered columns represent, in mm: (1) length of body, (2) length of dens, (3) breadth of dens, (4) breadth of caput craniale, (5) height of caput craniale. Lettered column d/w = domestic or wild.

Scapula

Context	Phase	(1)	(2)	(3)	d/w
KL 13	I	-	70x	50x	d
KL 105	II	-	64x	49	d
ML 7	II	48	64	42x	d

Scapula (cont.)

Context	Phase	(1)	(2)	(3)	d/w
KM 10	II	-	62	44	d
ML 111	III	-	69	47.5	d
ML 154	III	51.5	65	45	d
MM 16	III	41	57x	40x	d
		47	63.5	46x	d
		49.5	63.5	46	d
MM 19	III	-	67	45	d
MM 36	III	-	65x	47	d
MM 40	III	50	65	47.5	d
MM 43	III	51	68.5	47x	d
		54.5	70x	53	d
MM 50	III	47	61	44	d
		55.5	69.5	50x	d
MM 52	III	-	74x	52x	d
MMb 61	III	56	73	55	w
MMc 63	III	65	80x	59	w
PO 8	V	-	63.5	46.5	d
PN/A 97	V	-	87	63.5	w
PO 48	V	53	70	47	d
ZA 42	III	-	73.5	49	d
ZA 43	III	-	65.5	46x	d
		-	86x	60.5	w
ZA 44	III	-	77.5	56.5	w
ZA 47	III	-	67	50x	d
ZA 55	II	-	67.5	47x	d
ZA 57	II	50	65	45x	d
		-	61	45.5	d
ZE 80	IV	53	64	45.5	d
ZE 98	II	51	67	-	d
ZG 31	III	50	69	-	d

Note: Numbered columns represent, in mm: (1) breadth of collum, (2) breadth of angulus articularis, (3) diameter of facies articularis. x indicates approximation. Lettered column d/w = domestic or wild.

Humerus

Context	Phase	(1)	(2)	d/w
MM 157	III	94	87	d
MM 16	III	87	81	d
MM 21	III	78	72	d
MM 43	III	83	-	d
MM 50	III	79	77	d
PN/E 68	V	83x	80x	d
ZA 9	V	80	-	d
		72	69	d
ZA 41	III	87	86	d
		86	85	d
		77	66	d
ZA 51	II	75	-	d
ZA 52	II	122	105	w
ZA 54	II	90	81	d
ZH 23	IV	77.5	77	d

Note: Numbered columns represent, in mm: (1) distal breadth, (2) distal diameter. Lettered column d/w = domestic or wild.

Table 5.25. Cattle Measurements

Radius

Context	Phase	(1)	(2)	(3)	(4)	d/w
KL 106	II	-	68	-	42	d
KL 110	II	-	67.5	-	38	d
KL 114	II	78	-	41	-	d
KL 115	II	79	-	-	-	d
KL 120	II	-	69	-	41	d
KL 125	I	82x	-	-	-	d
KL 135	I	-	69.5	-	42	d
ML 4	III	-	67	-	43	d
MM 2	IV	-	67	-	41	d
MM 16	III	-	68	-	40	d
		-	69	-	40	d
MM 21	III	76	-	39.5	-	d
		78	-	40	-	d
MM 34	III/IV	-	62	-	40	d
MM 36	III	76	-	38	-	d
MM 40	III	-	74.5	-	44	d
MM 43	III	82	-	42x	-	d
		88	-	45	-	d
		97	-	49	-	w
		-	81	-	48	w
MM 51	III	79.5	-	40	-	d
MM 53	III	79	-	42x	-	d
MMb 61	III	79	-	39	-	d
MMb 63	III	-	70	-	42	d
PN/D 80	V	97x	-	48x	-	w
PN/A 90	V	-	59	-	38	d
PO 130	V	75.5	-	38x	-	d
QN 4	V	65	-	32x	-	d
QN 7	V	71		36x	-	d
		87	-	43x	-	d
QN 8	V	76	-	35.5	-	d
ROc 9	V	72	-	38.5	-	d
ROc 34	V	82	-	45x	-	d
ZA 41	III	76	-	40	-	d
ZA 42	III	92	-	46	-	w
ZA 44	III	97x	-	47	-	w
ZA 47	III	72.5	-	37x	-	d
ZA 48	III	97	-	45	-	w
ZA 51	II	-	75	-	45	d
ZA 53	II	72	-	39	-	d
ZA 54	II	78.5	-	40	-	d
ZE 86	III	81	-	43x	-	d
ZE 99	II	79	-	40	-	d
ZJ 30	III	100	-	48	-	w
ZJ 31	III	-	67x	-	40	d

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) distal breadth, (3) proximal diameter, (4) distal diameter. x indicates approximation. Lettered column d/w = domestic or wild.

Metacarpus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	d/w
JL 13	I	193	56	32	60	39	20.5	32	d
JL 101	I	-	-	-	58	-	-	32	d
KL 113	II	208	53.5	30	59	36	22	32.5	d

Metacarpus (cont.)

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	d/w
KL 115	II	-	-	-	59x	-	-	31	d
		-	-	-	59	-	-	37.5	d
KL 121	II	-	61	-	-	39.5	-	-	d
LL 9	II	-	-	-	51	-	-	30	d
ML 12	II	206	52	29.5	57	40	-	33	d
ML 34	I	-	-	-	83	-	-	45x	w
ML 110	III	-	62.5	-	-	40	-	-	d
		-	-	-	48.5	-	-	-	d
ML 116	III	-	55	29	-	35	-	-	d
		-	63	33	-	41	-	-	d
ML 151	III	-	-	-	59	-	-	32.5	d
ML 152	III	-	58.5	-	-	37	-	-	d
MM 2	IV	-	51	29	-	35	-	-	d
MM 9	IV	-	-	-	58	-	-	37	d
MM 12	III	-	60x	-	-	37x	-	-	d
MM 15	III/IV	-	66	37	-	41	-	-	d
MM 18	III	-	-	-	53	-	21	-	d
		-	-	-	56x	-	-	29.5	d
MM 20	III	-	55	33	-	37	-	-	d
		-	62	-	-	37	-	-	d
MM 27	III	-	54	35	-	36.5	-	-	d
		-	54.5	30	-	36.5	-	-	d
MM 40	III	-	50	-	-	35.5	-	-	d
		-	-	-	54.5	-	-	30	d
		-	-	-	76	-	26	38	w
MM 41	III	-	-	-	56	-	22	32	d
		-	-	-	57	-	22.5	33	d
		-	-	-	57x	-	20.5	29.5	d
MM 43	III	-	54	31	-	36.5	-	-	d
		-	-	-	54.5	-	-	29	d
		-	-	-	56	-	-	30	d
MM 49	III	-	-	-	58	-	21	32	d
MM 50	III	-	56	35	-	38	-	-	d
		-	61	36.5	-	41	-	-	d
		-	-	-	53x	-	-	-	d
		-	-	-	58	-	-	32	d
		-	65x	42	-	45	-	-	w
MM 52	III	-	64	36	-	40	-	-	d
		-	-	-	59.5	-	-	32	d
		-	-	-	67	-	24	35x	d
MMa 63	III	-	53.5	31.5	56	37	20.5	30.5	d
		-	-	-	55	-	-	-	d
MMb 65	III	-	-	-	56	-	-	30x	d
PN 7	V	-	67.5	38	-	43	-	-	d
PN 8	V	-	-	-	55.5	-	-	31	d
PN 15	V	-	-	-	52	-	-	28	d
PN/D 78	V	-	70x	-	-	45x	-	-	w
PN/B 100	V	-	-	-	65	-	-	33	d
PO 7	V	-	54	29	-	32	-	-	d
PO 8	V	-	-	-	58.5	-	-	29.5	d
PO 13	V	-	54.5	28.5	-	35	-	-	d
PO/D 37	V	-	-	-	66	-	-	35	d
PO/B-D balk 51	V	-	-	-	54.5	-	-	28.5	d
QN 5	V	185x	-	30.5	-	-	21.5	-	d
QN 7	V	-	53	29	-	33.5	-	-	d

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Table 5.25. Cattle Measurements

Metacarpus (cont.)

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	d/w
		-	56	30	-	33	-	-	d
		-	-	-	52.5	-	19.5	28.5	d
		-	-	-	65	-	21	33	d
QN 8	V	-	47	-	-	38	-	-	d
		-	59	32	-	36	-	-	d
QO 2	V	-	-	-	58	-	-	31x	d
QO 8	V	-	48	-	-	33	-	-	d
ROc 9	V	183x	-	-	57.5	-	20	30	d
ZA 4	V	-	52	32	-	35	-	-	d
ZA 17	V	-	52x	27	-	31	-	-	d
ZA 34/35	III	-	64	-	-	40	-	-	d
ZA 38	III	-	60.5	-	-	35	-	-	d
ZA 40	III	200x	-	36	-	-	24.5	-	d
ZA 41	III	-	57	-	-	40	-	-	d
		-	-	-	67	-	24.5	35.5	d
ZA 42	III	191	61	36	66	41	22	32	d
		-	58	32	-	36	-	-	d
		-	59	-	-	38	-	-	d
ZA 44	III	-	53.5	31.5	-	36.5	-	-	d
ZA 47	III	-	55	-	-	34	-	-	d
ZA 50	II	-	-	-	68.5	-	-	35	d
ZA 51	II	-	56.5	-	-	39	-	-	d
ZA 58	II	-	56	-	-	36	-	-	d
ZD 8	IV	208	64	39x	66	39.5	24.5	35.5	d
		-	62x	36	-	43	-	-	d
		-	-	-	68	-	29	37	d
ZE 61	IV	-	40.5	-	-	33	-	-	d
ZE 69	IV	-	58	30.5	-	35	-	-	d
ZE 73	IV	-	52x	-	-	37	-	-	d
ZE 81	IV	-	67	-	-	43	-	-	d
ZG 23	III	-	-	-	58	-	21	32	d
ZG 28	III	-	51	31.5	-	32	-	-	d
		-	67	-	-	40	-	-	d
ZG 28	III	-	51	-	-	35	-	-	d
ZG 30	III	-	64	-	-	41	-	-	d
ZG 42	II	-	-	-	59.5	-	-	34	d
ZH 23	IV	-	-	-	60	-	-	34x	d
ZJ 23	III	-	57	-	-	36x	-	-	d
ZJ 30	III	-	-	-	57	-	-	31x	d
ZJ 35	II	-	53	28.5	-	32.5	-	-	d

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter. x indicates approximation. Lettered column d/w = domestic or wild.

Tibia

Context	Phase	(1)	(2)	(3)	(4)	d/w
JL 9	I	-	60	-	44.5	d
KM 18	II	-	62	-	48	d
ML 8	II	-	70	-	52	d
ML 10	II	-	62.5	-	47	d
ML 36	I	-	63.5	-	45.5	d
MM 2	IV	-	57	-	45.5	d

Tibia (cont.)

Context	Phase	(1)	(2)	(3)	(4)	d/w
MM 10	IV	-	80	-	57	w
MM 16	III	-	61	-	44.5	d
MM 18	III	-	57.5	-	44	d
		-	66	-	50.5	d
MM 21	III	-	62	-	47	d
MM 40	III	-	57	-	45x	d
		-	58	-	45	d
		-	66	-	48.5	d
MM 41	III	-	71	-	53	d
MM 43	III	-	64.5	-	48	d
MM 50	III	-	62	-	47	d
		-	66	-	48	d
		-	67	-	48x	d
MM 53	III	-	61	-	44.5	d
		-	66	-	49	d
MMa 61	III	-	72	-	53x	w
MMb 61	III	-	64	-	47.5	d
MMd 65	III	-	34.5	58	42	d
PO/B 36	V	31	52.5	22.5	40	d
PO/A 53	V	-	54.5	-	41	d
QN 6	V	34	56	25	42x	d
QO 8	V	-	63	-	47.5	d
ZA 8	V	-	63.5	-	47	d
ZA 27	IV	-	87	-	65	d
ZA 39	III	-	61	-	47	d
ZA 42	III	-	66	-	49.5	d
ZA 43	III	-	70.5	-	53	d
ZA 45	III	-	68.5	-	50.5	d
ZA 53	II	-	64.5	-	46.5	d
ZA 63	I	-	61	-	44x	d
ZE 61	IV	-	50x	-	41	d
ZG 20	III	-	67	-	52	d
		-	69	-	49	d
ZG 40	II	38.5	62	28	48	d
ZJ 23	III	-	61	-	46	d

Note: Numbered columns represent, in mm: (1) smallest breadth, (2) distal breadth, (3) smallest diameter, (4) distal diameter. x indicates approximation. Lettered column d/w = domestic or wild.

Astragalus

Context	Phase	(1)	(2)	(3)	d/w
KL 15	I	58x	37x	33x	d
KL 111	II	67.5	46.5	37	d
KL 113	II	66.5	43	37	d
KL 114	II	68.5	49.5	40	d
KL 115	II	68.5	49.5	40	d
KL 121	II	77	52	-	d
KL 134	I	65	45	38	d
KM 13	II	62.5	43.5	35	d
KM 20	II	62.5	41	35	d
LL 6	II	76	51.5	-	d
ML 110	III	65	44	37	d
		77	53	44	d

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Table 5.25. Cattle Measurements

Astragalus (cont.)

Context	Phase	(1)	(2)	(3)	d/w
ML 151	III	62.5	40	33	d
		63	-	-	d
ML 155	III	67x	45x	37.5	d
MM 7	IV	65	49	-	d
MM 11	III	69	45.5	37.5	d
MM 12	III	70x	48	-	d
MM 16	III	59	39	33	d
		71	51.5	38.5	d
MM 18	III	64.5	45	35.5	d
MM 20	III	64	44.5	36	d
MM 27	III	62.5	43	35	d
MM 40	III	66.5	47.5	38	d
		67	46	39	d
MM 41	III	60	40.5	35.5	d
MM 43	III	72	52	40.5	d
		72x	47	39	d
MM 50	III	61	43.5	36.5	d
MM 51	III	64	43.5	37	d
		67	44	40	d
MM 52	III	64	46.5	38	d
		66	45.5	38.5	d
		66.5	48.5	-	d
MM 53	III	65	44	36	d
		68	46	38	d
MMd 60	III	69	45	37	d
MMc 63	III	62	44.5	36.5	d
PN 2	V	65.5	47	38	d
PN/E 61	V	63	42	35	d
PN/A 95	V	64x	46.5	-	d
PO 8	V	60.5	45.5	35	d
PO/C 50	V	62	41	36	d
PO 68	V	71.5	49	41	d
PO/C-D 128	V	68.5	46.5	40	d
PO/C-D 135	V	65	44	35.5	d
QO 7	V	64.5	48	38	d
QN 7	V	65	45	36	d
		67	47	-	d
QO 8	V	58.5	39.5	34	d
		62	44	34.5	d
ZA 4	V	61	43	36	d
ZA 9	V	62.5	42	34.5	d
ZA 19	V	67	45.5	38	d
ZA 40	III	65x	42	38	d
ZA 41	III	69	46	40.5	d
ZA 42, floor 15	III	68.5	46	40	d
		70	48.5	42	d
		71	50	41	d
ZA 42	III	59	42	33	d
		60	37.5	35	d
		63	45	37.5	d
		63	46	37	d
		65	44	35	d
		66	44.5	38	d
		66	46.5	39	d

Astragalus (cont.)

Context	Phase	(1)	(2)	(3)	d/w
		66.5	45	35.5	d
		66.5	45.5	37	d
		67	45.5	38.5	d
		67	46	38	d
		71.5	52	42	d
		72	48	41.5	d
		73.5	51.5	43	d
ZA 43	III	63	46.5	36	d
		65.5	48	39	d
		66	45	38	d
		66	48.5	40	d
		66.5	45	39.5	d
		67	44.5	37	d
		67.5	45	40	d
		68	45.5	37	d
		69	47	39	d
		69	47	40	d
		70.5	48.5	40	d
		72	52	42.5	d
		77.5	53	42	d
ZA 44	III	60.5	45	35	d
		61	41	34	d
		67.5	47	40	d
		68	49	40	d
		70	46.5	39	d
		63	40	34.5	d
		65x	48.5	-	d
ZA 49	III	67	48	40	d
ZA 50	III	66	44	37	d
		69	46	38	d
ZA 51	II	70	50.5	42	d
ZA 54	II	71	51	41	d
		76x	53	43	d
ZA 57	II	65	43.5	39	d
		72.5	51	43	d
ZA 62	I	66.5	46	40	d
ZE 50	IV	70	46	38	d
ZE 85	III	61.5	41	33.5	d
ZG 15	III	67	44.5	38	d
ZG 16	III	67	40	-	d
ZG 22	III	64.5	43.5	35	d
ZG 23	III	76	51	45	d
ZG 29	III	73	49	42	d
ZG 30	III	70	47	41	d
ZH 17	IV	66	43.5	37	d
ZH 20	IV	70.5	48	40.5	d
ZH 23	IV	70.5	-	-	d
ZJ 8	IV	86	57	48	w
ZJ 32	III	71	44.5	39	d

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest breadth, (3) greatest diameter. x indicates approximation. Lettered column d/w = domestic or wild.

Table 5.25. Cattle Measurements

Calcaneus

Context	Phase	(1)	(2)	(3)	d/w
KL 22	I	132.5	-	-	d
KM 7	II	123x	42x	50	d
KM 8	II	128.5	43.5	51	d
ML 3	III	127	45	54	d
ML 12	II	127	42	-	d
ML 110	III	120x	-	-	d
MM 20	III	119	39	46	d
		134	41.5	49	d
MM 29	III/IV	127.5	42	50	d
MM 30 pit A	III/IV	133.5	46	55	d
MM 40	III	141	49	59	d
		150x	52	62	w
MM 50	III	140.5	49	57	d
		149	53	61	w
MMd 61	III	149	51	-	w
MMc 63	III	127.5	-	-	d
		129	39	49	d
MMc 65	III	130x	-	-	d
PN/E 68	V	142	50	54	d
ROc 61	IV	141	48.5	54	d
ZA 41	III	122.5	42	49	d
		127	-	-	d
ZA 42, floor 15	III	131	48	52	d
ZA 45	III	150.5	59	63	w
ZA 61, pit 22	I/II	130.5	44	-	d
ZG 23	III	138.5	46	54	d
		145.5	53	56	d

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest breadth, (3) greatest diameter. x indicates approximation. Lettered column d/w = domestic or wild.

Metatarsus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	d/w
JL 103	I	-	57	-	-	55x	-	-	d
JL 105	I	-	47	-	-	45.5	-	-	d
KL 19	I	-	-	-	76	-	-	42.5	w
KL 25	I	-	-	-	76	-	-	45	w
KL 110	II	-	-	-	54.5	-	23	31	d
KL 117	II	-	-	-	55.5	-	-	33	d
KL 122	I	-	-	-	53	-	-	31	d
KL 125	I	-	-	-	53.5	-	-	32x	d
KL 134	I	-	-	-	64	-	-	38.5	d
KM 9	II	-	52.5	-	-	52x	-	-	d
KM 14	II	-	-	-	60	-	-	34	d
LL 9	II	-	54.5	-	-	53.5	-	-	d
ML 3	III	-	43	24	-	41.5	-	-	d
ML 4	III	-	-	-	55	-	26	32.5	d
ML 10	II	-	-	-	55x	-	25	32	d
ML 38	I	-	47.5	-	-	46	-	-	d
ML 116	III	-	50	-	-	48	-	-	d
		-	-	-	56	-	26	31x	d

Metatarsus (cont.)

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	d/w
ML 151	III	-	-	-	60	-	-	33	d
MM 6	IV	-	46.5	25	-	46	-	-	d
MM 10	IV	-	-	-	60	-	28	34	d
MM 16	III	-	-	-	52	-	23	30	d
MM 19	III	-	55	31	-	52.5	-	-	d
MM 21	III	-	-	-	59	-	-	33	d
MM 22 pit A	III	-	46.5	-	-	46	-	-	d
MM 27	III	-	49	27	-	49	-	-	d
		-	-	-	59	-	26.5	33	d
MM 34	III/IV	-	-	-	54	-	-	32.5	d
MM 40	III	-	51	-	-	51.5	-	-	d
MM 41	III	-	48.5	26	-	45.5	-	-	d
		-	-	-	51	-	23.5	29	d
MM 43	III	-	50x	26	-	49	-	-	d
		-	-	-	54	-	-	32	d
		-	-	-	67x	-	28	34.5	w
MM 50	III	-	45.5	-	-	45.5	-	-	d
		-	-	-	64	-	31	38	d
MM 51	III	-	-	-	58	-	25	33	d
MM 52	III	-	47	26	-	47.5	-	-	d
MM 54	III	-	47	22.5	-	45.5	-	-	d
MMc 60	III	-	-	-	53	-	24.5	32.5	d
		-	-	-	65	-	28.5	36	d
MMd 60	III	-	-	-	62.5	-	-	36.5	d
MMb 61	III	-	-	-	51.5	-	24	30.5	d
MMa 63	III	-	50	28	-	49.5	-	-	d
		-	-	-	62	-	27.5	34.5	d
MMc 63	III	-	44	-	-	44.5	-	-	d
MMc 65	III	-	-	-	53	-	24	31	d
MMd 65	III	-	44	25	-	43.5	-	-	d
MMd 66	III	-	44	-	43	-	-	-	d
MMd 68	III	-	52.5	-	-	50	-	-	d
PN 9	V	204x	-	-	-	-	-	-	d
		-	46	26	-	43x	-	-	d
PN 10	V	-	53	27	-	50	-	-	d
PN 28	V	-	-	-	60	-	26	34	d
PN/F 61	V	-	-	-	57	-	-	33.5	d
PN/C 86	V	-	56.5	-	-	55	-	-	d
PN/C 88	V	-	50	-	-	47.5	-	-	d
PO 6	V	-	-	-	50x	-	22.5	29	d
PO 10	V	-	-	-	50	-	-	29	d
PO 13 pit 1	V	-	-	-	48.5	-	-	27.5	d
PO/B 38	V	-	49.5	-	-	47	-	-	d
		-	54	-	-	51	-	-	d
PO/C 32	V	-	51	24	-	48x	-	-	d
QN 6	V	-	50.5	-	-	50	-	-	d
		-	54	-	-	51.5	-	-	d
		-	-	-	59	-	26	31x	d
QN 7	V	202x	-	24	50.5	-	23	29x	d
		226x	-	-	-	-	-	-	d
		-	-	-	55	-	25	31.5	d
QN 8	V	-	43.5	-	-	42.5	-	-	d
		-	48	24	-	43	-	-	d
		-	-	-	59.5	-	27	33	d

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Table 5.25. Cattle Measurements

Metatarsus (cont.)

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	d/w
QO 5	V	-	-	-	50	-	23.5	29.5	d
		-	-	-	61	-	-	34	d
QO 7	V	-	43	24.5	-	43	-	-	d
QO 8	V	-	53	-	-	50	-	-	d
ZA 8	V	-	50	-	-	44.5	-	-	d
ZA 17	V	-	52	-	-	50	-	-	d
ZA 22 pit 5	IV	-	-	-	53	-	24	33.5	d
ZA 39	III	-	-	-	60.5	-	-	35	d
ZA 40	III	-	-	-	52	-	24	30	d
		-	-	-	55	-	-	-	d
ZA 41	III	-	48.5	-	-	48.5	-	-	d
ZA 42 floor 15	III	-	-	-	52.5	-	24	30	d
ZA 42	III	-	49	26	-	-	-	-	d
		-	-	-	62.5	-	27.5	34	d
		-	-	-	64	-	29	37.5	d
ZA 44	III	-	48	-	-	47	-	-	d
ZA 45	III	-	-	-	57.5	-	24	31	d
ZA 47	III	-	49	-	-	47	-	-	d
		-	56	31.5	-	52.5	-	-	d
		-	-	-	60.5	-	-	37[x]	d
ZA 50	II	-	47	-	-	48.5	-	-	d
ZA 52	II	-	45	-	-	47.5	-	-	d
ZA 58	II	-	-	-	55	-	26	32.5	d
ZE 78	IV	-	52.5	-	-	49	-	-	d
ZE 92	II	-	51	-	-	51	-	-	d
ZE 98	II	-	46	-	-	45.5	-	-	d
ZG 19	III	-	44	-	-	41.5	-	-	d
		-	48	23	-	45	-	-	d
ZG 20	III	-	-	-	57	-	26.5	32	d
ZG 23	III	-	-	-	60.5	-	27	33.5	d
ZG 28	III	-	46	-	-	46	-	-	d
ZG 37	II	-	48	-	-	47.5	-	-	d
ZH 13	IV	-	-	-	55.5	-	-	33	d
ZH 16	IV	-	-	-	63	-	-	37.5	d
ZJ 8	IV	-	-	-	53	-	26	33	d
ZJ 29	III	-	-	-	51	-	22.5	29.5	d
ZJ 34	II	-	-	-	62.5	-	29.5	35[x]	d
ZJ 36	II	-	44	28	-	43	-	-	d

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter. [x] indicates approximation. Lettered column d/w = domestic or wild.

Os Phalangis III

Context	Phase	(1)	(2)	(3)	d/w
KL 114	II	85.5	32.5	36	d
KL 135	I	67	25	30.5	d
		83	41	38	d
KM 9	II	67.5	26	37	d
ML 29	I	68	30	30	d
MM 16	III	72	31	34	d
		68.5	27	32	d
MM 20	III	69.5	29	35	d
MM 34	III/IV	71	26	34	d
MM 40	III	77	28	33	d
MMd 61	III	66	28.5	33	d
		70	26.5	35	d
MMb 65	III	76	31	35	d
PN 17	V	80	31.5	40	d
PN/C 80	V	67.5	28	31	d
PO 6	V	77	30.5	33	d
PO/D 35	V	72	30	35	d
ROc 5	V	67	27.5	33	d
ZA 76	I	71	29	32.5	d
ZE 63	IV	76.5	30	37	d
ZE 83	IV	68	30	31	d
ZE 93	II	72.5	28.5	35	d
ZG 22	III	62	30.5	30	d
ZG 27	III	81	32	40	d
ZG 41	II	75	30	36	d
ZJ 20	IV	62.5	26	33	d
ZJ 30	III	70	31	34	d

Note: Numbered columns represent, in mm: (1) greatest length (2) greatest breadth, (3) greatest diameter. Lettered column d/w = domestic or wild.

Table 5.26. Sheep Measurements

Horn-core

Context	Phase	(1)	(2)	(3)	(4)
ML 4	III	-	42	28	121
ML 7	II	-	55	36	152
ML 8	II	-	66	44.5	180
ML 12	II	-	54.5	39	155
ML 20	II	-	49	31	135
ML 155	III	200x	49	33	132
MM 15	III/IV	102	35.5	18	94
MM 50	III	-	50.5	29	135
MM 53	III	-	49	30.5	135
PN 7	V	-	30.5	20.5	84
PN 15	V	-	59	40	163
PN/D 78	V	-	35	19	91
PN/D 80	V	175x	58	48	172
PN/B 100	V	110	-	-	-
PO 8	V	-	37	22	98
QO 4	V	-	37	23	100
ROc 47	V	195x	60	45	166
ROc 61	IV	70	25	16	70
ZA 15	V	-	28.5	19.5	82
ZA 47	III	-	54	36	151
ZA 55	II	60	46	34	134
		-	56	33	151
ZE 66	IV	-	30.5	21x	84x
ZE 94	II	-	48	33	132
ZG 42	II	130	53	-	-
ZH 2	IV	85x	29	14	72x

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest diameter, (3) smallest diameter, (4) circumference of basis. x indicates approximation.

Lower Row of Teeth

Context	Phase	(1)	(2)	(3)
KM 9	II	19.5	44	22
		20	48.5	23.5
KM 16	III	23	47	22
		-	-	20
MM 27	III	-	46	22.5
MMc 65	III	-	39	18.5
MMb 63	III	20	43	21
PN/B 100	V	22	47.5	23
		-	48	21
ZA 52	II	18.5	43	19
ZE 63	IV	22	47.5	22
ZE 80	IV	-	50	22.5
ZJ 38	II	21	47	23

Note: Numbered columns represent, in mm: (1) P_1-P_3, (2) M_1-M_3, (3) length of M_3.

Atlas

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)
MMd 66	III	20	19	42	-	-	33
ZE 61	IV	23.5	19.5	47	43.5	-	34
ZH 23	IV	25.5	-	45	42	-	35
ZH 24	IV	28	21	48.5	44	66	37.5
ZJ 29	III	28	22	49	43	-	33

Note: Numbered columns represent, in mm: (1) length of ventral arch, (2) length of dorsal arch, (3) breadth of cranial articular surface, (4) breadth of caudal articular surface, (5) greatest breadth, (6) greatest height.

Epistropheus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
KL 111	II	48	10.5	17.5	36.5	20	23.5	15	37
		54	13	20	40	24.5	25.5	21	-
KL 117	II	51	11	20	41	23	26	17	-
MMd 66	III	48.5	9	18	36	-	22	-	-
PO/C 33	V	56	10	20	39	-	24.5	-	-
PO/B 45	V	55	12	20	43	22.5	28	18	-

Note: Numbered columns represent, in mm: (1) length of body, (2) length of dens, (3) breadth of dens, (4) breadth of caput craniale, (5) breadth of fossa caudalis, (6) height of caput craniale, (7) height of fossa caudalis, (8) greatest height.

Scapula

Context	Phase	(1)	(2)	(3)
JL 103	I	21	32.5	19.5
KL 113	II	16	25.5	15.5
		17	27	17
KL 117	II	17	27	18
		21	31	-
		21	32	-
MM 41	III	19.5	28	20
MMb 61	III	18	29.5	19x
MMd 63	III	21	31	19.5
MMd 66	III	19	30	20
PN 7	V	25	39	25.5
PN/D 80	V	18.5	39.5	27.5
PO/B-D 58	V	19	34	20x
QN 6	V	23.5	37	24x
QN 7	V	22.5	38	-
ROc 6	V	19	39.5	27.5
ZA 60	I	19.5	36	24x

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Table 5.26. Sheep Measurements

Scapula (cont.)

Context	Phase	(1)	(2)	(3)
ZE 65	IV	20.5	33x	20.5
ZE 94	II	20	29.5	19
ZG 23	III	16	25.5	16.5
ZH 13	IV	20	32	21
ZH 23	IV	19.5	41.5	26.5

Note: Numbered columns represent, in mm: (1) breadth of collum, (2) breadth of angulus articularis, (3) diameter of facies articularis. x indicates approximation.

Humerus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
KL 107	II	-	-	-	31.5	-	-	25
KL 108	II	-	-	15	28.5	-	15	25
KL 111	II	-	-	-	26	-	-	22
		-	-	-	29	-	-	24.5
KL 113	II	-	-	13.5	25.5	-	14	22
		-	-	-	28.5	-	-	24
KL 113	II	-	-	-	25.5	-	-	22
KL 114	II	-	-	15	31	-	16	23.5
KL 115	II	-	-	-	29	-	-	26
		-	-	-	29.5	-	-	24.5
KL 118	II	-	-	15.5	30	-	-	24.5
KL 124	I	-	-	-	27	-	-	23.5
KL 130	I	-	-	-	31	-	-	26.5
KL 138	I	-	-	-	27.5	-	-	21
KL 151	I	-	-	-	25.5	-	-	21.5
KM 8	II	-	-	-	30	-	16.5	24.5
KM 10	II	-	-	-	27	-	-	25
KM 20	II	-	-	-	27	-	-	24
		-	-	-	27	-	-	25
ML 7	II	-	-	13	25	-	14.5	21.5
ML 102	III	-	-	17	32	-	19	27
ML 150	III	-	-	-	26	-	-	23.5
MM 2	IV	-	-	-	31	-	-	27x
MM 7	IV	-	-	-	29	-	-	25.5
MM 9	IV	-	-	14.5	28	-	16	25
MM 10	IV	-	-	-	24	-	-	22x
MM 16	III	-	-	-	27	-	-	24
MM 20	III	-	-	-	25	-	-	22
		-	-	13.5	25.5	-	14	22
MM 21	III	-	-	15.5	30.5	-	16.5	28
MM 27	III	-	-	15	27	-	15.5	22
MM 34	III/IV	-	-	14	26.5	-	15	22
MM 40	III	-	-	-	25	-	-	21
MM 41	III	-	-	14	26	-	15	22
		-	-	-	27.5	-	-	22
MM 43	III	118	-	13	24.5	35.5	13	20.5
MM 45	III	-	-	15	28	-	16.5	25
MM 50	III	-	-	14.5	29.5	-	15.5	24
MM 53	III	-	-	-	25	-	-	22.5
		-	-	-	26	-	-	22
MMc 60	III	-	-	14	26	-	14	22

Humerus (cont.)

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		-	-	-	27	-	-	23
MMb 60	III	-	-	-	26	-	-	22
MMb 61	III	-	-	-	26	-	-	21
MMd 61	III	-	-	-	27.5	-	15.5	23
MMb 63	III	-	-	-	25	-	-	22
MMb 63	III	-	-	12	24	-	13	19.5
MMb 65	III	-	-	-	24.5	-	-	20
		-	-	-	26	-	-	22
		-	-	-	26.5	-	14.5	22
		-	-	-	29	-	-	23.5
PN/C-E 166	V	-	-	15.6	30	-	15	26
PN/D 80	V	-	-	-	31	-	-	26
PN/A 95	V	-	-	16.5	34.5	-	17.5	29
PO 6	V	-	-	-	29	-	-	26
PO 7	V	-	-	-	32.5	-	-	28
		-	-	18	35	-	19.5	29
PO 8	V	-	-	15	30	-	17	-
		-	-	-	30	-	-	26
PO/B 39	V	-	-	14	27.5	-	14	24
PO/C 32	V	-	-	-	28.5	-	-	25.5
PO/C-D 129	V	-	-	-	30	-	-	26
PO/A-B 139	V	-	-	-	29	-	-	25
		-	-	-	29.5	-	-	25
PO/A-C 136	V	-	-	13	28	-	15	23
QN 6	V	130	36x	16	30	40	16	24
		-	-	-	28	-	-	24
		-	-	-	31	-	-	27
QN 7	V	-	-	-	35	-	-	20
QN 8	V	-	-	16	32.5	-	18	28
		-	-	-	35	-	-	29x
QO 8	V	-	-	-	31	-	-	27.5
		-	-	-	32.5	-	-	27
		-	-	-	33	-	-	27.5
SL 9	IV	-	-	-	30x	-	-	25.5
ZA 5	V	-	-	16	33.5	-	16	26
ZA 33	III	-	-	-	30	-	-	26.5
ZA 42	III	-	-	-	27	-	-	23
ZA 49	III	-	-	-	26	-	-	21.5
ZA 51	II	122x	-	14	27	-	14	23
ZA 52	II	-	-	-	26	-	-	22
ZA 53	II	-	-	-	27.5	-	-	22.5
ZA 54	II	-	-	-	28	-	-	23
ZA 57	II	-	-	13.5	26.5	-	13.5	22
		-	-	-	29.5	-	15	25.5
		-	-	13.5	26.5	-	13.5	22
ZA 58	II	-	-	13.5	26.5	-	14	21.5
ZA 60	I	-	-	14.5	27.5	-	15	22.5
ZE 86	III	117	32	12	25	33	13.5	21
ZG 13	III	-	-	-	28	-	-	25
ZG 22	III	-	-	13	26	-	13.5	20.5
ZG 26	III	-	-	-	28	-	-	24.5

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Table 5.26. Sheep Measurements

Humerus (cont.)

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ZG 30	III	-	-	-	26	-	-	22
ZG 31	III	-	-	14	25	-	14	21.5
ZG 36	II	-	-	-	23.5	-	-	21.5
ZH 17	IV	-	-	16	32	-	17	26
ZH 18	IV	-	-	-	31.5	-	-	27
ZJ 17	IV	-	-	-	26	-	-	23
ZJ 18	IV	-	-	-	26	-	-	22.5
ZJ 30	III	-	-	14	26.5	-	14.5	22
ZJ 45	II	-	-	-	28	-	-	23.5

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter. ˣ indicates approximation.

Radius

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
JL 104	I	-	28	-	-	14	7.5	-
KL 108	II	127	26	14.5	25.5	15	7	17
KL 113	II	132	27	14	24.5	16	7	17
		147.5	29	17	28	16	8	18.5
ML 102	III	-	34	-	-	18	10.5	-
MM 18	III	127	28	15.5	26	15	8	17.5
MMd 66	III	-	27	-	-	13.5	-	-
PN 15	V	179	35	20	33.5	21	11.5	23
QN 4	V	146	28.5	14	27.5	17.5	7	20.5
ZA 14	V	150.5	33	-	31	19	9	21
ZA 44	III	133	26	14.5	24.5	14	8	16.5
ZA 47	III	128ˣ	-	15	-	15	7	-
ZA 52	II	135.5	28.5	14.5	26	15	7.5	17.5
ZE 66	IV	-	30	-	-	16	-	-
ZE 86	III	124	28	13	25	15.5	8.5	17

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter. ˣ indicates approximation.

Metacarpus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
JL 13	I	-	19	11.5	-	13.8	-	-
JL 104	I	-	-	-	22	-	7	14
KL 12	I	-	19.5	11.8	-	13.8	-	-
KL 19	I	-	20.7	12	-	15.3	-	-
KL 102	I/II	-	22.5	14.2	-	17	-	-
KL 103	I/II	109.5	19.8	12	22	15	8	14.8
KL 109	II	-	21	-	-	15	-	-
KL 110	II	-	20	13	-	14.7	-	-
		-	20.2	12	-	14.5	-	-
		-	21	-	-	15.5	-	-
		-	-	-	22	-	7	14
KL 111	II	-	-	-	22	-	7	14

Metacarpus (cont.)

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		-	-	-	22	-	8	13
		-	-	-	23.5	-	8	15
KL 113	II	-	20.2	-	-	15	-	-
KL 114	II	-	20	11.3	-	14.7	-	-
		-	-	-	22	-	-	13.5
KL 115	II	-	-	-	23	-	8	14
KL 117	II	116.5	19	12	22.3	13.8	8	14
		-	19.3	-	-	15	-	-
		-	21.5	14	-	16	-	-
		-	-	-	20.2	-	7	13
KL 118	II	-	24.5	-	-	17.5	-	-
KL 119	II	114	18.5	-	-	14	-	-
KL 121	II	-	20	-	-	15	-	-
KL 123	I	-	20.5	-	-	15	-	-
KL 126	I	117.8	21	13	23.5	15	8.2	15.2
KL 135	I	-	19	11.7	-	14.2	-	-
KL 151	I	-	-	-	20.7	-	8	13.7
KM 6	II	-	-	-	22.2	-	7.5	13.7
KM 8	II	-	20	-	-	15.5	-	-
		-	-	-	22	-	7	13.7
KM 10	II	-	21.3	12	-	16	-	-
KM 18	II	-	20.2	11.2	-	14.8	-	-
		-	20.8	-	-	14.8	-	-
		-	21	-	-	16	-	-
KM 20	II	-	20	-	-	16	-	-
		-	21	13.5	-	15.2	-	-
ML 20	II	-	-	-	21.8	-	7.2	13.7
ML 110	III	-	18.3	11.8	-	13	-	-
ML 113	III	-	-	-	22.5	-	8.3	14ˣ
ML 112	III	-	-	-	22.3	-	8.5	14
ML 115	III	113	-	11	21	-	7.2	13.8
ML 116	III	115	19	11.3	21	14	8.5	14
ML 151	III	101	19	11.5	21	14.2	7	13
MM 7	IV	-	21.8	-	-	16	-	-
		-	24.5	-	-	17.5	-	-
MM 10	IV	-	21	12	-	15ˣ	-	-
		-	24	-	-	16	-	-
MM 11	III	-	20ˣ	12.2	-	15	-	-
		-	-	-	26	-	-	15.8
MM 12	III	-	19.2	11.5	-	14.5	-	-
		-	19.7	-	-	14	-	-
MM 16	III	105ˣ	-	11	22	-	7	14
		-	19	12.7	-	14	-	-
		-	19.5	13	-	14	-	-
		-	-	-	20.8	-	7	13.5
		-	-	-	23	-	8	16.5
MM 18	III	-	-	-	21	-	-	14
MM 19	III	-	-	-	22	-	7.5	13.5
MM 21	III	-	19.8	13	-	14.3	-	-
MM 27	III	113.5	20.2	11	21.8	15	8	15
		-	18	11.7	-	13	-	-
		-	19.5	12	-	14.5	-	-
		-	19.8	12	-	14.5	-	-
		-	20	12.3	-	14.2	7.5	-
		-	-	-	21.7	-	7.8	14.5
		-	-	-	22	-	-	13.2

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Table 5.26. Sheep Measurements

Metacarpus (cont.)

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
MM 38	III	-	21	-	-	15	-	-
MM 40	III	-	19	11.5	-	14.7	-	-
		-	22	-	-	15.5	-	-
		-	-	-	24.5	-	8.3	16.2
MM 41	III	-	19.3	11	-	14	-	-
		-	19.5	11.2	-	14.2	-	-
		-	-	-	23x	-	8.3	14x
MM 50	III	120x	22	12.3	-	15.2	8.3	15x
		-	19	13	-	14.5	-	-
		-	19.2	12.3	-	14	-	-
		-	21.3	13.5	-	15.5	-	-
		-	22	13	-	15.5	-	-
		-	-	-	21	-	8	15
MM 52	III	-	19	11.8	-	14	-	-
		-	19.2	11.7	-	13.5	-	-
		-	-	-	24.5	-	-	15.5
MM 53	III	-	21	12.5	-	15.3	-	-
		-	-	-	22	-	-	14x
MM 54	III	-	20.8	12	-	15	-	-
MMa 60	III	-	17.2	11.5	-	13	-	-
MMb 60	III	-	-	-	21	-	7.7	13.5
MMc 60	III	104	18	10.5	20	14	8	13
		110	19	11.3	21	14.3	8	13.5
MMd 60	III	-	19.5	-	-	15	-	-
MMb 61	III	-	19.8	-	-	13.5	-	-
MMb 63	III	-	18.5	10.8	-	15	-	-
		-	20	-	-	15.3	-	-
		-	-	-	21.2	-	7	12.7
MMd 63	III	-	-	-	21	-	-	14
MMb 65	III	102x	18	12	21	14.5	8.7	13x
MMd 65	III	111x	19.5	12	23	14.3	8	13
MMd 66	III	-	19	-	-	14.3	-	-
		-	18.2	11	-	13.7	-	-
PN 5	V	-	22	12.7	-	16	-	-
		-	24	13	-	17.5	-	-
		-	27	-	-	19.5	-	-
PN 7	V	-	22	13.5	-	16	-	-
		-	23	13	-	16.2	-	-
		-	-	-	25	-	9.8	15
PN 8	V	129	22.5	13	25	17	8.5	16
		-	22	-	-	15.5	-	-
		-	-	-	24.5	-	8.3	16.2
		-	23.5	12.8	-	17	-	-
PN 19	V	-	23.8	13.2	-	19	-	-
PN 27	V	-	22.5	13	-	16.8	-	-
PN/D 78	V	-	23.5	-	-	17	-	-
PN/C 80	V	-	21	-	-	15	-	-
PO 6	V	-	23.5	-	-	18	-	-
PO 7	V	124x	23	14	26	16.5	9.5	16.3
		-	-	-	24.8	-	10	17
PO 8	V	124x	-	12	-	-	8.8	-
		-	22.2	-	-	16.5	-	-
		-	23.3	12.2	-	16.5	-	-
PO 9	V	-	21	-	-	17.2	-	-
PO/A 53	V	-	23.8	15.3	-	17.8	-	-

Metacarpus (cont.)

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PO/B-D 57	V	-	22	-	-	16.5	-	-
PO/B-D/ A-C 132	V	-	-	-	24	-	8.7	15.7
PO/A-C 136	V	-	23.5	-	-	17.5	-	-
QN 2	V	-	21.5	12.2	-	16.8	9.7	-
QN 4	V	-	21	13.5	-	15.2	-	-
QN 5	V	-	-	-	24.8	-	9.8	16
QN 6	V	-	21	12	-	16	-	-
		-	21.3	-	-	16	-	-
		-	22	-	-	16	-	-
		-	23	-	-	17	-	-
		-	-	-	25.2	-	-	16.5
QN 7	V	117	21	13	-	15	9	-
		-	21.2	13	-	15.3	-	-
		-	22.2	11.5	-	17	-	-
		-	22.7	-	-	16	-	-
		-	24	-	-	15.7	-	-
		-	-	-	25.7	-	10	16
QN 8	V	-	-	-	23	-	8.5	15
QO 4	V	-	20	13	-	14.5	-	-
QO 6	V	-	22.8	-	-	17.2	-	-
		-	25.5	14.5	-	18.5	-	-
QO 7	V	117	20.8	13	23.8	14.7	9	15
		-	23	12.5	-	15.5	-	-
		-	-	-	26.7	-	10.6	17.3
		-	23	13	-	17.5	-	-
QO 8	V	-	21	11.5	-	16	-	-
		-	21.3	12	-	16	-	-
		-	24.2	13.8	-	17	-	-
		-	24.3	14.2	-	17.5	-	-
		-	-	-	24.2	-	-	14.2
ROc 6	V	-	21.3	13	-	17	-	-
ROc 7	V	-	21.2	13	-	15.5	-	-
		-	23	13	-	16.3	-	-
ROc 9	V	-	21	-	-	15	-	-
		-	-	-	27	-	-	16.3
ROc 12	V	-	-	-	26.5	-	9	17
ROc 34	V	-	22.7	12	-	15.2	-	-
ROc 49	V	-	22.5	-	-	17	-	-
SL 9	IV	-	25.5	13	-	17.5	-	-
ZA 14	V	-	23	13.7	-	16	-	-
ZA 19	V	-	24	-	-	17	-	-
ZA 33	III	-	22	13	-	16	-	-
ZA 39	III	98.8	18.8	11	21.2	14	7	13.3
		109	19.5	11	-	15.5	8	14.2
		-	19	11.2	-	14.5	-	-
ZA 40	III	-	19	12	-	14	-	-
		-	20.5	13.3	-	15.2	-	-
ZA 43	III	117	20	11	22.5	14	8	14.3
ZA 45	III	-	19.5	12	-	14.5	-	-
ZA 49	III	-	20	11.2	-	14.5	-	-
ZA 50	II	-	19.5	-	-	14	-	-

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Table 5.26. Sheep Measurements

Metacarpus (cont.)

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ZA 52	II	-	20	10.8	-	14.5	-	-
		-	22.2	13.3	-	16	-	-
ZA 54	II	115.5	21.5	13.7	24	16	7.5	14.5
ZA 60	I	-	19.5	-	-	16	-	-
ZD 7	IV	-	20.7	12	-	15.7	-	-
ZE 7	IV	-	21.8	11.8	-	16	-	-
ZE 8	IV	-	21.8	12.3	-	16	-	-
ZE 55	IV	-	21.7	-	-	16	-	-
ZE 68	IV	-	21	-	-	16	-	-
ZE 72	IV	121.5	22	12.2	22.5	16.5	9	15.5
ZE 73	IV	-	19.5	-	-	14	-	-
ZE 80	IV	-	24	-	-	17x	-	-
ZE 81	IV	-	19.5	11.3	-	14	-	-
		-	21.5	11	-	16	-	-
ZE 88	III	-	20	12.5	-	15.2	-	-
ZE 96	II	-	20	13	-	15.2	-	-
ZE 98	II	-	21	12.5	-	14.5	-	-
ZE 100	II	-	18.8	11	-	13.8	-	-
ZG 14	III	-	-	-	25.3	-	9	16.2
ZG 19	III	-	-	-	24	-	9.3	14.8
ZG 22	III	-	-	-	22	-	7	14
ZG 23	III	-	22	-	-	16.5	-	-
		-	-	-	21x	-	8	13x
ZG 29	III	-	-	-	21.2	-	-	14
ZG 32	III	-	18.8	-	-	15	-	-
ZG 39	II	-	-	-	21.7	-	8.8	14.8
ZH 13	IV	-	-	-	23.7	-	9	15.3
ZH 19	IV	-	21.3	12.5	-	15.8	-	-
ZH 20	IV	-	23.2	-	-	16.2	-	-
ZH 22	IV	-	22.2	-	-	15.2	-	-
ZH 25	IV	-	20	-	-	15	-	-
ZJ 29	III	-	20	13	-	13.5	-	-
ZJ 34	II	-	20x	12	-	13.5	-	-
ZJ 45	II	-	-	-	23	-	8.5	14

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter. x indicates approximation.

Femur

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
KL 113	II	-	-	39.5	-	-	20	-	-
		-	-	40	-	-	21	-	-
		-	-	39	-	-	20	-	-
ML 31	I	165.5	163	-	16	35.5	29	17	40
		166	163	41	16	35	30	17	40

Note: Numbered columns represent, in mm: (1) length from trochanter major, (2) length from caput, (3) proximal breadth, (4) smallest breadth, (5) distal breadth, (6) proximal diameter, (7) smallest diameter, (8) distal diameter.

Tibia

Context	Phase	(1)	(2)
JL 105	I	39	43
MM 16	III	36	38
		36	39
MM 43	III	36	35
ROc 9	V	38	39

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) proximal diameter.

Astragalus

Context	Phase	(1)	(2)	(3)
JL 103	I	26	19.5	15.5
KL 111	II	26	18.5	14.5
KL 126	I	25.5	17.8	16.5
MMd 66	III	28.8	19	17.3
PN/E 68	V	27	19.5	16
PO/A 53	V	28	20.5	17.5
PO/E 66	V	28	20	17
ROc 7	V	30	23	17.5
ROc 23	V	26	19.5	15.5
ROc 48	V	31	21.5	17.5
ROc 48	V	31	21.5	17.5
ZE 57	IV	29.3	19.3	16.2
		30	21	-
ZE 62	IV	30.8	20	17.5
ZE 63	IV	31	22	18
ZE 64	IV	30	20.5	18
ZH 19	IV	31	21	17.5

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest breadth, (3) greatest diameter.

Calcaneus

Context	Phase	(1)	(2)	(3)
KL 126	I	48	18	20.5
MMb 61	III	63	21	25
		53	18	19
MMd 66	III	49.5	19	19.5
PN/A 90	V	58.5	21	23
PN/C 90	V	61.5	23	24
PN/A 93	V	53	-	22
PN (south end of N-S balk)	V	61	21.5	24.5
PO/B 39	V	57	20x	23
ROc 9	V	54	19.5	21.5
ZE 65	IV	64	20.5	25
ZE 73	IV	47	16.5	19.5
ZE 100	II	50	18	19
ZG 35	II	45.8	16.5	17.5

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest breadth, (3) greatest diameter. x indicates approximation.

Table 5.26. Sheep Measurements

Metatarsus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
KL 107	II	-	-	-	20.5	-	-	14
		-	-	-	20.5	-	-	14.5
KL 110	II	-	-	-	21.5	-	8	14
		-	-	-	23	-	9.5	15
KL 111	II	-	-	-	22	-	8	14.5
KL 115	II	-	-	-	20.7	-	8	14
KL 118	II	-	-	-	21.8	-	8	14.5
KL 121	II	-	19.7	11.8	-	20	-	-
KL 122	I	-	19	-	-	18.8	-	-
KL 124	I	-	-	-	22	-	9	15.2
KL 138	I	-	-	-	21.7	-	8.5	15.5
KL 141	I	-	20.5	12.5	-	22[x]	8.2	-
KM 9	II	-	-	-	19.7	-	8.2	13.5
KM 18	II	-	-	-	20.3	-	7.8	14
KM 19	II	-	-	-	21.5	-	9	14
KM 20	II	-	-	-	20.7	-	7.5	14.2
ML 7	II	-	19	12.8	-	20	-	-
ML 10	II	-	-	-	23.3	-	9	15.5
ML 110	III	123	17	10.3	21	18	8.2	14
		-	-	-	22	-	8	14[x]
ML 119	III	-	-	-	21.5	-	8.5	15.5
ML 151	III	-	-	-	18.5	-	8	13
ML 153	III	113.5	17.2	8.7	21	17.2	7.6	14
MM 10	IV	-	17.8	-	-	18	-	-
		-	-	-	20.3	-	7.5	14
MM 11	III	-	19.5	11.5	-	20	-	-
MM 12	III	116	17	9.8	-	17	8	-
		-	16.7	9.5	-	17	-	-
		-	18	10	-	19.5	-	-
		-	18	11	-	20[x]	-	-
		-	-	-	19	-	-	12[x]
MM 16	III	-	17.7	10	-	18	-	-
		-	20	11.5	-	20	-	-
MM 19	III	-	17	-	-	18	-	-
		-	17.5	10.7	-	18.2	-	-
		-	-	-	20.5	-	7.5	13.7
MM 21	III	-	17	9.2	-	18	-	-
		-	17.5	-	-	17.5	-	-
		-	-	-	22	-	-	16[x]
		-	-	-	22.3	-	8	15.5
		-	-	-	22.5	-	9	15
MM 27	III	-	-	-	24.5	-	9.5	16.5
MM 40	III	-	18	11	-	18.2	-	-
		-	19	-	-	18.5	-	-
		-	-	-	20.5	-	8	14
MM 41	III	-	-	-	21.5	-	8.8	14
		-	-	-	21.8	-	-	14
		-	-	-	22	-	-	14.3
		-	-	-	22.8	-	9.2	16
MM 43	III	-	17.7	10.2	-	17.5	-	-
		-	-	-	20.3	-	8	14
		-	-	-	21	-	8.2	14.5
		-	-	-	26[x]	-	-	17[x]
MM 50	III	-	18	11.5	-	18.3	-	-
		-	18	10.5	-	18.7	-	-
		-	19	-	-	18.5	-	-
		-	-	-	21	-	-	14.8

Metatarsus (cont.)

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
MM 52	III	-	17	11.2	-	19.8	-	-
		-	18	11.8	-	19	-	-
		-	18.5	13.2	-	19[x]	-	-
MM 54	III	-	-	-	22	-	8.5	14
MMb 60	III	-	19	10.5	-	19.5	-	-
MMd 60	III	-	-	-	22	-	8	14.5
MMd 61	III	-	17.5	-	-	18	-	-
MMd 66	III	-	-	-	20	-	7.5	14[x]
		-	-	-	20.5	-	-	13.3
		-	-	-	21.3	-	9	14.2
		-	-	-	22	-	8.2	14.7
		-	-	-	22	-	8.5	15[x]
PN 9	V	-	20	11.5	-	20.5	-	-
PN/D 80	V	-	-	-	26	-	11.5	18
PN/C 89	V	-	19.3	11.3	-	19.7	-	-
PN/A-C-E well E 90-92	V	-	22[x]	13	-	23.5	-	-
PN/F 262	V	-	-	-	23.8	-	-	16.8
PN/D-F balk	V	-	20.5	-	-	20.5	-	-
PO 7	V	-	-	-	20.3	-	8.5	14[x]
		-	-	-	23	-	-	16
PO 8	V	-	-	-	26	-	-	18.5
PO 15	V	-	19.5	10.5	-	19.2	-	-
PO/C 32	V	-	18.5	-	-	19	-	-
PO 159	V	-	20.5	12.5	-	22.5	-	-
QN 6	V	-	19	12	-	19.5	-	-
		-	-	-	22.5	-	-	15
		-	-	-	23.8	-	9	16.3
QN 7	V	-	20.8	10.8	-	21.2	-	-
QO 5	V	-	19	-	-	19.5	-	-
QO 7	V	-	-	-	23	-	9.2	15
QO 6	V	126	18.5	11.3	22	19	9.5	14.7
		-	22.5	12.8	-	22	-	-
		-	-	-	23.2	-	9.8	16.2
QO 7	V	-	21	12	-	22	-	-
SL 9	IV	-	-	-	24	-	10.8	17
ZA 5	V	-	17.8	-	-	19	-	-
		-	20	-	-	21	-	-
ZA 17	V	-	19.8	-	-	19.8	-	-
		-	-	-	25.5	-	10.2	17
ZA 33	III	-	-	-	24.5	-	10.5	17.5
ZA 38	III	-	-	-	19.7	-	7.5	13.3
		-	-	-	20	-	8	14
ZA 47	III	-	18	-	-	19	-	-
ZA 50	II	158[x]	-	12.5	23.5	-	9	15.5
ZA 52	II	-	-	-	23	-	8.3	15
ZA 53	II	-	19.7	11.3	-	19.3	-	-
		-	20	11.3	-	20	-	-
ZA 60	I	-	-	-	23	-	9.8	15.8
ZA 63	I	-	19.8	11.3	-	20	-	-
		-	-	-	20.5	-	8	14.3
ZD 9	IV	-	-	-	22.8	-	9.2	15.2
ZE 86	III	116.5	17	9.2	20	17.2	8	13.3
ZE 94	II	-	-	-	20.5	-	7.8	14

continued on next page

Table 5.26. Sheep Measurements

Metatarsus (cont.)

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ZG 19	III	-	-	-	19.8	-	9	14.2
ZG 20	III	-	-	-	20.7	-	8.5	13.5
ZG 24	III	-	-	-	21.8	-	8.5	15
ZG 29	III	-	-	-	21	-	8.2	13.5
ZG 31	III	-	-	-	21	-	9	14
ZG 34	II	-	17	9.5	-	18	-	-
		-	-	-	21	-	8	14
ZG 35	II	-	18	11.8	-	19	-	-
ZG 36	II	-	-	-	20	-	8.5	13
ZH 17	IV	-	22.5	13	-	23x	-	-
ZJ 38	II	-	-	-	23	-	9	15

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter. x indicates approximation.

Table 5.27. Goat Measurements

Horn-core

Context	Phase	(1)	(2)	(3)	(4)
KL 115	II	145x	33	21	85
ML 157	III	-	29.5	20.5	80
MM 16	III	-	31.5	20	88
MM 38	III	197	-	-	-
MM 51	III	-	43.5	31	119
PN 6	V	-	37.5	34.5	102
QO 5	V	-	33	21	90
ZA 9	V	-	34.5	22.5	95
ZA 42	III	162x	28.5	21x	83x
		-	48	29.5	128
ZA 43	III	202	35	20.5	92
		-	47	30	127

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest diameter, (3) smallest diameter, (4) circumference of basis. x indicates approximation.

Lower Row of Teeth

Context	Phase	(1)	(2)	(3)
MM 12	III	-	44	20.5
MM 16	III	19	39	18.5
MM 27	III	20.5	41	19.5
MMb 63	III	23	48.5	23
ZA 32	IV	-	50	24
ZA 51	II	-	-	20
ZA 52	II	19.5	43.5	21.5
ZA 57	II	-	48	22

Note: Numbered columns represent, in mm: (1) P_1-P_3, (2) M_1-M_3, (3) length of M_3.

Epistropheus

Context	Phase	(1)	(2)	(3)	(4)
ZG 30	III	14	25	52.5	34.5

Note: Numbered columns represent, in mm: (1) length of dens, (2) breadth of dens, (3) breadth of caput craniale, (4) height of caput craniale.

Scapula

Context	Phase	(1)	(2)	(3)
KL 110	II	21.5	33.5	21.5
MMb 61	III	19	29.5	22
MMc 65	III	18	29	20.5
PN/C 87	V	17	26	20x
		19.5	29	22
ROc 13	V	19	32	23x
ZA 43	III	17	28	21

Note: Numbered columns represent, in mm: (1) breadth of collum (2) breadth of angulus articularis, (3) diameter of facies articularis. x indicates approximation.

Humerus

Context	Phase	(1)	(2)	(3)	(4)
KL 117	II	-	30	-	24.5
KL 118	II	-	28.5	-	24
KM 10	II	-	31	-	25
MM 16	III	-	34.5	-	27
PO/D 34	V	-	30	-	26
PO/E 66	V	-	32	-	27.5
QN 6	V	-	29.5	-	23.5
ROc 5	V	-	28	-	22.5
ZA 47	III	-	38	-	31
ZA 57	II	-	33	-	28.5
ZE 63	IV	-	27.5	-	24
ZE 67	IV	15	30	17	25.5
ZE 83	IV	16	30	17	25.5
ZE 100	II	-	27	-	23

Note: Numbered columns represent, in mm: (1) smallest breadth, (2) distal breadth, (3) smallest diameter, (4) distal diameter.

Radius

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
KL 120	II	-	34	-	-	19	-	-
MMd 66 PN/E-F balk Bb 3	III	-	37	-	-	18.5	-	-
	V	-	19	-	-	14.5	-	-
ROc 46	V	-	28	-	-	15	-	-
ROc 61	IV	149	27	15	25.5	17	7.5	19
ZA 53	II	-	35	19	-	21	10.5	-
ZE 96	II	-	33.5	-	-	18.5	10	-
ZJ 38	II	-	31	16.5	-	19	-	-

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter.

Table 5.27. Goat Measurements

Metacarpus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
JL 9	I	-	23	14.8	-	16.2	-	-
KL 18	I	-	27.5	17.5	-	18.5	-	-
KL 113	II	100.5	21.8	14.3	24.8	15.5	8.2	16
KM 9	II	107	22	14	25.3	16.5	8.5	15.5
		-	22.3	15	-	17	-	-
		-	-	-	27	-	8	16.2
KM 10	II	-	22	16	-	16	-	-
ML 36	I	105	22	15	25	17.5	9.5	15
ML 112	III	-	-	-	24.5	-	9	15.5
MM 12	III	-	24.7	-	-	17	-	-
MM 18	III	-	26	17	-	17	-	-
MM 19	III	-	-	-	32	-	-	18.5
MM 21	III	-	28	18	-	19x	-	-
MM 27	III	-	25.3	17	-	17.5	-	-
MM 41	III	103	-	16	26	-	10.5	16
		-	25.5	16	-	18	-	-
MM 43	III	-	25	16	-	17	-	-
		-	-	-	25.2	-	9	15.3
MM 52	III	-	-	-	30	-	11	18x
MM 53	III	105.5	24	15.5	27	17	9.5	16
		-	26	17	-	17x	-	-
MMc 60	III	-	25x	15	-	16.5	-	-
PN/D 81	V	-	22.5	14	-	16.2	-	-
PO/E 65	V	-	23	15.5	-	16.5	-	-
QO 8	V	107.5	22.5	14	25	16	9	15.5
		-	27	16	-	18	-	-
ROc 34	V	-	-	-	27x	-	9.7	16x
ZA 4	V	-	25.2	14.8	-	19	-	-
ZA 18	V	-	23.2	15	-	16	-	-
ZA 34/35	III	-	23	14	-	17	-	-
ZA 41	III	115	26.3	18	30.2	19.5	11	18x
ZA 54	II	-	26.3	15.8	-	17	-	-
ZE 57	IV	-	-	-	24.5	-	-	16
ZE 60	IV	-	22.5	14.3	-	16	-	-
ZE 62	IV	107	23	16	-	17	9.8	-
ZG 18	III	130	29	18.7	34.5	21	12	19
ZG 30	III	-	-	-	23.5	-	9.5	14
ZG 43	II	114.5	26.5	18.5	31.5	19.5	10.5	18

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter. x indicates approximation.

Tibia

Context	Phase	(1)	(2)
PO-B/A 138	V	41	42

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) proximal diameter.

Calcaneus

Context	Phase	(1)	(2)	(3)
KL 121	II	54.5	19.5	20.5

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest breadth, (3) greatest diameter.

Metatarsus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
KL 108	II	118	23	16	28	22	11	17x
		-	18	-	-	17.8	-	-
		-	18.2	-	-	18.2	-	-
KL 138	I	-	25	-	-	23.8	-	-
ML 8	II	-	21x	14.2	-	20x	-	-
ML 118	III	-	22.5	14.5	-	21.5	11	-
MM 16	III	-	21.8	15	-	20	-	-
MM 34	III/IV	-	20	14	-	20	-	-
MM 40	III	-	21.2	14	-	20.3	-	-
MM 43	III	111.5	19.2	13.2	23.2	17	10	14.8
		-	18.8	-	-	17.8	-	-
MM 50	III	-	21.2	-	-	19.8	-	-
		-	24	-	-	21.3	-	-
MM 52	III	-	23.2	-	-	21.5	-	-
MM 54	III	-	22.2	14.5	-	21.5	-	-
MMb 65	III	-	19.7	-	-	18	-	-
		-	21.2	13.5	-	20	-	-
MMc 65	III	-	19.3	-	-	18.5	-	-
MMd 66	III	-	18	-	-	17.5	-	-
		-	18.5	12	-	18	-	-
		-	18.5	-	-	18	-	-
PN 5	V	-	22	-	-	21.3	-	-
PN/D 78	V	-	-	-	26x	-	-	16x
PN/B 102	V	-	19	10.8	-	17	8	-
PO/C 33	V	-	23	14.5	-	12.5	-	-
QN 6	V	123	19.2	12	23.3	18	9.5	15
		-	19	10.8	-	16.5	-	-
QN 7	V	-	22.3	13.5	-	21.8	-	-
QN 8	V	-	-	-	25	-	10.2	18
ZA 19	V	-	21.5	-	-	21	-	-
ZA 38	III	-	21	13	-	-	-	-
ZA 39	III	-	24.3	15.7	-	24	-	-
ZA 41	III	122x	22	13	25.8	20	10	16
ZA 42	III	-	22	13.5	-	20.5	-	-
ZA 43	III	-	21.3	14.5	-	20	-	-
ZA 44	III	-	22.5	15.5	-	21.5	-	-
ZE 54	IV	-	19.8	-	-	19.3	-	-
ZE 70	IV	-	20	-	-	19.3	-	-

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter. x indicates approximation.

Table 5.28. Pig Measurements

Upper Row of Teeth

Context	Phase	(1)	(2)	(3)	d/w
JL 13	I	-	64	29.5	d
JL 15	I	-	75	35	d
KL 108	II	45	56	26	d
KL 111	II	-	61	26	d
KL 120	II	-	-	30	d
KL 121	II	-	60	28	d
ML 7	II	-	-	42	w
ML 107	III	-	66	31	d
ML 110	III	-	-	27	d
MM 6	IV	-	64	32	d
MM 16	III	-	-	31	d
MM 19	III	-	-	31	d
MM 34	III/IV	-	-	32.5	d
		-	-	35	d
MM 40	III	-	60.5	28	d
MM 41	III	57	-	-	d
MM 50	III	-	-	29	d
MM 52	III	45.5	-	-	d
MMb 60	III	-	78	39	w
MMb 61	III	-	61	28	d
MMd 61	III	-	-	34	d
MMb 63	III	44	-	-	d
MMb 63	III	-	-	28	d
PN 7	V	-	68	32	d
		-	-	31	d
PN 8	V	-	-	32	d
PN/F 55	V	47	-	-	d
PN/C-E 166	V	-	-	33	d
		-	-	43	w
PN/C 90	V	-	60	28	d
PO 6	V	-	-	30	d
PO 13	V	-	60.5	28.5	d
		-	-	28	d
PO/C 33	V	-	-	48	w
PO/D 35	V	-	58	27.5	d
PO/B 38	V	-	-	36.5	w
PO/A 54	V	-	59	29	d
		-	63	29	d
		-	80.5	39	w
PO 130	V	-	90.5	46	w
PO/A-C 136	V	-	61	28.5	d
		-	-	40	w
QN 7	V	-	-	29.5	d
		-	-	29.5	d
QO 6	V	-	59.5	27.5	d
		-	67	32	d
QO 8	V	-	66	33	d
ROc 7	V	-	-	32.5	d
ROc 9	V	-	-	29	d
ROc 41	V	44.5	60	28	d
ROc 61	IV	-	-	30	d
ZA 19	V	-	61.5	31	d

Upper Row of Teeth (cont.)

Context	Phase	(1)	(2)	(3)	d/w
ZA 21	IV	-	60.5	27	d
ZA 44	III	-	-	27	d
ZA 45	III	-	-	26	d
ZA 50	II	-	-	26	d
		-	-	28	d
ZA 52	II	-	60x	28x	d
ZE 64	IV	-	-	33	d
ZE 67	IV	-	-	29	d
		-	63	30	d
ZE 69	IV	-	-	29	d
ZE 72	IV	-	65	30	d
ZE 80	IV	-	63	31	d
		-	67	33.5	d
ZG 15	III	-	60.5	27	d
		-	63	30	d
		-	-	30	d
ZG 27	III	-	-	29	d
ZG 35	II	-	-	30	d
ZH 13	IV	-	59.5	27.5	d
ZH 16	IV	-	-	30	d
ZH 17	IV	43	-	-	d
ZH 19	IV	44.5	-	-	d
ZH 20	IV	-	56.5	26	d
ZH 23	IV	-	62	31	d
		-	-	32	d
ZH 24	IV	-	68	34	d
ZJ 29	III	-	-	26	d

Note: Numbered columns represent, in mm: (1) P_1-P_4, (2) M_1-M_3, (3) length of M_3. x indicates approximation. Lettered column d/w = domestic or wild.

Lower Row of Teeth

Context	Phase	(1)	(2)	(3)	d/w
KL 109	II	-	-	28	d
KL 111	II	-	-	31	d
KL 114	II	-	62	30	d
KM 8	II	-	67.5	34	d
KM 13	II	47.5	64	29	d
LL 43	II	-	-	29	d
ML 107	III	-	-	35	d
ML 112	III	-	-	45	w
MM 7	IV	-	-	33.5	d
MM 9	IV	-	-	37	d
MM 11	III	-	-	33	d
MM 12	III	-	66	33.5	d
MM 19	III	-	-	42	w
MM 20	III	-	-	30	d
		-	-	32	d
MM 21	III	-	-	48	w
MM 27	III	-	82.5	41	w
MM 40	III	-	-	31	d
MM 41	III	55	-	34	d
MM 50	III	-	-	43	w

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Table 5.28. Pig Measurements

Lower Row of Teeth (cont.)

Context	Phase	(1)	(2)	(3)	d/w
MM 52	III	-	72	35	d
MMb 60	III	-	66	32	d
		-	-	44	w
MMd 66	III	-	-	29	d
PN 4	V	-	-	33	d
PN/E 69	V	-	-	44	w
PN/C 87	V	-	-	39	w
PN/C 89	V	-	90	48	w
PN/F 262	V	-	-	36x	d
PN/E-F balk	V	-	84x	42x	w
PN/D 81	V	-	61	29	d
PO/B 38	V	-	83	40.5	w
PO/B 46	V	-	-	47	w
PO/B 47	V	-	-	43.5	w
PO/C 50	V	-	-	41	w
		-	-	41.5	w
PO/A 53	V	-	-	48.5	w
		-	-	33.5	d
PO/A 54	V	-	-	47	w
PO/E 66	V	-	-	42.5	w
QN 5	V	-	62	30	d
QN 6	V	-	62	30	d
		45.5	63	31.5	d
		-	-	32	d
		-	-	33	d
QN 8	V	-	-	35	d
QO 8	V	-	68x	33	d
ROc 61	IV	-	-	31.5	d
ROc 62	IV	-	-	45	w
SL 9	IV	-	65	33.5	d
ZA 15	V	-	-	31.5	d

Lower Row of Teeth (cont.)

Context	Phase	(1)	(2)	(3)	d/w
ZA 19	V	-	63.5	29.5	d
ZA 24	IV	-	-	31.5	d
ZA 44	III	-	-	32	d
ZA 45	III	-	-	31	d
ZA 47	III	-	-	30.5	d
		-	-	32.5	d
		-	-	33	d
ZA 50	II	-	-	30.5	d
ZA 52	II	-	-	29	d
		-	64	31	d
ZA 53	II	56	-	-	d
ZE 9	IV	-	87	48	w
ZE 53	IV	-	-	31.5	d
ZE 61	IV	-	-	44	w
ZE 63	IV	-	-	35	d
ZG 14	III	-	-	44	d
ZG 29	III	50	68	34	d
ZH 1	IV	-	-	32	d
ZH 10	IV	-	-	33	d
		56.5	-	-	w
ZH 11	IV	-	-	32.5	d
ZH 16	IV	-	-	28	d
ZH 18	IV	-	-	32.5	d
		-	66	34.5	d
ZH 20	IV	55	-	-	d
ZH 23	IV	-	-	33	d
		-	69	34	d

Note: Numbered columns represent, in mm: (1) P_1-P_4, (2) M_1-M_3 (3) length of M_3. x indicates approximation. Lettered column d/w = domestic or wild.

Mandible

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	d/w
PO/D 37	V	-	-	45	158	21.5	26.5	44	63	31	-	d
ZE 67	IV	-	42	-	-	33	45.5	-	-	-	52	w
ZE 70	IV	-	33	-	-	24	26	53	-	-	50	d
ZE 80	IV	-	37	-	-	28.5	35	-	-	-	51	w
ZH 6	IV	-	30.5	-	-	19	25	50	-	-	42x	d
ZH 11	IV	218	32	41	158	19	21	52	62	32	42	d
ZH 13	IV	-	35	-	-	21	27	-	-	-	52x	w
ZH 17	IV	-	28.5	-	162x	19x	22	48	66	33.5	43	d
ZJ 99	IV	-	46	-	-	29	36.5	76	-	-	-	w

Note: Numbered columns represent, in mm: (1) length to angulus, (2) height at P_1, (3) height at M_1, (4) length of row of teeth, (5) length of incisor row, (6) length of diastema, (7) P_1-P_4, (8) M_1-M_3, (9) length of M_3, (10) breadth at canines. x indicates approximation. Lettered column d/w = domestic or wild.

Table 5.28. Pig Measurements

Atlas

Context	Phase	(1)	(2)	(3)	(4)	(5)	d/w
MM 30	III/IV	18.5	21	53	48	45	d
MM 50	III	16	19.5	48	43	43	d
		-	28.5	64.5	62	52	w
PO/AC 136	V	27	25.5	63	-	59	w
QN 5	V	20	19	51	48	42.5	d
ZE 65	IV	21.5	18.5	58	48	42	d
ZJ 17	IV	15	17	45	-	40	d

Note: Numbered columns represent, in mm: (1) length of ventral arch, (2) length of dorsal arch, (3) breadth of cranial articular surface, (4) breadth of caudal articular surface, (5) greatest height. Lettered column d/w = domestic or wild.

Scapula

Context	Phase	(1)	(2)	(3)	d/w
KL 20	I	35	49	-	w
KL 113	II	27.5	43	31	w
KM 10	II	22	32.5	21	d
MM 5	IV	31	48	34	w
MM 11	III	20	30	22	d
MM 16	III	32.5	48	35	w
MM 30	III/IV	22	3	23	d
		23	36	-	d
MM 41	III	31.5	46.5	32	w
		-	46.5	35	w
		-	50	32	w
MM 43	III	-	47.5	33	d
PN 4	V	23.5	36	24.5	d
PN 5	V	24	37	23.5	d
PN 11	V	22	31	31	d
PN/A 90	V	22.5	33.5	23.5	d
QN 8	V	27	37	23	d
ZA 15	V	23.5	34.5	21.5	d
ZA 17	V	-	31.5	23	d
ZA 29	IV	30	47	35	w
ZA 33	III	21.5	34.5	22.5	d
ZA 52	II	34	49	35×	w
ZA 53	II	21.5	32	20.5	d
ZD 4	IV	27	40	27×	d
ZE 61	IV	-	42	28	w
ZH 10	IV	-	42	31	w
ZJ 9	IV	-	36	23×	d

Note: Numbered columns represent, in mm: (1) breadth of column, (2) breadth of angulus articularis, (3) diameter of facies articularis. × indicates approximation. Lettered column d/w = domestic or wild.

Epistropheus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	d/w
PO/B 45	V	54.5	21	13	62	39.5	21	25.5	w
7G 19	III	50	19	14	60	36.5	24	33	w

Note: Numbered columns represent, in mm:(1) length of body, (2) length of dens, (3) breadth of dens, (4) breadth of caput craniale, (5) breadth of fossa caudalis, (6) height of caput craniale, (7) height of fossa caudalis. Lettered column d/w = domestic or wild.

Humerus

Context	Phase	(1)	(2)	(3)	(4)	d/w
JL 105	I	-	35.5	-	36.5	d
KL 105	II	17	38.5	24.5	37	d
KL 115	II	-	29	-	26	d
		-	29.5	-	24.5	d
KM 9	II	12.5	32	20	32	d
ML 8	II	-	33	-	34	d
		-	35	-	35.5	d
ML 110	III	-	33	-	33	d
MM 9	IV	-	38	-	38×	d
MM 12	III	18	43	25	39	d
MM 16	III	-	33	-	35	d
		13.5	33.5	21	33×	d
MM 27	III	12	32	19	32.5	d
MM 34	III/IV	-	35	21.5	36.5	d
		18	40	27	41	d
MM 50	III	-	37	-	36	d
MM 51	III	-	49.5	-	47.5	w
MM 52	III	-	58	-	-	w
MM 54	III	-	35.5	-	36	d
PN 5	V	-	39	-	38	d
		-	39	-	39×	d
PN 19	V	-	39	24	38	d
MMb 60	III	16.5	38.5	24	38.5	d
PN/B-D-F 72-76	V	-	38	-	37	d
PO 5	V	-	37×	-	38.5	d
PO 7	V	-	39.5	-	39.5	d
PO 8	V	15	34	21	34	d
		-	37	-	35	d
		-	38.5	-	39.5	d
PN/D 80	V	-	39	-	40	d
PN/C 86	V	-	35.5	-	35.5	d
PO/D 31	V	16	38	22	37.5	d
PO/C 50	V	-	39	-	38	d
PO/A 54	V	16	38	23	36.5	d
QN 6	V	-	36	-	35.5	d
		-	36.5	-	35	d
QN 7	V	-	37	-	37.5	d
		-	37×	-	37	d
		-	38	-	37.5	d
		-	42	-	40.5	d

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Table 5.28. Pig Measurements

Humerus (cont.)

Context	Phase	(1)	(2)	(3)	(4)	d/w
QN 8	V	-	38.5	-	37.5	d
QO 2	V	-	39	-	37	d
QO 7	V	15	38	23	39	d
QO 8	V	15	36	24	34	d
SL 9	IV	-	39.5	-	38x	d
		-	40x	-	41	d
ZA 15	V	16.5	42.5	23	41	d
ZA 17	V	17.5	39	25	41	d
		17	40	27	41x	d
ZA 32	IV	-	41	-	40.5	d
ZA 41	III	-	53	-	51	w
ZA 44	III	22	51	32	51.5	w
ZA 50	II	-	37.5	-	35	d
ZA 51	II	-	55	-	53	w
ZD 9	IV	14.5	35	22	35.5	d
ZE 58	IV	-	37	-	36	d
ZE 65	IV	-	34	-	33x	d
ZE 68	IV	15	38.5	26.5	38	d
ZE 96	II	13	33.5	20	32.5	d
ZH 13	IV	-	42	-	43	d
ZH 18	IV	16	40.5	27	40.5	d
ZH 21	IV	16	40.5	25.5	40	d
ZJ 9	IV	-	40	-	39	d

Note: Numbered columns represent, in mm: (1) smallest breadth, (2) distal breadth, (3) smallest diameter, (4) distal diameter. x indicates approximation. Lettered column d/w = domestic or wild.

Femur

Context	Phase	(1)	(2)	(3)	(4)	d/w
JL 105	I	-	42	-	46x	d
MM 19	III	60	-	36	-	w
ZE 92	II	-	38	-	45	d

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) distal breadth, (3) proximal diameter, (4) distal diameter. x indicates approximation. Lettered column d/w = domestic or wild.

Tibia

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	d/w
KL 118	II	-	-	29.5	-	-	24.5	d
KL 121	II	-	-	40	-	-	34	w
KL 134	I	55	-	-	61	-	-	w
KM 19	II	-	17.5	29	-	12	23.5	d
ML 118	III	-	17	28	-	12	24	d
MM 11	III	-	-	37	-	-	34	w
MM 16	III	-	-	26	-	-	23.5	d
		-	-	37.5	-	-	32	w
MM 19	III	-	20	29	-	13	23	d
MM 21	III	-	27	41	-	21.5	36	w
MM 27	III	-	-	37	-	-	32	w

Tibia (cont.)

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	d/w
MM 40	III	-	17.5	29	-	12.5	24.5	d
MM 43	III	-	17	26.5	-	13	24	d
		-	-	27	-	-	24x	d
		-	-	28	-	-	25	d
		-	24	36	-	20	33	w
MMb 63	III	-	-	39.5	-	-	35	w
PN 4	V	-	-	29.5	-	-	25	d
PN/C 80	V	-	-	30.5	-	-	26	d
PN 11	V	-	-	30	-	-	27	d
PO 23	V	-	20.5	31	-	13.5	27.5	d
PO/C 33	V	-	-	40	-	-	36	w
PO/C 50	V	-	-	29.5	-	-	25	d
PO/A 52	V	-	-	37.5	-	-	33	w
QN 7	V	-	17	27	-	12.5	23.5	d
		-	18.5	30	-	13	25	d
QO 7	V	-	17.5	28	-	12.5	24	d
ZA 9	V	-	16	26	-	12.5	23.5	d
ZA 40	III	-	17.5	27.5	-	13	22x	d
		-	-	42	-	-	36	w
ZA 63	I	-	-	35.5	-	-	31	w
ZE 61	IV	-	-	43.5	-	-	36.5	w
ZE 67	IV	-	18	29	-	12.5	23	d
		61	-	-	63	-	-	w
ZE 68	IV	-	23.5	34.5	-	18	31	w
		-	-	39.5	-	-	34	w
ZE 69	IV	-	19	32	-	13.5	27.5	d
ZE 86	III	-	27	39.5	-	21	35	w
ZG 24	III	-	18.5	28.5	-	13	23	d
ZH 10	IV	-	-	29	-	-	27	d
ZH 18	IV	-	19	29	-	13	26	d
ZH 20	IV	-	-	35.5	-	-	32.5	w

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) smallest breadth, (3) distal breadth, (4) proximal diameter, (5) smallest diameter, (6) distal diameter. x indicates approximation. Lettered column d/w = domestic or wild.

Astragalus

Context	Phase	(1)	(2)	(3)	d/w
KL 121	II	51	32x	31	w
KL 126	I	39.5	24	22	d
ML 4	III	54.5	31	31	w
MM 34	IIIIV	52	32.5	32	w
MM 40	III	39.5	22.5	23.5	d
		48	31	30	w
MM 43	III	51	33	29	w
MM 53	III	38.5	23x	23.5	d
MMb 65	III	39.5	24	-	d
PO 3	V	41	26	24.5	d
PO 5	V	40.5	23	24	d
PO 6	V	40.5	26	23.5	d
PO/D 34	V	51.5	33.5	29	w
QN 7	V	38	23	22.5	d

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Table 5.28. Pig Measurements

Astragalus (cont.)

Context	Phase	(1)	(2)	(3)	d/w
ROc 8	V	42	28	25	d
ROc 19	V	43.5	26.5	26	d
ZA 18	V	43	26.5	24	d
ZA 48	III	42.5	25	26	d
ZA 55	II	39	26	22	d
ZA 76	I	47.5	32	-	w
ZE 53	IV	54	35	31	w
ZE 63	IV	42.5	26	26	d
ZE 67	IV	37.5	24	22	d
ZH 13	IV	43	28	23.5	d
ZH 18	IV	50.5	31	-	w

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest breadth, (3) greatest diameter. x indicates approximation. Lettered column d/w = domestic or wild.

Calcaneus

Context	Phase	(1)	(2)	(3)	d/w
JL 105	I	100	29	39.5	w
KL 113	II	72	22	29	d
KL 128	I	95x	26	35	w
KM 20	II	71x	22	-	d
MMd 61	III	78	23.5	30	d
PN 4	V	76	23	28	d
PO/B 47	V	101	31	39	w
QN 6	V	75.5	26	30.5	d
QN 7	V	107	31	41	w
QN 8	V	103	32	41	w
ZA 27	IV	110	34	42.5	w

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest breadth, (3) greatest diameter. x indicates approximation. Lettered column d/w = domestic or wild.

Radius

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	d/w
KL 115	II	-	29.5	-	-	20	-	-	d
KL 117	II	129	29x	15	30	23	11.5	22	d
KL 133	I	-	38.5	-	-	29	-	-	w
ML 103	III	-	38	-	-	28	-	-	w
MM 3	IV	-	22	-	-	20	-	-	d
MM 4	IV	-	28	-	-	21	-	-	d
MM 5	IV	-	-	-	46x	-	-	32x	w
MM 11	III	-	29	-	-	21x	-	-	d
MM 12	III	-	-	-	44	-	-	33	w
MM 30	III/IV	-	-	-	43.5	-	-	33	w
MM 40	III	-	28x	16	-	21.5	11	-	d
		-	40	-	-	30x	-	-	w
PN/D 80	V	-	-	-	44	-	-	34	w
ROc 72	IV	-	-	-	45x	-	-	34.5	w
ZA 18	V	-	29	18	-	21.5	11	-	d
		-	30	-	-	22	-	-	d
ZA 41	III	-	28	16	-	22	12	-	d
ZA 44	III	-	-	-	32	-	-	26	d
ZA 55	II	-	28	16	-	23	11	-	d
ZA 57	II	-	25.5	-	-	19.5	-	-	d
		-	26	-	-	20	-	-	d
ZH 20	IV	-	30.5	19	-	25	12	-	d
ZH 21	IV	-	-	-	31.5	-	-	24	d
		-	29.5	-	-	21.5	-	-	d

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter. x indicates approximation. Lettered column d/w = domestic or wild.

Table 5.29. Dog and Wolf Measurements

Skull

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
MMd 61	III	-	-	-	-	-	16	15	54.5	-	-	81	51	44	32.5	15	18	40
PO/C 32	V	71[x]	87	9	18	43	17.5	15	-	25	34	-	-	-	-	-	-	-

Note: Numbered columns represent, in mm: (1) I_1-M_1, (2) length of row of teeth, (3) length of incisor row, (4) length of diastema, (5) P_1-P_4, (5) M_1-M_3, (7) length of P_4, (8) breadth of brain case, (9) breadth of incisor row, (10) breadth at canines, (11) breadth at mandibular articular surfaces, (12) breadth at otions, (13) breadth at processus jugulares, (14) breadth at condyli occipitales, (15) length of foramen magnum, (6) breadth of foramen magnum, (17) height of occiput (bastion-opisthion). [x] indicates approximation.

Upper Row of Teeth

Context	Phase	(1)	(2)	(3)	d/w
KL 111	II	-	-	15	d
KM 6	II	-	16	18	d
KM 17	II	40	14	14.5	d
KM 18	II	38	17	15	d
ML 10	II	37.5	14	14	d
MM 11	III	-	-	17	d
MM 16	III	40	-	13	d
MM 27	III	40	-	15.5	d
PN 26	V	-	-	18	d
PN/D 102	V	-	22	-	d
PO/B 46	V	-	25	25.5	w
PO/C 50	V	-	17	-	d
PO/A 54	V	44.5	16	16.5	d
QO 8	V	-	18	17	d
ROc 42	V	-	18	19.5	d
ROc 61	IV	47	18	19	d
ZA 34/35	III	41	16	14.5	d
ZA 41	III	-	14	15	d
ZA 54	II	-	-	17	d
ZA 57	II	-	14.5	15.5	d
ZE 52	IV	-	-	25	w
ZH 10	IV	-	14.5	15.5	d
ZH 20	IV	40	-	15	d
ZJ 13	IV	45	18	16	d

Note: Numbered columns represent, in mm: (1) P_1-P_4, (2) M_1-M_2, (3) length of P_4. Lettered column d/w = domestic or wild.

Lower Row of Teeth

Context	Phase	(1)	(2)	(3)	d/w
KL 25	I	-	27.5	17.5	d
KL 103	I/II	-	-	18	
KL 108	II	-	29	18.5	d
KL 111	II	27	28	17.5	d
ML 151	III	32	34	21	d
		-	51	28.5	w
PN/C 87	V	-	34.5	21	d
KM 10	II	32	30	18	d
		32	30.5	18.5	d

Lower Row of Teeth (cont.)

Context	Phase	(1)	(2)	(3)	d/w
LL 4	II	31	-	18	d
ML 11	II	27.5	28	17.5	d
ML 12	II	-	28	18	d
ML 103	III	-	-	20.5	d
ML 115	III	30	26	18	d
MM 20	III	-	31.5	20	d
MM 27	III	-	30	17	d
MM 40	III	34	30	18	d
MM 53	III	-	-	19.5	d
MMb 61	III	-	26	14.5	d
MMd 68	III	-	29.5	16.5	d
MMd 61	III	31	-	18	d
		34	-	18	d
PN 8	V	-	-	19.5	d
PN/A 90	V	-	-	15	d
PO/C-D 128	V	-	33	20	d
PO/C-D 135	V	-	33.5	20.5	d
QN 5	V	38	-	-	d
QN 8	V	33.5	-	21	d
QO 2	V	31	32	17.5	d
		-	-	19	d
ZA 16	V	-	26.5	16	d
ZA 23	IV	37	-	-	d
ZA 49	III	-	32.5	19.5	d
ZE 64	IV	-	-	20	d
ZG 17	III	-	32	18.5	d
ZG 20	III	-	27	15.5	d
ZG 33	III	-	29	17	d
ZH 18	IV	-	27.5	16	d
ZH 19	IV	33	31	18	d
ZH 20	IV	-	27	16.5	d
		31	30.5	17.5	d
ZH 20	IV	-	34	20	d

Note: Numbered columns represent, in mm: (1) P_1-P_4, (2) M_1-M_3, (3) length of M_1. Lettered column d/w = domestic or wild.

Table 5.29. Dog and Wolf Measurements

Mandible

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	d/w
KL 107	II	-	-	16	17	78	3.5	13	32	30.5	18	d
KL 109	II	-	-	15.5	16	72.5	3	12	28	30	19	d
KL 113	II	103	43.5	14	15	72	4	11	30.5	30	19.5	d
KL 117	II	-	-	16	18.5	83x	3x	13	34	33.5	21	d
MMd 61	III	114x	-	16	17.5	76x	4x	14	32	30.5	18	d
MM 50	III	117	49	16	-	80.5	5	13	34	31	18	d
MM 53	III	107	-	16	19	81x	4	13	35	34x	20.5	d
PO/C 33	V	-	-	16	20	81	4	12	34	31.5	19	d
PO/C 32	V	131x	54	17.5	22	89x	4x	15	36	34	20	d
QO 8	V	116x	-	14	19	78x	4x	13	33.5	29.5	17.5	d
		-	-	17.5	21	87x	6x	15	35	33	20	d
QN 7	V	116	48.5	16.5	19	79	-	-	33	31	19	d
		-	-	15.5	17.5	83x	-	13	36	31	18	d
		-	-	17	19.5	88x	-	15.5	37	33	19	d
ROc 41	V	132	-	17.5	21	89.5	5	15	37	34	21	d
ZA 8	V	131.5	52.5	17.5	20	88	4	15.5	35.5	35	20.5	d
ZA 38	III	111	44.5	15	16.5	79	4.5	12	31	31	18	d
ZA 47	III	102x	41	13.5	-	72	4	13	-	-	-	d
ZA 54	II	-	38.5	-	15	-	-	-	33	30	19	d
ZA 62	I	-	49	16	19	-	-	-	35	32.5	19.5	d
ZE 68	IV	128	49	16	19.5	89	4.5	15	34.5	33	20	d
ZG 15	III	-	-	15x	20	84x	5x	12x	37x	32	22	d
ZG 29	III	-	-	25	-	-	-	-	50	-	31	w

Note: Numbered colums represent, in mm: (1) length to angulus, (2) height to processus coronoideus, (3) height at P_1, (4) height at M_1, (5) length of row of teeth, (6) length of incisor row, (7) length of diastema, (8) P_1-P_4 (9) M_1-M_3, (10) length of M_1. Lettered column d/w = domestic or wild. x indicates approximation.

Atlas

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	d/w
JL 13	I	8	14	33.5	26.5	64	24	d
KL 111	II	7	12.5	32	24	55x	19.5	d
KL 120	II	7	9.5	29	22.5	56	19	d
MM 43	III	6.5	11.5	34.5	26	68.5	22.5	d
		6.5	13.5	32.5	26.5	-	21	d
MM 50	III	6	13	31.5	27	52	23	d
MM 52	III	7	11	32	26	-	22	d
MMb 60	III	8.5	9	35	25.5	-	22	d
ZA 46	III	7	13	32	25	-	22.5	d
ZA 48	III	6.2	12	27.5	24	-	19.5	d

Note: Numbered columns represent, in mm: (1) length of ventral arch, (2) length of dorsal arch (3) breadth of cranial articular surface, (4) breadth of caudal articular surface, (5) greatest breadth, (6) greatest height. x indicates approximation. Lettered column d/w = domestic or wild.

Scapula

Context	Phase	(1)	(2)	(3)	(4)	d/w
LL 5	II	-	19	24	14x	d
MM 41	III	116	23.5	27	16	d
MM 43	III	-	21	-	18	d
MMd 66	III	-	19	22	13	d
PO/D 34	V	-	23.5	27.5	17.5	d
PO/E 66	V	-	-	28	-	d
QN 6	V	-	19.5	22.5	14.5	d
ROc 41	V	-	24	28.5	17.5	d
ROc 46	V	-	-	34x	21.5	w
ROc 61	IV	-	24	28	16.5	d
ZA 38	III	-	19	22	13.5	d
ZA 57	II	-	18	21	13	d
ZD 9	IV	-	21.5	-	16.5	d
ZG 40	II	-	18	22x	13	d

Note: Numbered columns represent, in mm: (1) greatest length, (2) breadth of collum, (3) breadth of angulus articularis, (4) diameter of facies articularis. x indicates approximation. Lettered column d/w = domestic or wild.

Table 5.29. Dog and Wolf Measurements

Epistropheus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	d/w
KL 120	II	36	9.5	6.5	21	13	-	11	9	26.5	d
KL 151	I	42x	12	7	29	17	-	13	-	34.5	d
ML 116	III	42	10	7.5	24	13.5	-	12	9	30.5	d
MM 16	III	40	10.5	7	25	15	-	13	9	29	d
MM 40	III	38	9.5	7	25	15	-	12	8.5	29	d
MMa 63	III	38	10	7	23.5	14	31	11.5	9	29	d
MMd 66	III	39x	10	6	22	14	-	11	-	30	d
QO 8	V	42.5	10	7	27.5	16	-	14.5	9	-	d
ZE 63	IV	46	12.5	7	28	18	-	14.5	12.5	-	d
ZG 23	III	47.5	12.5	8	29.5	17.5	37.5	15	13	-	d
ZG 34	II	39	10	7	25	15	-	12	10	30	d

Note: Numbered columns represent, in mm: (1) length of body, (2) length of dens, (3) breadth of dens, (4) breadth of caput craniales, (5) breadth of fossa caudalis, (6) greatest breadth, (7) height of caput craniales, (8) height of fossa caudalis, (9) greatest height. x indicates approximation. Lettered column d/w = domestic or wild.

Humerus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	d/w
KL 120	II	-	-	-	21.5	-	-	17	d
LL 4	II	-	-	-	25	-	-	20x	d
LL 10	II	-	-	-	24	-	-	-	d
MM 10	IV	-	-	-	46	-	-	35	w
MM 11	III	-	-	-	29.5	-	-	23	d
MM 16	III	-	-	-	26.5	-	-	20.5	d
MM 20	III	-	-	11.5	27.5	-	13.5	21.5	d
MM 40	III	-	-	-	29	-	12.5	22.5	d
MMc 60	III	-	-	10.3	26x	-	11	21x	d
MMb 60	III	-	-	9	22.5	-	8	18.5	d
PN 5	V	-	-	11	28	-	12	23	d
PO/B-D 55	V	-	-	10.5	27.5	-	11.5	22	d
PO 68	V	-	-	11.5	28	-	12	22	d
QN 7	V	-	-	-	28	-	-	22	d
ROc 34	V	-	-	-	31.5	-	-	-	d
ROc 67	IV	-	-	11.5	29	-	11	23x	d
ZA 38	III	-	24.5	-	-	33	-	-	d
ZA 54	II	115.5	-	8.5	22	29	10.5	18	d
ZE 58	IV	-	27	-	-	37	-	-	d
ZG 32	III	132.5	24.5	11	26	33	11.5	22	d
ZH 7	IV	139	22.5	10.5	26	32	10	22	d
ZH 21	IV	152	-	11.5	30.5	-	11.5	25	d

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter. x indicates approximation. Lettered column d/w = domestic or wild.

Table 5.29. Dog and Wolf Measurements

Radius

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	d/w
MM 20	III	143.5	16	11	21	11	6	12.5	d
MM 27	III	-	14.5	-	-	9.3	5.5	-	d
		-	15	-	-	9.8	6	-	d
MM 38	III	-	-	-	18	-	-	10.5	d
MM 51	III	-	-	-	19	-	-	11	d
MM 53	III	-	14.5	10	-	10	5.5	-	d
PN/C 87	V	-	-	-	20	-	-	11.5	d
PN south end of N-S balk	V	-	-	13	24.5	-	6.5	15	d
PN/E-F balk Bb3	V	-	17	13	-	11.5	6	-	d
PO 9	V	-	15	11	-	10	6	-	d
QN 6	V	-	-	-	20	-	-	11.5	d
QN 8	V	-	18	12.5	-	12	6	-	d
		-	-	-	18	-	-	10	d
ZA 17	V	158'	-	12	23	-	7	13	d
ZA 38	III	131	14	10	18	9	5	10	d
		-	15	10.5	-	10	5	-	d
ZA 50	II	-	14.5	9	-	9.5	15.5	-	d
ZE 78	IV	139	15	8.5	18	9.5	5	10.5	d
ZE 83	IV	-	14	9.5	-	9	4.5	-	d
ZJ 29	III	-	-	-	15	-	-	8	d

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter. ' indicates approximation. Lettered column d/w = domestic or wild.

Femur

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	d/w
ML 16	II	-	11	26	-	10.5	27	d
MM 20	III	32	-	-	16	-	-	d
MM 21	III	31	-	-	17	-	-	d
MM 50	III	33.5	12	-	20	12	-	d
MMb 60	III	-	-	20	-	8	-	d
MMa 63	III	28	11	-	18	-	-	d
PN/F 61	V	32.5	-	-	-	-	-	d
QN 8	V	35.5	-	-	20	-	-	d
		36	-	-	18	-	-	d
ROc 41	V	-	13	29.5	-	13	33	d
ZA 44	III	32.5	-	-	16	-	-	d
ZA 57	II	25.5	-	-	14	-	-	d
ZG 14	III	23	9	-	11	-	-	d
ZG 18	III	-	-	24	-	-	27	d

Note: Numbered columns represent, in mm; (1) proximal breadth, (2) smallest breadth, (3) distal breadth (4) proximal diameter (5) smallest diameter (6) distal diameter. Lettered column d/w = domestic or wild.

Tibia

Context	Phase	(1)	(2)	(2)	(4)	(5)	(6)	(7)	d/w
JL 7	I	-	25	-	-	25	-	-	d
JL 17	I	-	-	8.5	16	-	7.5	11	d
KL 112	II	-	-	10	16.5	-	9	12.5	d
KL 113	II	-	-	-	15.8	-	-	11	d
		-	-	10.2	17	-	9	12.5	d
KL 133	I	-	25.5	10	17	26.5	9.5	12.5	d
		-	25.5	-	-	27	-	-	d
MM 27	III	-	-	-	19	-	-	15.5	d
MM 40	III	136	-	10	17	-	8.5	12.5	d
MMb 63	III	-	-	11	19	-	10	15	d
PO 163	V	-	-	12	20	-	10	15	d
QO 8	V	-	-	-	27.5	-	-	19.5	w
ROc 42	V	-	-	-	21	-	-	15.5	d
ZA 8	V	-	-	-	22	-	-	16.5	d
ZA 38	III	143.5	24.5	10.3	17	-	9	12	d
ZE 70	IV	-	-	-	20.5	-	-	15.5	d
ZE 80	IV	-	-	11	18.5	-	9	14	d
ZH 19	IV	-	-	15	18.2	-	10	13	d
ZJ 45	II	-	-	9.5	17	-	9	13.5	d

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter. Lettered column d/w = domestic or wild.

Astragalus

Context	Phase	(1)	(2)	(3)	d/w
ROc 42	V	25	18.5	14	d

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest breadth, (3) greatest diameter. Lettered column d/w = domestic or wild.

Calcaneus

Context	Phase	(1)	(2)	(3)	d/w
ROc 42	V	40	17	18	d

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest breadth, (3) greatest diameter. Lettered column d/w = domestic or wild.

Table 5.30. Chamois Measurements

Horn-core

Context	Phase	(1)	(2)	(3)
MMb	III	25x	22	77x

Note: Numbered columns represent, in mm: (1) greatest diameter, (2) smallest diameter, (3) circumference of basis. x indicates approximation.

Table 5.31. Red Deer Measurements

Upper Row of Teeth

Context	Phase	(1)	(2)	(3)
PN/E 69	V	46	-	-
PN/E-F balk Bb 3	V	41	72	27
ZD 3	IV	-	62	25
ZE 64	IV	-	69	25
ZE 69	IV	-	64	24

Note: Numbered columns represent, in mm: (1) P_1-P_3, (2) M_1-M_3, (3) length of M_3.

Lower Row of Teeth

Context	Phase	(1)	(2)	(3)
MM 3	IV	34.5	-	-
MM 43	III	46.5	-	-
PN 7	V	49	78	32
PN/D 78	V	-	76	30
PN/C 87	V	-	-	32.5
		-	-	34
PN balk D-F	V	48	-	-
ZE 61	IV	54	-	-
		-	84	35.5
ZE 80	IV	51	-	-
ZH 6	IV	51	84	35.5
ZJ 32	III	50	-	-

Note: Numbered columns represent, in mm: (1) P_1-P_3, (2) M_1-M_3, (3) length of M_3.

Atlas

Context	Phase	(1)	(2)	(3)	(4)
KL 18	I	38.5	-	67.5	57
ZA 51	II	55	83.5	82	-
ZD 9	IV	49	77	72	60

Note: Numbered columns represent, in mm: (1) length of ventral arch, (2) breadth of cranial articular surface, (3) breadth of caudal articular surface, (4) greatest height.

Epistropheus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)
KL 132	I	123x	24	40	85.5	48	62
ZD 5	IV	-	24	38	80	-	53

Note: Numbered columns represent, in mm: (1) length of body, (2) length of dens, (3) breadth of dens, (4) breadth of caput craniale, (5) breadth of fossa caudalis, (6) height of caput craniale. x indicates approximation.

Scapula

Context	Phase	(1)	(2)	(3)
ML 42	I	37	57	40
ML 152	III	47	62x	-
MM 16	III	38.5	59	43
MM 41	III	-	62	49
MM 52	III	-	60x	42
ZA 33	III	-	62x	41x
ZE 59	IV	33	53.5	-
ZE 72	IV	-	61	41
ZE 98	II	-	59	40
ZH 17	IV	-	66	49x

Note: Numbered columns represent, in mm: (1) breadth of collum, (2) breadth of angulus articularis, (3) diameter of facies articularis. x indicates approximation.

Humerus

Context	Phase	(1)	(2)	(3)	(4)
ML 38	I	27.5	60	33	55
MM 12	III	-	66	-	61
MM 50	III	-	65	-	60
MM 52	III	-	73	-	65
PN 19	V	-	57	-	51
ZE 80	IV	27	59	35	54
ZG 23	III	-	61	-	59
ZH 24	IV	-	66	-	63

Note: Numbered columns represent, in mm: (1) smallest breadth, (2) distal breadth, (3) smallest diameter, (4) distal diameter.

Radius

Context	Phase	(1)	(2)	(3)	(4)
LL 9	II	-	51	-	38
ML 8	II	58.5	-	34	-
		-	50x	-	40x
MM 16	III	63	-	35	-
		-	47	-	35
		-	48	-	37
MM 20	III	58	-	34	-
MM 21	III	58.5	-	32	-
MM 36	III	-	52	-	39

continued on next page

Table 5.31. Red Deer Measurements

Radius (cont.)

Context	Phase	(1)	(2)	(3)	(4)
MM 43	III	58.5	-	32	-
		-	58x	-	44
MM 50	III	68.5	-	33x	-
MMd 60	III	-	55	-	43.5
PN/F 56	V	65	-	35.5	-
QN 5	V	-	57	-	42
ZA 31	IV	61.5	-	34	-
ZA 39	III	-	50	-	38
ZA 43	III	68	-	37.5	-
ZA 45	III	68	-	40	-
ZD 3	IV	-	58	-	45
ZD 5	IV	53	-	30x	-
ZD 8	IV	-	49.5	-	31.5
ZD 9	IV	55.5	-	30	-
		-	51	-	36
ZE 63	IV	-	50	-	39
ZE 64	IV	-	50.5	-	38
ZE 67	IV	-	50.5	-	-
ZE 68	IV	-	53	-	38
ZE 72	IV	55	-	31	-
		58.5	-	34	-
ZE 80	IV	-	53	-	41
ZG 13	III	-	48.5	-	36
ZG 19	III	-	49	-	36.5

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) distal breadth, (3) proximal diameter, (4) distal diameter. x indicates approximation.

Femur

Context	Phase	(1)	(2)	(3)	(4)
MM 19	III	89	-	54	-
ZE 72	IV	-	79	-	103

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) distal breadth, (3) proximal diameter, (4) distal diameter.

Tibia

Context	Phase	(1)	(2)	(3)	(4)
MM 19	III	-	55	-	42.5
MM 43	III	-	53	-	41
		-	54.5	-	43
MM 50	III	32	50.5	25.5	39
PO/A 52	V	-	48	-	38
QN 5	V	-	52	-	41
ZA 9	V	-	55	-	45
ZA 38	III	-	52.5	-	42
ZD 9	IV	-	57	-	44.5
ZH 21	IV	30	50	26	38.5

Note: Numbered columns represent, in mm: (1) smallest breadth, (2) distal breadth, (3) smallest diameter, (4) distal diameter.

Metacarpus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ML 7	II	-	-	-	48	-	-	31.5
ML 8	II	-	-	-	45	-	-	30.5
ML 116	III	270	43	26	44	34	19	28.5
MM 3	IV	-	-	-	49	-	22	30
MM 21	III	-	46.5	-	-	35	-	-
MM 27	III	-	50.5	-	-	35.5	-	-
MM 40	III	-	-	-	45	-	20	30x
		-	-	-	52	-	-	32
MM 41	III	-	42.5	-	-	30	-	-
		-	45.5	29	-	33	-	-
		-	-	-	45	-	23	30
MM 43	III	-	48	29	-	34	-	-
		-	-	-	46	-	-	30
MM 50	III	-	-	-	44	-	-	29
		-	-	-	45	-	21	29
MM 51	III	-	-	-	48.5	-	-	30.5
MM 54	III	-	42x	25	-	30.5	-	-
MMb 61	III	-	48.5	-	-	36	-	-
MMb		-	42.5	25	-	31	-	-
MMc 65	III	-	-	-	49.5	-	21.5	32
PO/A 53	V	-	-	-	47	-	-	31
ZA 38	III	-	50.5	-	-	39	-	-
ZD 9	IV	-	53.5	-	-	38.5	-	-
ZE 9	IV	-	47	-	-	34	-	-
ZE 65	IV	-	-	-	42.5	-	-	28.5
ZE 67	IV	-	48.5	-	-	35	-	-
ZE 69	IV	-	42	-	-	31	-	-
ZE 80	IV	-	-	-	43	-	19	28
ZE 84	III	-	-	-	48	-	-	32x
ZG 19	III	-	51	30.5	-	36.5	-	-
ZH 7	IV	-	-	-	46	-	20.5	29
ZJ 6	IV	-	39	-	-	33	-	-

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter. x indicates approximation.

Calcaneus

Context	Phase	(1)	(2)	(3)
KL 131	I	123	38	44
ML 116	III	136.5	43	53
Ml 151	III	118	29	54
MM 16	III	116	39	42
PN 4	V	110	37.5	44
PN 11	V	110	36	44
PO/C 33	V	125.5	43	46.5
PO/E 66	V	130	41	49
ROc 73	IV	134.5	43.5	48
ZE 64	IV	126	40	44

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest breadth, (3) greatest diameter.

Table 5.31. Red Deer Measurements

Astragalus

Context	Phase	(1)	(2)	(3)
ML 103	III	57	36	-
		64	42	36
ML 116	III	58	39	32.5
MM 18	III	60.5	40.5	34
MM 41	III	58	37	33
		60	35.5	33
		62	41.5	36
MM 43	III	53.5	-	-
		64.5	39	37
PN 2	V	58	37	32.5
ROc 65	IV	53.5	35x	31.5
ZA 28	IV	62	42	36
ZE 57	IV	55	36	30.5
ZH 19	IV	59	39	34
ZH 22	IV	58	39.5	-
ZJ 6	IV	55.5	36.5	31.5
ZJ 9	IV	61	38	33

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest breadth, (3) greatest diameter. x indicates approximation.

Metatarsus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
KL 105	II	-	38.5	-	-	41	-	-
MM 43	III	-	42.5	-	-	46	-	-
PO 159	V	311	37.5	25.5	48	44	24	30.5
ZA 41	III	-	45	29.5	-	47	-	-
ZD 9	IV	-	-	-	45	-	-	30
ZJ 6	IV	-	-	-	46	-	22	30
ZJ 13	IV	-	45	-	-	46	-	-

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diamter, (6) smallest diameter, (7) distal diameter.

Os Phalangis I

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
KL 120	II	52	22	19	22	27	15.5	18
KL 121	II	50.5	22	17	20.5	27	14.5	16.5
KL 134	I	55	22	17	21	27.5	15.5	17.5
KL 138	I	53.5	25	19.5	24	30.5	15.5	19
KL 141	I	51	22.5	16.5	21.5	28	15	19
LL 7	II	53	23.5	19	20.5	27.5	15	18
ML 151	III	51	22.5	17.5	20	27	15.5	18
ML 158	III	57	24.5	18.5	23	31	17	19.5
MM 11	II	51.5	23	-	21	27.5	16	19
MM 15	III/IV	53	22.5	18	22	17	15	18
		53	23.5	19	22.5	29	16	18
MM 16	III	55	24	18	23	29	16	19

Os Phalangis I (cont.)

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
MM 18	III	51	-	18	21	-	16	19
MM 21	III	50	22.5	18	20.5	26	15	18
MM 38	III	56	25	19.5	24.5	26	16.5	19
MM 39	III/IV	51x	22.5	17	21	28.5	15	16.5
MM 41	III	54.5	21.5	18	21	28.5	16	18
MM 43	III	50	22.5	18	21	28	16	18
		53	22.5	18	22	27.5	15.5	18.5
		57	27	21	24	31	17	-
MM 50	III	52	22	18	22	27.5	17	19
		53x	23	18.5	22	-	16.5	19.5
		54x	-	19.5	22	-	17	18.5
		56	25	22	24	30	18	20
MMb 60	III	54	22.5	18.5	22	26	16.5	19
MMc 60	III	49.5	21.5	18.5	20.5	27	15	17
MMc 63	III	59	-	19	23	-	17	20
MMc 65	III	56	25	20	24	31	17	20
PN/E-F balk Bb 3	V	53	21	17	19.5	26	15.5	17.5
PO 4	V	48	22	17.5	21	26	16	19
PO/D 35	V	54	24	19	22	30	16	18
ROc 67	IV	54	23	18.5	21.5	28	16.5	18
ZA 9	V	53	21	16	19	25.5	15.5	18.5
ZE 9	IV	51	-	17	21.5	-	15	17
ZE 55	IV	55	-	17.5	22	-	15	18
ZE 57	IV	52.5	23	18	21.5	29	14.5	17
ZE 59	IV	50.5	22	16.5	19.5	25.5	15.5	18
ZE 61	IV	49	20	16	19	25	15	17.5
		53	22	17	-	30	16	-
		53	23	18.5	22	28	17	19.5
ZE 64	IV	49	20.5	17	19.5	25.5	14.5	17
		57	25.5	19.5	23	30	17	19
ZE 65	IV	52.5	23	17.5	21.5	29.5	15.5	18.5
ZE 69	IV	51.5	23	18.5	21.5	29.5	15.5	18
ZE 70	IV	53	23	18	21.5	27	16	18.5
ZE 96	II	54	23	18.5	21.5	27	16.5	19.5
ZG 13	III	50	21	17	21	26	15	18
		52	22.5	16.5	21	26	15.5	19
ZG 13	III	53	-	16.5	20	-	15.5	17.5
ZH 19	IV	51	22	17.5	22	27.5	16	18.5
		51	23	17.5	21	28	15	17
ZH 20	IV	52	23	18.5	22	28.5	16.5	19
ZH 22	IV	49	21.5	16.5	20	27	14.5	17

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter. x indicates approximation.

Table 5.31. Red Deer Measurements

Os Phalangis II

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
KL 111	II	41.5	23.5	17	21.5	32	23	30
KL 115	II	42.5	24.5	18	22.5	31	22.5	30
KL 138	I	45.5	24.5	18	23.5	30.5	-	-
MM 3	IV	42.5	23.5	18	21	-	21	27.5
MM 5	IV	37.5	-	14.5	18.5	-	-	26
MM 11	III	39.5	21	16.5	18	-	19	24
MM 16	III	38	21	15.5	19	26	19	27
MM 41	III	38.5	-	15	18	-	19	25.5
		39	21.5	16	18	28	19	25.5
MM 43	III	40	23.5	18	20	29.5	20	26
		40.5	21.5	17	18	28	19.5	24.5
		41	22	16	17.5	28	19	25
		41	-	17	22	29	21	28.5
MM 50	III	41	21	16.5	19	27.5	19	25
MMb 60	III	43.5	24	17.5	20	30.5	20.5	-
MMc 65	III	40.5	23	17.5	19.5	29.5	19	25
ZH 17	IV	41.5	21.5	16.5	18.5	29	19.5	26.5
ZE 62	IV	42	22	17	18.5	28	20	26
ZE 63	IV	42	22	17.5	19.5	30.5	20	25.5
		42.5	-	-	22	-	-	-
ZE 67	IV	43	22	17	18	28.5	19	25
ZE 80	IV	45	26	20	22	30	22	28
ZG 12	IV	40	22	16	19.5	27.5	20.5	28
ZG 13	III	40	22	15	19	27.5	19.5	27
		40	22	16.5	20	29	20.5	27
ZG 18	III	42.5	-	17	-	29	22	-
ZG 25	III	39	21	16.5	18.5	27	19	25
		40.5	22	17	19	28	18	23.5
ZG 28	III	41	21	18	22	30	22	29.5
ZH 1	IV	44	24	17	20.5	30	20	27.5
ZH 17	IV	41.5	21.5	16.5	18.5	29	19.5	26.5
ZH 18	IV	41.5	21.5	16.5	20	-	21.5	29*

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter. * indicates approximation.

Os Phalangis III

Context	Phase	(1)	(2)	(3)
MM 50	III	52	24	27.5
ZA 48	III	50	19.5	33
ZE 62	IV	43	19	27
ZE 65	IV	45	19	25

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest breadth, (3) greatest diameter.

Table 5.32. Fallow Deer Measurements

Upper Row of Teeth

Context	Phase	(1)	(2)
PN/E-F balk Bb 3	V	36	-
PO/B 38	V	32	-
PO/A 54	V	33	-
PO/B-D/A-C 132	V	-	46

Note: Numbered columns represent, in mm: (1)P_1-P_3, (2) M_1-M_3.

Mandible

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
PN/E 67	V	24	26.5	-	-	35	-	-
PO/B 38	V	22.5	24	-	-	36.5	61	24.5
PN/E 69	V	23.5	25	7	58	35.5	-	-

Note: Numbered columns represent, in mm: (1) height at P_1, (2) height at M_1, (3) length of incisor row, (4) length of diastema, (5) P_1-P_3, (6) M_1-M_3, (7) length of M_3.

Lower Row of Teeth

Context	Phase	(1)	(2)	(3)
MM 16	III	35.5	60	25
PN/D 78	V	-	-	24
PN/C 87	V	-	-	24
PN/F 262	V	-	59	25.5
PO/B-D balk, 55	V	-	-	23
PO/E 66	V	-	-	24
PO/A-C 136	V	-	-	24
PO/B-A 138	V	-	-	23.5

Note: Numbered columns represent, in mm: (1) P_1-P_3, (2) M_1-M_3, (3) length of M_3.

Atlas

Context	Phase	(1)	(2)	(3)	(4)
PO/A 52	V	37	-	59	55
PO/C-D 135	V	39	42	65	59

Note: Numbered columns represent, in mm: (1) length of ventral arch, (2) length of dorsal arch, (3) breadth of cranial articular surface, (4) breadth of caudal articular surface.

Table 5.32. Fallow Deer Measurements

Epistropheus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)
PN/B 104	V	-	15	27	60	33	42
PO/B 38	V	93x	16	24.5	56	-	41x
PO/E 66	V	-	15	27	56	-	37.5
ZE 72	IV	-	18	27.5	57	-	41

Note: Numbered columns represent, in mm: (1) length of body, (2) length of dens, (3) breadth of dens, (4) breadth of caput craniale, (5) breadth of fossa caudalis, (6) height of caput craniale. x indicates approximation.

Scapula

Context	Phase	(1)	(2)	(3)
PO/B-A 138	V	-	43.5	27.5
PO 163	V	-	48.5	-
ZD 6	IV	21	-	30x
ZE 68	IV	22	44	30x
ZE 72	IV	-	49	34.5

Note: Numbered columns represent, in mm: (1) breadth of collum, (2) breadth of angulus articularis, (3) diameter of facies articularis. x indicates approximation.

Humerus

Context	Phase	(1)	(2)	(3)	(4)
PN/A-C balk 80	V	17.5	38	21	35.5
PN/E 69	V	-	39.5	-	36.5
PO/B-D/ A-C 132	V	-	41	-	38
QN 6	V	-	38.5	-	36.5
ZA 29	IV	-	39.5	-	36
ZA 31	IV	-	39	-	-
ZE 63	IV	-	38.5	-	36.5
ZH 16	IV	-	37.5	-	32
ZH 22	IV	21	44	26	41

Note: Numbered columns represent, in mm: (1) smallest breadth, (2) distal breadth, (3) smallest diameter, (4) distal diameter.

Radius

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)
MM 6	IV	41.5	-	-	24	-	-
MM 10	IV	42	-	-	26	-	-
MM 18	III	-	-	38	-	-	27
PO/A-C balk 25	V	43.5	-	-	24.5	-	-
PO/B 36	V	39	23	-	23	11.5	-

Radius (cont.)

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)
PO/A 52	V	-	-	40.5	-	-	29x
QN 6	V	-	-	34.5	-	-	25.5
QO 4	V	38	-	-	21.5	-	-
ZA 24	IV	-	-	39	-	-	29
ZD 5	IV	38	21.5	-	23	12	-
ZE 68	IV	41.5	-	-	23	-	-
ZH 16	IV	44	-	-	26	-	-
ZH 25	IV	37	-	-	22	-	-
ZH surface	IV ?	-	-	34	-	-	25

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) smallest breadth, (3) distal breadth, (4) proximal diameter, (5) smallest diameter, (6) distal diameter. x indicates approximation.

Metacarpus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)
MM 7	IV	-	-	30.5	-	-	20.5
PN 7	V	-	-	32.5	-	13	21
PN 8	V	31	20	-	24	-	-
PO/A 54	V	-	-	29	-	-	19
ZA 8	V	-	-	32	-	15	21
ZD 6	IV	31x	-	-	22x	-	-
ZH 13	IV	-	-	29.5	-	-	19.5
ZJ 9	IV	-	-	31	-	13	20.5

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) smallest breadth, (3) distal breadth, (4) proximal diameter, (5) smallest diameter, (6) distal diameter.

Femur

Context	Phase	(1)	(2)
ZE 80	IV	56	72

Note: Numbered columns represent, in mm: (1) distal breadth, (2) distal diameter.

Tibia

Context	Phase	(1)	(2)	(3)	(4)
PN 2	V	-	36	-	29.5
PN/E 67	V	-	36	-	-
QO 8	V	21.5	35	18	27.5
ZE 68	IV	-	35	-	28x
ZH 13	IV	24	36.5	19	29x

Note: Numbered columns represent, in mm: (1) smallest breadth, (2) distal breadth, (3) smallest diameter, (4) distal diameter.

Table 5.32. Fallow Deer Measurements

Astragalus

Context	Phase	(1)	(2)	(3)
PN 4	V	43	28	25
PN 7	V	39	25	23
PN 23	V	42	27	25.5
PO/A 53	V	40	25.5	23
QN 5	V	44	29	26
QN 6	V	41	27	24
QO 6	V	43	28	26.5
ZE 54	IV	41.5	27	23.5
ZH 10	IV	40x	25x	-
ZH 11	IV	40	26.5	23

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest breadth, (3) greatest diameter. x indicates approximation.

Calcaneus

Context	Phase	(1)	(2)	(3)
PO/A-C 136	V	86	28.5	28
ZE 72	IV	93.5	32.5	33

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest breadth, (3) greatest diameter.

Metatarsus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)
MM 16	III	-	-	32.5	-	15	22
PN 5	V	-	-	35	-	-	22.5
PN/E 69	V	-	-	32	-	15	20.5
PN/C 80	V	27	16	-	29.5	-	-
PO/A-C 136	V	-	-	31.5	-	-	20
QN 5	V	-	-	30	-	13	20.5
QN 8	V	-	-	33.5	-	-	21.5
SL 12	IV	-	-	31x	-	-	19
ZD 5	IV	31.5	-	-	34	-	-
ZE 61	IV	-	-	32x	-	-	21
ZE 67	IV	-	-	34	-	16	21.5
ZE 72	IV	27	15.5	-	30	-	-
		29.5	-	-	32	-	-
ZH 18	IV	28	-	-	31x	-	-
ZH 22	IV	32	-	-	33	-	-
		-	-	35	-	16	22
ZH 23	IV	28	16	-	30	-	-

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) smallest breadth, (3) distal breadth, (4) proximal diameter, (5) smallest diameter, (6) distal diameter. x indicates approximation.

Os Phalangis I

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
MM 19	III	44	17	13	16	20.5	12.5	14
PN/E 67	V	44.5	17.5	12	14.5	21	12	13.5
PN/D 80	V	43	16.5	11	13.5	20.5	10.5	12.5
PN/C 87	V	43x	16	12	14	19	11.5	-
PN/E-F balk Bb3	V	44.5	16.5	11.5	14.5	21.5	11	13
PN 7	V	44.5	16.5	11.5	14.5	20.5	13	14.5
PO 5	V	43.5	17	11.5	-	21	13	-
PO 9	V	45	17	11.5	14.5	22	11.5	13
PO 48	V	43	16	11.5	14	20	11.5	13
PO/B-D balk 57	V	39	16	-	13.5	19.5	11	12.5
PO/B-D balk 58	V	46	17.5	12	15	21.5	11.5	13
QN 2	V	44	16	12	14	20	12	13
QN 5	V	45	16	12	14.5	20	11.5	13
QN 7	V	42	16	12	14.5	19	11	13
QN 7	V	48	19	12.8	17	24	12.8	14
ZA 17	V	46.5	19.5	15	19.5	25	14.5	17.5
ZA 44	III	42	17.5	-	17	20	13	15
ZD 5	IV	47	21	16.5	20	25.5	15	18.5
ZH 10	IV	46.5	17	11	14.5	22	11.5	13
ZH 11	IV	42.5	16	12	14.5	19	11	13.5
ZH 18	IV	43.5	17	12	15	20.5	11.5	13.5

Note: Numbered columns represent, in mm: (1) sagittal length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter. x indicates approximation.

Os Phalangis II

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ML 152	III	30	13	9.5	9.5	16	12	14
PN/E-F balk Bb 3	V	29	15	10.2	11	20	13.5	-
PO 6	V	33	16.5	12	13	22	14	17.5
QN 6	V	32.5	14	11	12	20	13	-
ZA 76	I	32.5	17	12	13	22	14	18.5
ZE 57	IV	33.5	14.5	11	12	21	13.5	18
ZE 65	IV	29.5	14	10	11.8	18	12	15.5
ZH 22	IV	29	16	11	13	19.5	14	19
ZH 20	IV	33.5	16	11.5	13	21.5	13.5	18

Note. Numbered columns represent, in mm: (1) sagittal length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter.

Table 5.32. Fallow Deer Measurements

Os Phalangis III

Context	Phase	(1)	(2)	(3)
PN/A 90	V	34	14.5	19

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest breadth, (3) greatest diameter.

Scapula

Context	Phase	(1)	(2)	(3)
MM 3	IV	19	29.5	22
MMc 65	III	-	28	21
ROc 5	V	18	28	21
ZE 55	IV	-	28	20
ZE 58	IV	17	27	21.5

Note: Numbered columns represent, in mm: (1) breadth of collum, (2) breadth of angulus articularis, (3) diameter of facies articularis.

Table 5.33. Roe Deer Measurements

Upper Row of Teeth

Context	Phase	(1)	(2)
KL 132	I	-	36
PN/F 262	V	24	-
QN 7	V	-	35

Note: Numbered columns represent, in mm: (1) P_1-P_3, (2) M_1-M_3.

Humerus

Context	Phase	(1)	(2)
JL 13	I	30	28x
KL 134	I	30	27.5
ZE 8	IV	27	26x
ZE 55	IV	28.5	27x

Note: Numbered columns represent, in mm: (1) distal breadth, (2) distal diameter. x indicates approximation.

Lower Row of Teeth

Context	Phase	(1)	(2)	(3)
JL 13	I	25.5	-	-
KL 133	I	-	38x	-
KM 18	II	-	37	15
MM 40	III	-	41	17
PO/A-C 136	V	-	37.5	16
ZE 61	IV	28.5	-	-
		30	-	-
ZE 62	IV	28	-	-
		28	-	-
ZE 63	IV	-	35	16
ZE 64	IV	28.5	40	16
		29	-	-
ZE 65	IV	28	-	-

Note: Numbered columns represent, in mm: (1) P_1-P_3, (2) M_1-M_3, (3) length of M_3. x indicates approximation.

Radius

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ML 18	II	-	25	-	-	15.5	-	-
MH 18	III	-	-	-	25x	-	-	-
MM 21	III	-	26	-	-	16	-	-
MM 34	III/IV	-	27	-	-	18.5	10.5	-
MM 43	III	-	26	17.5	-	17	10	-
		-	27	-	-	17	-	-
QN 8	V	174	26.5	15	25.5	17	9	19
ROc 7	V	-	26	-	-	16	-	-
ZE 66	IV	-	27.5	18	-	17.5	10.5	-

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter. x indicates approximation.

Epistropheus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
MM 43	III	56.5	9.5	19	32	19	22	16

Note: Numbered columns represent, in mm: (1) length of body, (2) length of dens, (3) breadth of dens, (4) breadth of caput craniale, (5) breadth of fossa caudalis, (6) height of caput craniale, (7) height of fossa caudalis.

Metacarpus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)
JL 14	I	22	-	-	17	-	-
KL 133	I	22	-	-	16.5	-	-
MM 12	III	21	-	-	15	-	-
MMd 63	III	-	-	23	-	9.5	14.5
ZE 65	IV	-	-	21.5	-	9	14
ZH 23	IV	21	12	-	15	-	-
ZJ 29	III	-	-	22	-	10	14.5

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) smallest breadth, (3) distal breadth, (4) proximal diameter, (5) smallest diameter, (6) distal diameter.

Table 5.33. Roe Deer Measurements

Tibia

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)
MM 50	III	-	-	28	-	-	22.5
QO 8	V	43	-	-	49	-	-
ZE 72	IV	-	16	25	-	12.5	20

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) smallest breadth, (3) distal breadth, (4) proximal diameter, (5) smallest diameter, (6) distal diameter.

Metatarsus

Context	Phase	(1)	(2)	(3)	(4)
KM, 20	II	21	-	-	-
PN, 11	V	-	24.5	12	16.5
QN, 6	V	-	23.5	11	16
ZD, 5	IV	21x	-	-	-

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) distal breadth, (3) smallest diameter, (4) distal diameter. x indicates approximation.

Os Phalangis I

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ZE, 55	IV	36	11.5	8.5	10.3	15.5	8	9
		36.5	12	8.2	10.3	15.2	8	9
		39.5	12.5	9	11	16.3	8.3	9.5

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter.

Os Phalangis II

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ZE 63	IV	26	11	7.5	8	15	10	13

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter.

Table 5.34. Wild Cat Measurements

Lower Row of Teeth

Context	Phase	(1)	(2)
ML, 151	III	14	8.5
PO/E, 66	V	13.5	8.5

Note: Numbered columns represent, in mm: (1) P_1-P_2, (2) length of M_1.

Table 5.35. Marten Measurements

Lower Row of Teeth

Context	Phase	(1)	(2)
ZE 61	IV	14	10

Note: Numbered columns represent, in mm: (1) P_1-P_1, (2) M_1-M_2.

Table 5.36. Badger Measurements

Mandible

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ML 152	III	90.5	38.5	15.5	52	2	9.5	18.5	22	15.5
ZA 23	IV	82	34.5	12.7	48	2	7.5	18.5	19	13.2

Note: Numbered columns represent, in mm: (1) length to angulus, (2) height to processus coronoideus, (3) height at M_1, (4) length of row of teeth, (5) length of incisor row, (6) length of diastema, (7) length of premolar row, (8) length of molar row, (9) length of M_1.

Humerus

Context	Phase	(1)	(2)	(3)	(4)
ML 152	III	10	31.5	14	19

Note: Numbered columns represent, in mm: (1) smallest breadth, (2) distal breadth, (3) smallest diameter, (4) distal diameter.

Table 5.37. Brown Bear Measurements

Humerus

Context	Phase	(1)	(2)
MM 7	IV	100	64

Note: Numbered columns represent, in mm: (1) distal breadth, (2) distal diameter.

Tibia

Context	Phase	(1)	(2)
ZD 8	IV	53	33.5

Note: Numbered columns represent, in mm: (1) distal breadth, (2) distal diameter.

Table 5.38. Fox Measurements

Lower Row of Teeth

Context	Phase	(1)	(2)	(3)
KL 128	I	34.5	-	16
KM 13	II	32	-	13.3
LL 6	II	32	-	15
KMb 61	III	-	25.5	14.5
MMd 63	III	-	26	14
PN/E 62	V	32	27	14.5
PO 8	V	31.5	26.5	14.5
QO 8	V	30.5	28	15.5
ZH 64	IV	31.5	27	15

Note: Numbered columns represent, in mm: (1) P_1-P_4, (2) M_1-M_3, (3) length of M_1.

Scapula

Context	Phase	(1)	(2)	(3)
PO 8	V	16.5	18.5	12

Note: Numbered columns represent, in mm: (1) breadth of collum, (2) breadth of angulus articularis, (3) diameter of facies articularis.

Radius

Context	Phase	(1)	(2)	(3)	(4)
MM 16	III	11.5	7.5	7	4.5

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) smallest breadth, (3) proximal diameter, (4) smallest diameter.

Femur

Context	Phase	(1)	(2)
PO 8	V	24.5	13.5

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) proximal diameter.

Table 5.39. Beaver Measurements

Humerus

Context	Phase	(1)	(2)	(3)	(4)	(5)	(6)	(7)
MM 43	III	-	-	11	26	-	11	13
PN 5	V	-	-	10	26	-	10	13
ZA 28	IV	96	27	12	31.5	25	13	-
ZE 65	IV	92	26	11.5	38	22	11.5	12

Note: Numbered columns represent, in mm: (1) greatest length, (2) proximal breadth, (3) smallest breadth, (4) distal breadth, (5) proximal diameter, (6) smallest diameter, (7) distal diameter.

Radius

Context	Phase	(1)	(2)	(3)	(4)
ROc 13	V	11	7	8x	5

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) smallest breadth, (3) proximal diameter, (4) smallest diameter. x indicates approximation.

Femur

Context	Phase	(1)	(2)
MMd 60	III	44x	-
PN/A-C, balk 80	V	42.5	23

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) proximal diameter. x indicates approximation.

Table 5.40. Hare Measurements

Scapula

Context	Phase	(1)	(2)	(3)
ML 109	III	8	16	12
ML 151	III	7	13.5	12.5
PO 8	V	7.5	-	10.5

Note: Numbered columns represent, in mm: (1) breadth of collum, (2) breadth of angulus articularis, (3) diameter of facies articularis.

Humerus

Context	Phase	(1)	(2)	(3)	(4)
KL 117	II	6	13	6	10.2
KL 129	I	7	13	6.7	10
KM 18	II	7	12.5	6	10
ML 27	I	6	12.5	6	9.2
MM 16	III	-	12.5	-	10
MM 19	III	-	13	-	10
MM 21	III	-	12.5	7	10
MMd 63	III	6.3	12	6.3	10.3
		-	12.5	-	10
QN 2	V	6	13	6.5	10

Note: Numbered columns represent, in mm: (1) smallest breadth, (2) distal breadth, (3) smallest diameter, (4) distal diameter.

Radius

Context	Phase	(1)	(2)	(3)	(4)
KL 109	II	10	-	6.5	-
MM 21	III	8.5	5.2	6	3.5

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) smallest breadth, (3) proximal diameter, (4) smallest diameter.

Femur

Context	Phase	(1)	(2)	(3)	(4)
KL 113	II	-	20	-	18
MM 16	III	30	-	13	-

Note: Numbered columns represent, in mm: (1) proximal breadth, (2) distal breadth, (3) proximal diameter, (4) distal diameter.

Tibia

Context	Phase	(1)	(2)	(3)	(4)
PN/C 89	V	8	16.5	7	10.5

Note: Numbered columns represent, in mm: (1) smallest breadth, (2) distal breadth, (3) smallest diameter, (4) distal diameter.

Calcaneus

Context	Phase	(1)	(2)	(3)
ZG 35	II	34	12	12.5

Note: Numbered columns represent, in mm: (1) greatest length, (2) greatest breadth, (3) greatest diameter.

6.
Development of the Settlement Pattern

Brian Blouet

The reconstruction of settlement patterns in prehistoric times presents a number of problems. Evidence may have been completely destroyed by farming activity, erosion, or possibly buried under recently deposited gravels (see Davidson, this volume fig. 3.6, showing areas of active alluvication since the period of prehistoric settlement). There is a danger that we may recognize only those sites which have a long history of occupation and which identify themselves by the diagnostic toumba form. Possibly there were sites occupied for short periods, or on a seasonal basis, of which no trace remains today. It is feasible to conceive of a situation in which we identify the nucleated elements in a settlement pattern but fail, for want of evidence, to recognize the dispersed elements of a complex pattern. The above are some of the obvious dangers involved in settlement pattern reconstruction, and virtually every statement which follows should carry the qualifying phrase, "from the evidence available to us it would seem. . . ."

We should note two additional liabilities in the source material used. First, while the plain of Drama was searched for sites by a small team of geographers-geomorphologists, it was not systematically scoured. Ideally, the latter would involve the division of the region into quadrants, each of which should be perused for traces of settlement, however small. Second, evidence of occupation at various periods, defined in terms of the Sitagroi sequence, was gathered by means of surface pottery surveys, with all materials being identified later by archaeologists. There are limits to surface surveys, and examination of the maps (figs. 6.1-6.5) will show that the most persistent elements in the settlement patterns discussed here are Sitagroi and Dikili Tash, the two sites which have undergone excavation.

PHASE I

Analysis indicates that the phase I settlements occupied what may be termed prime sites and that they were located in such a way that the available territory was divided up fairly rationally among the various communities (fig. 6.1).

In phase I a prime settlement site contained the following elements. It would be close to surface water, ideally at a spring flowing into or giving rise to a stream but, failing that, an actively flowing watercourse. Close to the stream would be a low terrace on which dwellings could be sited above the spate level of the watercourse but not so high as to involve a tiresome journey between the village and the water supply. The bottomlands associated with the stream would be relatively wide, allowing the development of riverine environments where fish, amphibians, snakes, and shellfish could be caught, and small plots of crops raised, possibly aided by primitive irrigation techniques, on patches of alluvial soil. At no great distance from the site would be relatively light-soiled lands, associated with the alluvial fans sloping down from the encircling hills,

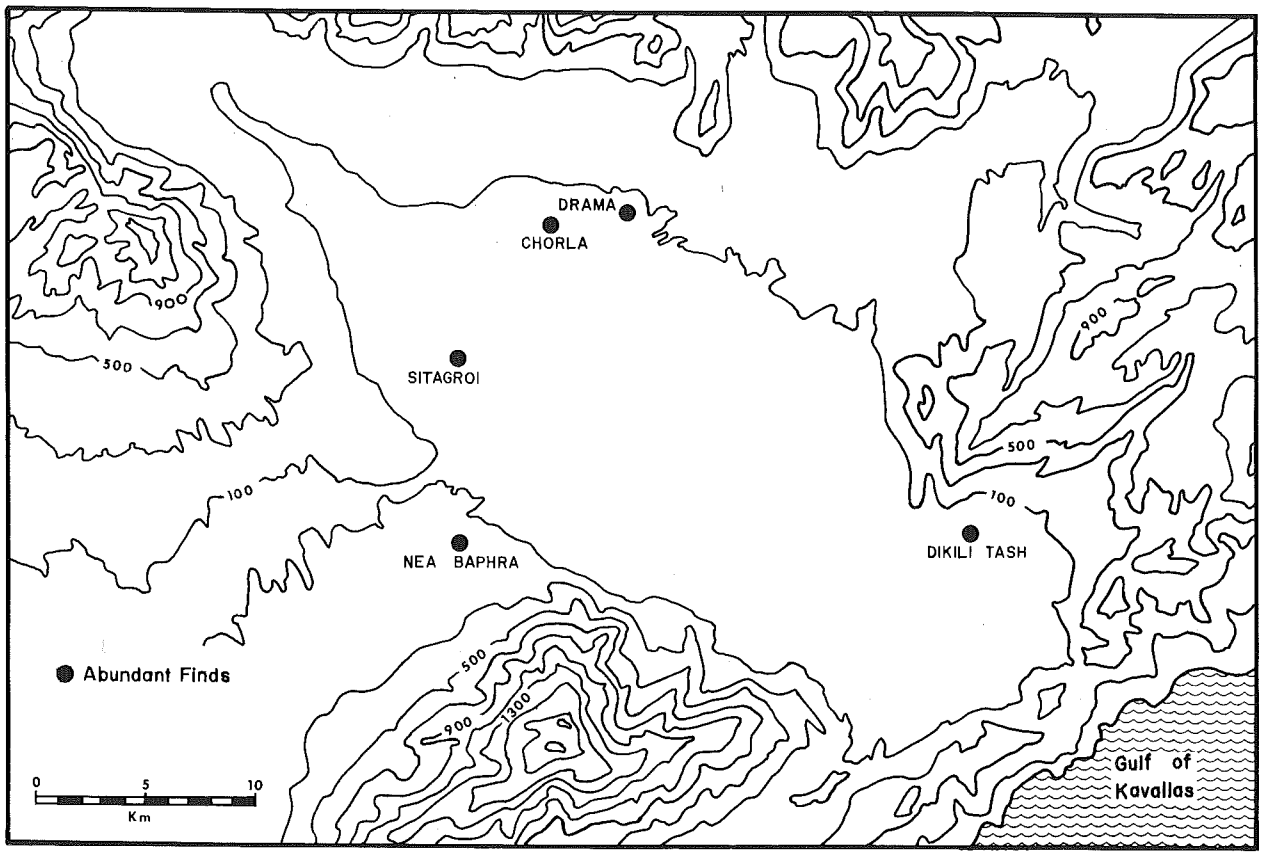


Figure 6.1. Distribution of sites in the Drama Plain, phase I (on the basis of available survey data).

on which more extensive forms of cultivation could be conducted. Naturally, not every site utilized had all these desirable qualities.

The siting of a settlement was not simply a matter of finding a location resembling that outlined above. A compromise had to be struck between the immediate site and the location of the village in relation to its own territory and to the territory and position of neighboring settlements.

If the position of the phase I settlements on the streams is examined, some idea of the balancing of siting factors can be gained. In neolithic terms there were probably numerous important environmental subdivisions (or ecological niches) on, or in proximity to, the plain of Drama. Surrounding the region were the uplands which offered opportunities for the hunting of animals. Sloping down from the uplands were the alluvial fans with soils which were probably easily worked with the cultivation tools available. There were important variations within this subdivision depending on the degree of slope, coarseness of the alluvial material (which lessened with increasing distance from the valley sides), and the availability of ground water. Toward the center of the plain was the limestone region, possessing soils which were rather heavier but potentially richer than those found on the fans, and this region was probably more difficult to clear of vegetation and to till than were the fans.

In the south of the plain were the marshlands with their relatively wet soils. The area provided opportunities for fishing, collecting, and hunting. Additionally, there were the streams themselves, which probably grew richer in quantitative faunal terms as they flowed away from their source springs.

All locations along a stream were not equally

good as settlement sites. Sites were obviously selected where there were a number of differing ecological niches within reasonable proximity. Sitagroi, Chorla, Drama, and Dikili Tash were all located in positions from which it was possible to exploit alluvial fans, riverine lands, marshes, and limestone areas. In addition, the phase I settlements were arranged in relation to one another so that the competition among settlements was reduced to a minimum (Hudson 1964).

The phase I sites were carefully selected, and they became highly persistent elements in the subsequent phases. An exception is Chorla, which may have moved to Mylopotamos over a period of time. Mylopotamos, which appears in phase II, occupied a good site, in the terms outlined above, and was closer to the alluvial fan lands than Chorla. Such lands may have become increasingly important for cultivation in phases II and III.

PHASE II

Phase II is marked by a considerable expansion in the number of settlements and the utilization of a greater variety of locations (fig. 6.2). The most likely reason for this development is that there was an increase in the intensity of agricultural land-use which resulted in a greater production of food. The latter allowed population numbers to increase, and the former made it desirable to establish new settlements.

In general terms, the sites occupied by settlements originating in phase II are not as well located in relation to the differing habitats of the plain as those founded in phase I. Interestingly, some of these settlements are not close to streams, for example, Mikri Toumba. Such a settlement must have had a well or access to a spring which has since ceased to flow. Davidson

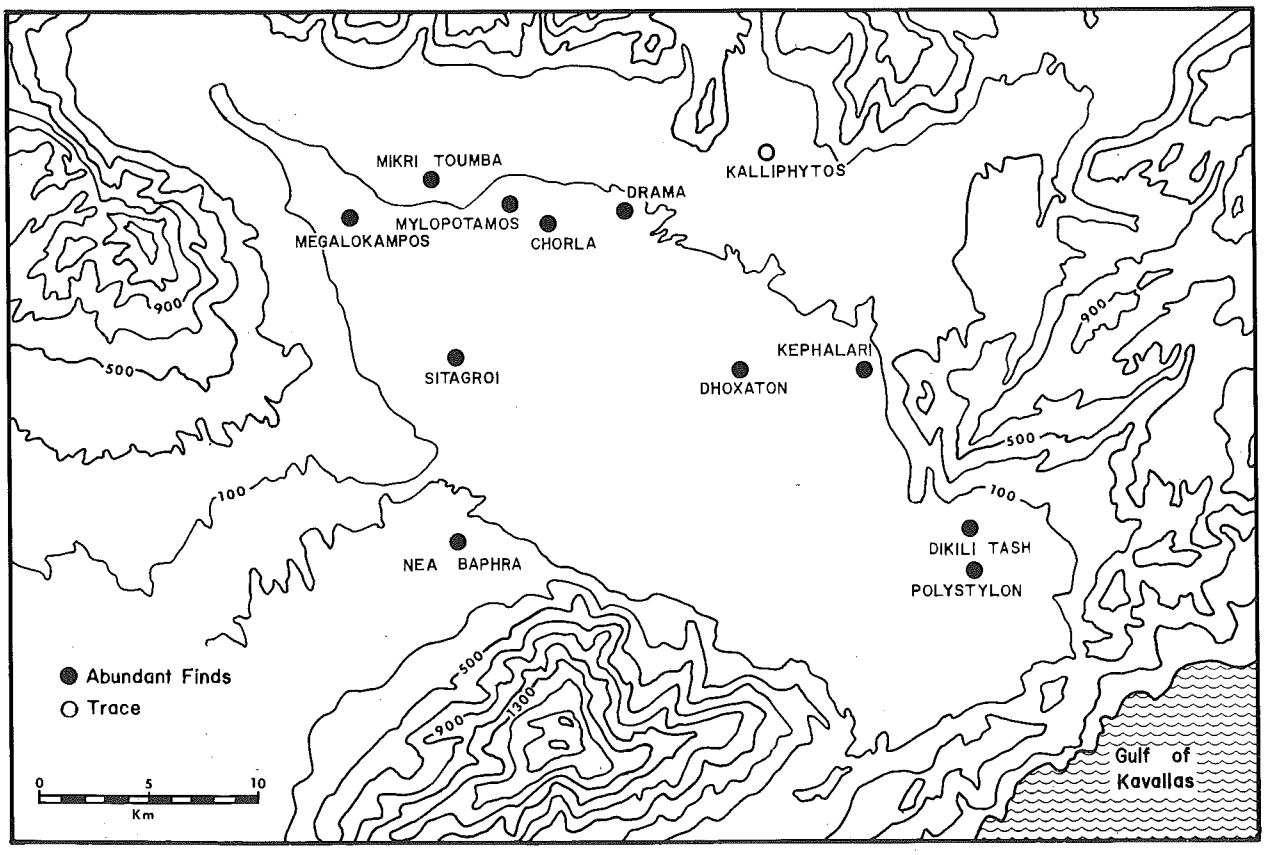


Figure 6.2. Distribution of sites in the Drama Plain, phase II (on the basis of available survey data).

(see chap. 3) has suggested that springs were probably rather more common in the neolithic than is the case today on the plain of Drama.

PHASE III

During phase III two settlements which had their foundation in phase II, Mikri Toumba and Kephalari, were apparently abandoned (fig. 6.3). In addition, available evidence suggests greatly reduced activity, at the least, at Polystylon and Chorla. The decline in the number of settlements could indicate a number of possible developments:

(1) There had been an overexpansion of the population, especially in the northern plain, leading to a decline in the length of fallowing periods. The result was eventually to lower soil fertility and food production. The resources of the plain had been overtaxed and it was no longer possible to support the enlarged population established in phase II. This resulted in a decline in the number of inhabitants and the abandonment of the less viable settlements.

(2) As cultures become more complex there is a tendency for larger settlements to develop in order to perform the greater number of necessary functions. Smaller settlements are often unable to perform these functions, and the inhabitants of such settlements are disadvantaged. Over a period of time it may well become apparent that the disadvantages of longer journeys to agricultural land are offset by the advantages of living in a larger settlement which provides a greater number of functions. In such a situation the larger settlements may well grow at the expense of the smaller, leading eventually to the abandonment of the latter. The decline in the number of settlements is not accompanied by a de-

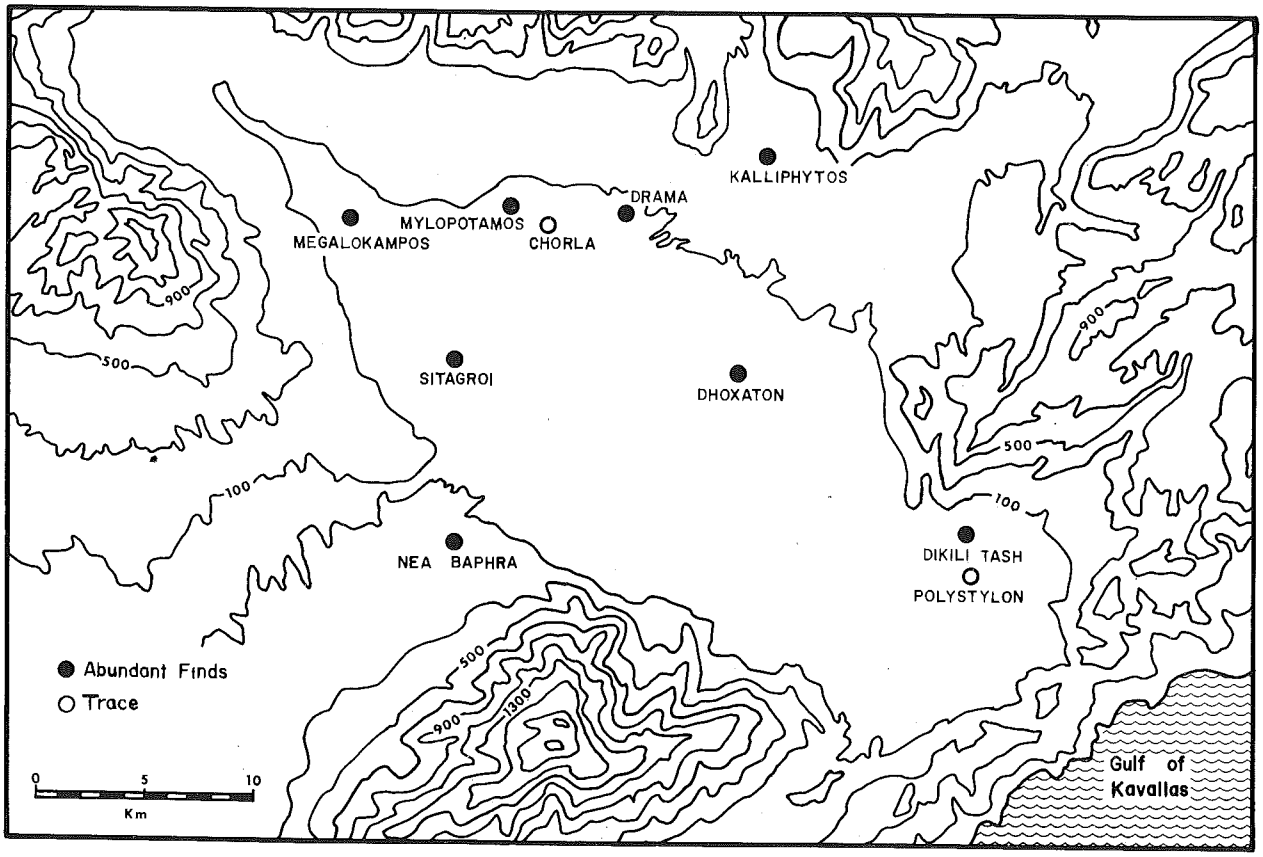


Figure 6.3. Distribution of sites in the Drama Plain, phase III (on the basis of available survey data).

Table 6.1. Postulated Population Densities, Plain of Drama, Phase III

(1) Various assumed Sizes of settlement population	(2) Total population in nucleated settlements	(3) Overall population density per square km	(4) Adjusted population density per square km	(5) Population density within 3-km radius of settlements
50	400	.55	.76	1.77
100	800	1.10	1.52	3.54
150	1200	1.66	2.29	5.31
200	1600	2.21	3.05	7.08
250	2000	2.76	3.81	8.85
300	2400	3.31	4.57	10.62
350	2800	3.86	5.33	12.38
400	3200	4.41	6.10	14.15
450	3600	4.97	6.86	15.92
500	4000	5.52	7.62	17.69

Note: Eight settlements have been recognized on the plain at this period; thus column 2 results from multiplying the figures in column 1 by 8. Column 3 figures are based on all land on the plain below 200 m (725 square km). Column 4 was computed on the premise that a part of the plain was unsuitable for agricultural activity because it was either waterlogged or under water. In this column the possible arable area was calculated at 525 square km. Re: column 5; there are 28.26 square km in a circle of 3-km radius.

cline in population; restructuring of a settlement pattern in the manner outlined above is likely to be accompanied by rising population numbers.

Agglomeration of the population may, of course, result from forces other than the desire to produce units which allow the most efficient operation of the social and basic productive systems. Because there is no evidence, as yet, that there were pressures to agglomerate for predominantly defensive reasons, speculation on these matters will not be pursued here.

Can the archaeological record help us to decide between points (1) and (2) above? The existing evidence appears to suggest that the second option is at least a partially acceptable answer. In phase III agriculture had attained a degree of expertise not present earlier (see J.M. Renfrew, vol. 2). The evidence appears to suggest higher yields and a far greater degree of control over cropping than was previously the case. Such evidence would hardly imply a decline in population numbers resulting from agricultural failure. In any case, table 6.1 suggests that population densities cannot have been high, even by primitive agricultural standards, at the time.

Culturally, phase III exhibits a greater richness than characterized phases I and II. It is perhaps stretching the evidence too far, but it is tempting to think that by phase III the larger settlements had progressed from habitation sites to being villages in the functional sense, that is, they had progressed to the point where they provided a number of services other than a convenient place for families to group.

PHASES IV AND V

The evidence relating to settlement in phases IV and V is probably suspect and does not supply a picture of how the settlement pattern evolved or devolved. The sites are naturally more liable to disturbance in the upper layers, and this factor, together with pottery recognition problems, renders any statement on settlement patterns liable to revision. As it stands at present, the evidence indicates a marked decrease in the number of occupied sites and a radical change in the settlement pattern. In broad terms, the sites occupied in these phases correlate well with the phase I locations, the sites which displayed a high degree of habitat connectivity (figs. 6.4, 6.5). This may suggest that it was only possible

to maintain villages on sites where the food supply derived from agriculture could be supplemented by the products of hunting and gathering. Some possible causes of the decline in the number of settlement sites are as follows:

(1) Continuing concentration of settlement as a result of the processes outlined as operative in phase III. This seems unlikely as we appear to be dealing with a pattern shrinking in areal extent. As a diagnostic feature, such shrinkage is not infallible, but it is more likely to be associated with a disintegrating agricultural settlement pattern than a pattern which is restructuring in response to economic developments.

(2) Cultural changes resulting in a dispersal of settlement and families practicing agriculture from scattered dwellings. No evidence of dispersed settlements has been found, but by their nature remains of such sites would be difficult, if not impossible, to locate in numbers sufficiently large to support generalization.

(3) Population decline as a result of overuse of agricultural resources. The archaeological record indicates changes in the agricultural system. The first domesticated grapes appear in these phases, and the cultivation of pulses increases, apparently at the expense of grains. The decline of grain production may suggest a drop in soil fertility or it might indicate a diversification of crops and land-use. Bearing in mind the population densities postulated in table 6.1, it is difficult to suggest that population pressure had built up to the point where soils and other agricultural resources had been strained. The population densities suggested in table 6.1 appear low when compared with some general estimates of the carrying capacity of land under early subsistence farming systems. In short it is not easy

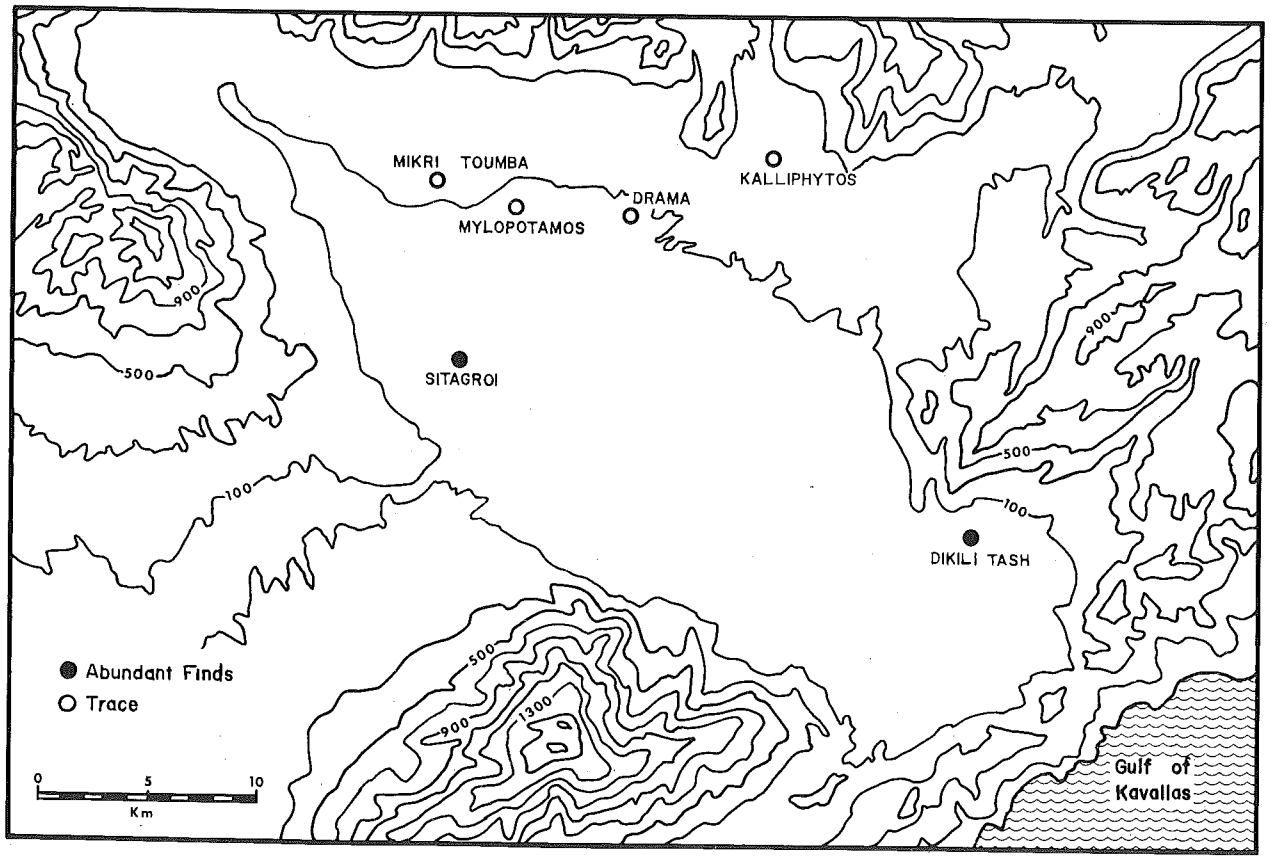


Figure 6.4. Distribution of sites in the Drama Plain, phase IV (on the basis of available survey data).

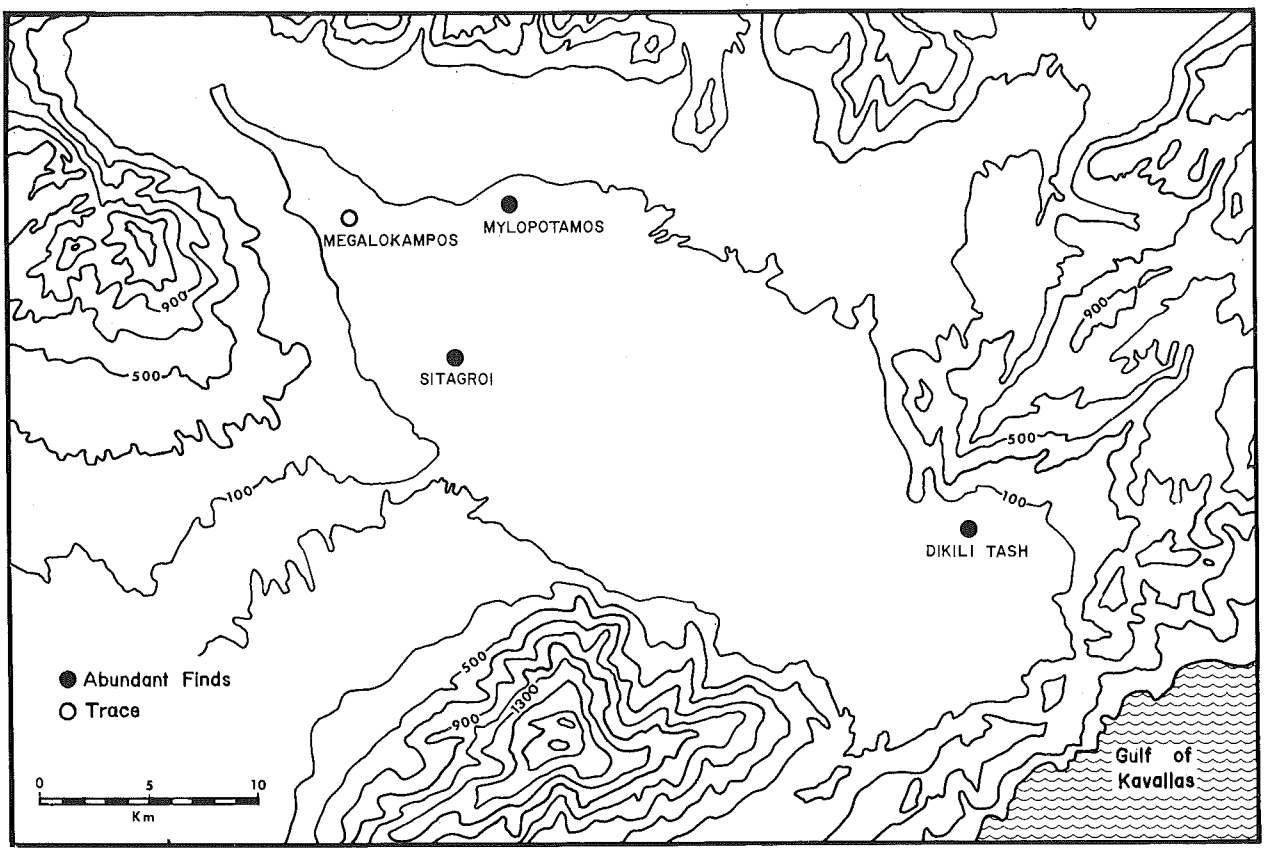


Figure 6.5. Distribution of sites in the Drama Plain, phase V (on the basis of available survey data).

to explain the decrease in the number of settlements in phases IV and V.

LATER BRONZE AGE

There is a resurgence in the number of identified settlement sites in the later bronze age, but the distribution of the sites is markedly different from that noted in earlier phases (fig. 6.6). A few sites were still occupied on the plain, but the most notable concentration of settlements was now located on the higher ground to the north, where a series of later bronze age occupations have been found perched upon hills more notable for their inaccessibility than for their convenience (fig. 6.7). This "upward migration of settlements" is probably of widespread occurrence in the period. A note of caution must be suggested here. The fact that we have discovered relatively well-preserved hilltop sites does not necessarily imply that the plain was sparsely populated. It may well be that many persons lived on the plain and withdrew to the hilltop villages at certain seasons or under certain conditions. It might be that, owing to a necessity for greater mobility, the agriculture practiced at the time had a greater emphasis on livestock raising than had been the case in earlier periods.

THE MORPHOLOGY, SIZE, AND SPACING OF SETTLEMENTS

Morphology

The structures discovered during the course of excavation do not suggest that there was any element of planning present in the form of the settlements. Indeed, it would be highly surprising

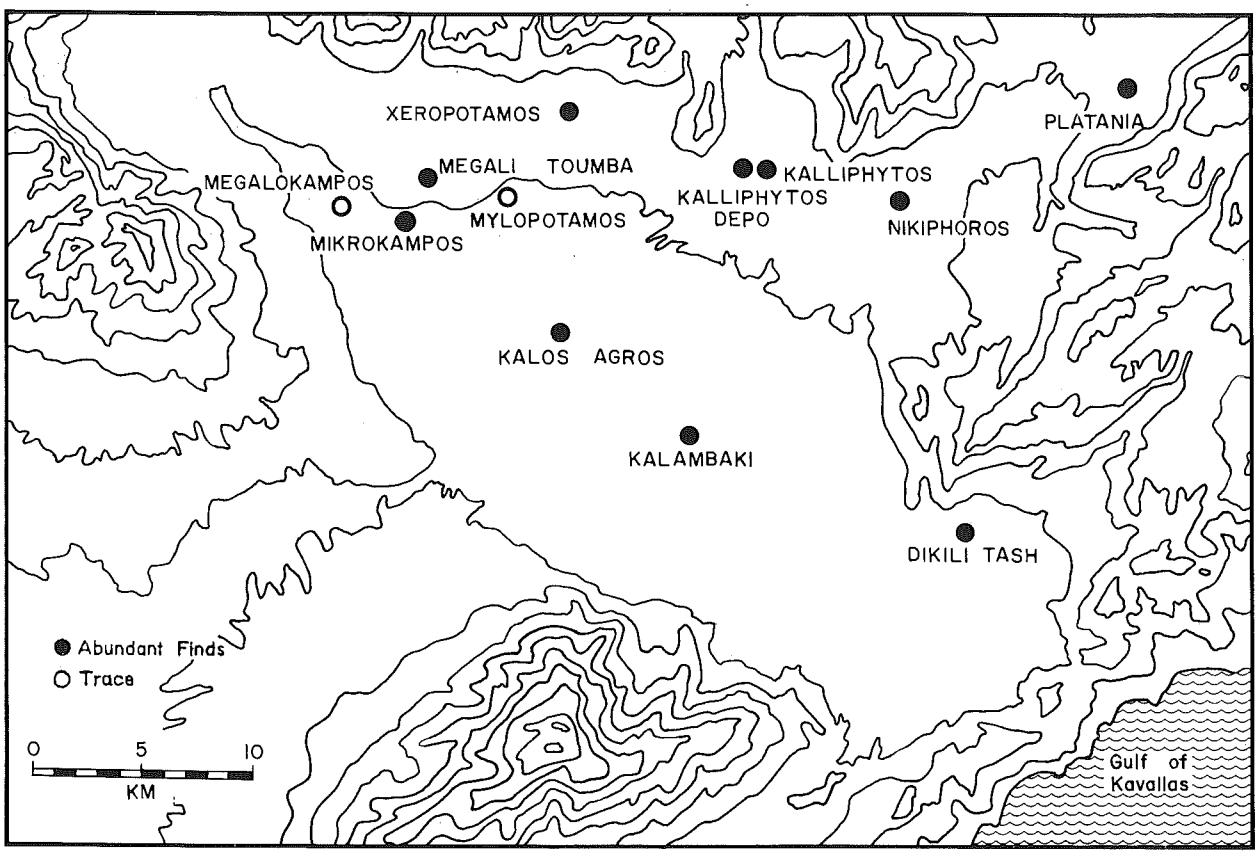


Figure 6.6. Distribution of sites in the Drama Plain, the later bronze age (on the basis of available survey data).

if there were. The settlements apparently consisted of a fairly tight huddle of dwellings on irregular "thoroughfares."

Size

Much of the analysis offered earlier in this section could be greatly refined if we had more evidence relating to the number of people living in the settlements at points in time within the phases. It is, however, unlikely that all the settlements were the same size or possessed the same functions. Certain settlements, by virtue of their location in relation to adjoining sites, would have been better suited than others to perform functions required by the region as a whole, supposing there to be a need for such activities. The size of the sites does offer some clues on this matter. If we rank the phase I-V sites on the approximate length of longest transect, we get the arrangement shown in table 6.2 (see fig. 6.8).

Very obviously, there are many dangers in suggesting anything on the basis of this information, which does not even compute total area or take account of total volume of deposits. Nevertheless, three sites do stand out as different from

Table 6.2. Approximate Length of Longest Transect of Each Site

Length of transect	Site
265 meters	Chorla
260 meters	*Nea Baphra
252 meters	*Mylopotamos
197 meters	Polystylon
194 meters	Dikili Tash
167 meters	*Megalokampos
165 meters	Sitagroi
137 meters	Mikri Toumba
119 meters	*Drama
101 meters	*Dhoxaton

*Indicates evidence of erosion of the site.

the rest: Nea Baphra, Chorla, and Mylopotamos. The last two, whatever their relationship, occupy a point of very high centrality within the settlement pattern as a whole. Chorla or Mylopotamos would have been convenient sites for functions needed by many inhabitants but not available at all settlements. Possible higher order functions would include the exchange of produce and hosting major gatherings or religious occasions. Nea Baphra is equally interesting. Sited close to the Angitis gorge, a route of entry from the southwest, it may well have been the initial settlement on the plain from which other villages budded off. Nea Baphra may have possessed special importance by virtue of its "mother" quality and position on a route to the southwest. The settlement may have had interregional exchange functions.

Spacing

Rashevsky (1968: chap. 16) has made some calculations relating to the size and spacing of prehistoric villages. The calculations are based on estimates of the productivity of land under early agricultural systems. Rashevsky suggests that villages of 100 inhabitants would require a territory approximately 2 km in radius to support themselves with early agricultural techniques. In such a pattern, the villages would be approximately 4 km apart. The phase I settlements on the plain of Drama are spaced rather farther apart than

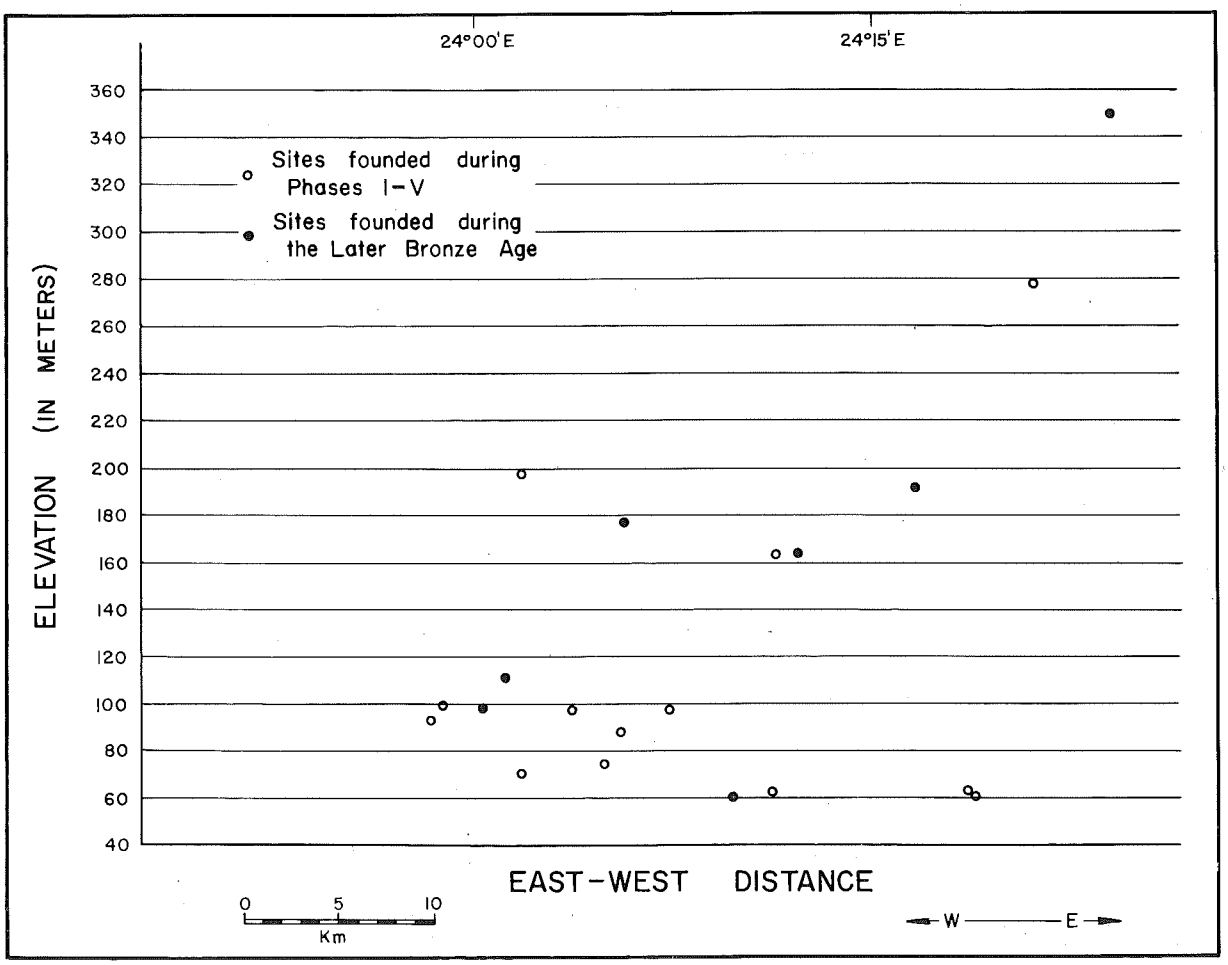


Figure 6.7. Location of sites in the later bronze age in the Drama Plain, compared with that of earlier sites in terms of elevation and position.

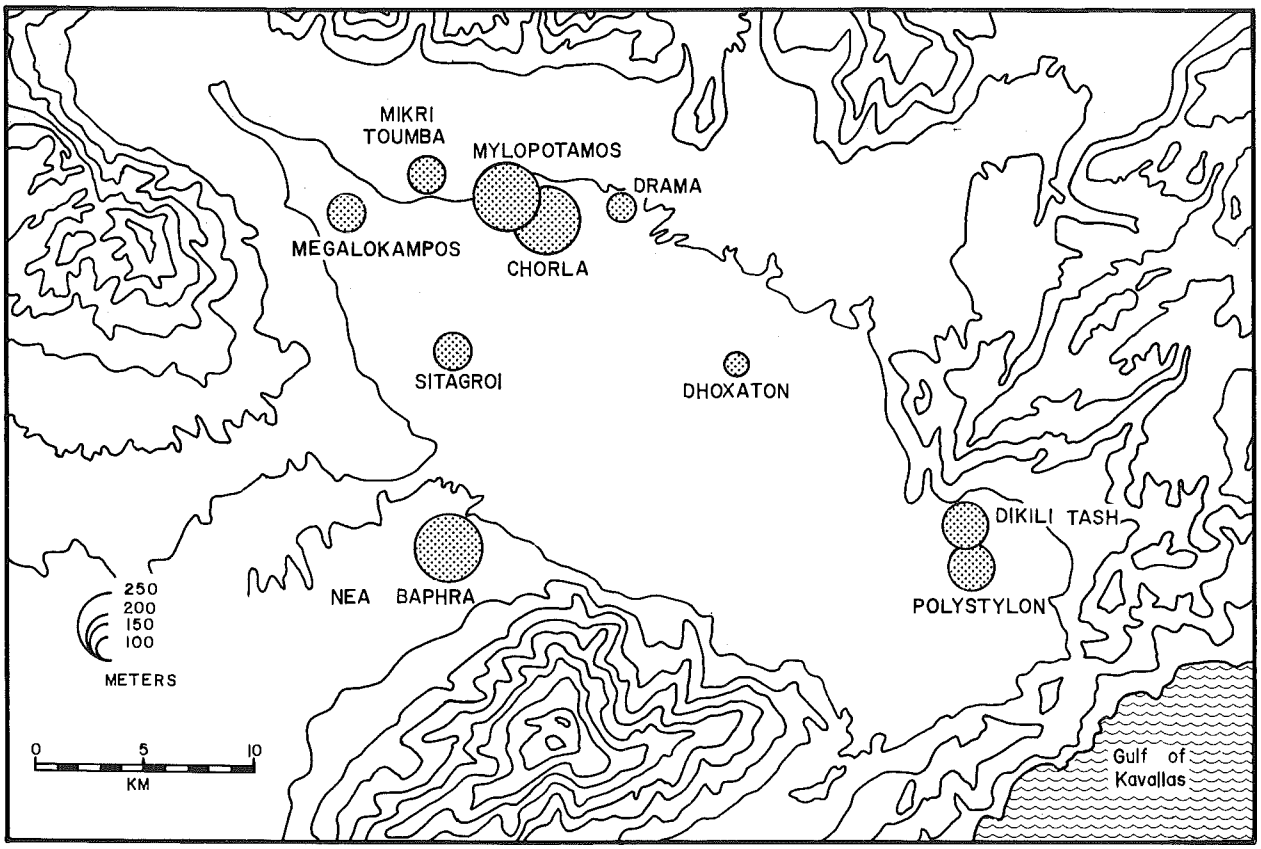


Figure 6.8. Sites in the Drama Plain. Circles are in meters and proportional to the longest transect at the site shown.

this, which might indicate that they were larger than 100 persons, that their agriculture was less efficient than Rashevsky's assumptions would have it or, and most probably, that a significant proportion of the territory of a village had limited agricultural potential. Rashevsky's calculations are based on the model builder's "uniform agricultural plain."

SUMMARY

It is interesting to note that the greatest concentration of settlement sites, and the highest degree of persistence, is found in the northern part of the plain. Indeed, there are large areas of the plain which were not close to settlement at any period and other parts which were occupied only for relatively short periods. The south-central section of the plain was probably ill drained and difficult to clear of vegetation and to cultivate. The zone was probably utilized for hunting and gathering purposes. With the tools available early men would have found cultivation there a problem.

The northern area of the plain, with its high settlement density and persistence, is just the area where junctions are found among the limestone, alluvial fan, and marshlands. However, we cannot be certain as to the exact margin of this last environment as it fluctuated from time to time.

The only other area of persistent settlement was around Dikili Tash. In this region there is a variety of habitats fairly conveniently grouped. The area is well provided with springs and

streams. Davidson (1970) has suggested that the alluvial soils found in the riverine zones were especially attractive to primitive agriculturalists, and if this is so, then the existence of such soils in the Dikili Tash zone may have been one important factor in the persistence of settlement in the area.

It is tempting to seek other explanations of the major lineaments in the settlement pattern of the plain of Drama. There are extensive areas of the plain which were poorly drained and possibly disease-prone. As such, they may have discouraged settlement in the south of the region. It is also possible that there were trade links with areas lying to the north (particularly in phase III) which gave added input to the economy in the northern part of the plain and, possibly, provided a motivating force for the emergence of nucleated settlements. If this last factor were of importance, then the possibility has to be considered that there existed large areas cultivated by dispersed subsistence farmers.

Tempting though such theories are, there is as yet no evidence to sustain them, and it would be wrong to press analysis further. Even if new evidence is uncovered, analysis of the basic factors relating to land potential and productivity will still have an important part to play in any understanding of prehistoric settlement on the plain of Drama.

APPENDIX D

Site Catchment Analysis

Eric S. Higgs and Claudio Vita-Finzi

The Quaternary alluvial history of the plain of Drama conforms to a sequence found to obtain in Epirus and indeed throughout the Mediterranean basin (Higgs and Vita-Finzi 1966; Higgs et al. 1967; Vita-Finzi 1969). An earlier phase of aggradation, characterized by the formation of alluvial fans composed of red soil and poorly rounded gravel, was followed by stream incision and then by the deposition of a well-bedded, silty channel fill. Since no artifacts or datable organic remains have hitherto been found in the older deposit, we have to be content with the inference that, like its counterpart in Epirus, it was laid down during the middle and late paleolithic and that the process had ended by about 5400 bc. The Younger Fill has yielded potsherds south of Sitagroi. Those collected by Davidson date from about 300 BC (see chap. 3), while we found some that could be as recent as Roman in age. The sherds being derived, these dates represent minima for the deposit. The corresponding alluvial fill in other parts of the Mediterranean region also contains Roman and earlier remains but in association with medieval pottery and with charcoal which has given radiocarbon dates spanning the interval 550-1460 ad.

The Younger Fill postdates the period represented by the excavated portions of the tell and therefore has to be eliminated from the present-day picture prior to any discussion of the setting of Sitagroi. The Older Fill—to judge from its form, lithology, and structure—was deposited by ephemeral floods. Its incision was performed by steams with discharges and regimes close to those of today and had progressed little when the tell of Sitagroi was first occupied.

CATCHMENT ANALYSIS

The interpretation of sites in economic terms is facilitated by focusing attention on their catchments, that is to say, the areas likely to have been exploited habitually by their inhabitants (Vita-Finzi and Higgs 1970). The limits of each site catchment depend to some extent on the nature of the economy prevalent during the period under review. Reference to present-day subsistence agricultural economies suggests that at a distance of 1 km from the settlement, the decline in net return "is large enough to be significant as a factor adversely affecting the prosperity of the farming population" and that "at about 3-4 kilometres, the costs of operation rise sufficiently to be oppressive" (Chisholm 1968:66). Since time of travel rather than simple distance is the crucial factor, the site catchment of Sitagroi shown on figure 6.9 was constructed by plotting a set of radii representing the distance covered by a walk of ten minutes; the resulting boundary, though somewhat irregular, departs little from the 1-km circle. The map also shows that once the Younger Fill has been discarded, the entire catchment is underlaid by the older alluival deposit.[1]

EXPLOITATIVE CAPACITY

The catchment encompasses an area of about 3.2 square km, or approximately 790 acres. The predominantly clayey nature of the Older Fill probably means that in the early stages of stream incision, the areas bordering the channel were marshy. Given that crop rotation was not practiced and that techniques were not more advanced than in 1922, half the area would have lain fallow every year. In short, about 380 acres were available for cultivation.

To assess the agricultural potential of this land, local opinion was sampled. It might seem more reasonable to employ the official figures published for the region, but little experience is required to show that the performance of any such unit of 790 acres bears little resemblance to the regional average. The general view was that 12 cwt of wheat per acre was a reasonable yield to expect from dry agriculture and 1 ton per acre for wet or irrigated agriculture. These figures resemble those obtained by similar means at other archaeological sites in the Drama Plain (dry: 14 cwt/acre) and in Thrace (dry: 14 cwt/acre; wet: 20-25 cwt/acre) and in Yugoslavia west of Skopje and outside the range of dry agriculture (wet: 1 ton/acre). From these figures it may be concluded that the site does not now occupy a particularly favored situation. It is worth noting that irrigation in the vicinity of Sitagroi is largely confined to the better drained, flat areas underlain by the Younger Fill.

In 1922 the average yield of wheat in Greece was 4.5 cwt/acre, as compared with 11 cwt/acre in France, 15 cwt/acre in Germany, and 22 cwt/acre in Denmark. The figure for Greece would seem to be representative of arable agriculture in a marginal situation. In Palestine 3.5 cwt/acre is the yield currently obtained by primitive methods in marginal areas that have just come under cultivation and, of this, some 1.5 cwt must be set aside for seed. If we accept a figure of 3 cwt/acre as the net yield, we obtain a total of about 57 tons per annum for the catchment of Sitagroi.

Doubtless there was cultivation of areas less favorably situated than those within the proposed boundary. But it seems unlikely that the site had an "extended territory" subject to a mobile element in the economy (such as upland pastures). There is little terrain suited to this purpose within the radius of 4 km, which represents the normal range of economic exploitation in Greece. As regards seasonal migration, it is instructive to note that the uplands around the plain of Drama are thus utilized not by the sedentary lowland agriculturalists but by the transhumant Vlachs, and that this pattern is both ecologically sound and of considerable antiquity (Higgs and Vita-Finzi 1966).

There is evidence for only one source of change in the exploitative capacity of the catchment, namely, the progressive incision of the Older Fill and the associated topographic and hydrological factors. The marshy areas which bordered the stream channels in the early stages of settlement would have been suitable for cattle and, at certain seasons, for sheep. As down-cutting improved drainage and lowered the local water table, the balance would swing in favor of sheep.

The general picture that emerges is that of a site poorly endowed for agricultural activities in terms both of European agriculture during the period in question and of the plain of Drama as a whole. Given that the most favorable situations were available for settlement, one would expect early agricultural sites to lie closer to the upland areas where a more balanced and preferred diet could be ensured. We have elsewhere suggested that the entry of agricultural economies into Greece was in the first instance only marginally advantageous and pointed out that, by virtue of the mountainous terrain, the staple food of much of the population of Greece still consists of animal products. The site of Sitagroi could ensure a viable economy for a limited population; its occupation can be taken to reflect population pressure and to indicate that the better situations in the region were already being exploited, although it does not follow that the economies responsible for their exploitation were agricultural or associated with the use of pottery. Recent observations in Thrace show

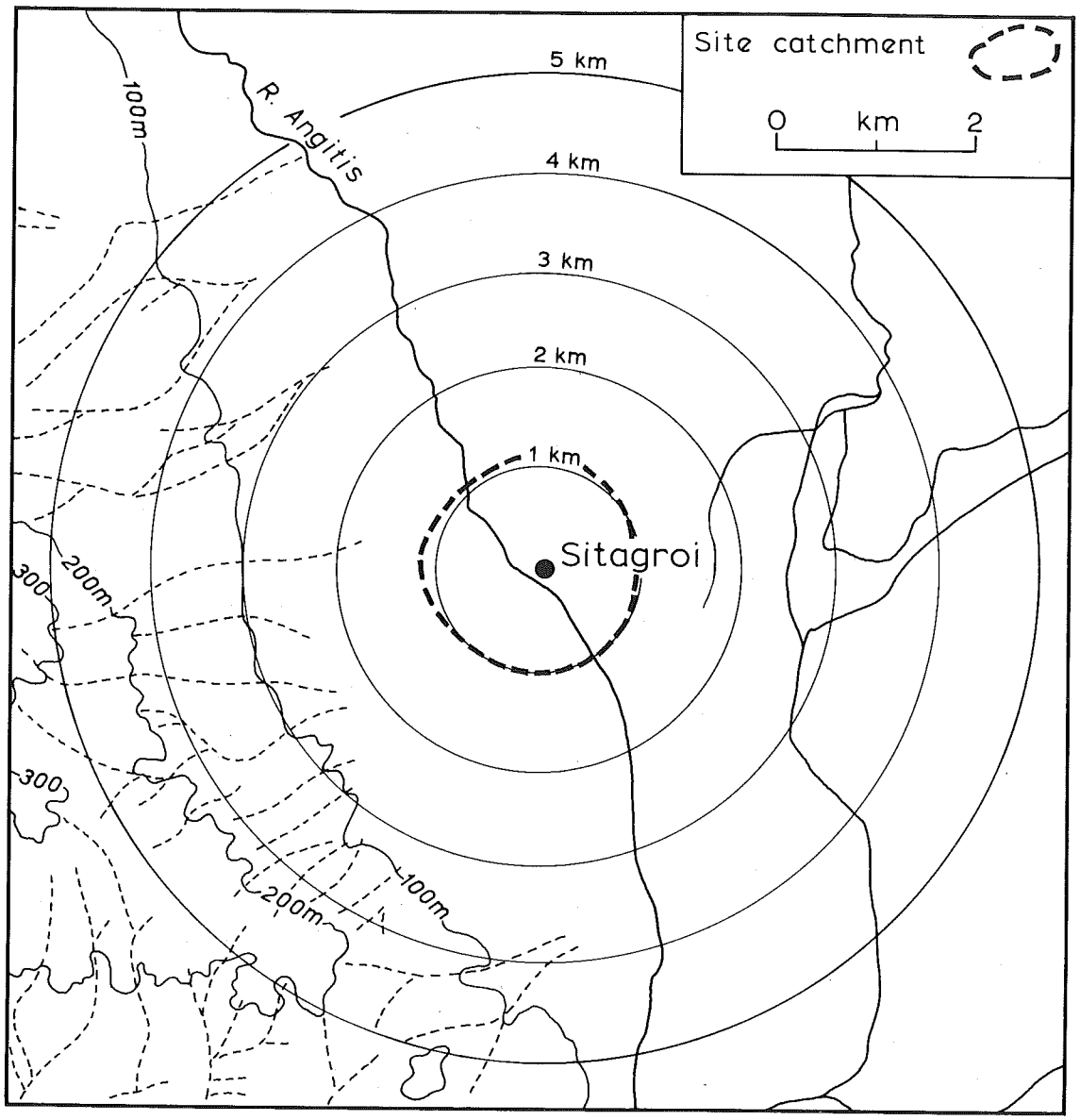


Figure 6.9. Site catchment for Sitagroi, based on a walking distance of ten minutes.

that productive lowland areas occupied by transhumants have been taken over by arable agriculture only in the very recent past. The limited resources available at Sitagroi may help to explain its late occupation and its relatively early extinction.

NOTES

1. Davidson (see chap. 3) states that the "lowland limestone area" northeast of the tell is mantled with soils derived from weathered limestone. In our opinion these represent the outermost portions of the piedmont alluvial fans that border the plain.

7.
The Sitagroi Sequence
Colin Renfrew

The first necessity at Sitagroi was to bring order into the wealth of material represented at that site and more generally in the plain of Drama. As always in archaeology, the first variable to consider was time itself. It was clear from the outset that the great depth of strata at Sitagroi, which proved to amount to some 11 m, must represent several millennia of occupation. It was desirable, therefore, to assemble a sequence of cultural materials which could be used to form a relative chronology. Radiometric methods could then be used to give quantitative determinations, thus allowing the establishment of an absolute chronology. Once the Sitagroi sequence was firmly established, based on a sound stratigraphic succession, the sequence could be extrapolated to other sites in the area on the basis of the surface collections taken from them. The surface collection at Sitagroi itself, taken before excavation began, thus had a special relevance, allowing us to see which aspects of the material culture in the sequence revealed themselves most diagnostically at the surface of the mound.

As described in chapter 2, our strategy initially centered on the excavation of the deep sounding ZA (fig. 7.1) which was completed during the first excavation season. Although it was not assumed that ZA would illuminate the sequence for the mound as a whole—that was a matter for subsequent evaluation based on the other areas excavated—ultimately such proved to be the case.

To monitor the passage of time using cultural materials, it is necessary to use parameters which vary significantly with time. The first desideratum, therefore, is variability which is significantly patterned with respect to time. In practice, since no absolute measure of time could be determined until the relative chronology was established, this implied seeking cultural materials which showed variability within a sound and well-established stratigraphic sequence.

The excavation of this deep sounding (ZA) is outlined in the next chapter, with the stratigraphic section of all four faces (fig. 8.2) illustrating the relevant relationships. Here the concern is simply to treat the excavated units in their true relative sequence, as stratigraphically established. This generally approximates the numeration of the units (strata and features) as excavated, with layer 1 at the surface. During excavation, of course, no special effort is made to ensure that the numeration relates to the true stratigraphic sequence. While in the field, the objective is to dig stratigraphically, although in practice it is often necessary, for pragmatic reasons, to deal with features out of their precise stratigraphic order. The true stratigraphic sequence is as seen along the *x*-axis of figure 7.2 and succeeding stratigraphic figures. It cannot be stressed too firmly that although the following discussion utilizes counts of pottery shapes and fabrics, the first task was to establish a rigorous stratigraphic sequence. The exercise which follows is therefore not some seriation employed to make up various deficiencies in a stratigraphic

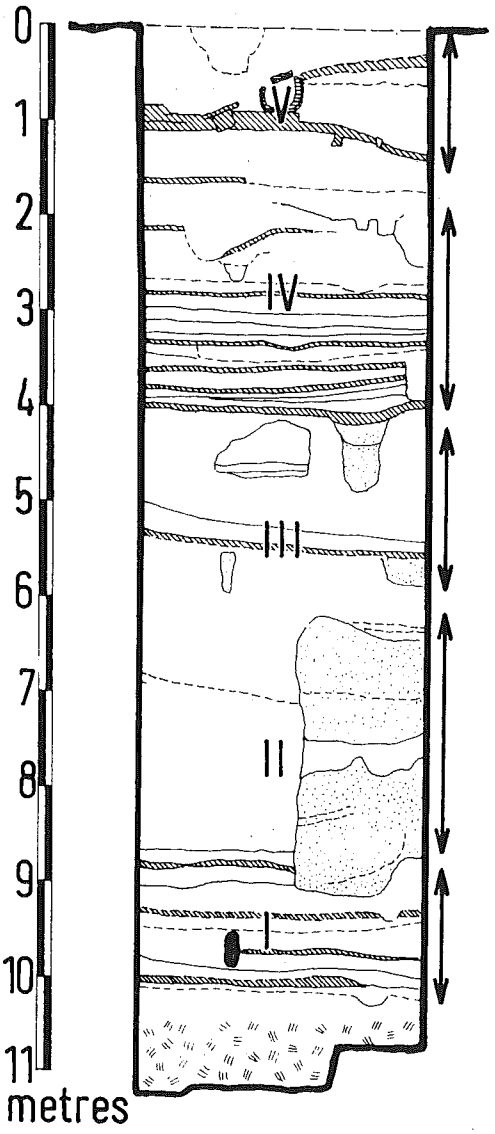


Figure 7.1. Diagrammatic sketch of the south face of deep sounding ZA, indicating division into phases achieved on the basis of the stratigraphy and the sherd count.

record; it is a means of using that sound stratigraphy for chronological purposes.

It soon became clear, and indeed was initially anticipated, that the only material found in sufficient abundance to permit chronological characterization of each stratigraphic unit (i.e., layer) was the pottery. The only other material found in quantities approaching comparable abundance was bone. As the bone study proceeded it was revealed that changes in the subsistence strategy at Sitagroi did indeed produce marked variations with respect to time. But the bone provided less convenient material for purposes of chronology. Moreover, while certain pottery fabrics proved to be specific diagnostic criteria for particular phases on the site, the simple presence of a given animal species was not diagnostic; chronological variations among the fauna could in general be seen only by the use of quantitative methods. Other cultural materials—for example, figurines or weaving equipment—were certainly capable of providing sure chronological indicators, but they did not occur with sufficient frequency to allow a quantitative treatment. It will be seen, however, in the discussion of other mounds that such materials are indeed sufficiently diagnostic to indicate, on a presence/absence basis, the occupation of a site during a particular period.

THE PROCEDURE

Pottery, as so often in archaeology, proved an excellent chronological indicator. Because of the plasticity of the material and the wide range of possible decorations and shapes, there are many factors beyond the purely functional which determine the end product (Renfrew 1977). Moreover, in the plain of Drama, as in the chalcolithic of southeast Europe in general, there was indeed considerable fluctuation in the shapes and decoration over the three millennia during which our site was occupied. This is in contrast to the experience in certain other areas, where a greater stability of form and a more restricted range of fabrics have made such an exercise much more difficult. Dr. John D. Evans was the first to develop an accurate and pragmatic system for quantitatively monitoring variation in the ceramic materials in a long stratigraphic sequence (Evans 1964, 1973). Evans and I used this method together at neolithic Saliagos (Evans and Renfrew 1968) and, in essence, the same approach was used here. For each stratigraphic unit the amount of pottery recovered is recorded both by total weight and by number of sherds; the sherds with diagnostic features are then counted and

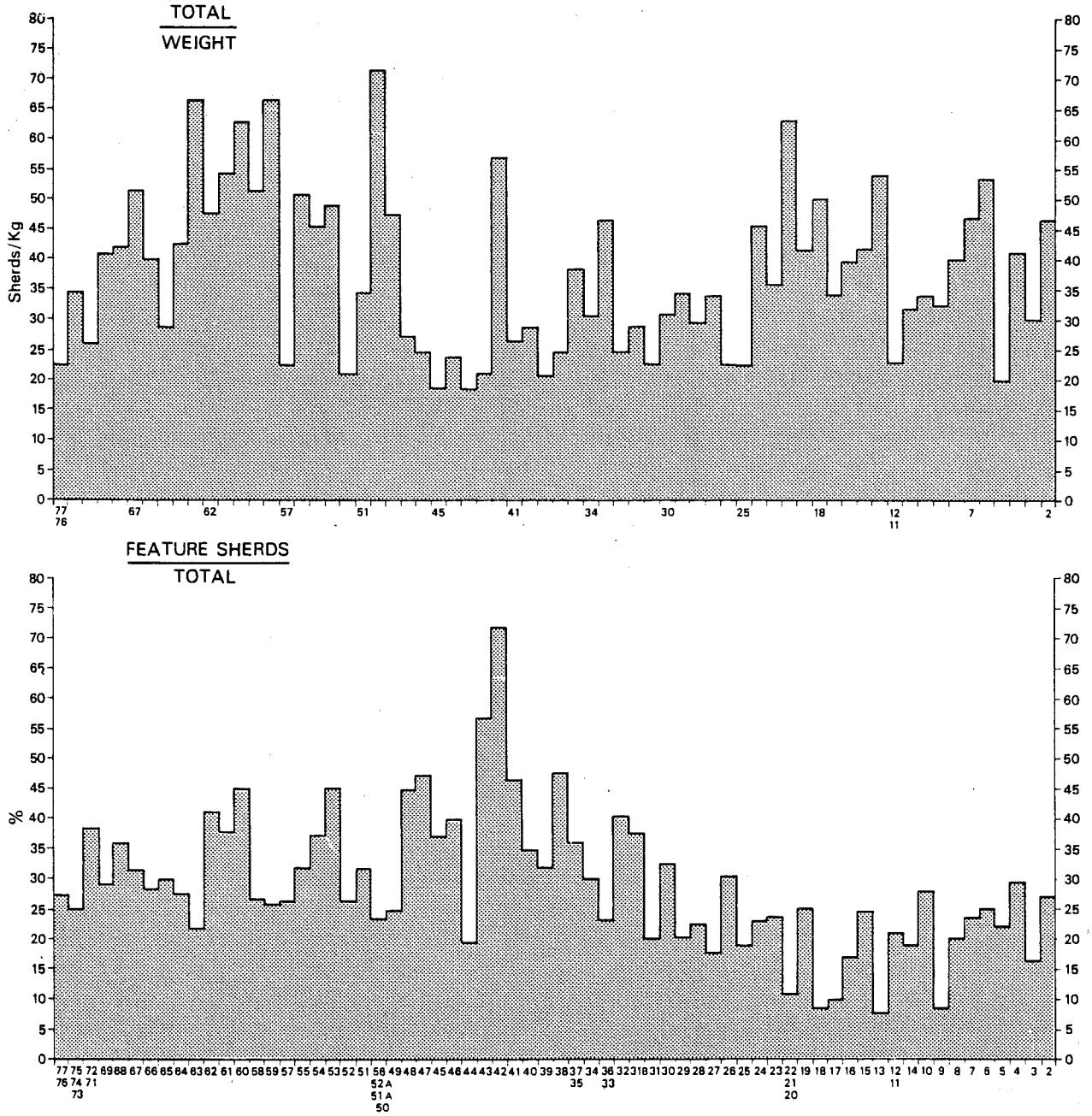


Figure 7.2. Number of sherds per kilogram (*above*) and percentage of feature sherds in the total sherds (*below*) recovered from the successive stratigraphic layers of sounding ZA (the earliest on the left).

can also be weighed. This provides the simple observational basis for the analyses which follow.

At the suggestion of Sebastian Payne, all the soil from sounding ZA was passed through a 3-cm mesh to ensure that, at least for sherds of that dimension, there was absolutely no loss. (This procedure was instituted from layer ZA 55 onward). In the course of his further experiments on sieving procedures at Sitagroi, Payne became concerned that trench collecting procedures, in the absence of systematic sieving, would produce serious and essentially arbitrary biases in the quantitative results obtained from the counting of finds (Payne 1975). Subsequent experiments conducted during the excavations I directed at Phylakopi in Melos (1974-1977) suggest that there need be no serious distortion for feature sherds of pottery, although for other

classes of material (e.g., chipped stone artifacts) the bias is indeed serious, and Payne's concerns were well justified (cf. Cherry 1975, 1978). It was found appropriate, at Phylakopi, to exclude from quantitative consideration sherds smaller than a given arbitrary size (e.g., 1 cm), and by this method to avoid the distortion from large quantities of very small sherds. This refinement was not, however, practiced at Sitagroi.

When one is dealing with a site yielding several tons of pottery and a sounding producing many tens of kilograms of pottery per day, the efficient handling of the material presents practical problems. A total of 28,213 sherds were processed from ZA (including 9,446 feature sherds), representing 817 kg of pottery. All the pottery, collected by layer and appropriately labeled by layer number (and pottery bag number), was washed, when necessary in a mild acid bath, and then dried by strewing in the sun on reed mats. This allowed us to inspect the finds on the day following excavation and generated rapid feedback of information to the site supervisors. The pottery was then boxed and subsequently strewn by the vase mender. It was weighed and counted and divided into "feature sherds" and "non-feature sherds" (see below). The feature sherds were then laid out by fabric and shape category and counted; for the sake of consistency I inspected every layout to ensure that the same criteria were being used in the allocation to categories.

Using the sherd counts, it was possible to arrive at a sequence for ZA, where quantitative data were available for the variation through time of a large inventory of ceramic fabrics and shapes and their joint occurrence. In practical terms, the unit of measure of time elapsed was the excavated unit, namely, the stratigraphic layer. This was the effective unit of observation, and further subdivision was not possible (although it should be noted that in the smaller stratigraphic sounding ZB, field-directed by Payne, the stratigraphic distinctions made were deliberately finer and the time units therefore in many cases shorter).

There is, naturally, no doubt that sounding ZA contained deposits of many different kinds: floors and occupation deposits upon them, house collapse material, accumulations of material from periods when the area had no buildings upon it, foundation excavation, deep rubbish pits, surface debris, etc. Such is the character of any deep archaeological site. But it did not prove easy while in the field to recognize with confidence the nature of each stratum, although some were obvious enough. So we have followed the rather mechanical procedure of simply using the stratigraphic sequence of excavated layers without initial reference to the functional character of the deposit. Such a procedure has its limitations, and it must be remembered that the different layers certainly do not represent approximately equal spans of time. One layer, representing some period of accumulation of debris, could represent a century or more. Another, being the digging of a pit and its rapid infilling, might represent only a few days or weeks. But while this is a limiting feature of the analysis which must be borne in mind, it does not diminish the validity of taking the deposits in strict stratigraphic succession.

The problem of stratigraphic mixing is a different one. It is possible that in prehistoric times, disturbance to the earth at a certain moment and location may have mixed material from more than one precise period. There is also the risk of subsequent disturbance, perhaps by rodents or even foxes or badgers as well as the perennial small displacement of sherds by earthworm action. And, finally, there is the possibility that excavators could have failed to recognize stratigraphic distinctions during the process of excavation and thus could have artificially mixed stratigraphic material. Fortunately, we do have ways of estimating the joint effects of these three disturbing agencies. For example, if a particular ceramic fabric was indeed characteristic of a specific period, its findspot should—in the absence of these disturbing agencies—be limited primarily to contexts of that period. Conversely, if the fabric had a longer duration or if mixing has occurred, it may be found sporadically in later deposits. In cases where specific fabrics are indeed highly localized stratigraphically and are *not* found to occur sporadically in later (or earlier)

deposits, we may be confident that little significant mixing has occurred. It was possible to apply this test in several cases, and in many of them the degree of disturbance was very small. This gives some measure of confidence that the emerging pattern is not too grossly distorted by uncontrolled perturbations.

As the work proceeded in ZA, we were able to observe that considerable quantities of plain burnished pottery and abundant coarse ware had been emerging from the outset. This, indeed, continued from top to bottom. After some time, two distinctive painted fabrics appeared (see color plates). First was the fabric with a silvery paint on a dark burnished ground (pls. B:3, D:1), termed here Graphite-painted ware, although as seen in Gardner's study (vol. 2), the description may not be a technically accurate one in all cases. With it was a handsome red-surfaced ware with bold decorations in black (pl. D:2). This Black-on-Red ware was already known from such sites as Galepsos, Akropotamos, and Dhimitra. Lower in the sequence several other painted fabrics appeared, usually painted on a cream background. In the lowest levels these painted wares disappeared altogether, and the most characteristic fabric was a fine black ware possessing a grayish lustre, as if graphite had been used in an overall wash in its decoration.

These observations were reinforced by preliminary counts of the ZA materials and by initial counts from other soundings, so that an outline structure of ceramic variation was emerging. It was here that serious and systematic counting began, using some very rough-and-ready typological divisions. After some considerable experience of counting sample strata from the entire depth of the stratigraphic column, it was possible to redefine the fabric and shape classes, and at this point a systematic and final count was undertaken from top to bottom of the column.

The initial methodological problem should be noted. A count can only be operated on the basis of categories of shape and fabric. More correctly, it should only be operated on the basis of specific traits relating to shape (e.g., Kritsana or flaring bowl) and to fabric (e.g., Graphite-painted or Black-on-Red); this is a significant methodological distinction. However, we found the recognition of fabrics and shapes a convenient procedure in the field, and I cannot envisage working without such categories, and using only traits, even with the aid of an on-line computer terminal. It seems appropriate to undertake the task in two stages, first spending some time on the establishment of stable shape and fabric categories on the basis of a good deal of counting, and then counting afresh when these stable categories have been defined.

The data for each category of shape and fabric were then expressed both as frequency per kilogram of pottery from the layer and as frequency per hundred sherds. In practice, the first proved the more convenient and was used in the analysis. By presenting these results graphically, in some cases using a logarithmic scale for quantities (figs. 7.3–7.8), significant trends in the basic data on chronological variability were brought out.

At this point a decision was required on how the information on relative chronology obtained from the ZA stratigraphy could best be applied to other parts of the site and ultimately to other sites as well. Counts were undertaken in trenches JL, KL, ML, and ZG which in general supported the validity of the ZA sequence for the site as a whole—at any rate for the levels up to and including those where the Graphite-painted and Black-on-Red fabrics were represented. The upper levels of ZA were not so clearly represented there as in squares PO, QO, PN, and QN or in square ROc. The aim was to achieve as refined (i.e., detailed) a division as possible of the ZA sequence into phases, which could then be applied to the material from other areas on the basis of the pottery from individual stratigraphic units (or short stratigraphic sequences) in those areas. It would be altogether vain to hope for a fiftyfold division, comparable with that for ZA itself, for the variation in ZA was not so clear or rapid as to allow adjacent layers to be distinguished one from another on the basis of their ceramic contents alone. Even a tenfold division would be difficult to sustain and to use as a basis for sure ascriptions.

In the end, a fivefold division was achieved.

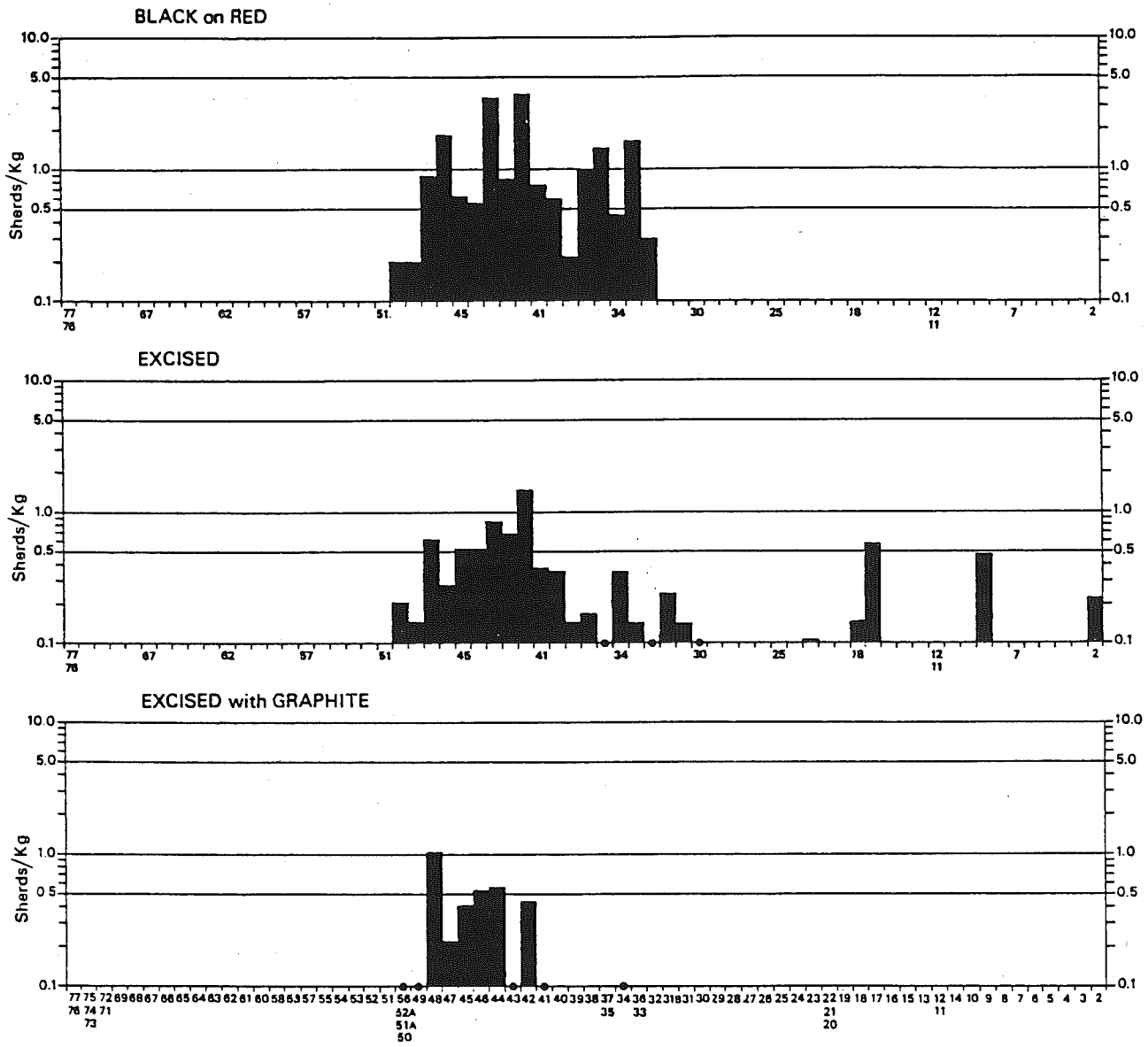


Figure 7.3. Occurrence by stratum in ZA of three fabrics characteristic of phase III: *upper*, Black-on-Red; *middle*, Excised; *lower*, Excised-with-Graphite. Counts in sherds per kilogram indicated on a logarithmic scale.

The period of high frequency of the two most obvious fabrics (the Graphite-painted and the Black-on-Red) proved one obvious aggregate unit. The span before this time could be subdivided into two on the basis of shape and fabric. With greater difficulty the period after the central phase, representing a time when painted pottery was no longer found, was likewise divided into two. The Sitagroi sequence was thus divided into five phases or periods, I to V, on the basis of stratigraphy and pottery counts. It was in general possible to ascribe any well-stratified deposit of reasonable size (a few hundred sherds) to one of these periods.

Later, as more material became available from square PO and adjacent squares (and as the material associated with the Burnt House came to light), it proved possible to divide phase V into two subphases, Va and Vb. Phase Va corresponds essentially to the Burnt House and the levels of phase V which precede it. Phase Vb corresponds to the subsequent levels, including

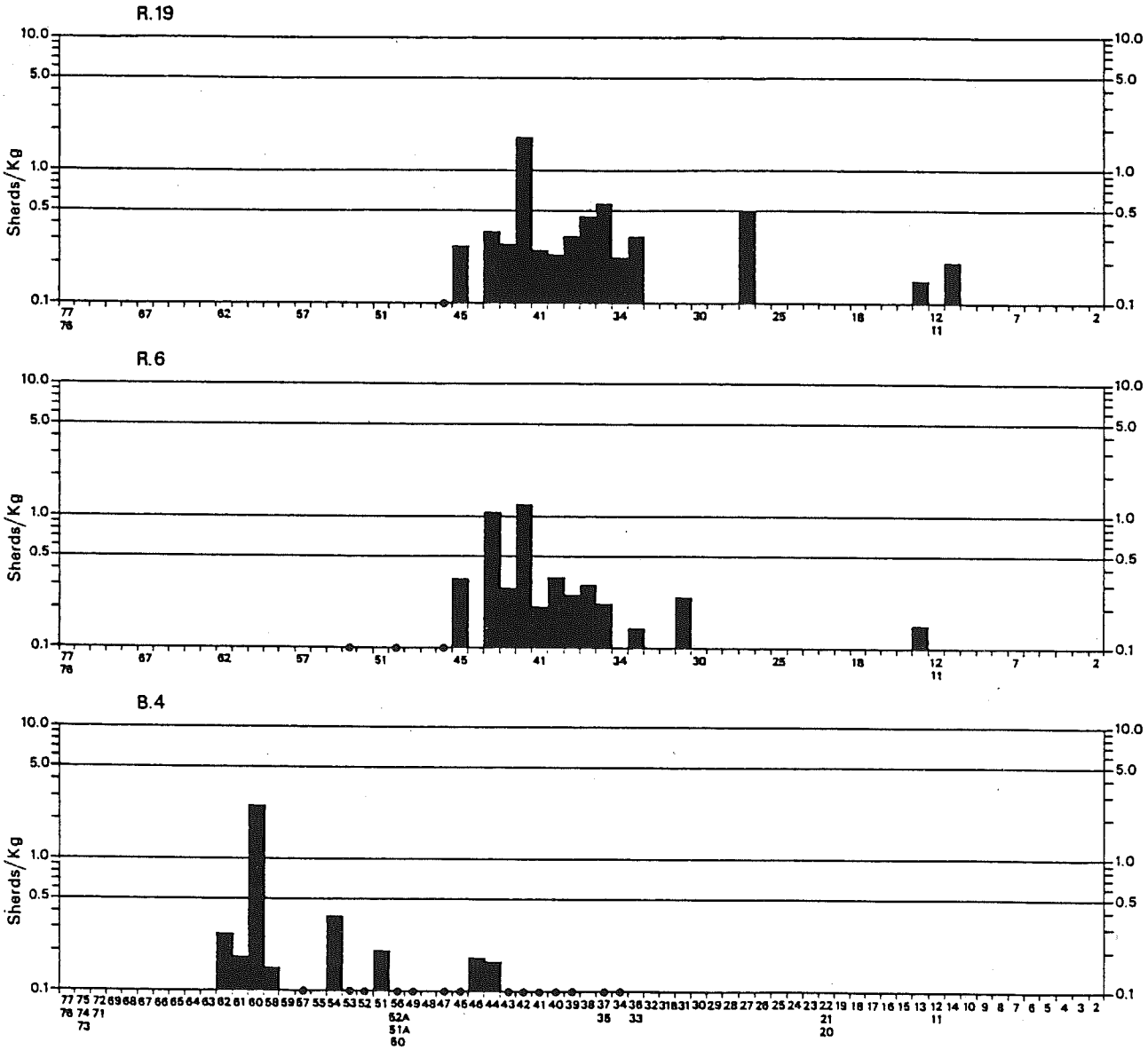


Figure 7.4. Shape categories diagnostic of phases II and III: *upper*, R19 (Kritsana rim), typical of phase III; *middle*, R6 (flaring rim bowl), typical of phase III; *lower*, B4 (pedestal base), typical of phase II.

those associated with the overlying Long House. It was possible to establish the approximate position of this stratigraphic interface in ZA and hence to include this refinement in the ZA sequence. But in fact the distinction between Va and Vb is not well seen in the ZA counts since the relevant diagnostic forms occur with so low a frequency that they are not often seen in an area of only 9 square meters. This division was achieved on the basis of structural remains on the site, in contradistinction to the others which were on the basis of ceramic changes considered in strict stratigraphic sequence.

The approximate division of the ZA sounding into periods is seen in figure 7.1, which should be compared with the detailed stratigraphic section in figure 8.2. The relationship between levels and stratigraphic phases on other parts of the site is indicated in figure 3.3 and in table 7.1.

Radiocarbon samples were selected with considerable care in order to date absolutely the stratigraphic sequence described above. The

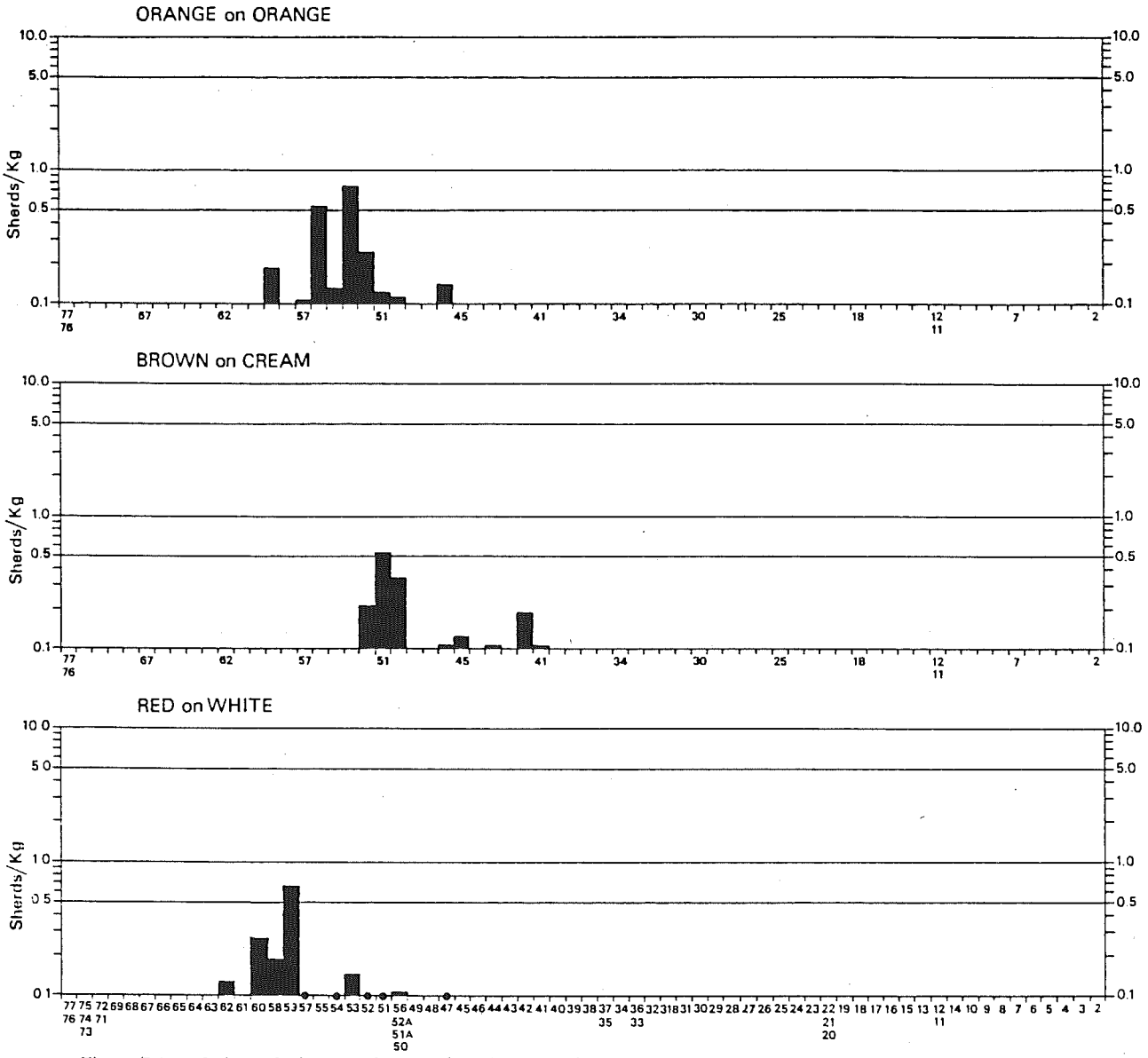


Figure 7.5. Fabrics relating to phase II in ZA successive strata: *upper*, Orange-on-Orange; *middle*, Brown-on-Cream; *lower*, Red-on-White.

considerations guiding the choice of sample, and the results, are set out below.

The main shape and fabric categories defined for the sherd count were relevant also to the interpretation of the data from the surface collection. The results, presented below, proved a useful guide for the interpretation of finds from other mounds in the area. It became clear, however, that occupation on some mounds extended further into the bronze age than at Sitagroi. Information concerning finds from this later bronze age period is given in chapter 13.

THE SHERD COUNT

The division of the ceramic material into fabrics, although discussed with E. Gardner from a technological standpoint, was essentially made on the basis of visual properties and was a pragmatic undertaking. The preliminary classification was revised, in the light of a trial counting exercise, to yield the list below. The abbreviations used on figure 7.9 are in parentheses after the names of the fabric and are listed separately for convenience in figure 7.10. The list is based on

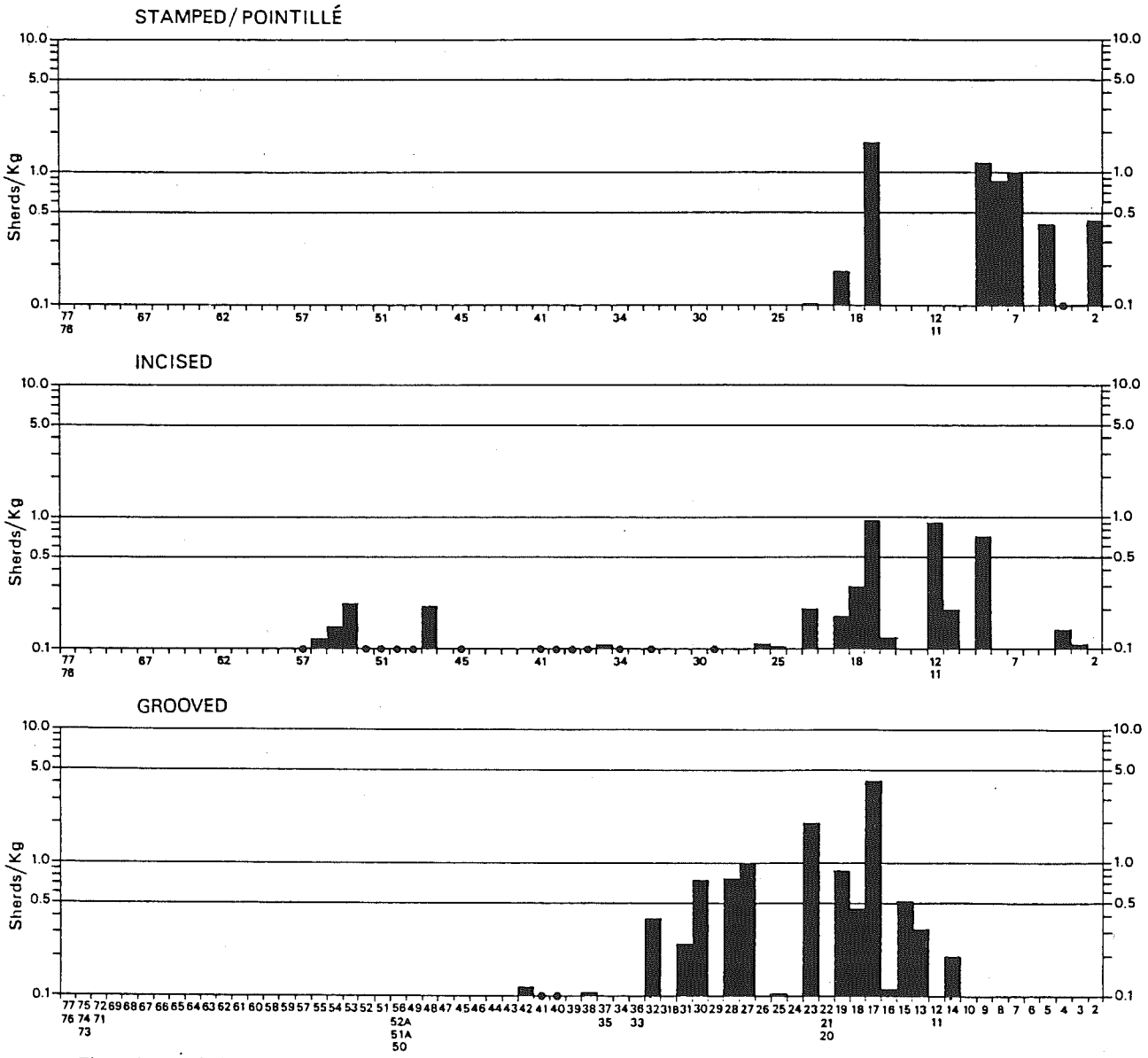


Figure 7.6. Fabrics relating to phases IV and V in ZA successive strata: *upper,* Stamped and Pointillé; *middle,* Incised; *lower,* Grooved.

the BA dissertation of Jenifer Marriott Keighley, compiled after discussions in the field among all those undertaking the sherd count. Figures illustrating this chapter are based on those given in her dissertation (Marriott 1969).

List of Fabrics

Black-on-Red (Bl/R). A fine ware. Cores are usually red and hard fired; nearly all show mica. Surface very finely burnished. Color of surface usually, but not always, a deep red. Paint is a black slip, allover burnished. There are slight variations in color of surface and paint (pl. D:2).

Brown-on-Buff (Br/Bf). Fine fabric. The buff has a warm brown tinge. It is not the same as the cream on which paint is placed in early phase II. Well fired (color pl. C:12).

Brown-on-Cream (Br/C). A fine ware. Cores are red, hard fired, and micaceous. Surface has a cream slip or wash. Paint is dark brown, but there are some color variations among black,

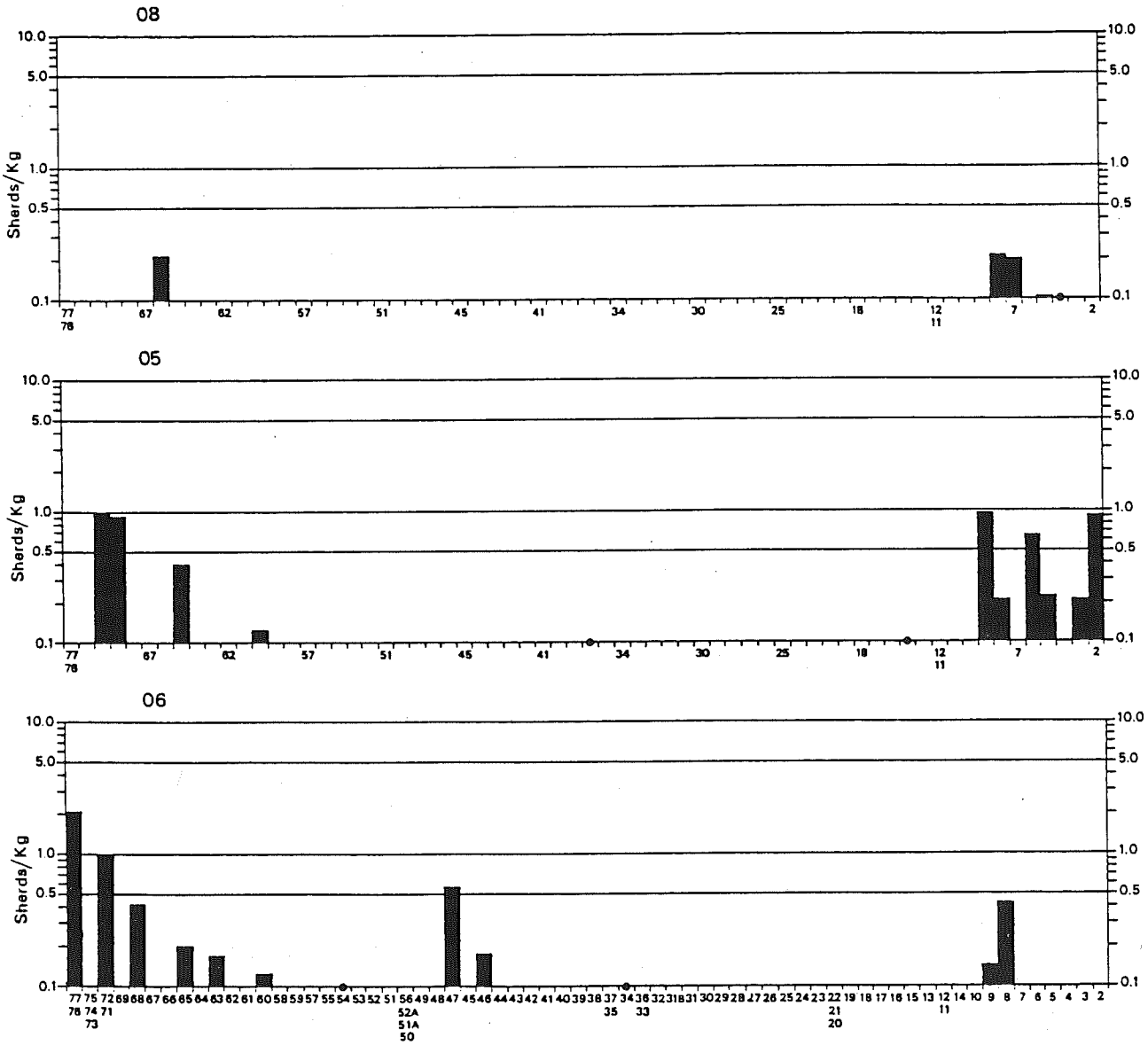


Figure 7.7. Features relevant to phase V, some of which also occur earlier in the ZA stratigraphy: *upper,* O8 (impressed cordon at rim); *middle,* O5 (impressed cordon on body); *lower,* O6 (impressed edge at rim).

purple-brown, and brown. Surface and paint are allover burnished. Decoration in narrow lines (color pl. C:11).

Black-Topped (BT). Like Fine Black Burnished (FBB) except that bright red occurs below the carination (color pl. C:21, 22).

Black-Topped with Differential Burnishing (BTx). There are very few examples of this. The burnishing is uneven and has a streaky effect. Otherwise like FBB.

Coarse (C). Very plentiful on the site. A coarse brown fabric, sometimes perfunctorily burnished (color pls. C:9, D:12).

Clumsy Grooved (ClGvd). Coarse fabric with marked heavy grooves (pl. D:5).

Dark Burnished (DB). Contains no graphite wash

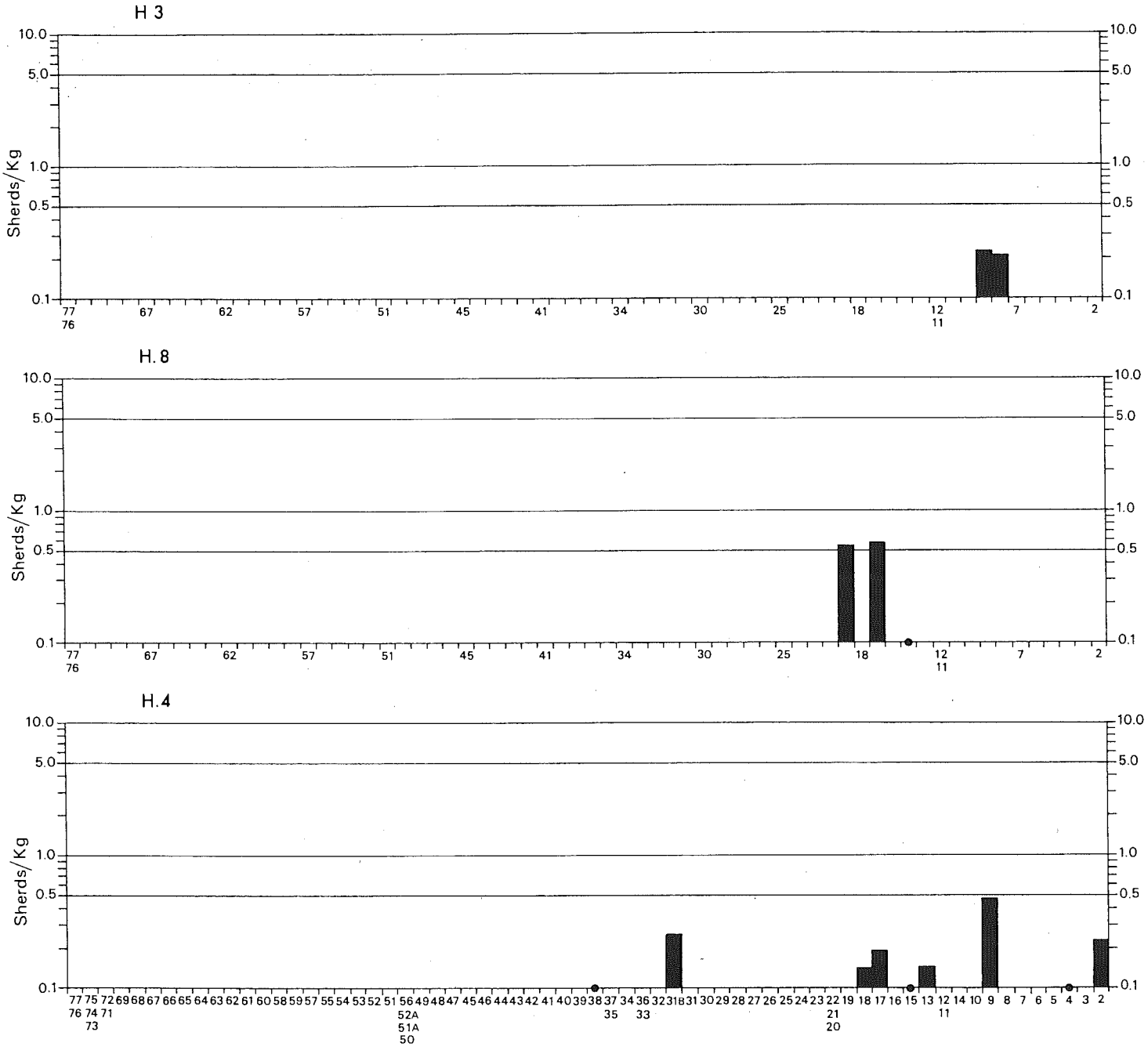


Figure 7.8. Handle forms relating to phase V in the ZA stratigraphy: *upper*, H3; *middle*, H8; *lower*, H4.

and is not gray; to be distinguished from Gray Lustre ware. The surface color varies from black through brown and red. It is chiefly dark brown. The grit is very fine, hard, and micaceous. Some sherds are black burnished but with a more uneven surface finish (color pls. C:3, D:8, and with channeling, D:7).

Excised (Exc). Distinct from Incised ware since the excised decoration is much heavier, and wider channels are gouged out of the sherd. The fabric is fairly coarse but hard fired. Surface color is usually a reddish-brown but sometimes gray.

Excised with Graphite (ExG). The fabric is similar to

Graphite-painted (Gr) but slightly coarser and with a rougher surface. The graphite paint is applied along the raised area left by the excision, usually in straight lines (pl. D:4).

Fine Black Burnished (FBB). A fine ware. Cores are gray or black, hard fired, micaceous, and sometimes with grit. The surface inside and outside is highly burnished. Surface color inside is usually a pale gray; the outside is jet black. It can be fairly easily distinguished from dark burnished fabrics.

Fine Incised with Infillings (FII). Slightly coarse ware. Cores vary from red or brown to gray. Micaceous and slightly coarse in texture. Fairly hard fired. The decoration consists of shallow incisions filled in with white paint. Sometimes the traces of white paint are barely visible (pl. D:3).

Gray Lustre Channeled (GLC). Like Gray Lustre (GrL) except that the surface is decorated with shallow grooving (color pl. C:2).

Graphite-painted (Gr). The fabric is fairly coarse but hard fired; no straw is added. Surface is usually brown or reddish-brown, but the color varies to black and various shades of brown and gray.

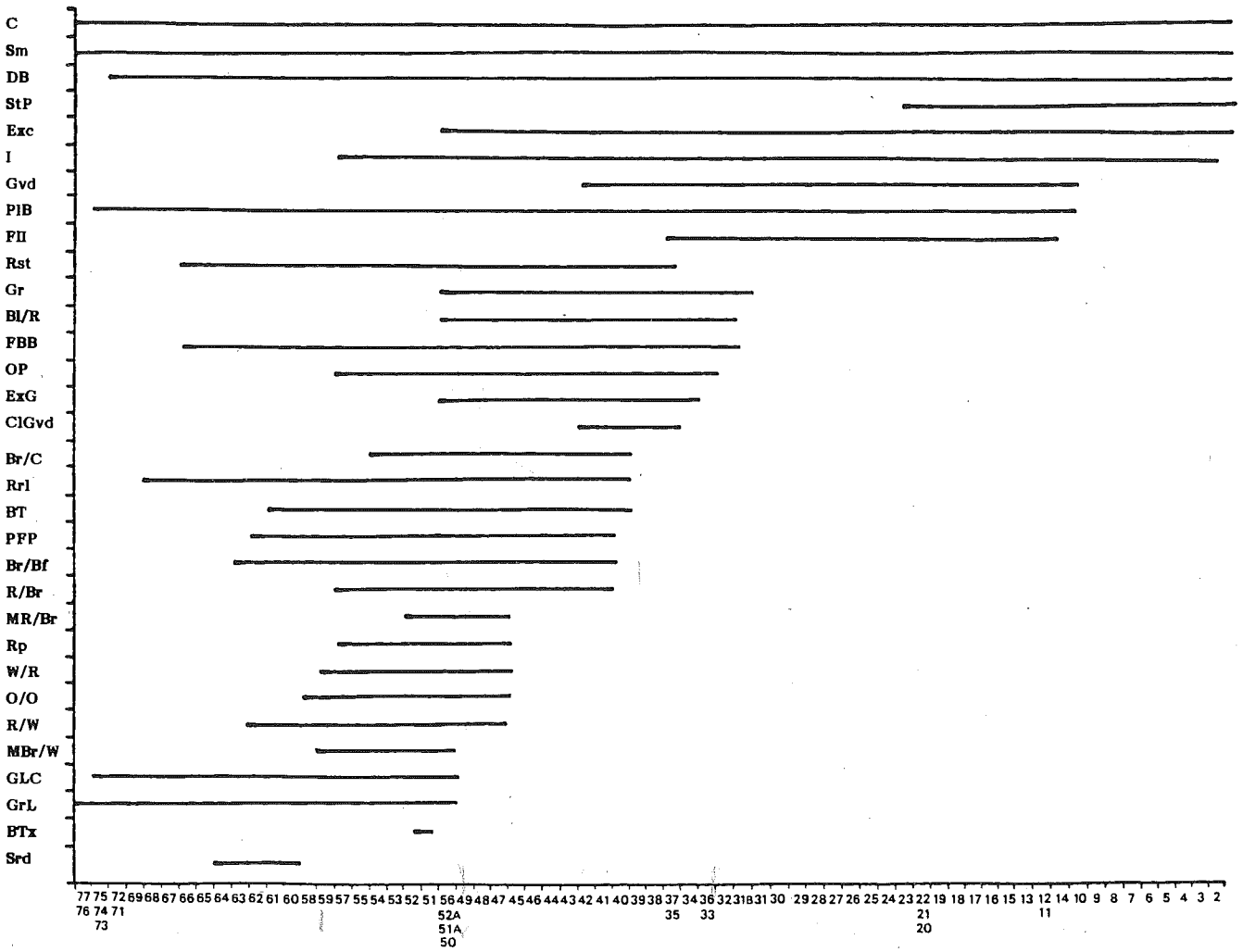


Figure 7.9. Fabric duration in ZA: the range of occurrence within the strata of ZA for the different fabric categories utilized in the sherd count.

Surface is always smooth burnished. The paint (applied after burnishing) is usually a fine silvery graphite but sometimes, possibly when of poor quality or badly fired, it is nearer to a matte white (French [1964] has noticed this also at Dikili Tash). On some examples it is, therefore, difficult to distinguish between graphite and matte white (pl. D:1).

Gray Lustre (GrL). The biscuit is either pale or dark with applied graphite forming a "wash" effect. This paste is well made with some grit and mica. The surface is very smooth and feels soapy to the touch (color pl. C:1).

Grooved (Gvd). Fairly coarse fabric with quite narrow grooves, but wider than ordinary incised lines (pl. D:5).

Incised (I). Slightly coarse ware. Cores vary from red or brown to gray. Micaceous and rather coarse in texture. Decorated on outside with broad open lines. These lines are different from those occurring on Rusticated ware (color pls. C:18, D:11).

Matte Brown-on-White (MBr/W). Rare fabric, the biscuit the same as MR/Br (color pl. C:13).

Matte Red-on-Brown (MR/Br). A fine ware. Cores are red, hard fired, only slightly micaceous. Surface finely burnished. Color of surface varies among cream (perhaps a wash), orange, brown, and pale red. Paint is thick, matte, and dark red.

Orange-on-Orange (O/O). Fine fabric, fairly rare. The decoration is difficult to recognize since the orange-painted areas sometimes merge with the background (color pl. C:14).

Bl/R	=	Black-on-Red	I	=	Incised
Br/Bf	=	Brown-on-Buff	MBr/W	=	Matte Brown-on-White
Br/C	=	Brown-on-Cream	MR/Br	=	Matte Red-on-Brown
BT	=	Black Topped	O/O	=	Orange-on-Orange
BTx	=	Black Topped with Differential Burnishing	OP	=	Other Painted
			Pi	=	Pithos
C	=	Coarse	PFP	=	Pale Fabric, Probably Painted
ClGvd	=	Clumsy Grooved	PlB	=	Pale Burnished
DB	=	Dark Burnished	R/Br	=	Red-on-Brown
Exc	=	Excised	Rp	=	Rippled
ExG	=	Excised-with-Graphite	Rrl	=	Rural
FBB	=	Fine Black Burnished	Rst	=	Rusticated
FIl	=	Fine Incised with Infillings	R/W	=	Red-on-White
GLC	=	Gray Lustre Channeled	Sm	=	Smooth
Gr	=	Graphite-painted	Srd	=	Smeared
GrL	=	Gray Lustre	StP	=	Stamped Pointillé
Gvd	=	Grooved	W/R	=	White-on-Red

Figure 7.10. Abbreviations of pottery fabrics.

Other Painted (OP). Isolated sherds with clear painted (or slipped) decoration which do not fall within other categories (color pl. C:16, 17, 23).

Pithos (Pi). Very coarse crude fabric identified by shape of vessel. Dull brown in color and much thicker than ordinary Coarse ware. It is sometimes decorated with shallow grooving.

Pale Fabric, Probably Painted (PFP). Sherds which cannot be safely recognized as belonging to any specific category though they are definitely painted (color pl. C:5).

Pale Burnished (PlB). Slightly coarser grit than Dark Burnished. Surface varies from almost white through cream to light brown. Not highly burnished. (color pls. C:4, D:9)

Red-on-Brown (R/Br). Fabric like MR/Br. The paint is not, however, matte.

Rippled (Rp). Fabric like FBB except that the surface has a shallow rippling effect (color pl. C:20).

Rural (Rrl). Termed by D. French "Rustic ware." It is slightly coarse ware. Cores are usually brown or red, sometimes gray; micaceous and slightly spongy; fairly hard fired. Surface color varies among red, brown, gray, and black. The inside surface is well burnished, the outside is rough and unfinished, often straw tempered. On the outside, grain impressions sometimes occur. No mica (color pl. C:6).

Rusticated (Rst). Well fired, fairly coarse grit to 3 mm. Inside well smoothed; outside decorated by "pinched" effect or thin incisions (color pl. C:8).

Red-on-White (R/W). Very rare. Fine fabric. Sometimes the white has a cream tinge. Red paint is thick and dark (color pl. C:25).

Smooth (Sm). Medium grit to 2 mm. Color varies but always pale; often it is gray and sometimes red. A somewhat nondescript fabric which occurs in large quantities (color pls. C:7, D:13).

Smeared (Srd). Has a streaky effect to the burnishing. Quite distinct and rare (color pl. C:10, 19).

Stamped Pointillé (StP). Fabric like FBB but with stamped and pointillé decorations (pl. D:10).

White-on-Red (W/R). Extremely rare. Only a couple of sherds found. The red is not dark but rather a pinkish red. White paint applied in thin lines (color pl. C:15, 24).

Shape Categories

The basic recognizable features of shape were divided into five major headings: bowls (rims), jars (rims), handles, bases, and other features. These shape categories were employed in the Sitagroi sherd count.

The categories on figures 7.11-7.15 (prepared by J. M. Keighley) are indicated as follows: bowls (fig. 7.11), jars (fig. 7.12), bases (fig. 7.13), and handles (fig. 7.14). The final category, "other features" (fig. 7.15), incorporates various attributes which are grouped together here for convenience; for example, forms 9 and 10 (on fig. 7.15) relate to bowls but are included here since in these cases the rims were not preserved.

THE RESULTS

For reasons of space, the full data cannot conveniently be given here. They are included in Keighley's dissertation (Marriott 1969) which is deposited, with the other site records, in the library of the British School of Archaeology at Athens. Other quantitative aspects of the ceramic material are considered in chapters 11, 12, and 13.

The variations in the mean size of sherds in different levels are indicated in figure 7.2 (upper). As in all the following diagrams, the cultural strata are listed in stratigraphic order rather than numerically. It will be seen that the means range from 20 to 70 sherds per kilogram. The percentage of feature sherds in the total pottery

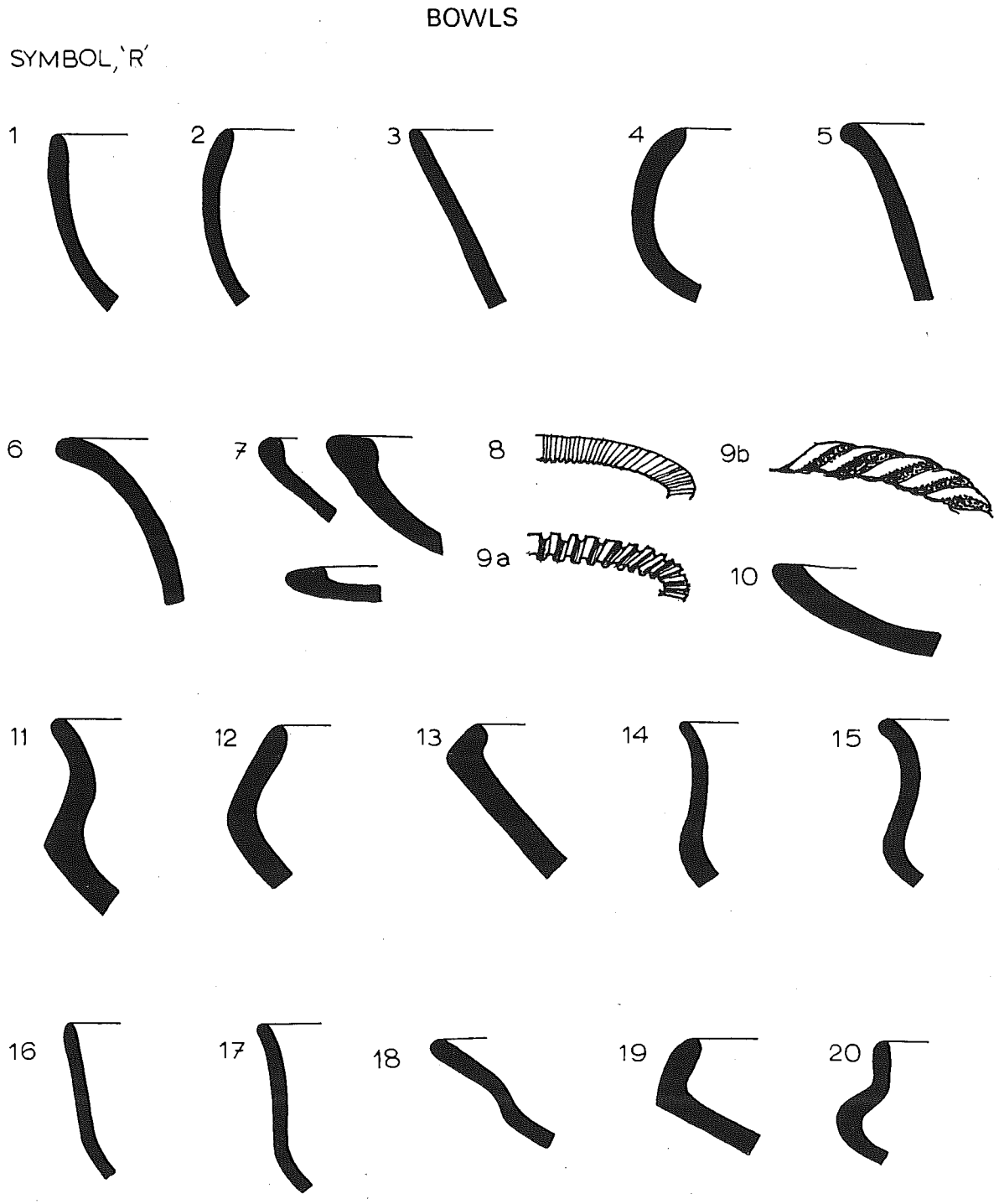


Figure 7.11. Shape categories employed in Sitagroi sherd count. Bowls, "R": (1) rounded, (2) rounded, slightly incurved, (3) straight-sided, (4) incurved, (5) everted, (6) flaring, outcurved, (7) thickened rim, three forms, (8) thickened rim with incisions, (9a) thickened rim with grooves, (9b) thickened rim with relief grooves (spiraling), (10) shallow plate or dish, (11) biconical, sinuous with thickened carination, (12) biconical, straight-sided, (13) biconical, short, (14) biconical, vertical, (15) sinuous profile, (16) low carination, straight-sided, (17) deep form, (18) Dikili Tash, (19) Kritsana, (20) necked form.

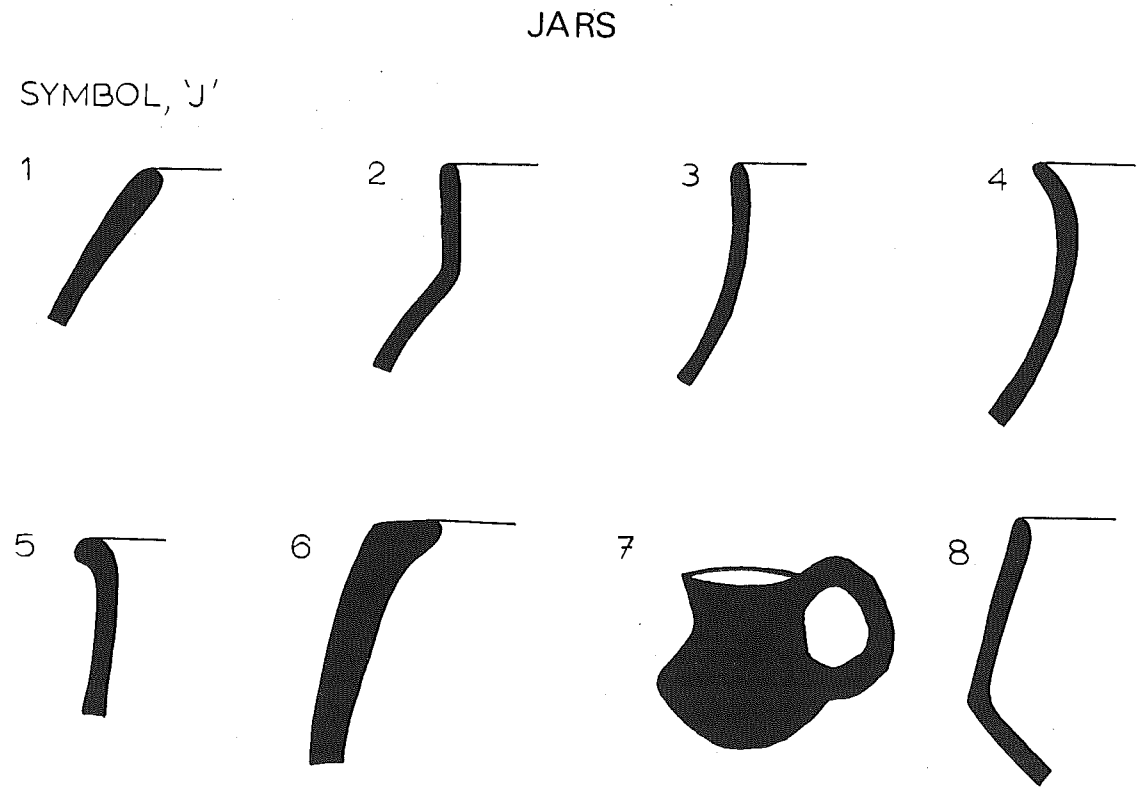


Figure 7.12. Shape categories employed in Sitagroi sherd count. Jars, "J": (1) hole-mouth, (2) cylindrical-neck, (3) constricted-neck, (4) open-neck, (5) beaded-rim, (6) thickened-rim, (7) early bronze age, (8) carinated.

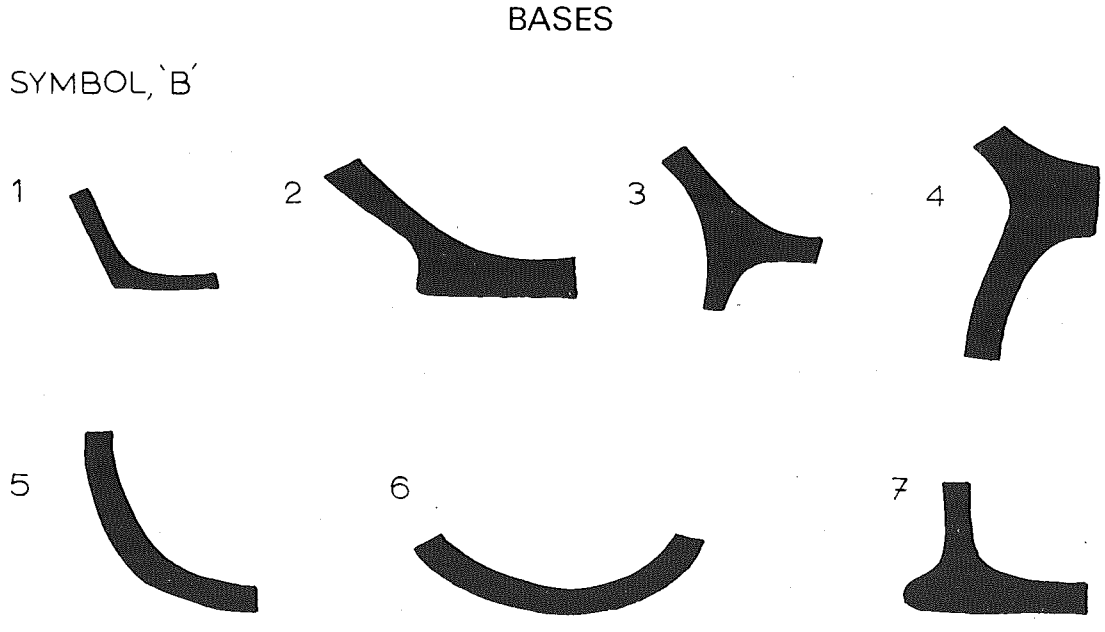


Figure 7.13. Shape categories employed in Sitagroi sherd count. Bases, "B": (1) flat, (2) modified platform/flat base, (3) ring-footed, (4) pedestal, (5) rounded, (6) curved, (7) platform.

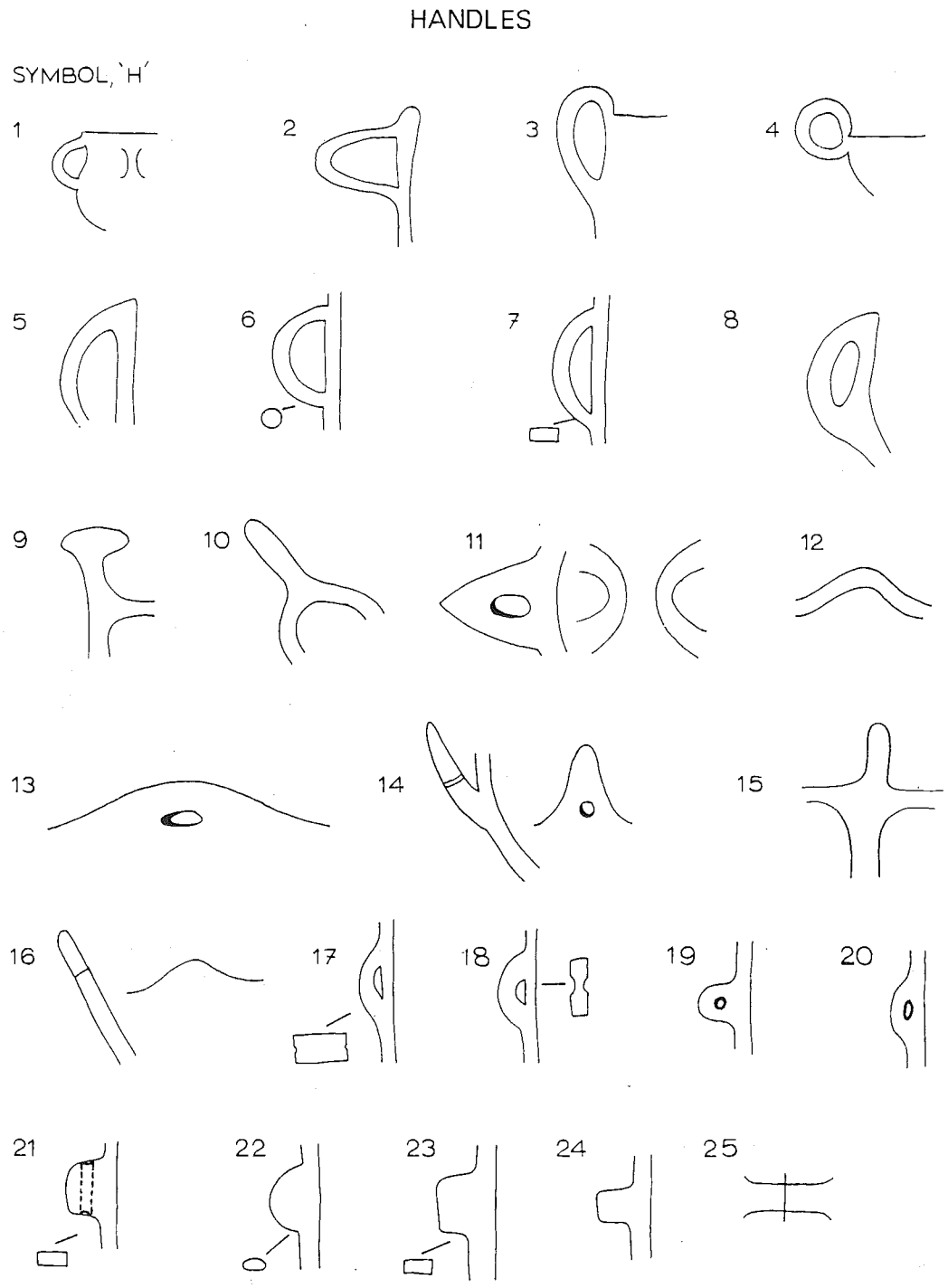


Figure 7.14. Shape categories employed in Sitagroi sherd count. Handles, "H": (1) Paradimi (small strap below rim), (2) strap, (3) strap, elongated loop, (4) strap/loop, (5) strap from rim, (6) strap, circular, (7) strap, elliptical or rectangular, (8) strap to carination, (9) knob, (10) prong, (11) side tab, (12) loop tab, (13) rim tab, (14) tab, perforated, (15) upright rim tab, (16) tab, (17) flattened lug, (18) waisted lug, (19) elliptical lug, horizontally pierced, (20) lug, horizontally pierced, (21) lug, vertically pierced, (22) lug/ledge, (23) ledge, (24) smaller ledge, (25) ledge, horizontal.

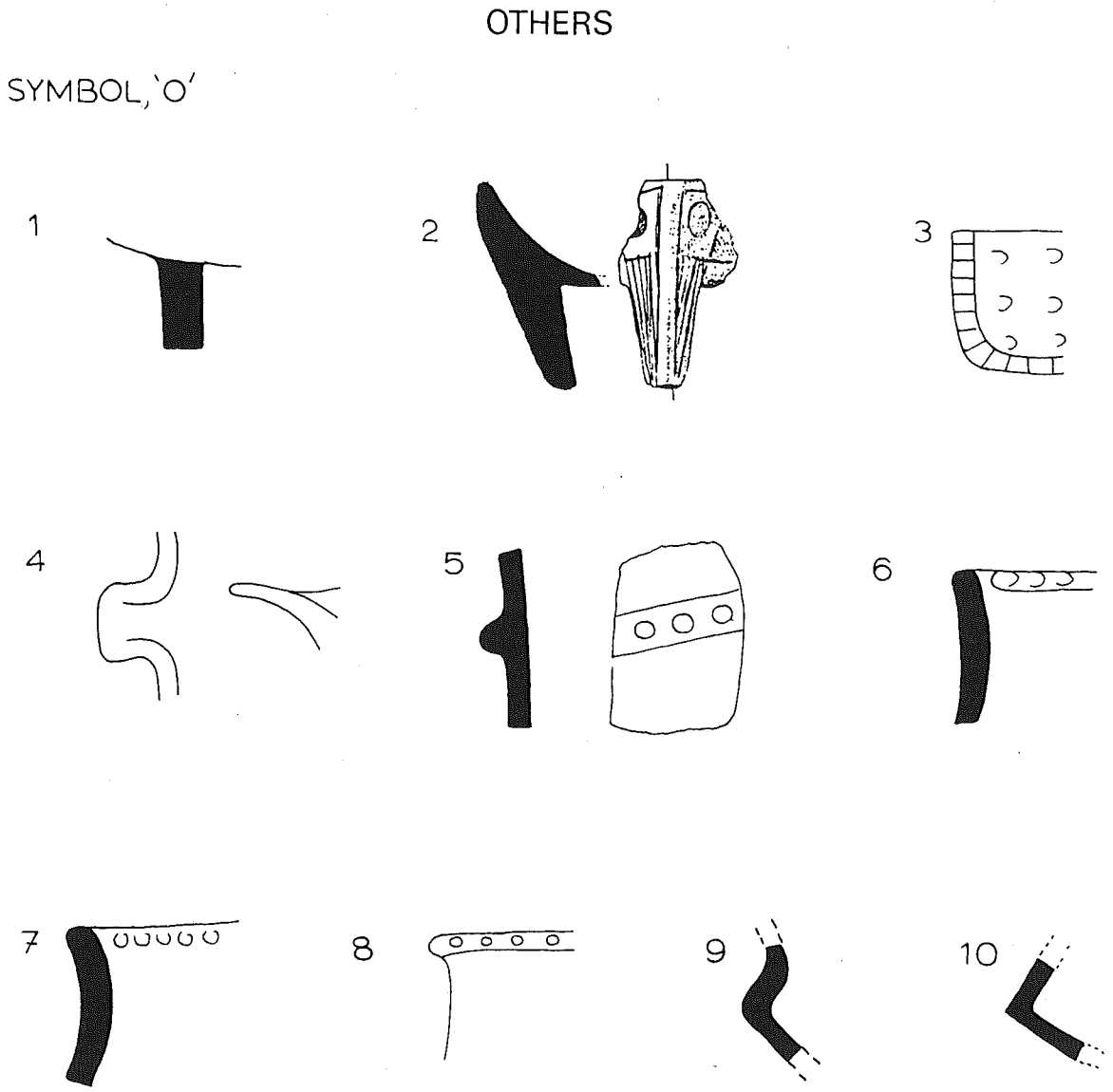


Figure 7.15. Shape categories employed in Sitagroi sherd count. Other features, "O": (1) Paradimi leg, (2) incised tripod, (3) sieve/brazier (square base), (4) spout, (5) cordon, (6) impressed edge, (7) impressed rim, (8) cordon at rim, (9) carination (some with channeling), (10) carination.

collected for each level is diagrammed in figure 7.2 (lower). Feature sherds are defined as those in one of the shape categories of rim, base, handle, other, or sherds bearing decoration. The lower frequencies from layer 20 upward mainly reflect the absence of painted wares in the upper strata of the sequence.

The data concerning the various pottery fabrics are summarized in figure 7.9. This indicates for each fabric (as defined above) the range of strata (in stratigraphic sequence) through which they occur, with no indication of the magnitude of occurrence. The material is reliably set in its serial order by stratigraphic means, and the aim is to present data about the pottery on this firm basis of relative chronology. A similar chart was compiled for the duration of specific shape categories, but this is not shown here since patterning does not emerge so obviously from it. It will be noted that the most frequently occurring fabrics are the Coarse, the Smooth, the Dark Burnished, and the Pale Burnished wares. These are of course undecorated categories, the two last ranking as fine wares. Note also that dark predominates over pale in the later levels. Most of the other fabrics rank as decorated.

Nearly every fabric and shape category shows some measure of chronological patterning, as is illustrated by the plots in figure 7.16 for the frequencies of occurrence of Graphite-painted and Gray Lustre wares. The plots show the total occurrence of these throughout the sequence, omitting frequencies of less than 0.2 sherds per kilogram. Superimposed on each plot is the smoothed plot resulting from taking the arithmetic mean of successive pairs of units. These are among the most clear-cut cases in which the chronological patterning emerges directly, but many other fabric categories, and to a lesser extent shape categories, give satisfying and essentially unimodal plots in this way. This point is illustrated further in a number of later figures. In the remaining figures illustrating fabric distributions through time (e.g., fig. 7.3), the number of sherds per kilogram is shown on a logarithmic scale which allows not only greater compactness but, in particular, due weight for lower frequencies, from 0.1 sherds per kilogram. (The fractional quantities are notional, of course: 0.1 sherds per kilogram represents a frequency of 1 sherd per 10 kilograms.) The same comment applies to the diagrams illustrating occurrence of shape categories through time (figs. 7.4, 7.7, and 7.8).

The initial purpose of the sherd count was both descriptive and analytical. As explained above, it was also designed to facilitate a division into phases, which will now be discussed.

THE PERIOD DIVISIONS

The purpose in dividing the stratigraphic sequence at Sitagroi into a number of chronological divisions has already been discussed. It was felt desirable that each period so defined should be recognizable on the basis of a unit of around 200 sherds (i.e., around 5 to 10 kg of pottery) from any stratigraphic context on the site. In fulfilling that desideratum, it would be convenient to have as fine a chronological division as possible.

In a preliminary look at the pottery, the Graphite-painted and Black-on-Red fabrics at once catch the eye. After their period of occurrence there is virtually no more painted ware. These two fabrics have closely similar durations (cf. figs. 7.16 and 7.3). Moreover, they correlate with the appearance of several other fabrics, including the Excised and Excised-with-Graphite (fig. 7.3), although the latter has a more restricted chronological range. It should be noted that the Excised fabric is a category which in fact covers the products of two different periods which can, on the application of more detailed criteria, readily be distinguished.

A similar picture is presented by a number of shapes (fig. 7.4), for instance the Kritsana bowl (fig. 7.11: form R19), and the flaring bowl (fig. 7.11: form R6). The occasional later occurrence of these shapes is not thought to be due to contamination but to homology of form.

These observations allowed the definition of a stratigraphic range for these and related fabrics

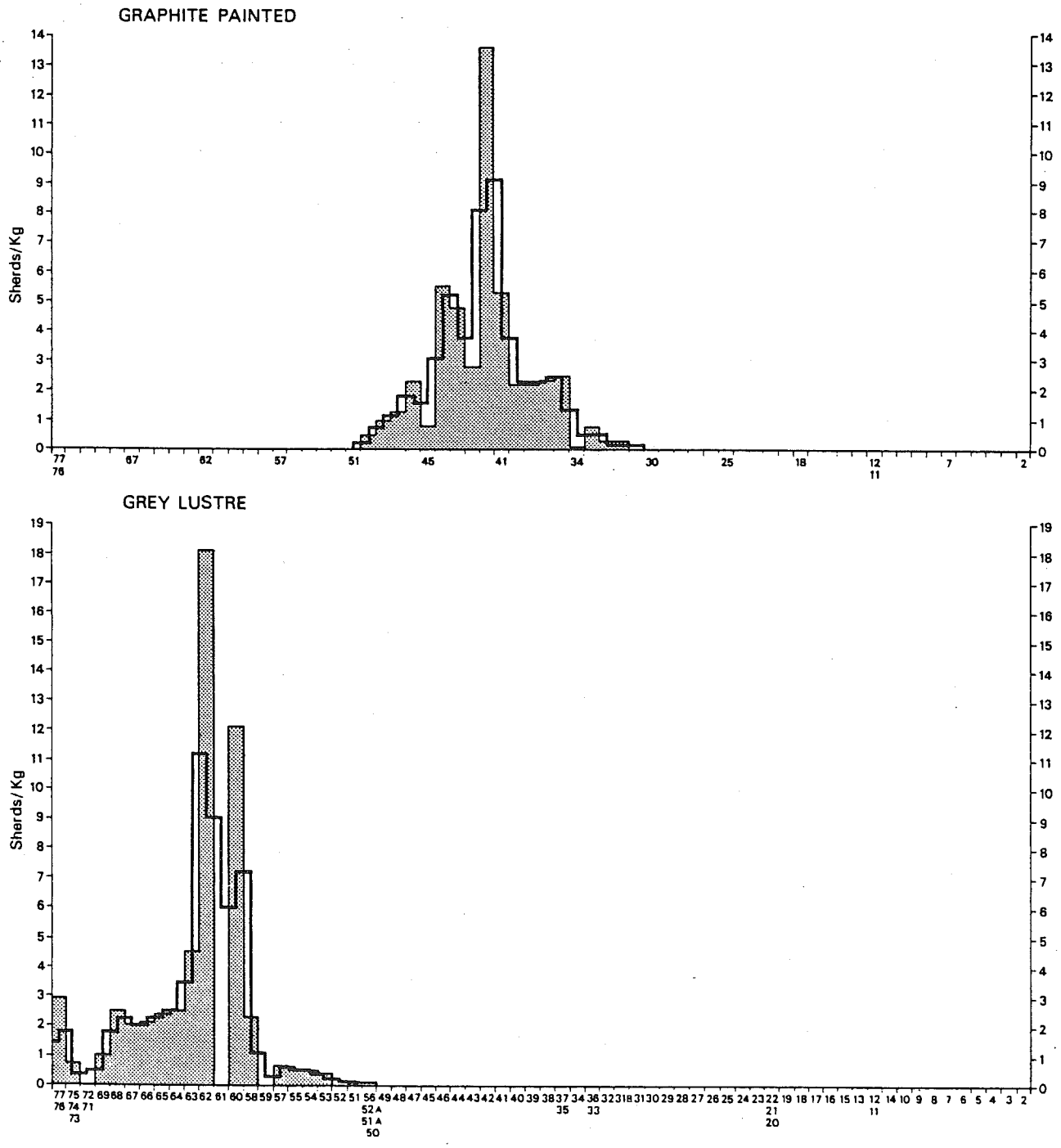


Figure 7.16. Occurrence of two phase-diagnostic fabrics in ZA successive strata: *lower*, Gray Lustre ware, typical of phase I; and *upper*, Graphite-painted ware, typical of phase III. The actual counts (in sherds per kilogram) are shown by shading and the running average of two successive strata in heavy outline.

and shapes from layer 49 up to layer 33. The precise limits, as with all boundary selection procedures, involve an element of arbitrary choice, but the general characteristics of the pottery of this phase are abundantly clear and are discussed in chapter 12. Following the further divisions to be discussed below, this period was named phase III.

By designating layers 49 to 33 as a recognizable period at Sitagroi, we had effectively partitioned the sequence into three. Consideration of the earliest span, from layer 77 to 50, showed much variation of fabric and shape. The pedestal base (fig. 7.13: form B4) was found only in the later part of the early phase (fig. 7.4). And while the Gray Lustre fabric (fig. 7.16) and Gray Lustre Channeled are seen through most of its duration, there is a range of distinctive painted fabrics which occurs only in the later part of it. Amongst these are Brown-on-Cream, Orange-on-Orange, Red-on-White (fig. 7.5), Brown-on-Buff, and the residual category "other painted." These and other occurrences allowed a subdivision of the early span into phase I (layers 77–60) and phase II (layers 59–50).

Phases IV and V presented more problems, chiefly because the bulk of the pottery was not decorated (none was painted) and thus the frequency of occurrence of individual diagnostic features tended to be low. For this reason there

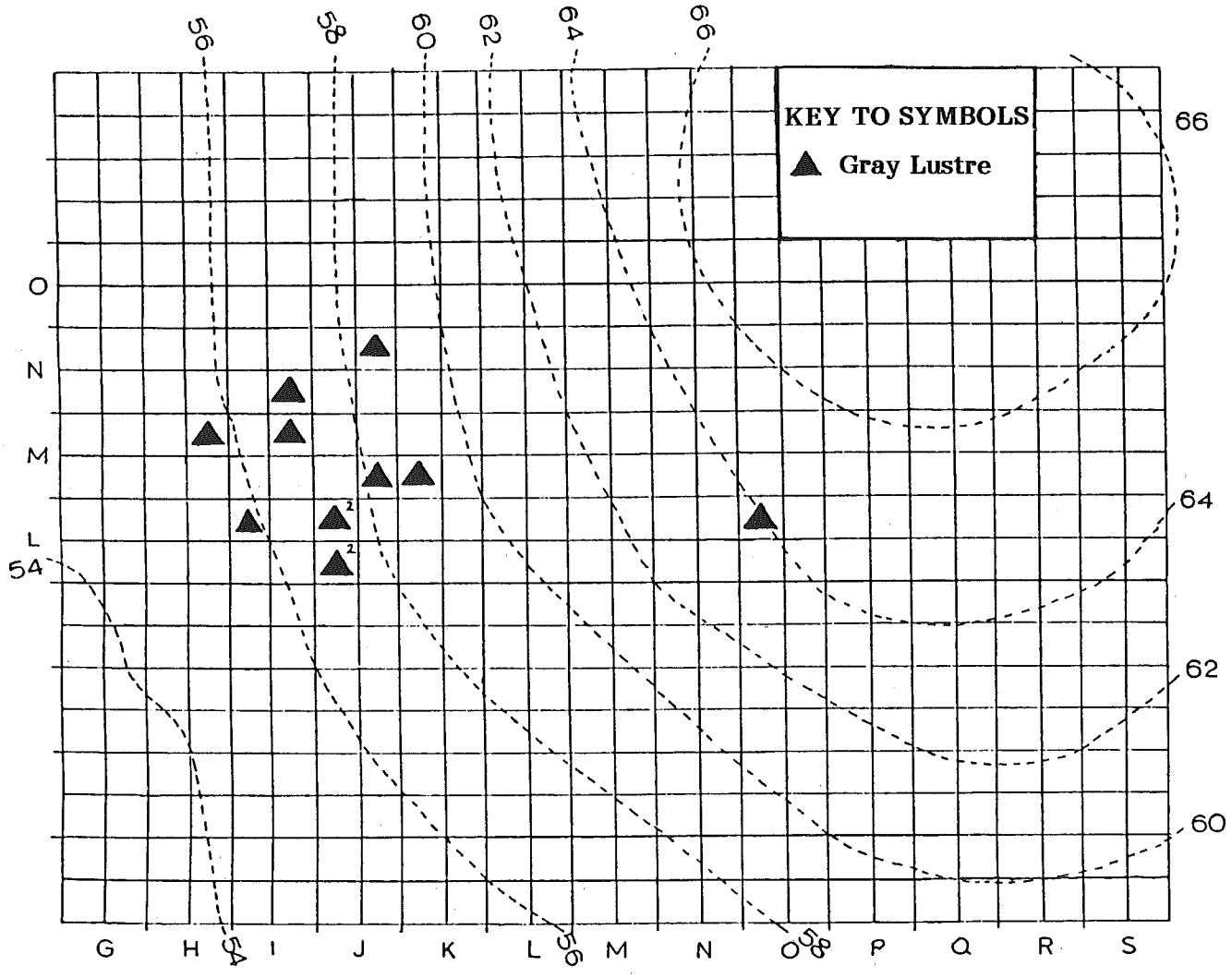


Figure 7.17. Distribution of surface-collected diagnostic fabrics, phase I.

is a pattern of sporadic occurrence and nonoccurrence on the ceramic plots after phase III. Larger samples were necessary, and indeed it was only through the study of material from the Main Area (squares PO, PN, QO, and QN, with ROc) that Sherratt was able to obtain a clear picture of the pottery (see chap. 13). The handled cup, pot 128 (fig. 13.20:5; pls. XXII:2, XCIX, top:4), was characteristic of the upper levels in those squares, while the lower levels in ZA yielded several shallow, one-handled scoops or bowls (pot 5, fig. 13.4:9; pl. XI:2) with what proved to be a characteristic decoration with rounded, shallow grooves. The occurrence of this grooved decoration, as well as stamped and pointillé decoration and incised pottery, is seen in figure 7.6. The early occurrence of incised decoration is not related to this later frequency.

One feature which appears very late in the sequence is the use of finger impressions, either at the edge (fig. 7.15: form 06) or actually on the rim (fig. 7.15: form 07) or on a cordon applied to the rim (fig. 7.15: form 08). The occurrence of two of these traits is seen in figure 7.7. It should be noted that some of them are also seen in phase I. This represents a coincidence of form rather than the survival of a tradition. Most of the pottery of phase I, like that of the periods in

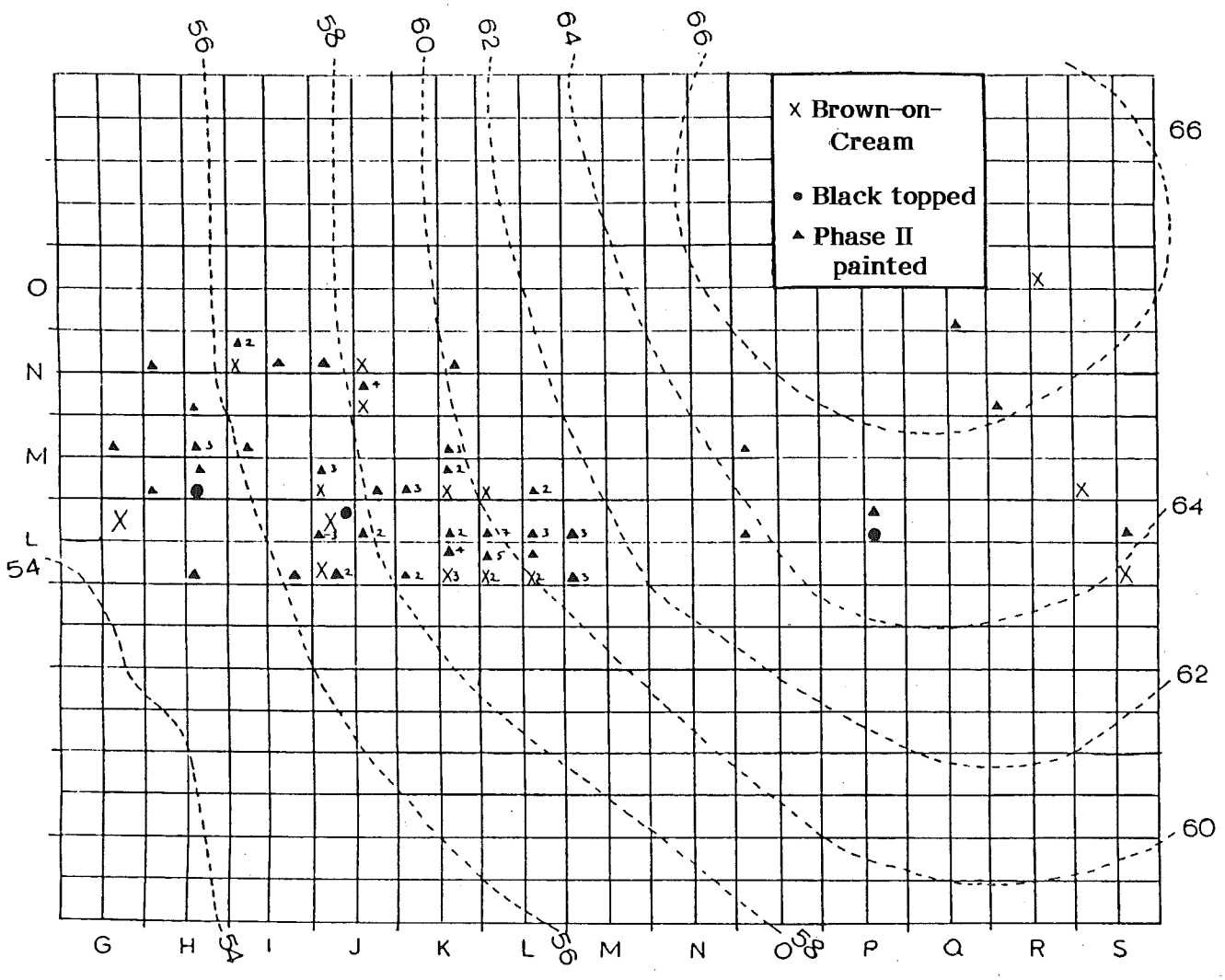


Figure 7.18. Distribution of surface-collected diagnostic fabrics, phase II.

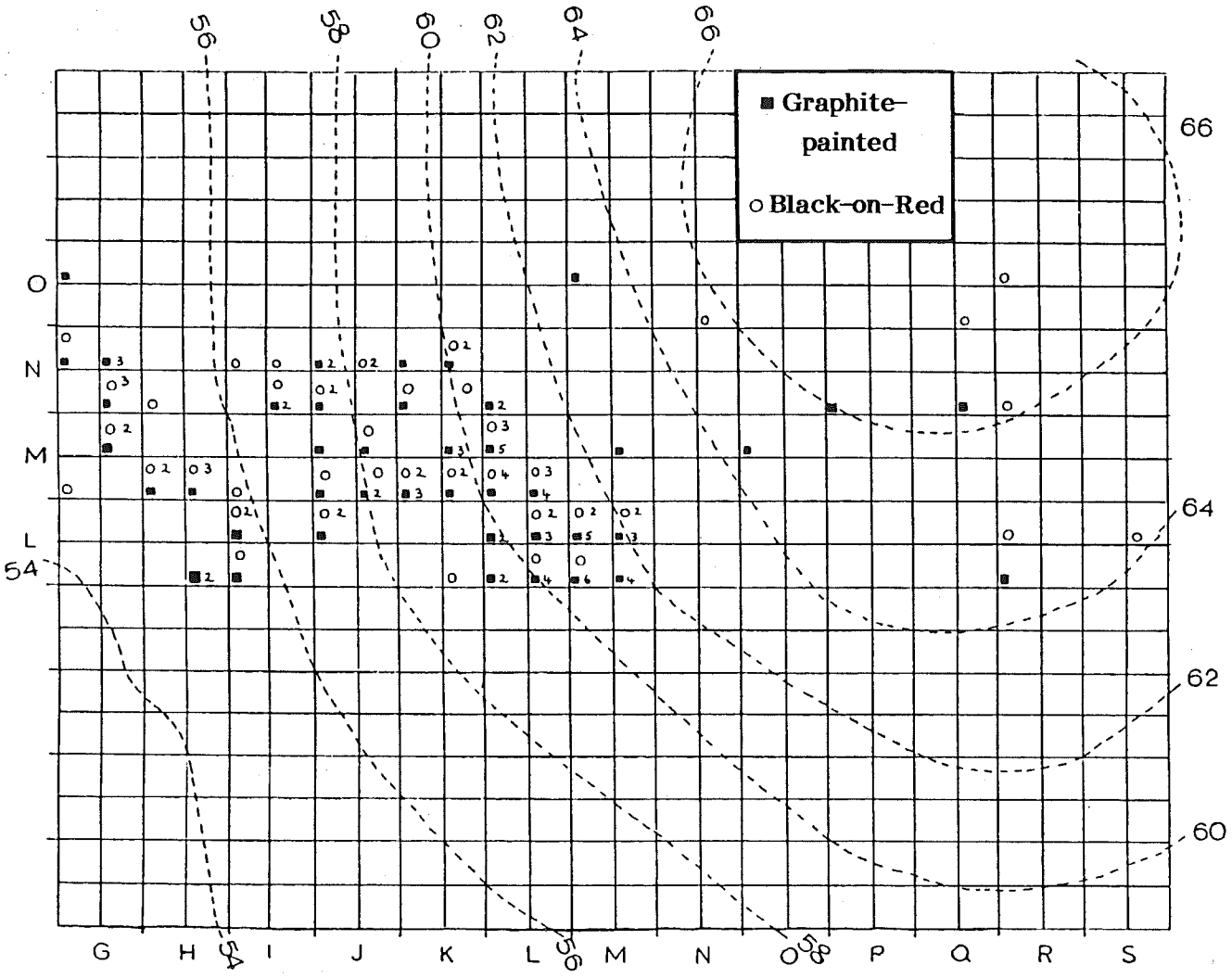


Figure 7.19. Distribution of surface-collected diagnostic fabrics, phase III.

question, is unpainted. In these circumstances, relief and impression may more readily seem an appropriate form of decoration. The occurrence of certain handle forms is seen in figure 7.8. On the basis of these and other considerations it was possible to divide this time span into phase IV (layers 32–21) and phase V (layers 20–2). As indicated above, phase V was subsequently subdivided into Va and Vb on the basis of the structures and finds in the Main Area.

Following this division of the ZA stratigraphic sequence into phases, it was possible to apply the same criteria to the other areas excavated, and hence in general to ascribe any stratigraphic unit from the site to one of these five periods. The result is seen in table 7.1. The division of the ZA deep sounding into phases is illustrated diagrammatically in the sketch section, figure 7.1.

RADIOCARBON DATES AND ABSOLUTE CHRONOLOGY

Considerable care was taken in the collection of radiocarbon samples and in the subsequent

choice of specimens sent for determination. In convenient cases where carbonized seeds were found in sufficient abundance, these were used in preference to longer-life materials, represented by wood charcoal. The ZA stratigraphic column provides the bulk of the samples utilized, and the samples from the adjacent sounding ZB, collected by Payne (from his flotation and water-sieving procedure), could be tied in stratigraphically directly with ZA. For phase V, most of the samples came from the Main Area (squares PO, PN, QO, QN), and these are listed in table 7.2 along with those from ZA and ZB, in strict stratigraphic order. Samples from squares ML, MM, and ROc were also included, and their ascription to phase is secure, but they could not be tied in precisely with the ZA sequence.

Nineteen samples were determined in the Berlin laboratory (Deutsche Akademie der Wissenschaften, Berlin, DDR), through the kindness of Dr. G. Kohl and Dr. Hans Quitta, and seven in the British Museum Radiocarbon Laboratory, through the kindness of Richard Burleigh. These determinations have been previously published (Renfrew 1971). Two hitherto unpublished determinations are included here, from the La Jolla laboratory (University of California, San Diego), through the kindness of Dr. Hans Suess. Both

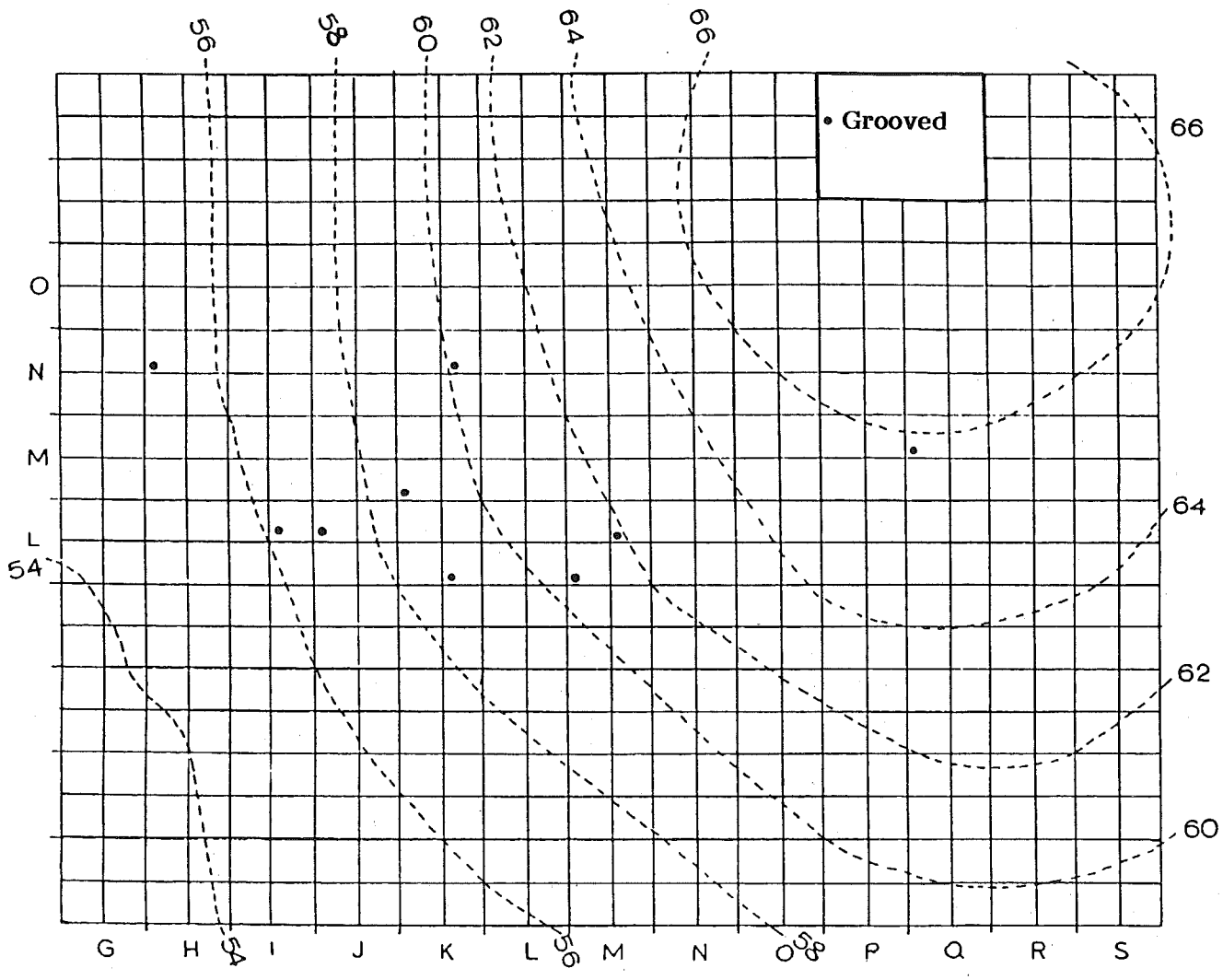


Figure 7.20. Distribution of surface-collected diagnostic fabrics, phase IV.

are from a substantial timber of carbonized wood from square PN/C layer 81. The first (LJ 2715) is from the outer portion of the preserved log; the second (LJ 2714) is from a sample from near its center. On the basis of a count of the tree rings which were visible in the preserved structure of the charcoal, it is estimated that the former represents a calendar date some 35 years later than the latter. It will be observed that the chronological relationship is reversed by the radiocarbon dates (since LJ 2715 has a determination some 34 years older than LJ 2714). This need cause no alarm since it can be argued that statistically the determinations are indistinguishable. However, Suess offers an alternative explanation (personal communication, March 30, 1973): "As the older inner wood gave a slightly younger age than the outer wood it seems probable that it came from a time when the C-14 trend was reversed, as around 2800 BC."

All the radiocarbon dates are quoted here on the Libby (5568 years) half-life. Naturally they require calibration to yield dates in calendar years BC.

It should be noted that two samples were divided and half sent to the British Museum laboratory, half to Berlin. These are BM 650a with Bln 880, and BM 648 with Bln 779.

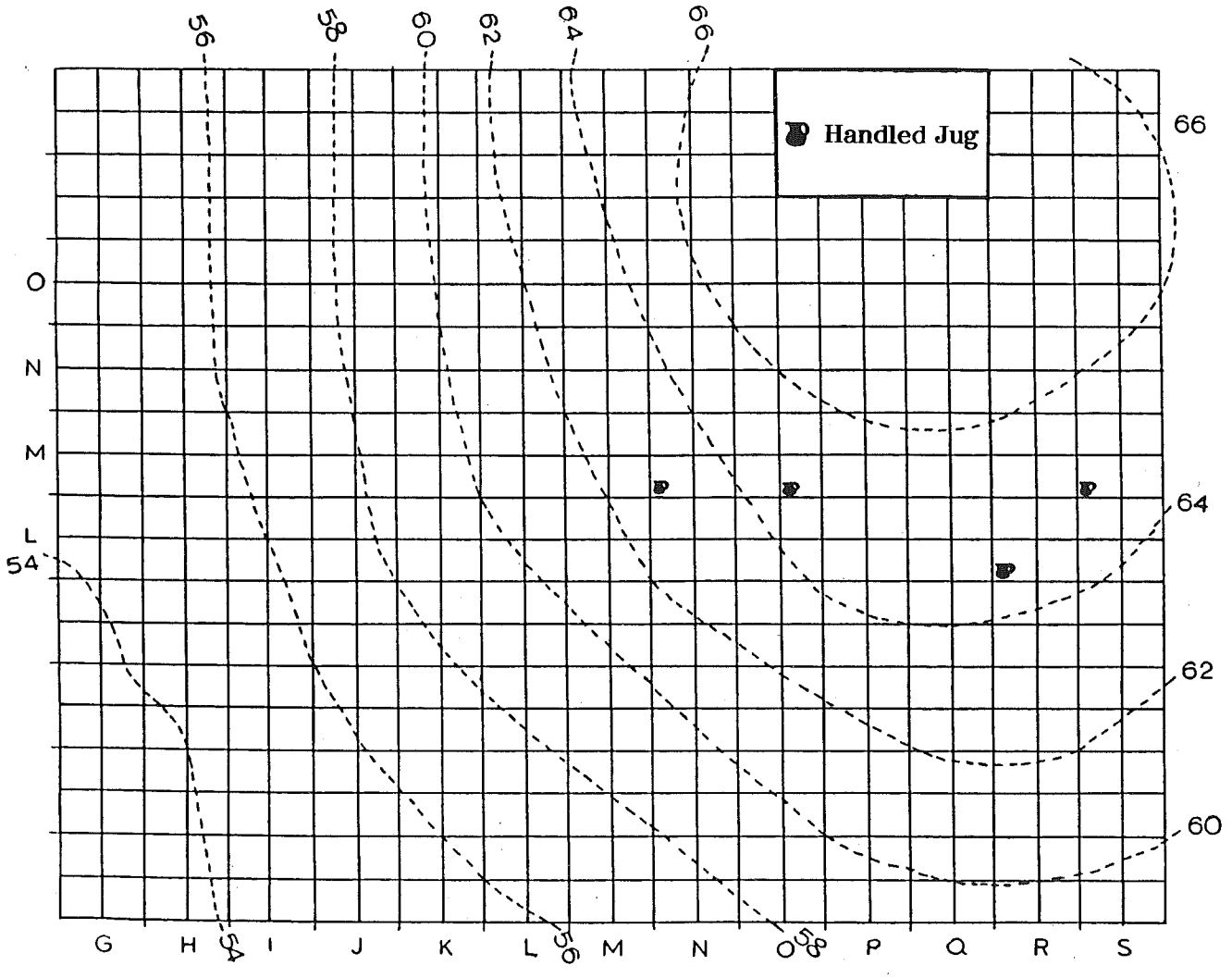


Figure 7.21. Distribution of surface-collected diagnostic jug, phase V.

Table 7.1. Periodization of Excavated Layers at Sitagroi

Trench	Phase I	Phase II	Phase III	Phase IV	Phase V
ZA	60-77	50-59	33-49	21-32	2-20: Va 15-20+11-13 Vb 2-10+14
IL	7, 9-11				
JL	(2)* 4-22, 100-105				
KL	10-30 and 122 downward	(2, 3)* 4-8, (100-104)* 105-121			
ML	23-45	6, 7-21	(1, 2)* 3-5 and 101 downward		
MM*			11-54, 60-69 (less 13-15, 22-26, 29, 30, 34, 39)	2-9, (10)** 13-15, 22-26, 29, 30, 34, 39	
KM		(2, 3)* 4-20			
ZE*		92 downward	84-90	7-83	
PN					all
QN					all
PO					all
QO					all
ZC	Mixed				
ZD				(3-9)**	
LL		4-11			
NL	Mixed				
OL	Mixed				
ZG		34-42, (43)*	13-33	(9-12)**	
ZHt				(1, 2)* (3-27)**	
ZJ		34-44, (45)*	23-33	(5-22)**	
ROc				53-73	2-52: Va 41-52+34 Vb 2-40
SL				(9-14)**	(7-8)**
ZB		131 downward	113-130	49-108	5-41

Note: ( )* indicates some mixing, contamination; ( )** attribution to phase uncertain.

Table 7.2. Radiocarbon Dates from Sitagroi in Stratigraphic Order

Phase	Level	Dates in precise stratigraphic order bc	Other dates bc	Lab. no.	Material
Vb	QO 8		1840±78	BM 653	Vetch
Vb	QO 8		2135±150	Bln 781	Vetch
Vb	PO 9	1920±100		Bln 780	Charcoal
Vb	PO 23	2015±100		Bln 876	Charcoal
Vb	PN/C 81	2055±40		LJ 2715	Charcoal
Vb	PN/C 81	2021±40		LJ 2714	Charcoal
Va	PO 158	2220±100		Bln 877	Charcoal
Va	PO 162	1853±59		BM 652	Charcoal, from posthole
Va	ZA 16	2360±100		Bln 782	Charcoal, from beam
IV	ZA 29	2440±100		Bln 773	Acorns
IV	ZA 31	2600±100		Bln 879	Charcoal
IV	ROc 59		2445±100	Bln 878	Charcoal
IV	ZB 108	2382±79		BM 651	Acorns, from flotation
IV	ZB 112	2413±56		BM 650a	Charcoal, from flotation
IV	ZB 112	2430±80		Bln 1102	Charcoal, from flotation
IV	ZB 112	2560±100		Bln 880	Charcoal, from flotation
III	ZA 41a	3150±120		Bln 774	Charcoal
III	ZB 125	3605±100		Bln 881	Charcoal, from flotation
III	ML 118		3417±85	BM 650b	Charcoal
III	MM 52		3845±100	Bln 882	Charcoal
III	MMb 69		3595±100	Bln 883	Einkorn, from flotation
II	ZA 50	3954±66		BM 649	Charcoal, from flotation
II	ZA 50	4290±100		Bln 884	Charcoal
II	ZA 52	3770±100		Bln 776	Charcoal
II	ZA 59	3970±120		Bln 777	Charcoal
(I)	ZA 63	(6030±150)		Bln 885	Charcoal
I	ZA 67	4315±75		BM 648	Charcoal
I	ZA 67	4675±170		Bln 779	Charcoal
I	ZA 70	4475±100		Bln 778	Charcoal

Note: Determination Bln 885 is the only date which departs markedly from the stratigraphic sequence. It was omitted from consideration in the production of table 7.3.

Of these 29 radiocarbon determinations, only one fails entirely to harmonize with the clear and coherent chronological pattern. This is Bln 885 (6030±150 bc). Kohl wrote, "Bln 885 is very uncertain since the quantity of carbon for analysis from this sample was very limited" (Renfrew 1971:276), and this date, which is clearly incorrect, is omitted from further discussion. In general, the Sitagroi radiocarbon dates give a very satisfactory absolute chronology for the site. It is unfortunate, however, that no samples were available from the later levels of phase III (ZA levels 40–33).

These determinations lead to the following possible dating of the phases in radiocarbon years (table 7.3), which may be converted to calendar years following the calibration proposed by Clark (1975). It should be noted that the date for the end of phase III and beginning of phase IV could be up to three centuries earlier.

Table 7.3. Calibration of Radiocarbon Determinations

Phase	Duration (radiocarbon years bc)	Duration (calendar years BC)
Vb	2100-1800	2700-2200
Va	2400-2100	3100-2700
IV	2700-2400	3500-3100
III	3800-2700	4600-3500
II	4300-3800	5200-4600
I	4600-4300	5500-5200

THE PHASING OF FINDS FROM THE SURFACE SURVEY

In light of the ZA phasing, it is now possible to look at material from the surface of almost any prehistoric settlement mound in the plain of Drama and to ascribe the greater part of the pottery found to an appropriate phase.

The efficacy of the approach was shown at Sitagroi when it was applied to the materials systematically collected from the surface of the mound at the outset of the 1968 season. The distribution of certain diagnostic sherds in this area is shown for each phase in figures 7.17-7.21. Each plan (e.g., fig. 7.17, which represents phase I) indicates the contoured surface of the southwest section of the mound on the 5-m squares of the survey grid. Not surprisingly, indications are most abundant for those phases (notably II and III) which possessed the most distinctive ceramic fabrics.

The Sitagroi ceramic sequence can be used as a firm framework for the chronological placing of other sites within the plain of Drama. So far, no material from the area has been found which is earlier than Sitagroi phase I. The later bronze age is not represented at Sitagroi. Indications of this period, obtained from the surface survey of other sites in the plain of Drama, are given in chapter 6 and volume 2.

8.
The Excavated Areas
Colin Renfrew

The intention of this chapter is to give a concise account of the work in each of the excavated areas (see fig. 2.2). Details were given in chapter 2 of the general stratigraphic correlations between a number of the trenches (fig. 2.3), of the grid imposed upon the site (fig. 2.1), and of the recording methods used. Before moving on to deal with specific areas, let me note two relevant points of detail. It has already been stated that grid north is approximately 30° west of true north and that the concrete triangulation point lies in grid square OQ, some 9.0 m east and 5.5 m north of the southwest corner of that square. The southwest corner of square PP (i.e., the northwest corner of square PO) is 15.8 m away from the trigonometric survey point, at a magnetic bearing of approximately 144°. The site datum (for vertical measure), located at the southwest corner of square PP (i.e., the northwest corner of square PO), is 1.095 m below this point.

In 1968 the ground surface at the southwest corner of each grid square was surveyed, giving a depth below the site datum as indicated in figure 8.1. During the 1969 season the datum points for the excavated areas (located as usual at the southwest corner of the square) were at the following depths below site datum (the discrepancy of approximately 20 cm between the two figures should be noted—in some cases the datum point for the excavated square may have been established below the original ground surface):

Square (southwest corner)	Depth of datum below site datum
PN	1.10 m
PO	0.50 m
RO	0.50 m
SL/ZE	3.11 m
ZL	10.11 m
ZH	3.49 m
NL (for ZE)	4.83 m
MM	5.24 m
ML	6.40 m
KL	9.37 m
ZB (TD4)	3.29 m

It will be convenient to deal first with the deep sounding ZA, then with the Main Area, and then with each of the other excavation areas in turn. The discussion here is deliberately as concise as possible; the finds are dealt with in greater detail in the chapters dealing with specific classes of material.

The Deep Sounding ZA

The southwest corner of ZA lies in grid square 00, 6 m east and 6 m north of the southwest corner of that square. The square ZA measures 3 m x 3 m (and its sides are therefore separated by a notional 1 m balk from the north and east sides of 00). Because of its great stratigraphic importance, all four faces of ZA are shown in section in figure 8.2. Layer numbers are indicated in a

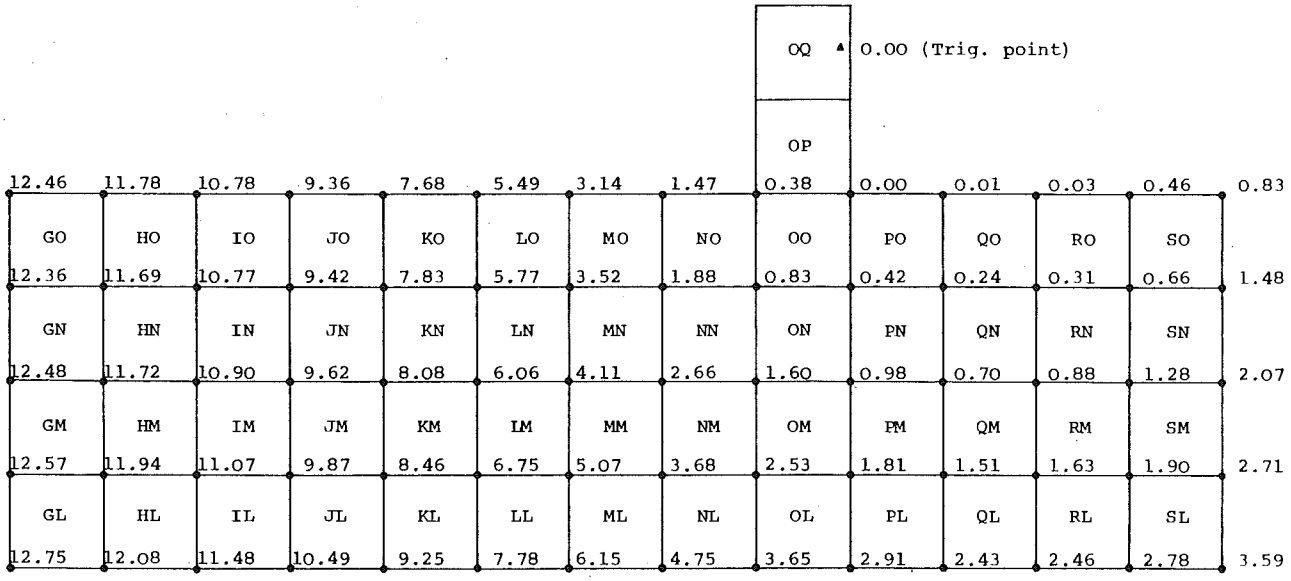


Figure 8.1. Chart indicating the depth in meters (below site datum) of the surface at the southwest corner of each 10 m grid square. These points were used as the local datum zero for depth for each excavation square.

circle, each number being shown at the top of the layer to which it relates.

The main structural features are already visible from the section, since walls were very difficult to trace. The term "floor" does not necessarily imply a well-prepared surface but simply a smooth surface that may be interpreted as an activity area.

The upper levels were disturbed in three locations by burials of very late date, described in the next section. Phases IV and V are represented by a sequence of floor levels, fourteen in number. Layers 32 and 33 initiate a deep deposit of "fill"—mainly settlement debris—without indications of structures in this area, and it is not until layer 42 in phase III that floor 15 is seen.

The deposits of phase II are likewise mainly fill in character, with only floor 16 suggesting a living surface. The large size of pit 22 should be noted. With the levels of phase I, indications of structures are more numerous, and floors 17 to 20 should be noted.

To understand the very scanty nature of the structural remains found, it is pertinent to look at the structure of the Burnt House of phase Va, found in the Main Area. While early structures may not have had the same plan, there are abundant indications that the general construction—pisé applied on a timber frame—was much the same. Such structures are only seen clearly when burnt.

Debris from the destruction of such houses is indicated in layer 26 (lying on floor 10) and layer 32 (lying on floor 14), both of phase IV, and in layer 41 (lying on floor 15) of phase III.

In general, neither the features nor the finds warrant a detailed, level-by-level treatment. Finds are extensively illustrated. Numbers are assigned to ceramic vessels and fragments with the term "pot" before the number. Description makes the item's condition clear even if unillustrated. Other artifacts are referred to as "small finds" (abbreviated as "SF") plus the number. It should be clearly understood that the term "floor" is freely applied to any horizontal patch of pale clay which extends over more than a square meter or so of the trench, and in many cases the area covered was not greater than this. In cases where the surface had been exposed to burning, the color was reddish, but only rarely (in ZA) was the surface actually hard as a result. Postholes were visible in places, wherever the floor surface was recognizable, but the area was not sufficiently large to allow elucidation of

structures. In layer 12, the postholes in floor 4 were lined with pale clay. An approximately circular hearth about 1 m in diameter was examined in layer 16. Pot 1 (fig. 13.25:12) was found in ZA 3; it is a handled jug assigned to a late stage of phase Vb.

Contexts of Phase IV

Two successive spreads of debris were found in the strata of phase IV. Although scanty, they are important because they provide contexts for an assemblage of phase IV material.

Above the first of them, in layer 25, a short length of clay wall standing about 12 cm above floor 9 was unearthed. Exceptionally for this site, the stretch of wall consists of five baked clay slabs roughly 24 cm long, 12 cm high, and 5 cm thick, with a smooth interior surface.

The destruction level of layer 26 is below this feature and covers the whole of the square. It contained:

Pot 5 (fig. 13.4:9; pl. XI:2). High-handled shallow bowl or scoop (a characteristic form of the period). Black burnished. Burnt. Diameter 6.2 cm.

Pot 63 (fig. 13.5:2; pl. XI:3). Rounded bowl with incurving profile and horizontal stringhole lug. Black burnished. Burnt. Diameter 13.0 cm.

Pot 325 (fig. 13.5:5; pl. XI:4). Fragment of piriform bowl with upright rim and incised and applied decoration. Black burnished. Burnt. Diameter 23.0 cm.

These were in debris lying on floor 10. The section here clearly illustrates the series of floors of this phase. In layer 28, debris on floor 11 contained:

Pot 80 (fig. 13.5:6; pl. XI:5). Piriform bowl with upright rim and incised and applied decoration. Black burnished. Burnt. Diameter 25.0 cm.

The destruction of layers 31 and 32, associated with floor 14, is dated by carbonized wood from a posthole, giving a determination of 2600 ± 100 bc (Bln 879). At the north end of the trench was a small bowl hearth set into the floor, some 25 cm in diameter, consisting simply of burnt clay. At the south end was a subrectangular clay platform some 70 cm long, with an elongated depression in the middle. At the southwest corner was a network of fallen carbonized beams, perhaps from a ceiling. The southeast corner of the trench is seen in plate XII:1 with three of the four further scoops which were found.

Inevitably in so small an area, the structural features are limited in extent. However, there is little doubt that well-preserved remains of the period, including at least one house, are found at this depth. Our sounding was, in effect, sampling this structure in rather the same manner as would a 3 m x 3 m trench cut through the Burnt House of phase Va.

The following pots come from these levels, along with an unbaked clay spool (SF 125), a bone point (SF 136), a worked metapodial (SF 128), a fragment of a shell bracelet (SF 127), and a stone axe (SF 129) from below floor 14:

Pot 19 (fig. 13.4:10; pl. XII:2). Scoop with hemispherical bowl and projecting strap handle. Black burnished. Burnt. Diameter 9.0 cm.

Pot 20 (fig. 13.4:6; pl. XI:1a). Scoop with sinuous bowl and projecting strap handle. Black burnished. Burnt. Diameter 8.0 cm.

Pot 21 (fig. 13.4:12; pl. XI:1b). Scoop with slightly carinated bowl with upright rim and projecting handle. Black burnished. Diameter 11.4 cm.

Pot 23 (fig. 13.4:8; pl. XI:1c). Scoop with sinuous bowl and projecting handle. Black burnished. Burnt. Diameter 8.0 cm.

Pot 24 (fig. 13.4:11; pl. XI:1d). Scoop with hemispherical bowl and projecting strap handle. Black burnished. Burnt. Diameter 7.9 cm.

Pot 6 (fig. 13.4:2; pl. XII:3). Rounded bowl with grooved or channeled decoration. Black burnished. Burnt. Diameter 12.0 cm.

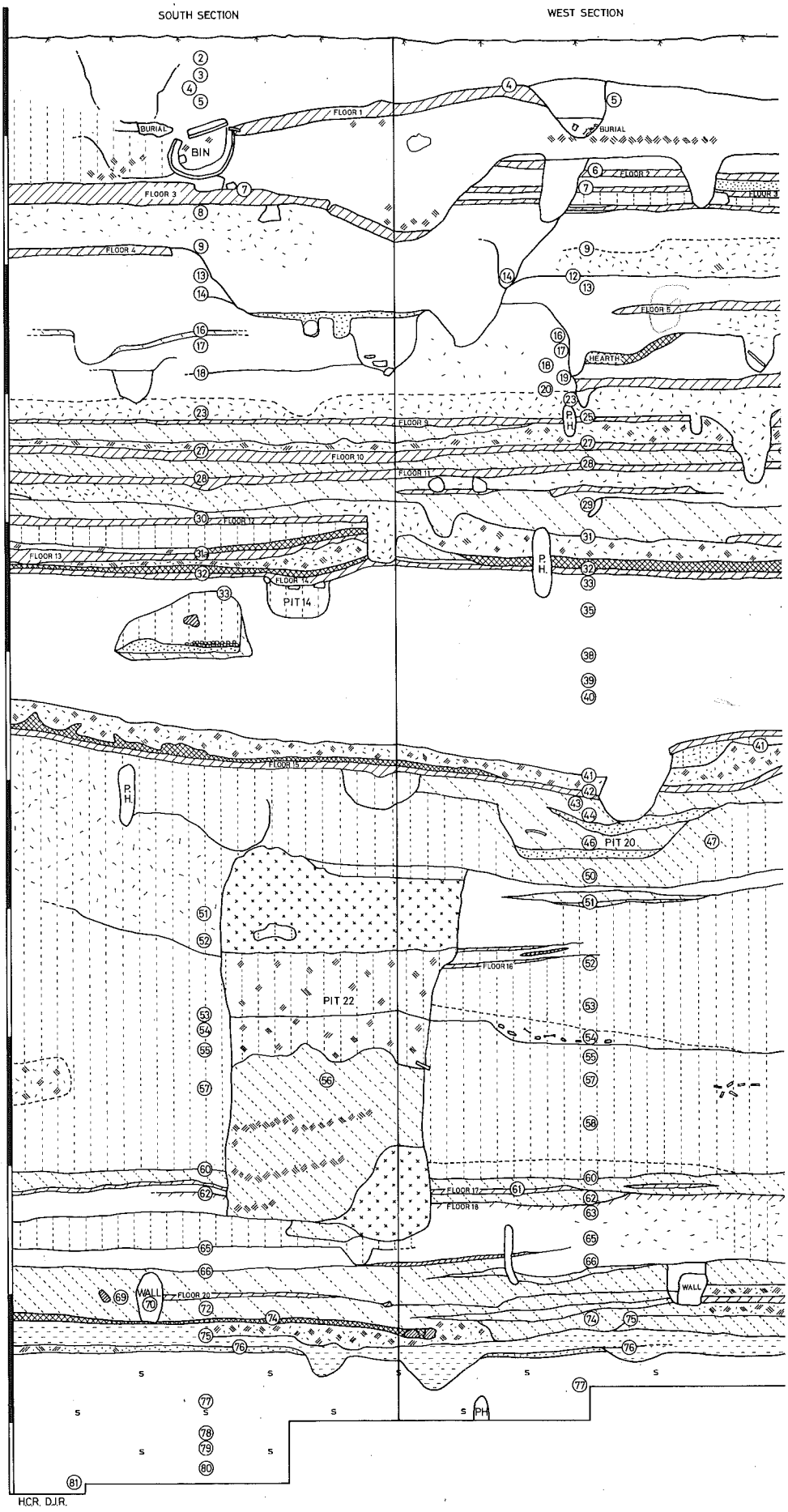
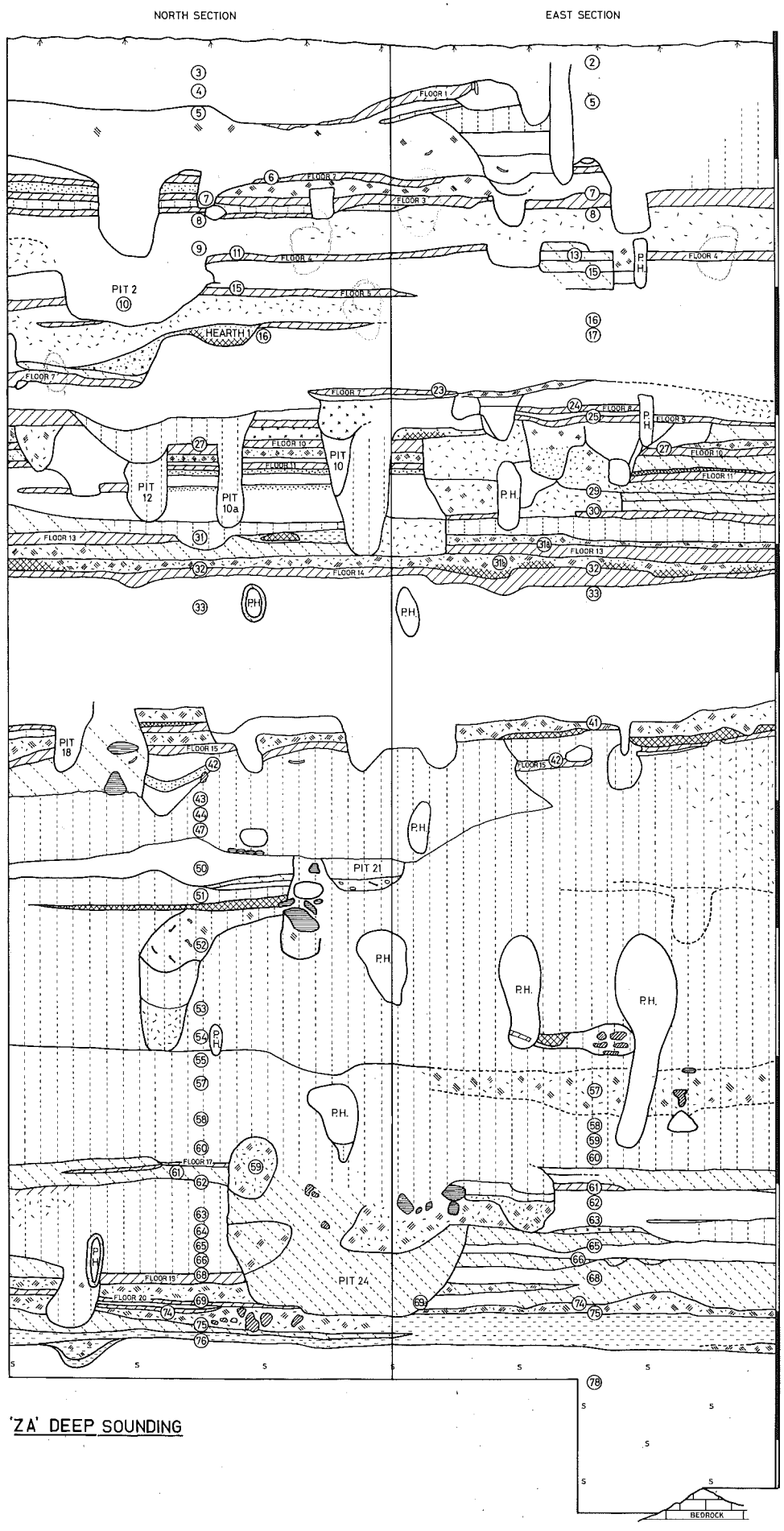


Figure 8.2. (On facing pages): Stratigraphic section of the four faces of the deep sounding ZA. Layer numbers are enclosed by a circle, each indicating the top of the layer in question.



'ZA' DEEP SOUNDING

CONVENTIONS

- SOIL (DARK / LIGHT)
- CLAY (DARK / LIGHT)
- CLAY FLOORS
- RED/ORANGE CLAY
- SAND
- ASH
- CHARCOAL
- DENSE CARBON
- LOOSE FRAGMENTS OF DAUB OR CLAY FLOOR
- STERILE DARK CLAY
- LARGE FRAGMENTS OF DAUB OR CLAY FLOOR
- STONE
- BONE
- LARGE SHERDS
- P H POST HOLE

Contexts of Phase III

The upper phase III levels (layers 33-40) are without striking features. A sherd with impressed decoration formed by a shell was found in ZA 35 (pl. XIII:6), and a fragment of a bowl with inturned rim, pot 134, occurred in layer 34.

With level 41 we reached what was evidently a destruction deposit, associated with floor 15; beneath this (layers 42-47) were some "fill" deposits with abundant pottery. The deposit associated with floor 15 is an important closed deposit of phase III.

The Deposit of Floor 15 (ZA 41)

Removal of layer 40 revealed traces of a floor over much of the trench, indicated by harder yellow clay material. The yellower soil on it may have been roof debris. The floor itself was undulating, without evidence of walls or postholes. Upon it was a patch of large stones, including a pounder and a flat grinder, a number of complete pots, several scatters of sherds which gave complete profiles on restoration, and massive sherds from a large pithos. A radiocarbon sample from this level gave a date of 3150 ± 120 bc (Bln 774). The following pots are from this context:

Pithos (pl. XIII:2). Thick-walled (up to 2 cm), decorated with heavy excisions. Coarse. Originally it may have stood to a height of 1.5 m.

Pot 8 (fig. 12.12:6; pl. XIII:1). Two-handled, carinated amphora with third handle. Dark Burnished. Height 9.9 cm.

Pot 9 (fig. 12.11:6; pl. XIII:4). Inturned bowl or pyxis with incised decoration. Diameter 9.0 cm.

Pot 10. Straight-sided bowl. Coarse. Diameter 6.4 cm.

Pot 11 (pl. XIII:3). Two-handled carinated amphora with third broad handle. Graphite-painted. Height 6.2 cm.

Pot 12 (fig. 12.5:4; pl. XIII:5). Incomplete two-handled jar. Graphite-painted. Height 5.2 cm.

Pot 14. Pedestal base, upper part of vessel missing. Coarse. Height 9.0 cm.

Pot 38 (fig. 12.9:3; pl. XIV). Two-handled amphora with oval mouth. Black-on-Red. Height 28.3 cm.

In addition, a bracelet segment (SF 213) and a chert blade (SF 214) come from these levels. A large number of mussel shells were found in one area of the square. This may be regarded as a domestic area, although the existence of one pot of exceptional quality (pot 38) should be noted. The frequency of special finds was low, much lower than in the succeeding levels of fill (although it should be noted that routine water sieving was not in operation when layer 41 was dug).

The Deposits of ZA 42-45

Several important pots come from the layers represented by the removal of floor 15 and what appeared to be midden deposit beneath, characterized by a dark brown soil with a plentiful supply of bones. This deposit may antedate the finds of floor 15 either by a short period or by a period of several centuries. The consideration of the pottery statistics by Evans (chap. 12) inclines him toward the former alternative. Mention should be made here of a find in layer 43: an adult human skull, lying in the middle of the trench. Despite careful search, no associated bones were found. This does not appear to be a burial, and there is little suggestion of a ritual deposit (although some of the pottery from these levels, notably pot 35, does show special characteristics). The find is the more strange since no other human bones were found in the strata of phase I to IV, nor are stray human bones or skulls common in contexts of the Gumelnitsa culture.

Pot 26/35 (ZA 42 with joins from ZA 45 and ZB 125R; fig. 12.7:1; pls. LXXIV:4, B:3). Offering stand. Graphite-painted. Preserved height 8.0 cm.

Pot 126 (ZA 43; fig. 12.3:1; pl. XV). Open bowl with thickened rim. Graphite-painted. Diameter 36.0 cm.

Pot 16 (ZA 44; fig. 12.14:3; pl. XVI:2). Two-handled amphora. Smooth. Height 19.4 cm.

Pot 75 (ZA 44; fig. 12.9:1; pl. XVI:3). Large fragment of oval pitcher. Black-on-Red.
Pot 117/159 (ZA 44; fig. 12.12:7; pl. LXXXIX, bottom:2). Straight-sided, open bowl. Dark Burnished. Diameter 27.5 cm.
Pot 76 (ZA 44; fig. 12.13:1; pl. LXXXVI:10). Globular jar with vertical neck. Smooth. Height 26.3 cm.
Pot 111 (ZA 44; fig. 12.13:6). Rounded bowl with vertical neck. Smooth. Diameter 18.0 cm.
Pot 99 (ZA 45; fig. 12.2:1; pl. XVI:4). Kritsana bowl. Graphite-painted. Diameter 24.0 cm.
Pot 17 (ZA 45; fig. 12.5:5; pl. XVI:1). Two-handled jar with spout (feeding bottle?). Graphite-painted. Height 8.8 cm.

The small finds from these levels were:

Layer 42: SF 216, end scraper on chert blade; SF 218a, zoomorphic leg from pot (fig. 10.7:13); SF 219, clay spindle whorl; SF 220, clay ring; SF 480, fragment of clay stand with graphite decoration.
Layer 43: SF 222, antler chisel; SF 223, chert blade.
Layer 44: SF 229, clay spindle whorl.
Layer 45: SF 226, fragment of incised clay disc; SF 228, bone tool.

Contexts of Phases II and I

Few structural features were seen associated with phase II in ZA. Floor 16 covered only part of the trench, represented by ZA 52. It has an associated radiocarbon date of 3770 ± 100 bc (Bln 776). Several small finds come from this level, including figurine fragments.

With strata of phase I, structural features were again observed, notably the earth floors 17 and 18. In level 67, however, a well-defined floor (floor 20), bounded at its northeast side by a stretch of wall, came into view. The wall ran northwest-southeast and is visible in the drawing of the south and west sections. There are two associated radiocarbon dates (on divided samples): 4315 ± 75 bc (BM 648) and 4675 ± 170 bc (Bln 779). Layer 70 immediately underlies layer 67, and the further date of 4475 ± 100 bc (Bln 778) may be taken as effectively associated with the other two.

The wall in question was revealed as an area of pale yellow clay, the remains of daub up to 20 cm wide; in places this line was preserved to a height of approximately 30 cm. Outside the wall (to the northeast) a scatter of yellow fragments in layer 69 clearly represents the remains of collapsed wall material, either fragmented daub or softened mud brick. Sherds, as reported in the sherd count, were recovered, but there were few small finds.

Discussion

After this account of the stratigraphic sequence in ZA, it may be more clearly seen that what is represented is a series of building and occupation episodes, perhaps of relatively short duration, interspersed with midden deposits.

The first of these, from phase I (ZA 67-70), is securely dated by radiocarbon to around 4500 bc and is associated with floors 20 and 21.

There are scanty remains of occupation in phase II (floor 16), radiocarbon dated to around 3800 bc.

The rich destruction of ZA 41 in phase III (floor 15) is dated to ca. 3200 bc. It should be noted that this is the only positive structural feature in the long phase III.

There are more numerous floor levels for phase IV, where the destruction deposit of ZA 31 (floor 13) is dated to 2600 bc. Floor levels are found in thick succession from then upward, during both phases IV and V.

Clearly, therefore, the continuity of settlement as represented by the ZA sequence itself should not be exaggerated for phases I to III. This does not necessarily imply, however, that the site as a whole was abandoned during those times when no structures stood on the space subsequently sampled by trench ZA.

Absolute Depths

For the sake of reference, the following approximate depths are given for strata of the various phases as seen in ZA (measured below site datum) and in PO.

Top of Vb: 0.0 m
Floors of Long House in PO: 1.0 to 1.4 m
Floor of Burnt House in PO: 1.8 m
Vb/Va interface in ZA: 1.9 m
Va/IV interface in ZA: 2.9 m
Floor 10 of ZA (level 26): 3.3 m
Floor 14 of ZA (level 32): 4.1 m
IV/III interface: 4.2 m
Floor 15 of ZA (layer 41): 5.5 m
III/II interface: 6.5 m
Floor 16 of ZA (layer 52): 7.5 m
II/I interface: 8.8 m
Floor 20 of ZA (layer 67): 10.0 m
Base of I: 10.5 m

THE LATE CEMETERY

In the central area of the site, within the area covered by squares PO, PN, ZA, and ZB, inhumation burials were found belonging to a cemetery of iron age date. The term "iron age" is used with caution, however, since it is likely that the cemetery is from after the classical period. Certainly it has nothing to do with the neolithic to bronze age occupation of the mound.

The locations of nine burials are seen in figure 8.3. Indications of a tenth were found in square ZD, legs and vertebrae only being recovered, without associated finds. Bökönyi identified these remains as juvenile. A further skull was found while digging a drainage ditch immediately to the north of square ZA; this was aged under eighteen years.

As shown on the plan, the burials are extended inhumations, the deceased person buried on his or her back, lying with the head to the west, with the arms generally crossed at the waist, the right over the left. There is evidence that burial 3 was within a wooden coffin, the nails of which are preserved. Nails were not found with the other burials, and these were probably not in coffins. Children and adults, male and female, were buried. It should be noted that six burials of babies were found in the phase Vb levels of squares PN and PO. They had no accompanying grave goods. Although we interpret them as belonging to the early bronze age period, an association with the later cemetery is not completely excluded.

The grave goods accompanying the burials are listed below. It should be noted that burials 2, 4, 5, and 6 were only partly uncovered, since the skeletons lay partly under the balks of the excavated areas. Identifications of age and sex are by Bökönyi.

BURIAL 1 (ZA 3). In this case the arms appear to have underlain the body, possibly with hands clasped behind the head. A child under eight years.
Finds: SF 12 (pl. XVIII:4). Iron knife, lying on the chest.
SF 11 (pl. XVIII:3). Pair of metal earrings (bronze?) underlying the skull.

BURIAL 2 (ZA 3). Two large stones overlie the right side of the chest, but their occurrence and position may be fortuitous. Excavated only above pelvis. Mature female.
Find: SF 13 (pl. XIX:2). Bronze ring with bezel.

BURIAL 3 (ZA 5 and ZB 4; pl. XVII:1). Several iron nails were found together, tips pointing downward, around this burial. A fragment of iron-stained wood was also found. These are interpreted as indicating inhumation within a coffin. Mature female. (Dr. C. Ackroyd concurs, setting the age at 20-25 years.) The exceptional find here was a bronze diadem, SF 2107, encircling the skull.

Finds: SF: 2100 to 2106 (pl. XVIII:1). Iron nails.
SF 2107 (fig. 8.4a, pl. XVII:2). Bronze diadem with decoration of repoussé dots and curled ends.

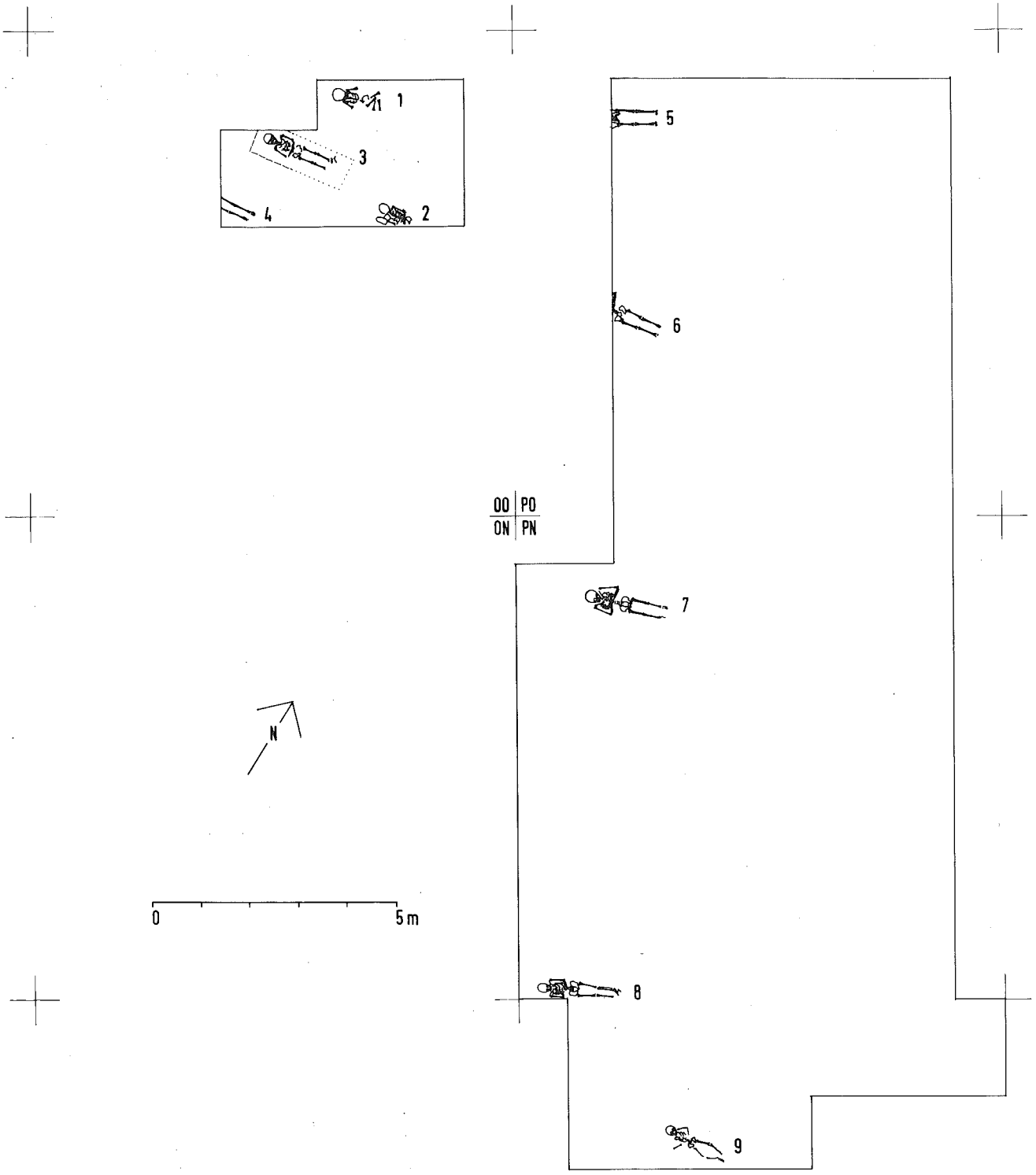


Figure 8.3. Late (iron age) burials in the Main Area, in squares ZA (numbers 1 to 4), PO, and PN.

BURIAL 4 (ZB 5). Legs only uncovered, from mid-femur downward. Adult. A stone was found a little above each foot. No associated finds.

BURIAL 5 (PO 8). Legs only. Subadult.
Finds: None in situ. However, a metal ring (bronze?) with incised bezel found unstratified nearby may be from this burial, SF 2842 (pl. XIX:5).

BURIAL 6 (PO 9). Legs only. Adult male. No associated finds.

BURIAL 7 (PN 7). Skeleton not seen by Bökönyi.
Finds: SF 1006 (pl. XIX:3). Silver ring.
SF 1007 (pl. XIX:4). Silver earring.

BURIAL 8 (PN 21). Mature male. The dead man had iron heels on his shoes (the shoes are not preserved), and a hazelnut was found in his left hand.
Finds: SF 1348 and 1349 (pl. XVIII:2). Iron heel plates.

BURIAL 9 (PN, south extension). Juvenile. No associated finds.

Two further bronze earrings, SF 1008 (pl. XIX:1), were found in superficial levels near ZA and may be associated with the skull from the same area, mentioned earlier.

It is of interest that the only burial within a coffin, a practice perhaps suggestive of higher status, was a mature female, with a diadem on her head. If burial 7 can be adjudged female on the basis of the finger ring (since burial 2, with a ring, was female), the women appear to be more adequately endowed than the men with burial goods indicative of high status. Burials 6 and 8, the adult males, yielded only two metal heel plates.

THE MAIN AREA

The Main Area comprises the four squares PN, PO, QN, and QO which were selected for a more extended area excavation. As explained in chapter 2, the slope of the mound dictated that other excavation areas be smaller. Inevitably, then, the excavation in our main area was concerned with the later phases of occupation on the site—specifically, with phases Va and Vb. And, despite the difficulties encountered in the elucidation of structures, we were able to recognize a Long House as well as the earlier Burnt House of phase Va.

In principle, each of the four squares in question is a 10 m square in which the excavated area is reduced to 9 m x 9 m through leaving a 1 m balk undug on the north and east sides. In square PO, however, in view of its proximity to the deep sounding ZA, an additional 2 m were left undug on the west side of the square (see fig. 8.5).

The burials of late date found in squares PN and PO (as well as ZA and ZB) have been described separately and are not further discussed here (see also the PO west section, fig. 8.7).

During the 1968 season, work went ahead in all four areas, with the discovery of the various bins and installations described below. These could not, however, be associated with any house structures. Late in the season, traces of walling with ditches on each side appeared in PN and PO, resulting in the situation seen in plan in figure 8.8. During the 1969 season, digging in the area was restricted to these two squares to allow elucidation of this structure.

At this stage it was felt necessary to dig in smaller areas to improve stratigraphic control, and the narrowness of square PO made 5 m squares (with a 4 m square excavation surface) impracticable. The grid was accordingly modified to give a system of 3 m squares, separated by 1 m balks (five 3 m squares with intervening balks in the north-south direction replacing two 9 m squares with intervening balk). Starting from the southwest, these were termed: PN/A and PN/B; PN/C and PN/D; PN/E and PN/F; PO/A and PO/B; PO/C and PO/D. The balk separating PN from PO had thus in effect moved 2 m northward. Areas PN/A and PN/C and part of PN/F measured 5 m from east to west. The arrangement of balks, after some further modifications during digging, is seen in figure 8.9.

Using this grid, the structure of the Long House was elucidated, and at a lower level the destruction deposit of the Burnt House was discovered. When the stratigraphic problems relating to the Burnt House had been studied, the balks were removed to permit the clearance of the entire structure.

The Stratigraphy

The great difficulty in detecting house remains, and indeed the problems in distinguishing strata, presented obstacles to the rapid and effective excavation of the area. It was not until late in the 1968 excavation season, when the two walls (D and E) seen on figure 8.5 were recognized, that some of the floor levels already detected could be related to structures at all.

The main problem was to determine which of the floors already investigated was contemporary with the walls. This was made harder by the trenches which had been dug on each side of the two walls (or which had been dug to facilitate the construction of the walls).

The section drawn at the end of the 1968 excavation season of the south side of square PO is the most informative (fig. 8.6). Here the more easterly of the two walls, wall E, is seen in section as we look south. It is clear that the two floors there, termed floor 1 and floor 2, pass over wall E and are later than the Long House. With these floors are associated many of the bins and other features made of clay or plaster seen in figure 8.5. Floor 3 runs up against the wall, but it is not clear from the section whether it passed over it or stopped against it. Floor 4 does not pass over the ditch, as floor 3 does, but this circumstance does not necessarily mean that it was cut by the ditch (and therefore earlier than the ditch and house). Elsewhere, notably in square PN/C as investigated in 1969, it seems that this same floor is associated with wall D (the more westerly of the two walls). As one follows these four floors west in the section, they form a complex "layer cake" sequence of clay surfaces. There is no doubt that floors 1 and 2 postdate the Long House, and we regard floors 3 and 4 as being in association with it (although there is a possibility that floor 3 is in fact later, or indeed that floor 4 is earlier, associated with a structure prior to the Long House, although of course later than the Burnt House). At a depth of some 0.6 m below floor 4, the destruction debris and then the floor of the Burnt House were discovered.

There are thus three major occupation episodes: Burnt House, Long House, and the Bin Complex, each of which has floors and accompanying finds in association.

The stratigraphic units associated with the Bin Complex are as follows: PO layers 7-9; PN layers 5-7; QO layers 7-9; and QN layers 6-8.

The stratigraphic units associated with the Burnt House are as follows: PO layers 158-164; PO/A layers 51-54, 56, 157, and 160; PO/B layer 56; PO/C layers 135 and 136; PO/D layer 38; PN/C layers 89 and 90 (with some material labeled 60); PN/D layers 80 and 81; PN/E layers 67-69; and PN/F layers 263 and 264. Squares PN/A and PN/B do not contain remains of the Burnt House.

The strata associated with the Long House are those intermediate between the earlier Burnt House and the later Bin Complex, as listed above, and need not all be itemized here. Those intermediate layers include the material lying above the Burnt House destruction, yet actually below the lowest floor of the Long House; but finds in these levels are not abundant. The levels in PN and PO which most clearly show features probably associated with the walls of the Long House are as follows: PO layer 23; PO/A layers 45-47; PO/B layers 33-36; PO/C layers 25-29; PO/D layers 25-32; PN layer 29; PN/A layers 91-93; PN/B layers 100 and 101; PN/C layers 80-83; PN/D layers 70-75; PN/E layers 60-62; and PN/F layers 51-54.

It should be noted, finally, that in squares PO and QO (but not in PN and QN which were at a lower absolute level) there were vestigial remains of floors actually later than those associated with the Bin Complex. These levels are represented by PO layers 5 and 6 and QO layers 5 and 6, but finds within these are very few. Higher levels than these (bearing numbers 1-4) may in this area be regarded as having undergone mixing as a result of plowing.

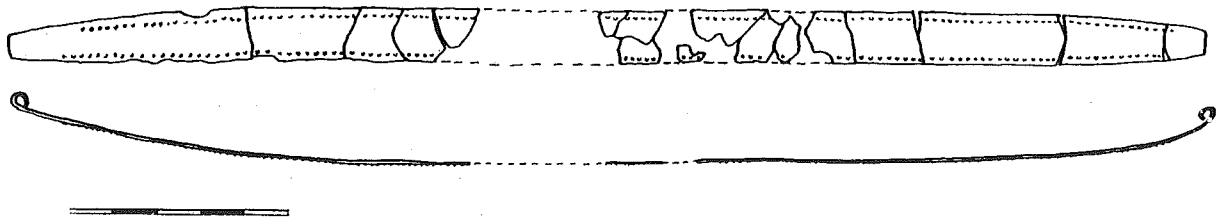


Figure 8.4a. Bronze diadem found on the forehead of iron age burial no. 3 in trench ZA (SF 2107).

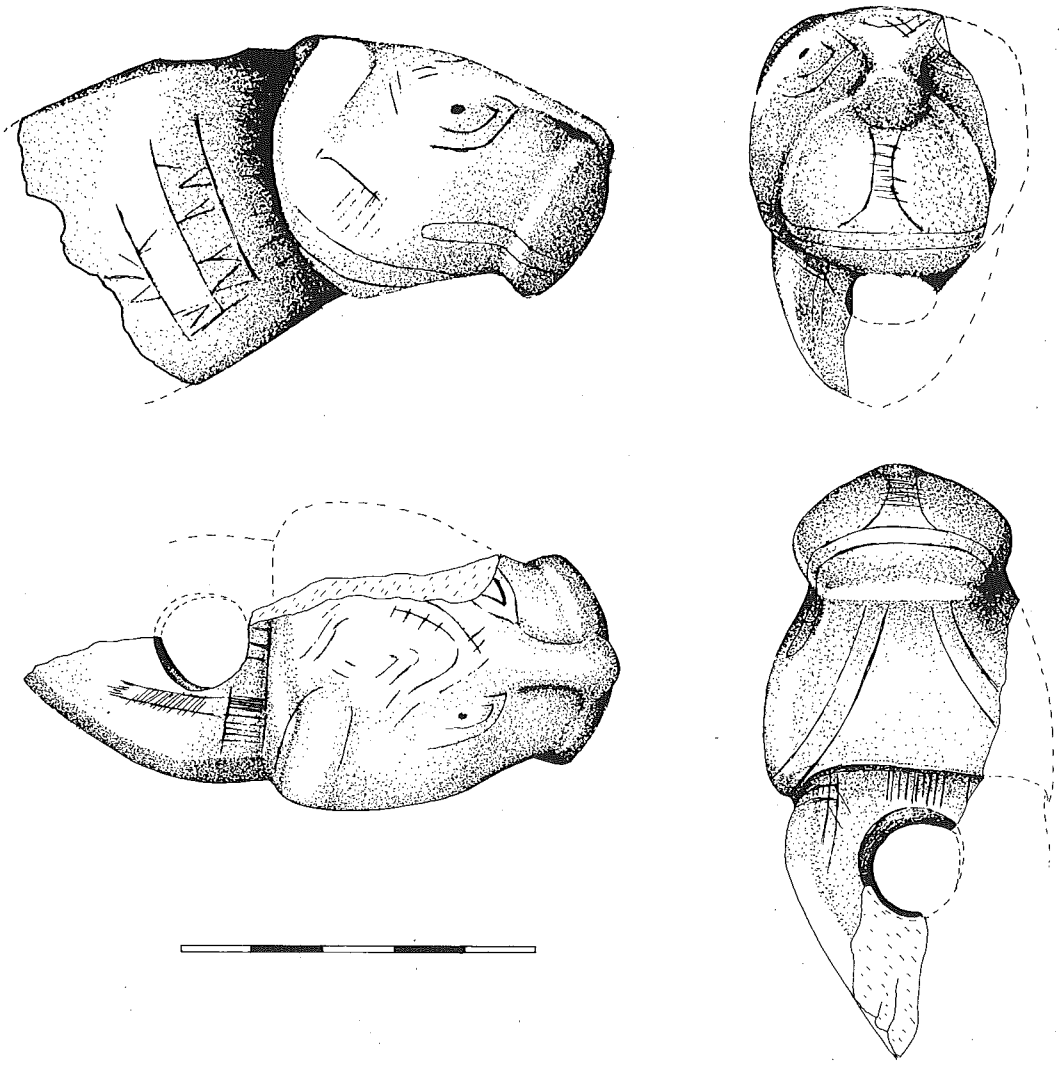


Figure 8.4b. Stone shaft-hole axe head, SF 2409, from PN/C (see also pl. XXV).

Having established this basic, if simplified, stratigraphic sequence, we can now go on to consider the three principal complexes in turn, beginning with the latest.

The Bin Complex

In the upper levels of the central area several features of unbaked clay were very clearly observed. Evidently these represent either bins (constructed above the floor level) or clay-lined pits, or both. The complex is seen in figure 8.5. The walls of the Long House, as recognized during the 1968 excavation season, are indicated here in squares PO and PN. In general, the bins are associated with floors which in certain instances cross the line of these walls, and they thus belong to a later phase (cf. the PO south section, fig. 8.6).

A general impression of this area at an early stage of excavation is given in plate XX:1. The floor levels in this general area are defined by patches of clay and confirmed by the pots and other finds in concentrations such as that of QO 8.

In addition to the bins, another feature of great importance is the hearth ridge (feature C in square QO and feature A in square QN, fig. 8.5). This is simply a linear feature some 40 cm long and rising about 15 cm above the level of the floor, easily recognizable because the clay is baked through the action of heat. None of these features is well preserved. Feature C of QO is seen in plate XX:2. A similar hearth feature, much better preserved (although not so prominent in height), is associated with the Burnt House.

The bins themselves are most clearly seen in the complex on the eastern side of square PO (pl. XX:3). They are made of whitish clay or plaster, with the walls up to 7 or 8 cm thick. The smooth exterior surface and tapering profile suggest that in general these were built up from the floor rather than being dug down from a higher level. Most of them are circular, or nearly so, and often of about 80 cm in diameter, although feature B in square QN is oval and 2 m long. The preserved height is up to about 30 cm but may originally have been higher.

Feature C/D in square PO is a different form, consisting of a circular bin some 40 cm in diameter, with an adjoining oval bin of about the same size which may have been open at the side distant from its adjoining bin (pl. XXI:1). The internal and external surfaces are carefully smoothed.

Feature A in square QO at first seemed similar to these bins (seen at an early stage of excavation in pl. XXI:2), but it proved to extend to the considerable depth of 70 cm (pl. XXI:3), and its irregular shape, rough outer surface, and stratigraphic relations suggest that this is a clay-lined pit.

Two important questions relate to these features: are they related to house structures, and what is their function? The first question can probably be answered in the affirmative, in view of the hearths and the quantities of finds of a domestic nature (including loom weights and numerous spindle whorls). It should be noted that comparable bins and hearths were found in the Long House and the Burnt House in undoubted contextual association. At the same time, the complete absence of structures and the paucity of postholes is puzzling and allows the speculation that this was some kind of courtyard area. It is possible that the houses in this level were not of timber frame structure but of mud brick. However, the proximity of these levels to the surface should not be forgotten, and it is more probable that all traces of the house structures which may once have existed with them have disappeared.

The function of the bins is interpretable in the light of their contents and context. Two loom weights (SF 1028 and 1032) were found in bin A in PN 7, and this indeed correlates with the numerous finds of spindle whorls and other weaving-related artifacts found from these levels. This does not, however, provide strong evidence for the use of the bins. It should be noted that finds of carbonized grain are a frequent feature of these levels, and it is indeed more likely that the bins were destined for the storage of grain. The small feature C/D in square PO may have

been an installation used in processing grain for flour.

Several pots and other artifacts were found in clear association in QO 8, and these will be listed below. The association was dated by radiocarbon analysis. It is not otherwise proposed to give a detailed listing of the finds from these levels. As mentioned, they contain much equipment associated with weaving (see vol. 2); for instance, QN 7 contains seventeen spindle whorls, one clay spool, and three loom weights. There are finds also of bone tools and stone axes, stone rubbers, and flint blades. One association of note is a one-handled cup (pot 79, fig. 13.20:23) in PN 14 (which probably belongs in this phase) which contained two flint blades (SF 1322) with several others being found close by (SF 1327-1330). It is remarkable, therefore, that in the same layer another pot of the same form (pot 116, fig. 13.20:15; pls. XXII:5; XCIX, top:16) was found containing eight flints (SF 1601-1608); these are illustrated next to the pot on plate XXII, bottom left.

THE DEPOSIT OF QO 8. In the northeast, near the clay-lined posthole setting (or basin) some 30 cm deep (indicated F on fig. 8.5), five virtually complete pots (including 73, 85, 86, and 89) were uncovered. The association is clearly seen in plate XXIII:2. Two radiocarbon determinations made on associated carbonized vetch fix the chronology of this final phase at the site: 1840 ± 78 bc (BM 653) and 2135 ± 150 bc (Bln 781). Charcoal from what should be an approximately contemporary context in PO 9 gave a date of 1920 ± 100 bc (Bln 780). The following pots in the associated material are one-handled cups, the most common form of this phase: pots 45 (fig. 13.20:1; pl. XCIX, top:12), 73 (fig. 13.20:21; pl. XCIX, top:1), 106 (fig. 13.20:7), 118 (fig. 13.20:6), 123 (fig. 13.20:20), 124 (fig. 13.20:13), 128 (fig. 13.20:5; pls. XXII:2; XCIX, top:4), 129 (fig. 13.20:17; pl. XCIX, top:8), and 92. The other pots are:

Pot 86 (fig. 13.23:3; pl. XXII:4). Barrel-shaped urn with two lug handles. Roughly burnished. Buff, once black. Burnt. Height 18 cm.

Pot 125. Conical bowl with incurving rim. Burnished, black. Diameter 22 cm.

Pot 139 (fig. 13.24:4). Small, conical bowl with handle. Surface unsmoothed. Burnt. Diameter 21 cm.

Pot 97 (fig. 13.25:4). Small, squat urn or bowl. Coarse. Height 8 cm.

Pot 89 (fig. 13.20:25; pls. XXII:1; XCIX, top:2). Two-handled cup. Burnished brown. Burnt. Height 9 cm.

Pot 310. Rim fragment of large, situlate urn with finger-impressed cordon at rim. Smoothed. Diameter 30 cm.

Pot 155 (fig. 13.22:4; pl. XXII:3). Barrel-shaped urn with lug handle. Coarse, gray. Height 25 cm.

Pot 136 (fig. 13.27:2). Small, conical bowl. Roughly burnished, black. Diameter 12 cm.

Pot 85 (fig. 13.24:1). Small, conical cup. Smoothed. Diameter 10 cm.

The following small finds came from this layer (by small find number):

Spindle whorls: SF 1030, 1032, 1033, 1040, 1047, 1051, 1072, 1073, 1077, 1082, 1084, 1091, 1092, 1100, 1856, 1858, 1861, 1863–1867, 694
Loom weight: SF 1029
Spools: SF 1038, 1003
Clay anchors: SF 1080, 1085
Clay slingstone: SF 1088
Figurine fragment: SF 1074, probably dating from phase III (fig. 9.129)
Fired clay support: SF 1852
Bone needle: SF 1031
Bone awls: SF 1095, 1099
Flint blades: SF 1036, 1057, 1076, 1083, 1089, 1098
Stone axe: SF 1060
Stone pounders: SF 1039, 1069, 1079, 1094
Miscellaneous stone objects: SF 1046, 1059, 1062
Clay crucible: SF 1037
Slag: SF 1066, 1070

Broadly comparable finds were made in the other squares for this phase.

The Long House

From the standpoint of the excavator, the Long House represents almost the exact opposite of the Bin Complex, where we have numerous features but no evidence of house structures. With the Long House we have clear information on structure but very few accompanying features.

The walls of the Long House (walls D and E) were first recognized in square PN during the investigation of the features described above (pl. XXIV:1). At the same time the narrow ditches on each side of the walls were seen. At a later stage, the apsidal end at the north, in PO, was distinguished, although it was less initially obvious.

The walls themselves are not different in color from the surrounding soil, but they are of more solid texture. The ditches were easier to discern, being softer in texture than the surrounding soil and reaching a depth of some 50 cm below the uppermost preserved levels of the walls. The whole area is riddled with postholes (fig. 8.9), many of them within the thickness of the walls. The width of the structure is 5.2 m and the length 15.5 m, although the southern end is not recognizable. The building is seen in plate XXIII:1.

The function of the ditches running on each side of the walls has not been satisfactorily explained. One might readily imagine that during construction of the house, ditches would be dug prior to wall construction to allow for the setting of upright wooden posts and for construction of the wall from a little below ground level, and this remains the most likely explanation. But it is not clear why the clay floor material of the lower floors associated with the walls should not extend over the ditch. Alternatively, it is possible that the ditches were dug down below ground level during a late period in the use of the house, perhaps to facilitate drainage. We were not able to reach a firm conclusion, and certainly the paucity of association between floors and walls made the excavation of the Long House very much more difficult.

This very large house was undoubtedly a timber frame structure with analogies to the Burnt House, to be described below. But the structural features of the Long House are not so clear. We did not recognize a line of large postholes within the wall, nor were holes for central supporting posts immediately obvious among the other holes, although some large central holes or "pits" make plausible candidates.

As discussed earlier, floor levels were difficult to recognize in association with the house, the ditches presenting problems of stratigraphic interpretation. Nonetheless, a hearth ridge with three bins was recognized to the south in PO 23 (pl. XXIV:2). The "layer cake" effect of successive floors belonging with the later Bin Complex is seen in the section above them. This is the west end of the PN/PO balk, drawn at the end of the 1968 excavation season, represented in figure 8.6.

The approximate period of occupation is conveniently dated by the large carbonized beam found about 1 m west of wall D in square PN/C level 81, which yielded dates of 2055 ± 40 bc and 2021 ± 40 bc (LJ 2715 and 2714).

The Long House levels did not yield abundant associations of finds. One-handled cups are again the dominant ceramic form. One important small find is outstanding: a stone shaft-hole axe with zoomorphic decoration, SF 2409, from PN/C 80 (fig. 8.4b; pl. XXV; see also chap. 9, cat. no. 228). It is effectively dated by the radiocarbon samples just cited.

Burials

Several burials of children, without accompanying grave goods, were recognized in levels contemporary with the Long House. Although in some cases it is conceivable that they might have been inserted from the succeeding Bin Complex phase, their depth and the lack of accompanying disturbance in upper levels make it seem unlikely that they could be as late as the very much later iron age cemetery in the area. The contexts of discovery were:

PO 23, under north balk of PO in the northwest corner. Head to west, perhaps lying on left side, crouched burial of baby.

PO/D 37, apparently stratified below hard

floor surfaces of PO/D 34 and 35. Baby burial, head west, crouched burial, on right side.

PN/A 92, in northwest corner of square PN/A (see fig. 8.9), inserted through floor above. During excavation this was first interpreted as a posthole, and the orientation of the body was not observed.

PN/C west layer 80, lying to west of wall D (see fig. 8.9). Baby burial, head west, legs flexed, lying on left side.

PN/A/C balk. Baby burial, head west, laid on back with legs flexed.

These burials appear to indicate that in the period of the Long House, intramural burial (or at least burial near the house) was practiced for babies. There is a consistent patterning that the head lies to the west. We have no information as to the disposal of the adult dead.

The Burnt House

Some 50 cm below the lower levels of the Long House, burnt clay, reddish soil, and other destruction debris were encountered in squares PO/A, PO/B, PO/C, and PO/D, and it became clear that the balks within this square were impeding progress. These were removed, and the 7 m x 7 m square was dug as a single unit. Burnt clay wall tumble and potsherds were encountered, and then indications of bins and ovens. In the west of the square a line of walling running north-south could be distinguished. Most of the ancillary features lay north of a line drawn east-west from where this straight wall terminated. The line of the corresponding wall to the east of the square could be distinguished. The position at a relatively advanced stage of excavation is seen in plate XXVI:1, with numerous pots, pieces of stone, and other objects photographed in situ.

At this stage the features seen at the north end appeared to lie to the north of the house proper. But investigation using the air blower (*randistiki michani*) revealed a narrow circular trench of softer earth, clearly indicating an apsidal end to the house. This is well seen in plate XXVI:2 in which a number of the finds are seen still in position. A line of postholes now appeared to the east, indicating that a similar apsidal-ended house had lain immediately to the east of our Burnt House.

The region to the south of the PN/PO balk was now excavated, and the balk itself removed, giving the complete plan of the house seen in plate XXVII. The floor had subsided to a depth of some 30 cm inside the house at the south and southwest but otherwise was preserved in excellent condition, baked by the fire which had evidently destroyed the house.

The complete plan is seen in figure 8.10, and positions of some of the finds are indicated in figure 8.11. The most prominent feature within the square area of the house proper is the hearth ridge. In the apsidal end are circular bins 1 and 2 (at the west), a large oven platform (oven 1) immediately to the east of bin 2, and a further interesting structure to the east of this, designated "oven 2." The excavation and interpretation of most of this house was extremely easy, in contrast to the overlying levels, and only oven 2 presents any problems of interpretation.

The House Structure

The house lies in alignment with the excavation grid (and thus with its axis some 30° west of true north). The apse is at the north end. The house is 5.3 m wide. The squarish room is 5.2 m long and the apse 2.8 m, giving an overall length of 8 m.

The walls of the main, square room are defined by plaster faces on the inside (pl. XXVIII:1). The north wall (which is an interior wall) also had plaster faces on the north side. The thickness of these walls of burnt plaster is 10-12 cm. At the northeast corner, in a line immediately inside this wall, are small stake holes some 3 cm in diameter and 10-15 cm apart (pl. XXVIII:2). Immediately against the walls on the outside, and sometimes appearing to cut into the outside of the wall, are postholes some 10 cm in diameter and spaced at intervals of 30-40 cm (pl. XXIX:1). This clearly suggests that the wall structure, at any rate at the east side of the

house, was constructed primarily from the inside, after the erection of the timber frame of the house. On the west side, the daub wall is a little thicker, set symmetrically about the postholes (pl. XXIX:2). A possible explanation for this difference is that a house to the east was already standing when our house was built, so that the outside of the east wall was difficult of access. It should be noted that the east wall continued for some 3.7 m beyond the south side of the house, presumably defining a courtyard area separate from that of the house to the east.

The evidence for the apsidal end is different. Only a trench was observed. Dr. G. Georgiev suggested that this represents a continuous series of postholes. No plastering was found at this end, and it may well be that the apse was essentially a timber structure, with timbers close together, in contrast to the main room which had mud walls supported on the timber frame.

The interior wall at the north of the square room has a doorway into the apsidal end to the right of the central axis. At the right, in the northeast corner, there are indications of flat planking some 2–3 cm thick, and inside the thickness of this wall to the west of the axis are some postholes 3–6 cm in diameter and indications of some horizontal wattle preserved in the plaster.

The position of the main door to the house is not certain; it may have been at the northwest corner of the square room where the mud and plaster of the wall appear to end (although the postholes continue) or perhaps at the southwest corner.

The central posthole, at the middle of the north side of the square room, measures 25 cm x 45 cm and contains the carbonized remains of a stake 20 cm in diameter. The method of roofing is not known but may have been a structure of horizontal beams supporting a crisscross pattern of wattle, made watertight by a layer of clay.

Interior Features

The most interesting feature within the square room is the hearth ridge near its center. It is 95 cm long and rises to a height of 4 cm above the floor (pl. XXIX:3). A line of stake holes near it is visible in plate XXIX:1.

Within the apsidal room, bins 1 and 2 are floored with clay of the same material as the floor, and the sides are constructed up from the floor, although they are not preserved to a height of more than about 10 cm. The large pot 228 was found within bin 1 and was presumably kept there.

Oven 1 is preserved as a raised, sloping platform with a hard-baked clay floor which is cracked and, perhaps for that reason, not well preserved (fig. 8.12). At its greatest width it is 90 cm wide, and at the front 73 cm wide, and measures 1.1 m from front to back. It is seen on the left in plate XXX:1. The form is familiar from finds in Bulgaria and is represented in the model from phase III at Sitagroi (fig. 8.20b; pl. XL:2). The front edge of the raised floor is well preserved on the right side, as is the base of the oven wall. A piece from it, fallen outward, is seen on the right of plate XXXI:3.

Oven 2 initially appeared to present problems of interpretation. It is seen at a very early stage of excavation, from the northeast, in plate XXXI:1. At first sight it looked like a central structure with an exterior structure some 50 cm outside it, separated by an area of sticky brown soil with ash. But, as indicated above, the burnt clay at the west is part of the slumped eastern side wall of oven 1. The material to the north and east is loose tumble, and cleaning produced the structure seen in plate XXXI:2, and ultimately as seen in plate XXX:2. The ground plan is seen in figure 8.13. The southwest corner may be seen in plate XXXI:2 and the southeast corner, with the aperture on the east side, in plate XXXI:4. It is seen from the front, as finally excavated, in plate XXX:1.

The center of this oven was naturally, as first found, filled with debris (pl. XXXI:1): gritty soil and much coarse burned daub. A further stage of clearance is seen in plate XXXI:3, in which the tumbled material at the south end gives the impression of roofing the aperture at the south. This is, however, tumbled material, and no roof-

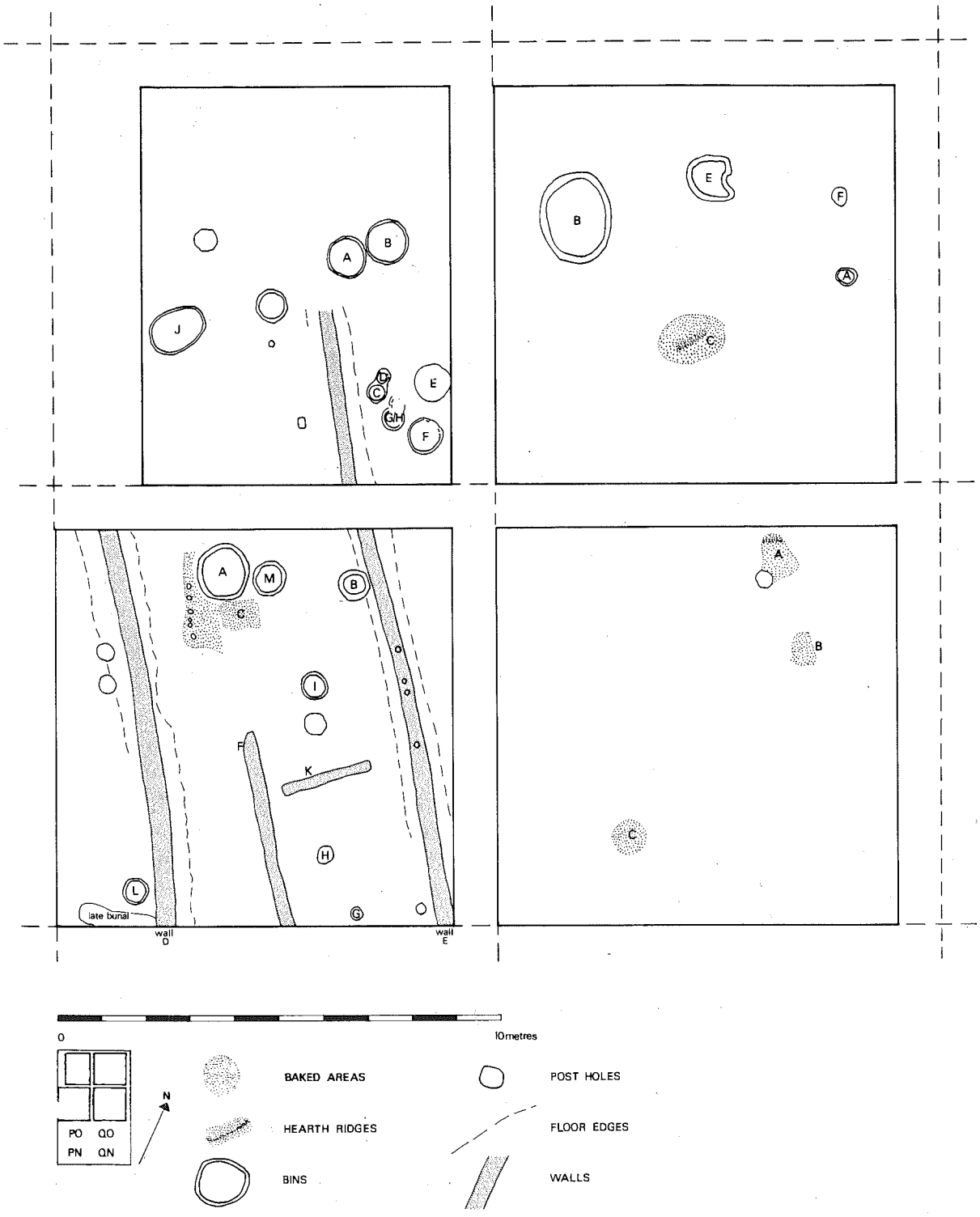


Figure 8.5. The Main Area at an early stage of excavation showing bins and hearth ridges, which constitute the Bin Complex, overlying the Long House.

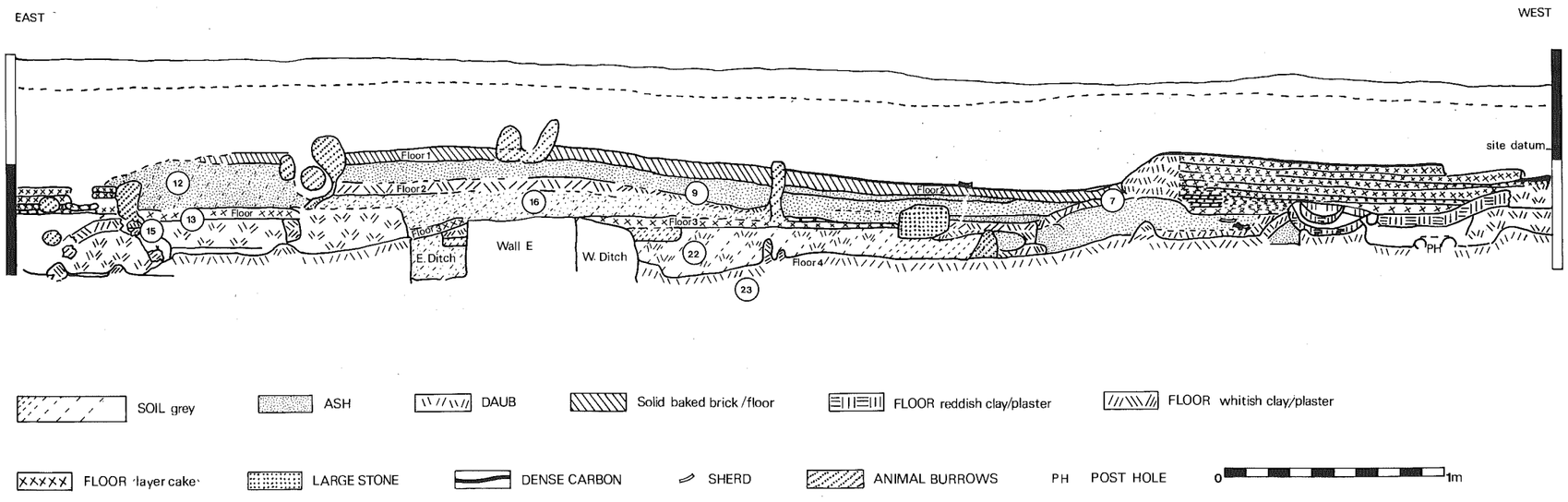


Figure 8.6. South section of square PO (seen from the north). Note that 20 cm of topsoil were removed before this section was cut. Layer numbers are shown in circles. Floors 1 and 2 pass over the wall of the Long House (Wall E) and are associated with the later Bin Complex. Floor 4 is probably associated with the Long House. The balk was removed during the excavation of the Burnt House and thus does not show levels relating to it.

SOUTH

NORTH

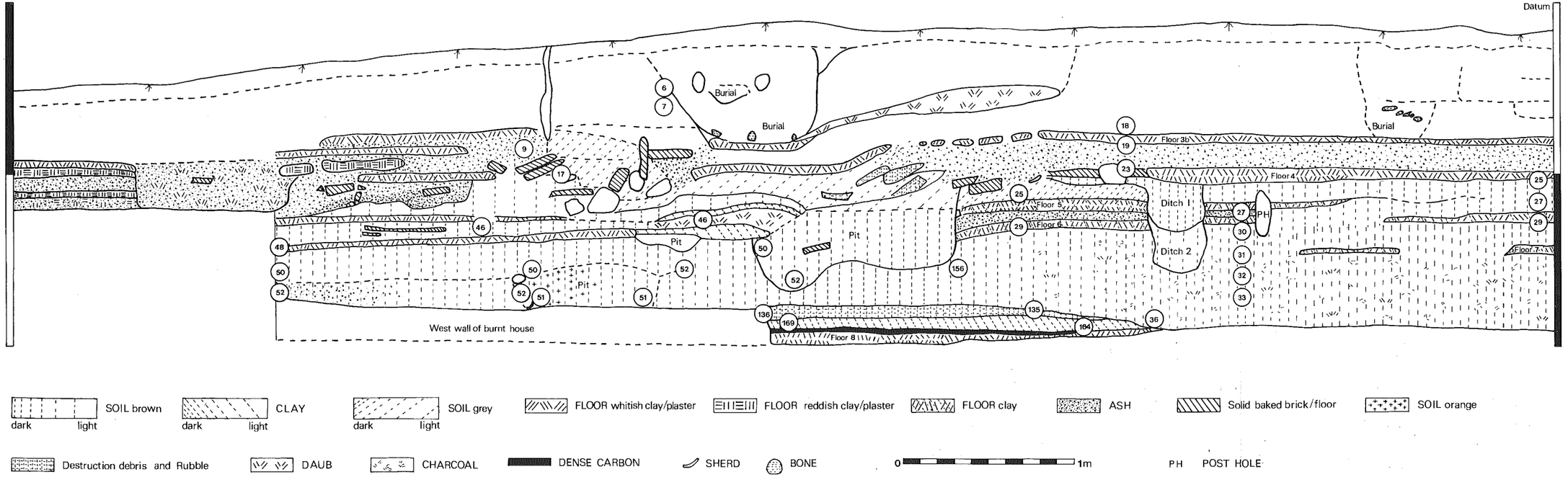


Figure 8.7. West section of square PO (seen from the east). Floor 8 is associated with the Burnt House. Floor 4 is probably associated with the Long House (see fig. 8.6).

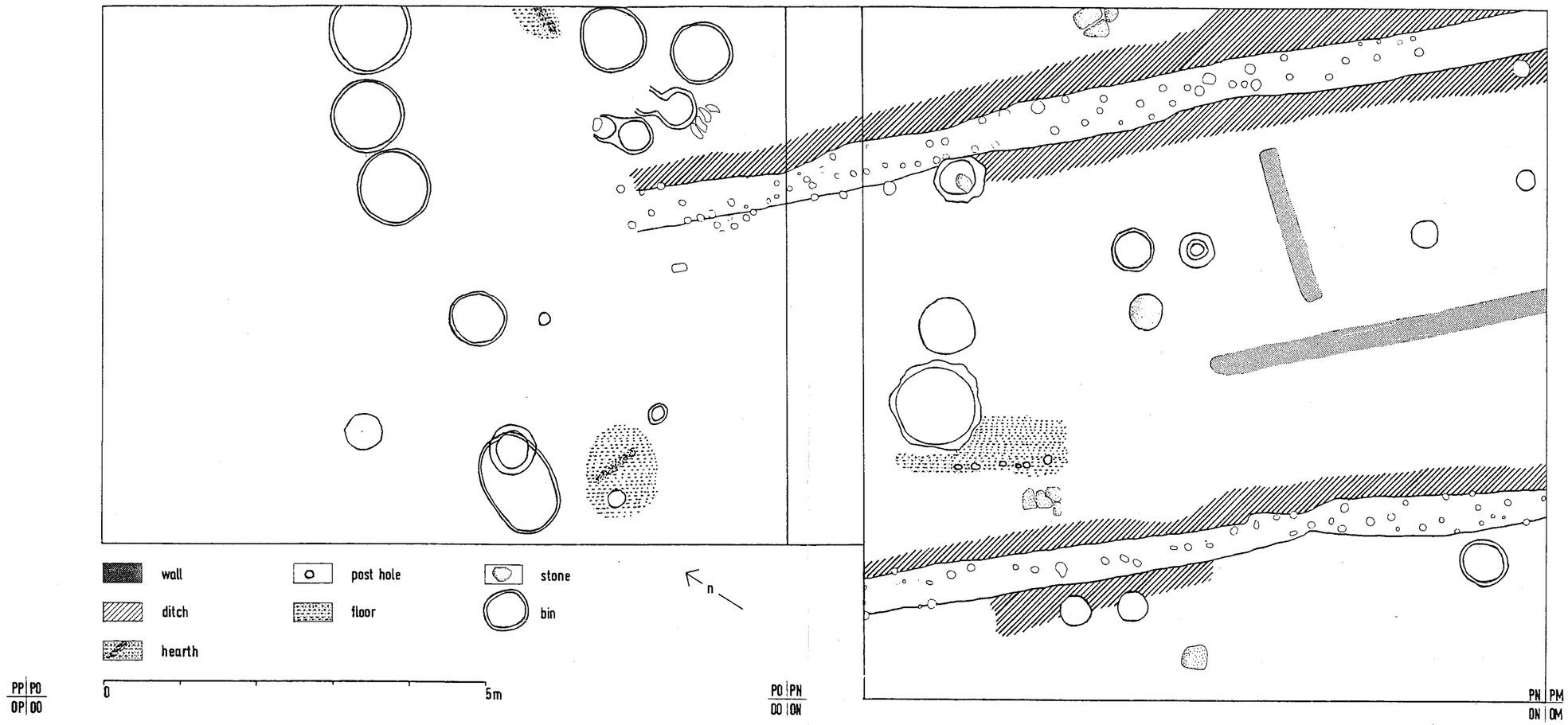


Figure 8.8. The Bin Complex in squares PN and PO at the same early stage of excavation as seen in figure 8.5. The walls and accompanying wall trenches of the (earlier) Long House are already evident.

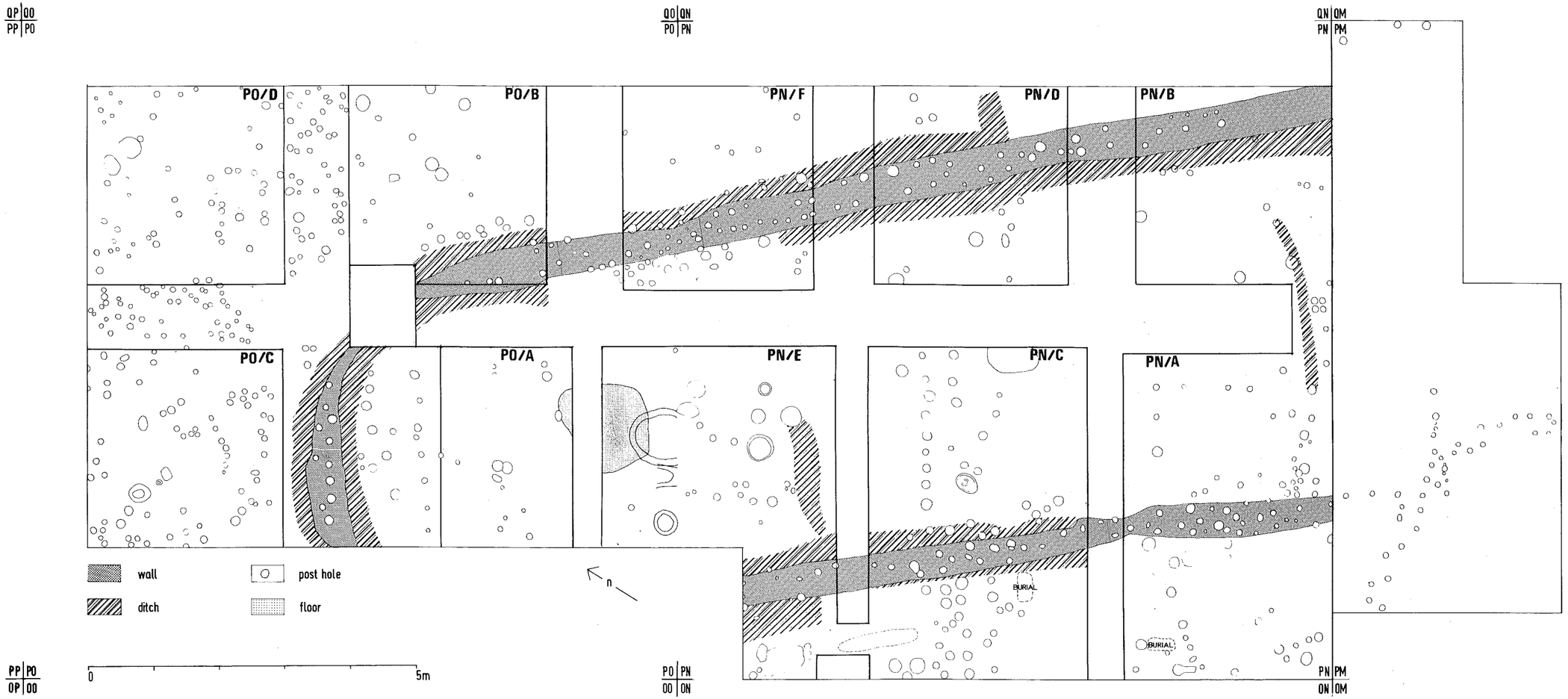
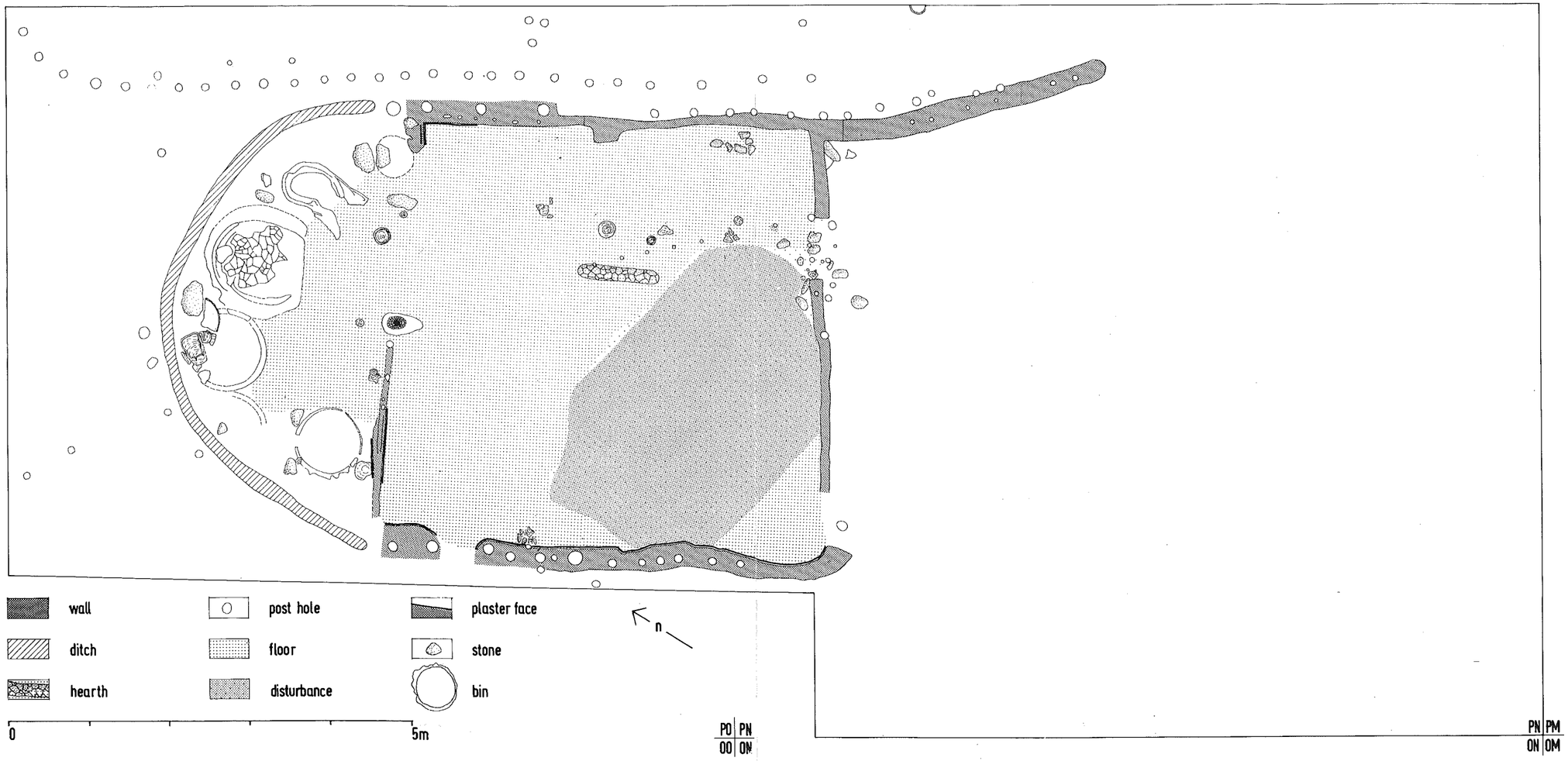


Figure 8.9. The Long House.

QP | QO
PP | PO

QO | QN
PO | PN

QN | QM
PN | PM



PP | PO
OP | OO

PO | PN
OO | ON

PN | PM
ON | OM

Figure 8.10. The Burnt House.

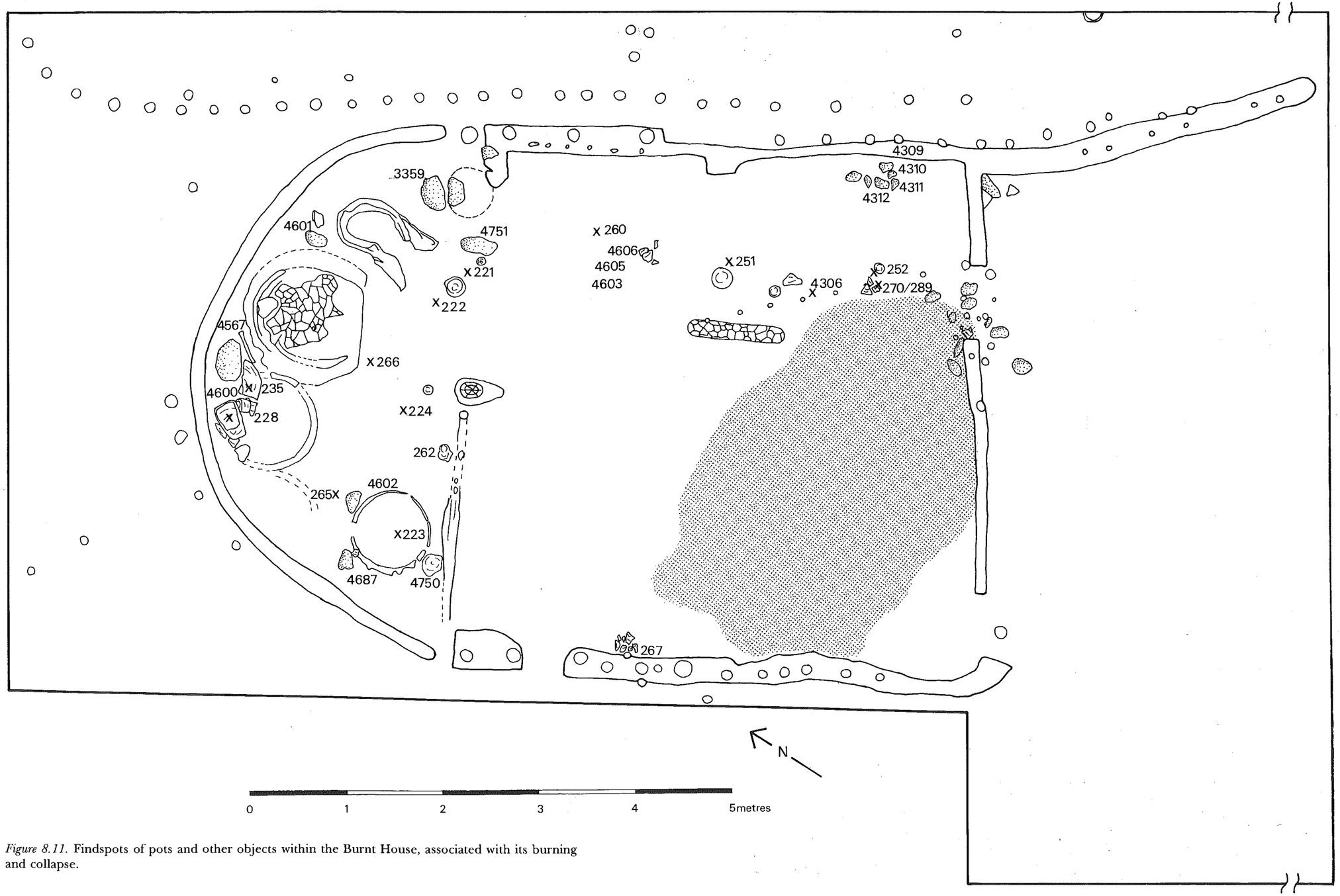


Figure 8.11. Findspots of pots and other objects within the Burnt House, associated with its burning and collapse.

ing was found in situ. The preserved height of the structure is 29 cm, the diameter of the round hole on the southeast side 14 cm. The plaster surface at the side shows seven layers, suggesting replastering. The interior floor of the oven slopes gently down to the front aperture at the southwest, and the area of baked floor extends some 20 cm in front of it. Several photographs of this structure, at different stages in its excavation, are given here since its function is unclear.

Oven 1 was presumably used either by placing red-hot embers within it, to heat it, or by lighting a fire inside. This is the common oven form in the Balkans in the prehistoric period and was presumably used for baking bread and for drying grain. The superstructure of oven 2 is not preserved and its mode of operation is unclear, but the side aperture suggests a controlled draft. There are no wasters of pottery to suggest its use as a potter's kiln and no metal slag or splashes to indicate metallurgical practice. Both perhaps are possible uses, but a domestic function seems more likely in view of its context in the apsidal kitchen area of the house, beside the querns and grindstones seen in the left in plate XXX:2.

POTS. The main finds from the Burnt House are ceramic: it contained a remarkable assemblage of whole or restorable pots. Many of these were photographed in situ, and all were, in principle and according to the site recording system, located in three dimensions before removal. In just a few cases, seen at the end of the list of pots, the coordinates were not adequately recorded, and there is now no record of the precise location within the house from which those pots came, although their stratigraphic context is certain. All those pots whose precise position given by measurements could be confirmed from the photographic file are indicated on the plan, figure 8.11. These and the other pots are listed below with their coordinates in brackets. The finer vessels are in black or Dark Burnished ware, the remainder Smooth or Coarse; most of them show signs of burning. Further discussion of the pots is provided in chapter 13.

Square room

Pot 251 (PN/F 264; fig. 13.11:3; pl. CV:1). Squat conical bowl with incurved rim. Burnished, black. Burnt. Diameter 19.4 cm. [2.55 W x 7.25 S] (see fig. 8.11)

Pot 252 (PN/F 264; fig. 13.11:1; pl. CV:2). Sinuous bowl, undecorated. Smooth, black. Burnt. Diameter 11.7 cm. [2.56 W x 8.95 S] (see fig. 8.11)

Pot 270/289 (PN/F 264; fig. 13.12:1; pl. XXXII:2). Shallow, conical bowl with straight rim, ledge lug, and impressed decoration. Roughly burnished, black. Burnt. Diameter 38.0 cm. [2.77 W x 8.95 S] (see fig. 8.11)

Pot 280 (PN/F 264; fig. 13.17:2). Large, necked urn. Roughly burnished, probably black. Burnt. Diameter 36.0 cm.

Pot 281 (PN/F 264). Rim fragment of conical bowl with rolled rim. Burnished, black. Burnt. Diameter 34.0 cm. [0.18 W x 4.10 S]

Pot 250 (PN/F 264). Body fragment of large urn. Smooth, possibly black. Diameter 40.0 cm. [2.23 W x 8.65 S]

Pot 271 (PN/F 264; fig. 13.14:2; pl. CIV:6). Storage vessel with swelling profile, closed neck, and ledge lug. Fine, burnished, black. Burnt. Height 26.0 cm. [1.80 W x 4.50 S]

Pot 246 (PN/C 90; fig. 13.10:3; pl. XXXIII:2). Sinuous bowl with incised decoration. Fine, burnished, black. Diameter 8.2 cm.

Pot 267 (PO 160; pl. CV:3). Base of urn. Probably black. Burnt. Diameter 24.0 cm. [0.60 W x 0.70 S] (see fig. 8.11)

Pot 260 (PO 159; fig. 13.15:2; pl. CIV:2). Conical bowl with slightly rolled rim. Burnished, probably black. Burnt. Diameter 32.0 cm. [4.90 W x 0.90 S] (see fig. 8.11)

Pot 264 (PO 160; fig. 13.19:1; pl. CIII:3). Jar with rounded profile, upright rim, and lug handles. Roughly burnished, possibly black. Burnt. Diameter 24.0 cm. [4.65 W x 1.40 S]

Pot 276 (PO 159; fig. 13.18:1; pl. CIV:4). Conical bowl with straight rim. Burnished, black. Burnt. Diameter 37.5 cm. [4.60 W x 0.30 S]

Pot 268 (PO 161; fig. 13.11:2; pl. CIV:5). Deep sinuous bowl with ledge lugs. Unburnished?

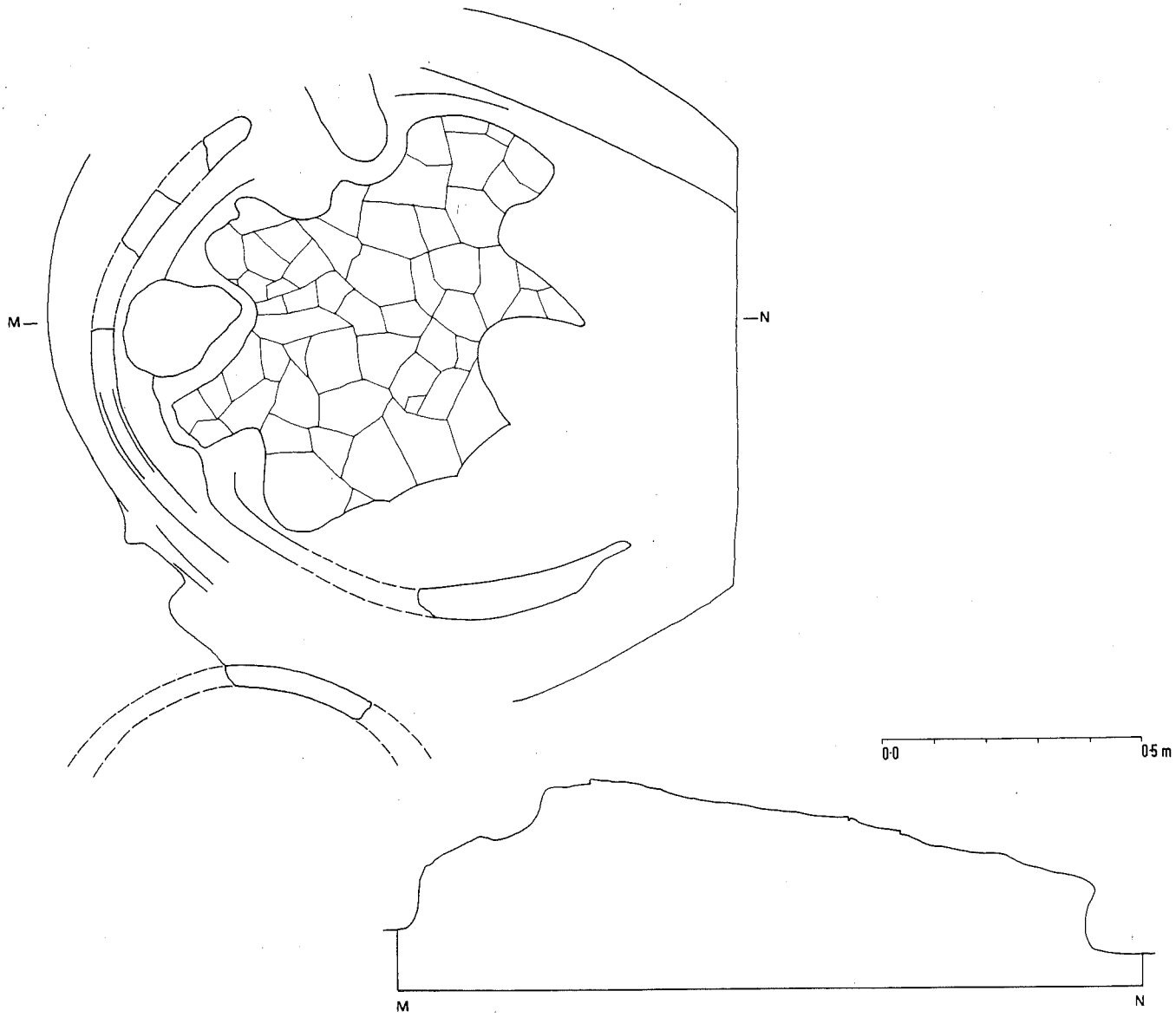


Figure 8.12. Plan and section of Oven 1 of the Burnt House.

Possibly black. Burnt. Diameter 12.0 cm. [4.50 W x 0.50 S]

Pot 209 (PO/A 54; fig. 13.10:4; pl. XXXII:9). Sinuous bowl with impressed and incised decoration. Black. Burnt. Diameter 8.2 cm. [0.60 W x 1.20 S]

Pot 282 (PN/C 90; fig. 13.14:3, 5; pl. XXXII:7). Globular jug with cylindrical neck and rising strap handle plus handled lid. Fine, burnished, black. Diameter 18.0 cm.

Apsidal room, eastern part

Pot 221 (PO 158; fig. 13.10:5; pl. XXXII:8). Sinuous bowl with impressed and incised decoration. Black. Burnt. Diameter 5.9 cm. [4.40 W x 2.25 S] (see fig. 8.11)

Pot 222 (PO 158; fig. 13.11:4). Conical bowl with upright or slightly incurving rim. Roughly burnished, probably black. Burnt. Diameter 19.5 cm. [4.20 W x 2.50 S] (see fig. 8.11)

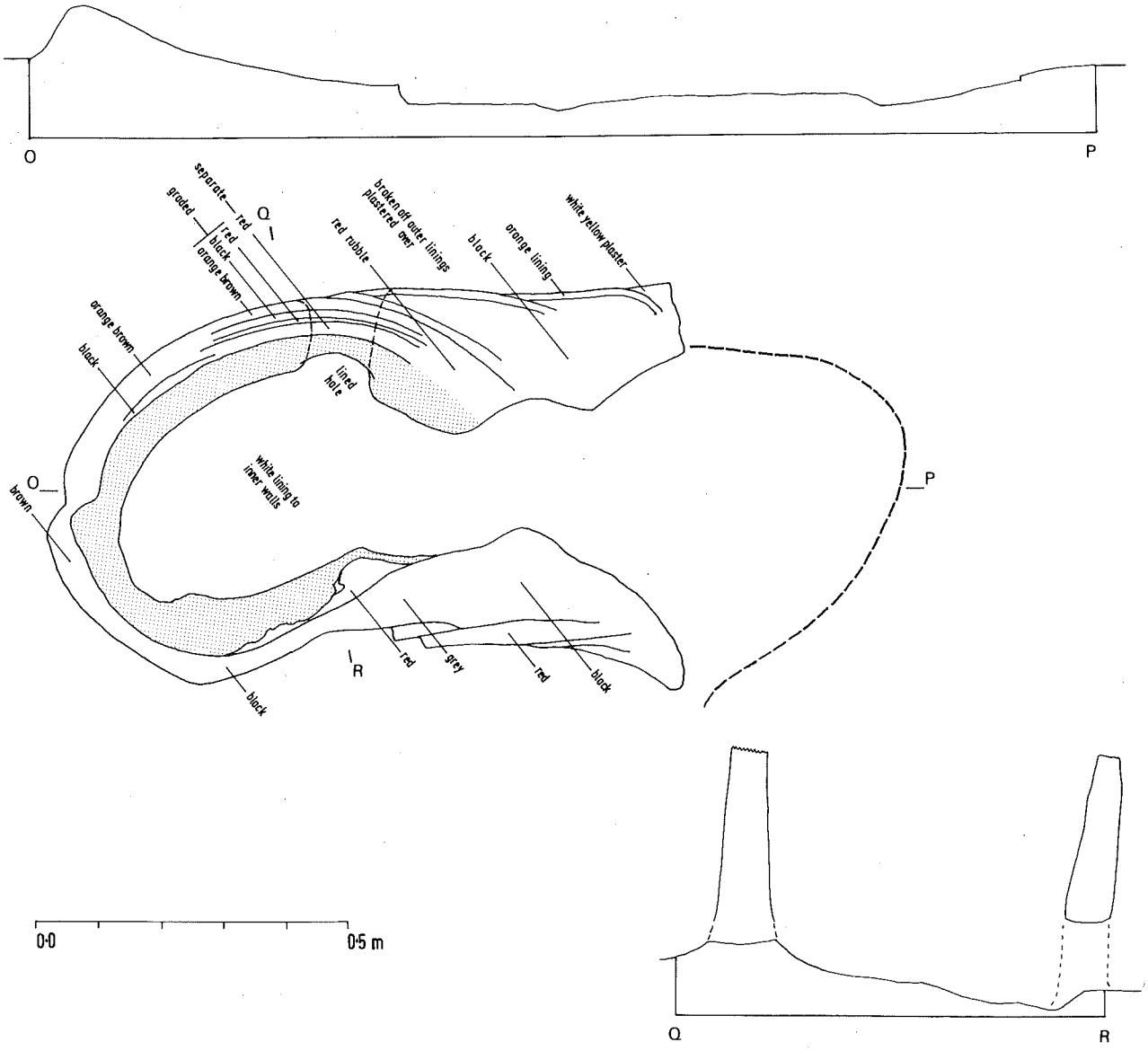


Figure 8.13. Plan and section of Oven 2 of the Burnt House.

Apsidal room, near bin 1

Pot 235 (PO 158; fig. 13.17:1; pl. CV:4). Conical bowl with slightly rolled rim. Burnished, black. Burnt. Diameter 31.7 cm. [2.90 W x 4.60 S] (see fig. 8.11)

Pot 228 (PO 159; fig. 13.19:2; pl. CIII:2). Barrel urn with ledge lug and handle. Unburnished, probably black. Height 33.0 cm. [2.75 W x 4.70 S] (see fig. 8.11)

Pot 273 (PO 161; pl. XXXII:4). Fragment of shallow, conical bowl with straight rim and impressed decoration. Burnished, black. Diameter 30.0 cm. [3.40 W x 4.80 S]

Pot 274 (PO 161; pl. XXXII:3). Fragment of shallow, conical bowl with straight rim and impressed decoration. Burnished, black. Burnt. Diameter 40.0 cm. [3.40 W x 4.80 S]

Apsidal room, near bin 2

Pot 223 (PO 161; pl. XXXII:11). Deep sinuous bowl with impressed and incised decoration. Burnished, black. Burnt. Diameter 21.4 cm. [1.30 W x 2.80 S] (see fig. 8.11)

Pot 265 (PO 161). Base. Undecorated. [2.00 W x 3.50 S] (see fig. 8.11)

Pot 278 (PO 161). Fragments of conical bowl with straight rim and applied decoration. Burnished, black. Burnt. Diameter 30.0 cm. [1.40 W x 3.00 S]

Pot 269 (PO 161; pl. CIII:1). Urn with rounded profile and ledge lug. Unburnished, possibly black. Burnt. Height 19.0 cm. [1.60 W x 3.90 S]

Pot 261 (PO 161; pl. CV:5). Open urn with curved profile. Smooth, possibly black. Burnt. Height 21.8 cm. [1.60 W x 3.60 S]

Apsidal room, central area

Pot 266 (PO 159). Barrel urn with slightly incurving rim and lug handle. Smooth, possibly black. Burnt. Diameter 27.0 cm. [3.50 W x 3.20 S] (see fig. 8.11)

Pot 224 (PO 161; fig. 13.10:2; pls. XXXIII:3, B:4). Sinuous bowl with impressed and incised decoration. Probably black. Burnt. Diameter 11.3 cm. [3.05 W x 2.80 S] (see fig. 8.11)

Pot 262 (PO 161; fig. 13.11:6; pl. CIII:6). Urn with slightly rounded profile and ledge lug. Unburnished, possibly black. Burnt. Height 12.9 cm. [2.40 W x 2.60 S] (see fig. 8.11)

Pot 257 (PO 159; fig. 13.18:2; pl. CIII:5). Barrel urn with slightly incurving rim and lug handle. Smooth, possibly black. Height 29.5 cm. [3.50 W x 2.60 S]

Pot 277 (PO 159). Fragments of conical bowl with straight rim. Probably burnished, black. Burnt. Diameter 34.0 cm. [3.65 W x 3.05 S]

Pot 263 (PO 159; pl. CIV:1). Conical bowl with straight rim, ledge lug, and vertical slashes below rim. Burnt. Diameter 28.0 cm. [4.00 W x 2.80 S]

Pot 258 (PO 159; fig. 13.16:3; pl. CIII:4). Open urn with straight rim and lug handles. Unburnished, possibly black. Height 21.2 cm. [3.50 W x 2.75 S]

Undocumented positions

Pot 255 (PO 159; pl. XXXII:5). Fragment of deep bowl with impressed and incised decoration. Fine, burnished, black. Diameter 22.0 cm.

Pot 210 (PN/C 60; pl. CIV:3). Base fragment of pithos. Smooth, probably black. Height 11.8 cm.

Pot 286 (PN/F 264; fig. 13.13:9; pl. XXXII:6). Fragment of deep sinuous bowl with rim lug and impressed and incised decoration. Fine, burnished, black. Diameter 18.0 cm.

Pot 291/287 (PN/D 80; fig. 13.10:1; pl. XXXIII:1). Sinuous bowl with incised decoration. Black. Burnt. Diameter 10.1 cm.

Pot 288 (PO 157; fig. 13.15:3). Squat, globular urn with lug. Burnished, possibly black. Diameter 19.0 cm.

Pot 337 (PN/C 89; pl. XXXII:1). Fragments of shallow conical bowl with straight rim and impressed decoration. Burnished, black.

SMALL FINDS. The small finds are in general shown (with their four-figure reference numbers) on the plan, figure 8.11. They are given with their coordinates below (* indicates measurements from PN peg). Most fall into the category of stone grinders (and miscellaneous stones, which were also recorded). Only two not in this category are noteworthy. The first is a deer metapodial bone, SF 4567, found north of oven 1 and to the northeast of bin 1. It is clearly seen in plate XXVI:1 and 2. The second is an object of baked clay, SF 4306, found some 30 cm east of the south end of the hearth ridge. It is 8.5 cm high and is shown in plate XXXII:10. In addition, a clay disc, SF 4750 (pl. CV:6), was found immediately southwest of bin 2.

Square room

SF 4303 (PN/F 264). Sickle blade. [2.23 W x 3.94 S]

SF 4306 (PN/F 264; pl. XXXII:10). Clay object. Stopper? [0.18 W x 3.50 S] (see fig. 8.11)

SF 4308 (PN/F 264). Pestle. [3.20 W x 4.80 S]

SF 4309 (PN/F 264). Quern fragment. [5.40 W x 9.80 S*] (see fig. 8.11)

SF 4310 (PN/F 264). Stone. [5.35 W x 9.76 S*] (see fig. 8.11)
SF 4311 (PN/F 264). Stone. [5.25 W x 9.73 S*] (see fig. 8.11)
SF 4312 (PN/F 264). Stone. [5.25 W x 9.70 S*] (see fig. 8.11)
SF 4605-6 (PO 159). Group of stone grinders. [5.50 W x 1.50 S] (see fig. 8.11)

Apsidal room

SF 3359 (PO 159). Stone grinder. [5.10 W x 2.40 S] (see fig. 8.11)
SF 4751 (PO 159). Flat stone. [4.50 W x 1.90 S] (see fig. 8.11)
SF 4601 (PO 159). Stone rubber. [1.40 W x 4.70 S] (see fig. 8.11)
SF 4600 (PO 159). Flat stone. [3.20 W x 5.20 S] (see fig. 8.11)
SF 4567 (PO 159). Deer bone. [3.20 W x 5.00 S] (see fig. 8.11)
SF 4687 (PO 159). Broken quern. [1.20 W x 4.10 S] (see fig. 8.11)
SF 4602 (PO 159). Stone. [1.95 W x 4.20 S] (see fig. 8.11)
SF 4750 (PO 159). Clay disc. [1.35 W x 2.90 S] (see fig. 8.11)
SF 3360 (PO 158). Quern fragment. [1.50 W x 3.00 S]
SF 3361 (PO 164). Flint flake. [0.28 W x 3.50 S]
SF 3354 (PO 159). Spindle whorl. [3.30 W x 4.70 S]
SF 3356 (PO 163). Fragment of copper or bronze. [2.10 W x 4.90 S]
SF 3357 (PO 164). Bone point. [0.75 W x 3.40 S]

In general, the dearth of small finds from the Burnt House is notable; it contrasts with the wealth of material from the levels of the Bin Complex above.

Date

Radiocarbon dates were obtained on charcoal samples from the Burnt House. The first, from PO 158, gave a date of 2220 ± 100 bc (Bln 877). The second, on charcoal from the carbonized post in the central posthole, gave a date of 1853 ± 59 bc (BM 652).

SQUARE ROc

Trench ROc is a sounding dug immediately to the east of the Main Area to refine the stratigraphic sequence for the upper phases which emerged from sounding ZA. This was felt particularly necessary since both structures and stratigraphic relationships had proved difficult to elucidate in the Main Area's large 9-m squares.

Square ROc is a 5 x 5 m square in the northwest quadrant of square RO (which lies immediately to the east of square PO). With a 1 m balk left to north and east, the dug area was 4 x 4 m.

The investigation of structures again presented difficulties, but here in this smaller space stratigraphic control was much easier. The section (fig. 8.14) shows a number of clay levels, including floors at a depth of between 0.9 m and 1.4 m below site datum (layers 12–34). These may be equated with the "layer cake" complex of phase Vb in the Long House of PN and PO. The upper levels of PN, PO, QN, and QO, which formed the Bin Complex, were represented by traces at the very top of ROc.

The next group of floor levels was first seen in layer 49, at a depth of 1.8 m below site datum. We equate this with the Burnt House of square PO, of phase Va.

Floor levels with associated hearths continued to be found as deep as this trench was dug; work stopped at approximately 3.5 m below site datum. Consideration both of the pottery found and of the absolute depth of the strata in relation to square ZA led us to set the interface between phases IV and Va at a depth of 2.8 m below site datum, at layer 52. It should be clearly understood, however, that in a continuous sequence such divisions are essentially arbitrary and to be used only as a general guide (fig. 8.15).

Among the features of note in this square is the complex seen in layer 41. A line of postholes shows that the northeast corner of a house occupied the western half of the square and was cut by the foundation trench for the apsidal north end of a long house. This long house had approximately the same orientation as the Long House of squares PN and PO. This in turn cut (or perhaps was cut by) the foundation trench of

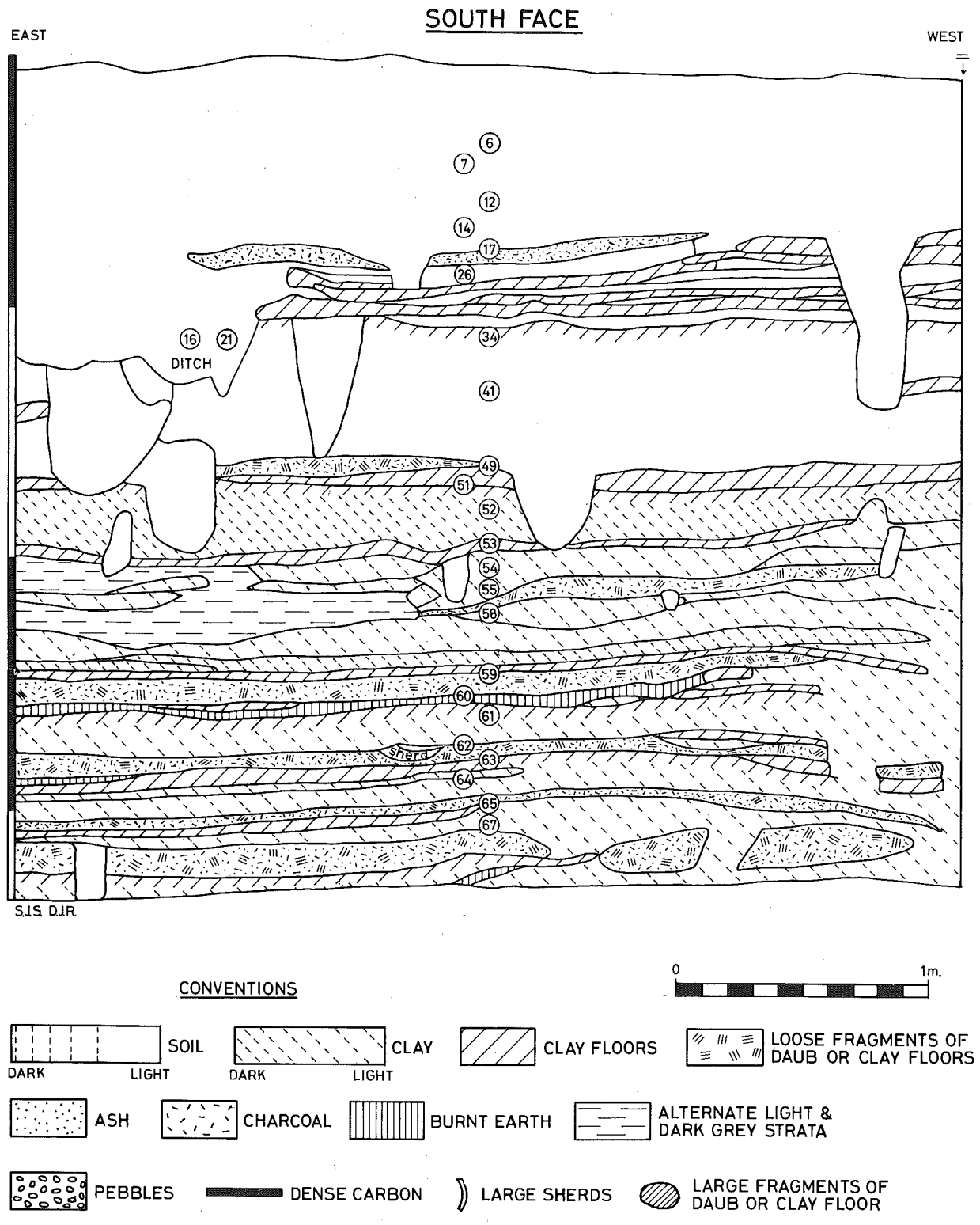


Figure 8.14. (On facing pages):
South and west sections of square ROc.

ings is therefore to provide material, albeit from very limited contexts, for the earlier occupation of the site which can be used to supplement the information from sounding ZA.

Square KM

Square KM is a 9 x 9 m square on the usual site system. Only the northeastern half of the square could be excavated in the upper levels since the relevant levels in the southwest had eroded away. All the levels in this square (KM 4-20) are of phase II. The levels were excavated almost sequentially from KM 4 down to KM 22, KM 4 being at about 6.5 m below site datum and KM 22 at about 8.0 m below site datum. Baked levels, the remains of hearths, were found in layers 9, 16, 19, and 22.

Two complete pots from these levels add to the limited repertoire from phase II: both are from KM layer 9.

Pot 18 (fig. 11.19:2; pl. XLIII:6). Open bowl. Irregularly burnished, red-brown. Diameter 9.7 cm.

Pot 144 (fig. 11.14:8; pl. XLIII:5). Rounded open bowl, decorated inside and out with red-painted circles. Pale Burnished. Diameter 22.0 cm.

Also of note from among the numerous small finds are the two incised clay cylinders SF 516 (from KM 7) and SF 446 (from KM 13).

Square KL

Square KL is a square trench 7 m from east to west (the two westernmost meters being excluded) and 7 m from north to south (fig. 8.21). Along the south side of the grid square is sounding KL (described below), separated by a 1-m balk from square KL. This square's excavation represents layers 1–4, and then 100–118. From 118 down to 142, excavation in square KL was narrowed to a 2 x 2-m square in the southeast corner, designated KLb.

The uppermost levels in this square are 7.8 m below datum, layer 118 is 9.1 m below datum, and natural soil at layer 143 is 11.6 m below datum. The interface between phase II and phase I occurs at about layer 118/119.

The wooden sleeper beam lay in layers KLb 120 and KL 121 and 122 (pl. XLIV:1). It is 5.5 m long, and in section seems to have been approximately square, and of side 15 to 20 cm. Its orientation is to the northwest of grid north and thus approximately parallel to the houses of phase IV in square ZH. At its northern end a concentration of bones was found. This beam lay in the uppermost levels of phase I.

Sounding KL

Sounding KL is a trench 1 m wide (from north to south) on the south side of square KL, and 4 m long, its western end 5 m east of the KL peg. The excavated layers are KL 5-32, inclusive. Layer 5 is about 8.9 m below datum, and bedrock was reached in layer 32 at 12.1 m. Only the uppermost layers, 5-8, can be assigned to phase II. Below layer 9 the pottery is of phase I.

The following pots are important, belonging to the repertoire of phase I:

Pot 160 (KL 10; fig. 11.5:8; pl. XLIV:2). Straight-sided, carinated bowl. Gray Lustre. Diameter 22.0 cm.

Pot 32/311 (KL 21; fig. 11.5:4, pl. XLIV:5). Deep, carinated, biconical bowl. Gray Lustre (lustrous only above carination). Diameter 34.4 cm.

Sounding ML

Trench ML is 1 m wide (from north to south) and 3 m long, its western end being 6 m east of the ML peg. Its excavated layers are ML 7-45, inclusive. The top of layer 7 (which corresponds to the top of the phase II levels) is 6.3 m below datum. The phase II/I interface at layer 22/23 is at 8.3 m below datum. Digging was terminated at a depth of 11.3 m in this trench without reaching natural soil.

A hearth feature was found in layer 15 of phase II and the remains of an oven in layer 42.

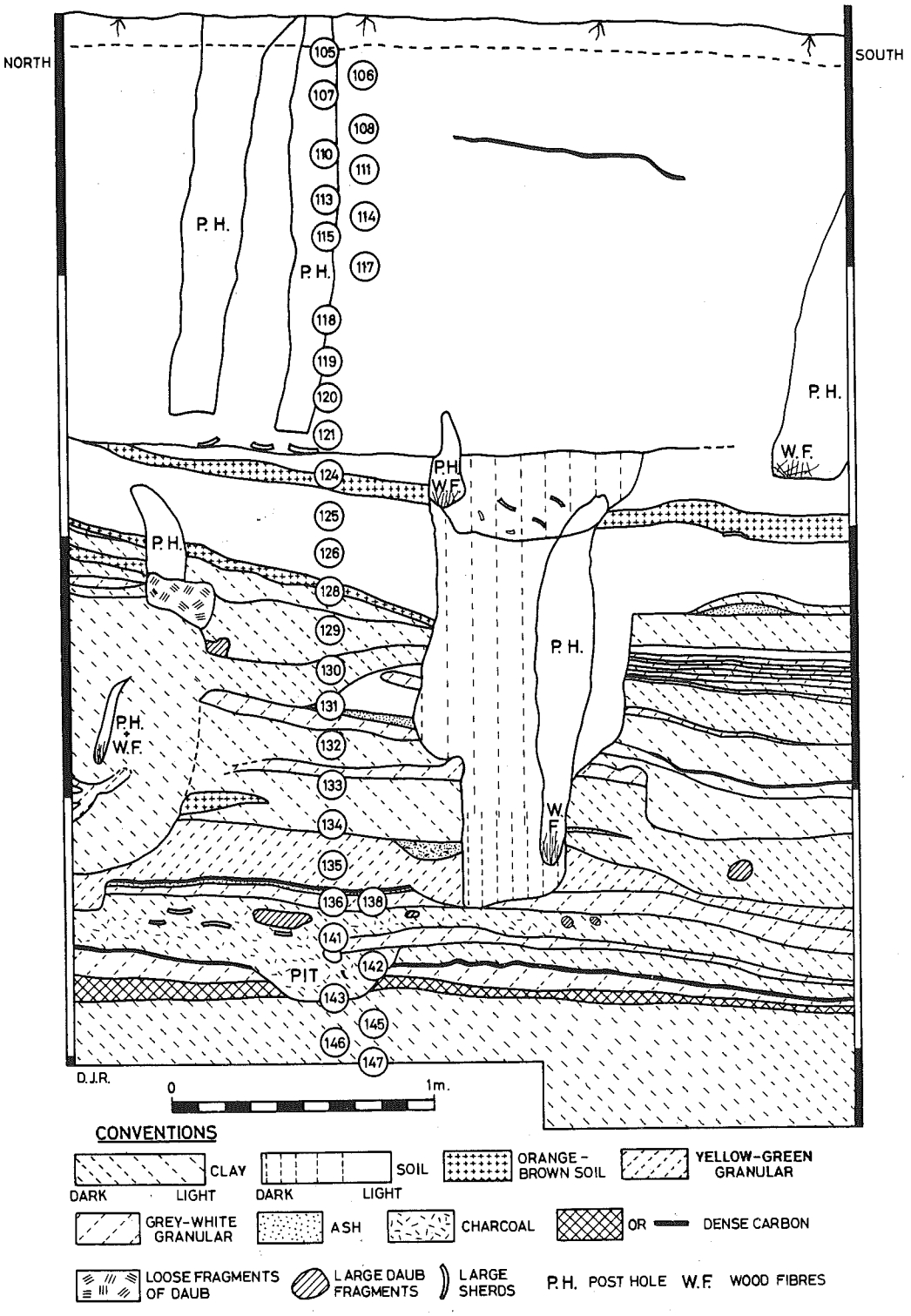


Figure 8.21. East section of trench KL.

Associated with the oven feature is a destruction from which came two important pots of phase I:

Pot 156 (ML 45; fig. 11.4:1; pl. XLIV:3). Shallow bowl with thickened rim standing on four cylindrical feet. Gray Lustre. Diameter 44.0 cm.
Pot 137 (ML 45; fig. 11.7:1; pl. XLIV:4). Barrel-shaped vessel, rusticated below the middle, with finger impression at the middle and at the rim. Pale Burnished. Diameter 24.2 cm.

Area JL

Area excavations were initiated in the northeast corner of grid square JL. Because of the slope of the tell, the area initially available for horizontal excavation was small. Layers 100–105 were excavated, and work in the area was then discontinued. The layers in question belong to phase I of the site.

Sounding JL

Trench JL is 1 m wide (from north to south) and 3 m long, its western end being 6 m east of the JL peg. Its excavated layers are 1–22 (bedrock), inclusive. All the levels lie within phase I. The top is about 9.8 m below site datum, and the bottom 12.2 m below site datum.

Soundings IL, LL, and OL

Narrow soundings were initiated in squares IL, LL, and OL (see fig. 8.1). They were not pursued to any significant depth, since the trench soundings ML, KL, and JL provided sufficient stratigraphic information.

Sounding ZG

Sounding ZG is a 2 x 2 m square, its southwest corner 7 m east of the NL peg (ZG lies within the grid square NL). Its layers run almost consecutively from 3 to 45. Its surface is 4.0 m below site datum, the phase IV/III interface at layers 12/13 is at 5.1 m below site datum, and the phase III/II interface at layers 33/34 is at 7.1 m below site datum. Minor indications of features were seen at many levels through the sequence.

Sounding ZJ

Sounding ZJ is a 2 x 2 m square whose southwest corner lies 3 m north of the MO peg (ZJ lies within square MO). The excavated layers run almost consecutively from 6 to 46. The phase IV/III interface is set at layers 22/33, and the phase III/II interface at layers 33/34. An omission in the recorded datum measurements make it difficult to attach to these layers absolute depths below site datum. A well-preserved oven floor was uncovered and sectioned in layer 24.

Minor Soundings

Most of the major soundings, prefixed by the letter Z have been described above, namely:

ZA. Deep sounding located in grid square 00.
ZB. Small sounding to the west of ZA and adjoining it.
ZE. Within square SL.
ZG. Within grid square NL.
ZH. Mainly in square MN.
ZJ. In grid square MO.

Minor sounding are as follows:

ZC. 2 x 2 m square lying at the southwest corner of grid square GL. It was undertaken for geomorphological purposes and contained no stratified occupation levels.
ZD. 3 x 3 m square opened in the northeast corner of grid square LO. It was not dug below superficial levels.
ZF. 2 x 2 m square lying on the line running west from the GL peg (and the ZC sounding), 35 m west of the GL peg.
ZK. 4 x 1 m trench lying on the same line, 25 m west of the GL peg. It contained no stratified occupation levels.
ZL. 2 x 2 m square along the same line, lying 65 m east of the SL peg. It was opened for geomorphological purposes.

Table 8.1. Volume of Soil Excavated (cu. m)

Trench	Phase I	Phase II	Phase III	Phase IV	Phase V
ZA	10.8	22.5	19.8	13.5	24.3
IL	2	-	-	-	-
JL	7.5	-	-	-	-
KL	28.2	25.4	-	-	-
ML	7.2	7.2	18.2	-	-
MM	-	-	72.9	32.6	-
KM	-	40.5	-	-	-
ZE + SL	-	4	4	15	-
PN	-	-	-	-	89.1
QN	-	-	-	-	48.6
PO	-	-	-	-	100.4
QO	-	-	-	-	40.5
ZG	-	3.2	8.0	1.6	-
ZH	-	-	-	-	30
ZJ	-	4	3.6	3.2	-
ROc	-	-	-	25.6	20.4
Totals	56	107	127	92	353
Approx. total	60	110	130	90	350
Grand total	740 cubic meters				

VOLUMES

Calculations of the approximate volume of earth excavated for each phase in each excavated area are given in table 8.1. They are only approximate but do provide a basis for assessing the frequency of occurrence of artifacts and other classes of material in relation to the volume of earth removed.

Part II

From Artifacts to Society

9.
Mythical Imagery of Sitagroi Society

Marija Gimbutas

General Information

Sitagroi figurines, close to 250 in number,* provide important material for studying the religion of the Sitagroi community. Their analysis elicits aspects of prehistoric life which cannot be reconstructed from the investigation of pottery, tools, or house debris.

The material for the present study is preponderantly from phases II and III: 93 pieces from phase II and 136 from phase III. Phase I is represented by only 8 pieces; this small recovery is due in part to the small size of the excavation area and in part to the production of fewer figurines in this early period, as demonstrated in analogous sites. Five figurines assigned to phase IV are typologically of phase III. The largest excavated area of phase V yielded only a few pieces. Production of figurines and of cult vessels with animal head protomes in phases IV and V was virtually nonexistent. The few figurines of phase V are therefore of a different character from those of phases I, II, and III, and they indicate a discontinuity of local cultural traditions. The artistic traditions of chalcolithic Europe did not survive the close of phase III. The caesura between phases III and IV reflects one of the most dramatic changes in the art and religion of prehistoric Europe.

*Each illustration is given a figure number, which is followed by a number in parenthesis which refers to the catalog numerical system. The scale is 1:1 unless otherwise indicated. Plates XLV-LXV by Kalman Konya.

This chapter deals with the repertoire of the sculptural art of the eastern Balkan Karanovo (Maritsa-Gumelnitsa) culture of which Sitagroi and its sister tell at Dikili Tash are a part. From around 6000 BC and onward the Karanovo culture was an autonomous cultural unit, closely linked with the Starčevo-Criş culture of the central Balkans and with the Lower Danube valley. During the fifth millennium BC, phases II and III at Sitagroi are parallel to Karanovo V and VI of Bulgaria and to the Boian and Gumelnitsa culture groups in Romania. This culture developed its own art traditions, differing from those of the neighboring Vinča, heir of Starčevo, Cucuteni, and other culture groups of Old Europe. In our analysis of Sitagroi figurines it is relevant to look for parallels: first, in the Maritsa plain of Bulgaria and the Lower Danube region; next, in the area of the Cucuteni culture of Moldavia and the western Ukraine and in the Vinča region of the central Balkans—a formidable source of sculptural art.

Karanovo V-VI tells in Bulgaria and Romania, chronologically equivalent to phases II and III at Sitagroi, are rich in figurines, but these have never been fully described or analyzed. Only the most appealing examples from an aesthetic point of view have been published (V. Dumitrescu 1968, 1974; Detev 1965; Georgiev 1961; Rosetti 1938). The Sitagroi corpus, however, can be regarded as a substantial and reliable nucleus for the study of the religious concepts of these related cultures. Its breadth permits not only the cat-

aloging and description of the sculptures but also their interpretation. The ample use of symbolic signs on figurines reveals a great deal of their possible meaning and function.

One disadvantage of such a study is the fact that the Sitagroi figurines came from excavation levels of habitation debris, not from ideal in situ locations. The exact contexts of most of the figurines are not known; they came either from the various squares or from sieving. If the excavation could have been extended into the center of the mound and a large area of phases II and III opened, Sitagroi probably would have yielded thousands of figurines and the necessary information as to how they were kept and used. Under present circumstances we must look for help in other excavated sites. On the basis of the comparative evidence from contemporary Karanovo sites, we can surmise that the majority of figurines came from house (or shrine) areas, that some were near ovens within the houses where they were on benches or altars, and that most of the figurines either had flat bases and could firmly stand on a flat surface or were seated on stools or thrones.

Exact locations and levels where figurines were found, correct measurements in centimeters, and detailed descriptions are given in the figurine catalog; 227 figurines are listed; some fragments are illustrated in the section on cult vessels (chap. 10). Eighty-seven figurines were chosen for discussion in the text; the remainder are arranged in chronological order in the catalog.

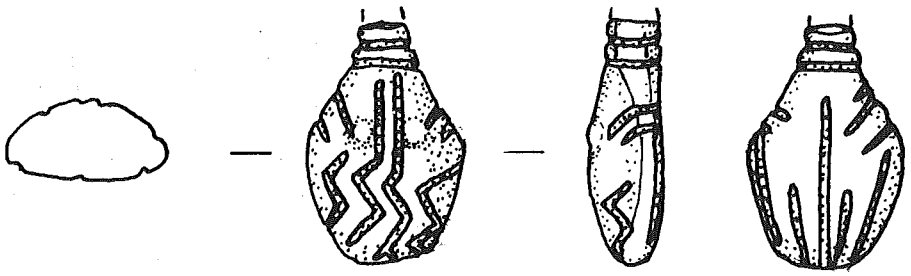
The Sitagroi collection contains 50 zoomorphic pieces, including whole animal figurines and head protomes, deriving from cult vases, receptacles, or lamps. There are also half-human/half-animal creatures. Of the entire assemblage of anthropomorphic figurines, not one can clearly be identified as male, and only about 1% can be considered as possibly portraying men. This statistic agrees with Cucuteni and Vinča site reports where the male statuettes number no more than 2% or 3%.

Sitagroi sculptures are of clay with the exception of one very fine carved figurine of greenstone (fig. 9.51; pl. LIV:4). In the present text, figurine material not otherwise specified should be understood to be clay. Clay, of course, is easily breakable, and therefore practically all figurines except a few of the miniatures are more or less damaged. Most of them are broken through the narrow juncture of the neck or waist.

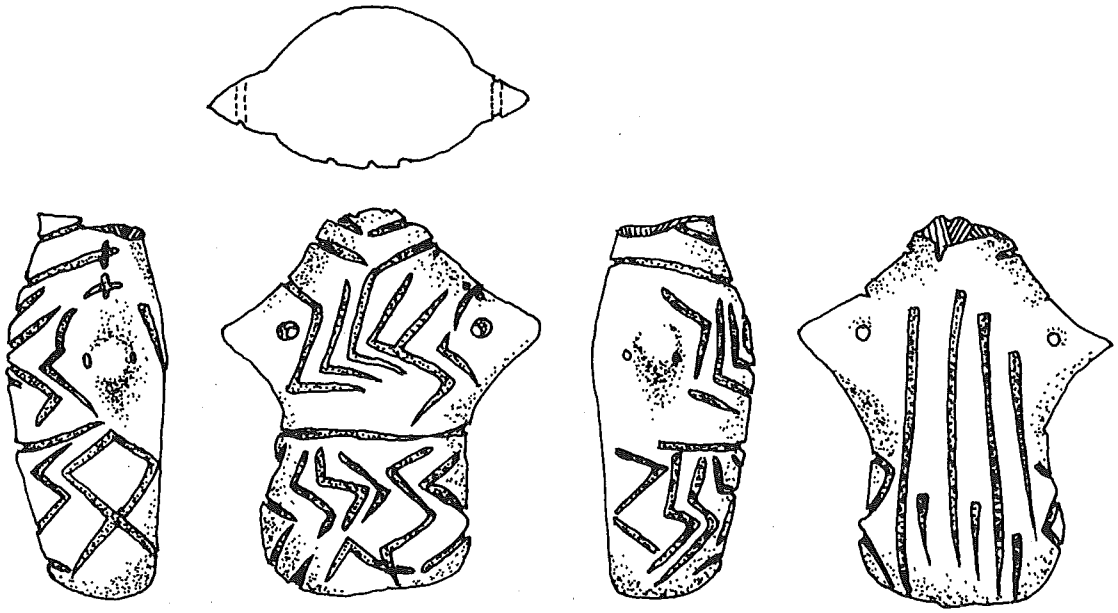
It should be emphasized at the outset that prehistoric sculptures, from the upper paleolithic to the period under discussion, should not, except incidentally, be considered as mere art objects. They were intended and produced as a means of communicating with the supernatural. They can be considered the small, ragged remnants of a rich fabric constituting the mythical world of their time. To regard them merely as toys or inexplicable amulets is to do injustice to a society whose creativity was far above a primitive level. The little figures, despite their unimpressive size, were sacred objects: personifications of goddesses and their zoomorphic epiphanies, or of hierophants impersonating them in the ritual festivals of an agrarian society. Some, excessively conventionalized, may have served as fertility charms, but in general they were sacred images of divine entities.

SCHEMATISM

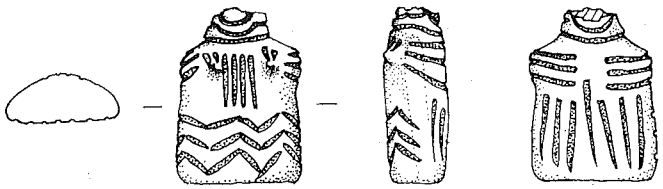
In Sitagroi, as in the entire Karanovo region, human figurines are predominantly schematic, reduced to a sort of instantly comprehensible sculptural shorthand. Hence, very little effort focused on molding the details of the human body, as that aspect was immaterial to the purpose. Much effort, on the other hand, was devoted to proper placement of fortifying and appropriate symbols—which to our eyes seems merely haphazard or superfluous decoration. In the corpus of over 200 figurines belonging to phases I, II, and III, not more than 20 are naturalistically rendered, and even those are not completely so: the body area other than the belly and buttocks is schematized. Partial emancipation from schematic convention occurred in phase III as a result of efflorescence in the plastic arts. The most beautiful sculptures and vases, including graph-



9.1 (19)

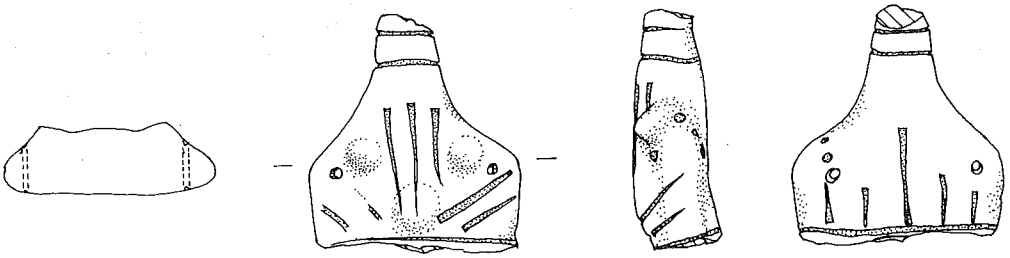


9.2 (26)

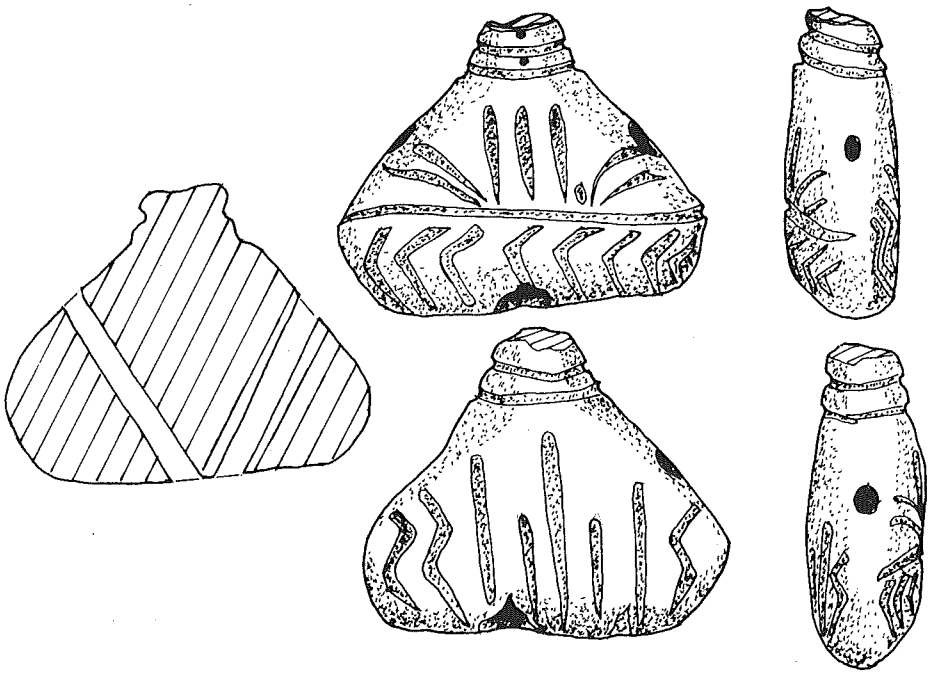


9.3 (98)

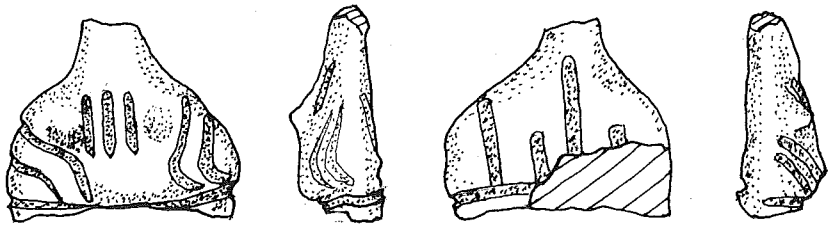
Figures 9.1-9.3. Schematic figurines marked with symbols.



9.4 (32)



9.5 (29)



9.6 (30)

Figures 9.4-9.6. Schematic female figurines incised with tri-lines, parallel lines, zigzags, and V's.

ite-painted and black-on-red painting, belong to this period. A similar sophistication in sculptural and ceramic art can be seen over the entire Balkan peninsula at that time.

Phase II and some phase III figurines are miniatures, portrayed without arms and legs; many have a flat base and a tiny, truncated torso. In most cases heads are missing, broken off and lost. All these nearly geometric figurines are incised with symbols. The incising is encrusted with crushed white shells or red ocher. In isolated context, the figurines could be mistaken for geometric amulets bearing an inexplicable design (figs. 9.1, 9.2; pl. XLV:1, 2).

The schematic human figurines can be divided into two general categories: (1) the totally abstract, like those shown in figures 9.1 and 9.2 and in plate XLV:1, 2; and (2) the semi-schematized, with some indication of anthropomorphic body features. Breasts are shown on a series of truncated torsos on which lines suggest dress necklines or necklaces (fig. 9.3; pl. XLV:3). Arms are often omitted; instead, there are stumps or curving incisions over the shoulders (fig. 9.95; pl. LX:2). There are also vertical incisions between the breasts and, very frequently, several incisions around the neck, zigzag rows on the lower torso in front, and long vertical lines on the back. The consistency of these markings indicates their importance as a significant feature of the image, as opposed to the relative unimportance of physical detail.

About half of all schematized figurines have perforations through the shoulders (cf. figs. 9.2, 9.4, 9.12, 9.13; pls. XLV:2, XLVII:3, XLVIII:1) or diagonally across the figurine (fig. 9.5); otherwise these are of the same type as those that do not have perforations (fig. 9.6). The perforations were probably used for inserting certain attachments, such as feathers (note that the schematic figurines do not have arms; feathers would be appropriate to a half-human/half-bird image).

The formal reduction that dominates all phase II and most phase III anthropomorphic figurine art is not due to an inability to model in the round, but to functional purpose, as I try to explain below. Technical skill is obvious in contemporary animal figurines which are quite naturalistically rendered, and sculptures of stools or thrones seem to be accurate renderings of actual objects. During phase III, the human form in some sculptures exhibits somewhat more natural proportions but, in the main, conventional form continued: certain classes of figurines remained miniature, with "shorthanded" allusiveness. The juxtaposition of abstraction and naturalism in the portrayal of both human and animal figurines can be observed through the entire duration of phase III.

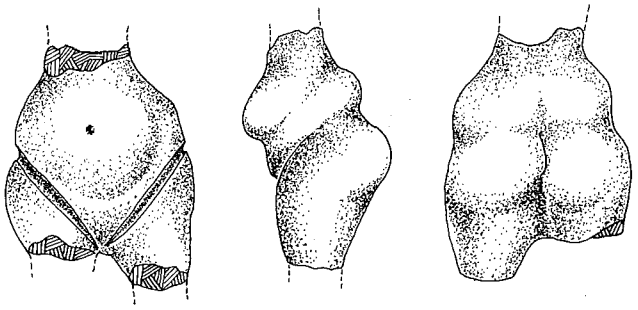


Figure 9.7 (147). Standing nude with pubic triangle. Scale 1:2.

Among the most naturalistically rendered sculptures is the perfectly proportioned squatting woman (fig. 9.145; pl. LXII:1). The fleshy, red-painted torso (fig. 9.7; pl. XLVI:1) with well-modeled belly, back, and buttocks is one of the best nude torsos of the period. Another outstanding piece is the undecorated lower portion of a seated female with legs intact (fig. 9.144; pl. LXII:3). A series of sculptures of corpulent women in seated position have charmingly modeled bellies and posteriors (figs. 9.8, 9.52-54;

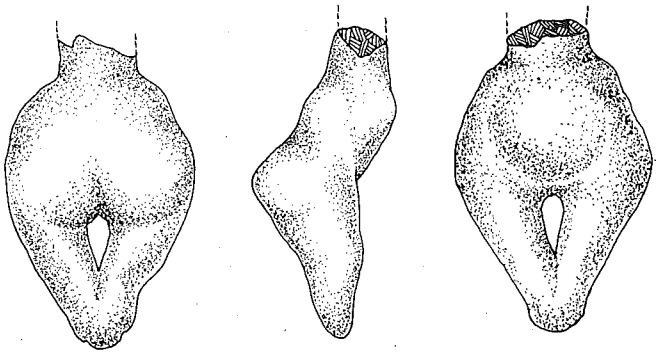


Figure 9.8 (146). Lower half of female figurine. Scale 1:2.

pls. XLVI:2, LIV:3). The pubis is often indicated, and several torsos with youthful breasts were discovered (fig. 9.123; pl. LXI:2). Occasionally the head was modeled: several naturalistic heads with eyes, lips, and nose in relief have been found. On a round head, unfortunately severely damaged, eyes with eyeballs and nose with nostrils are indicated (fig. 9.9; pl. XLVI:3). Several masked heads are quite naturalistically portrayed (figs. 9.27-29; pl. LI:1-3), demonstrating the ability of the Sitagroi people to model in the round.

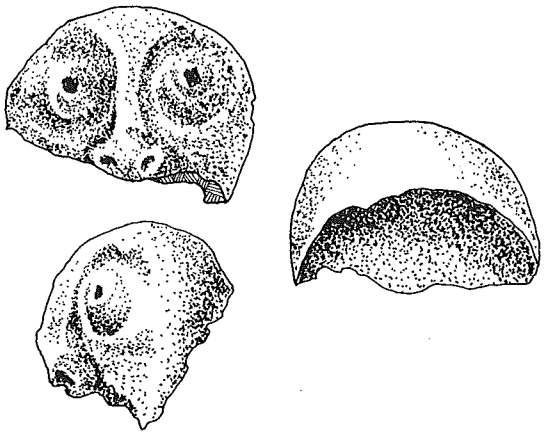


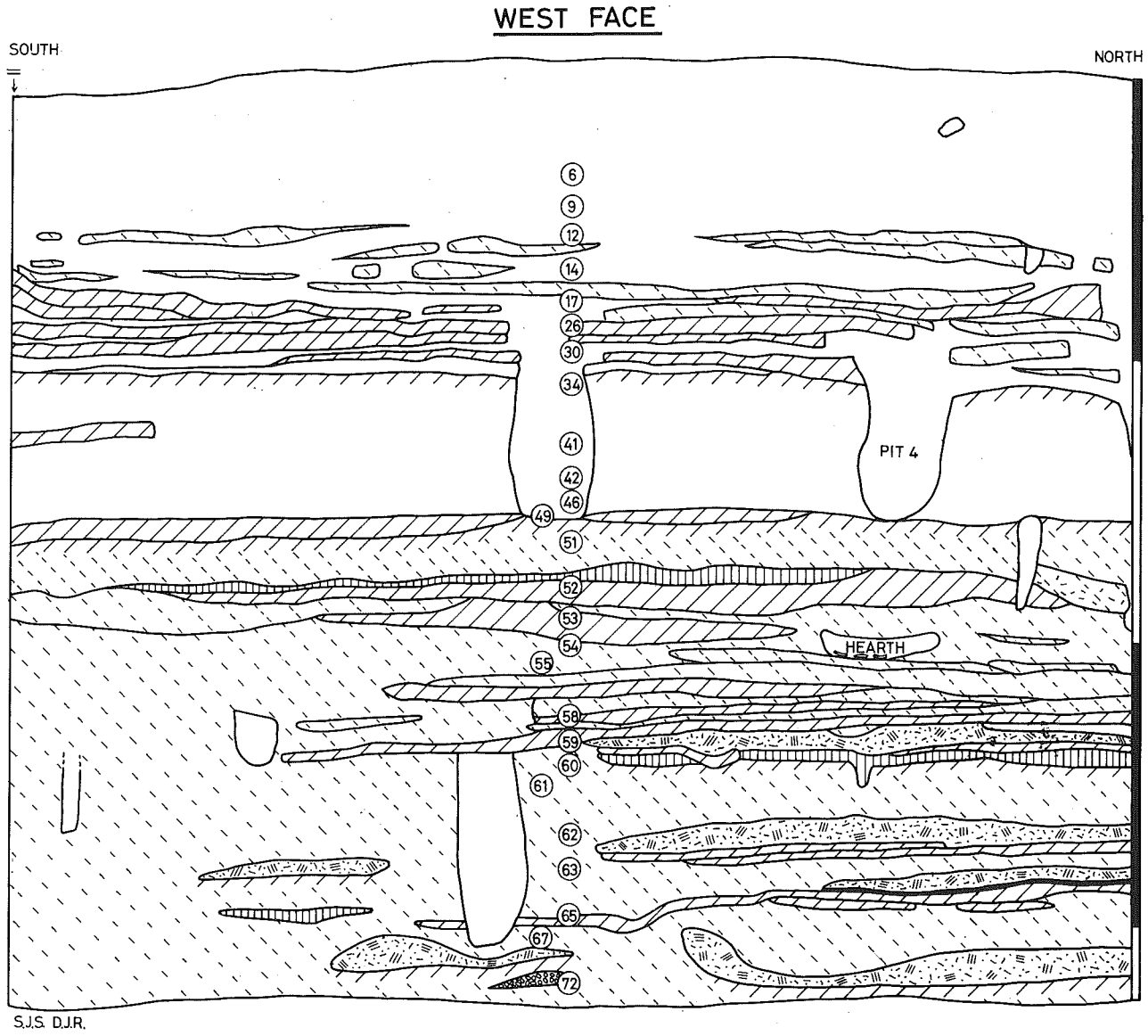
Figure 9.9 (172). Fragment of human head or mask. Scale 1:2.

COSTUME

In view of the extreme schematism and the multitude of symbolic signs on the figurines, can we hope to deduce the costumes of the period? And how shall we correctly interpret the incised or painted geometric signs—parallel lines, chevrons, zigzags, lozenges, or spirals—on bodies or legs of figurines? Are they abstract symbols or ornaments of dress? Parallels in other regions of the Karanovo culture and in the Vinča area facilitate the distinction between certain decorational elements and certain constituents of female dress such as skirts, aprons, and hairstyles. In spite of their symbolic nature and schematic form, a number of figurines show interesting details of female costume.

Consider first the semi-nude torsos (fig. 9.10; pl. XLVII:1). The belly is meticulously molded; the navel is almost always indicated. The line around the middle of the hips, universally exhibited by this type, is undoubtedly a genuine article of clothing—a belt, an apron support, or a skirt top. A few torsos have no indication of dress above the belt, but on most a necklace or blouse neckline is indicated by meeting oblique lines (figs. 9.11-13; pls. XLVII:2, 3, XLVIII:1). Two dots, squares, or concentric circles indicated on the back, however, are probably of symbolic significance and do not depict buttons sewn on the blouse or jacket (figs. 9.10, 9.11, 9.14; pls. XLVII:1, 2, XLVIII:2). Long and short vertical lines on the back (figs. 9.12, 9.13; pls. XLVII:3, XLVIII:1) may or may not show blouses narrowing at the waist, constructed of three or more pieces (fig. 9.12; pl. XLVII:3). These lines are more likely symbolic. Identical lines on the schematic figurines with truncated torsos of phases II and III (fig. 9.13; pl. XLVIII:1) do not suggest blouse seams. Sleeves cannot be recognized because the majority of figurines are armless or the arms have broken off. One to three necklaces are indicated by incised and white encrusted semicircles or V's. These marks seem both necklace and symbol, perhaps actual ornaments symbolically characteristic of the personage.

Portrayal of the skirt reveals a sophisticated garment. On the schematic truncated figurines, horizontal lines of zigzags may be a shorthand indication of a skirt. On the more naturalistic statuettes, incised or painted lines indicate a tight skirt profusely decorated. Diagonal, vertical, zigzag, or spiraling lines may represent folds just below the buttocks (figs. 9.12-17; pls. XLVII:3, XLVIII:1-4, B:2). A spiral or concentric circle on each buttock does not represent embroidered decorations on the skirt (fig. 9.15) but is intended to emphasize the symbolic significance of that part, as do the spirals combined with crosses or lozenges on the sides of thighs or knees (fig. 9.18; pl. XLIX:2). One of the figurines mentioned above (fig. 9.10; pl. XLVII:1), showing a skirt folded around the thighs, revealing parted legs, may appear to be wearing closely fitted trousers, but because of



another long house on the same axis but encroaching by some 2 m upon the plan of its successor (or predecessor).

In the levels of phase IV, a sequence of no fewer than six hearths was observed (layers 59–67). Most are of the ridgeback plan already familiar from the Main Area. But one, in layer 65, is made up of large, broken sherds and may have been, rather, an oven analogous to oven 1 of the Burnt House. A radiocarbon sample of charcoal from layer 59 gave a date of 2445 ± 100 bc (Bln 878) which harmonizes with the dates from ZA and ZB obtained for phase IV.

An interesting complex was found in ROc 73. A group of three cylindrical loom weights (SF 3057–3059) was found lying juxtaposed about 1 m north of the daub and posthole traces of a wall running approximately east and west. Forty cm to the west of these lay a fourth loom weight (SF 3060) of different form, and 30 cm to the north lay a complete bowl, pot 248 (fig. 13.7:3). There were indications of a hearth under the north balk 1.5 m to the northwest, and the group clearly represents part of the destruction deposit of a burnt house of phase IV (pl. XXXIV:1).

As indicated earlier, the main interest of this

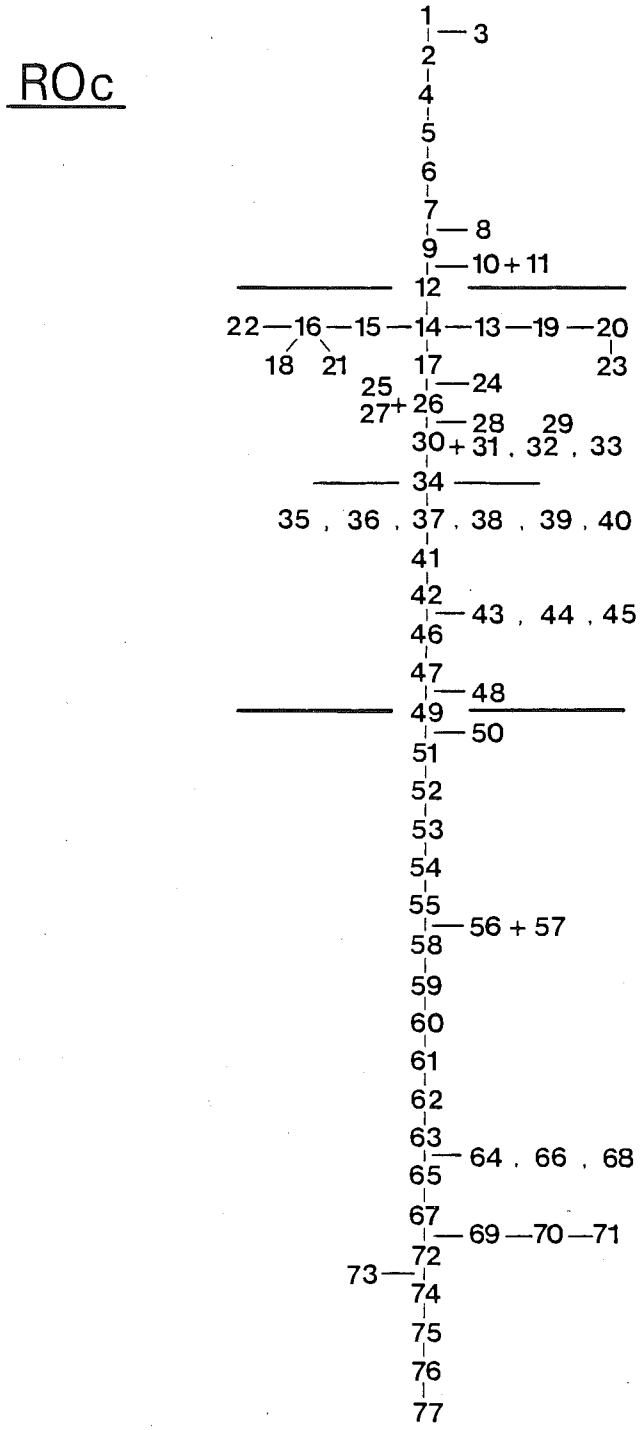


Figure 8.15. Diagrammatic stratum sequence for square ROc.

square is stratigraphic, and the sequence of pottery is useful in providing the relative chronological background to chapter 13.

AREA ZH

A sounding, ZH, measuring 2 m x 2 m was opened in the southwest corner of grid square MO. Indications of burnt flooring were at once seen very close to the surface, and the trench was extended to the south and east to give a 4 m square. The structural features proved very interesting, so this area was extended a further 8 m south, to the south edge of square MN. This strip, now 12 m x 4 m, lay horizontally along the contour of the mound so that very little digging was necessary. The air blowing machine proved very useful in detaching loose soil from the burnt features (pl. II:2).

In view of the structural information so readily forthcoming, it was decided to extend the entire trench 4 m to the east. This was uphill and hence meant shifting more earth; downhill, the strata in question were no longer preserved. The resultant area measured 12 m north-south and 8 m east-west with the southwest corner coterminous with the southwest corner of square MN (pl. XXXIV:2). This area thus lay immediately to the north of square MM which was already undergoing excavation to deeper levels (fig. 2.2).

The structures revealed are seen in figure 8.16. Much whole or reconstructable pottery was found, especially on the eastern side where it was protected by an overburden of earth. The levels definitely associated with the destruction of the structures examined are: ZH layers 14, 15, 24, 26, 27, and 28. The overlying layers 13, 19, 22, and 23 may well contain associated material. Layers 12, 17, 18, 20, and 21 lie mainly over a higher floor, but they may incorporate material of the destruction; difficulties of digging a large area on the slope of the mound may also mean that some of the main destruction deposit was uncovered while these layers were being dug. Layers 1–11 and 16 represent levels in the western part of the area; they are in principle contemporary with the destruction but were very near the surface in 1968-69.

The prevailing impression in these strata is of burning: the floors are baked, parts of the wall are preserved through fire, and there is much ash and charcoal as well as a concentration of carbonized acorns at the north end of the westerly house. It became very clear that we had here well-preserved parts of two long houses, which as we shall see below should be assigned to phase IV of the site. Of the west house the eastern part remains, the rest having all but eroded away. The east house lies parallel to its neighbor and 2.3 m distant from it. The west end of the west house is preserved, although only scantily, and is indicated by postholes. It should be noted that we did not go below the floor levels in this area, so that only some of the postholes were revealed. The east wall of the house is continuous (but for an intrusive pit) and achieves the remarkable length of 11.5 m without reaching its southern end. Two ditches (at 12.5 and 13.5 m from the north end) intersect this wall and are probably foundation trenches for interior house walls, analogous to the well-preserved wall 2.5 m from the north end. It is, of course, possible that the east wall of this house, like that of the Burnt House in square PO, extended south of the house itself. But against this view is the well-preserved flooring which accompanies this wall to its southernmost preserved extremity. The length of this wall is seen in plate XXXIV:2 and the interior dividing wall in plate XXXV:1.

The house to the east contained most of the pots recovered and a ridge-backed hearth of the form now familiar from the Main Area. The most striking feature of these houses, apart from their great length, is their disposition. They hold the same orientation as the house from area SL, to be described below. More remarkably, their orientation approximately west-northwest is close to that of the Long House of phase Vb (although the Burnt House of phase Va was oriented close to grid north, approximately 30° west of true north, and is not in quite the same direction). It would be necessary to open a larger area of the mound before being able to make any firm statements about village planning of the period, but

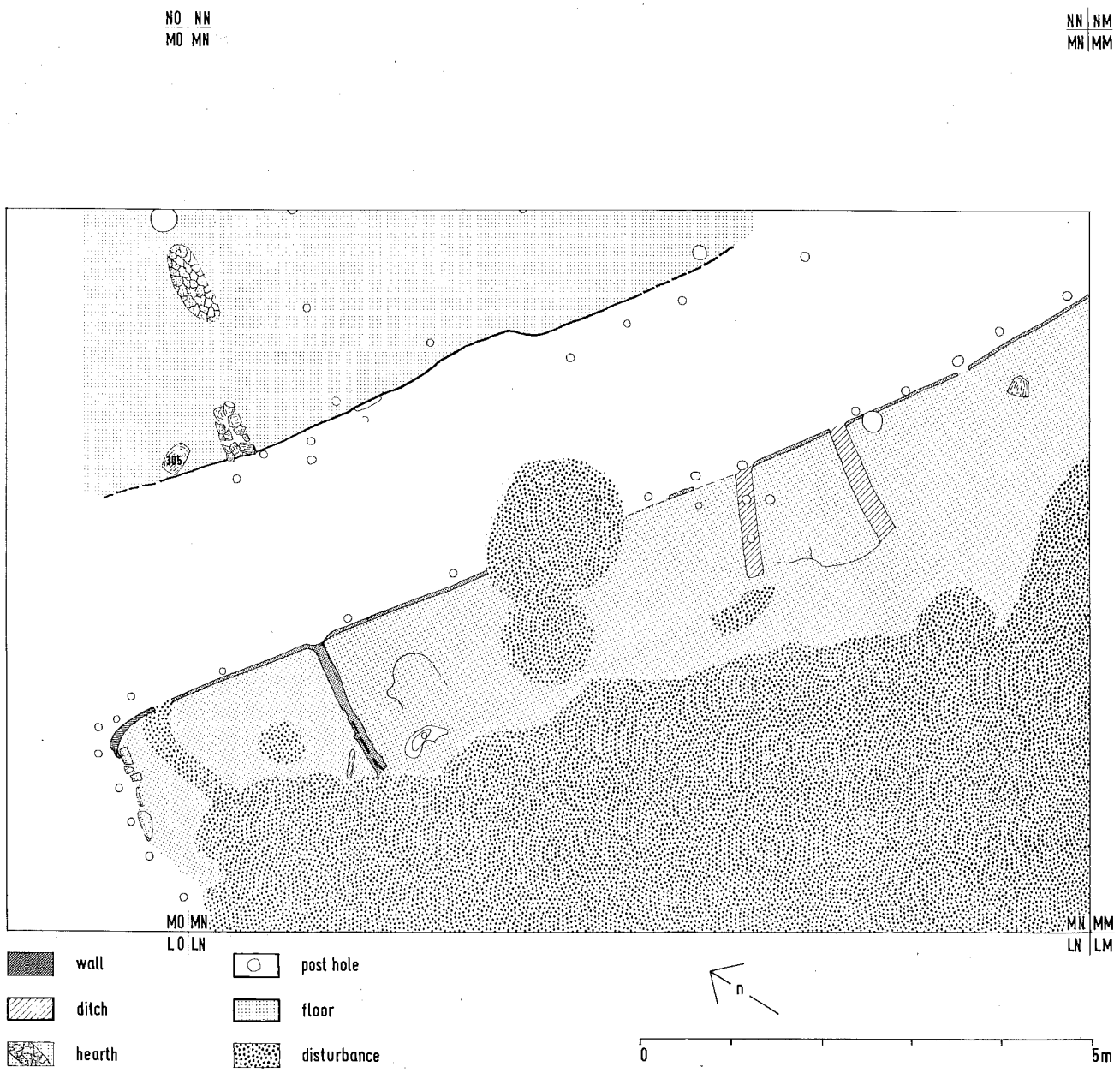


Figure 8.16. Plan of area ZH, showing parts of two long houses belonging to phase IV.

there are indications here that in phase IV, and perhaps in later phases, there was a regular lay-out.

The Destruction: Layers 14, 15, 24, and 26–28

The following pots came from these levels:

Pot 247 (ZH 24; pl. XXXV:2). Sinuous bowl with incised and appliqué decoration. Burnished, black. Diameter 11.0 cm.

Pot 323 (ZH 24). Miniature open urn. Height 2.3 cm.

Pot 345 (ZH 26; fig. 13.16:2; pl. C II: 1). Open urn with straight rim and perforated rim tabs. Roughly burnished. Burnt. Height 15.0 cm.

Pot 346 (ZH 26; fig. 13.7:1; pl. CII:3). Open urn with incurved rim. Burnished, possibly black. Burnt. Height 20.8 cm.
Pot 374 (ZH 26). Open urn with vertical lug. Roughly burnished. Possibly burnt. Height 14.8 cm.
Pot 332 (ZH 26; fig. 13.4:1). Fragment of sinuous bowl with vertical incisions. Burnished, black. Diameter 14.0 cm.
Pot 305 (ZH 26; pl. XXXV:4). Tall-necked, piriform storage vessel. Coarse, burnished, black. Burnt. Height 26.1 cm.

Pots from nearby levels, possibly associated with the destruction include:

Pot 330 (ZH 11; fig. 13.11:7; pl. CII:2). Rounded bowl with incurving profile and horizontal stringhole lug. Burnished, black. Diameter 15.7 cm.
Pot 206 (ZH 13; fig. 13.10:9; pl. XXXV:3). Sinuous bowl with vertical channeling and projecting handle. Burnished, black. Burnt. Height 6.0 cm.
Pot 207 (ZH 13). Sinuous bowl with vertical channeling and projecting handle. Burnished, black. Diameter 8.0 cm.
Pot 213 (ZH 16; fig. 13.10:8). Fragment of carinated bowl with incised decoration. Gritty, burnished, black. Diameter 7.0 cm.
Pot 324 (ZH 19). Sinuous bowl with vertical channeling. Burnished, black. Diameter 8.3 cm.
Pot 328 (ZH 19; pl. CII:5). Barrel urn with lug handle. Roughly burnished, probably black. Height 18.2 cm.
Pot 329 (ZH 19; fig. 13.12:2; pl. XXXV:5). Conical bowl with thickened rim with incised decoration. Fine, burnished, black. Burnt. Diameter 44.0 cm.
Pot 333 (ZH 19; fig. 13.16:1). Barrel urn with impressed ledge below rim. Possibly smooth. Height 17.4 cm.
Pot 334 (ZH 23; fig. 13.14:1; pl. CII:4). Jug with rounded profile and projecting handle. Burnished, black. Height 17.8 cm.
Pot 335 (ZH 23; fig. 13.14:6). Piriform bowl with incised and applied decoration. Burnished, black. Diameter 20.0 cm.

Small finds include:

Bone points: SF 3247, 3255
Spondylus shell bracelets (fragments): SF 3263, 3266, 3267, 3271, 3274
Flint flakes or blades: SF 3246, 3250, 3251', 3256-3262, 3264, 3265, 3268-3270, 3272, 3273
Quern stone (fragment): SF 3217
Stone axe (fragment): SF 3275
Worked stone: SF 3218
Figurine head: SF 3245 (fig. 9.137)
Miniature pot: SF 3254
Spindle whorls: SF 3244, 3248, 3249, 3252, 3253

PHASE AND DATE. There is no direct stratigraphic link between area ZH and either square ZA or the Main Area. Attribution to phase must in such a case either be on stylistic grounds, mainly with reference to the pottery, or on a consideration of absolute level, which can be no sure guide. The pottery of phases IV and V, being unpainted, is not easy to assign to phase. Most of the material from ZH is assigned by Sherratt to phase IV, but some pieces have affinities with phase V. The question is further discussed in chapter 13. The destruction levels in area ZH are within 10 or 20 cm of the datum peg for the area, the MO peg, which is about 3.5 m below site datum. This is at the same height as phase IV levels in square ZA, and indeed is within approximately 20 cm of the level of layer 26 and the deposits there lying on floor 10. These comparisons can offer no more than guidance, yet it seems fairly safe to assign the ZH destruction to phase IV of the site.

AREA SL WITH SOUNDING ZE

The 9 x 9 m square was opened at the southeastern corner of the land acquired for the excavation, in order to investigate the stratigraphic structure of the mound. During the 1968 season structural remains were found in the upper (northern) part of the square, but they were not preserved in the southern part because of mound erosion. In the 1969 season the 4 x 4 m square ZE was opened at the southeast corner of

square SL (leaving a 1 m balk, as always, at the east of the square). This was taken down into deeper levels to provide the stratigraphic information sought.

In the upper levels of SL (layer 5) a well-preserved ridge-backed hearth was uncovered (pl. XXXVI:1). At lower levels, some 20 cm below in layer 14, part of a more coherent structure was uncovered (fig. 8.17). The southwest corner of the area drawn lies 4 m north (on the grid) from the SL peg. There were clear indications of flooring, where the clay had been hardened by fire, and of a hearth ridge at the southwest side of the area. Burnt wall remains were found, suggesting a long wall running along the main axis of the house to the northwest, with an interior wall joining it at right angles. This structure may be compared with those in area ZH and, indeed, with the Burnt House of square PO.

Finds from this area are not numerous, although the levels in question clearly belong to phase IV or V. These levels are some 10 cm higher than the SL datum peg and thus 2.7 m below site datum. By comparison with the ZA stratigraphy, they can be assigned to the top of phase IV or the bottom of phase Va.

There are no notable associations of finds in area SL.

The ZE Sounding

As stated above, ZE is a 4 x 4 m square at the southeast corner of square SL. In the upper levels, ZE 50-55 and 61-65, several indistinct clay patches, with such minor features as postholes and burnt areas, were observed. They were more clearly seen in section as a series of clay floors of the kind encountered in many places on the site, amounting to an accumulation some 50 cm thick. Their base is some 4.1 m below site datum.

Below these levels are steeply sloping layers, sloping down toward the east. In general, as remarked earlier, the strata at Sitagroi run approximately horizontally, and a layer with a slope of 1 in 2 was not encountered elsewhere.

At the foot of this slope, at the southeast corner of the trench in what was evidently the result of destruction by fire, there is a remarkable complex. The main feature is a large pithos, pot 226 (fig. 13.8:2), containing a second pot, no. 227 (fig. 13.8:1). Between the two there appeared to be a lining of brown soil (pl. XXXVI:2). Inside the inner pithos was a quantity of carbonized grain, including whole ears of grain. Immediately to the east of the pithoi, and level with their bases, was a depression filled with large quantities of carbonized acorns. This feature was first noted level with the top of the pithoi, and resembled a pit filled with carbonized acorns. To the west of the pithoi, the base of an urn, pot 256, was found, and immediately at the base of the pithoi on the west side, in layer 79 at a depth of 5.33 m below site datum, a high-handled scoop, pot 219.

A similar scoop, pot 199, was found in association with burnt flooring (and burnt acorns) at the top of the steeply sloping destruction levels, in layer 66, at a depth of 4.3 m below site datum. The interpretation is clear here. The pithoi and their contents had fallen from the higher levels to the east in the collapse that accompanied the burning of the house to the east. The burnt acorns had fallen with them and above them, as had much carbonized wood.

Some 50 cm below these remains, in layer 84, pottery characteristic of phase III was found (at a depth of 5.6 m below site datum), and in layer 90 (at a depth of 6.3 m below site datum), pottery defining levels of phase II. Comparison with the absolute depths in ZA indicates that the phase II levels are at about the same absolute height in the two areas, as are the phase IV levels at the east of ZE, from which the pithoi are inferred to have fallen. It is notable that the phase III levels in ZE are only some 70 cm thick, in contrast to the 2.3 m of deposit in ZA. It is clear that either this eastern part of the site was not intensely occupied during much of phase III or that a large pit was dug in this area. In either case, there was a marked declivity to the east during the life of the phase IV house documented in layer 66, and into this declivity some of the food stores of that house collapsed during a disastrous fire. It should be noted that the scoops, pots 199 and 219, are very like pot 5 (fig. 13.4:9; pl. XI:2) and those found in the destruc-

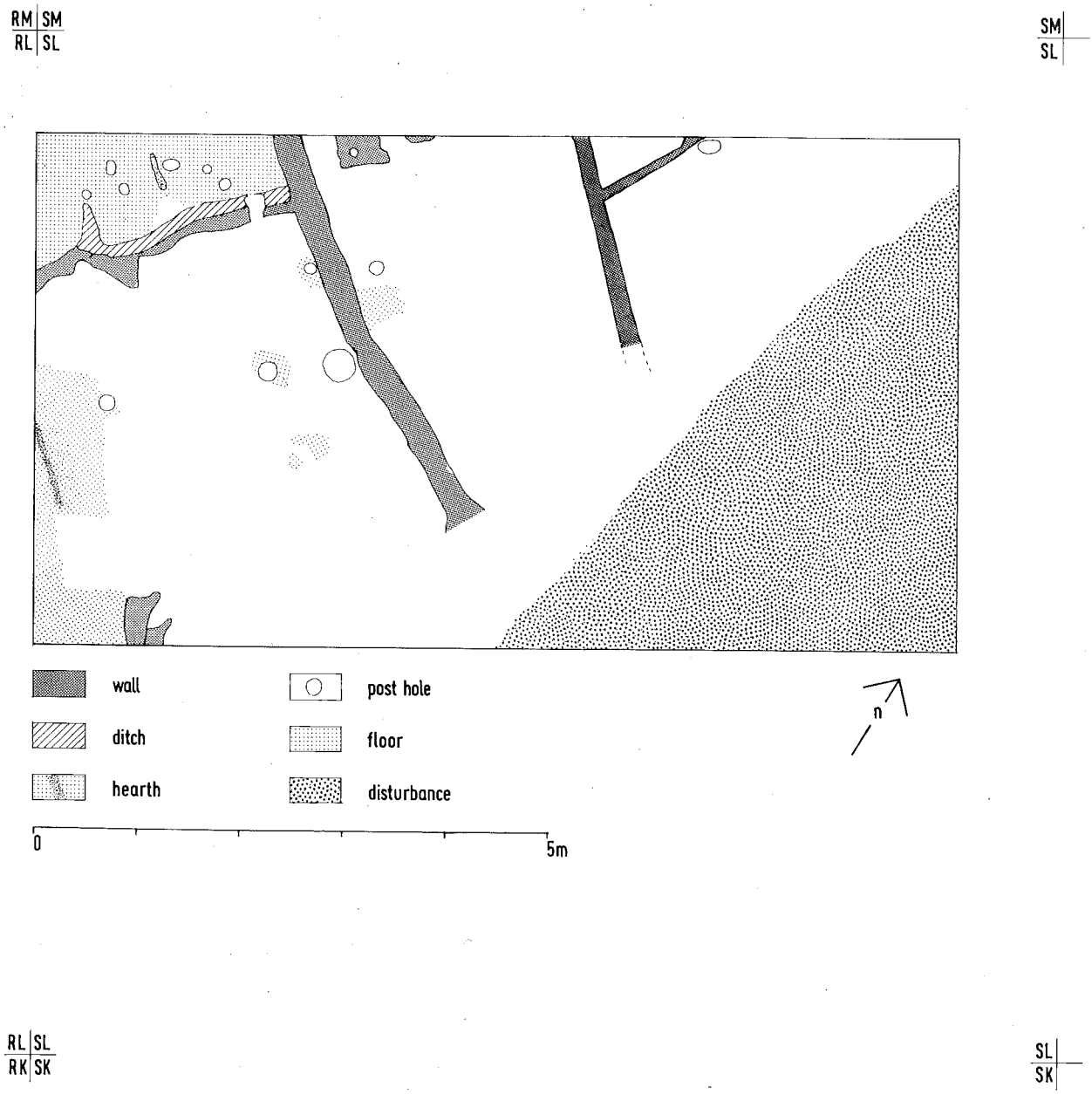


Figure 8.17. Plan of square SL, showing parts of houses belonging to phase IV or Va.

tion on floor 14 of square ZA (e.g., fig. 13.4:10, 11; pls. XI:1 and XII:2), which is likewise in the earlier part of phase IV and may be approximately contemporary.

The ZE Destruction of Phase IV
Layers 59 and 66-79

Pots from these layers include:

Pot 226 (ZE 76; fig. 13.8:2; pl. XXXVI:2). Piriform pithos with two lug handles. Burnished, black. Burnt. Height 38.0 cm.

Pot 227 (ZE 76; fig. 13.8:1; pl. XXXVI:2). Pithos with two handles. Burnished, black. Height 36.5 cm.

Pot 256 (ZE 76). Base of piriform urn. Burnished, black. Diameter 19.0 cm.

Pot 219 (ZE 79). High-handled scoop. Bur-

nished, black. Burnt. Diameter 7.0 cm.
Pot 199 (ZE 66). High-handled scoop. Burnished, black. Diameter 9.0 cm.

Small finds include:

Worked flints: SF 2745-2751, 2755, 2756, 2758, 2761-2764, 2768, 2771, 2772, 2775-2777, 2780-2784
Stone axes: SF 2752, 2754, 2769
Stone pounder: SF 2760
Other worked stone: SF 2753, 2767, 2773
Spindle whorls: SF 2757, 2770, 2779
Loom weight: SF 2778
Worked bone: SF 2759

SQUARES ML AND MM

Squares ML and MM are the principal area excavations within levels of phase III at Sitagroi. The finds are of great interest, although unfortunately no clear indications of house structures were found.

Square MM is a 9 x 9 m excavation area, following the site system. It should be noted that the slope of the tell is here downward to the west, so that the west side of the square was initially at a lower level (in terms both of height and stratigraphy) than the east side, which was consequently dug first.

Square ML was similarly organized but for the existence of a deep sounding (the ML sounding) as a 1 m wide trench along its south side. The excavation within the deep levels of this narrow trench is described in a later section. To distinguish the strata in the deep sounding from those in the area now being described within ML, the latter are all numbered within the "100" series, beginning with 101.

Squares ML and MM are divided by a 1-m balk. Since stratigraphic indications are not profuse, it is not possible to correlate the layers between the squares with great precision. However, approximate correlations are seen in the level diagram, figure 8.18, which indicates stratigraphic relationships in a schematic manner.

Within square MM, the layers in the northeast corner, which are higher than those elsewhere in the square, were first excavated. At the top of level 12 a large pit was observed, pit B, and the contents of this were naturally kept separate as it was cleared. They are assigned to phase IV of the site, and phase III in MM begins with layers 11 and 12. The remainder of MM and all of the main area of square ML (but not the ML sounding) are assigned to phase III.

The main sequence of observations in square MM is easily described. In the upper levels (layers 10-12) a few pots were recovered, and these appear to be from a late stage of the phase.

With layer 16, an irregular rubble consisting of lumps of burnt daub was found over the center and eastern half of the trench. Little was made of this at the time. No structural remains were found below it other than the hearth to the southwest of the square, soon to be described, which lay to the southwest of the main rubble concentration. These were superficial levels in most of the square, and indeed the absence of the rubble at the west may be due to erosion. This material is seen, looking to the west, in plate XXXVII:1. Although it was not so interpreted during excavation, the line of postholes visible in the plate may represent the west wall of a house whose axis ran somewhat to the west of north. Certainly the main concentration of finds in the levels below lay in the eastern part of the square. Clearance of this debris (represented by layers 18-20) revealed a baked clay area—the remains of a hearth—in the southwest. Further investigation indicated that this was enclosed within a square structure, of side 2 m, with clear indications of daub walls (pl. XXXVII:2). A sketch plan is given in figure 8.19. The structure appears to have been open on the east side. Why it should be thought necessary to enclose and possibly roof a hearth or oven in this way is not clear. But it does appear to imply that the hearth was not within a house. Possibly it was associated with the putative house which we have suggested to the east. The clearance of these levels brings us to layer 50, which we may perhaps equate with layer 115 in ML.

Excavation was continued in MM for some 70 cm below this point, yielding considerable quantities of finds but no good evidence for structures.

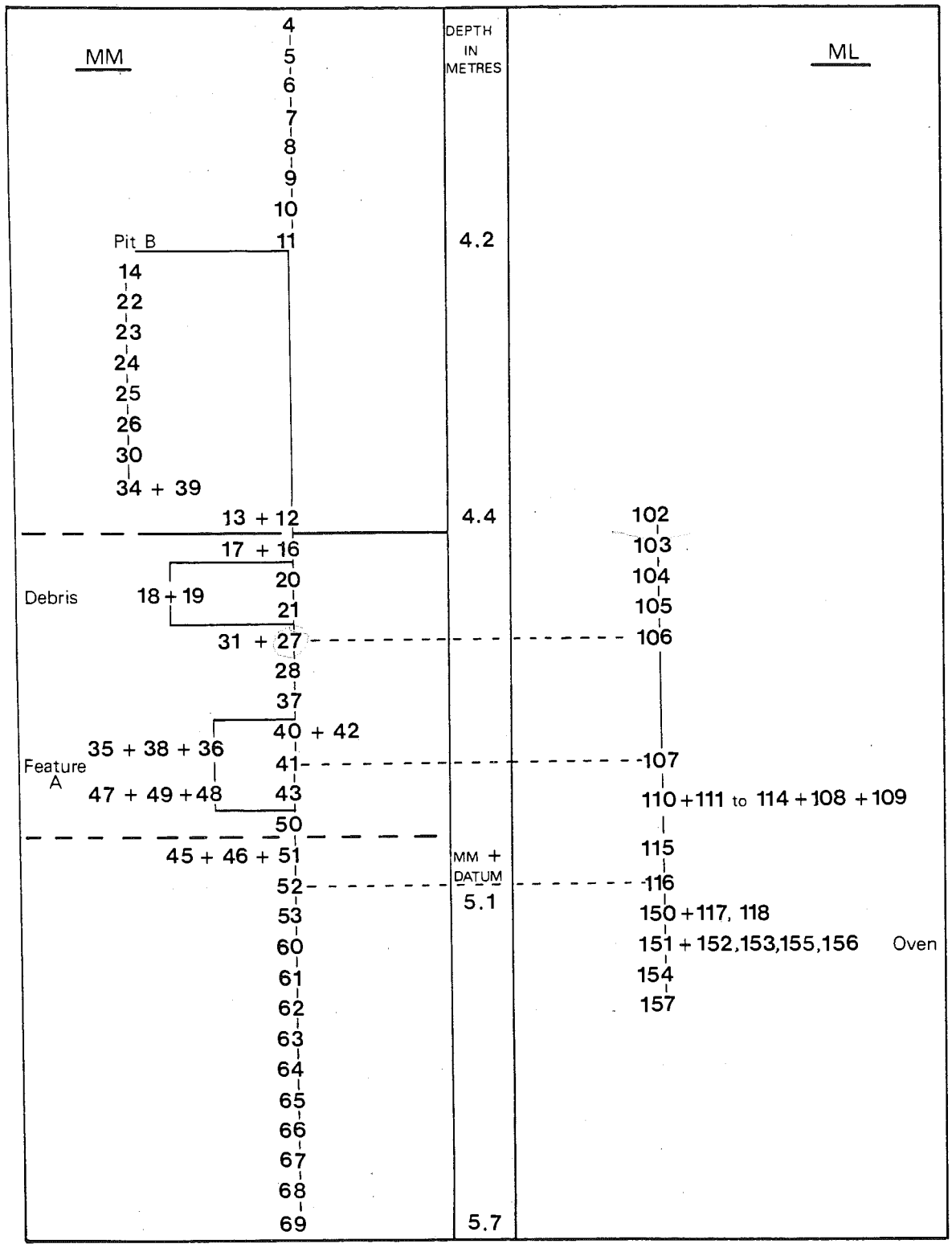


Figure 8.18. Diagrammatic stratum sequence for squares ML and MM.

In layer 151 a well-baked hearth surface was uncovered, and the opportunity was taken to section and examine it more closely. There is little doubt that it was the lower part of an oven of the kind depicted in the model SF 813 (fig. 8.20b; pl. XL:2) from MM 27 and seen in a later context in oven 2 of the Burnt House in square PO. The oven is 1.2 m wide and about the same in length. It is founded first on a layer of large stones up to 30 cm in length. On these is a layer of river pebbles and then alternating layers of baked clay and river pebbles to a depth of 25 cm, designed to facilitate heat retention. The oven base is seen during sectioning in plate XXXVIII.

Among the finds from this area, it is convenient to recognize three successive groups.

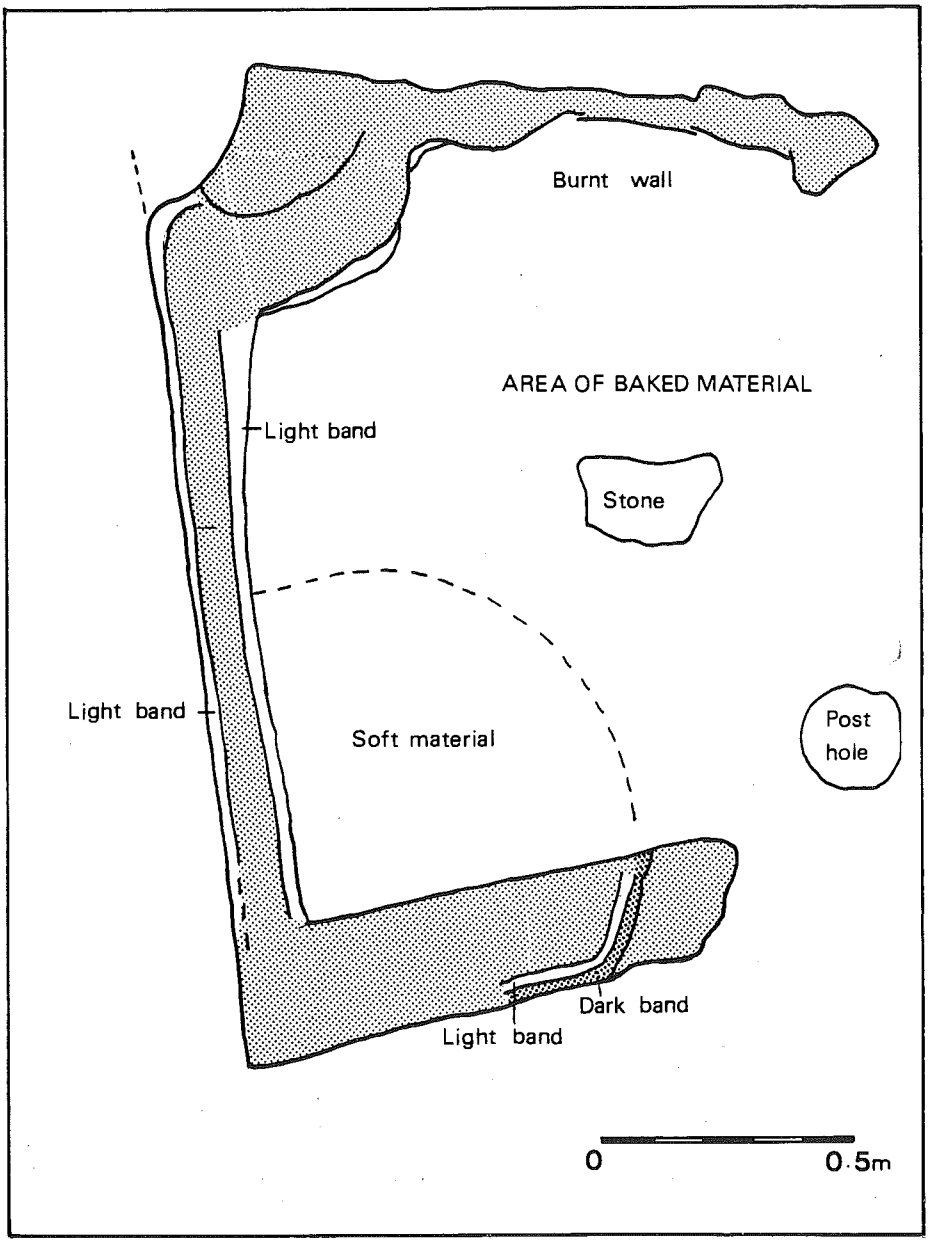


Figure 8.19. Sketch plan of rectangular structure surrounding a hearth area in square MM, layers 18, 19, and 20.

The Upper Levels (MM 10–13)

The small finds from the upper levels are few. The pots are listed here in view of their chronological interest.

Pot 303 (MM 10). Cylindrical pyxis. Coarse. Height 3.5 cm.

Pot 344 (MM 11). Straight-sided bowl with thickened (barley-sugar) rim. Smooth. Diameter 32.0 cm.

Pot 150 (MM 12). Deep cup. Coarse. Diameter 5.4 cm.

Pot 29 (MM 12; fig. 12.13:2). Conical jar with short open neck. Smooth. Diameter 23.5 cm.

Pot 27 (MM 12; fig. 12.13:5). Kritsana bowl. Smooth. Diameter 17.0 cm.

Pot 33 (MM 12; fig. 12.5:2; pl. XXXIX:3). Two-handled open-neck jar. Graphite-painted. Diameter 11.5 cm.

Pot 40 (MM 13). Deep bowl with slightly inturned rim. Smooth. Diameter 13.9 cm.

The Debris and Hearth Levels

These levels may be said to include those on the level diagram (fig. 8.18) which lie stratigraphically between layer 16 and layer 50 in square MM. These do not represent an absolute association but should certainly reflect a restricted time range. They may indeed be related to both the hearth and the building whose destruction was recognized in layer 16. It seems reasonable to include here the approximately contemporary material from square ML, layers 103–115, inclusive.

The material here is enormously profuse, and it is not proposed to describe it all in detail. Discussion and illustration of the various forms and materials will be found in other chapters. Attention is drawn in particular to the following classes: figurines, tripods, shell bracelets, evidence of metalworking, miscellaneous clay objects (including miniature furniture), spindle whorls and, of course, pottery.

A noted concentration of sherds with traces of solidified copper or copper slag adhering to them was found in layer 20 of square MM. Other occurrences were seen lower in the same square and in square ML. These are among the most important indications of metalworking on the site, and there can be little doubt that the metal was worked very close at hand or indeed in this very area. These indications are discussed in volume 2.

The figurines are discussed in chapter 9. Attention must be drawn, however, to the remarkable zoomorphic figure decorated with black paint on a red ground, nicknamed by us "the camel" (fig. 9.67; pls. LVI:3, B:1). Cataloged as SF 1207, it was found in ML 106.

Among the clay objects, the model oven, SF 813, from MM 27 (fig. 8.20b, pl. XL:2) is of special interest. The house model, SF 755, from MM 16 (fig. 8.20a; pl. XL:1; and base alone, pl. XCV:4) should also be noted. A stamp seal or pintadera (SF 861) was found in MM 41.

The following pots came from these levels:

Pot 308 (MM 16; fig. 12.6:2; pl. XLII:2). Tall stand base. Graphite-painted. Diameter 17.0 cm.

Pot 53 (MM 40; fig. 12.2:7). Deep, carinated bowl, ribbing on carination and dimple at base of handle. Graphite-painted. Diameter 18.0 cm.

Pot 82 (MM 27). Open bowl with sinuous carinated profile. Graphite-painted. Diameter 29.0 cm.

Pot 48 (MM 16; fig. 12.2:4; pl. XCII:bottom left). Kritsana bowl. Graphite-painted. Diameter 17.0 cm.

Pot 236 (MM 27; fig. 12.2:5; pl. XXXIX:1). Small-necked bowl with rounded carination and three decorative zones. Graphite-painted. Diameter 12.3 cm.

Pot 285 (MM 31). Graphite-painted. Diameter 11.0 cm.

Pot 313 (MM 21; fig. 12.10:5; pl. XLIII:4). Fragment of globular jar with constricted neck, row of punched decoration on upper body. Graphite-painted. Height 15.0 cm.

Pot 67 (MM 20; fig. 12.4; pl. XLI:3). Sinuous Dikili Tash bowl, originally on stand base. Graphite-painted. Diameter 35.4 cm.

Pot 58 (MM 43; pl. XCV:9). Deep, hole-mouth jar. Smooth. Height 5.1 cm.

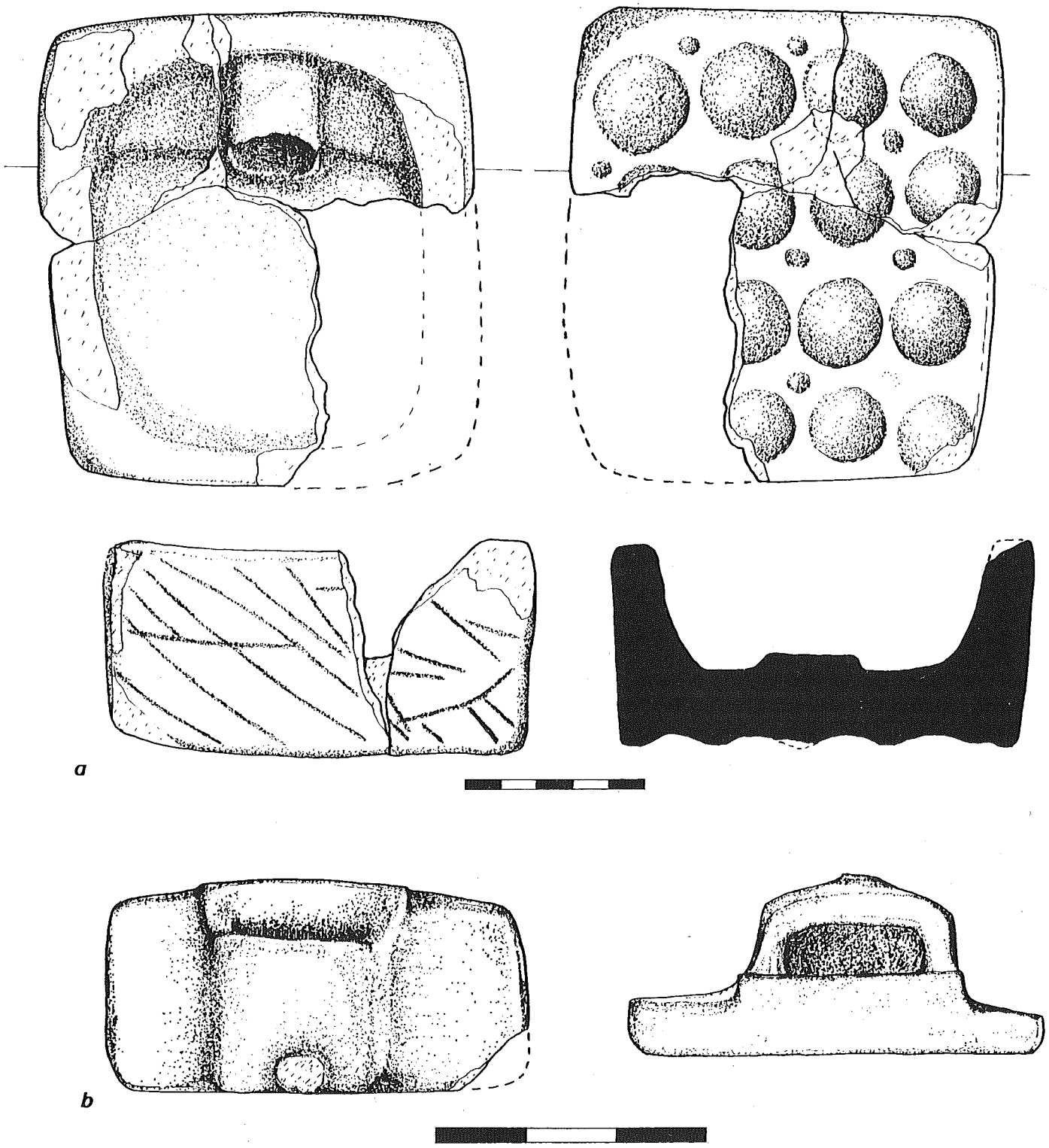


Figure 8.20. (a) House model, four views. *(b)* Oven model, two views.

Pot 61a (MM 43; pl. XCV:8). Biconical jar, upper part missing. Height 2.2 cm.
Pot 342 (MM 42). Incomplete.
Pot 205 (MM 20; pl. XCV:7). Pyxis. Height 1.8 cm.
Pot 217 (MM 18). Flaring open bowl. Coarse. Diameter 5.0 cm.
Pot 42 (MM 16). Straight-sided bowl. Coarse. Diameter 3.3 cm.
Pot 299 (MM 41). Base of miniature vessel with pinched handle. Incomplete.
Pot 230 (MM 19; fig. 12.12:2). Deep, carinated jar with handles. Graphite-painted? Height 10.3 cm.
Pot 283 (MM 16). Kritsana bowl. Coarse. Diameter 7.0 cm.
Pot 109 (MM 48; fig. 12.13:4; pl. XCV:1). Kritsana bowl. Smooth. Diameter 15.2 cm.
Pot 113/833 (MM 49; fig. 10.1:3; pl. XLIII:2). Four-legged vessel with incised decoration. Height 6.5 cm.
Pot 112 (MM 49; fig. 12.10:3; pl. XLII:3). Sinuous, quadrilobate Dikili Tash bowl. Black-on-Red. Height 13.6 cm.
Pot 309 (MM 16). Jar, part of neck and upper body. Black-on-Red.
Pot 312 (MM 21; pl. XLII:4). Handled pitcher. Black-on-Red.
Pot 237 (MM 21; pl. XLIII:3). Open, flaring bowl with thickened (barley-sugar) rim. Smooth. Diameter 38.0 cm.
Pot 71 (MM 50). Fragment of bowl, probably with stand base. Smooth.
Pot 72 (MM 50; fig. 12.12:5). Rounded bowl. Smooth. Diameter 10.0 cm.
Pot 30 (MM 18). Oval vessel with rounded profile and base. Coarse. Height 4.3 cm.
Pot 57 (MM 43; fig. 12.14:1). Straight-sided bowl with thickened rim. Smooth. Diameter 30.0 cm.
Pot 318 (MM 43). Flaring bowl. Smooth. Diameter 14.0 cm.
Pot 319 (MM 43). Flaring bowl. Smooth. Diameter 21.0 cm.
Pot 49 (ML 107; fig. 12.3:3). Open, flaring bowl. Graphite-painted. Diameter 19.0 cm.
Pot 133 (ML 109; fig. 12.3:2; pl. XXXIX:4). Open, flaring bowl. Graphite-painted. Diameter 27.0 cm.
Pot 66 (ML 111; pl. XLIII:1). Deep bowl with slightly constricted mouth and excised decoration. Diameter 5.8 cm.
Pot 56/146 (ML 107; fig. 12.10:2; pl. XLII:5). Square vessel with nearly straight sides and small feet at corners of base. Black-on-Red. Height 7.2 cm.
Pot 104 (ML 106; fig. 12.2:3). Kritsana bowl. Graphite-painted. Diameter 21.0 cm.
Pot 321 (ML 106). Straight-sided bowl. Smooth. Diameter 11.0 cm.

The Lower Levels

The lower levels are represented by layers 51-53 and 60-69 of square MM, and by layers 116-118 and 150-157 of square ML. They contained an extensive repertoire of finds. The cataloged pots are given below in view of their chronological importance.

Pot 340 (MM 52). Deep bowl. Diameter 2.8 cm.
Pot 88 (MM 52; pl. XCV:5). One-handled miniature jug with incised decoration. Height 3.7 cm.
Pot 142 (ML 116; fig. 12.2:2). Kritsana bowl. Graphite-painted. Diameter 19.6 cm.
Pot 110 (ML 116; fig. 12.13:3). Flaring bowl. Smooth. Diameter 12.0 cm.
Pot 352 (ML 116). Corner of straight-sided rectangular or square vessel. Smooth. Height 4.3 cm.
Pot 202 (ML 151). Straight-sided bowl. Coarse. Diameter 3.8 cm.
Pot 182 (ML 151; fig. 11.16:10; pl. XCV:3). Straight-sided rectangular bowl. Coarse. Height 5.3 cm.
Pot 212 (MM 60). Flaring bowl. Smooth. Diameter 10.0 cm.
Pot 350 (MM 63). Rounded bowl. Graphite-painted. Diameter 16.0 cm.
Pot 349 (MM 64). Flaring bowl. Diameter 20.0 cm.
Pot 254 (MM 64; fig. 12.7:2; pl. XLI:1). Hemispherical lid with apex handle. Graphite-painted. Diameter 27.5 cm.

Pot 306 (MM 65; fig. 12.5:1; pl. XLI:2). Two-handled jar. Graphite-painted. Height 13.0 cm.
Pot 290 (MM 68; fig. 12.6:1; pl. XXXIX:2). Globular urn, probably with two handles and possibly with stand base. Graphite-painted. Height 28.0 cm.
Pot 348 (MM 68). Kritsana bowl. Diameter 22.0 cm.
Pot 115 (MM 51; pl. XCV:6). Miniature vase on pedestal base. Coarse. Diameter 2.4 cm.
Pot 98 (MM 52). Bowl. Coarse. Incomplete.
Pot 77 (MM 51). Sinuous, deep, Dikili Tash bowl, probably with quadrilobate rim. Height 8.8 cm.
Pot 192 (MM 64). Base. Dark Burnished. Incomplete.
Pot 191 (MM 60; fig. 12.10:7). Sherd. Polychrome red/black-on-orange. Length 15.5 cm.
Pot 216 (MM 60; pl. XCIII: bottom left). Rounded bowl with projecting handle. Dark Burnished. Diameter 5.3 cm.
Pot 204 (MM 65). Small Kritsana bowl. Smooth. Diameter 6.5 cm.
Pot 292 (MM; fig. 12.6:3; pl. XLII:1). May belong with this assemblage or with that of the hearth levels above.

CHRONOLOGY. Radiocarbon dates are available for three samples, all of which fall within the lower levels of the squares as defined above. These are 3595 ± 100 bc for MMb 69 (Bln 883: einkorn); 3845 ± 100 bc for MM 52 (Bln 882: charcoal); and 3417 ± 85 bc for ML 118 (BM 650c: charcoal). One would have expected the last two to be approximately contemporary, but once again the Berlin date is earlier than that from the British Museum. In absolute depth, MM 52 and ML 118 are about 5.1 m below site datum. These levels are thus within approximately 40 cm in absolute height of floor 15 (layer 41) of the ZA sounding.

FURTHER AREAS AND SOUNDINGS

The remaining trenches on the site, although they yielded some important finds, did not offer associations of structures on any large scale with finds, nor important and considerable closed assemblages of finds from any one time period. For that reason they will be dealt with rather summarily here.

The squares KL and KM are again 9 x 9 m excavation areas, opened within levels of phase II.

In addition, 1-m trenches were opened at the south side of JL, KL, and ML. These have a separate numbering system, and care must be taken to avoid confusion between the KL and ML trenches (soundings) and the KL and ML squares.

One interesting feature of the lower levels of the tell, approximating to deposits of phase I and the lower levels of phase II, was the damp condition of the soil, which makes it much more clayey and sticky in texture and much more liable to show up interesting differences in color. In several trenches indications of wood were found, not in the form of charcoal, but as pale, uncarbonized fibers, lacking their original form but unmistakably organic. At first these were suspected to be decayed roots of more recent date, but the excavation of the sleeper beam in levels of phase II in KL, described below, confirmed their prehistoric origin.

In all of these small soundings, traces of floor in the form of clay patches and of structures, generally as postholes, were seen. Only when the clay was burnt, however, did it become hard and easy to follow. It was, therefore, the hearths and, in sounding ZJ, an oven which particularly attracted attention and were most adequately recorded. Fuller details of these features can be found in the site notebooks, deposited at the British School of Archaeology at Athens, which should be read in association with the stratigraphic sections for each square also on file there.

Finally, it should be observed that it was in these lower areas of the site that deposits of phases I and II were investigated. It is inevitable on such a site that large areas of the upper levels are excavated prior to comparable areas in the lower strata; the area excavation in squares KL and KM was the only one attemped in these lower levels. The great importance of these sound-

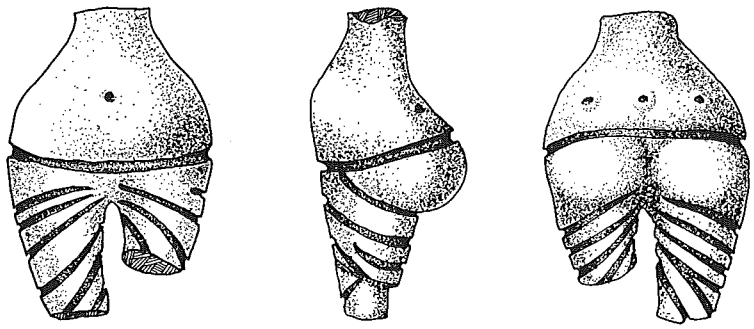


Figure 9.10 (144). Semi-nude lower body of female figurine.

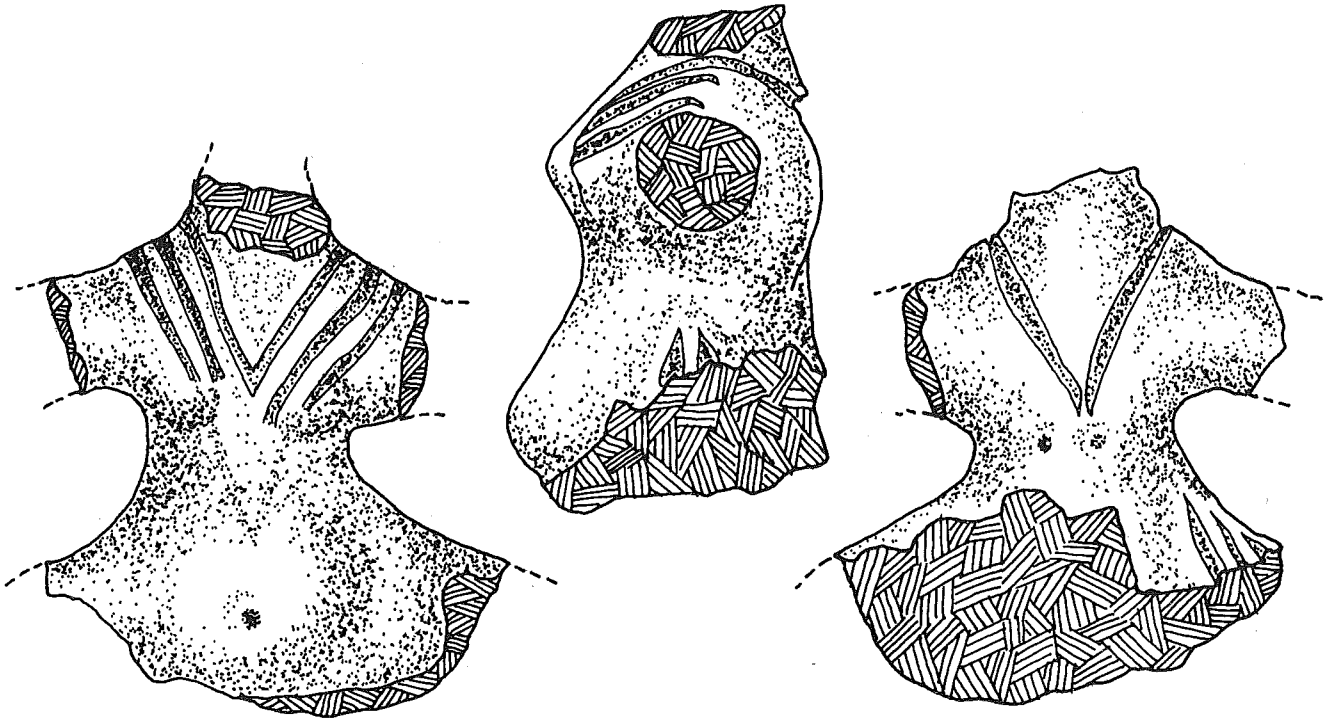


Figure 9.11 (159). Torso of female figurine with chevron in front, V at back of neck.

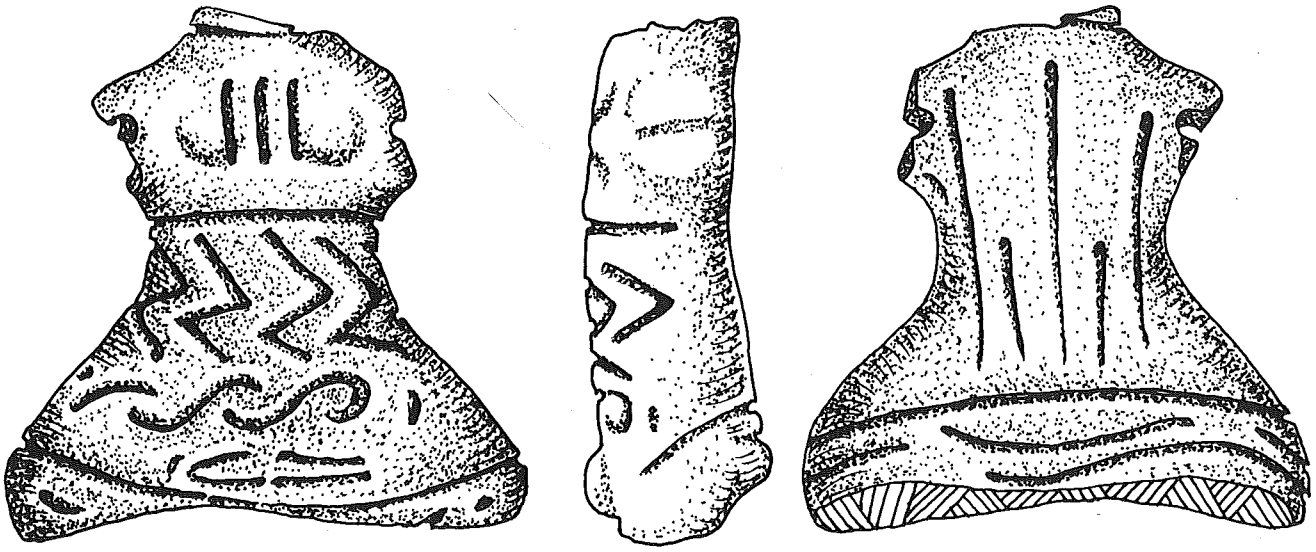


Figure 9.12 (39). Torso of female figurine in a squatting position.

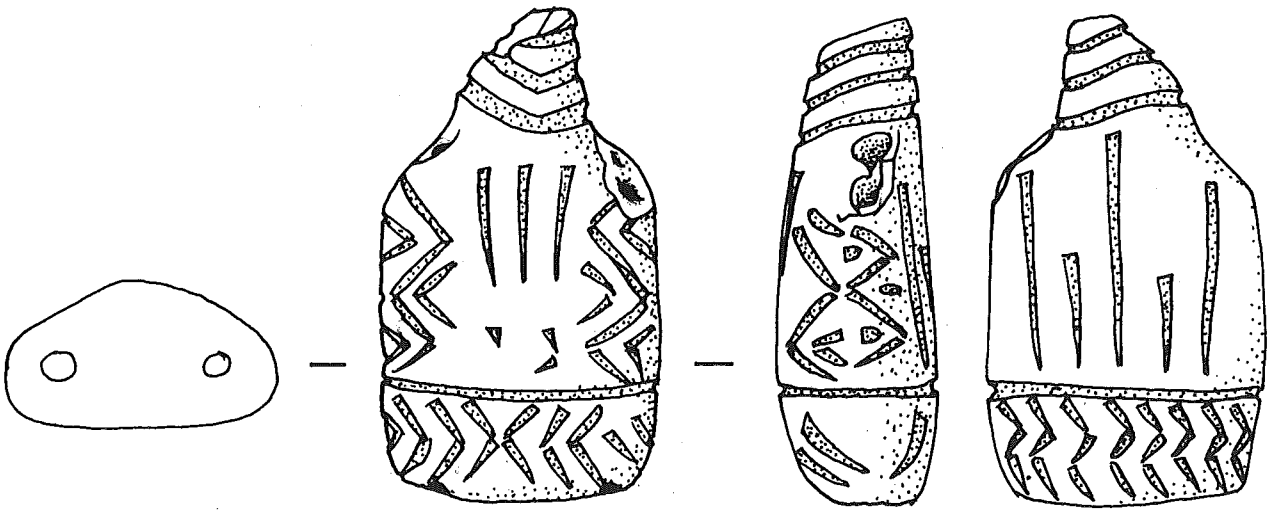


Figure 9.13 (23). Body of schematic female figurine, flat-based.

the construction method—legs were usually modeled separately and then joined—such is not the case. Legs are also visible when a skirt covers them (as in fig. 9.17; pl. XLVIII:4), where the garment clings tightly around them. The long skirt has a hem or border indicated by two horizontal lines just above the ankles. Long, very tight skirts, possibly slit below the knees and fastened with woven bands or ribbons, are depicted on sculptures of the late Vinča period (fig. 9.19). The Vinča feminine costume and that of Sitagroi are reminiscent of the tight-fitting Japanese costume and give an impression of constrained movement.

The incised or painted line below the waist on a number of figurines may portray a hip belt, supporting an apron decorated with tassels on the sides and the back, or perhaps holding a fringed skirt. The fragment of a black-on-red painted seated figurine shows an angularly cut apron and a group of fringes (fig. 9.20; pl. XLIX:1). The incised decoration around the back and sides of a fat lady indicates skirt fringes with tassels (fig. 9.21). Aprons and skirt fringes are also known in late Vinča fashions.

Footwear cannot be commented on as feet are not detailed. Gumelnitsa and Cucuteni sites, however, yielded shoe designs which can be assumed as indirect evidence for their use at Sitagroi. The feet of large goddesses preserved at the site of Vidra, near Bucharest, are decorated with incisions indicating the wearing of soft leather shoes (Bucharest City Museum; see Rosetti 1938:pl. 23).

Figurines of human males are rare, and those that might represent men are either undecorated or decorated so vaguely as to preclude reconstruction of male attire. Figurines decorated with diagonal incised bands or painted stripes may be mentioned here as possibly male (figs. 9.89, 9.94; pl. LX:1). The diagonal bands either are symbolic lines or represent leather belts.

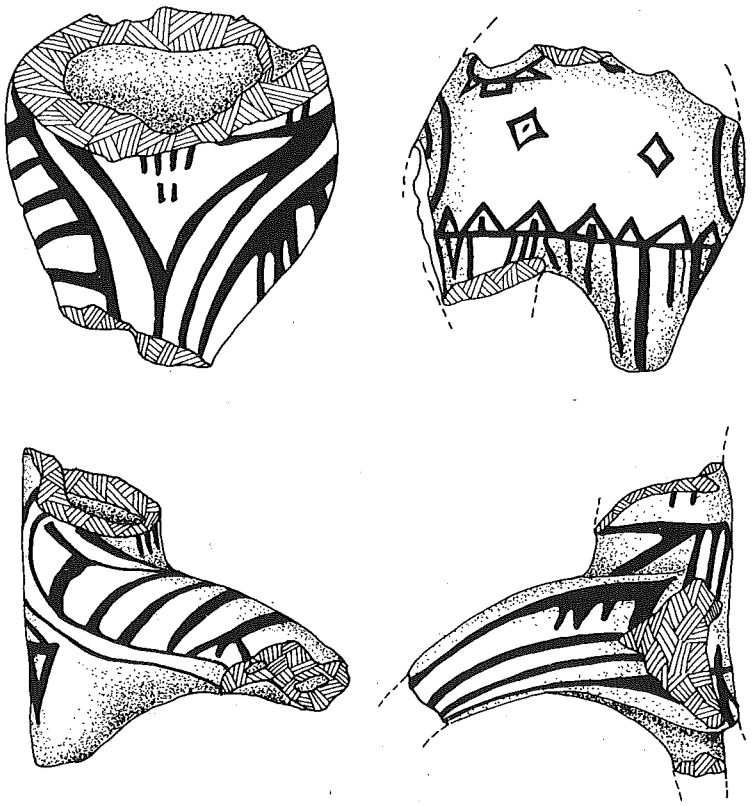
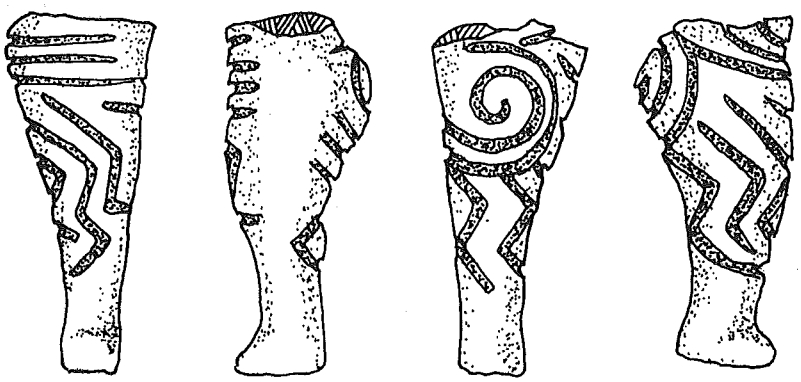
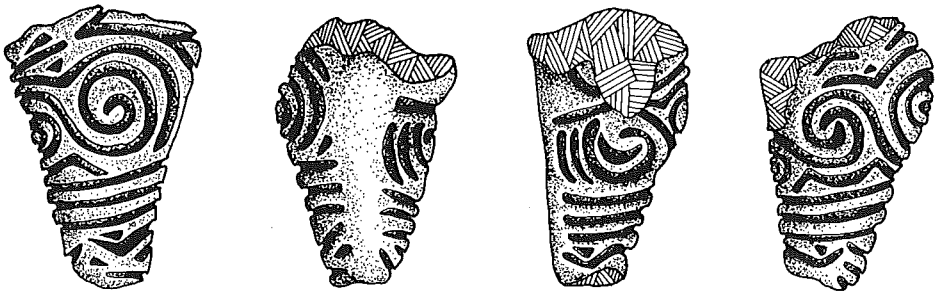


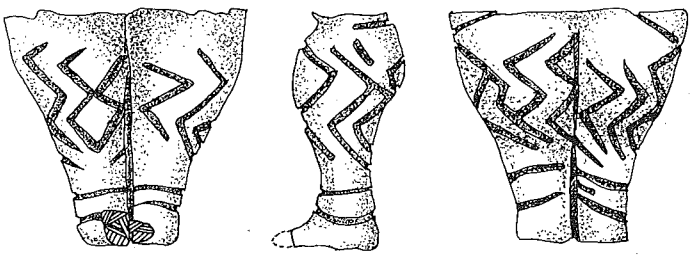
Figure 9.14 (169). Lower half of seated figurine. Scale 1:2.



9.15 (57)



9.16 (106)



9.17 (60)

Figures 9.15-9.17. Figurine legs and buttocks, incised with symbols.

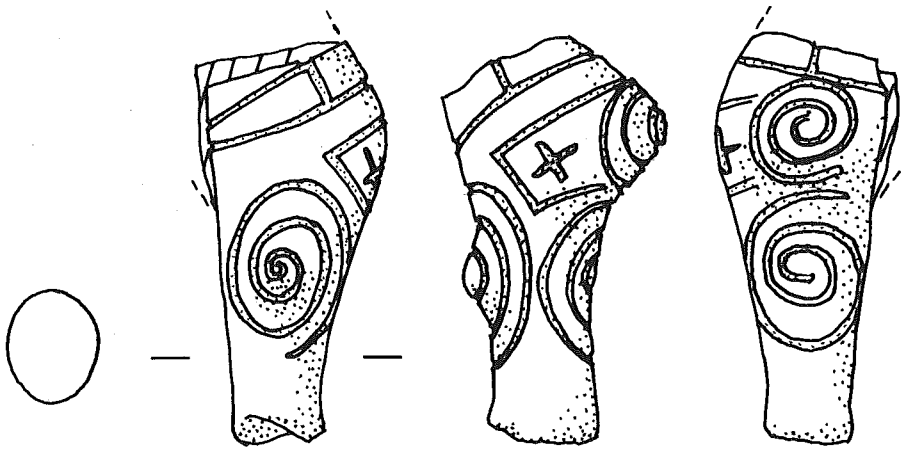


Figure 9.18 (59). Figurine leg and buttocks.

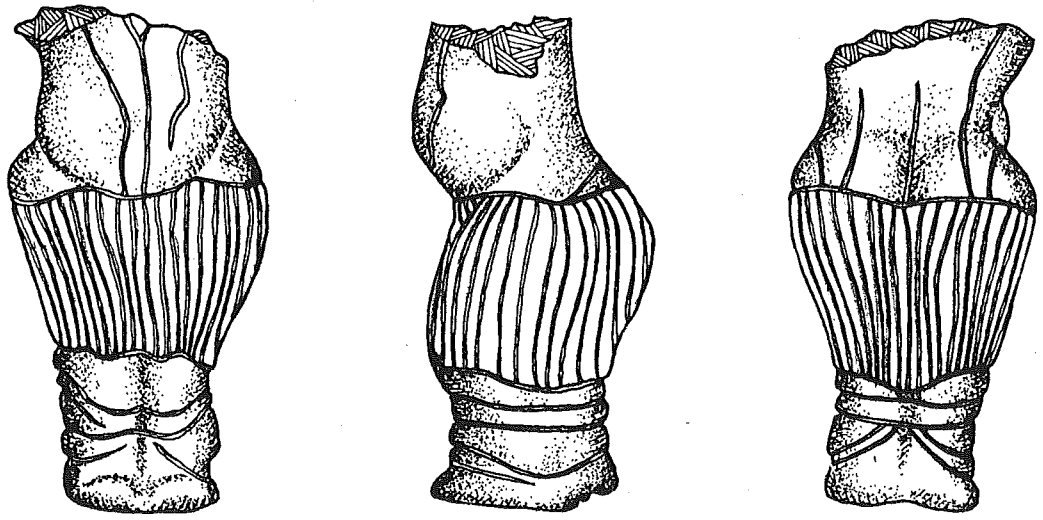


Figure 9.19. Female figurine wearing a tight skirt (three views) from a late Vinča site of Crnokalačka Bara at Rujiste, south of Niš, Yugoslavia. Belgrade National Museum. Height 13 cm.

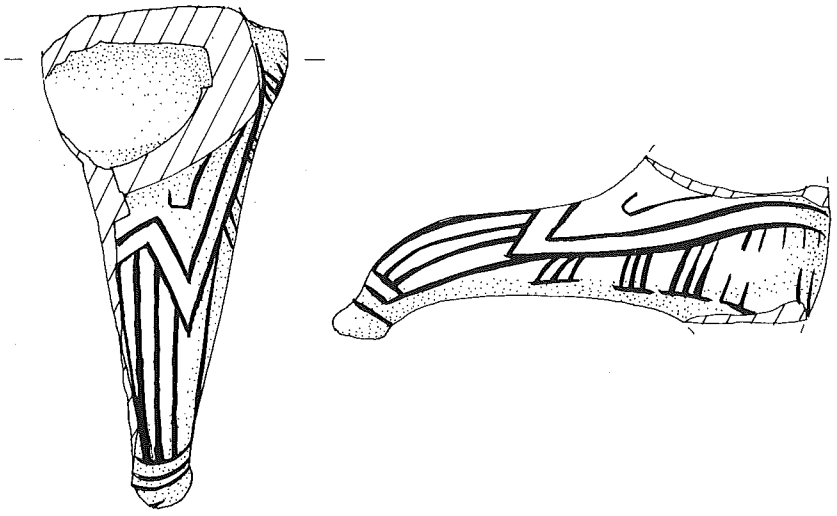


Figure 9.20 (166). Leg of seated figurine. Scale 1:2.

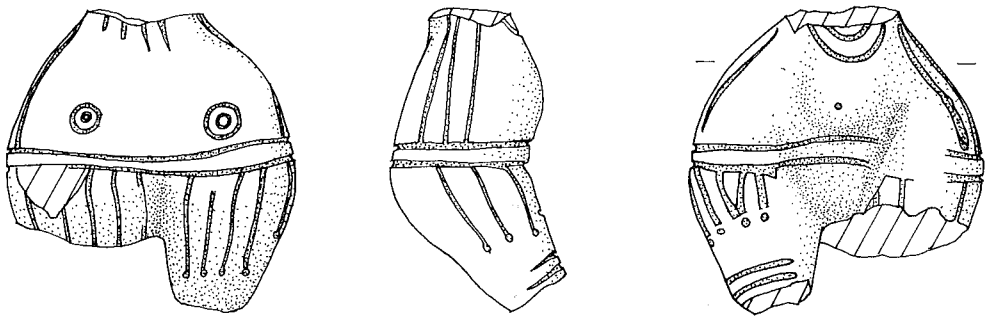


Figure 9.21 (154). Lower half of female seated figurine. Note incised hip belt and tassels. Scale 1:2.

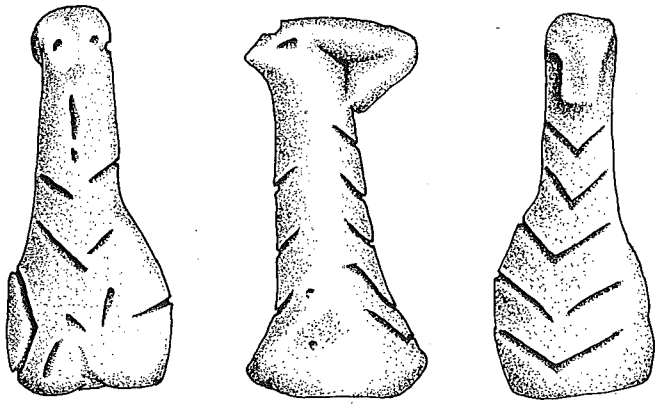


Figure 9.22 (84). Seated bird-headed figurine with coif.

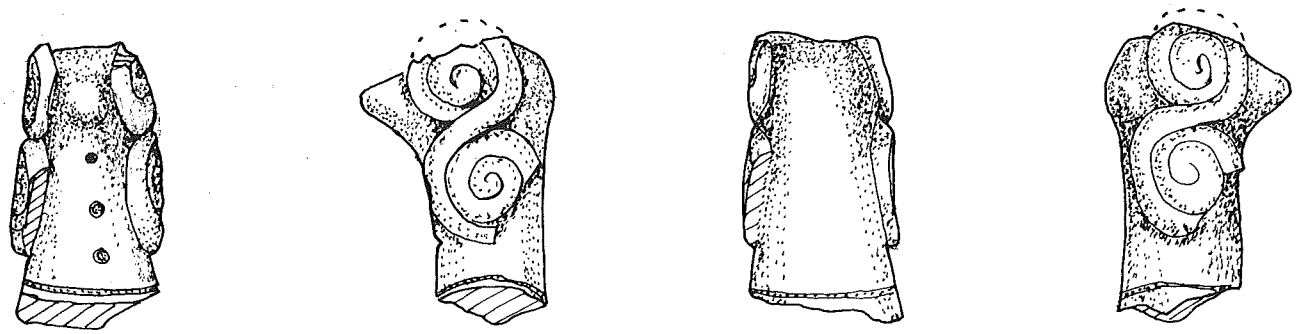


Figure 9.23 (131). Head of Bird Goddess with coif and pointed nose. Note three holes on the neck.

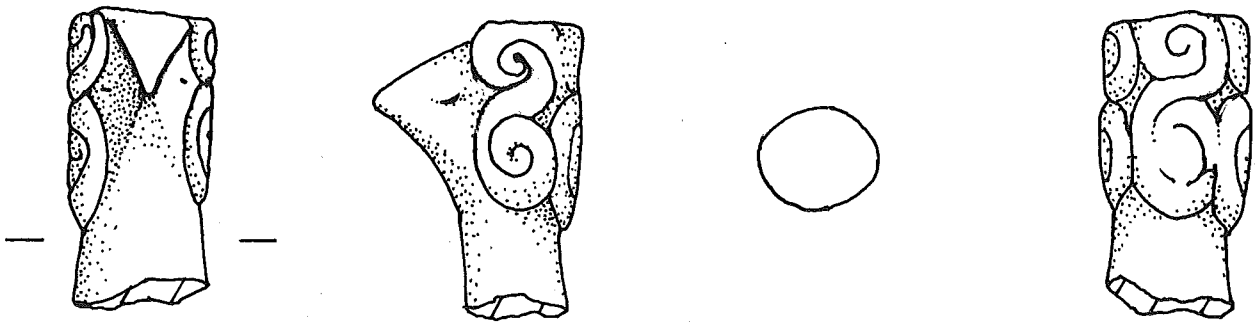
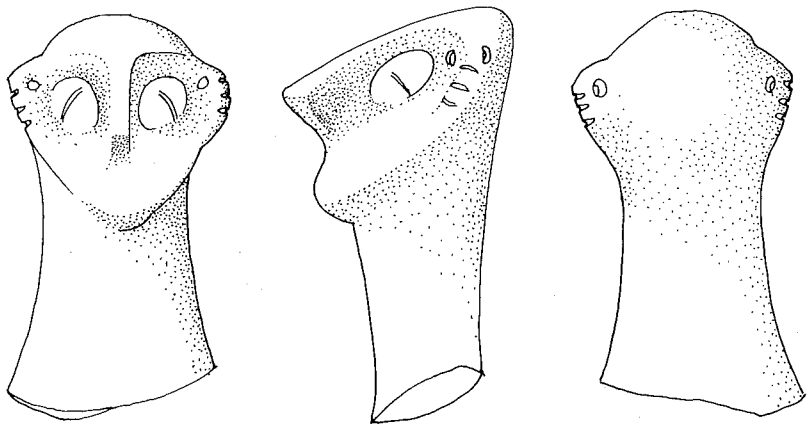


Figure 9.24 (130). Head of Bird Goddess with coif.

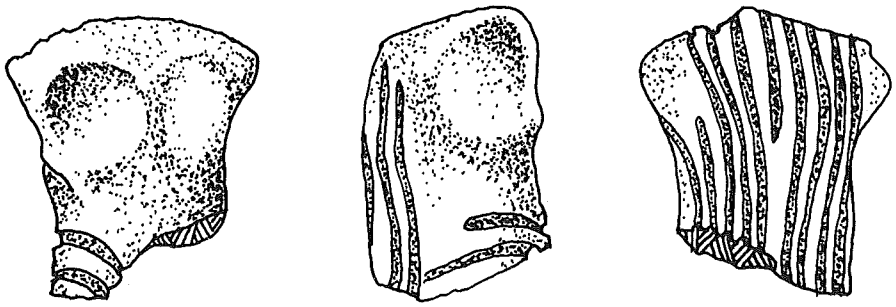
Perforations at the sides of heads (fig. 9.134; pl. LXI:3) are frequent, but no figurine with earrings has been discovered at Sitagroi. Numerous parallels from Karanovo VI (Gumelnitsa) sites in Bulgaria and Romania leave no doubt that two or three perforations at the sides of the head were intended for earrings, because at those sites numerous figurines with copper earrings attached to the perforations were found.

The schematic truncated figurines of phase III feature elaborate hairstyling. A small figurine with a pointed face sports a ponytail (fig. 9.22; pl. XLIX:3). Several tiny, broken-off heads have hanging spiral curls (figs. 9.23, 9.24; pl. L:1, 2). These few examples reveal at least two styles of coiffure, but only those with beaked or otherwise nonhuman faces have elaborate hairstyles.

The symbols of dress preserved on clay figurines suggest a sophisticated society in phases II and III of the Sitagroi tell. Style and ornamentation of the female garment are particularly rich during the latter half of phase III. The tight skirt with fringes and the apron held securely on the hips most probably do not represent everyday dress, but a more formal garment appropriate to festivities and ritual ceremonies. The richly clad female figurines apparently do not depict ordinary women, but devotees as personifications of certain aspects of the divinity, clad in the mask and festive costume of the goddess. Such custom persisted in Greece in the Dionysiac festivals, and in Attic tragedy of the sixth and fifth centuries BC.

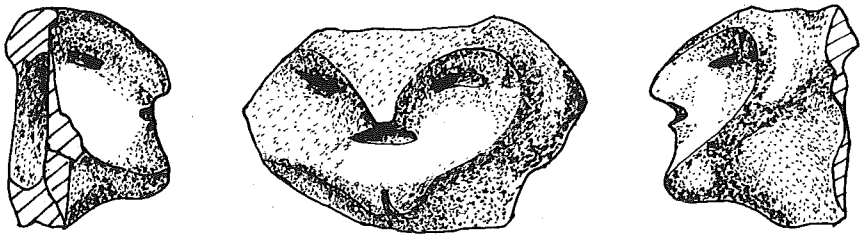


9.25 (42)



9.26 (135)

9.27 (168)



9.28 (171)

Figures 9.25-9.28. Masked human heads.

THE MASK

Almost all figurine heads conform to a stylized representation. Most are beaked, that is, bird-shaped, and have no mouth or forehead. Others, more humanlike, have protruding cheekbones denoting a mask or are marked with symbols. The presence of a mask is a striking characteristic of the Sitagroi figurines.

Details cannot be seen on many of the figurines because of their miniature size, and the contour of a mask is not easily seen. Larger figurines are more informative: a figurine from phase II (fig. 9.25; pls. L:3, A:1) has a triangular face with a perforation for earrings at each upper corner. In profile the contour of a mask is visible, and *en face* the top of the head protrudes from behind the mask. Other schematic figurines show hair on the back of the head emerging abruptly as if the front hair were partly covered (fig. 9.26).

One of the most remarkable masked heads in the Sitagroi repertoire is naturalistically rendered, red-slipped, and with a design painted in black (fig. 9.27; pl. LI:1). The painted mask does not reflect a Mediterranean type but is massive and thick-lipped with protruding cheekbones. The design—three and two lines and an oval or egg across the cheeks, two lines down the chin, and multiple parallel lines over the forehead—is symbolic, with good parallels in the Vinča culture. Triangles around the eyes (preserved only at the end of the left eye) seem to be purely decorative. This head belonged to a seated female figurine, the lower part of which may well be the piece illustrated in figure 9.38. Complete reconstruction of this remarkable sculpture is not possible because the portions between the head and belly are missing.

A head with large globular eyes and a pensive expression, named by excavators the "Old Wise Man," was a surface find at Sitagroi; it apparently belongs to phase II (fig. 9.29; pl. LI:3). Close parallels from the tell of Dikili Tash near Philippoi show that such heads formed the ends of ladle handles, which explains the function of the "Old Wise Man." However, there is no real indication that the head depicts a male. The face is flat and the back of the head rounded. The flatness of the front implies that here, too, a mask is represented. I surmise that there were once many such ladles with owlish masks cut from wood. The few of clay that have survived were apparently connected with a ritual sacrifice or meal. A flat, broad mask is also seen on a pottery fragment (fig. 9.28; pl. LI:2).

The representation of masks in the figurine art of southeastern Europe was a common phenomenon, richly evidenced from the early phases of the neolithic to the end of the copper age. Masks

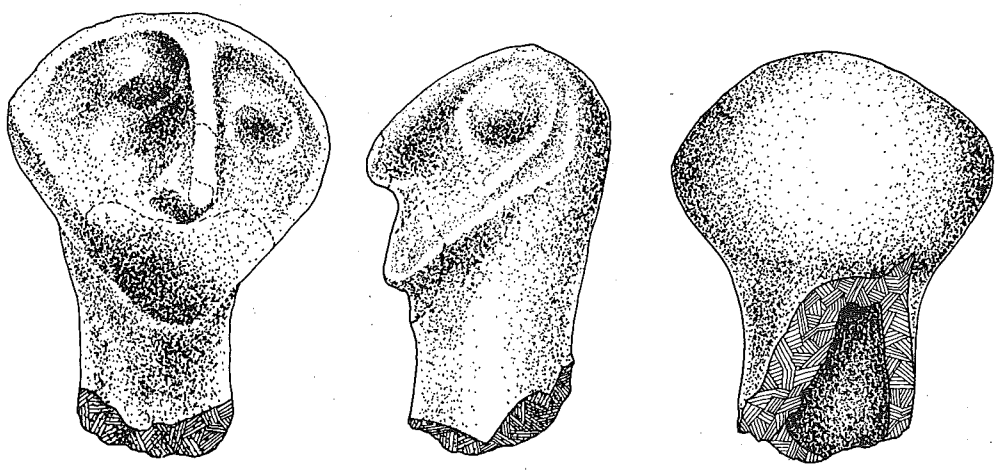


Figure 9.29 (203). Large masked head, probably handle of ladle. Scale 1:2.

on cylindrical heads of figurines and on the necks of pots are known in the Sesklo and Starčevo cultures of 6500-5300 BC. Vinča art of the end of the sixth and into the fifth millennium BC is entirely "under the sign of masks." The mask developed from a roughly triangular, undecorated shape in the early phase, to a pentagonal shape in the middle Vinča period, and in the late period to decorated masks having almond-shaped eyes. The development of the mask in the Karanovo civilization parallels that of Vinča but has its own progression. Phase II triangular masks at Sitagroi are similar to those of early Vinča. The Vinča sculptor was preoccupied with the head and mask, and many of his creations are true masterpieces; the Karanovo sculptor was less meticulous but became more artistic toward the end of the era to which the Sitagroi black-on-red painted ceramic masterpieces are assigned. Sitagroi figurines wearing bird masks are miniature and schematic.

As previously argued, Sitagroi art, like much prehistoric art, was directed toward the plastic realization of a concept. The purpose of the mask produced in this art must have been the same as that of the masks worn from antiquity to the present in festivals of the year-cycle. Undoubtedly the neolithic-chalcolithic masks represented certain personalities of myths and ritual, some human, some in bird or animal form. They should be recognized as vestiges of cult drama.

LIFE-PERPETUATING SYMBOLS

Symbolic signs are a dominant feature of Sitagroi and all east Balkan chalcolithic (Karanovo IV-VI) figurines. The same signs appear consistently through time: groups of parallel lines, two or three horizontal, vertical, or diagonal lines; multiple V's, interconnected V's (zigzags); M's; half-spirals, spirals, double spirals; snake coils; circles, semicircles, concentric circles, each apparently with its own significance. Many appear on a phase II cylinder (or leg fragment of cult vessel) incised on all sides (fig. 9.30). These signs appear most often on schematic figurines of phases II and III. Parallel lines, V's, double V's, interconnected V's, and M's are inscribed on round stamps, cylinder seals, and spindle whorls as well.

The cross, X, or whirl is a breast-associated symbol often incised on figurines above the breasts (fig. 9.31). Crosses substitute for breasts on schematic flat-based figurines of phase II (figs. 9.32, 9.33), sometimes replaced by V or inverted V signs over the breasts (figs. 9.34, 9.35; pl. LI:4). The V and the cross alternate on schematic figurines dating from phases II and III. Crosses, V's, and snake spirals are associated on a seated female figurine (fig. 9.36; pl. LII:2); the back is marked with parallel lines, the sides with zigzags.

The use of crosses and V's as described above unmistakably marked on the icon the desirable attribute of the deity responsible for milk, rain, or nourishment in general, interrelated in ancient mythologies. The long tradition of the symbolic signs is evidenced by crosses painted on or over the breasts of clay figurines found at Shrine VI of Çatal Hüyük in central Anatolia, dated to the seventh millennium BC (Mellaart 1962). The symbolic importance of breasts begins much earlier than the neolithic. Emphasis on the breasts of the Goddess can be traced throughout the upper paleolithic. Frequently the Goddess was represented by the breasts alone, marked with parallel lines, crosses, or X's (Gimbutas 1982).

Three or four (very exceptionally one or two) vertical lines usually appear between the breasts and are associated on the same figurines with V's, crosses, chevrons, zigzags, and parallel vertical lines on the back (figs. 9.3-6, 9.12, 9.13; pls. XLV:3, XLVII:3, XLVIII:1), and occasionally, with concentric circles and snake coils (fig. 9.86; pl. LIX:2). Schematic figurines often have three horizontal lines around the neck (figs. 9.3-5, 9.13, 9.87, 9.94; pls. XLV:3, XLVIII:1, LX:1) and two or three lines across the shoulders (figs. 9.3-6, 9.33, 9.35, 9.47; pls. XLV:3, LI:4). The association of the three or four lines with the breasts suggests that the number three (and four) may mean "abundance." In myths, the number three usually means "totality" or "plurality."

If the breasts are the source of nurture, the

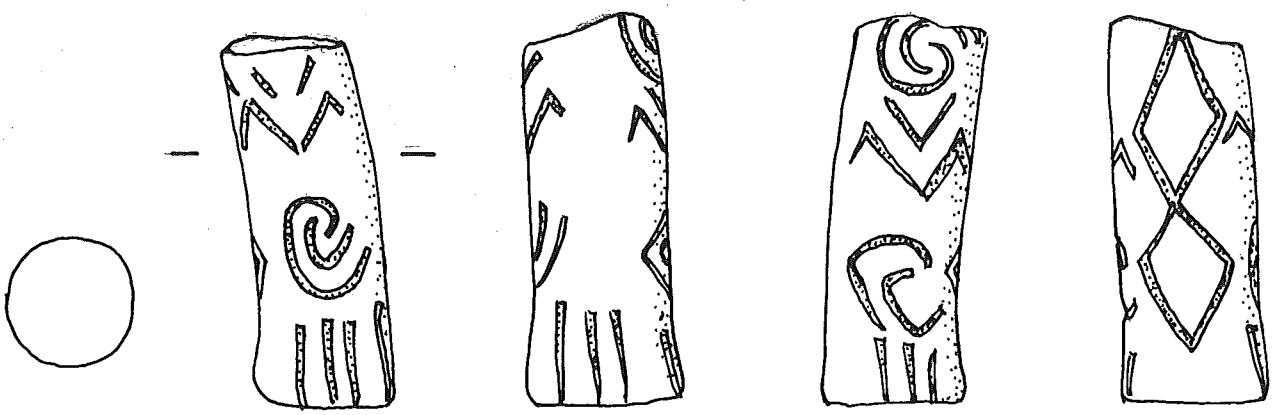


Figure 9.30 (51). Possible cult vessel leg, Scale 1:2.

belly represents the source of new life. A concentric circle, snake coil, double spiral, or lozenge appears frequently on both schematic and naturalistic seated, pregnant figurines. Breasts are ignored in a series of figurines which are nearly all belly, incised with a large spiral or double spiral, as illustrated by the "double-spiral fat lady" (fig. 9.37; pl. LII:1). Despite her pitiable condition—headless, armless, reduced, and the legs broken off—there is a V at the throat, and the ornamentation on the back shows a richly decorated skirt and two "buttons" in the waist area. The large spiral obviously stimulates incipient life within. Another figurine painted black-on-red shows one or two snakes lengthwise over the abdominal area (fig. 9.38). Another has incised concentric circles above the slightly protruding belly on which a frog or toad crawls diagonally (fig. 9.86, pl. LIX:2). The creature cannot be reconstructed entirely as only half of it has been preserved. The frog or toad is a symbol or an incarnation (epiphany) of the life-generating goddess, omnipresent in mythical imagery in central and southeastern European and Anatolian neolithic and chalcolithic ages—and even beyond, up to modern times. The same figurine bears coiling snakes engraved on the front and back of the neck, perhaps indicating that the neck and mouth are also important life-producing areas. A painted relief from Shrine VII of Çatal Hüyük portrays the Goddess with concentric circles in the navel area and a series of lozenges above it (Mellaart 1963, 1967).

The concentric circles, snake, and double

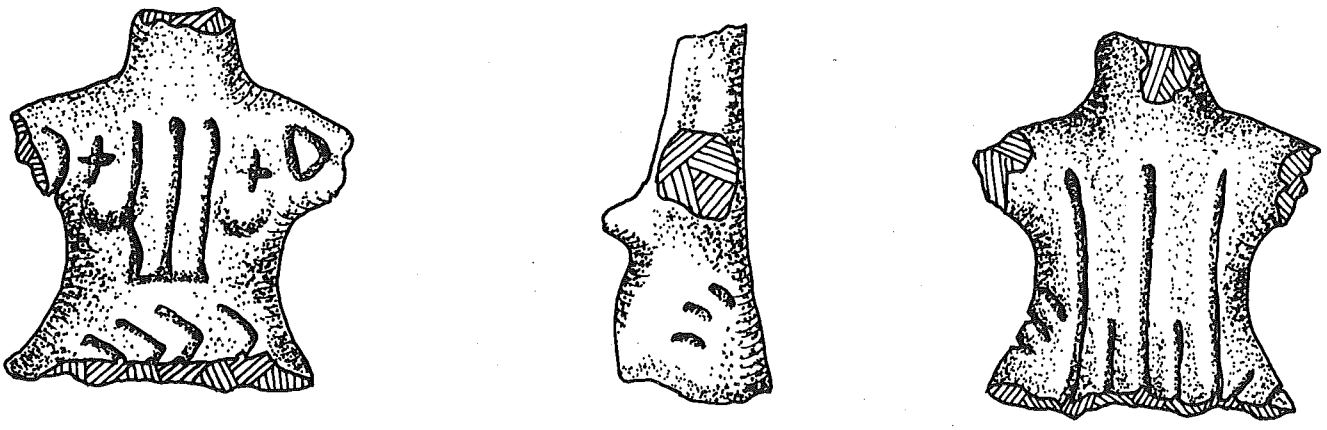
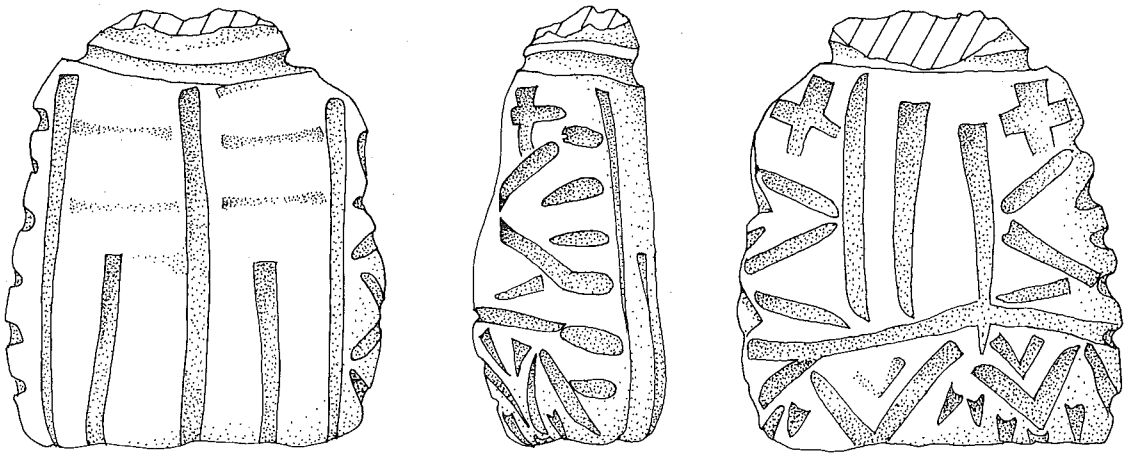
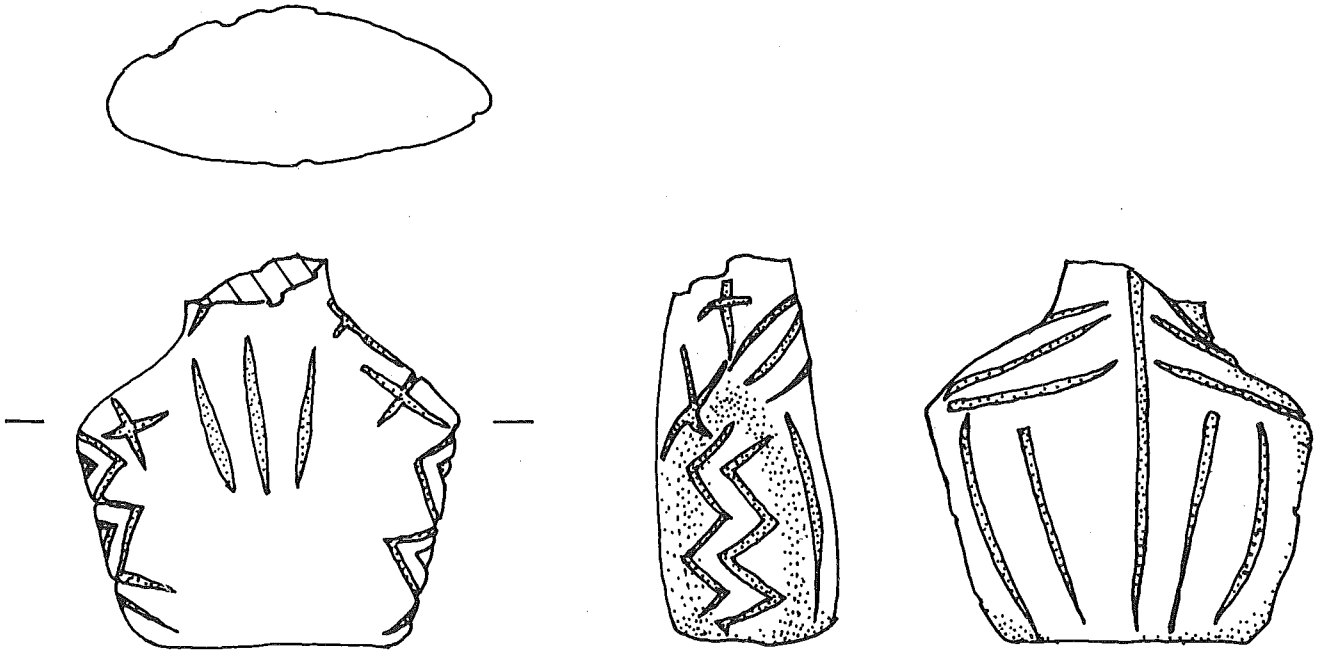


Figure 9.31 (103). Torso of stylized female figurine. Note tri-lines and X's above breasts.



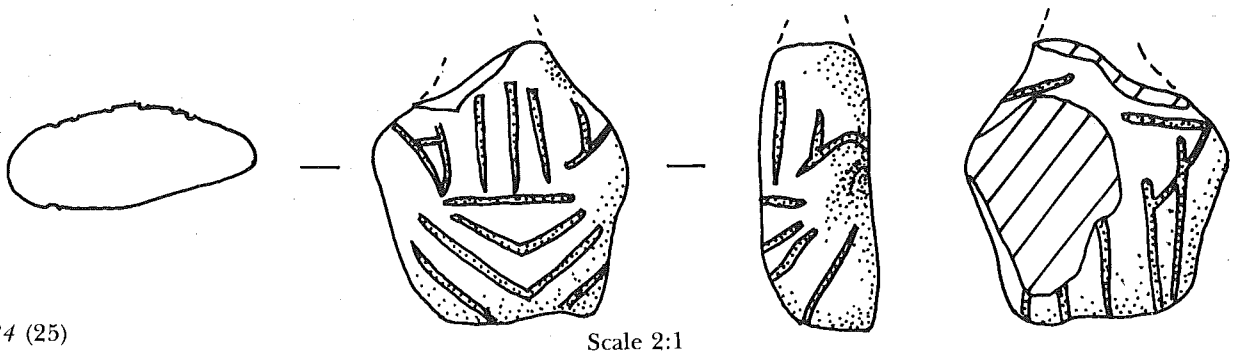
9.32 (22)



Scale 2 : 1

9.33 (20)

Figures 9.32-9.33. Bodies of schematic female figurines incised with symbolic signs.



9.34 (25)

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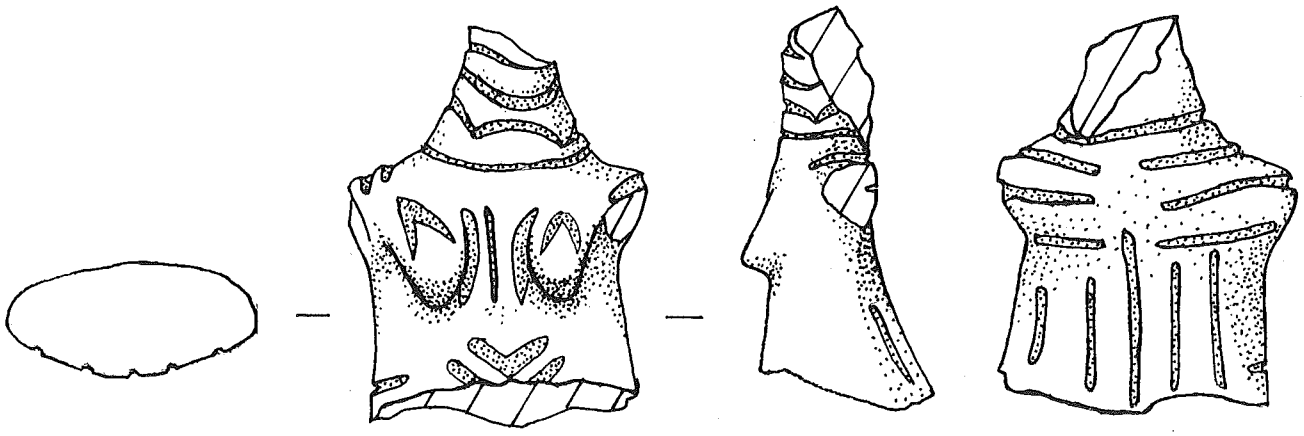

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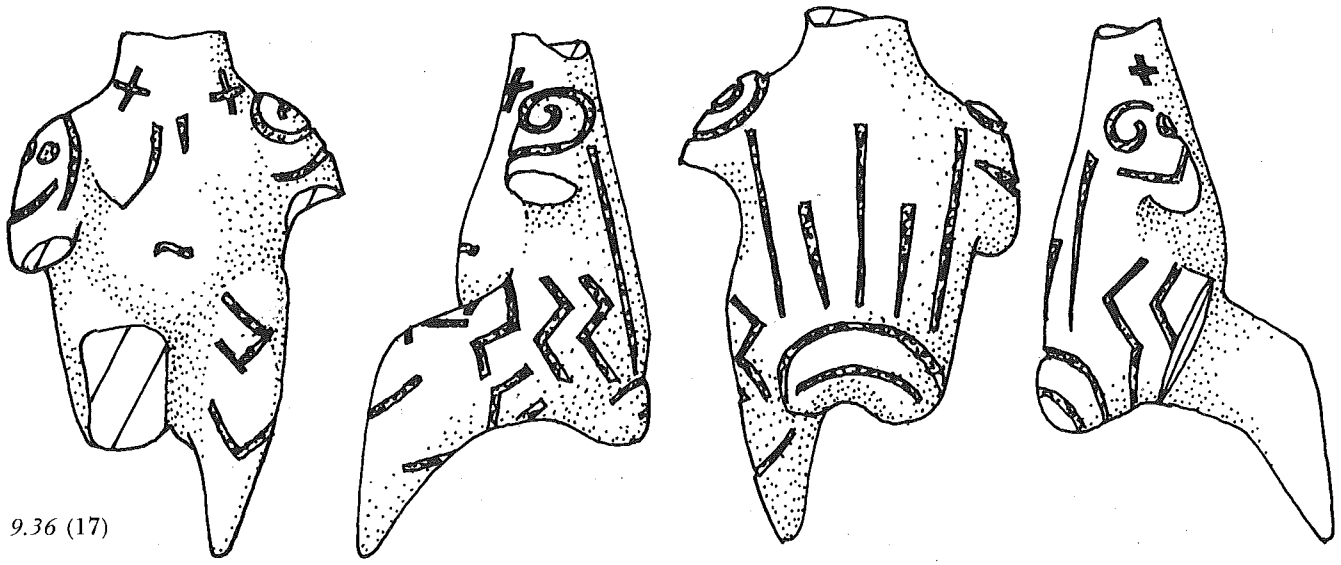
9.35 (101)



9.36 (17)

Figures 9.34-9.36. Schematic female figurines incised with symbols: V's or X's above or instead of breasts, and tri-lines between. *9.36*: Figure seated (on a throne).

snake are associated not only with the female abdomen and neck but also with the buttocks and knees. Buttocks and knees are frequently portrayed within concentric circles (fig. 9.18; pl. XLIX:2). All protuberances of the female body must have been revered as sacred sources of life-producing power.

A lozenge, a lozenge with a dot inside, or a lozenge within a lozenge is incised on some schematic phase II figurines (fig. 9.87). Their meaning may be related to earth fertility, the womb conceived as a field in the sense of a measured land for sowing. The lower part of a schematized barrel-shaped figurine is incised with many lozenges, each with a dot in the center (fig. 9.98). The upper register is marked with diagonal lines forming a whirl pattern. Many parallels are known from Cucuteni-Tripolye art in Moldavia and the western Ukraine. Lozenges with one, four, or five dots—divided into several, usually four, compartments—are prevalent on Pre-Cucuteni (Tripolye A) and Cucuteni A (Tripolye B1) figurines (Bibikov 1953). These highly conventionalized figurines from Gumelnitsa and Cucuteni areas belong to the Pregnant Goddess category.

A large pubic triangle marking a group of seated figurines from phase III (fig. 9.39) and from classical Cucuteni (fig. 9.40) makes explicit still another function of the Goddess: parturition. The seed within is symbolically indicated by a dot in the two upper corners (fig. 9.39). Another figurine painted black-on-red is decorated with two and four strokes on the belly (fig. 9.14; pl. XLVIII:2, B:2). The number two—two dots, two lines, two circles or lozenges—is many times repeated on figurines (figs. 9.14, 9.27, 9.37, 9.39, 9.46; pls. XLVIII:2, LI:1, LII:1, LIII:2, A:4, B:2) and cult vessels of Sitagroi as well as of all the other culture groups of Old Europe. Two dots, two dashes, two lines are on the pubic triangle, on the back below the waist, across the arms,

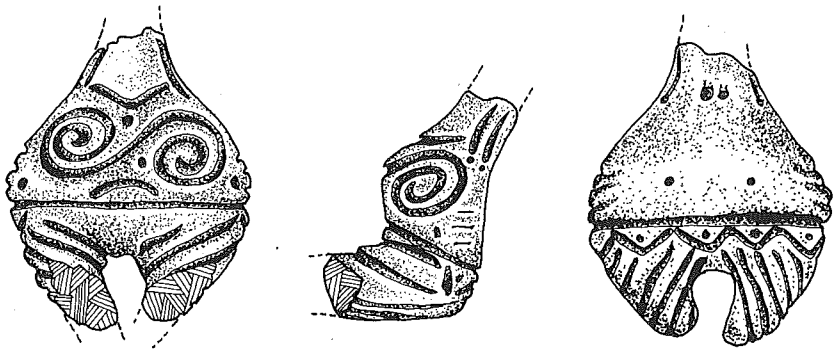


Figure 9.37 (153). Lower half of seated female figurine with double spiral over pregnant belly.

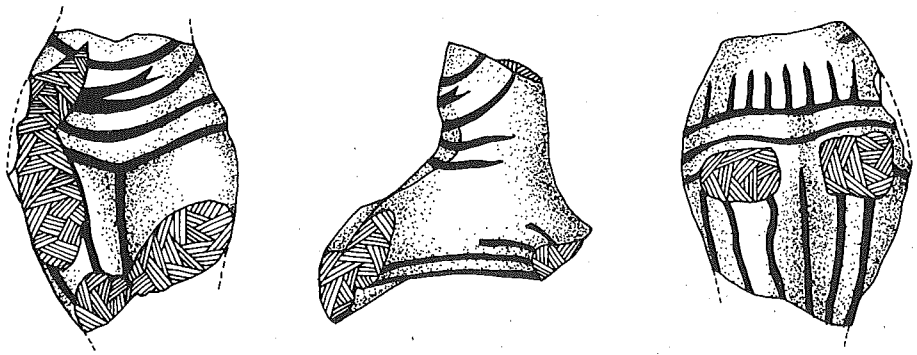


Figure 9.38 (165). Lower half of seated figurine. Note snake (?) encircling the abdominal area. Scale 1:2.

across the hip; on the mask they are over the cheeks and down the chin, as seen in figure 9.27, plate LI:1, which has two black lines painted diagonally over the cheeks and vertically across the chin somewhat to the side. The doubled sign must have been significant in exactly those places, since through time and in different geographical areas they are repeatedly painted or incised in just those places. Good parallels are known from the late Cucuteni culture of the western Ukraine, and from the Narva culture of Latvia. The two ring-shaped gold pendants attached to the left side of the chin of the Goddess masks discovered in several graves of the Varna cemetery in Bulgaria may be symbolically related (Gimbutas 1977:47; I. S. Ivanov 1978a, 1978b). What is the significance of the repetitious number two? The two dots, circles, or dashes on the vulva or on the back of the figurine (at the *trigonum lumbale*) may symbolize a double seed or a double egg. Two is more, therefore better and stronger, than one and therefore brings more luck, more fertility. The symbolism of double seeds, double ears, and double fruits as fertility charms is still alive in European folklore.

Sometimes actual grains were inserted in the belly of Cucuteni figurines, and a large number of Pre-Cucuteni (Tripolye A) figurines bear grain impressions on both the thigh and belly areas. Many hollow figurines of the classical Cucuteni period even contained one or two small clay "eggs" within the body (fig. 9.40). Larger Sitagroi figurines may also have originally contained one or more clay balls in the belly (cf. fig. 9.14; pls. XLVIII:2, B:2) which have since been lost. The symbolic dots and strokes on these figurines reveal a deep concern with fertility and the processes of birth and growth.

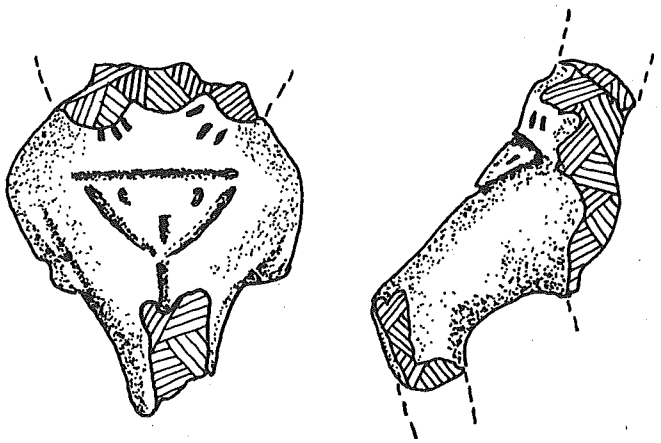


Figure 9.39 (162). Lower half of seated female figurine. Note large pubis marked with two dots.

Certain signs and groups of interrelated signs are clearly associated with certain types of figurines. Analysis of signs characteristically associated with posture distinguishes at least two principal categories:

1. Schematic flat-based figurines or semi-schematic portrayals in a squatting posture. On these, the breasts are usually indicated and marked with a V or an X (or cross); when the breasts are not shown, the signs stand in their place. Below the breasts are two lines and between them are three lines (occasionally four, rarely one or two). Three lines cover the shoulder area, and three short strokes are incised on the side below the waist. Triple chevrons or triple lines of zigzags are incised over the lower part and along the sides of the figurine. The neck is frequently engraved with three horizontal lines. Occasionally there are three vertical holes across the front of the neck. Each figurine of this group is marked with vertical long and short lines on the back. The above signs appear on some figurines in a complete series (cf. figs. 9.3, 9.4, 9.31, 9.33, 9.34, 9.35, 9.46; pls. XLV:3, LI:4, LIII:2, A:4) or in a partial series from which one or two are missing (see figs. 9.5, 9.6, 9.12, 9.13, 9.32, 9.36; pls. XLVII:3, XLVIII:1, LII:2). Parallel lines front and back are always included, and the number three is always part of the formula. In this category there is no indication of vulva, belly, or buttocks. The head, if preserved, is clearly that of a bird, beaked and with a crest, or it is bird-masked. The 76 figurines of this category constitute the largest group in the Sitagroi corpus.

2. The fat lady with vulva, pregnant belly, and buttocks. The number two—two lines or dashes, two dots or holes, and two squares alone or with a dot inside—is the dominant sign on this class of figurines or their masks. The egg is in association with the number two. A snake coil or a double spiral appears on protuberances of the

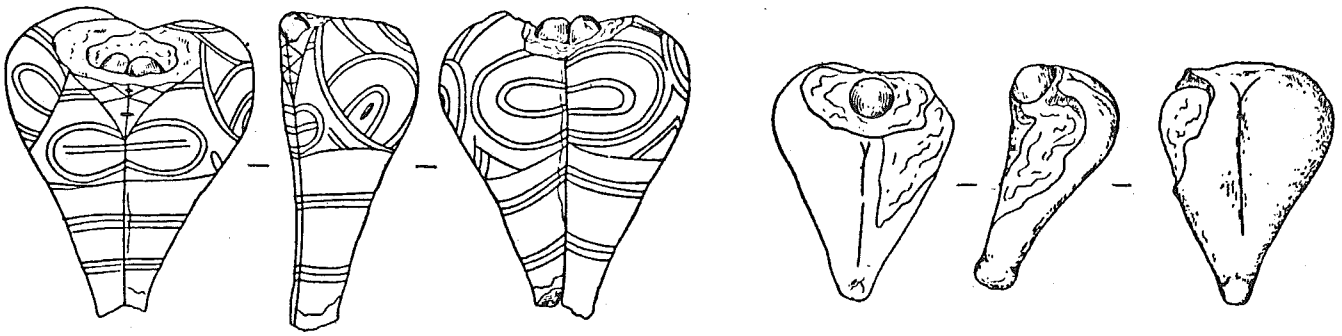
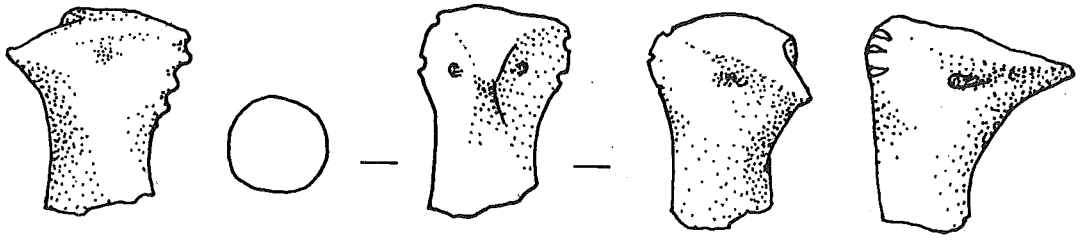
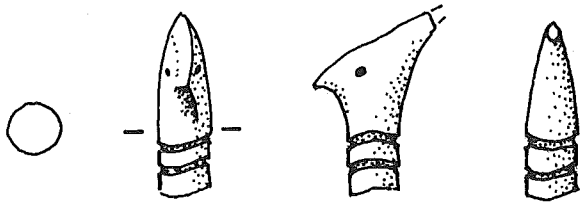


Figure 9.40. Figurines with clay balls inside the belly room from a classical Cucuteni (Cucuteni A-Tripolye B1) site at Novye Ruseshty 1 near Kishenev, Soviet Moldavia. Scale approximately 1:2. *Left*: After Markevich (1970). *Right*: After Kusurgasheva (1970).

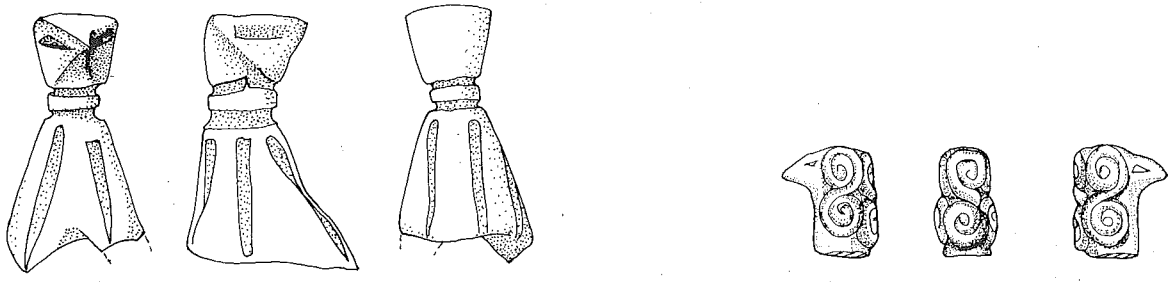


9.41 (128)



9.42 (85)

9.43 (116)



9.44 (121)

9.45 (87)

Figures 9.41-9.45. Miniature depictions of the Bird Goddess.

body—belly, buttocks, even knees—all obviously seen as being pregnant. The snake, the single spiral or double spiral, and the egg are symbols of "becoming" and express the idea of renewal of life. The number two may have been linked with the duality of the seasons and the insurance of fertility. Figurines of this category have human masks, and their bodies are of human proportions, except that buttocks and belly are exaggerated like those of the upper paleolithic "Venus." The pregnant figurine is usually seated on a throne or, in more schematic versions, is fused with the throne. There are 26 figurines in this category; if the 6 separate thrones are included, there are 32.

There are other groups, numerically too small to permit a clear association of attributes, which belong to neither of the two categories above. Even if functionally related, they do not represent the same stereotype. Such, for instance, are standing nude figurines with pubic triangle and neatly modeled buttocks, but unmarked with signs, and a figurine (fig. 9.86) with concentric circles and a probable toad over the belly, a snake spiral at the neck, unexaggerated buttocks, and breasts with three lines between.

The Sitagroi culture developed its own style and tradition of marking figurines with symbolic signs. It is not that the symbols here are different from those of other areas of Old Europe; the symbols are the same between the Carpathian Mountains and Greece and between the Iberian and Irish neolithic and the Karanovo culture, but their specific grouping and application is unique to Sitagroi.

In summary, the signs, their interrelationships, and their association with a certain posture help establish the functional identity of the figurine types. The following text will classify the figurines, according to the categories of divine functions, much on the basis of what was said above about the signs.

STEREOTYPES OF DIVINE CHARACTER

The survey of symbols incised or painted on female figurines illustrates emphasis on certain functions: giving birth, producing rain or milk, crops, or life in general. Accordingly, there must have been distinct goddesses, or different aspects of one Goddess, to whom these functions were attributed. The naturalistically rendered sculptures represent young or slender bodies; mature or corpulent bodies reflect stages in the life-cycle of the Goddess by analogy with the human female. A variety of postures—standing, sitting, squatting—are characteristic of the attributes and function of the Goddess at a particular stage. Her functions are further specified by the mask she wears and the symbols on her body, representing different functions.

On the basis of the available material, the following types of the Goddess can be distinguished:

a. The Bird Goddess, a human-bird hybrid, probably the Cosmic Creatrix (see explanation in Gimbutas 1974a, 1982).
b. The Youthful Goddess.
c. The Birth-giving Goddess.
d. The Pregnant Goddess.
e. The Goddess in the form of an anthropomorphic vessel with hands on the abdomen.

The presence of male gods in the Sitagroi repertoire of mythical images is problematic, but can be assumed on the basis of their presence in neighboring groups.

The Bird Goddess

The majority of preserved Bird Goddess heads are beaked and have eyes but no mouth (figs. 9.22-24, 9.26, 9.41-48; pls. XLIX:3, L:1-2, LII:3, LIII:1, 2, LIV:1, A:4). The beaked heads belong to highly schematized figurines which are 1-3 inches high. Some figurines are truncated (figs. 9.5, 9.13, 9.32, 9.34, 9.90-94, 9.99-102, 9.129, 9.132; pls. XLVIII:1, LX:1), and some are in a schematized squatting position (figs. 9.12, 9.47; pl. XLVII:3). Arms are never represented; however, larger figurines have small stumps with perforations which probably served for the insertion of feathers or plumes in imitation of wings. Some figurines (figs. 9.1, 9.3-6, 9.46, 9.48; pls. XLV:1, 3, LIII:2, LIV:1, A:4) are decorated with red- or white-encrusted, semicircular, vertical, or

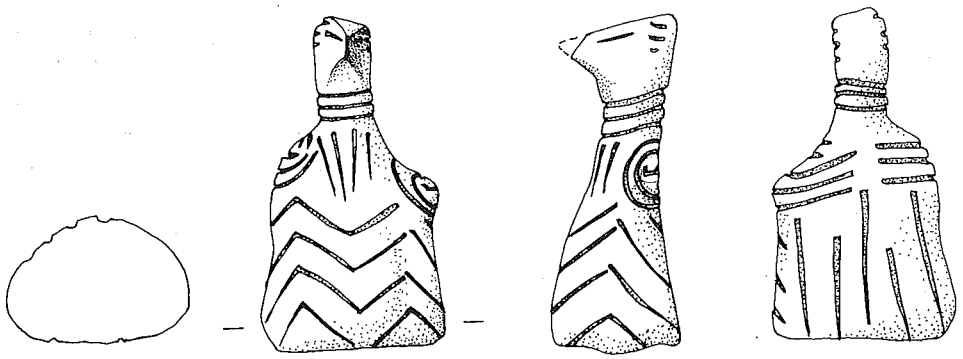


Figure 9.46 (127). Complete birdlike schematized figurine.

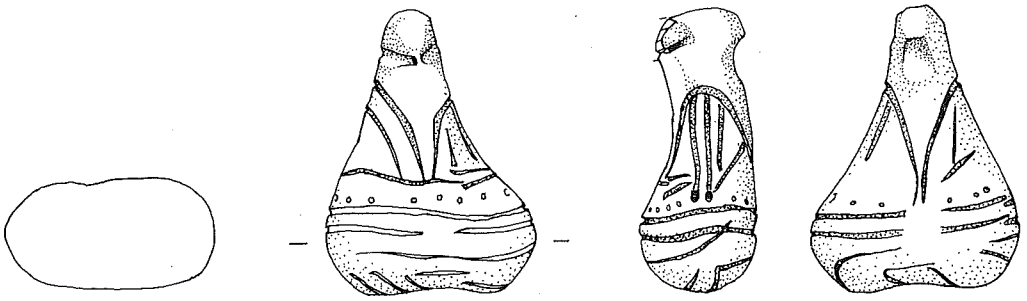


Figure 9.47 (132). Complete birdlike figurine in squatting position.

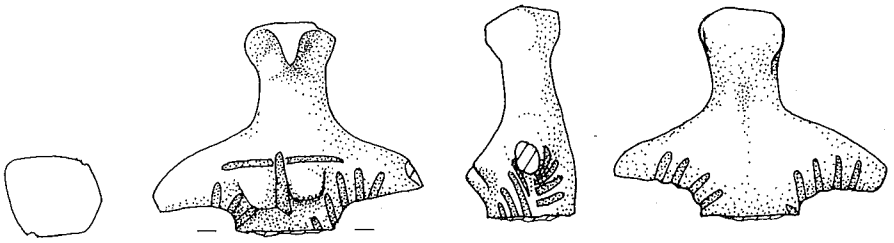


Figure 9.48 (133). Upper half of Bird Goddess. Radial lines may symbolize wings or brushes.

radial incisions just below the "arm" stumps. Some bird-headed figures have an elaborate coiffure (figs. 9.22-24, 9.45; pls. XLIX:3, L:1, 2) and are perforated for earrings (fig. 9.46; pls. LIII:2, A:4).

This category of figurine can be distinguished by the consistent appearance of signs discussed above: a V or X on breasts, horizontal or vertical zigzags, triple chevrons, and three (occasionally four) vertical parallel lines between the breasts, on the neck, or on the shoulders. The following figurines should be regarded as symbolically interrelated: figures 9.1-6, 9.12, 9.13, 9.17, 9.20, 9.22-24, 9.26, 9.31-36, 9.41-47, 9.87, 9.92-94, 9.96, 9.97, 9.99-102, 9.114-117, 9.119, 9.127-132, 9.135; plates XLV:1–3; XLVII:3; XLVIII:1, 4; XLIX:1, 3; L:1, 2; LI:4; LII:2, 3; LIII:1, 2; LX:1, 3, 4; LXI:1; and A:4.

Cult vessels, richly decorated with animal heads and geometric patterns—groups of parallel lines, net and checkerboard patterns—may have been connected with the worship of this Goddess. The triple lines and chevrons on the necks of rams (figs. 9.72, 9.73; pls. LVII:4, LVIII:1) suggest that the ram was the sacred animal of the Bird Goddess. A Sitagroi phase II sculpture of a basin-shaped stool joined to a probable human figure (fig. 9.49; pl. LIII:3, figure broken off) may portray an act of invocation to a milk/rain-giving divinity. A constant concern for water and invocation for rain play a part in religious rites typical of all agrarian societies. In the Macedonian region, the scarcity of rain was certainly an urgent concern.

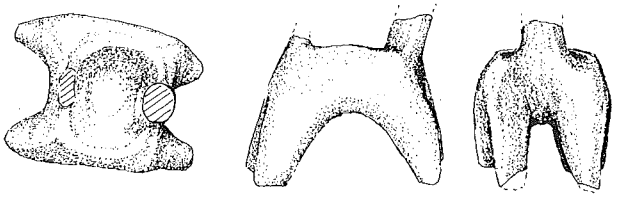


Figure 9.49 (12). Four-legged table with basin.

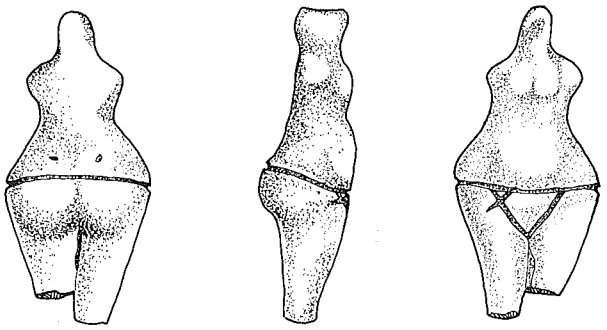


Figure 9.50 (145). Nude female figurine.

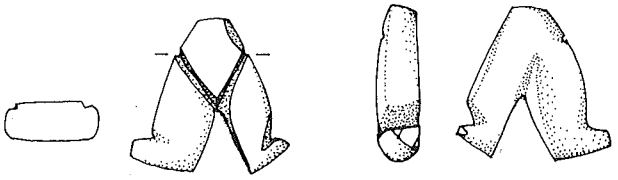


Figure 9.51 (151). Birth-giving Goddess of ground greenstone.

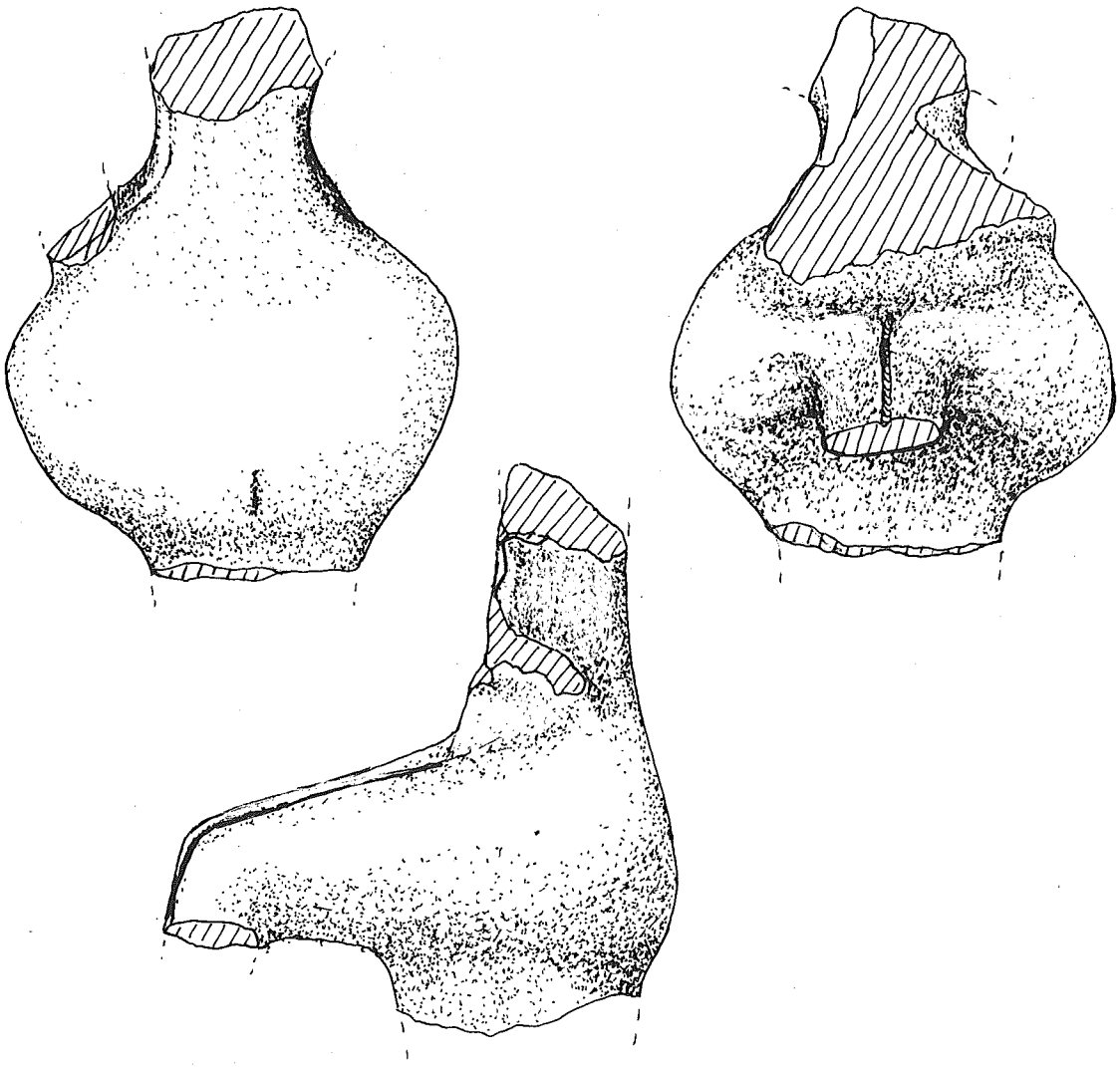
The Youthful Goddess

Youthful bodies with well-modeled, unexaggerated belly parts typically wear a hip belt (fig. 9.50; pl. LIV:2), a hip belt with fringe and tassels (fig. 9.21), or a tightly wrapped skirt (fig. 9.10; pl. XLVII:1). Nude torsos (fig. 9.7; pls. XLVI:1, A:3) belong to this category.

The Youthful Goddess is not easily identified because of the lack of special emblems such as those which abound on sculptures of the Bird and Pregnant types, but precisely this absence of symbolic markings (except for two dots or circles at back) makes it possible to single out this type as a separate category. We may conjecture that these figurines portray the virgin nature goddess which survived in Minoan, Mycenaean, and post-Mycenaean times as Artemis.

The Frog-Shaped Goddess of Regeneration

This Goddess is a well-known stereotype in southeastern Europe and Anatolia. She is portrayed with widely parted legs, protruding pubic triangle, and upraised hands. The head is human or is reduced to a triangle, and the belly is emphasized by a circle or concentric circles. She is known from plaster wall reliefs at Çatal Hüyük in seventh millennium BC shrines of levels VII and VI. She appears in relief on Sesklo and Starčevo vessels in Greece and Yugoslavia of the seventh



9.52 (161)

9.53 (164)

Figures 9.52, 9.53. Seated nude females, lower body.

and sixth millennia BC. She is carved in black or greenstone and marble or alabaster. One of the earliest examples, carved in black stone and found at Achilleion near Farsala, Thessaly, dates to 6300-6200 BC (Gimbutas 1974b:299, fig. 28). She is found in the later neolithic at Paradimi in Thrace (Theocharis 1973:pl. 235).

Toads or frogs, as known from later cultures and present European folklore, are epiphanies of the birth/life-giving and life-taking Goddess. Her image in stone or clay as frog, toad, or anthropomorphized frog appears throughout the neolithic and chalcolithic and later.

At Sitagroi, this aspect of the Goddess seems to be represented by miniatures (figs. 9.146-148; pls. LXII:2, LXIII:1, 2), unfortunately badly damaged, and a figurine with a concentric circle over the abdomen and a snake spiral over the neck (fig. 9.86; pl. LIX:2); at the top of the concentric circle, something crawls, perhaps a toad.

A small frog-shaped female figurine of greenstone (fig. 9.51; pl. LIV:4) also came to light at Sitagroi. It is stratigraphically classified between phases III and IV, but it may be surmised that the well-worn, frog-shaped green amulet was made in phase I and was in use for a long time. Its closest parallels are from the Karanovo I period in the Maritsa plain in central Bulgaria. One from the mound of Azmak is now housed in the museum of Stara Zagora, Bulgaria. Another similar figurine was discovered in Franchthi Cave in the southern Peloponnese (Jacobsen 1970:pl. 99a, bottom).

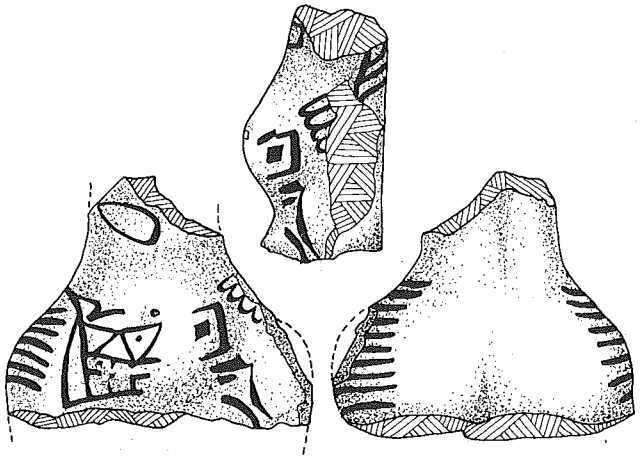


Figure 9.54 (167). Lower body of seated figurine. Scale 1:2.

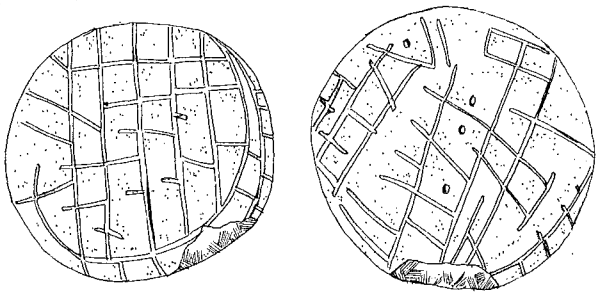


Figure 9.55. Clay disc with white-encrusted incisions bearing designs related to that of figure 9.54. From Ploskata Mogila near Plovdiv, Bulgaria. Diameter approximately 4 cm. After Detev (1952).

The Pregnant Goddess

Corpulent females seated on stools are numerous. Those of phase III have very large, nicely rounded hips. The most corpulent portions naturally survived best; heads and legs are usually missing. Posteriors are tremendous, larger than the stool, swelling from the narrow waist in the shape of a ripe pear. The fat ladies of Sitagroi are portrayed either nude (figs. 9.52, 9.53, 9.138, 9.143, 9.145; pls. LIV:3, LXII:1) or with indications of attire in combination with symbolic signs (figs. 9.14, 9.140; pl. XLVIII:2). Their usual companions are snakes, their emblems are lozenges or (pubic) triangles with a dot, two dots, two or four dashes inside. The fragment of a black-on-red painted figurine (fig. 9.54) shows a system of lozenges and triangles over the lower abdomen. Analogous symbols appear on a clay disc from Ploskata Mogila near Plovdiv (fig. 9.55).

The stool or throne on which the Goddess sits is either separate or in one piece with the figurine. Separate miniature stools of phase II are four-legged (figs. 9.79, 9.80, 9.83; pl. LIII:4) or three-legged (figs. 9.81, 9.85). Red painting survives on throne legs; some are incised with double lines (fig. 9.83). Some of the pieces in this category are composite, the body inseparable from the four-legged stool, the front legs fused with those of the Goddess (figs. 9.56, 9.57, 9.82; pl. LV:1). Totally schematized figurines resembling chess pieces also apparently symbolize the throned goddess (fig. 9.58). Schematized figurines with large lozenges and a dot in the mid-

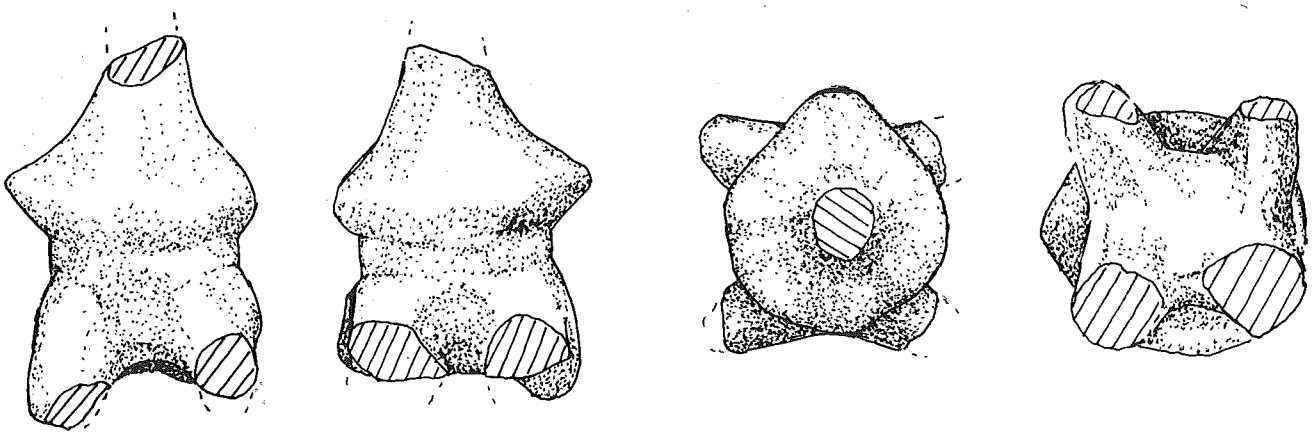


Figure 9.56 (13). Schematized "Throne Goddess."

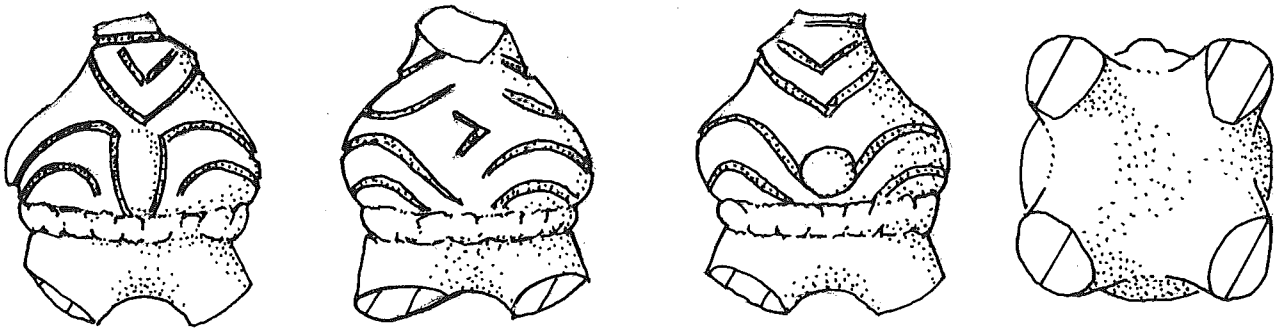


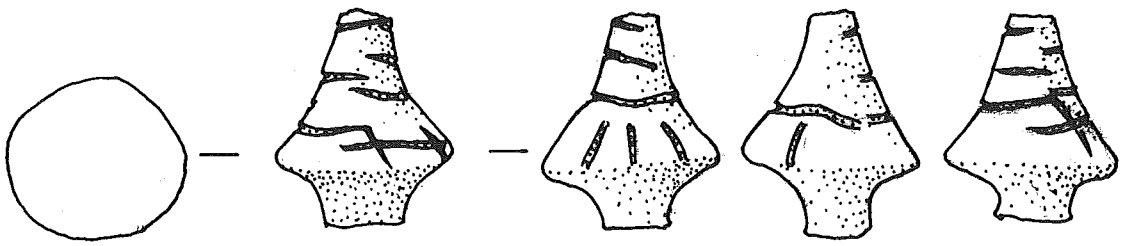
Figure 9.57 (14). Schematized enthroned Pregnant Goddess.

dle (fig. 9.59, pl. LV:2) or with snakes on the abdomen (fig. 9.60, pl. LV:3) may be reduced versions of the Pregnant Goddess. Similarly formed bottle-shaped statuettes with incised, white-encrusted snakes on the belly are known from Karanovo V and VI sites in the area of Plovdiv, central Bulgaria (Detev 1965:67, fig. 3). Close analogies of the schematized figurine shown in figure 9.59, plate LV:2, have been found in Boian-type sites near Bucharest (Comşa 1974). Although the latter are clearly anthropomorphic and portray a squatting woman, the composition of the lozenge with a dot and triangle with extended lines is identical to Sitagroi examples.

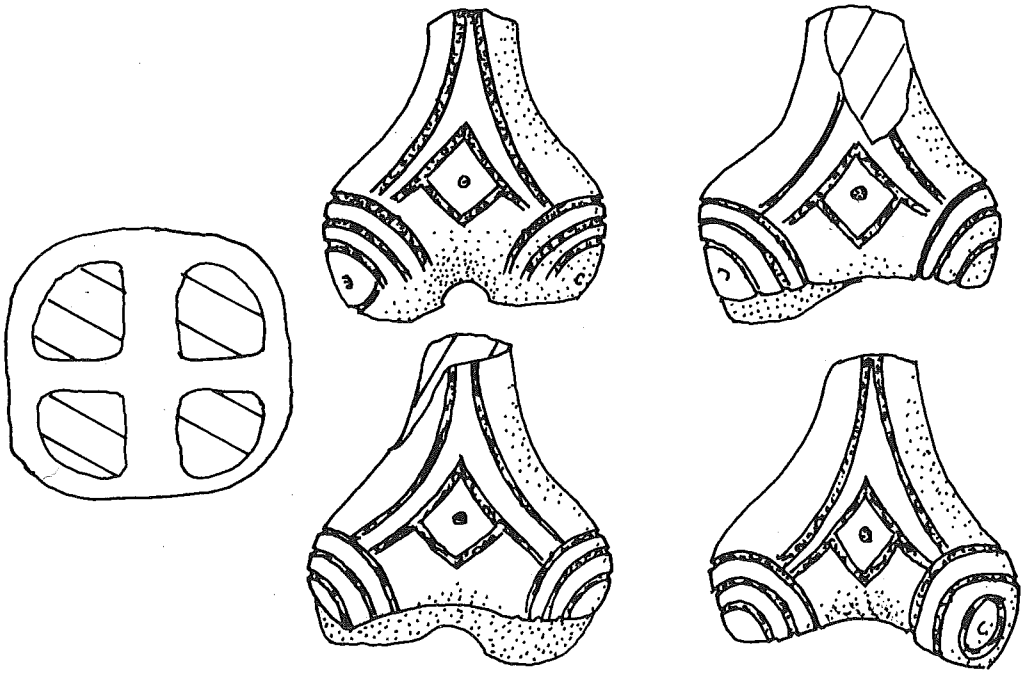
As prospective mother (fig. 9.59; pl. LV:2), this seated Goddess is modeled with a large pubic triangle or square seed-implanted "field" on the belly. Spiral (fig. 9.37; pl. LII:1) and snake (fig. 9.38) are fertility symbols which mark the Pregnant Goddess. A masterpiece of this type was found at Pazardžik near Plovdiv. This fully preserved "Lady of Pazardžik" wears a broad mask; the buttocks are incised with lozenges, the pubic triangle with a spiral (now housed in the Naturhistorisches Museum of Vienna, illustrated in Gimbutas 1982:209).

The Goddess in the Form of an Anthropomorphic Vessel with Hands on the Abdomen

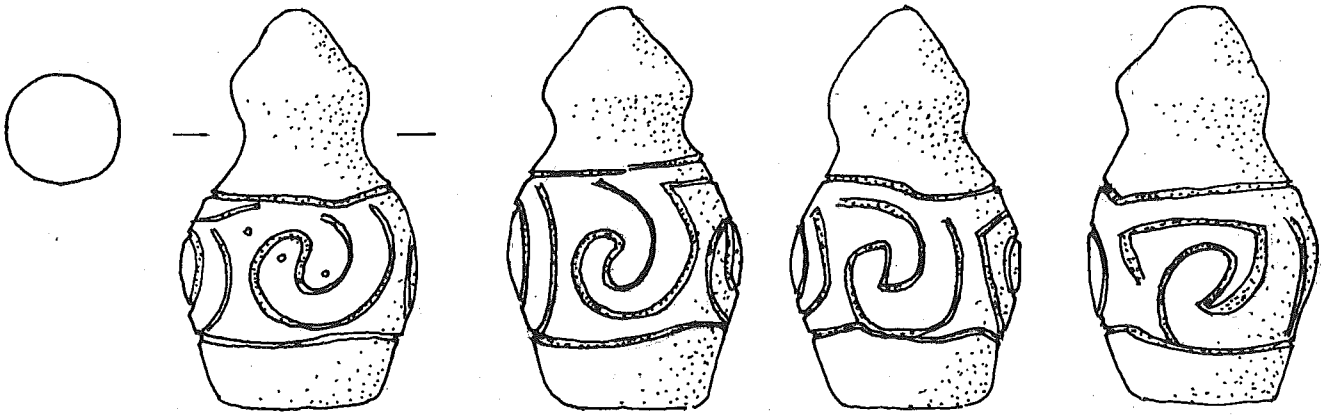
This image had a long tradition in the neolithic and chalcolithic ages in southeastern Europe and Anatolia. A potsherd found at Sitagroi with a hand sculpted in relief (fig. 9:61; pl. LV:4) belongs to this type as does a handle fragment with hands clasped across the stomach (fig. 9.149; pl. LXIII:3). Bulky anthropomorphic vases with two hands on the belly are widely distributed and have been found at Haçilar, central Anatolia; at Achilleion of the Sesklo culture in Greece (Theocharis 1967:figs. 87, 88); in the early Starčevo



9.58 (15)



9.59 (157)



9.60 (156)

Figures 9.58-9.60. Schematized figurines of Pregnant Goddess (*top and middle,* enthroned).

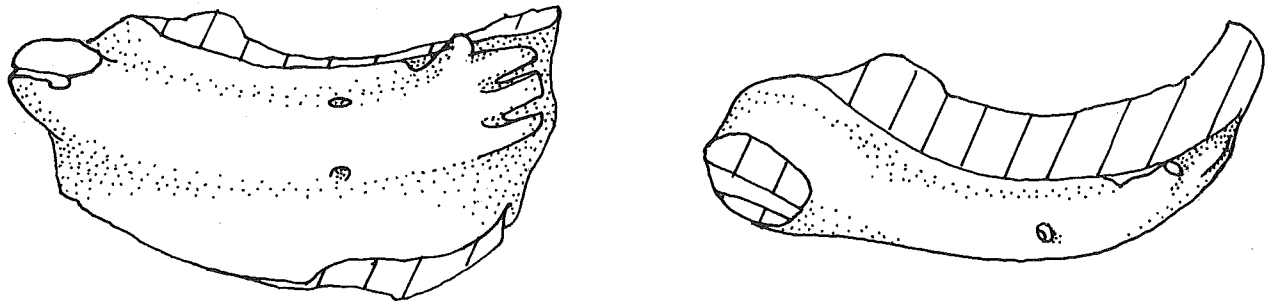


Figure 9.61 (170). Part of anthropomorphic vase with hands on abdomen.

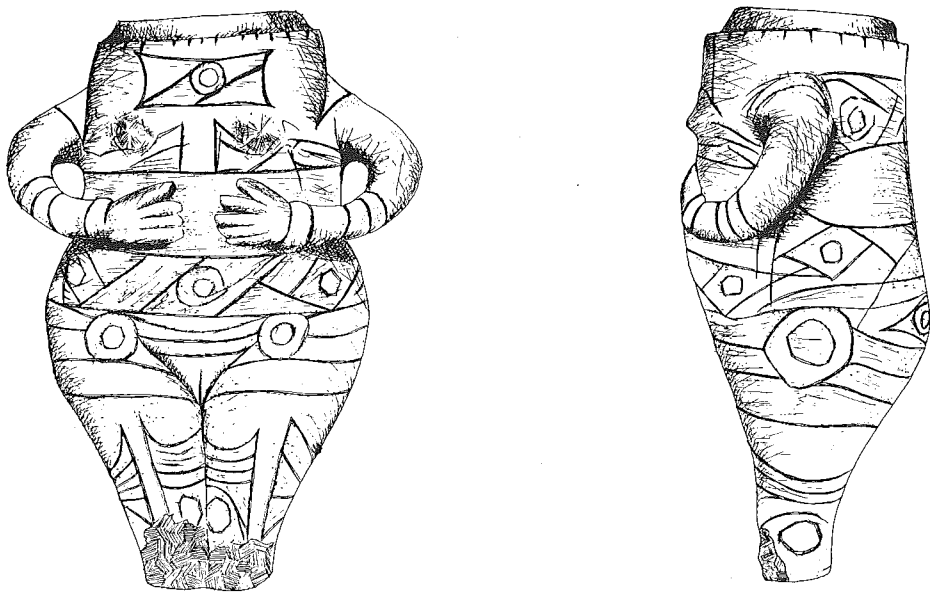


Figure 9.62. "Lady of Vidra," anthropomorphic vessel with hands placed on large abdomen, white-encrusted incisions with interconnected circles, lozenges, and circles with lozenges. Bucharest City Museum. Height 42.5 cm. After Rosetti (1938).

complex of Yugoslavia, at Anza near Štip, Macedonia (Gimbutas 1976:pl. 26); at Lepenski Vir on the Danube in Yugoslavia (Srejović 1969:pl. 90, color pl. XI); in the Tisza complex of eastern Hungary (anthropomorphic vase in seated goddess shape from Kökenydomb at Hódmesövásárhely: Banner 1959); and in the Karanovo VI (Gumelnitsa) culture of Romania. The best example from the latter, and closest to that of Sitagroi, is the "Lady of Vidra," nearly 60 cm high (housed in the Bucharest City Museum; Rosetti 1938). The lady is fat, has small breasts, and is decorated with white-encrusted incisions of concentric circles within squares below the mouth of the pot and in the area of the abdomen and buttocks (fig. 9.62). Incised white-encrusted circles interconnected by lines, seen on many cult vases of phases I and II, symbolically relate these ritual vessels to this specific aspect of the Goddess.

The Male God

One figurine, a seated personage (fig. 9.63; pl. LVI:1), can be considered a possible male divinity. The slender torso is inclined slightly forward. The head and legs are broken off, but the remaining stumps are spread wide and are characteristically masculine. The neatly modeled back

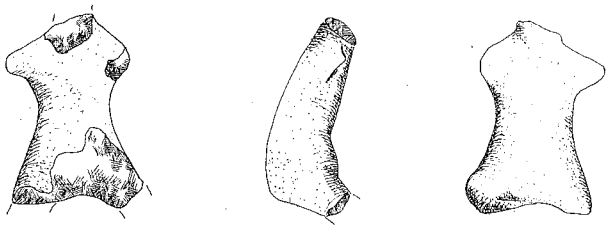


Figure 9.63 (174). Torso of seated figure, presumably male. Scale 1:2.

is reminiscent of a series of male figures seated on a small stool, bent forward and resting arms on knees. An important example is the famous "Thinker" of the Cernavoda cemetery (Berciu 1966) from the Hamangia culture. From the Cucuteni culture a similar "Thinker" was recovered from Tirpeşti settlement in northern Moldavia (Marinescu-Bîlcu 1964); and from Karanovo VI, Gumelnitsa, comes the seated man found at Vulkaneşti in Soviet Moldavia (Passek and Gerasimov 1967). All three are reproduced in Gimbutas 1974a on plates 246-252. The closest parallel for the Sitagroi sculpture is the masterpiece from Vulkaneşti, now at the archaeological museum of the Institute of History in Kishenev (fig. 9.64). The seated pensive male gods are presumably "worrying gods" (perhaps connected with the death of the year god), a common image in the Balkan pantheon throughout the neolithic-chalcolithic period.

Figures with diagonal bands across the chest and back (figs. 9.89, 9.94; pl. LX:1) may portray another type of male god or ritual attendant. Analogies are known in the late Cucuteni culture of Moldavia and the western Ukraine. Some of the male figures wear a chest and hip belt, some are ithyphallic and have no indications of dress (Dragomir 1967). The Sitagroi piece has no marking and is too ambiguous for positive classification.

MYTHICAL ANIMALS

Animal sculptures portray bulls, stags, rams, pigs, and dogs. Bulls and rams are the most numerous, the stags or deer, dogs, and pigs far fewer.

Zoomorphic sculptures can be divided into two main groups: (1) whole figures, and (2) heads decorating corners of cult vessels. These figurines are of various dimensions, ranging from miniature to medium size. Only those of bulls are of medium size, about 15-20 cm long and up to 10 cm high. Most pieces are very small; no life-size sculptures have been discovered. The stylization of heads reached its culmination in cult vessels or lamps in animal form and in ram or bull heads attached to vases as protomes. In the cult vessel series, the genius of the Sitagroi people reached artistry of the highest order.

The most naturalistic whole-figure representations are those of bulls. Eighteen fragments of rather large bull sculptures have been found (figs. 9.65, 9.66, 9.150-157; pls. LVI:2, LXIII:4), all from phase III except one from the end of phase II. All are of nonfired clay and badly preserved. Parts that have survived are either forelegs, hindlegs, or torsos; only one head has been partially preserved (fig. 9.66; pl. LVI:2). The bull's strength is given special emphasis: legs are short and massive, giving the impression of firm monumentality; the body is vigorous and muscular (fig. 9.65).

The most celebrated piece is a bull decorated

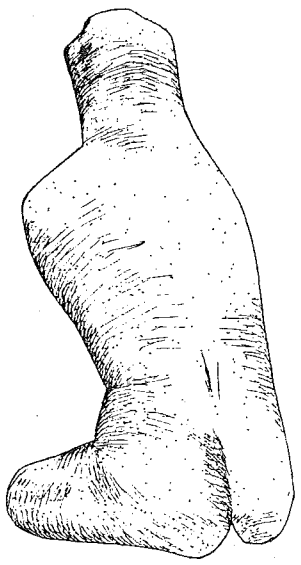


Figure 9.64. Seated male, slightly bent figure from Vulkaneşti in Soviet Moldavia. Gumelnitsa culture. Archaeological Museum, Kishenev. Height approximately 15 cm. After Passek and Gerasimov (1967)

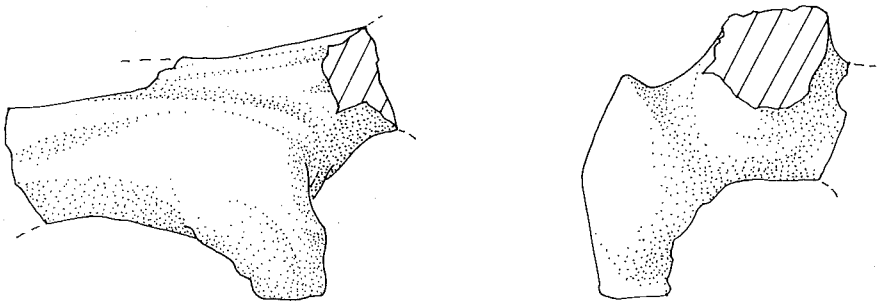


Figure 9.65 (178). Part of torso and front leg of animal. Scale 1:2.

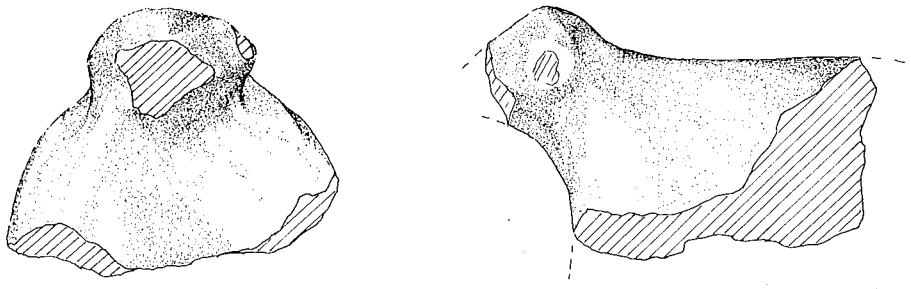


Figure 9.66 (183). Forequarters of animal (bull?), legs missing. Scale 1:2.

with a design of black on orange-red and bearing a receptacle on its back (fig. 9.67; pls. LVI:3a, b, B:1). Although excavators first thought this represented a camel or bear, the massiveness of the legs and the hanging "belly," which is really the bottom of the container, are unmistakably characteristic of the bull, an identification supported by parallels from the Vinča culture (Medvednjak and Selevac at Smederevska Palanka, southeast of Belgrade, excavated in 1968-1970 by R. Galović) where containers standing on massive, spiral-decorated bull legs have been discovered (fig. 9.68). Bull vases are richly represented in the Karanovo VI culture of Romania and Bulgaria. One of the best examples is from the site of Calomfireşti, district of Teleorman, near Bucharest: decoration surrounds the mouth of the vase; the short tail and protruding circular eyes are perforated and large horns protrude from the vessel (National Museum of Antiquities Bucharest; V. Dumitrescu 1968: fig. 106). A close parallel from the contemporary Cucuteni culture is a thick-legged, hollow bull-vase with cover lid from Košilovce (Lvov Historical Museum, Ukrainian SSR).

Perforations above all four legs and through the tail and nose of the Sitagroi piece indicate that this sophisticated bull vase hung by a cord inside a house or shrine. The sculpture is of outstanding workmanship, neatly modeled, polished, and painted with symbolic designs. Strong legs indicate the bull's power. The exaggerated, large, rounded rump is painted over with spirals to mark the divine energy considered innate in that impressive protuberance. Symbolically the spiral connotes the spontaneous energy of the

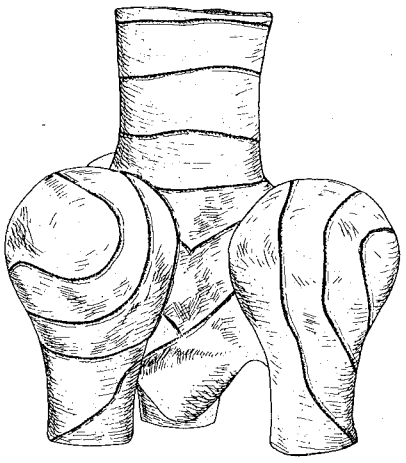


Figure 9.68. Bull-legged receptacle or lamp from late Vinča site of Medvednjak, southeast of Belgrade. Smederevska Palanka Museum. Height 11.5 cm.

snake. Spirals engraved on protuberances of the bull's body reinforce the musculature. Such an association is found in the unmistakable snakes engraved on the disproportionately large forelegs of late Vinča bull-men (Tasić 1957a:pl. XXV). The bulging Graphite-painted vessels of Sitagroi phase III are usually decorated with spirals on their elevated and rounded parts. On the bull vase under discussion, the design flows freely between the spirals, and its bands cover almost the entire body of the animal. The painting on the head is most charming. Dark circles (or snake heads?) mark the eyes from which painted bands go upward and around the eyes to delineate the brow ridges. The design gives the face almost a human character (fig. 9.67a). The bands continue around the ears and, on returning, join into a single narrow line on the forehead, then

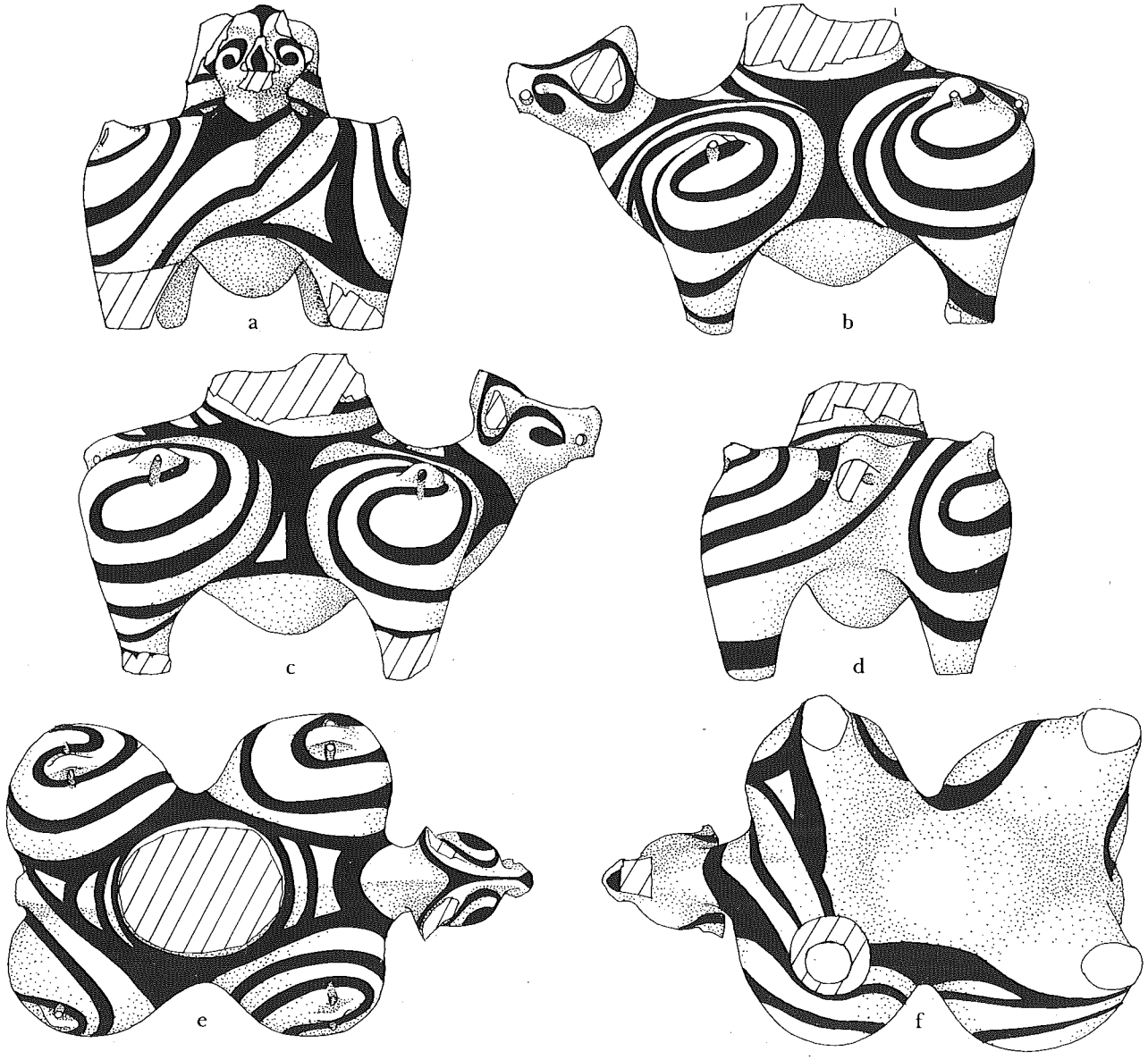
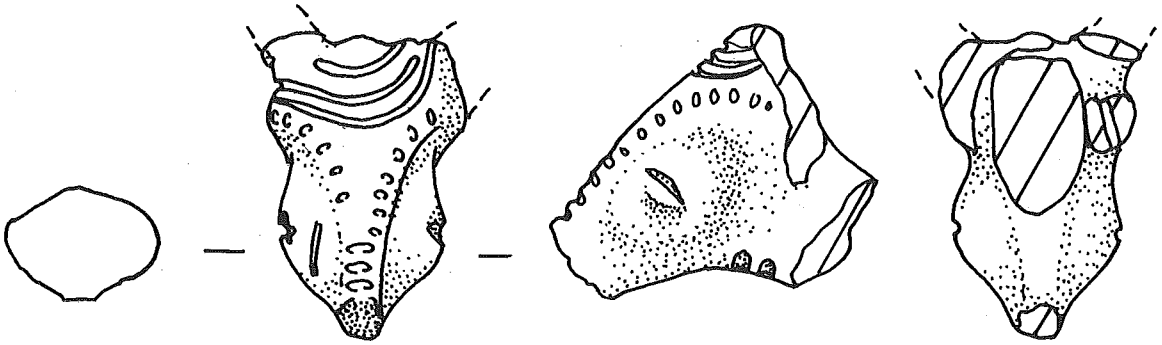
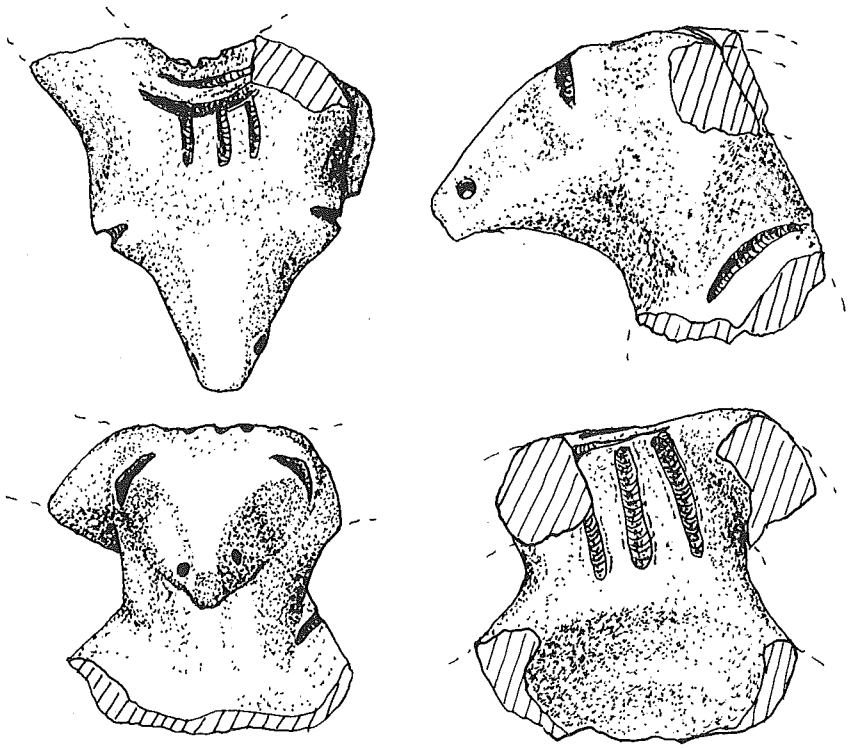


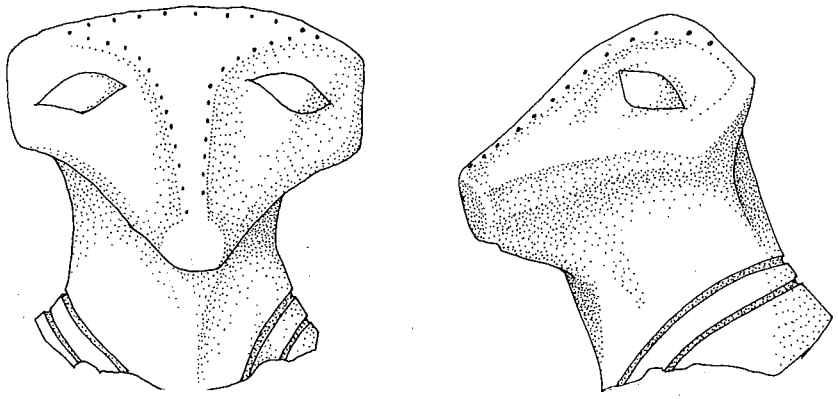
Figure 9.67 (190). Stylized bull as lamp and/or cult vessel. Height 10.6; length 16.4; width at shoulder 9.9 cm.



9.69 (196)

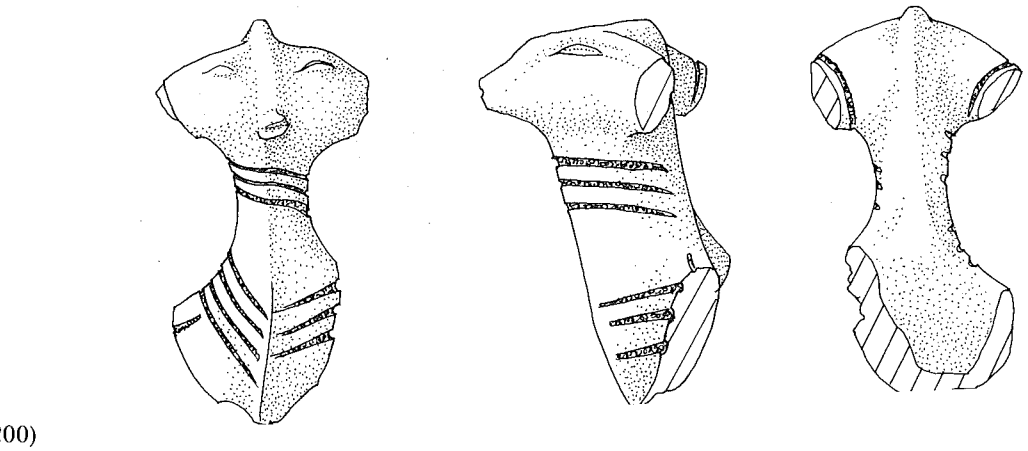


9.70 (193)

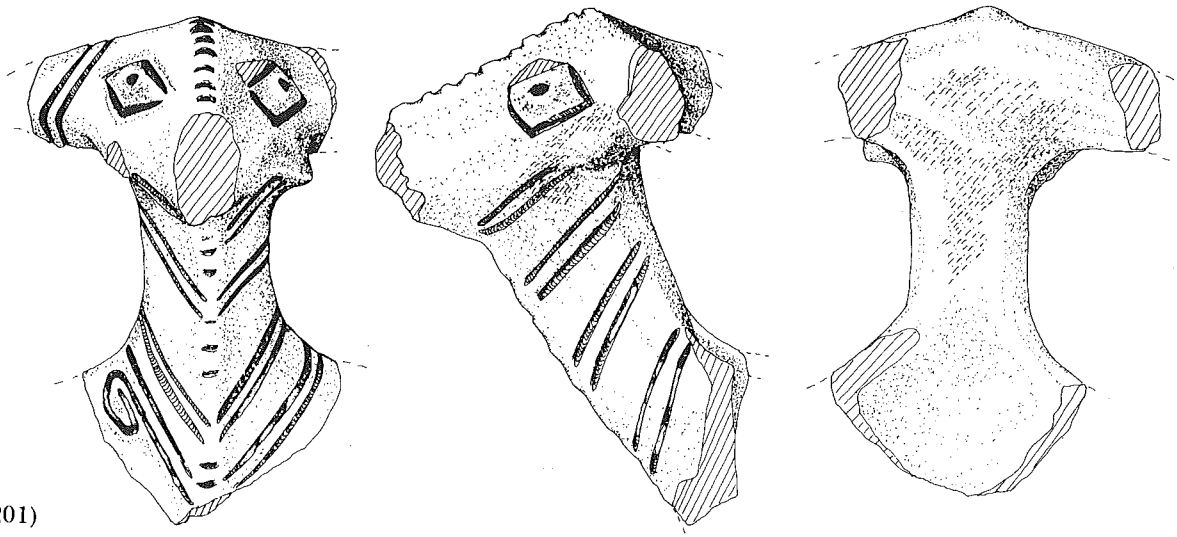


9.71 (192)

Figures 9.69-9.71. Stylized bull/animal heads.



9.72 (200)



9.73 (201)

Figures 9.72, 9.73. Animal head protomes or ladle handles.

continue to the tip of the nose to form a triangle (fig. 9.67c, e). This elegant design is one of the most original encountered on Old European sculptures. Richly decorated animal sculptures or zoomorphic containers were presumably made for special occasions and by the best artists. At the same time, casual, smaller undecorated pieces were produced for general use (fig. 9.182; pl. LXIV:3).

The stylized heads of bulls and rams which adorned ritual vases, oil lamps, or other kinds of vessels are strikingly effective (figs. 9.69-74; pls. LVII:1-4, LVIII:1, 2, A:2; figs. 10.1:2, 10.7:1; pls. LXX:1a, b, LXXIV:2). White encrustation and red and black decoration on brown, buff, or black background are vivid and pleasing in color. Stylization of natural forms is so extreme that it is sometimes difficult to differentiate between animal species. Bull heads have shorter necks than those of rams. They have large eyes in relief, either semi-globular with a center slit (figs. 9.69, 9.70; pl. LVII:1, 2) or diamond-shaped (fig. 9.71; pl. LVII:3). Lines of dots or incisions outline the forehead (figs. 9.69, 9.71; pl. LVII:1, 3); above them are several incised white- or red-encrusted semicircular lines with rays; on the forehead or neck are concentric circles (figs. 9.69, 9.70; pl. LVII:1, 2), which recall the rosette symbols on Minoan, Mycenaean, Near Eastern, and other prehistoric bulls. Notched lines on the heads and necks of rams may indicate wool or may have some undefined symbolic meaning (fig. 9.73; pl. LVIII:1). Grouped parallel lines (figs. 9.71, 9.72; pl. LVII:3, 4) are a customary

pattern on animal necks throughout phases II and III.

One of the superbly decorated Sitagroi animal heads, probably of a ram, has large black-painted eyes encircled by red bands. The top of the head is decorated in red, the neck in black. The horns, unfortunately severely damaged, were also painted with horizontal black and red bands (fig. 9.74; pls. LVIII:2, A:2). Its near-human appearance, especially the large "other world" eyes, implies a mythical creature. Perhaps this was a mask representing a creature half-human, half-animal, related to the Vinča sphinxes, its mythical or supernatural character indicated by the painted bands. Painted masks of horned ram heads with huge semicircular eyes are known from the late Vinča culture (National Museum, Belgrade, permanent exhibit; Gimbutas 1974a:pl. 233). The highly stylized heads on Sitagroi cult vessels may indeed have been representations of the animal masks worn by men in dance or other cult performances. A fully preserved small vase with attached anthropomorphic or half-human animal head from Dikili Tash seems in that mode (Philippoi Museum). Several short-legged, fat animal figurines may represent pigs (fig. 9.75; pl. LVIII:3).

Miniature figurines of animals with short, upraised tails dating from phases I, II, and III are probably dogs (figs. 9.158-161; pls. LXIV:1, 2, 4). Although animals, presumably dogs, attached to vases do not show much stylization or decoration, their open mouths seem to represent barking dogs which may have had ritual significance (fig. 9.76; pl. LVIII:4); mythical dogs (divine guardians) are usually reputed to be ferocious. Zoomorphic handles in the form of an animal in a crawling position, legs attached to the pot, may also portray dogs. Another possible dog figurine, of which only the forepart is extant, has two parallel white-encrusted lines on the neck and legs and traces of red paint. Because its back is flat and somewhat depressed, this figurine may have served as the throne of the Goddess (fig. 9.77; pl. LIX:1), and may even have had an identical head and legs at the opposite end.

The last group consists of a few heads suspected of being horse heads. The head illustrated in figure 9.78 and plate LIX:3 has large white-encrusted, lozenge-shaped eyes and similar lines along the middle of the head. An incised line goes through the neck; other lines, perpendicular to this, run over the top of the head and down either cheek. Perforations occur on each side of the nose. That the head portrays a bridled horse cannot be established since the top of the head is damaged, and no ears or mane are shown. The longitudinal line through the front of the head is not unique; ram and bull heads usually have a

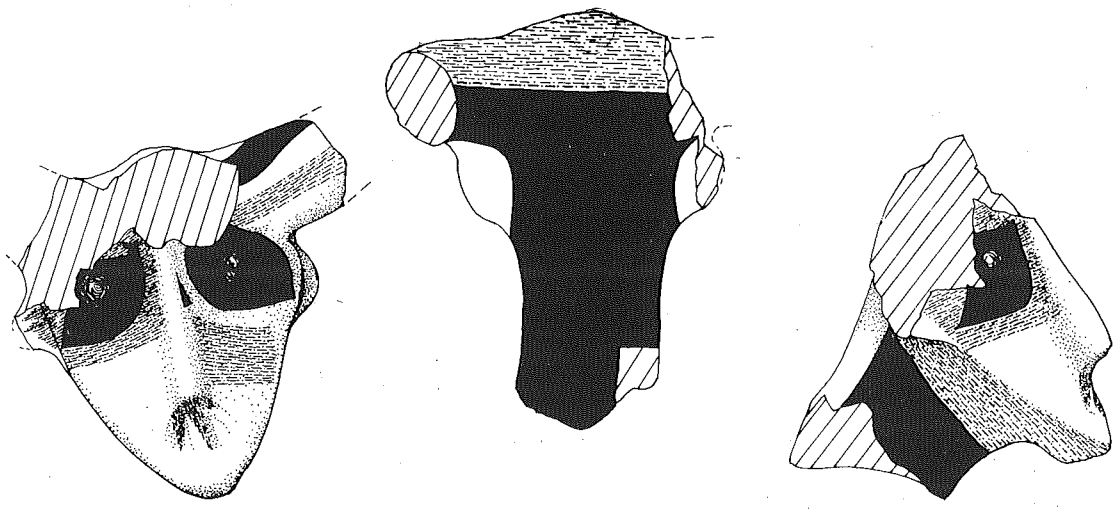
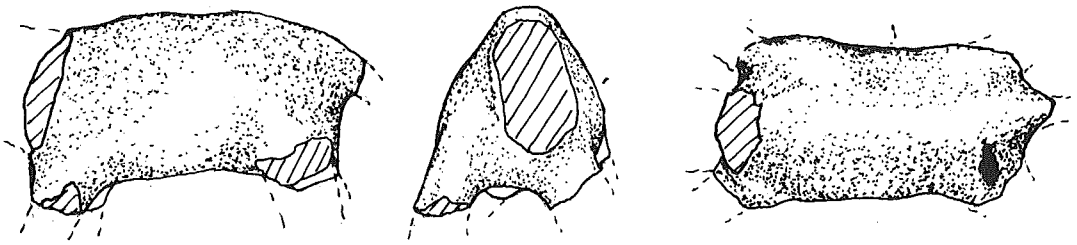
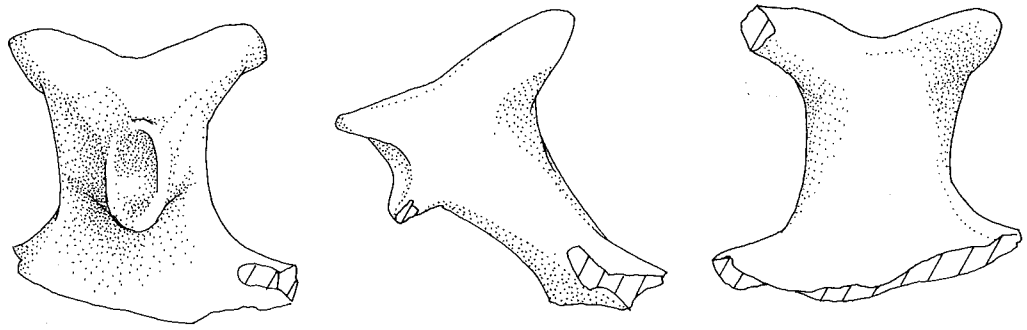


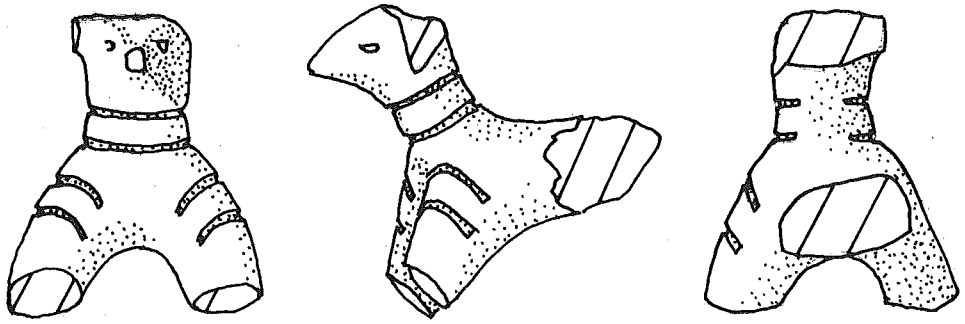
Figure 9.74 (202). Human/animal mask. Scale 1:2.



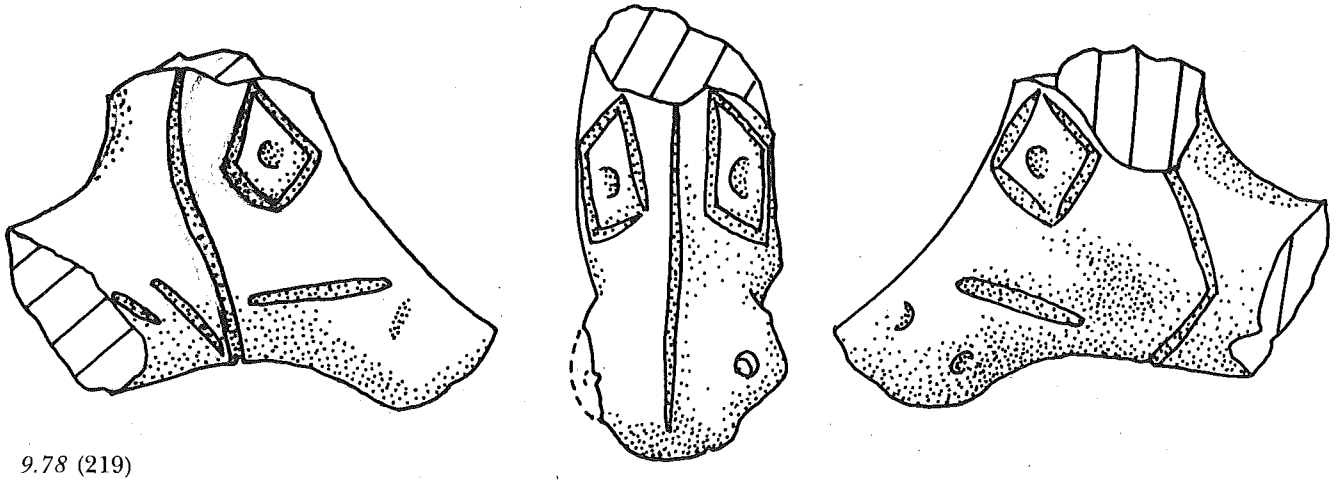
9.75 (215)



9.76 (92)



9.77 (88)



9.78 (219)

Figures 9.75-9.78. Animal figurines, fragmentary.

raised ridge in the center. The perforations may have served for suspension and not for the insertion of cheek pieces. A long cylindrical head of phase III, with deep incisions on top possibly representing a horse's mane, is another quasi-horse figurine (fig. 9.179; pl. LXV:3). However, no horse bones have been found in the Sitagroi tell.

INTERPRETATION OF CULT

Analysis of the Sitagroi figurines strongly suggests that the miniature statuettes served as a medium of worship, incorporating divine beings in a variety of aspects or their worshipers enacting a variety of rituals. There is evidence in other sites that most of the figurines had their place on a dais near the oven—the sacred part of the house. Such a dais or altar at the oven, constituting a house shrine, must have existed at Sitagroi, as is shown by the models from phase III of a house shrine (SF755; pl. XL:1a-d) and a separate oven (SF813) with a bench attached (pl. XL:2a, b). The more than 50 known models of shrines and temples in Old Europe (Gimbutas 1980) show that only shrines and temples—not simple houses—were reproduced on a miniature scale as gifts to the Goddess. But the placement of figurines was not restricted to the altars. As their functions were many, they were used in a variety of cult places—in courtyards near hearths and elsewhere. This is well indicated by a series of sites of various phases (particularly by the author's excavations at neolithic Achilleion in Thessaly, and a number of Cucuteni-Tripolye settlements). Some of the figurines were simply kept in niches or other storage places, together with various miniature sacrificial tables, receptacles for water or oil, incense burners, lamps, and other cult accessories with which they were used.

It has been demonstrated here that the character and function of a divinity can be distinguished through an assessment of the incised or painted symbols on the body or mask and their interrelationships; from the typical posture of the statuette; from costume details; and from the style of the mask. Six stereotypic images are represented in the Sitagroi figurine corpus: (1) the bird-woman hybrid with breasts, marked with V's, chevrons, zigzags, and three or more parallel lines; (2) the standing nude with no incised signs; (3) the regeneration aspect associated with the toad/frog, marked with concentric circles and snake spirals over the belly and neck; (4) the Pregnant Goddess in the form of a fat lady with bulging posterior, marked with spirals, snakes, eggs, and lozenges; (5) the vessel-shaped divinity with hands on the abdomen, functionally probably close to the pregnant category; and (6) the "thoughtful" seated male nude. Several other types may have existed, but they are not clearly evidenced by the available material at Sitagroi. One of the ambiguities in the Sitagroi material is the Snake Goddess, well known from many other sites. The figurines with snake-spiral coiffures (figs. 9.23, 9.24; pl. L:1, 2) may possibly be thought to represent the Goddess, but both these figurines have beaked, that is, bird-shaped, faces. Since the squatting position is characteristic of the Snake Goddess, several squatting figurines (particularly that illustrated in fig. 9.47) might be considered to be Snake Goddess representations, but again the face of these figurines is either beaked or the head is broken off. We may hypothesize the existence of a single divinity, whose principal epiphanies were the bird and the snake. The elaborate coiffure indicates that this Goddess was conceived as "the beautiful goddess." It is true that from the early neolithic to the end of Old Europe, only the Bird-and-Snake Goddess is shown with crown, head band, or a snake-spiral coiffure, a convention which persisted in Minoan Crete and Mycenaean Greece. It is also interesting to note that from neolithic to Minoan Crete the only deity worshiped in house shrines and placed on altars was the Bird/Snake Goddess.

It is obvious that there were many aspects of the divinity, each manifested in a somewhat different form and used in different ritual cult procedures.

In summary, an assessment of the Goddess symbolism and figurine forms leads us to reconstruct certain basic religious concepts: the Goddess is Giver of All; she is Creatrix, responsible for the world creation and for the nourishment and protection of humanity, and she is responsi-

ble for the constant renewal of life. She creates from her own body and promotes fertility. The Sitagroi divinities fit very well into the religious system which stretches temporally from the upper paleolithic to the end of Old Europe.

The most numerous figurines, probably depicting the most important goddess, were of the Bird (or Bird/Snake) Goddess, represented, as previously mentioned, by 76 pieces. It is a Sitagroi peculiarity that this divinity was portrayed almost totally schematized and miniature in size. Such is not the case in other areas of Old Europe, where the portrayals are neither miniature nor drastically schematized. In neolithic Sesklo and chalcolithic Vinča cultures, the Bird Goddess was quite frequently portrayed naturalistically, with a well-modeled female body but with a bird-shaped mask. At Sitagroi, symbols took precedence over body portrayal. The V's, chevrons, and the triple-line concisely express the essence of this divinity. Next in number of figurines and apparently also of major importance was the enthroned Pregnant Goddess, with pregnant belly, voluminous buttocks, and vulva marked with symbols of "becoming" (including the number two), and squares, the perennial female signs connected with the fertility of cultivated plant life. Other aspects of divine functions are not as well evidenced, but their presence is indicated, and from the variety of the stereotypes we assume a rich pantheon of divine characters.

Bulls, rams, pigs, and dogs are demons with divine powers closely associated with those of certain types of divinities. They stimulate, animate, and insure germinating seeds, sprouting, growing and ripening corn and other plants; and they ward off evil (death) powers. Both classes of animal representations—whole animal sculptures and zoomorphic vessels or animal-head protomes attached to vases—are marked with symbols or decorated with a symbolic design through which they can be linked with certain aspects of the divinities. The first are of primary significance in ritual performances. Bulls were undoubtedly as important in the Sitagroi (and all Karanovo) culture as in the Minoan culture of the second millennium BC. Many sculptures portraying vigorous bulls demonstrate the importance of this animal in the ancient rites at Sitagroi. Analogies from early historic times point to the association of the bull with a specific goddess. In Asia Minor, Artemis Tauropolis was the ruler of strong bulls, and her cult was connected with bullfights and deer hunts. In Attic reliefs, Artemis wears a deerskin robe, and on Roman coins she rides a bull. Vegetation demons appear in animal form in the Artemis cult of ancient Greece. At Sitagroi, it was probably the corpulent virgin who was the ruler of bulls and stags. An ancestral manifestation can be recognized in the Çatal Hüyük "Mistress of Animals" of Shrine II, 1, where the seated deity, flanked by leopards, is giving birth to a child (Mellaart 1967:184).

The ancient rite of the Attic Thesmophoria was the sacrifice of a suckling pig to Demeter by throwing it into a subterranean cave. Its rotted remains were then mixed with seeds prepared for sowing. From inscriptions in Demeter's sanctuary of Despoina at Lykosura we learn of further offerings to Demeter: terracotta figurines, oil, honeycomb, barley, poppy seeds, lamps, and incense burners (Nilsson 1957:312ff.). Quite possibly, cult practices were similar at Sitagroi, and similar offerings were made and pig effigies sculpted as important sacrificial animals, sacred to the Pregnant Goddess. Portrayals of pigs and pig masks are abundant in Starčevo, Vinča, Karanovo (Gumelnitsa), and Cucuteni art.

The character of mythical dogs can be perceived from pictorial representations on Cucuteni B vases from the Sipenici (Schipenitz) and other settlements in Bukovina and Moldavia. They are flying dogs depicted in the heavenly sphere on the upper zone of the vases. Their ferocity is emphasized by extended, clawed paws, alert ears, and raised hackles (Kandyba 1937:49, 51, 67, 69, 73, 75, 79; Rybakov 1965-66:45; Gimbutas 1974a: figs. 120-123). They fly above plant life and above young shoots or are portrayed flanking a tree, probably symbolic of young life. Heads of ferociously barking dogs on Sitagroi cult vessels (fig. 9.76; pl. LVIII:4) probably portray those divine dogs also seen in the Cucuteni-Tripolye art.

Animal heads on vases have huge eyes encrusted in white and red or are black-painted

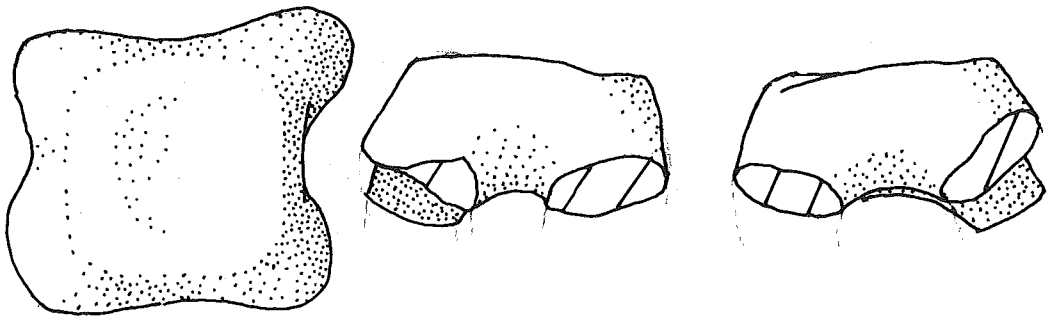
over the necks and faces. They carry impressive horns and appear as terrifying demons, incarnations of the vital forces of nature, ensuring the success of rituals. These heads are supernatural and are represented through masks. Masks of bulls, rams, or other animals were probably worn at religious festivals during dances in which the motion of the animal was mimicked. Such animal-headed demons, half-human, half-animal creatures, walking upright, are known from Mycenaean frescoes and gems produced by Minoan artists. On a lentoid bead seal from Vaphio, animal-headed demons, half-human, half-lion, holding beaked ewers, stand at an altar on which a life-tree grows from a horned stand (A.J. Evans 1935: fig. 378). It is notable that masked figures survived in Greek comedy of the fifth century BC, used by comic poets in choruses of animals, birds, fish, and insects, and as mythical centaurs, sirens, and amazons (Sifakis 1967). Centaurs, sphinxes, and human-headed bulls are known from late Vinča art in southern Yugoslavia (Valać sculptures, Museum of Kosovska Mitrovica; Tasić 1957a), roughly contemporary with the second half of phase III at Sitagroi where some zoomorphic representations may portray centaurs (fig. 9.74; pls. LVIII:2, A:2).

Masks of human beings and animals, and images of the aspect of the Goddess linked with the yearly plant life cycle, suggest the existence of cult drama performed in winter, spring, summer, and fall; of these the chief ceremony was most probably the ritual coition of the goddess and the male god, the bull-man or goat-man, the prototypal Dionysus. This performance was considered by many early agrarian cultures as imperative to insure fertility of the fields, animals, and human beings, bringing happiness and prosperity to the entire community.

The ceremonial *hieros gamos*, sacred marriage, is probably represented in a small statue of a masked ithyphallic man embracing a masked woman on whose body a large pubic triangle is incised (unearthed in the settlement of Gumelnitsa south of Bucharest; V. Dumitrescu 1968: 90). This is the same culture and the same phase as Sitagroi III, a circumstance which strengthens the possibility of the presence of the *hieros gamos* ritual at Sitagroi.

Sitagroi figurines are evidence of an advanced stage of a religion containing mythical images of a non-Indo-European (pre-Greek and pre-Thracian) system of ritual and belief with elements typical of an agricultural, matrifocal, and probably matrilinear society. Many of these elements continued in Minoan Crete, the Cyclades, and Greece of the third and second millennia BC. Some persisted in the ritual practices and myths of the Mycenaeans and later Greeks.

At Sitagroi, the sumptuous cult imagery and art disappeared from the archaeological record almost completely after phase III. The abrupt change must have been due to external influences, such as the introduction of a new religion linked to a different social system and economy. Such a change in the economy between phases III and IV is clearly seen in studies of grain and animal bones. The Balkans of the second half of the fifth millennium experienced the first infiltration of the horse-riding, pastoral people from south Russia, with a patrilinear, patriarchal social structure and a totally different religion (Gimbutas 1977, 1980). Many of the east Balkan tells after the second wave, ca. 3400-3200 BC, were converted to centers and acropolises of the conquering rulers (Ezero, Karanovo, Mikhalić, Sitagroi). The prolific production of images of the gods, goddesses, and demons of the indigenous religion ceased. The local population apparently resorted to secret practice of rituals in caves, hillsides, and woods. Little can therefore be said about the cults of phases IV and V. The lioness head carved of black stone from phase V (fig. 8.4b; pl. XXV) indicates Near Eastern influences and fits nowhere into earlier Sitagroi traditions but may have adorned a scepter belonging to the chieftain who resided in the Long House. Pottery decoration changed drastically: the exquisite painting techniques and the symbolic motifs dominated by snake spirals and meanders ceased, replaced by incised, stabbed, finger-pinched, and cord-impressed motifs representing symbols of a different nature. Foremost among them were sun and star designs, so characteristic of Cernavoda-Ezero-Baden, and Globular Amphora-Corded complexes of the fourth and third millennia BC bearing unquestionable elements of proto-Indo-European culture.



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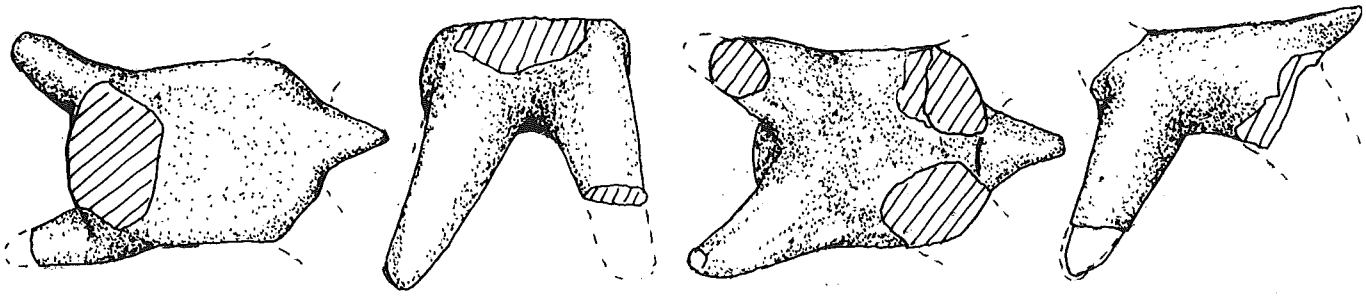

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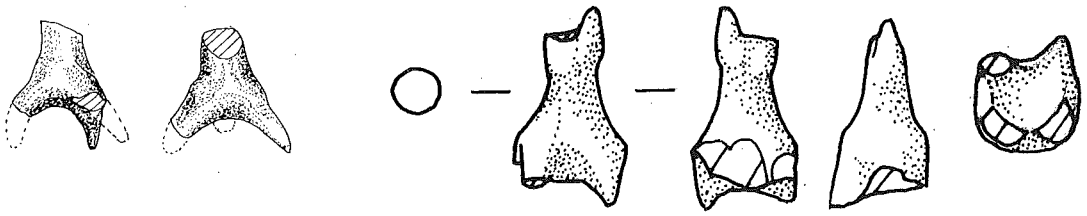

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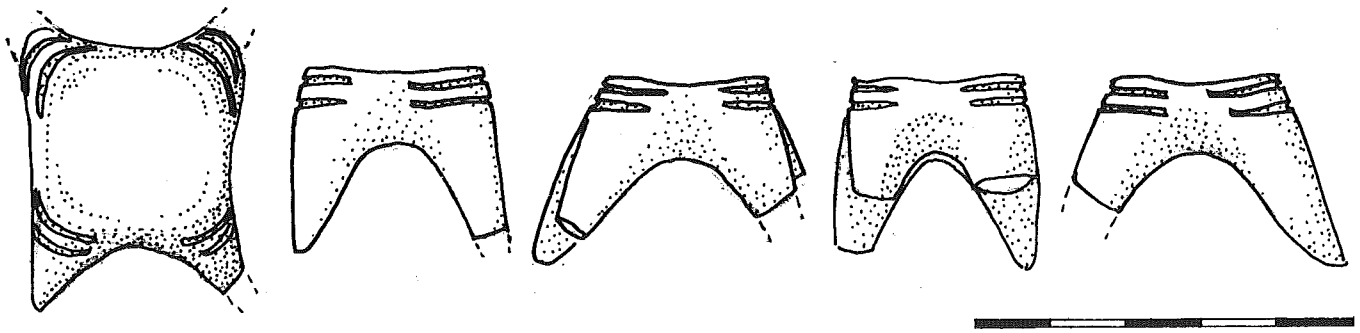
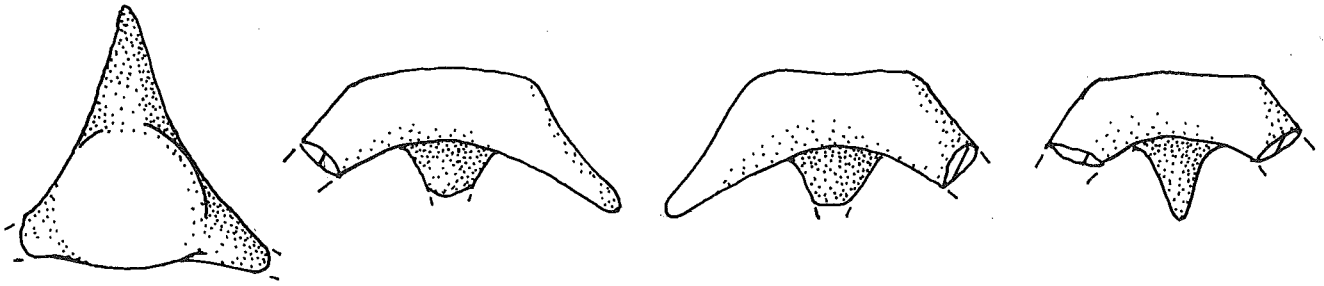
9.82 (16)



9.83 (9)

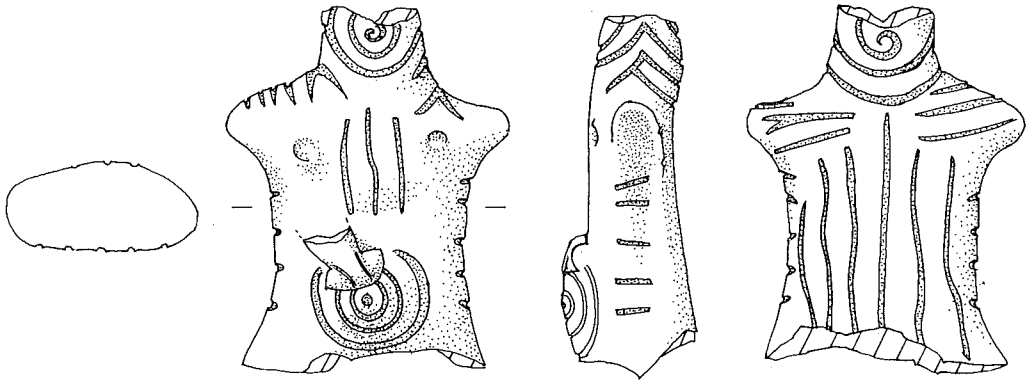
Figures 9.79-9.83. Thrones and goddesses fused with thrones.

9.84 (11)



9.85 (8)

Figures 9.84, 9.85. Miniature stools or thrones.



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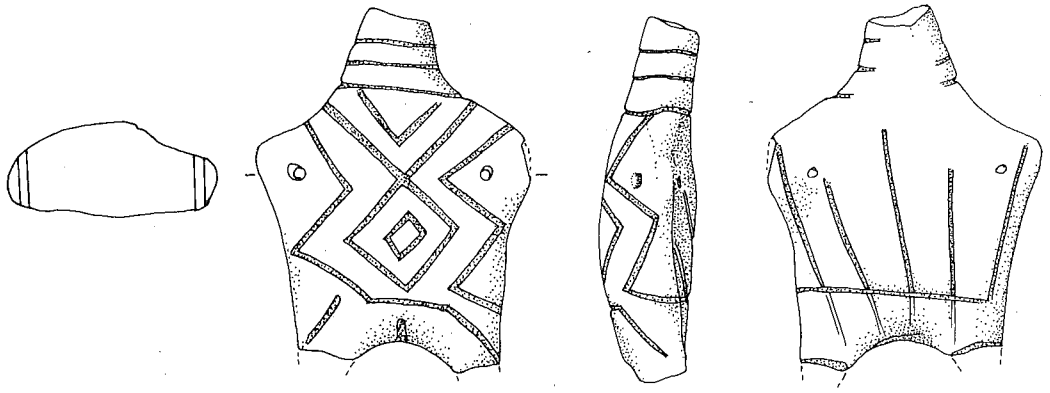
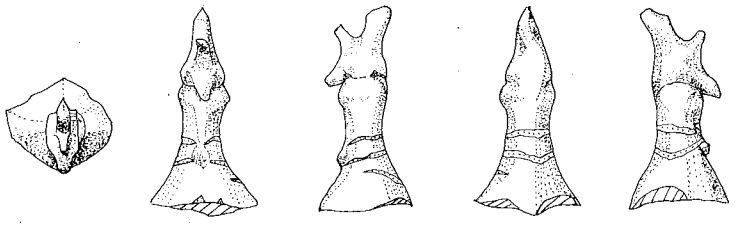


9.87 (27)

Figures 9.86, 9.87. Schematic figurine torsos.



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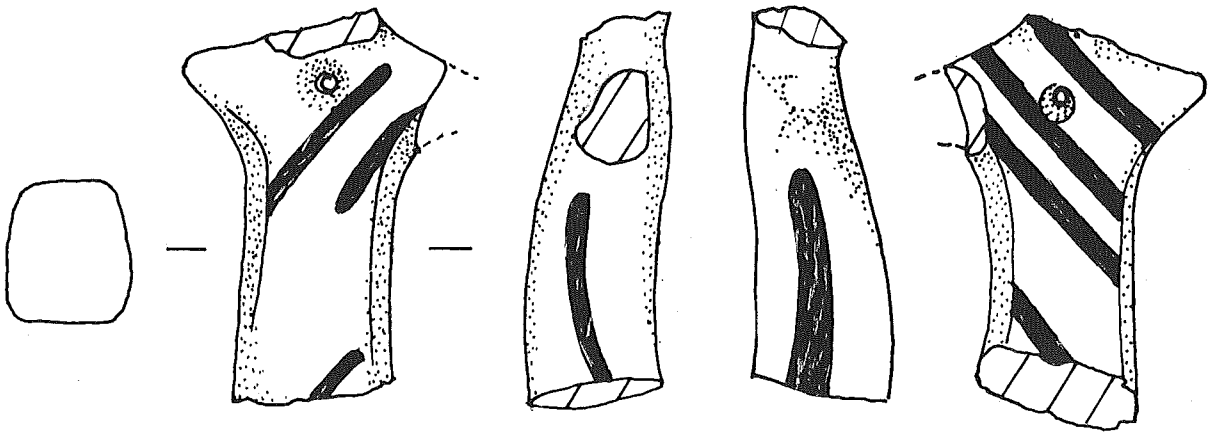

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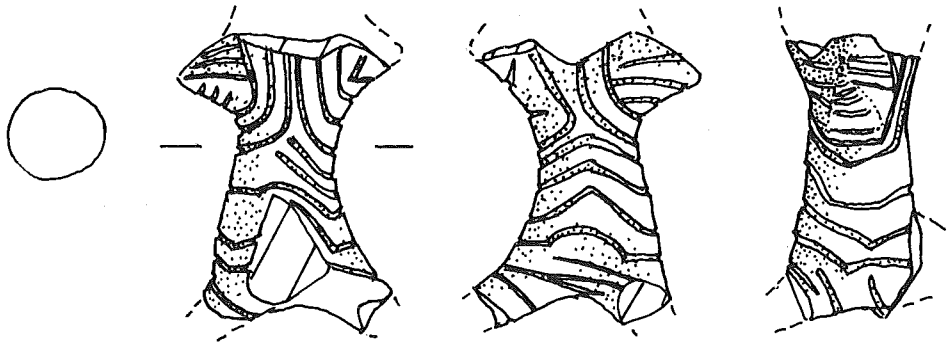

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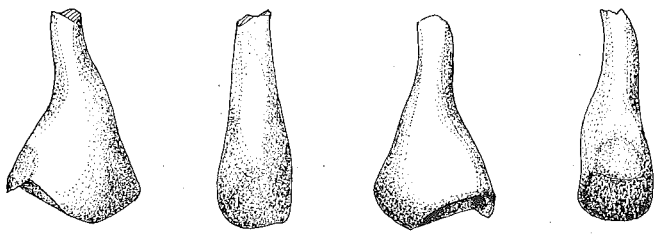
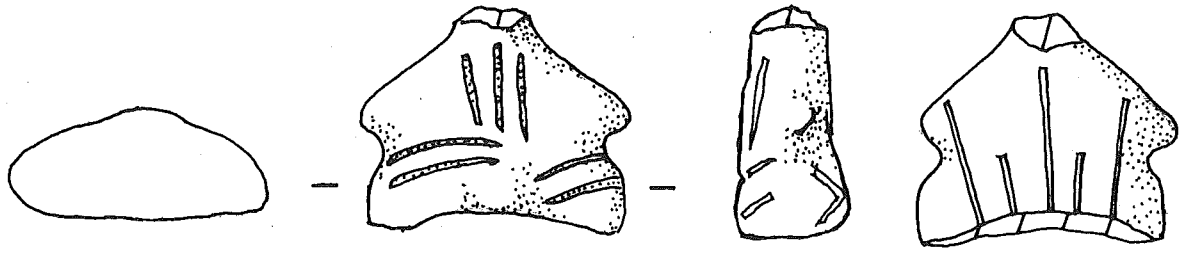


9.91 (1)

Figures 9.88-9.91. Unusual figurines.



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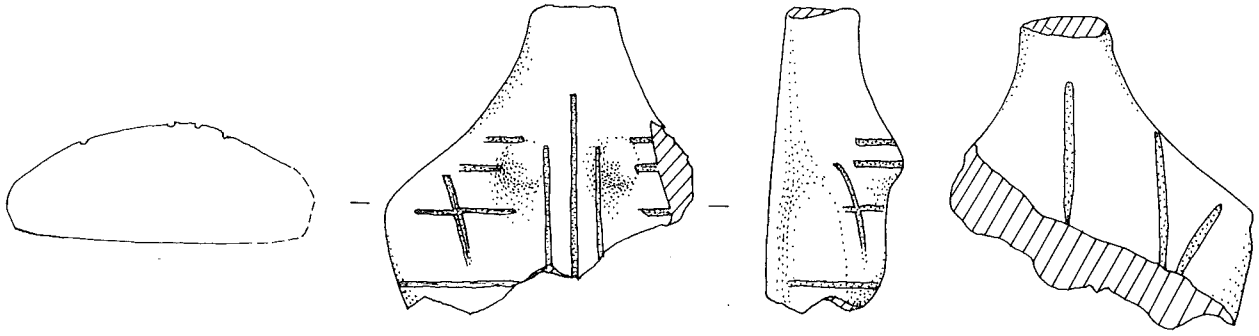

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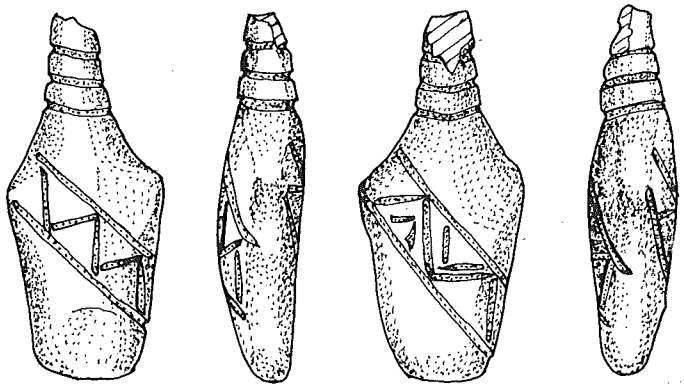

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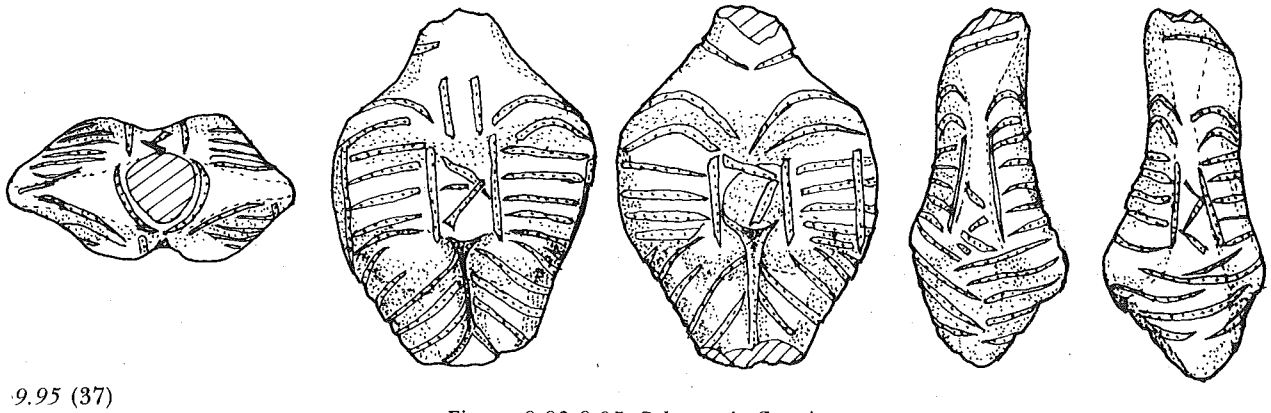

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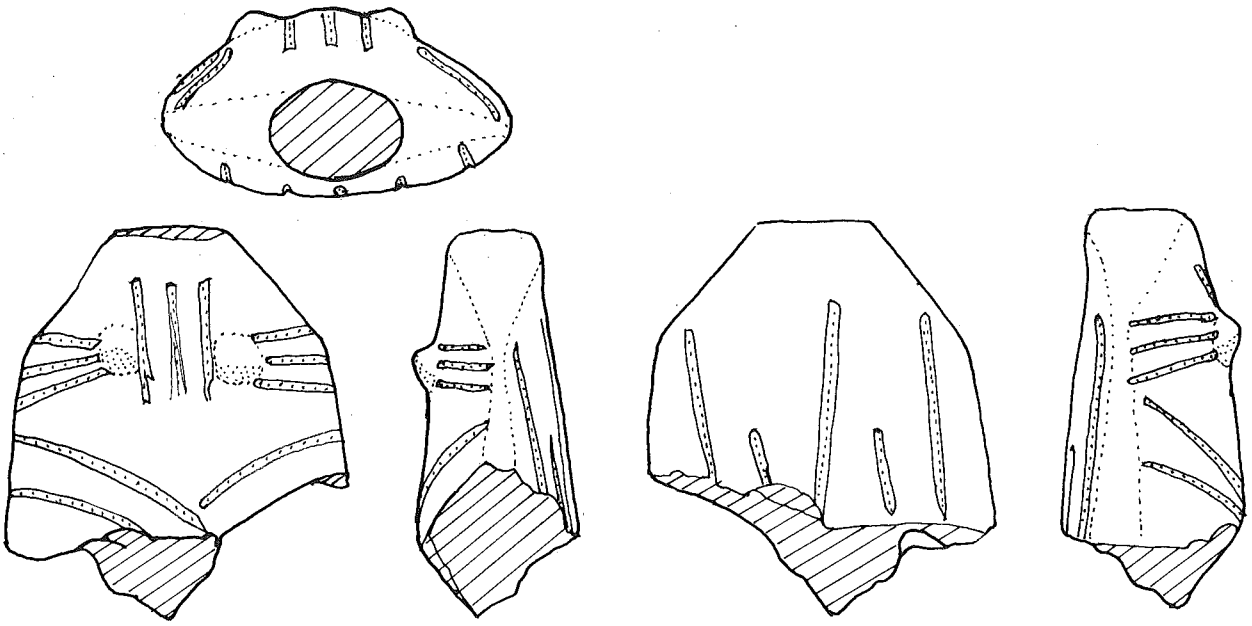
Figures 9.92-9.95. Schematic figurines.



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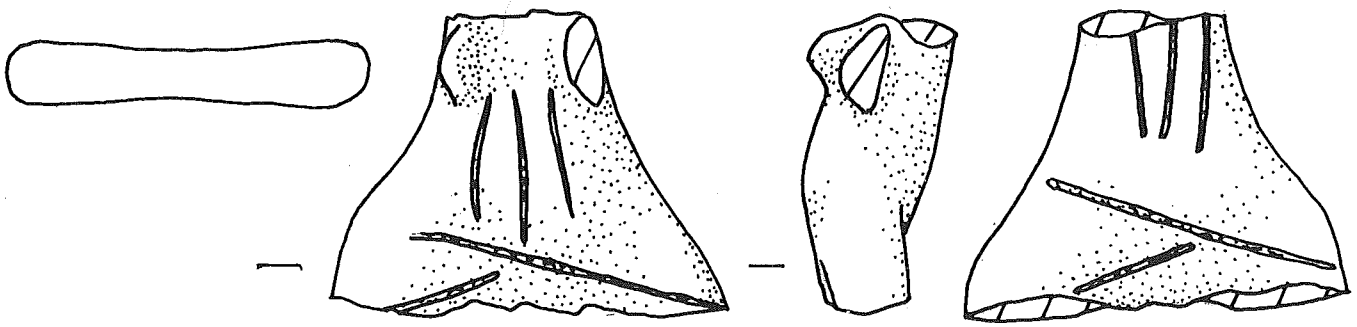

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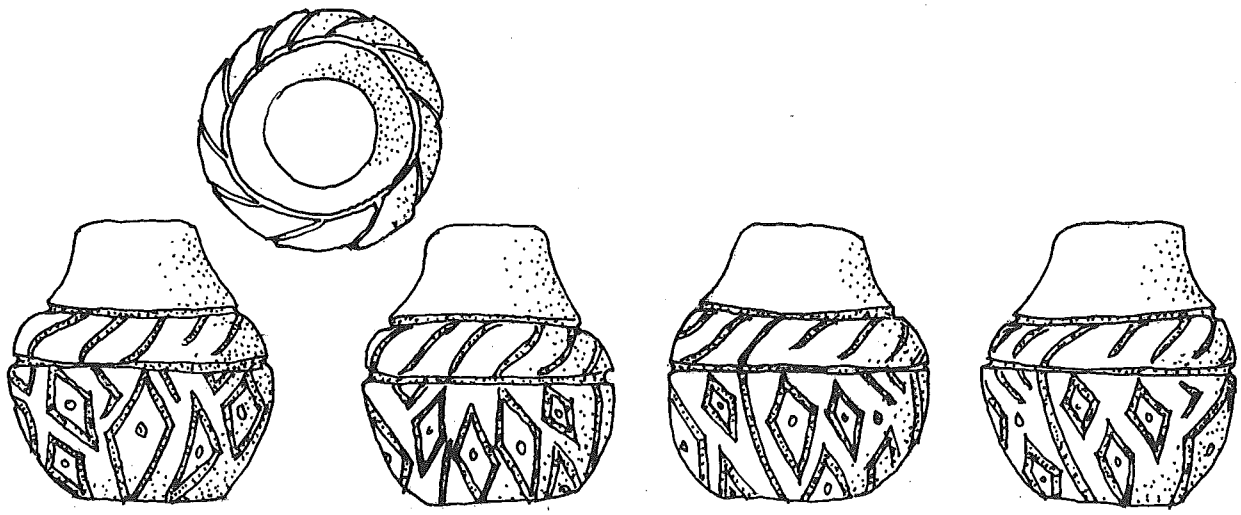
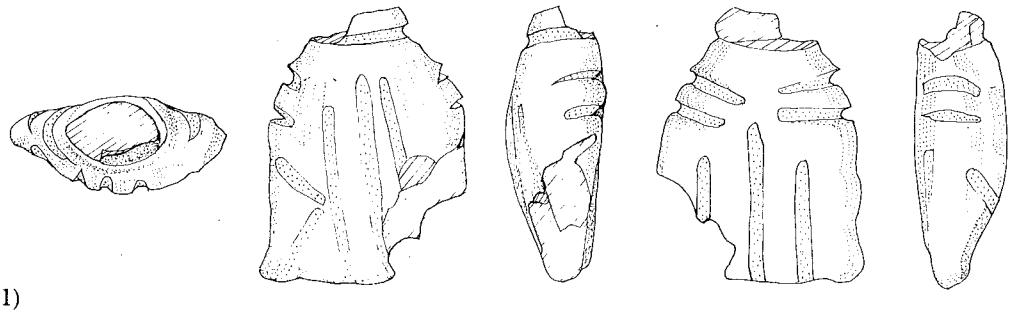


9.98 (155)

Figures 9.96-9.98. Figurines incised with symbolic signs.



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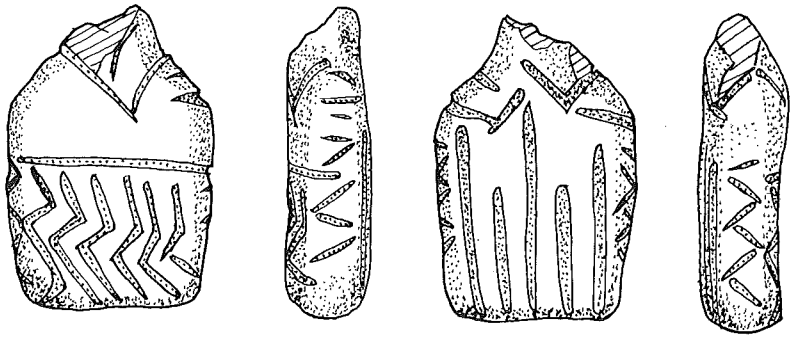

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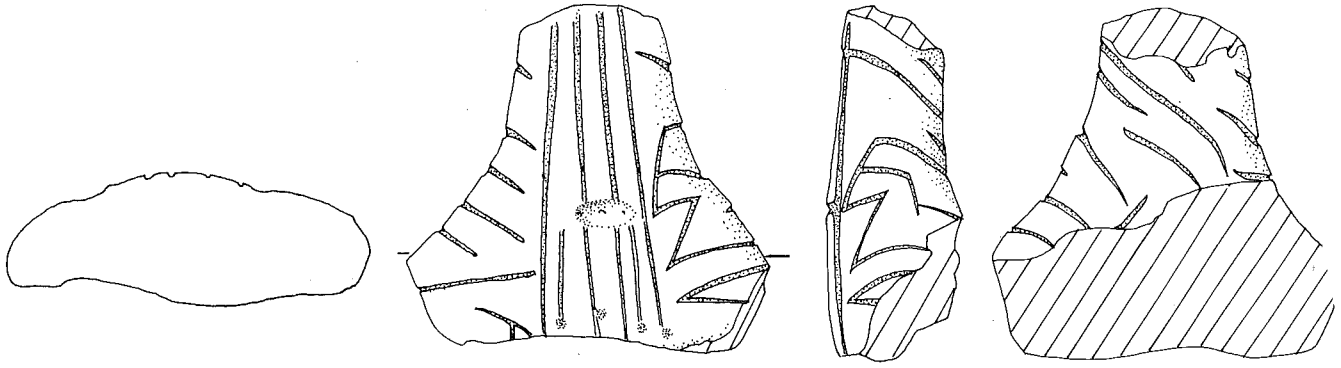

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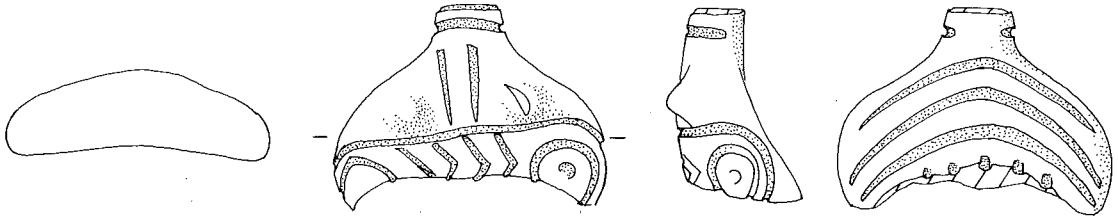

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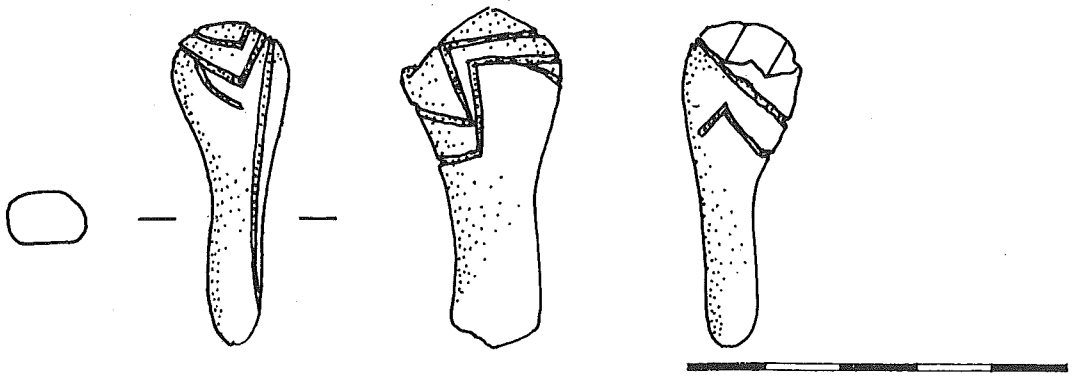
Figures 9.99-9.102. Figurines incised with symbolic signs.



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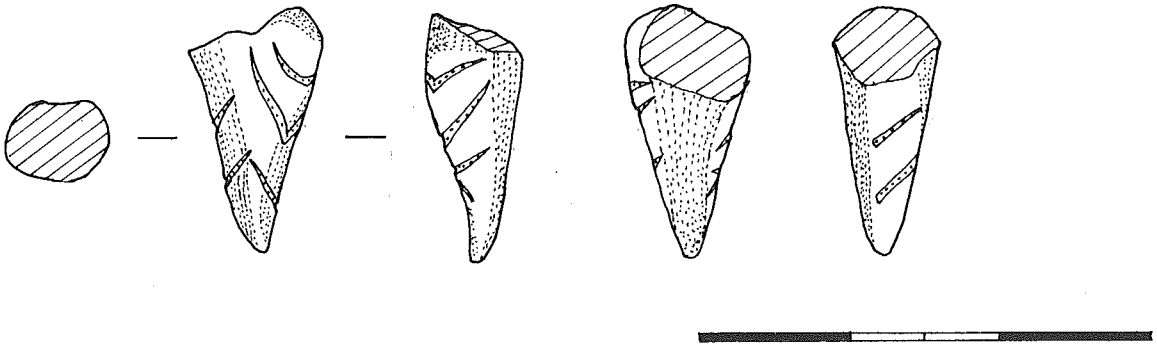

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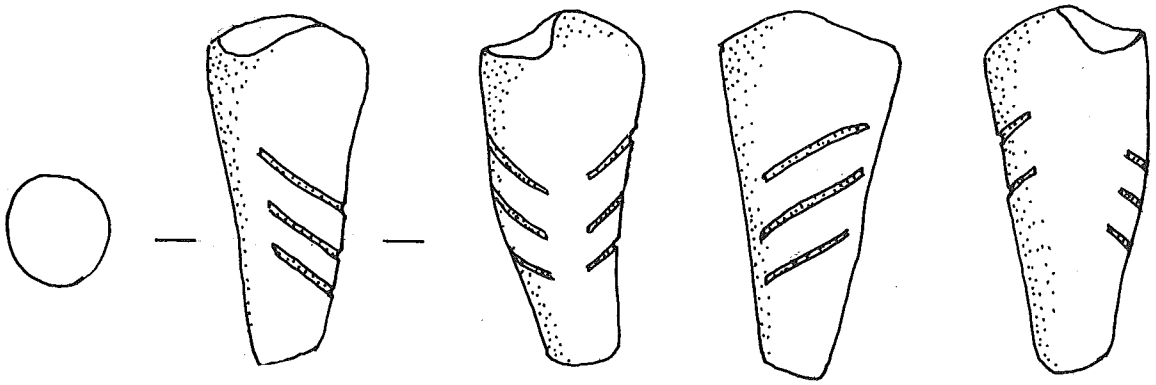

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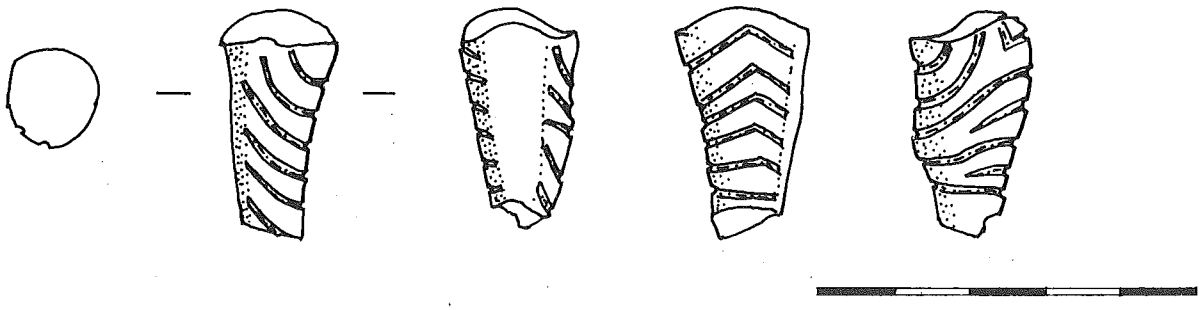

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Figures 9.103-9.106. Figurine legs incised with chevrons, zigzags, and parallel lines.

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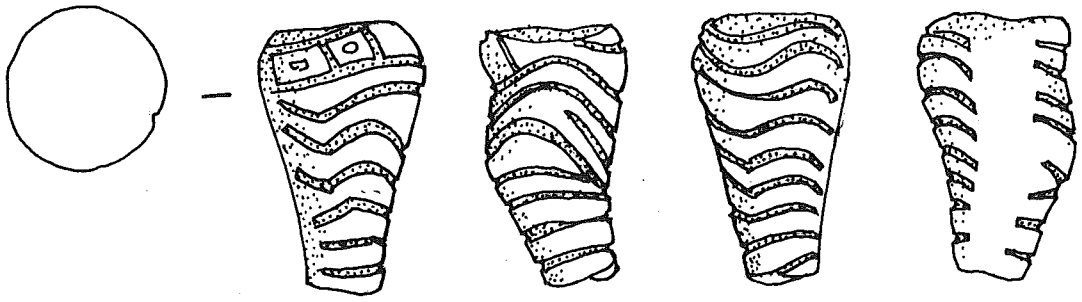

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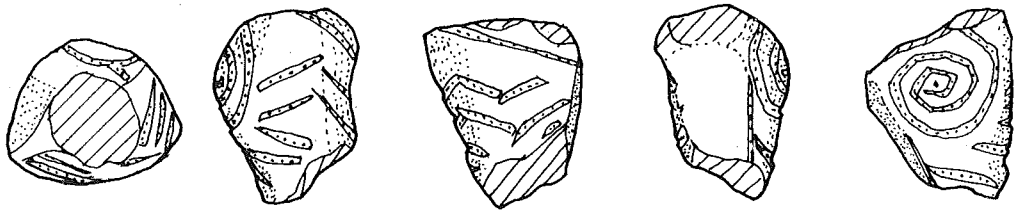

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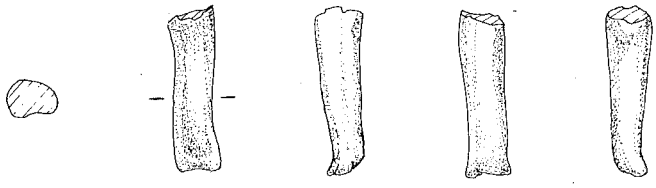

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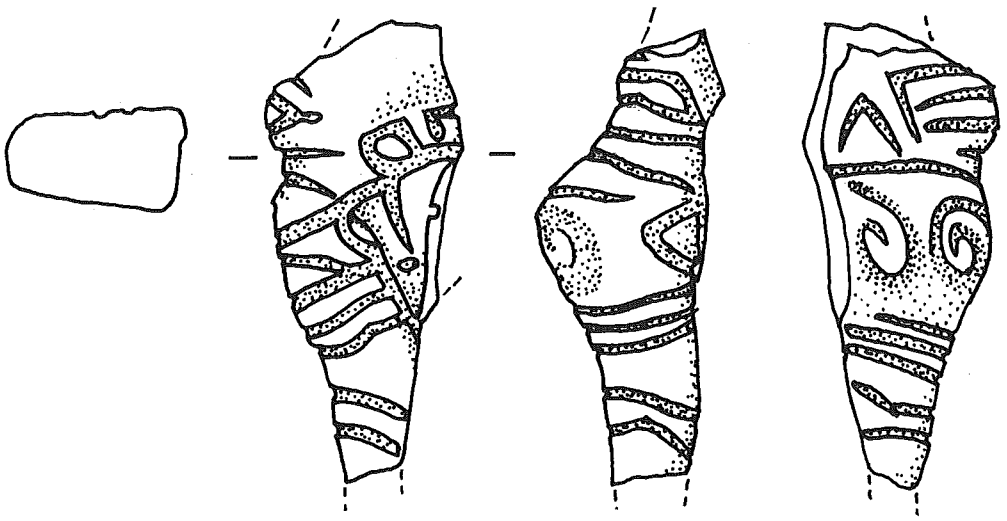
Figures 9.107-9.110. Figurine legs, incised and plain.



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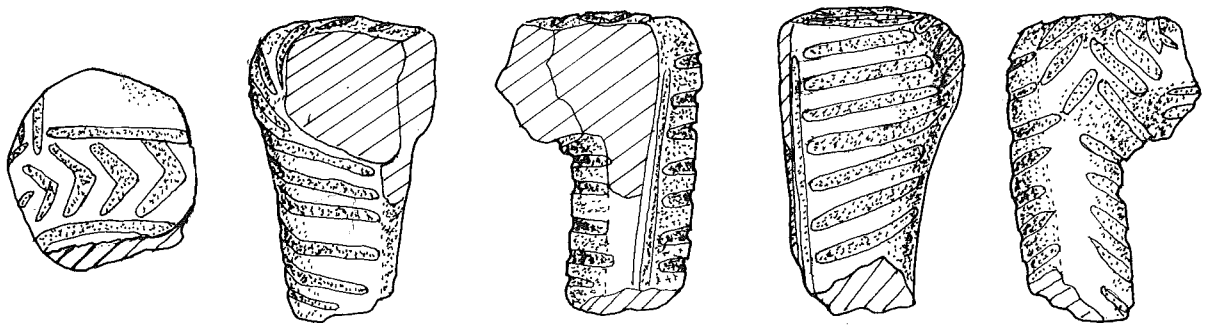

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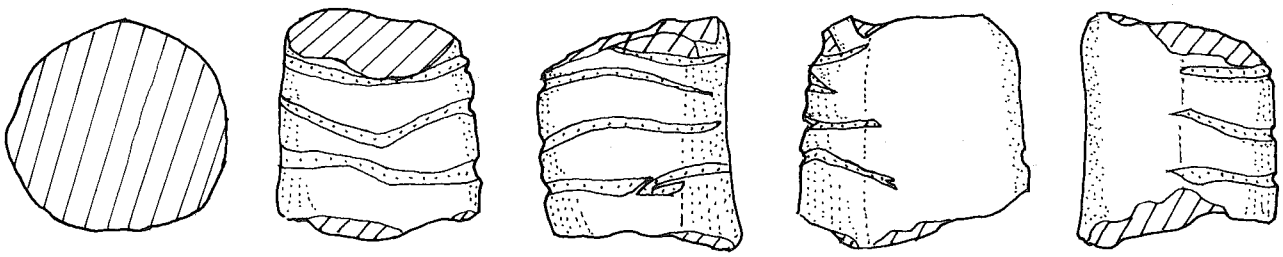
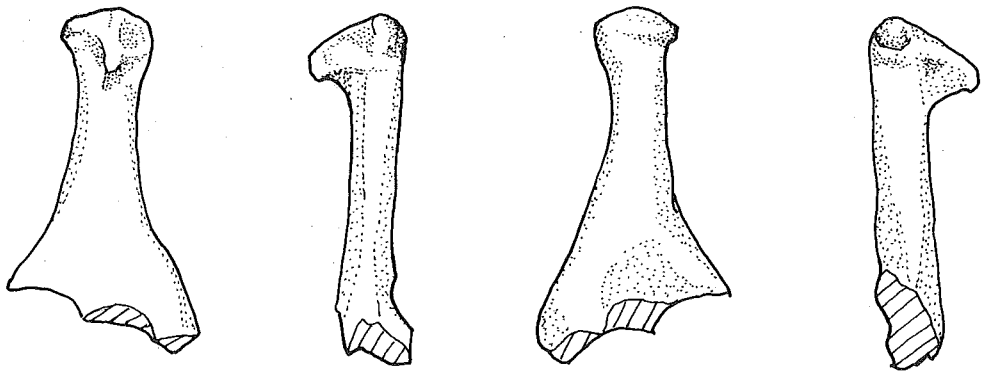


9.113 (108)

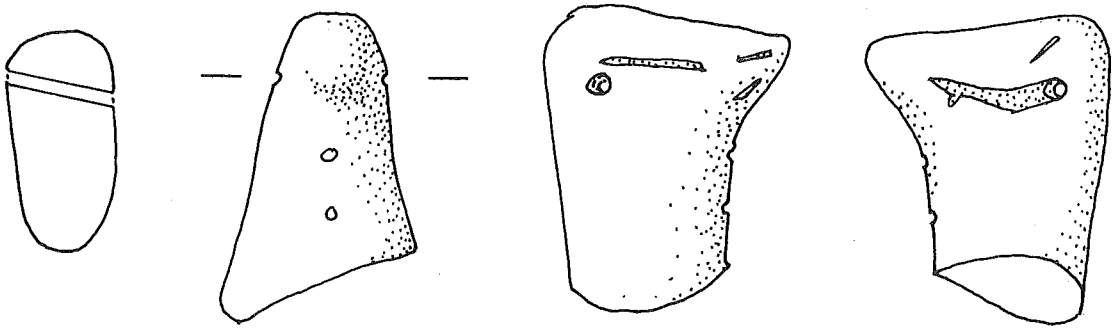
Figures 9.111-9.113. Symbolically decorated leg fragments.



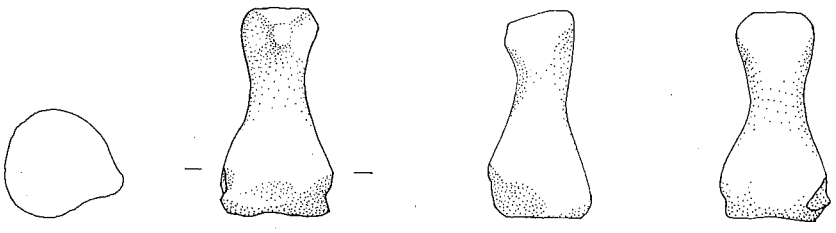
9.114 (80)

9.115 (81)

9.116 (82)

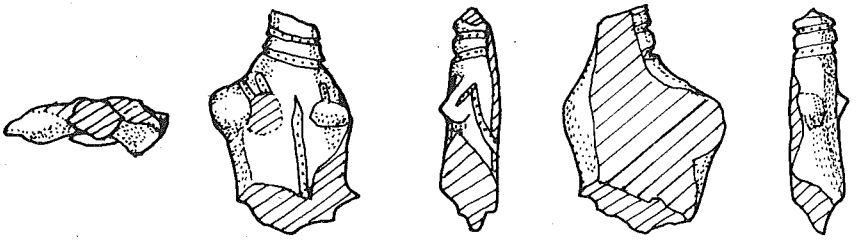


9.117 (86)

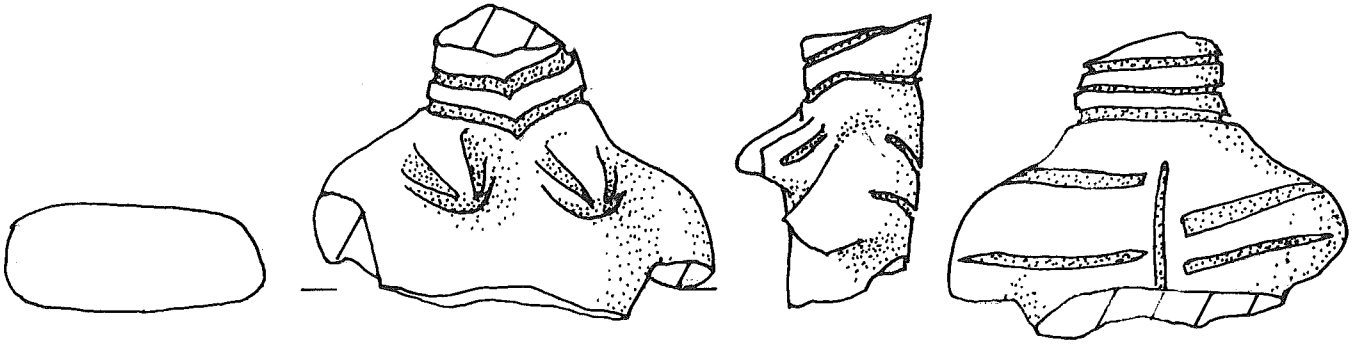


9.118 (115)

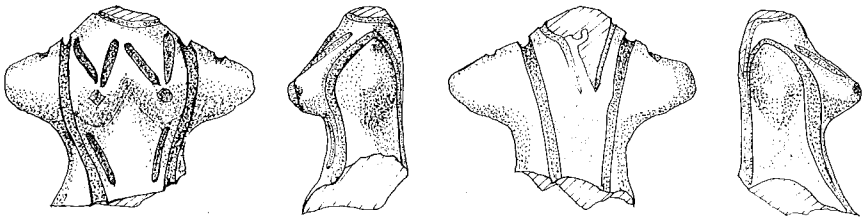
Figures 9.114-9.118. Bird-headed figurines.



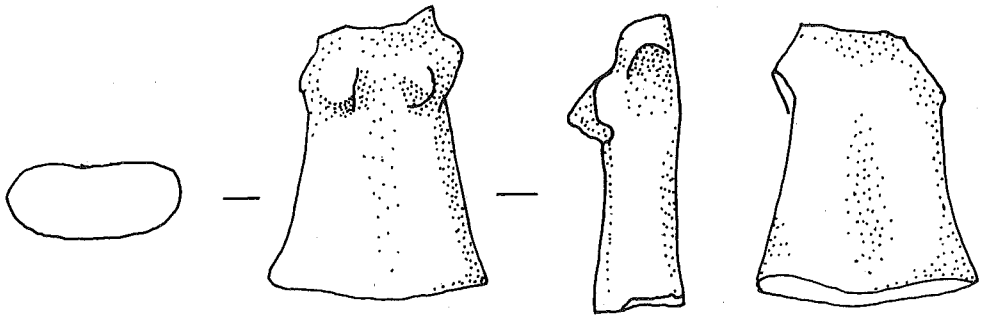
9.119 (99)



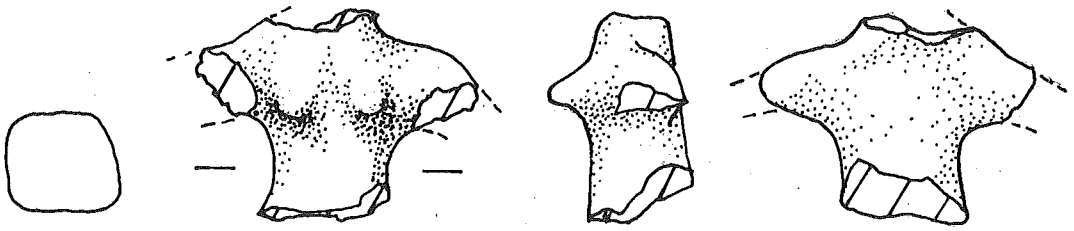
9.120 (100)



9.121 (102)

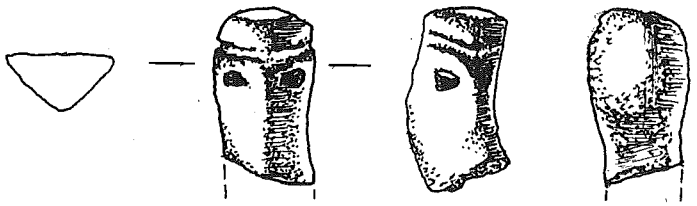


9.122 (140)

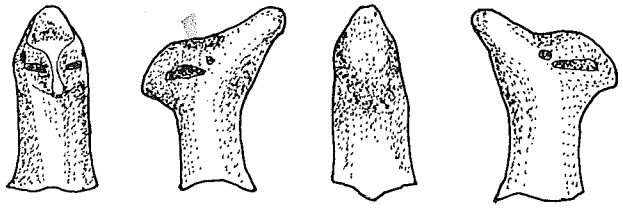


9.123 (142)

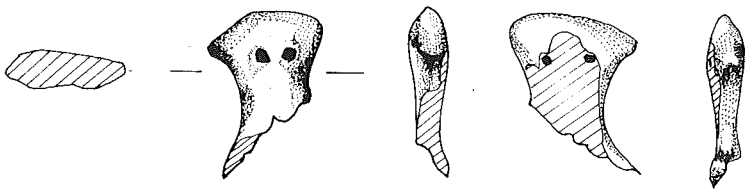
Figures 9.119-9.123. Figurines with breasts, some with V's above breasts.



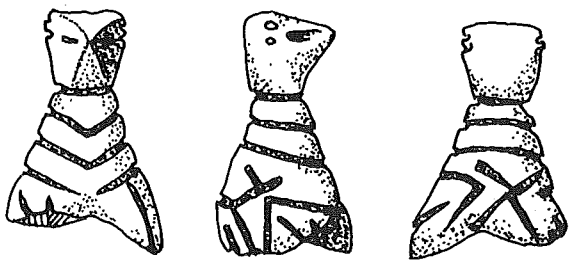
9.124 (113)



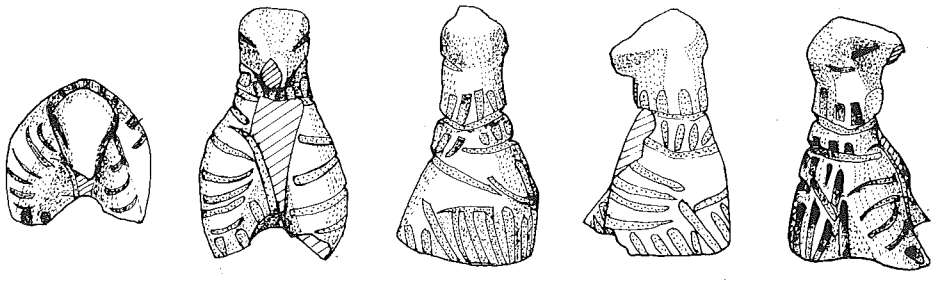
9.125 (117)



9.126 (136)



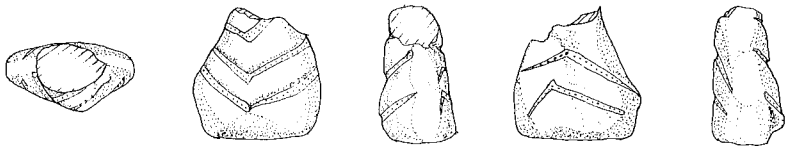
9.127 (83)



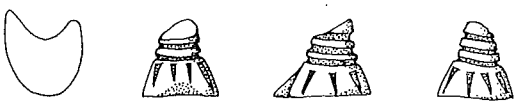
9.128 (122)

Figures 9.124-9.128. Miniatures and schematic bird-headed figurines.

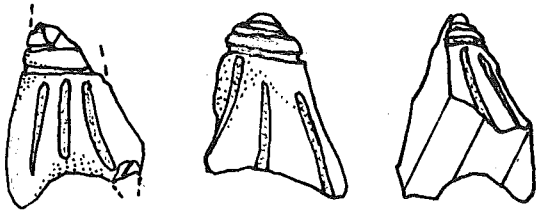
9.129 (123)



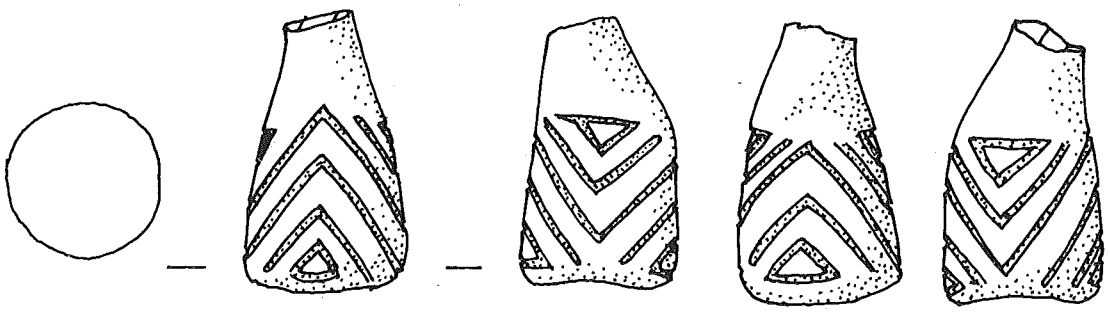
9.130 (120)



9.131 (124)

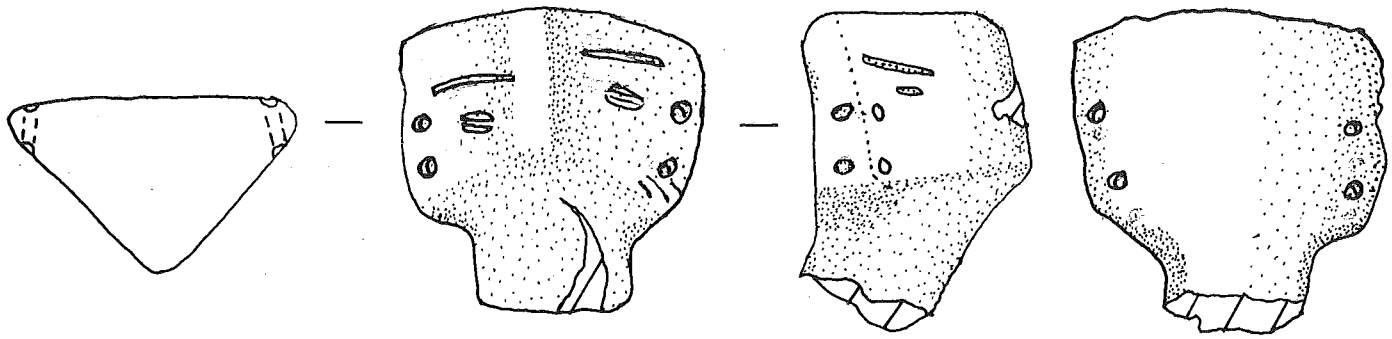


9.132 (125)



9.133 (226)

Figures 9.129-9.133. Schematic headless miniatures.



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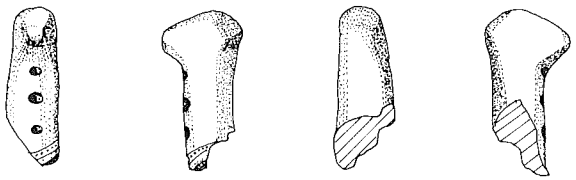

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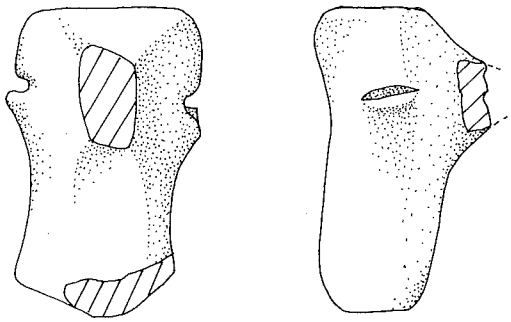
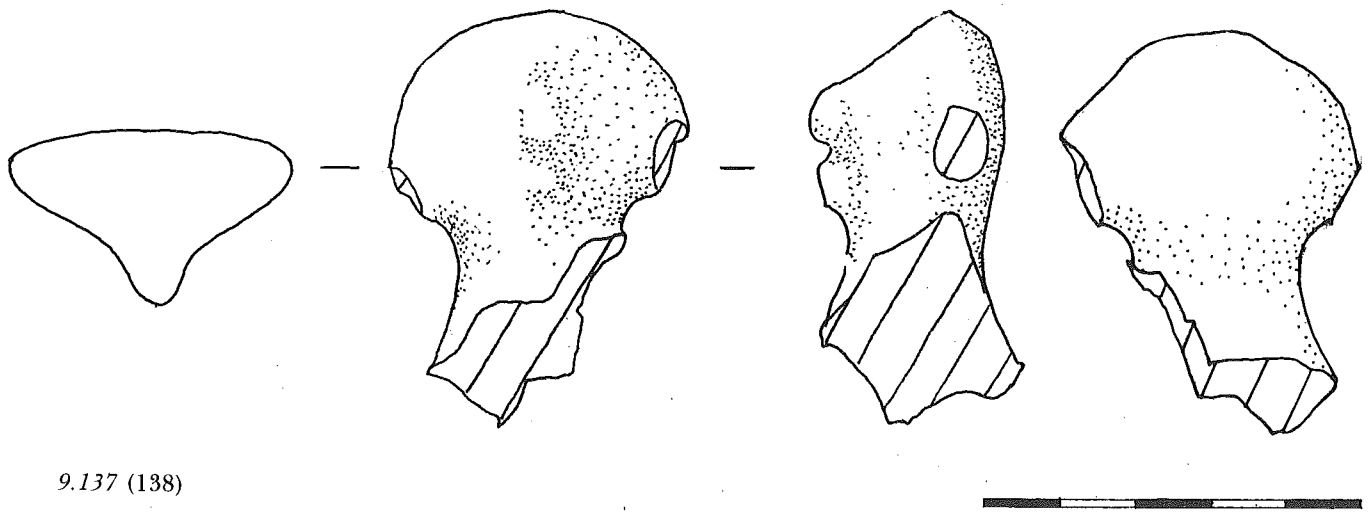


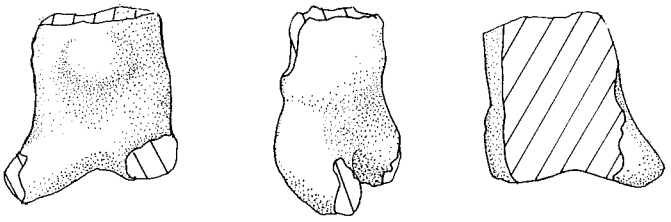
9.136 (212)



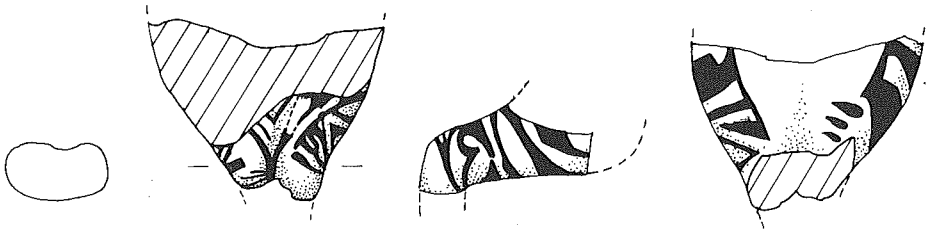
9.137 (138)

Figures 9.134-9.137. Figurine heads, some with perforations for earrings or three holes on the neck.

9.138 (148)



9.139 (185)



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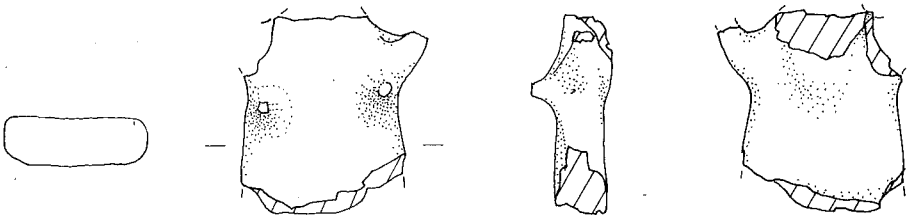

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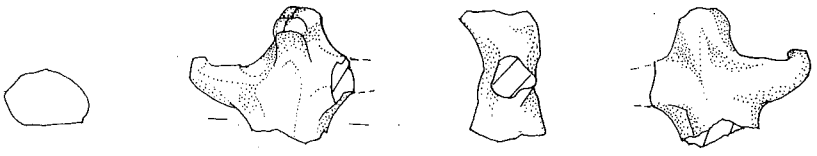
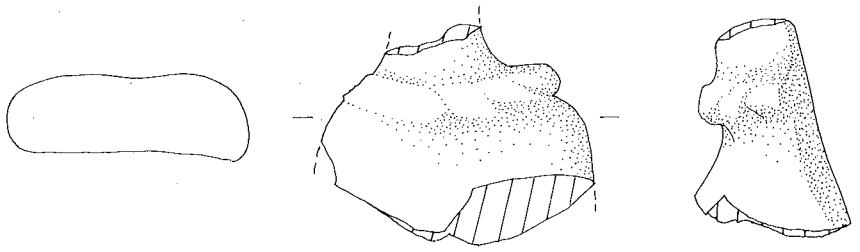
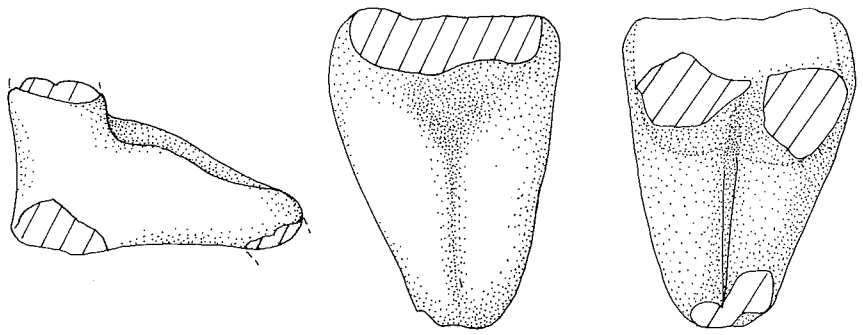


9.142 (224)

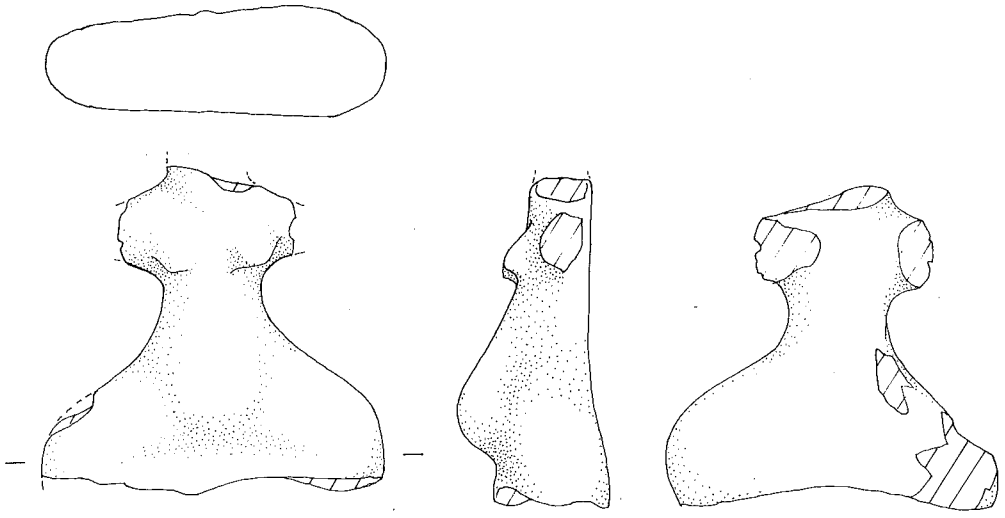
Figures 9.138-142. Various fragmentary figurines. Note double fruit (or acorn) sign on *9.140*.



9.143 (143)

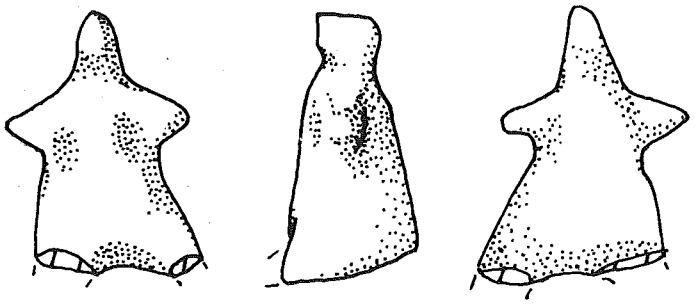


9.144 (163)

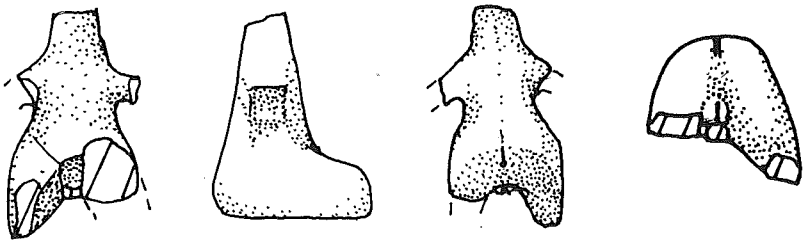


9.145 (149)

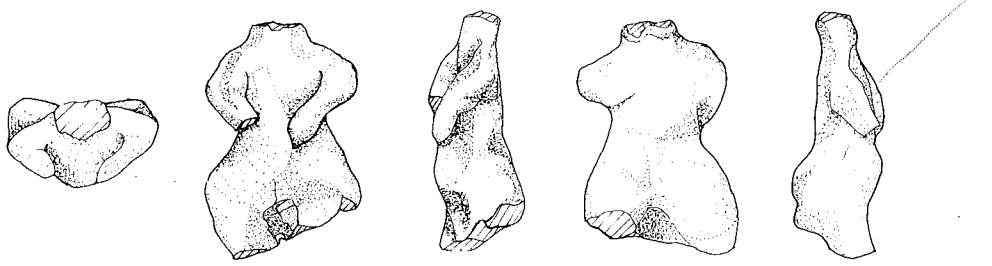
Figures 9.143-9.145. Figurines: *9.143*, corpulent; *9.144-145*, seated or squatting.



9.146 (173)



9.147 (158)



9.148 (150)

Figures 9.146-9.148. Possible representations of birth-giving posture.

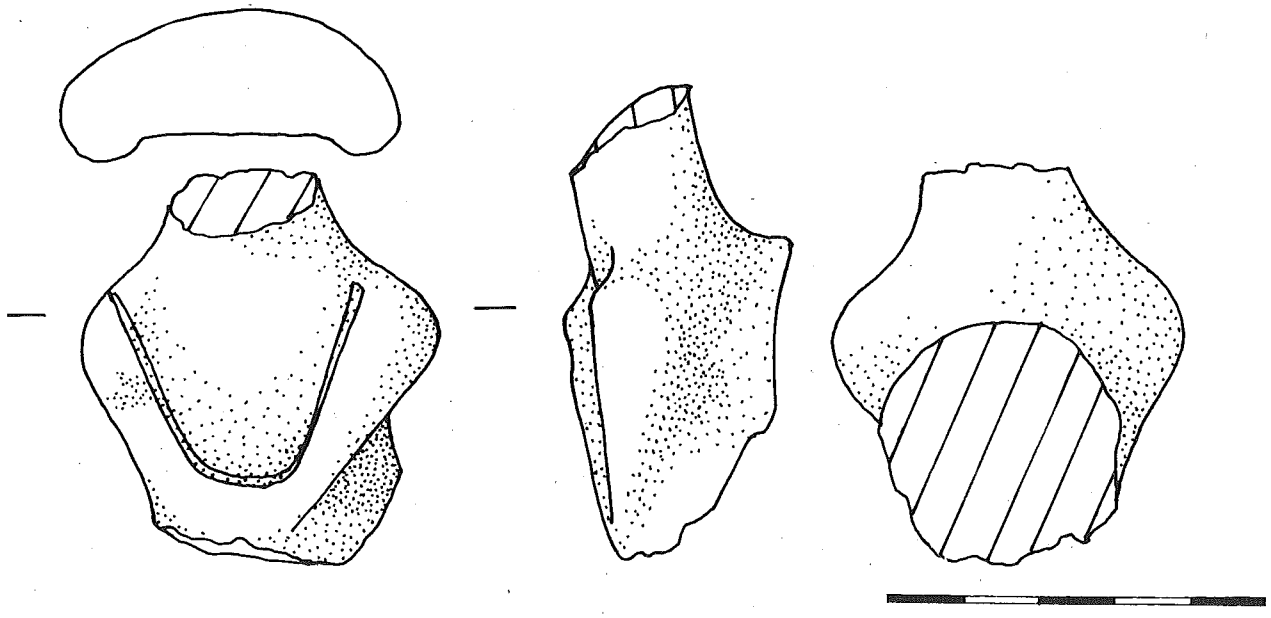
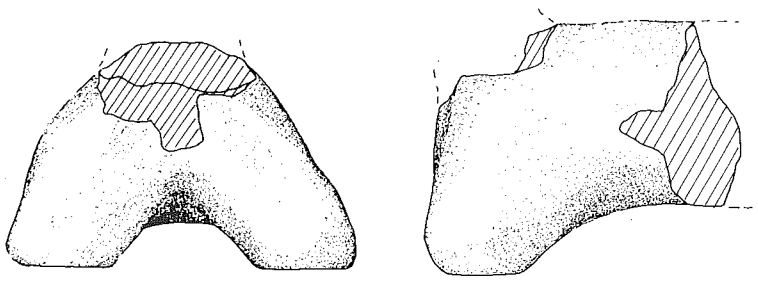
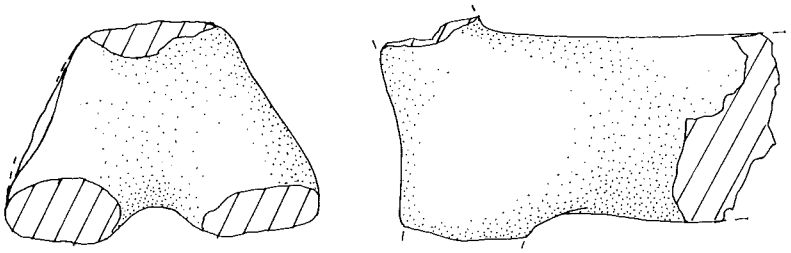


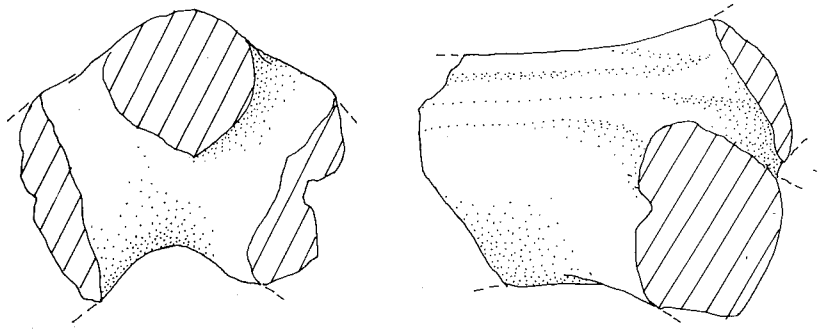
Figure 9.149 (227). Anthropomorphic vessel handle.



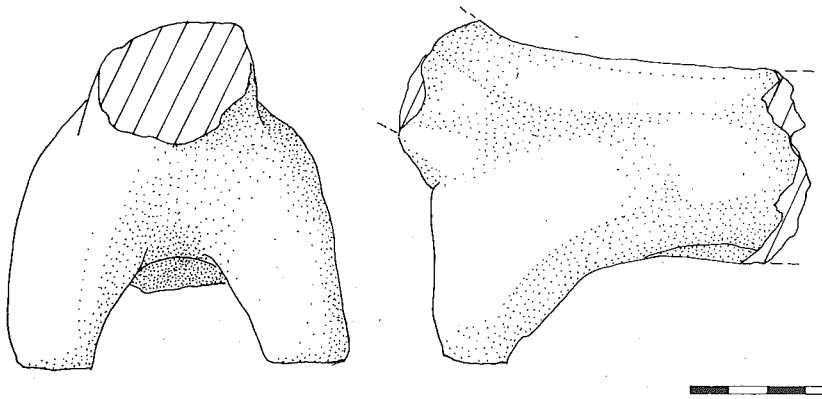
9.150 (96)



9.151 (177)

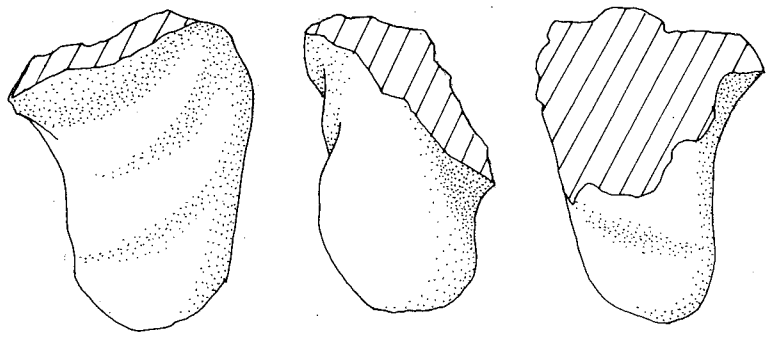


9.152 (176)

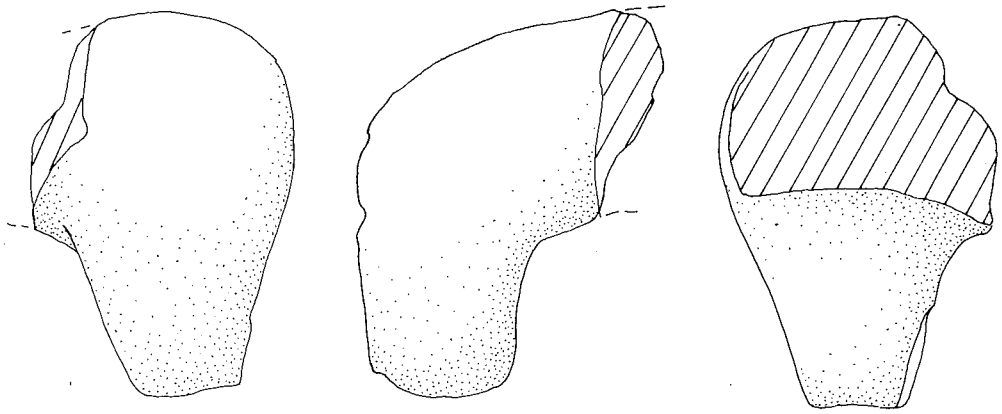


9.153 (179)

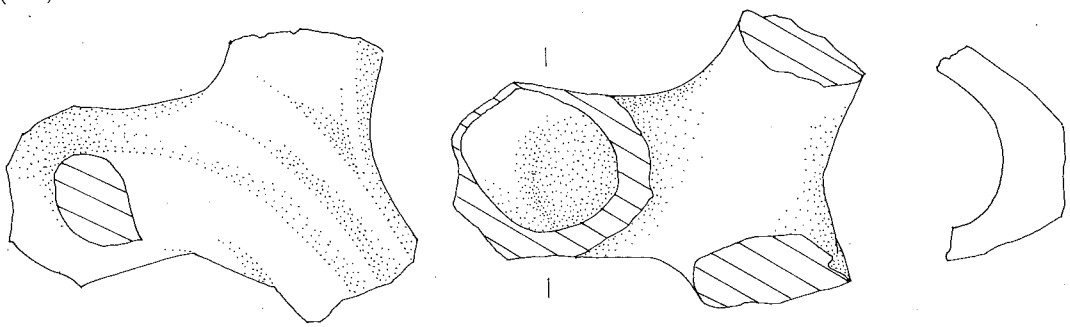
Figures 9.150-9.153. Torsos of bulls.



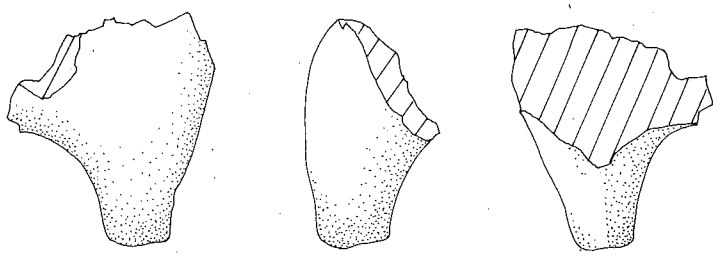
9.154 (180)



9.155 (181)

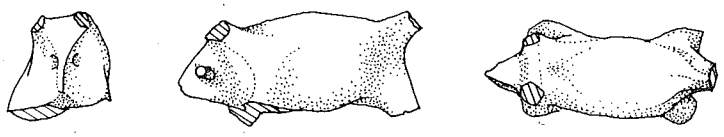


9.156 (182)

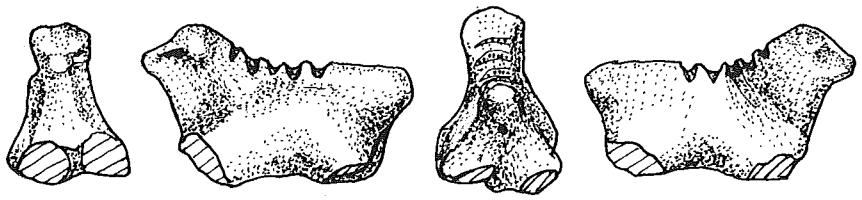


9.157 (184)

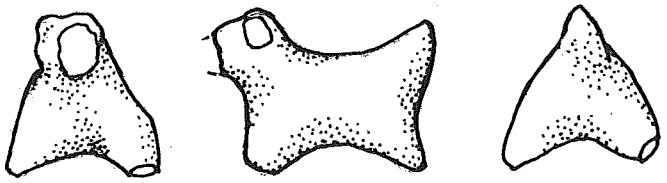
Figures 9.154-9.157. Front and hind legs of bulls.



9.158 (6)



9.159 (188)



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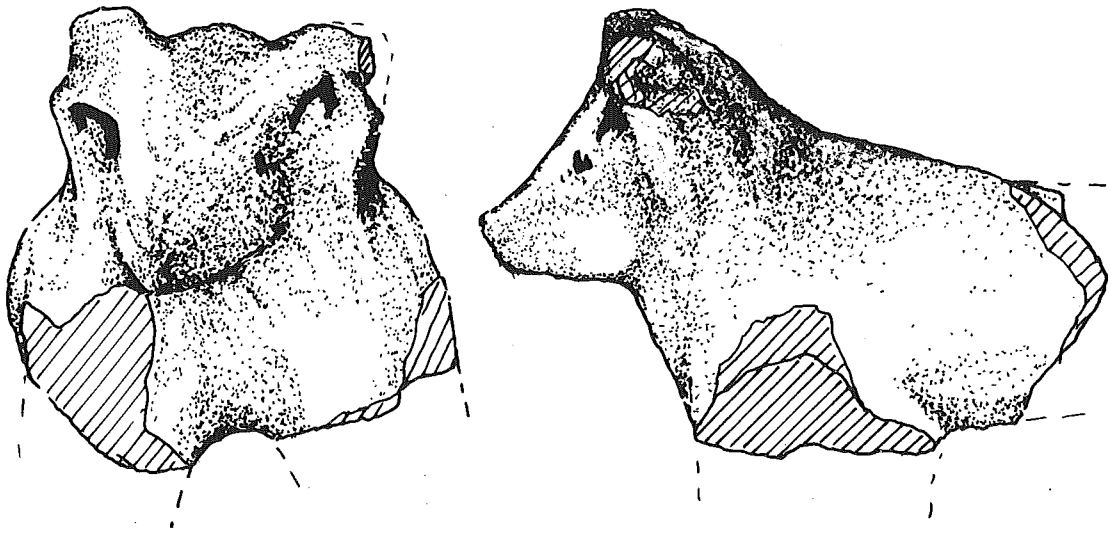
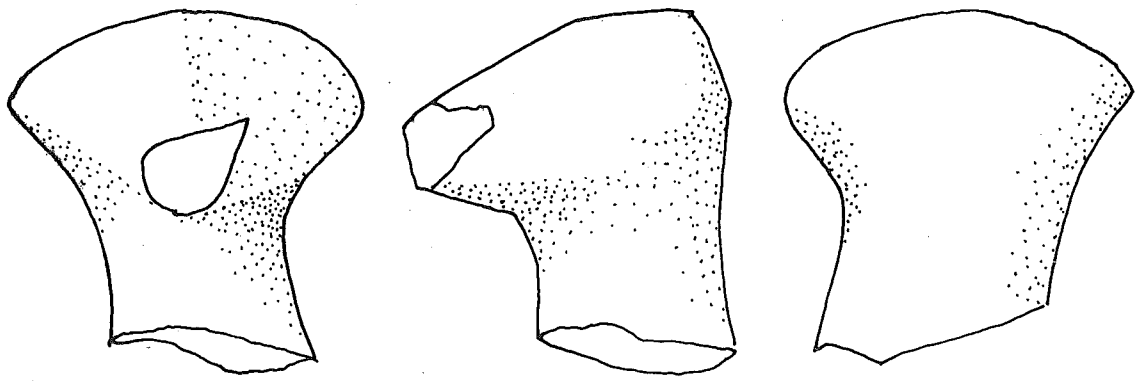


9.161 (217)

Figures 9.158-9.161. Zoomorphic figurines, probably dogs.



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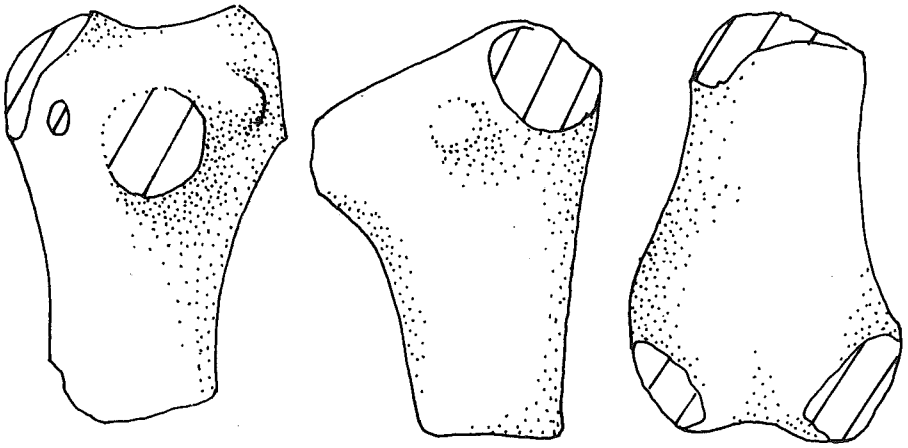
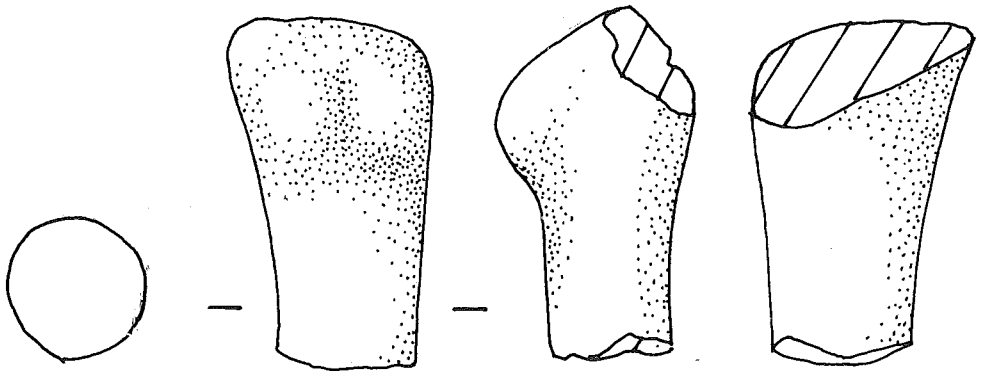


9.163 (209)



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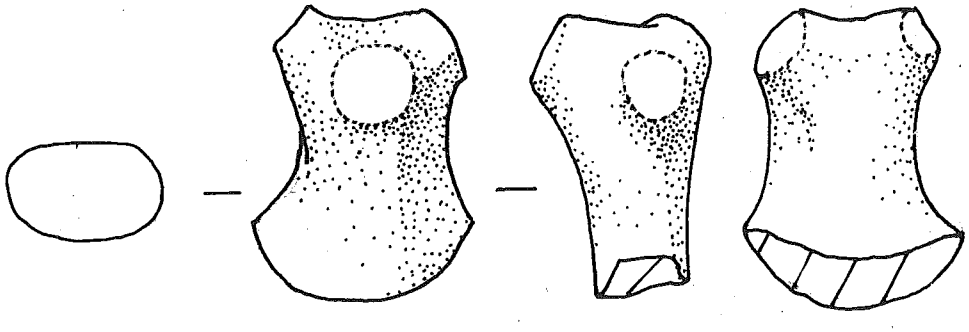
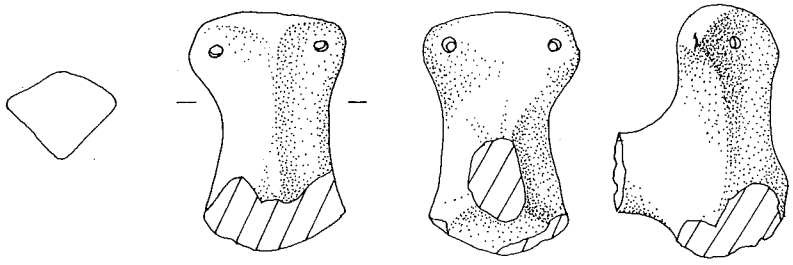


9.165 (210)

Figures 9.162-9.165. Animal heads.



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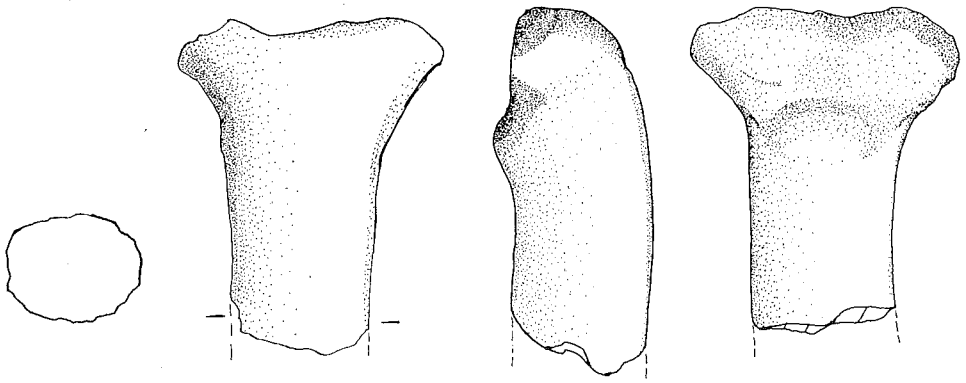

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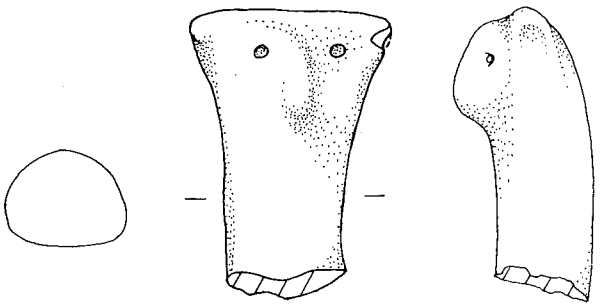

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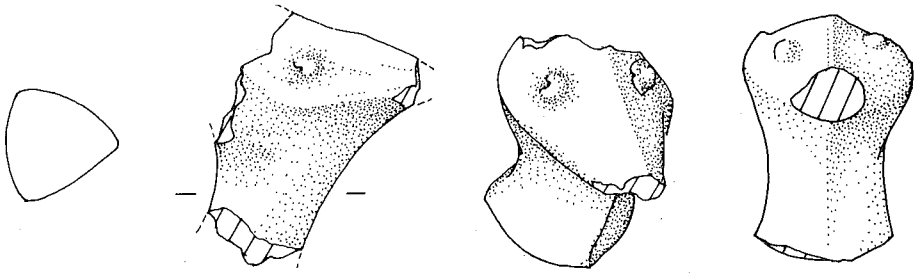
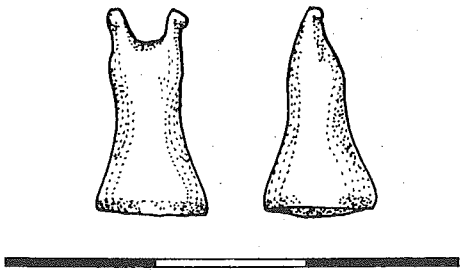
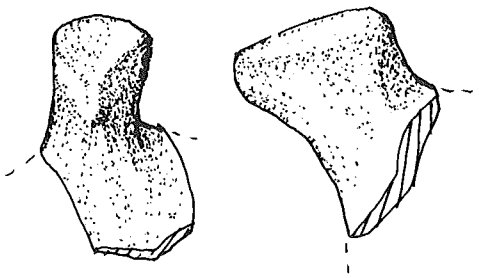


9.169 (199)

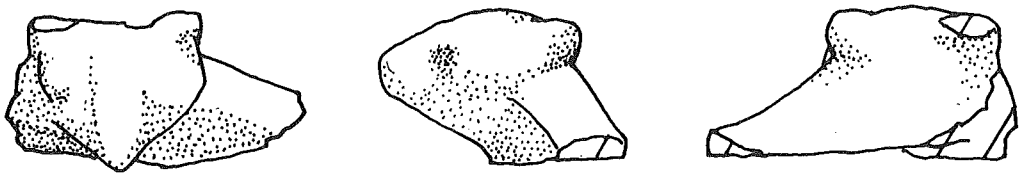
Figures 9.166-9.169. Animal heads.



9.170 (95)



9.171 (89)



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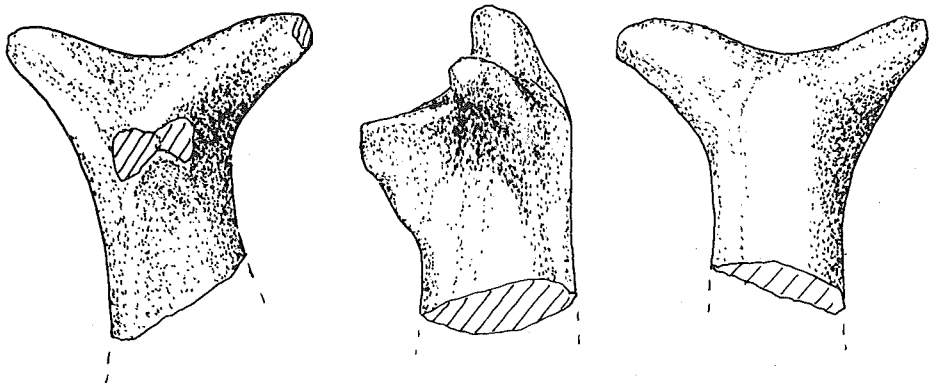

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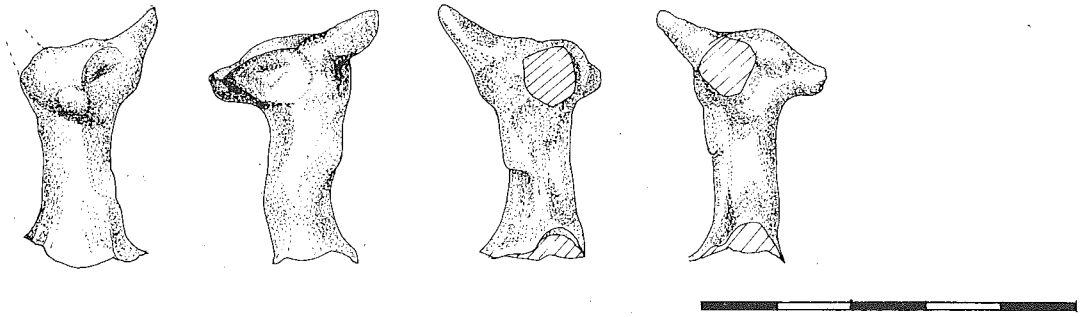

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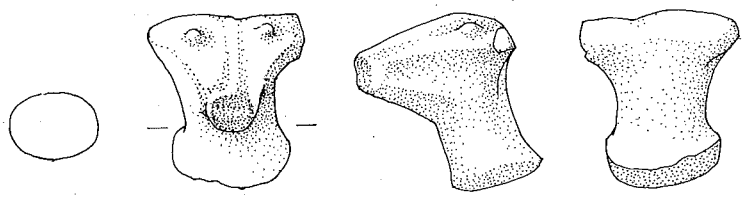
Figures 9.170-9.174. Animal heads.



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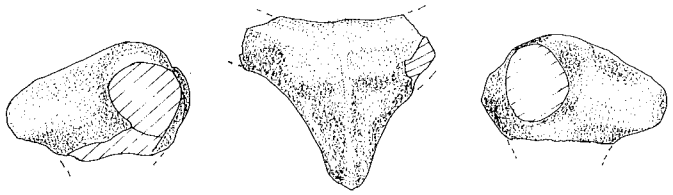

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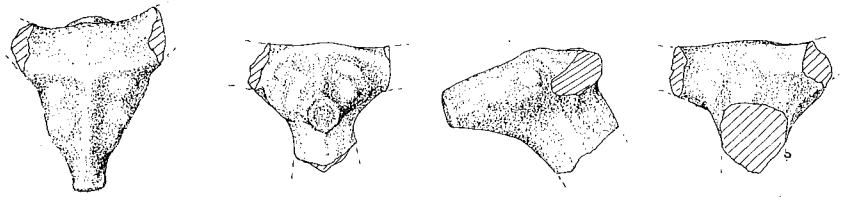

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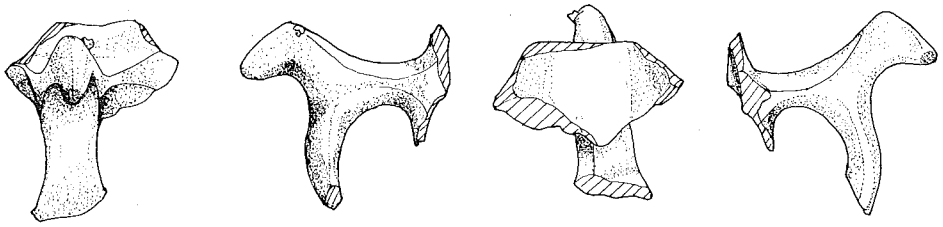

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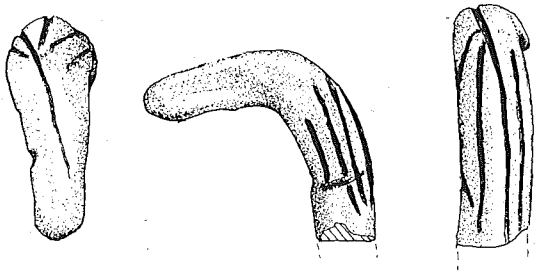
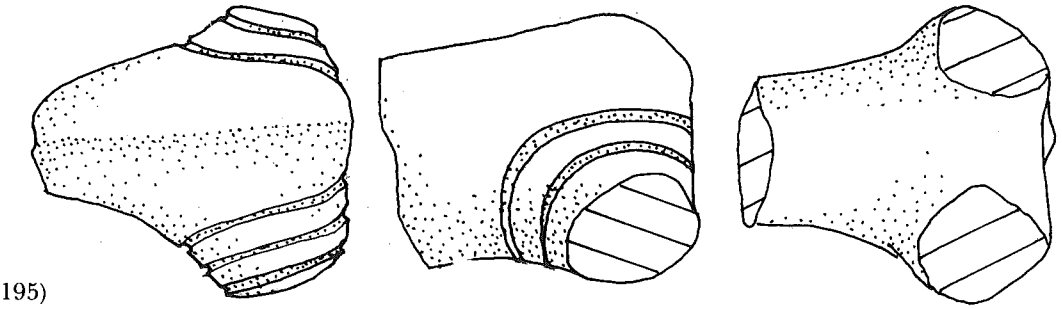
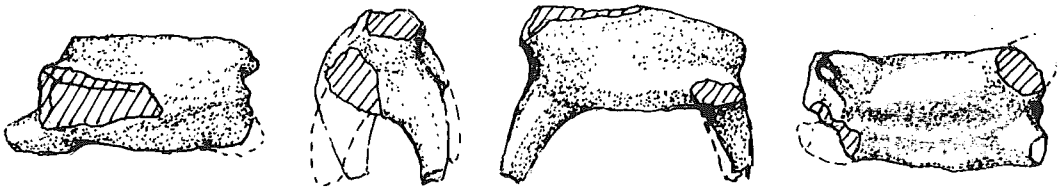


9.179 (218)

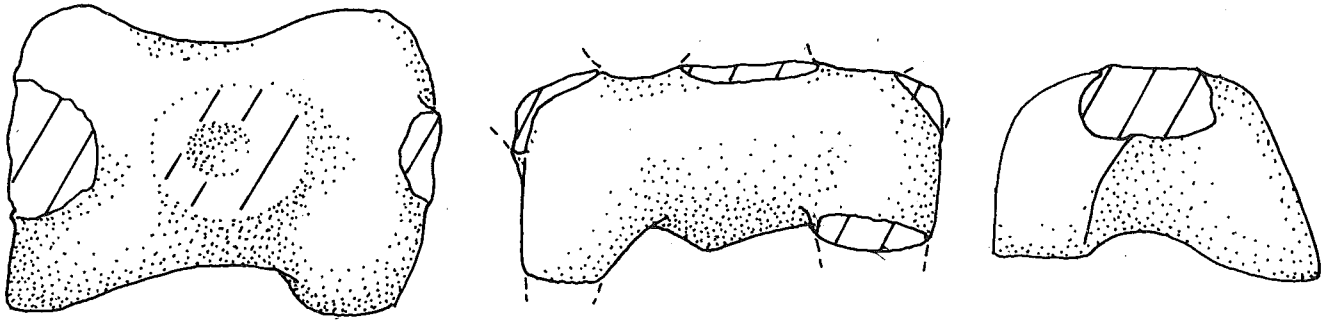
Figures 9.175-9.177, 9.179. Animal heads. *Figure 9.178.* Vessel handle.



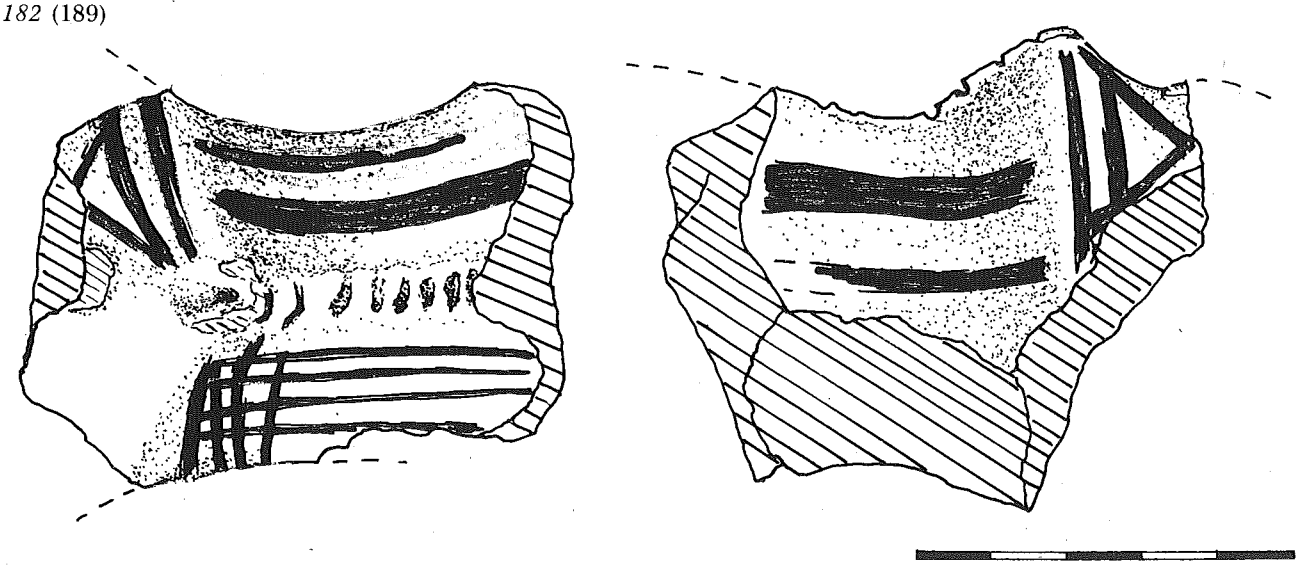
9.180 (195)



9.181 (216)



9.182 (189)



9.183 (187)

Figures 9.180-9.183. Animal body fragments.

APPENDIX E
Figurine Catalog
Marija Gimbutas

This catalog is ordered typologically from phase I through V. Information given follows this sequence: catalog number, phase (in parentheses, if more than one, second indicates typological phase assigned by author, U indicates unstratified, S indicates surface find), small find number, context (lower case "s" means recovery during sieving), reference to illustration (not all artifacts are illustrated), description, measurements in cm (in brackets). Abbreviations used are L., length; H., height; W., width; Diam., diameter; and Th., thickness.

1 (I) 5189a ZA 63 s Fig. 9.91
Miniature schematized seated figurine. Head and base broken. [H. 1.7, W. 1.6]

2 (I) 5189b ZA 63 s Not Illustrated
Probably base of figurine. Almost rectangular in shape. Buff, fine baked clay fabric. [L. 1.4, W. 1.1]

3 (I) 2628 KLb 124 Fig. 9.103
Figurine leg. Narrowing to one end and flattened slightly. Incised zigzag decoration on one side of wide end; incised line down one edge of other side. Light brown baked clay shaded to dark gray at widest point. [L. 4.4, Max. W. 2.0, Min. W. 1.1]

4 (I) 5189c ZA 63 s Not Illustrated
Pair of figurine legs. Divided by incised line, slightly widened feet. Buff/gray clay. [L. 0.9, W. 0.7]

5 (II) 2628 KL 115 Fig. 9.79
Stool (throne). All four legs broken. [L. 4.6, W. 4.0]

6 (I) 921 ZA 62 s Fig. 9.158, Pl. LXIV:1
Animal figurine, probably dog. Legs, tail, and ears broken off; eyes pierced. Light brown clay fabric. [Max. L. 3.0, Max. W. 1.3, Max. Th. 1.4]

7 (I) 5189d ZA 63 s Not Illustrated
Conical object, possibly horn, arm, or leg. Traces of incision(?). Buff/gray clay. [L. 0.7, Max. W. 0.6]

8 (II) 2508 JC s Fig. 9.85
Stool. Three-legged; two legs broken. [L. 3.5]

9 (II) 2666 KL 117 Fig. 9.83
Four-legged stool (throne). Three legs broken at ends. Two semicircular, white-encrusted incisions above each leg. [H. 2.2]

10 (IV, II) 3212 ZHt 10 Fig. 9.80
Four-legged stool (throne) with a protuberance. Three legs broken. Buff/gray baked clay, medium fine. [L. 5.45, Max. W. 2.5]

11 (II) 5180 ZA 52 s Fig. 9.84, Pl. LIII:4
Miniature throne. Four-legged with back support; legs broken and incomplete. Buff baked clay, greatly reduced to gray. [H. 1.1, L. 2.2, W. 1.45]

12 (II) 2600 KL 113 Fig. 9.49, Pl. LIII:3
Four-legged table with basin. Protome broken at neck; further protome fracture at rear; central concavity. Buff, wet-smoothed baked clay. [H. 2.3, W. at back of legs 1.8]

13 (U, II) 1715 LLa 1 Fig. 9.56
Schematized "throne goddess" with four legs. Legs broken off, head missing; circular, widening at center with protuberance suggesting Pregnant Goddess. Two incised lines below widest point, traces of white infill. Light gray/buff, fine baked clay, well fired. [H. 4.95, W. across legs 2.8, W. across center 3.2]

14 (II) 2602 KL 114 Fig. 9.57, Pl. LV:1
Four-sided schematized pregnant "throne goddess." All four legs broken off; rounded body with top broken off. Heavily incised with curved and linear decoration; remains of red color over the lower part. Smooth buff to gray baked clay. [H. 3.9, Max. W. 3.0]

15 (II) 2511 JL 101 Fig. 9.58
Schematized figurine, totally reduced, probably enthroned Pregnant Goddess. Broken off at top, widening at lower end; flattish base. Incisions above widest point, vertical and horizontal; encrusted with white. Buff baked clay with gray areas. [H. 2.6, Diam. 2.3]

16 (II) 404 KM 2 Fig. 9.82
Schematized figurine, probably representation of "throne goddess." Four legs and pointed "ears," one broken off. Dark gray baked clay. [H. 2.5, Max. W. 1.5]

17 (II) 4002 ZG 40 Fig. 9.36, Pl. LII:2
Seated female figurine. Head, part of arms, and one leg missing. Incised with long and short lines at back, zigzags on leg and arms, two crosses above breasts near neck, vertical lines between breasts, and spirals over shoulders. Chevrons over legs indicate skirt design. White encrusted. Smooth, buff baked clay, matte. [Max. H. 3.6, Max. W. 2.1]

18 (II) 4253 ZJ 40 Fig. 9.94, Pl. LX:1
Schematic figurine. Head broken off at top of neck; widening at shoulders, rounded base. Incised with three lines around neck, bands and zigzags diagonally across front and back; incisions encrusted with white. Buff/gray, smooth baked clay. [H. 4.8, Max. W. 2.1, Th. 1.1]

19 (U, II) 53 NLd 1 Fig. 9.1, Pl. XLV:1
Miniature, schematic female figurine. Head broken off, rounded base. Incised with two lines on front, long and short lines on back and across shoulders, zigzags at base, and three lines around neck; encrusted with red ocher. Buff/gray, smooth baked clay. [H. 3.2, Max. W. 2.0]

20 (II) 918 ZA 54 s Fig. 9.33
Torso of very stylized figurine. Head broken off; arms only indicated by widening for shoulders; flat base. Decoration by linear incision on front, back, and shoulders, with zigzags down sides. Pink/brown clay, gray on much of back. Fine, well fired, burnished. [H. 2.5, W. 2.6, Th. 1.4]

21 (II) 5417 ZA 52 s Fig. 9.99
Body of schematic figurine. Broken off at neck and at corner of base. Incised decoration of usual three lines on front, on back across shoulders, around neck; traces of red ocher. Gray/buff baked clay. [H. 2.7, W. 2.5, Th. 1.1]

22 (II) 1664 ZA 51 s Fig. 9.32
Body of stylized female figurine. Head missing, base flat. Decorated with wide incised lines and chevrons, characteristic three lines on front, long and short lines on back, lines around neck, crosses in place of breasts, V's on sides and below waist. Brown, fairly fine baked clay, well fired. Dark gray on back. [H. 5.7, W. 4.5, Th. 2.5]

23 (IV, II) 3920 ZJ 14 Fig. 9.13, Pl. XLVIII:1
Body of schematic female figurine. Head broken off; body roughly rectangular before narrowing to neck; flat base; perforations from tops of shoulders to edge of base. Incised with three lines on front, long and short lines on back and around neck, zigzags on lower part and down sides. Dark gray, rough baked clay. [H. 6.3, W. 3.7, Th. 2.2]

24 (V, II) 4429 PN/A 95 Fig. 9.100
Schematic female figurine. Head missing, almost rectangular body, flat base widening a little toward shoulders. Incised with zigzags on front and chevrons at neck, long and short lines on back with traces of red infill; chevrons down each side. Buff, fine baked clay. [H. 3.9, Max. W. 2.55, Th. 1.05]

25 (U, II) 51 KLb 1 Fig. 9.34
Schematic truncated figurine. Head broken off; arm stumps; flat base. Incised with straight lines and chevrons, some apparently encrusted with a dark color; V's in place of breasts; heavily encrusted. Light buff, rough baked clay. [Max. H. 3.7, Max. W. 3.5]

26 (II) 914 ZA 55, 57, or 60 Fig. 9.2, Pl. XLV:2
Stylized torso with pierced arm stumps. Head broken off. Incised with zigzag and linear decoration on both sides; cross near left shoulder; long and short lines on back; engraved symbols of V's and interconnected V's on front and neck; incisions once filled with white paint. Light brown clay with gray patches. [H. 4.8, W. across arms 4.0, Th. 2.5]

27 (II) 414 KL 2 Fig. 9.87
Body of stylized figurine. Head and possibly legs broken off; perforated through arm stumps; indentation in base at center front. Incised decoration of long and short lines on back, zigzags and squares on front; traces of white encrustation. Buff/gray baked clay. [H. 4.8, Max. W. 3.5, Th. 1.4]

28 (V, II) 3016 ROc 48 Fig. 9.92
Upper half of schematic figurine. Head and base missing; arm stumps; raised stomach. Characteristic three lines in front and long and short lines on back, chevrons on side. Orange/buff baked clay. [H. 3.6, W. 3.4, Max. Th. 1.4]

29 (II) 4256 ZJ 40 Fig. 9.5
Body of schematic figurine. Head broken off; roughly triangular shape; flat base; perforations from center of base to center of both long sides; two holes in neck between horizontal incised lines. Incised with characteristic three lines on front, two over each shoulder, zigzags at bottom; long and short lines and zigzags on back; white encrustation. Buff/gray baked clay. [H. 3.8, Max. W. 4.8, Th. 1.5]

30 (II) 4265 ZJ 44 Fig. 9.6
Upper half of schematic female figurine with breasts. Head and lower half broken off; roughly triangular shape, curving out at shoulders. Three lines between breasts, two curving lines below; long and short lines on back; encrusted with white paint. [H. 2.4, W. 3.1, Th. 0.9]

31 (II) 3943 ZJ 37 Fig. 9.96
Torso of stylized female figurine. Head and lower half broken off. Linear incised decoration; characteristic three lines on front, long and short lines on back; white encrusted. Smooth buff/pale gray baked clay with green encrustation. [H. 5.1, W. 4.7, Th. 2.5]

32 (II) 116 ML 14 Fig. 9.4
Torso of schematic female figurine. Head and lower half broken off; perforations at point of shoulders. Dots above breasts; characteristic three lines on front, long and short lines on back; two diagonal lines below breasts; two lines around neck; horizontal line around waist; white encrustation preserved. Light brown baked clay. [H. 3.2, W. at waist 2.9]

33 (II) 1113 KM 18 Fig. 9.93
Upper half of torso of schematic female figurine. Head and base missing; flat back. Linear incisions on front and back. Well-fired black clay, coarse temper, fine paste. [H. 4.0, W. 4.0, Th. 1.9]

34 (I or II) 2823 JL 22 Fig. 9.97
Torso of stylized female figurine. Base, head, neck, and one breast missing; wide hips. Incised lines, three at front and back, same on both sides. Buff/gray baked clay, poorly fired. [H. 3.7, Max. W. 4.9, Min. W. 2.1]

35 (IV, II) 3730 ZJ 22 Fig. 9.102
Upper half of female schematic figurine. Head and lower half broken off, leaving "horned" ends, curving backward. Incised with two lines at front, chevrons, circles, lines around neck, and three lines following contours of back. Buff/gray baked clay. [Min. H. 2.3, Max. W. 3.4, Th. 1.2]

36 (II) 1120 ZA 58 Fig. 9.101
Upper half of stylized figurine. Head and base broken off. Vertical and diagonal lines on front, diagonal on back. Matte medium/light gray baked clay with some yellow-gray coloration; rough paste. [H. 4.4, W. at base 4.9, Th. at base 1.6]

37 (II) 5178 ZA 52 s Fig. 9.95, Pl. LX:2
Schematic figurine. Head broken off. Incised decoration: horizontal, curved, diagonal, and vertical lines all over; V incision in pubic area filled with white material; traces of red ocher in incisions on legs. Fine, buff baked clay, well fired. [H. 4.6, Max. W. 3.6, Th. 1.95]

38 (II) 300 KM 2 Fig. 9.90
Seated figurine. Incised decoration encircling body. Red/gray surface over buff baked clay. [H. 3.75, Max. W. 2.7]

39 (II) 2627 KL 115 Fig. 9.12, Pl. XLVII:3
Torso of squatting female figurine. Base, arms, and head missing; toes indicated; perforations at shoulders. Curved and linear incisions, characteristic three lines at front, long and short at back, zigzags and running spirals below waist; white-filled incisions. Light brown-greenish clay, smooth, matte. [H. 6.2, Max. W. 6.7, Th. 2.2]

40 (II) 5037 ZB 131 Not Illustrated
Small human (?) figurine. Head broken off at neck; slightly conical shape; punctate eyes. Buff baked clay. [H. 1.0, Max. W. 0.6]

41 (II) 5182 ZA 52 s Fig. 9.88
Schematic miniature figurine. Fantastic head, applied with three projections; slightly hollow circular base. Incised lines around minimum width. [H. 2.6, Max. W. 1.2, Min. W. 0.65]

42 (II) 4409 ZE 98 Fig. 9.25, Pls. L:3, A:1
Masked head of human figurine. Broken off at neck; mask triangular with well-modeled eyes and long nose; ears perforated. Three incised lines at sides of ears; traces of white painting around chin and eyes; neck and forehead smoothed. Pink/buff smooth baked clay with gray at end of nose. [H. 5.3, W. at ears 3.0]

43-48 (II) 5184a-f ZA 52 s Not Illustrated
Six figurine fragments: (*a, b*) Two applied spirals on sides of bird-headed figurines, one buff, one gray clay. (*c*) Upper torso of schematic figurine, buff clay, with incised lines and dots. (*d, e*) Two parts of figurines with incised decoration, buff/gray clay. (*f*) Possible head; conical, with punctate eyes, gray core, buff surface.

49, 50 (II) 5187a, b ZA 55 s Not Illustrated
Two fragments: (*a*) Applied spiral from side of figurine; buff/gray clay. [Diam. 0.5]. (*b*) Conical object, possibly head; traces of eyes (?); gray clay. [H. 0.9]

51 (II) 405 KM 3 Fig. 9.30
Long cylindrical object, possibly leg of cult vessel; broken at top; widens slightly to flat base. Incised lines around base; spirals, chevrons, and diamonds around leg. Buff, fine baked clay. [L. 4.85, Diam. 1.7]

52 (II) 5423 ZA 52 s Fig. 9.104
Conical leg of figurine. Pointed at one end; one side flat. Incised with chevrons except on flat side. Buff baked clay. [L. 1.7, Max. Diam. 0.8]

53 (II) 4007 ZG 42 Fig. 9.105
Conical figurine leg. Flat on one side. Three incised lines on either side of front, white encrusted. Dark gray/brown clay, smooth paste. [L. 5.0, W. 2.0]

54 (II) 2674 KL 118 Fig. 9.106
Leg of figurine. Flat on one side. Incised with curved and straight lines, red encrusted. Light brown, smooth baked clay. [L. 2.9, Diam. 1.7]

55 (II) 2672 KL 117 Fig. 9.107
Leg of small figurine. Large hips; curved at knee; top and foot broken off. Flat on one side, zigzag incisions on rest, encrusted with red. Light brown, smooth baked clay. [L. 2.9, Diam. 1.7]

56 (II) 2346 KL 111 Fig. 9.108
Figurine leg. Top and foot broken off. Flat on one side, rest covered with zigzag incised decoration. Medium gray, smooth baked clay. [L. 3.4, Max. Diam. 2.0, Min. Diam. 0.9]

57 (II) 2325 KL 108 Fig. 9.15
Right leg and buttock of figurine. Flat on one side. Incised with snake spiral over buttock; zigzag and lines

all over. Smooth light brown and gray clay. [Max. L. 4.35, W. 1.7, Th. 1.85]

58 (II) 5179 ZA 52 s Fig. 9.109
Top section of figurine leg. Broken at both ends; one flat side; hole in lower broken edge. Incised spiral and chevrons. Buff baked clay. [L. 2.4, Max. W. 2.05]

59 (S, II) 2221 PJc 1 Fig. 9.18, Pl. XLIX:2
Leg of figurine. Pronounced buttock and knee; front of foot and upper part missing; flat on inside. Encircling incised line above buttock; spirals on buttock; down back of leg and around knee; framed cross on hip. Buff, fine baked clay, gray reduced areas. [L. 5.25, Max. W. 2.27, Min. W. 1.3]

60 (II) 3937 ZJ 36 Fig. 9.17, Pl. XLVIII:4
Pair of figurine legs with feet. Broken off at top. Incised with zigzags over upper part, two lines around ankles. [L. 3.0, W. 2.6, Th. 1.5]

61 (II or III) 5358 ZA 54 Fig. 9.110
Long object with one flat side, broken off at top, probably leg. Dark gray, fine clay. [L. 2.2, W. 0.7]

62-73 (II) 5183 a-l ZA 52 s Not Illustrated
Twelve figurine fragments; mostly legs and horns (?). Three definite legs with feet. Buff baked clay.

74, 75 (II) 5186a, b ZA 55 s Not Illustrated
Two fragments: (*a*) Long conical object, possibly leg. Buff clay. (L. 1.8, W. 0.9). (*b*) Cylindrical object broken at both ends; arm or leg (?). Traces of incision (?). Fine red baked clay. [L. 2.2, W. 1.5)

76-79 (II) 5188a-d ZA 58 s Not Illustrated
Four fragments: (*a*) Possibly leg with foot. Gray core, buff surface. [L. 2.45, W. 0.9]. (*b*) Leg or conical object, broken at base. Buff clay. [L. 2.2, Max. W. 1.35]. (*c*) Object with incised decoration. Gray clay. [W. 1.15]. (*d*) Cylindrical object, one end slightly flat; leg (?). Buff clay. [L. 0.8]

80 (II) 4569 KL 113 Fig. 9.114, Pl. LX:3
Head and neck of birdlike figurine. Broken off at base; ears and nose (beak) modeled but no distinct features (one eye possibly shown). No decoration. Dark gray, fairly smooth baked clay. [H. 4.5, Max. W. 2.6]

81 (II) 5426 ZA 52 s Fig. 9.115
Small beaked figurine. Conical; back of head missing; incised eyes; flat nose. Chevrons and lines on body; white encrustation(?). Gray/brown baked clay. [H. 1.4, Max. W. 0.9]

82 (II) 5425 ZA 52 s Fig. 9.116
Beaked head. Flattened, widening at neck; back flat. Eyes incised, two incised lines around neck. Buff baked clay. [H. 1.3, W. of head 0.75]

83 (II) 90 MLa 2 Fig. 9.127, Pl. LXI:1
Seated, small bird-headed figurine. Triangular-shaped head; punctate eyes; pointed leg at front; second broken off; hollow base; hole at back of neck. Incised with lines around neck and zigzags at back and on legs; perforations through either ear. Buff, fine baked clay, burnished. [H. 3.2, W. across base 2.2, Th. 1.2]

84 (II) 2658 KL 117 Fig. 9.22, Pl. XLIX:3
Seated "bird-headed lady with a coif." Schematic figurine with flat base and triangular basal section; eyes punctured; elegant rolled coif at back of head. Incised with V lines encrusted with red. Face and legs entirely reduced. Brown and gray, smooth baked clay. [H. 5.0, Max. W. 2.0, Min. W. 1.0]

85 (II) 412 KM 2 Fig. 9.42, Pl. LIII:1
Bird-shaped head. Broken off at neck; pointed nose; punctate eyes; protuberance at back of head. Two lines incised around neck. Fingerprints at top of head. Buff/gray, smooth baked clay. [H. 2.2, Th. of neck 0.7]

86 (II) 2262 KL 113 Fig. 9.117
Head of bird-headed figurine. Broken off at neck; beaked; eyes punctate with incised lines; two perforations at front of neck. Light brown, smooth baked clay, matte. [H. 3.2 to 4.1, W. of head 3.4, Th. at base 2.2]

87 (II) 5181 ZA 52 s Fig. 9.45
Beaked head. Incised eyes; hole in front of neck. Two applied spirals on each side and at back representing coils of hair; white encrustation. Brown/black baked clay. [H. 1.35, Max. W. 1.3]

88 (II) 2255 KL 108 Fig. 9.77, Pl. LIX:1
Animal (dog?) figurine. Flat, depressed back broken off, leaving front legs and head; head triangular on top; very pointed nose; eyes punctate. Legs and neck incised and white-encrusted; traces of red ocher between the legs. Light brown and gray, smooth baked clay. [H. 4.0, W. at base 3.4, Th. across legs 3.3]

89 (II) 757 ZA 55 Fig. 9.171
Stylized animal head. Triangular, broken off at neck; features indistinct but one eye present. Animal protome. Light pink/brown, smooth clay. Traces of burnishing and ocher. [L. 3.0, W. 2.0, Th. 1.7]

90 (II) 2370 KL 113 Fig. 10.7:1
Animal protome on handle of vessel. Four holes on either side; flat circular head; pointed nose; no features shown. Red burnished changing to brown at edges; lines on inside of sherd. Buff, medium-fine baked clay, red-brown burnished surface. [See also chap. 10, cat. no. 2370). [H. 7.0, W. of sherd 5.6, Th. of head 2.6]

91 (II) 2274 KL 113 Fig. 9.178
Finely modeled animal head at top of vessel handle. Flattened at sides; rounded nose; one ear present. Buff, very smooth, burnished clay. Inside not smoothed. [H. from nose to pottery surface 5.4, W. 2.0]

92 (II) 239 ZA 51 Fig. 9.76, Pl. LVIII:4
Head of animal, possibly dog. Protome or handle of cult vessel. Broken off at base of neck; mouth open. Smooth, well-fired, medium/light brown clay. [L. 4.0, W. at shoulder 4.5, Th. 3.0]

93 (II) 5344 ZA 50 s Fig. 9.174
Head and neck of animal resembling deer. Long pointed nose; eyes raised; long slender neck. Buff/gray baked clay. [H. 3.0, W. of head 2.6, W. of neck 0.9]

94 (II) 5185 ZA 55 s Not Illustrated
Head and part of neck of animal. One ear broken off; simply modeled triangular head; one punctate eye; top of head flat. Gray, medium-coarse baked clay, badly fired, with smooth buff surface. [H. 3.7, Max. W. 4.0, W. of neck 2.4]

95 (II) 5036 ZB 131 Fig. 9.170
Small schematic animal figurine. Two ears and flat base. Dark gray baked clay. [L. 1.2, Max. W. 0.7]

96 (II) 804 ML 106 Fig. 9.150
Hind legs and torso of animal figurine. Tail and front half missing; heavy and crude; legs thick with flat base; body oval in section. Gray/brown clay, fine paste and temper, well fired. [L. 7.5, W. across back legs 9.0, Th. of trunk 4.5]

97 (III) 5158 ZA 44 s Fig. 9.81
Fragment of three-legged throne with schematized goddess (broken through the waist); two legs broken off. Buff, fine baked clay. [H. 1.7, Max. W. 1.6, Min. W. 0.6]

98 (III) 770 ZA 47 s Fig. 9.3, Pl. XLV:3
Delicate torso of female figurine. Head broken off; roughly square in shape. Incised with vertical, horizontal, zigzag, and curved lines—unusual four on front, three over shoulders; breasts marked by V's; three incisions around neck, three zigzag lines on lower front; traces of red ocher infill. Brown/gray baked clay, darker on front, reduced. [H. 2.2, W. 1.6, Th. 0.7]

99 (III) 5424 ZA 45 s Fig. 9.119
Torso of female figurine. Broken at waist, neck, one side, and back. Incised horizontal lines around neck, vertical lines on chest. Buff baked clay. [H. 1.4, Max. W. 1.1]

100 (III) 4207 ZE 89 Fig. 9.120
Upper half of torso of female figurine. Head, most of both arms, and lower half missing; one shoulder remains. Pronounced breasts marked with V's; incised lines around neck and across back filled with white paint. Buff, medium-coarse baked clay. [H. 4.15, W. 5.2, Th. 1.45]

101 (III) 769 ZA 47 s Fig. 9.35, Pl. LI:4
Upper half of female figurine. Base, arms, and head missing. Incised with three lines and two V's on front, horizontal and vertical lines on back and around neck; traces of white paint infill and red ocher, especially on back. Buff/gray baked clay (gray on front, buff on back). [H. 2.5, W. 1.9, Th. 0.8]

102 (IV, III) 4460 ZB 107 Fig. 9.121, Pl. LX:4
Upper torso of female figurine. Head and base missing; arms moderately developed for type; perforations through tops of arms. Incised decoration of lines and chevrons; breasts marked with V's; deep lines over shoulders and along sides. Buff baked clay with gray surface, brown encrustation. [H. 2.6, W. 3.2, Th. 0.95]

103 (III) 1208 MM 45 Fig. 9.32
Torso of stylized female figurine. Head, arms,and base broken off. Crosses above breasts; usual three lines between breasts, joined at bottom by horizontal line; long and short lines on back; three incisions on left side, two over right hip; zigzags and circles, filled with white paint. Black baked clay, fine paste and temper, well fired. [H. 4.7, W. across shoulders 4.4, Th. 1.5]

104 (III) 5161 ZA 44 s Not Illustrated
Part of figurine broken on three sides. Incised with horizontal and vertical decoration. Buff, coarse baked clay with dark gray surface. [H. 2.45, Max. W. 2.0]

105 (III) 5346 ZA 49 s Fig. 9.112
Leg of figurine. Broken off at both ends. Incised decoration of chevrons and lines on sides and base. Buff/gray baked clay. [L. 3.7, Max. Diam. 1.7]

106 (III) 5163 ZA 44 s Fig. 9.16, Pl. XLVIII:3
Leg and buttock of figurine. Broken at both ends, one side flat. Incised decoration of encircling lines, spirals, chevrons, etc.; white infill. Buff, medium-fine baked clay, reduced gray on one side. Well fired. [L. 3.8, Max. Diam. 2.3, Min. Diam. 1.1]

107 (III) 1595 ML 116 Fig. 9.111
Half base of schematic female figurine. Other leg, foot, and top broken off; large buttocks, thick leg. Incised pubic triangle, lines and triangles down leg, and spirals on buttock. Buff baked clay with buff/black surface, fine paste and temper, well fired. [L. 5.6, Max. W. 2.3, Min. W. 0.8]

108 (III) 5168 ZA 44 S Fig. 9.113
Leg fragment with horizontal incised lines. One flatter, undecorated side. Buff, medium-coarse baked clay, gray surface. [L. 2.9, Diam. 2.6]

109 (III) 5571 MM 20 Not Illustrated
Leg and foot of figurine. Leg broken at thigh, foot base flat; thick, crude. Incised decoration around top of leg. Coarse, buff baked clay. [L. 7.2, Max. W. 4.3, Min. W. 2.65]

110 (III) 5020 ZB 119 Not Illustrated
Leg and foot of figurine. Thick leg, short foot, flat

base; raised ankle on decorated side. Incised decoration on one side only of diagonal lines, line of incisions down edge. Buff/gray baked clay, medium-fine. [L. 3.45, Max. W. 2.5, Diam. of leg 1.8]

111 (U, III) 1769 KMd 1 Fig. 10.8:17
Foot of figurine. (See also chap. 10, cat. no. 1769.) [L. 3.15, Max. W. 2.6, Min. W. 1.75]

112 (III) 5031 ZB 125 Not Illustrated
Small foot of figurine. Oval in section, widening from leg at both sides. Buff baked clay. [L. 0.8, Max. W. 0.95]

113 (III) 1103 ZA 47 s Fig. 9.124
Tiny figurine head. Triangular; eyes punctate with incised lines above as eyebrows. Light buff baked clay. [H. 1.1, W. 0.9, Th. 0.7]

114 (III) 5038 ZB 123 Not Illustrated
Triangular bird-head. Incised lines for eyes and mouth; broken at neck. Buff baked clay, gray core. [H. 1.15, W. 0.7]

115 (III) 458 ZA 47 s Fig. 9.118
Complete birdlike figurine. Triangular-shaped head; conical body; flat base; no features distinct except nose. Dark gray. Possible incision of horizontal lines around base. Pale buff, smooth, well-fired baked clay. [H. 2.7, W. across base 1.3, Th. 1.3]

116 (III) 772 ZA 47 s Fig. 9.43
Stylized bird-headed figurine. Broken off below neck; diamond-shaped head. Three incised lines around neck; incised eyes; angle as nose; crest at back of head. Red/brown baked clay. [H. 1.2, Max. W. 1.2]

117 (V, III) 4459 ZB 10 Fig. 9.125
Small bird-headed figurine. Broken off at neck; diamond-shaped head with upward-pointing crest; eyes are incised lines. Orange/buff baked clay. [H. 1.3, W. of head 1.2]

118 (III) 5034 ZB 125 Not Illustrated
Long flat object with two incised lines. Neck(?). Buff baked clay. [L. 0.9, W. 0.5]

119 (III) 5173 ZA 46 s Not Illustrated
Crested animal (bird?) head. Diamond-shaped section. Incised lines as eyes and down each side of crest. Buff baked clay. [H. 1.2, Max. W. 1.0, Min. W. 0.5]

120 (III) 5176 ZA 48 s Fig. 9.130
Lower part of schematic figurine. Flat base. Incised V's down front, inverted V's down back. Gray/buff baked clay. [H. 1.6, Max. W. 1.55]

121 (III) 771 ZA 47 s Fig. 9.44
Schematic, beaked, seated figurine. Slightly hollowed base; two leg stumps; one leg broken off. Eyes as long incised lines, incised lines around neck and vertically down body. Brown, smooth baked clay. [Width across base 1.7, W. across head 1.2]

122 (III) 5029 ZB 128 Fig. 9.128
Beaked, seated figurine. Flat base and two legs at front, one partially missing; head triangular in section; incised eyes. Incised decoration in bands of vertical and diagonal lines, horizontal across legs. Dark buff, fine, baked clay. [H. 3.2, Max. W. 1.95, Min. W. 1.0]

123 (V, III) 1074 QO 8 Fig. 9.127
Base of birdlike seated figurine. Round, slightly hollow base; two feet facing forward; head missing. Incised with horizontal encircling lines, encrusted with white. Light buff, fine baked clay. [H. 1.7, W. across feet 1.6]

124 (III) 3844 MMd 66 Fig. 9.131
Totally schematized figurine of bird-headed seated goddess. Head partially broken off. Three incisions around neck, vertical and diagonal down the body; encrusted with white. [H. 1.1, W. 1.3]

125 (III) 482 ZA 47 s Fig. 9.132
Lower half and legs of figurine. Broken at the back and upper part. Incised vertical decoration down legs, horizontal around top. Dark gray/buff baked clay. [L. 2.4, W. across feet 1.7]

126 (III) 5160 ZA 44 s Not Illustrated
Conical object with rounded end, incised lines encircling it. Buff baked clay. [H. 1.4, Max. W. 1.2]

127 (III) 1216 ML 111 Fig. 9.46, Pls. LIII:2, A:4
Complete birdlike stylized figurine. Flat base, body narrowing to shoulders; triangular head. Eyes as long incised lines; three lines in place of each ear; three lines around neck, four down front, long and short at back, several over shoulders, and zigzags at base of front; traces of white paint infill. Black, smooth, well-fired baked clay. [H. 4.4, Max. W. 2.5, Th. at base 1.8]

128 (V, III) 699 PO 8 Fig. 9.41, Pl. LII:3
Head of Bird Goddess figurine. Broken off at neck. Eyes incised circles; three perforations for earrings. Buff/gray, medium-fine baked clay. [H. 2.5, L. of head 2.4, W. of neck 1.2]

129 (III) 5416 ZA 48 s Fig. 9.135
Head on long neck. Flat, back of head slightly crested; no features shown. Three holes down front of neck, incised line. Buff baked clay, grains of mica. [H. 2.3, Max. W. 1.1, Min. W. 0.75]

130 (III) 767 ZA 47 s Fig. 9.24, Pl. L:2
Head of Bird Goddess with hairdo. Broken off at neck; long triangular head. Two spirals representing hairdo applied on each side, incised line around neck, three holes at front of neck. Black baked clay encrusted with gray. [H. 1.8, W. of head 1.2, Th. at base 0.7]

131 (III) 768 ZA 47 s Fig. 9.23, Pl. L:1
Birdlike head with pointed nose. Broken off at neck. Two applied spirals on each side and at back; narrow

punctate eyes. Light buff, smooth baked clay. [H. 1.9, W. of head 1.4, W. of neck 0.7]

132 (III) 1241 ML 112 Fig. 9.47
Complete birdlike figurine in squatting position. Eyes incised, with perforation; slight crest at back of head. Incised with V front and back, three lines down shoulders, lines at base with a row of dots above. Reddish brown, well-fired baked clay. [H. 3.5, Max. W. 2.8, Th. 1.2]

133 (III) 872 MM 41 Fig. 9.48, Pl. LIV:1
Upper half of birdlike female figurine. Broken off at waist; arm stumps; triangular head with hollows for eyes. Incised decoration of one line between breasts and above each breast, several under arms at front and back, filled with red ocher. [H. 2.7, Max. W. 3.4, Th. 1.0]

134 (III) 5165 ZA 44 s Not Illustrated
One leg and part of body of two-legged, bird-headed figurine. Broken on three sides. Incised vertical decoration down leg. Gray baked clay with buff surface. [H. 2.3, W. 1.95]

135 (III) 382 MM 21 Fig. 9.26
Probable bird-masked head. Roughly triangular in section, broken off at top of neck; eyes not shown, only hollows. Incised decoration of parallel lines down back indicates hair. Orange/buff baked clay, medium paste and temper. [H. 3.5, W. across top of head 3.1, Th. 2.3]

136 (III) 5028 ZB 128 Fig. 9.126
Flat head and part of neck. Somewhat triangular-shaped; eyes perforated through; front of face missing. Yellow/buff baked clay. Fine. [H. 2.0, W. of head 1.6]

137 (U, III) 42 MLa 2 Fig. 9.134, Pl. LXI:3
Triangular head. Three flat sides; broken at neck; two perforated holes on each side of head. Incised lines for eyes and eyebrows. Buff/light gray baked clay with large grit, well fired. Medium-coarse paste and temper. [H. 3.9, W. of head 3.7, W. of neck 1.9]

138 (IV, III) 3245 ZHt 24 Fig. 9.137
Head and part of neck of figurine. Broken off on both sides; top of head semicircular; protruding nose and mouth; eyes not shown. Originally black-burnished surface. Buff/gray, medium-fine baked clay, black/brown surface. [H. 5.25, W. of head 3.8, Th. 2.0]

139 (III) 5175 ZA 48 s Not Illustrated
Upper part of figurine with arm stumps. Broken at top and bottom. Buff baked clay. [W. 1.1]

140 (III) 3592 ZG 18 Fig. 9.122
Torso of female figurine. Bottom, arms, and head broken off; widening toward bottom; grooved down center, back, and front; hole in head area and base but not apparently all the way through. No decoration. Fine, buff baked clay. Traces of burnishing on back. [H. 3.55, Max. W. 2.9, Th. 0.95]

141 (III) 805 MM 27 Fig. 9.141
Torso of female figurine. Lower half, one arm, most of other arm, and head missing; very flat and simple; arm apparently upraised. Slight traces of incision (?). Black-burnished baked clay, fine paste and temper. Well fired. [H. 5.0, W. 4.3, Th. 1.1]

142 (U, III) 82 IL 3 Fig. 9.123, Pl. LXI:2
Torso of female figurine. Base, arms, and head broken off; pronounced breasts; hole in center of neck fracture. No decoration. Buff baked clay, with gray core. Coarse paste, porous surface. Completely fired. [H. 2.8, W. 3.5, Th. 1.25]

143 (III) 3715 MM 16 Fig. 9.143
Waist and hips of female figurine. Possible arms or hand resting on hips; wide hips; narrow waist. Possibly black-painted. Red clay with traces of burnishing and black paint (?). Not fired throughout. Straw temper (?). [H. 5.8, W. 7.05, Th. 2.2]

144 (III) 2947 ZG 19 Fig. 9.10, Pl. XLVII:1
Lower half of torso of female figurine. Most of legs and part above waist missing; narrow waist, exaggerated hips; hole for navel, three holes at back. Incised line around hips. Lines around lower legs resemble folds of cloth. Medium-coarse, black clay, buff toward bottom. [H. 4.0, Max. W. 2.55, Max. Th. 1.65]

145 (S, III) 3551 No context Fig. 9.50, Pl. LIV:2
Female figurine. Lower legs missing; birdlike head; arm stumps; exaggerated hips; punctate eyes; two holes at back above buttocks. Incised pubic triangle, line above encircling hips, incision dividing legs. Buff/gray baked clay. [H. 4.0, Max. W. 1.8, Th. 0.95]

146 (III) 1224 MM 49 Fig. 9.8, Pl. XLVI:2
Lower part of female figurine in half-sitting position. Wide hips; short legs with gap between; back flat; narrow waist. Red/brown baked clay, fine paste and temper, well-fired but coarse surface. [H. 7.8, Max. W. 4.5, Th. 2.1]

147 (IV, III) 154 MM 9 Fig. 9.7, Pls. XLVI:1, A:3
Lower half of female figurine. Broken at waist, most of legs missing; hollow back; pronounced buttocks; part of pubic triangle incised, hole for navel; indentation above buttocks. Medium-coarse, buff baked clay, red-painted surface, black areas. [H. 6.65, Max. W. 4.4, Max. Th. 3.05]

148 (III) 5166 ZA 44 s Fig. 9.138
Hips of figurine. Broken off at waist and tops of legs; exaggerated buttocks and stomach; narrow waist. No decoration. Orange/brown baked clay, medium coarse. [H. 4.0, W. 3.9, Th. 2.4]

149 (III) 178 MM 16 Fig. 9.145, Pl. LXII:1
Nude torso of pregnant figurine. Broken off at lower hips, base of neck and arms; narrow waist; exaggerated hips and belly; probably in a sitting or squatting position. No decoration. Orange/buff baked clay, traces of burnishing and smoothing. [H. 8.4, W. at hips 9.2, Th. at base 3.0]

150 (III) 5023 ZB 130 Fig. 9.148, Pl. LXIII:2
Torso of figurine. Legs, head, and part of one arm missing; buttocks and incision dividing legs shown. No decoration. Buff, medium-fine baked clay. [H. 3.1, Max. W. 2.0, Min. W. 1.15]

151 (IV, III) 2907 ZG 11 Fig. 9.51, Pl. LIV:4
Schematized Birth-giving Goddess of ground and polished greenstone. Not obviously fractured. Two sides of pubic triangle incised. Division between legs and feet noticeable. [H. 1.9, W. of legs 1.7, Th. 0.65]

152 (III) 232 ZA 49 Fig. 9.86, Pl. LIX:2
Torso of schematic female figurine. Head and bottom broken off; arm stumps quite developed. Incised with vertical and horizontal lines on back, three lines on front, circles on neck, lines on shoulders, inverted V's above breasts, concentric circles on belly on which a frog or toad crawls diagonally. Buff baked clay, rough. [H. 4.7, W. across hips 3.5, Th. 1.3]

153 (III) 1276 MM 50 Fig. 9.37, Pl. LII:1
Lower half of seated female figurine. Broken at waist and ends of legs; narrow waist, wide hips, gap between legs. Carefully incised with lines, spirals, and dots; double spiral on the belly, triangles set on band on the back; upper back plain except for dots in two pairs. Brown/gray, fine baked clay. [H. 3.5, W. across hips 3.1, Th. 1.2]

154 (U, III) 6 LMb 1 Fig. 9.21
Lower half of seated female figurine. Broken at waist; all of one and part of other leg missing; flat back. Incised with two lines encircling hips, with vertical lines down legs, two circles with dots at back, three lines down each side. Pink/gray, medium-coarse baked clay. Traces of red/brown burnishing. [H. 8.3, W. across hips 7.6, Th. 3.2]

155 (U, III) 498 No context Fig. 9.98
Totally schematized "throne goddess." Flat base widening toward center; perforation in base. Incised decoration between horizontal lines on lower half-diamonds, dots, diagonal lines, chevrons; upper band marked with diagonal lines to form whirling pattern; traces of white infill. Buff/pink baked clay, gray patches; well fired. [H. 3.65, Max. Diam. 3.4]

156 (III) 4489 ZB III Fig. 9.60, Pl. LV:3
Schematized pregnant "throne goddess." Slightly hollow base, widening then narrowing toward the top, with the suggestion of a head. Band of incised curving "snakes" around widest part. Orange/buff, fine baked clay. [H. 5.15, Max. Diam. 3.0]

157 (III) 3130 ML 151 Fig. 9.59, Pl. LV:2
Schematized pregnant "throne goddess." Square object on four legs; legs and top now broken off. Incised with curved lines around each leg; diamonds with dots on all four sides; traces of white paint. Buff, medium-coarse baked clay with orange/red surface. Well fired. [H. 3.9, W. 3.7]

158 (U, III) 134 KL 2 Fig. 9.147, Pl. LXIII:1
Small seated female figurine. Legs, part of one arm, and head fractured. A few incisions on back and base; genitals indicated. Pale buff, smooth baked clay. [H. 2.7, W. at waist 1.2, Th. at waist 1.0]

159 (III) 801 MM 27 Fig. 9.11, Pl. XLVII:2
Torso of female figurine. Arms, head, and base broken off; wide hips, narrow waist. Three incised lines over shoulders to front, one nearest to neck joining at back; two holes at base of incised lines at back, hole for navel at front. Black/brown baked clay, rough temper, burnished. [H. 6.8, W. across hips 5.5, Th. 3.2]

160 (III) 1632 MM 50 Fig. 9.140
Part of legs of seated figurine, broken off at hips and feet. Well-fired, lightly burnished, fine red-baked clay, black-on-red painted lines emphasizing hips. [L. 4.4, W. across hips 5.9, Th. 1.7]

161 (III) 2988 ZG 30 Fig. 9.52, Pl. LIV:3
Lower part of seated figurine. Broken off at waist and below bent knees; stool broken off at bottom; exaggerated hips, narrow waist; apparently seated on circular stool. Incised line dividing legs. Buff baked clay, dark gray surface. Medium-coarse paste and temper. [Seated H. 6.9, L. of legs 6.3, W. at hips 5.7]

162 (III) 1638 MM 27 Fig. 9.39
Lower half of female seated figurine. Upper half, back and feet broken off; knees apparently bent. Incised pubic triangle; incised line dividing legs; two raised objects and incised lines above pubic triangle. Buff baked clay, fine paste and temper, well fired, with black-burnished surface. [H. 4.7, Max. W. 3.4, Th. 1.3]

163 (III) 836 MM 38 Fig. 9.144, Pl. LXII:3
Legs of seated female figurine. Broken above hips; back and base quite flat. Red clay, fine paste and temper, well fired, rough surface. Traces of burnishing. [L. 7.8, W. across hips 5.8, Th. 2.9]

164 (S, III) 3 LOd 1 Fig. 9.53
Lower half of seated female figurine. Broken at waist, one leg and part of other missing; narrow waist, wide hips; flat back and base. Incised pubic triangle and groove along underside of remaining leg. Fine, red clay, well fired. [H. 2.9, W. 3.85, L. 2.9]

165 (III) 2825 MM 16 Fig. 9.38
Lower half of seated figurine with end of legs on a stool, and upper body missing. Black painted lines

over most of surface; one or two snakes over abdomen, parallel lines down legs. Buff core, red-painted burnished surface. Fine paste and temper, well fired, black painted. [Seated H. 5.8, seated L. 7.1, Max. W. 5.55]

166 (IV, III) 3680 ZE 80 Fig. 9.20, Pl. XLIX:1
Leg of seated figurine. Other leg, hips, and leg of stool missing; hips hollow, fabric 0.75 cm thick; leg thick, knee bent, small foot indicated; possible fringed apron; vertical lines suggest skirt. Painted with black lines on upper surface only. Red, fine baked clay; well fired, red-burnished surface, black painted. [L. 13.3, H. 3.0, Max. W. 6.3]

167 (III) 1756 MM 27 Fig. 9.54
Lower part of seated figurine. Legs and upper half missing; flat back; raised stomach with hole for navel at front. Fine buff core; well fired. Surface burnished; black-on-red painted lines on front and sides of back. [H. 6.5, Max. W. 7.6, Max. Th. 3.45]

168 (III) 377 MM 20 Fig. 9.27, Pl. LI:1
Human head (masked?). Broken off at top of neck; realistic oriental-type features; "coffee-bean" eyes, high cheek-bones, modeled nose; roughly oval-shaped; black-painted lines following contours of cheeks; well-modeled eyebrows and mouth. Red baked clay, burnished; black-on-red painted. [H. 5.2, W. across cheeks 3.7, Th. 2.6]

169 (III) 3927 ZJ 24 Fig. 9.14, Pls. XLVIII:2, B:2
Lower half of seated figurine. Broken off at hips and ends of legs; one conical stool leg broken off; wide hips, hollow inside. Pubic triangle shown in black paint, lines on legs, two diamonds and triangles on back. Orange/red, fine baked clay. Red-burnished surface, black painted. [H. 7.0, L. 8.5, W. 8.3]

170 (III) 3741 MM 18 Fig. 9.61, Pl. LV:4
Part of anthropomorphic vessel. Hand laid across body, three fingers and thumb shown, elbow bent; hole through arm at wrist; curved and hollowed at back; also perforated through elbow but broken. (Probably) black-on-red painted. Red baked clay. Traces of red paint and black paint. [L. 7.25, W. 3.2, Th. 1.6]

171 (III) 5171 ZA 45 s Fig. 9.28, Pl. LI:2
Head, probably representation of masked face, on potsherd. Basically triangular, upper side curving into the nose. Incised lines for eyes and mouth. Orange baked clay, coarse temper. [H. 2.8, W. 4.3, Th. 0.8]

172 (III) 209 ZA 39 Fig. 9.9, Pl. XLVI:3
Human head. Face below nostrils broken off; appears hollow inside; nose molded; nostrils and raised eyes punctate. Buff baked clay with gray paste surface, rough. [H. 5.1, Max. W. 6.5]

173 (III) 2931 ZG 14 Fig. 9.146, Pl. LXII:2
Small bird-headed figure. Arm stumps; most of both legs missing; almost triangular-shaped body; small pointed head; possibly seated. Buff, medium-fine baked clay, black/brown surface. [H. 3.5, Max. W. 2.0, Th. 1.3]

174 (U, III) 271 No context Fig. 9.63, Pl. LVI:1
Torso of figurine, probably male. One arm, legs, and head missing; probably seated. No decoration. Gray/orange, medium-fine baked clay. [H. 4.95, Max. W. 3.3, Th. 1.55]

175 (III) 1609 MM 52 Fig. 9.89
Torso of figurine, possibly male. Stumps for arms; perforated; square in section. Diagonal graphite-painted lines down sides. Buff clay core with brown burnished surface painted with graphite lines. [H. 5.0, L. of head 3.3, Th. 1.6]

176 (III) 3102 ML 150 Fig. 9.152
Very coarse and heavy torso of animal (bull) figurine. Either fore or hindquarters with head/tail and legs missing. Grooving on back from smoothing (?). Buff, coarse baked clay, surface slightly smoothed. [L. 8.9, W. 9.0]

177 (U, III) 1745 KNc 1 Fig. 9.151
Hind legs and torso of very crude animal (bull) figurine. Tail, most of legs, front half missing; body oval in section. Orange/brown, very coarse baked clay, coarse paste and temper, buff, rough surface. [L. 10.4, H. 6.55, W. across legs 8.3]

178 (III) 1210 MM 46 Fig. 9.65
Part of torso and front leg of animal (bull). Heavy and crude; leg standing slightly away from body; flat base. Buff/red coarse baked clay, well fired. [L. 9.2, W. 6.3, Th. 3.7]

179 (III) 878 MM 43 Fig. 9.153, Pl. LXIII:4
Front part of animal figurine (bull?). Crudely modeled; legs flat at base. Light buff baked clay, coarse paste and temper, very low fired. [L. 8.5, W. across back legs 8.2, Th. 5.2]

180 (III) 3101 ML 150 Fig. 9.154
Hind leg of animal. Broken at body joint; rounded base. Very coarse clay, sand temper, buff surface. [L. 7.85, Diam. 3.9]

181 (III) 1666 MM 54 Fig. 9.155
Large hind leg of bull figurine. Simply modeled with flat base. Very coarse red clay, very coarse paste and temper, low fired. Black/gray paint. [L. 10.6, Max. W. 6.7, Min. W. 2.9]

182 (III) 859 MM 40 Fig. 9.156
Fragment of bull's body. Three projections, two broken, scoop on third with red/brown coloration; probable use as a lamp with raised edges (now broken off). Light gray, rough baked clay. [L. 11.3, W. 6.6]

183 (III) 3446 MMd 61 Fig. 9.66, Pl. LVI:2
Heavy, coarse head and torso of animal (bull) figurine. Front legs missing; nose broken off; no obvious features. Gray/buff core, fairly coarse; smooth buff surface. [L. 10.25, W. of body 8.25, W. of head 4.4]

184 (III) 1438 MM 34 Fig. 9.157
Very coarse leg of animal (bull) figurine. Thick, with flat base. Orange/gray baked clay, coarse paste and temper, very low fired. [L. 5.9, Max. W. 5.0, Th. 2.9]

185 (U, III) 1751 INa 1 Fig. 9.139
Lower part of seated figurine. Remains of two legs; whole back missing. Protruding stomach. Black, medium-fine baked clay, red matte surface. [H. 4.9, Max. W. 4.3, Min. W. 2.1]

186 (III) 806 MM 27 Fig. 9.167
Coarse, heavy animal head. Broken off at neck; head of triangular shape, slightly curved forward from neck; small protuberance for nose. Slight incisions all over back. Coarse, brown/gray baked clay, medium-coarse paste and temper, well fired. [H. 7.7, W. across head 6.6, Th. 3.2]

187 (U, III) 95 ML 2 Fig. 9.183
Central torso of animal figurine. Ridge of shoulder blades with broken projection at top; incised lines on ridge down back. Graphite-painted, brown/gray burnished surface; buff/light gray clay. [L. 7.1, W. 4.4, Th. 4.2]

188 (III) 4461 ZA 44 s Fig. 9.159, Pl. LXIV:2
Small animal figurine, possibly dog. Legs missing; body triangular; head and tail simply modeled; eyes incised; five incised lines down neck and back; hole under tail. Fine, buff baked clay. [L. 3.3, W. 1.4, H. 1.95]

189 (III) 3501 MMd 63 Fig. 9.182, Pl. LXIV:3
Torso of animal (bull). Head and tail missing; most of legs broken off; roughly rectangular, narrowing to middle; fracture and depression at center top and lump at center bottom. No decoration. Orange/buff baked clay, medium fine. Reduced gray areas. [L. 5.5, H. 2.75, W. 3.7]

190 (III) 1207 ML 106 Fig. 9.67, Pls. LVI:3, B:1
Stylized bull as lamp or cult vessel. Four pointed legs with flat base; rounded thighs; ridge down back continuing to tail (now broken off); large hump on back (now broken); head small compared with body, ridge down center; protruding eyes or cheeks; triangular nose; perforations for hanging at top of each leg, through nose and base of tail. Black-on-red painted with curved lines following contours of body. Lump underneath with no painting. Red fine baked clay, burnished, well fired. [H. 10.6, L. 16.4, W. at shoulder 9.9]

191 (III) 177 MM 16 Fig. 10.1:2, Pl. LXX:1a, b
Animal protome and side of vessel with one leg. (See also chap. 10, cat. no. 177). [H. 12.2, Max. W. 9.8, W. of head 3.8]

192 (U, III) 1286 LM 7 Fig. 9.71, Pl. LVII:3
Well-modeled animal head. Broken at neck; roughly triangular head with eyes as incised diamonds. Line of dots along back of head and down nose; two incised lines around neck. Rough, light gray clay, surface red/brown burnished and smoothed, traces of red ocher on neck. [H. 4.9, W. across ears 4.8, Th. 3.2]

193 (III) 3417 MM 60a Fig. 9.70, Pl. LVII:2
Head and neck of animal figurine, probably bull. Both horns broken off; nose long and pointed; bottom of neck hollowed out. Raised eyes incised; incised horizontal and vertical lines on back of head and neck; nose perforated; white infill. Coarse, buff clay core. Black/brown surface. [H. 4.3, W. of head 4.2]

194 (U, III) 2234 MM Fig. 9.177, Pl. LXV:2
Animal head. Broken off at neck, horns missing; triangular-shaped head; long nose with flat end; ridge down center of head and neck, curving around as eyebrows; raised eyes and cheeks. Traces of red ocher, burnished (?). Buff, medium-fine baked clay with black reduced areas; red/buff and black burnished (?) surface. [H. 4.7, W. across ears 3.75, W. of neck 2.0]

195 (III) 1583 MM 50 Fig. 9.180
Hindquarters of animal. Legs, tail, and front broken off; roughly triangular body. Three incised lines around top of each leg. Buff, medium-coarse baked clay, smoothed surface; underside rough. [L. 3.9, Max. W. 3.8, Th. 2.6]

196 (III) 1435 MM 43 Fig. 9.69, Pl. LVII:1
Head of animal. Broken off at neck; nose, horns, and ears missing; raised "coffee-bean" eyes; ears pierced, broken off. Line of incisions down head to nose; series of curved lines at forehead; two incisions filled with white paint on front of neck. Black paint over buff/red, medium-coarse baked clay. Traces of burnishing. [H. of head 4.0, W. of head 2.5]

197 (III) 210 ZA 39 Fig. 9.175, Pl. LXV:1
Head and neck of animal (bull?). Head roughly triangular; ridge down center; eyes protruding; horns broken. No obvious decoration but possibly some incision on neck. Orange/buff-burnished baked clay, slightly encrusted. [L. 3.9, H. 4.6, W. 2.7]

198 (III) 4614 MM 61 Fig. 9.176
Head of animal. Broken off at top of neck; both horns/ears missing; triangular shape; slightly raised eyes. Trace of smoothing; traces of red ocher. Buff, medium-coarse clay with black surface. [H. 2.8, W. 5.1]

199 (III) 1298 MM 53 Fig. 9.169
Animal head, sheep. Broken at neck and down back; long triangular nose; raised eyes. Dark gray, rough clay, smoothed down neck. [L. 6.4, W. of head 4.3, Th. 2.8]

200 (III) 203 ZA 38 Fig. 9.72, Pl. LVII:4
Head and neck of animal, possibly ram from cult ves-

sel. Features are distinct; eyes narrow following contours of head; head roughly triangular with ridge down middle; horns broken off. Incised with deep parallel lines around neck, encrusted with white; neck painted red between and below incisions; eyebrows molded; incised line around base of horn. Black-burnished baked clay, well fired. [H. 10.0, W. across head 5.4, Th. 3.5]

201 (III) 3837, 3838 MMd 66 Fig. 9.73, Pl. LVIII:1
Animal head protome (sheep/goat?) from cult vessel. Broken at base of neck; most of horns and end of nose broken off; raised ears below horns; eyes raised, shown by incised diamond with hole in center. Line of incisions down center of head, two around horns, two from ears to chin, three groups of two down neck, last one on left curving into spiral. Line of incisions down front of neck. White paint in incisions; traces of red ocher under horns, over ears, eyes, and neck. Buff, coarse clay core, black-burnished surface. [H. 13.5, Max. W. 7.8]

202 (U, III) 5 LK b 1 Fig. 9.74, Pls. LVIII:2, A:2
Human/animal mask. Broken neck; all of one and part of other horn missing; head at 45° angle to neck; long, narrow nose, two nostrils grooved out; raised eyes surrounded by black paint; ears raised; incised lines below horns; traces of red ocher around neck and ears. Buff, medium-coarse baked clay, buff surface and gray burnishing on neck and around eyes. [H. 7.3, W. of head 6.65, W. of neck 2.4]

203 (U, III) 10 KMa 1 Fig. 9.29, Pl. LI:3
Large masked head, probably handle of ladle. Broken off at neck; end of nose, chin missing; triangular head with curved top; eyebrows curving into long nose; eyes raised. Front surface brown-and-black burnished, back rough. Buff, medium-coarse baked clay. [H. 10.3, W. of head 8.0, W. of neck 3.95]

204 (III) 822 ML 107 Pl. LXV:4
Animal head modeled on long, round vessel handle forming neck of animal. Head triangular in shape; ears and eyes molded; gaping mouth. Incised lines down front and traces of red ocher in mouth and at front; rough surface underneath. Buff baked clay, coarse black paste, burnishing. [L. 7.6, W. across front feet 3.5, Th. 2.2]

205 (III) 386 MM 21 Fig. 9.172
Head of animal probably from bowl rim or handle. Head triangular in section; one ear missing; ridge down center; broken off at top of neck; little trace of features. Light buff baked clay, burnished. [L. 3.5, W. from ears to nose 2.4, Th. 2.4]

206 (III) 1525 MM 40 Fig. 9.173
Animal head with horns (cattle?). Triangular head with short nose; broken at neck. No decoration or distinct features. Red-painted, light buff clay, burnished, fine paste and temper, well fired. [H. 4.0, W. across horns 3.9, Th. 2.0]

207 (III) 3141 ML 151 Fig. 9.62
Head and neck of animal figurine. Head triangular in section. No features or decoration. Buff/orange clay with black surface. Fine. [H. 4.7, W. of head 4.4]

208 (U, III) 2273 ML Fig. 9.164
Head of animal. Broken at neck and side of head; no distinct features. Buff, medium-fine baked clay, black-burnished surface. [H. 4.8, Max. Th. 3.15, Min. Th. 1.4]

209 (III) 3430 MMb 61 Fig. 9.163
Head and neck of animal figurine. Ears and nose broken and weathered; right eye incised, left missing. Buff/gray baked clay; medium coarse. [H. 5.45, W. across head 3.4, Diam. of neck 2.0]

210 (III) 1550 MM 49 Fig. 9.165
Animal head. Nose and ears truncated; broken at neck; triangular head; flat back of neck. Light buff clay with pink/brown, smooth surface; traces of burnishing (?). [H. 3.5, W. at neck 2.7]

211 (III) 1513 MM 52 Fig. 9.168
Figurine head. Broken at neck; head slightly curved forward, widening at ears; long, shallow nose; eyes punctate; "owl" appearance. Orange-red/gray, medium-coarse baked clay, burnished and smoothed. [H. 7.7, Max. W. 5.3, Th. 2.5]

212 (III) 524 MM 11 Fig. 9.136
Figurine head. Broken off at base of neck; head roughly triangular in section; nose broken off; head flat on top; eyes or ears cut into sides. Orange/buff baked clay, traces of burnishing; encrusted. [H. 4.0, Max. W. 2.4, Th. 1.5]

213 (III) 158 MM 11 Fig. 9.166
Head and neck of animal. Protuberance at back; head and neck of triangular section; eyes pierced through. No decoration; a little encrusted. Brown/dark gray, smooth baked clay. Smoothed down back of neck. [H. 6.6, Max. W. 4.1, Max. Th. 4.4]

214 (III) 823 MM 27 Fig. 9.160, Pl. LXIV:4
Small animal figurine, possibly dog. Complete except part of legs and nose broken off; simple, and crudely made with pointed legs and tail, poorly modeled head. Buff baked clay, fine paste, rough temper, well fired. [Max. L. 2.8, W. across front feet 1.7, Th. 1.5]

215 (III) 230 ZA 46 Fig. 9.75, Pl. LVIII:3
Torso of animal, possibly pig. Head, tail, and legs broken off. Some incisions but probably unintentional. Brown/gray baked clay. [L. 4.0, W. of torso 2.0, Th. 1.9]

216 (III) 1283 MM 52 Fig. 9.181
Body of animal, pig. Head and two legs broken off; simply molded; body roughly triangular with groove

down underside; stump for tail. Light buff/orange baked clay. Black where leg broken off. [L. 2.9, H. 2.3, Th. 1.3]

217 (III) 395 ML 103 Fig. 9.161
Very crude animal head and part of torso. Rear half and front legs broken off; triangular-shaped head with pointed nose, molded ears; asymmetrical. Buff/light gray, coarse baked clay, very low fired; color half oxidized, half reduced. [L. 7.8, W. across shoulders 5.3, Max. Th. 5.2]

218 (III) 378 MM 20 Fig. 9.179, Pl. LXV:3
Curving cylindrical head of animal. Five incisions on top; flattened on inside surface. Buff/gray, rough baked clay. Traces of orange/red. [Diam. at broken end 1.6, curved L. 8.2]

219 (III) 1427 MM 43 Fig. 9.78, Pl. LIX:3
Bull (horse?) head. Broken off at neck, back of head, and end of nose. Incised eyes white encrusted, diamond shaped with dot at center; line down head to nose; line around neck. Perforation at one side of nose (cheek-piece?), other side broken off. Rough, brown clay with black surface. [L. 6.6, W. of head 2.6]

220 (III) 5032 ZB 125 R Not Illustrated
Possibly horned animal head; nose missing. Buff baked clay. [H. 1.5, Max. W. 2.55]

221 (III) 5033 ZB 125 R Not Illustrated
Head of animal. Broken at top of neck; end of one horn, nose missing; horns curve forward; two holes in front of neck (?). Orange/buff baked clay. [H. 1.15, Max. W. 1.7]

222 (III) 5568 MM 12 Not Illustrated
Head and neck of animal protome. Flat triangular head, thick neck. No real features shown. Light buff baked clay, traces of burnishing. [H. 6.0, W. of head 4.0, Th. 4.2]

223 (III) 5164 ZA 44 s Not Illustrated
Possibly head and neck of figurine, but weathered. Nose broken off; incised eyes? Buff/gray baked clay. [H. 1.7, W. 0.95]

224 (III) 396 ML 5 Fig. 9.142
Head, upper torso, and one arm of figurine. Human stance but animal head, long and pointed; arm held out and curved at end. No obvious decoration; rather crude. Rough red clay slip over black clay core, coarse paste and temper, well fired. [H. 3.4, W. across arm 4.0, Th. 1.6]

225 (III) 774 ZA 47 s Not Illustrated
Object indistinct due to weathering. Flat base, widening toward center; pointed top off center. Traces of incision at widest point and at top. Buff baked clay. [L. 1.9, Max. W. 1.6]

226 (V, III) 2821 QOd 9 Fig. 9.133
Lower part of figurine. Broken at neck; slightly hollowed base; one straight side, one narrowing toward top. Incised with chevrons; traces of white infill. Dark gray/brown baked clay. [H. 3.5, Max. Diam. 2.0]

227 (V, III) 3011 ROc 34 Fig. 9.149, Pl. LXIII:3
Upper torso of figurine, part of anthropomorphic handle. Base and head missing; hands clasped across stomach; wide shoulders. Buff, medium-fine baked clay, brown-burnished surface. [H. 5.25, Max. W. 4.5]

228 (V) 2409 PN/C 80 Fig. 8.4b, Pl. XXV
Lioness head carved of black stone. [L. 8.25, W. across body, 3.5]

10.
Tripods, Plastic Vessels, and Stands: A Fragmentary Collection of Social Ceramics

Ernestine S. Elster

Readers familiar with Greek and Balkan pottery from neolithic through bronze age periods will recognize the following terms: "altars" (Berciu 1961:29, 31, fig. 3:1), "libation platforms" (Fewkes et al. 1933:47), "cult tables" (Detev 1960:27, fig. 26), "ritual object," "model throne," or "altar" (Childe 1929:28; 1957:61, 62, fig. 32), and "lamps" (Seure and Degrand 1906: 413; Nandris 1973:152, 161). The items reported on in this chapter are clearly related to these. All have been grouped as "social ceramics" because their form is obviously not primarily utilitarian. The names *tripods, plastic vessels*, and *stands* are purely descriptive. There is no direct archaeological evidence of use, in terms of findspot or associated find material, to support the application of interpretive names at Sitagroi, but the term "social ceramics" allows for further elaboration.

The data base of over 200 items includes full profiles as well as many fragments. The common characteristic shared by all of these types is elevation. Thus, whether or not the complete artifact had container capacity, all were modeled with legs or sides which raised the artifact (and what it contained or held) above the surface of the floor, platform, or ledge on which it was placed. There may well be some functional explanation for this elevation.

In the following discussion, a description is given for the fragments of the three types plus miscellaneous pieces of much larger incised vessels, and a grouping of plain leg and shoulder fragments and small feet. Phase designation is presented in table 10.1 for the assemblage. As will be seen, the tripods are represented by the largest number of fragments and thus allow for multiple observations. A catalog has been prepared using the small find (SF) numbers in numerical order; all artifacts are included whether or not illustrated. Concordances between figures and plates are also provided.

Tripods

Description

These fragments represent small triangular vessels with shallow bowls elevated by legs which are formed smoothly at each of the three corners (e.g., fig. 10.1:1; pl. LXVI:1). They are most characteristic of phases I and II. The outside surface of most tripods is incised with a linear frame which outlines the shape of the vessel following the rim and base of the bowl, the sloping or straight corner, the triangular, tapering or angled leg (fig. 10.2:5; pl. LXVIII:3). This frame provides rectangular, triangular, or square zones within which the motifs are incised in a repeating pattern. On the stylized drawing (fig. 10.2:9), the zones are numbered: "1" corner, "2" bowl sides, "3" leg, "4" tip or base of leg.

Incised patterns include framed and reserved circles in the corner, zone 1, and framed linear patterns of angled, zigzag, or straight lines on

Table 10.1. Distribution of Types Over Time

Groupings	Phases						
	I	II	III	IV	V	Sur.	Total
Tripod	33	75	9	4	5	16	142
Plastic vessels	0	1	39	3	1	5	49
Stands	0	1	9	1	0	2	13
Large incised vessel fragments	0	2	3	0	0	1	6
Plain legs, feet	0	4	17	5	1	10	37
Totals	33	83	77	13	7	34	247

the leg, zones 3 and 4. Circles and half-circles frequently are incised at the base of the leg, zone 4. The other repeating patterns of surface decoration include: crisscross, ladders, hatching, and checkerboard. Incisions are generally infilled with white material. Within this general description there is variability in (1) the leg form (angular or triangular, with or without tapering), (2) the bowl-corner angle (narrow or wide), and (3) the side-corner line (straight or concave). Fragments with similar patterns have been illustrated together but are not part of the same artifact unless so indicated (e.g., SF 710/711: fig. 10.2:4a, b).

A detailed study of these artifacts and their classification (based on attribute analysis and tests of covariation in terms of form and chronology) is to be found in an earlier work (Elster 1971). It must be noted that fragments of legs will give us no information on the finish of the interior of the bowl; thus the data base fluctuates when various leg, corner, or bowl fragments are discussed. Most pieces, however, can be examined for paste-ware and/or surface finish.

Structure

Judging from the fragments and the author's experiments, the potter formed the bowl first and attached the legs at each corner by adding clay to support the join underneath the bowl. This join and the thinner bowl-side sections are the weak points of the vessel as demonstrated by the fragments. The pieces were tabulated in structural groups: full profile, legs, corners, sides, leg-corners, corner-sides. Single legs (50 items) account for 35% of the assemblage; corner-side fragments (56 artifacts) 40% of the assemblage, and side pieces (25 artifacts) 17%. No items are complete, but full profile fragments constitute close to 8% (11 artifacts) of the collection (e.g., fig. 10.2:1, 3, 8; pl. LXVI).[1]

It is assumed that the tripods were modeled symmetrically, each corner with a relatively narrow angle (e.g., fig. 10.1:1; pl. LXVI:1b).[2] Certainly some variability is expectable, and it is conceivable that one of the three corner angles would differ from the other two. Lacking a complete model from Sitagroi, we can extrapolate from the unbroken tripods recovered in situ from Bulgarian neolithic sites (Fortier 1981: 363), and from others examined by the author through the courtesy of the officials at the Stara Zagora archaeological exhibit (Bolnitsa Hospital) in September 1984. Reproductions of tripods from early neolithic Karanovo (Fortier 1981:580, fig. 90:111-113) and Gradeshnitsa B (ibid.:591, fig. 100, lower) indicate that all were modeled with narrow-angle corners, as were three-fourths of the Sitagroi tripod fragments (50 out of a possible 67). The angle of the tripod corner can be predicted from measurement of the leg angle since the leg extends down following the angle of the corner.

However, there are a few fragments which surely represent a vessel that is not triangular (fig. 10.6:1, 5, 9-13). In these cases, the corner is modeled with a wider angle and the surface exhibits a variant pattern of incisions, especially in relation to zones. The majority of Sitagroi tripods are incised with a framed circle in zone 1 and framed, repeated, controlled patterns in zones 2 and 3-4. The squarish corner fragments are incised with less zone restriction and a freer expression of lozenges (fig. 10.6:4), lines and dotted triangles (fig. 10.6:2, 11, 14), radiating semicircles (fig. 10.6:5, 6, 9, 10), and dots (fig. 10.6:13). The circle in the corner of SF 750 (fig. 10.6:1) is incised in the expected zone 1 but there are neither framing lines nor banded leg or side patterns. Five (fig. 10.6:2, 4, 11, 12, 14) of these eleven corner fragments (fig. 10.6:1, 2, 4-6, 9-14) are associated with phase III, and this distribution plus the distinctive incised design

and the wider corner angle suggest that the form is changing through time since the Sitagroi narrow tripod is overwhelmingly a product of phases I and II.

The rim of the tripod is either straight or, if the corner is exaggerated (fig. 10.3:2, 9), concave (fig. 10.1:1; pl. LXVI:1). Small midsection bowl fragments will often have a straight rim (fig. 10.4:1, 9, 13) regardless of the overall form. The form of the corner indicates whether the rim will be sloping (fig. 10.1:1; pl. LXVI:1)[3] or straight (fig. 10.2:1).[4] Some bowl-side fragments, large enough to articulate with the slant of the corner (fig. 10.4:10)[5] demonstrate this attribute. An equal number of sloping (20) and straight (20) corner forms were tabulated; however, many more side fragments were tabulated having straight (25) rather than concave (10) rims, and this may be due to their small size.

There were three variations noted in legs: one leg form was tapering in profile (20 examples) and triangular in section (e.g., fig. 10.2:5);[6] another was triangular in section without tapering (18 pieces) (fig. 10.3:3);[7] and the third was straight in profile (35 artifacts) but angled in section (figs. 10.1:1; 10.2:1, 3, 4).[8]

Adding the mean of the corner fragment (5.5 cm) to the mean of the leg (6.2 cm) gives a height of 11.7 cm, within the highest range of full profile height (see table 10.2). Adding the mean of the side (3.1 cm) to that of the leg (6.2 cm) yields 9.3 cm, close to the computed mean of profile fragments. The profile SF 339, restored to demonstrate the complete form, is 10.3 cm high by 15.2 cm wide from outside corner to corner (fig. 10.1:1; pl. LXVI:1b). The tripod modeled by the author and baked in an outdoor fire is 8 cm high by 10.5 cm corner to corner, with bowl depth of 2.5 cm. This vessel holds 1/2 cup (50 ml) of liquid. Measurements of eight complete tripods indicate that they varied in height from 5.5 to 8.0 cm, the mean at 6.4 cm (Fortier 1981:363). The Bulgarian early neolithic artifacts were modeled with less elevation than these Sitagroi counterparts; this was also noticeable in the materials at the Stara Zagora exhibition.

Table 10.2. Tripod Measurement Ranges

Fragment measured	Range (in cm)	Mean
Profile height	7.2-11.9	9.2
Side depth	2.0-4.9	3.1
Preserved leg height	3.0-7.9	6.2
Preserved corner height	2.0-9.9	5.5

Technology

Paste-ware of approximately 140 pieces was examined to learn something about the manner of preparing the clays. The fine paste-wares are well levigated; the medium pastes include larger grains of tempering materials, and the walls of the tripod fragments manufactured with these pastes are thicker. The examples of coarse paste-wares exhibit larger inclusions and more air bubbles with spaces between. Over half of the fragments (58%) are manufactured of medium paste-ware, 31% of fine paste-ware, and 11% of coarse paste-ware.

Because of the prevalence of dark-faced wares (table 10.3), reduction firing is inferred, especially since the graphite paint would not be stable over 725° F. without reduction (Frierman 1969:42). Dark cores clearly predominate among tripod fragments (table 10.3). This suggests low temperatures and insufficient length of firing and/or reduction, since the color of the core would have lightened as the carbonized organic material (present in all clays) was removed through oxidation (Matson 1963:492). The dark core color can also suggest firing in the open without use of a kiln (ibid.), perhaps the situation at Sitagroi.

Finish and Design

Finish and design refer to surfaces: interior and exterior (table 10.3). Variables are color of biscuit, treatment of surface, incised patterns, plus the way in which these variables relate to form and/or chronology.

Usually the bowl interior is smoothed when wet and the exterior surface is incised and burnished, with white infill inserted in the incisions (pl. LXVII:2, 4).[9] Well over half of our examples

Table 10.3. Technological Data

Attribute	Variable	Figures	Plates	No. of specimens by phase I	I/II	II
Color of exteriors, bowls and legs (n=108)	dark	10.1:1 10.2:1, 3, 5, 8 10.3:1, 2, 6, 10, 14-16, 20-23 10.4, 1, 2, 9, 25	LXVI:1, 3 LXVII:2, 4 LXVIII:1, 3	29		55
	light	10.2:6, 7, 10 10.3:3, 5, 7, 9, 11, 13, 19 10.5:1,8	LXIX:13 LXVIII:2	4		20
Core color (n=91)	zoned/mottled	10.2:5, 8, 10 10.3:6, 11, 14, 15, 20, 23	LXVIII:1, 3 LXIX:13	3		28
	dark/solid	10.2:1, 6, 7, 10 10.3:1, 5, 7, 9, 10, 13, 16, 21, 22 10.4:25	LXVII:2, 4 LXIX:13	17		43
Interior finish, bowl (n=57)	wet smoothed	10.2:2, 5, 6 10.3:4 10.4:1, 2, 6, 7, 9, 10.5:1 10.6:1, 4, 5, 9	LXVII:1 LXVIII:3		41	
	rough, unfinished	10.4:5, 12, 20 10.6:10	LXIX:3		16	
Surface finish (n=142)	matte	10.2:4a, b 10.3:3, 6, 7, 11, 23 10.5:8 10.6:9, 10	LXVIII:2		48	
	burnished	10.2:5-8, 10 10.3:2, 9, 10, 14, 15, 20, 21, 22	LXVII:4 LXVIII:1.3		74	
	high burnished	10.1:2 10.2:1, 3 10.4:1, 20	LXVI:3 LXVIII:2 LXX:1			
	high burnish w/graphite	10.4:5, 24, 25	LXIX:3		7	
	nonobservable	10.3:4			6	

are burnished, and more than one-third exhibit a matte surface. Some of the latter must reflect the adverse effects of soil conditions over time.

The surface color varies from somber hues of black-brown, brown, dark and medium gray, matte gray-black-buff through the lighter surfaces of pale gray, buff, buff-pink, and mottled pink-gray. Tripods are not decorated with painted designs, but the surface pigment does demonstrate considerable variability; still, over three-fourths of the tripods are dark-faced.

All fragments are incised; occasionally deeper grooves or excisions appear (compare fig. 10.2:1 with 2; pl. LXVII:1 with 2). Checkerboard motifs

require excision; examples are from phase I (fig. 10.3:21; pl. LXVII:4), two from phase II (fig. 10.3:22, 23), and one from the surface (fig. 10.2:2; pl. LXVII:1). The checkerboard design is important when discussing cultural contact, because this motif is found on similar forms from sites north of the Rhodope Mountains in Karanovo III contexts. The motifs are incised before the clay hardens for well over three-fourths of the collection, as witnessed by the smooth grooves (pl. LXVI:1a, 2a). If the clay is allowed to dry before incision, irregular edges frame the incisions (fig. 10.2:3; pl. LXVI:3).[10]

Incised linear motifs appear in banded zones on virtually all the tripods. Exceptions were referred to earlier as representing artifacts with a wider corner (e.g., fig. 10.6:1). Separation of designs by a reserved area is common; of 117 fragments large enough to exhibit the juxtaposition of two motifs, only 3 or 4 show no reserve (fig. 10.4:4, 12).

Very frequently the incisions in zones 1 and 3-4 repeat on the opposite face (e.g., fig. 10.1:1; pl. LXVI:1).[11] For 92 fragments in which these zones are observable, only 8 show an independent design on the opposite face (fig. 10.6:4, 11). Occasionally this seems accidental (fig. 10.3:16); regularly the zones of the outside exterior surfaces are incised in a repetitious fashion if not exactly a mirror image.

The most common form is the full circle which is incised in all zones except zone 3. Three of the full profile fragments exhibit circles in zones 1 and 4 (pls. LXVI:1, 2; LXVII:3). Many more fragmentary pieces demonstrate the custom of incising a full circle in the corner, zone 1 (fig. 10.2:5; pl. LXVIII:3)[12] or in zone 2 (fig. 10.4:12).[13] The half-circle is not found in zone 1, rather in zone 2 (fig. 10.4:22; pl. LXIX:6, 7), or zone 3 (fig. 10.5:14) or zone 4 (fig. 10.3:6, 18). Sometimes circles radiate (fig. 10.6:5, 6, 9), usually in or near zone 1. Almost half of all the fragments are incised with a linear motif and a circle; small side fragments exhibit only circles (fig. 10.4:13, 16, 18) and linear designs appear alone on various pieces (fig. 10.3:7).[14]

Linear motifs include ladders (fig. 10.2:1; pl. LXVII:2), nets (fig. 10.1:1)[15] and lines or grooves varying as vertical (fig. 10.5:1), horizontal (fig. 10.3:6),[16] angled (fig. 10.3:5),[17] hatched (figs. 10.5:7, 8, 12), or crisscross (fig. 10.3:16).[18] Triangles appear filled (fig. 10.4:25),[19] *en face* (pl. LXVIII:4), or nesting as in zone 4 (fig. 10.3:17; pl. LXVII:6). Herringbone (fig. 10.2:6, 10; pl. LXIX:13) and multiple zigzag (fig. 10.2:7)[20] complete the repertoire of linear motifs. To these must be added dots or punctates (fig. 10.6:3; pl. LXIX:10)[21] and stabs (figs. 10.3:20, 10.5:15). The designs on the tripods are so distinctive that the fragments would be set apart in all phases even if it were impossible to reconstruct the complete form. Table 10.4 presents the distribution of the incised motifs based on observation of over 140 artifacts.

Table 10.4. Frequency of Motifs

Motifs	Number	Percentage
Circular	13	9
Linear and triangular	57	40
Checkerboard and linear	5	3
Circular, linear and triangular	67	47

Form and Chronology

Although the tripod form is most frequent in phases I and II (108 artifacts out of the inventory of over 140), a number of tripod fragments have been recovered from phases III through V and on the surface. Eight of the nine phase III fragments are from square MM, parts of which underwent some mixing and contamination.

Examples are two incised corner fragments (figs. 10.3:8, 10.5:3), and several cited earlier in connection with different incised patterns, such as lozenge (fig. 10.6:4) and dotted, paired zigzags (fig. 10.6:11, 14), and the wider corner (fig. 10.6:1). These may represent a square or rectangular vessel such as those reported from Servia (Heurtley 1939:91, 150), Zelenikovo (Dimitrijević 1969:31, Sl. 3, 7) and Deve Bargan (Gaul 1948:pl. LIV:5). These pieces, plus the unillustrated items (SF 1450, MM 43, phase III, and SF 369, QO 5, phase V) could represent another form and thus be examples of what Clarke (1968:152) describes as "population variation

and the basis of developmental change." A phase III corner fragment (fig. 10.6:12) differs in that the leg was slightly inset and, again, the artifact probably does not represent a triangular vessel. Its red color reflects phase III more than I or II. Only one tripod fragment (fig. 10.4:15) is from a clear phase III context (ZA 47), and this was at the very beginning of the phase since phase II ends with ZA 50. Thus, six of these nine fragments indicate experimentation with the traditional triangular shape and incision pattern. This is not at all surprising considering the time span involved.

Four items are from phase IV, although attribution to phase IV is uncertain for ZJ 19 and 22, as noted in table 7.1. Yet, one of the most complete examples of the tripod, SF 339, is from phase IV (fig. 10.1:1; pl. LXVI:1). Other pieces include a triangular tapering leg, SF 1459 (MM 34); a side fragment incised with triangles filled with the net pattern, SF 3728 (ZJ 22); and half of an angled leg with excised checkerboard and net pattern, SF 3685 (ZJ 19). Another, SF 369 (QO 5), can be mentioned in connection with the artifacts from phase III (fig. 10.6:4, 11, 14), with a variant pattern of incisions and a wider corner angle. Three others complete the recovery from phase V: a leg-side fragment (fig. 10.3:19); and a bowl-side piece (fig. 10.4:22) with net pattern and half-circle; and SF 3635 (ZH 19), a corner leg with a straight rim and angled leg incised with multiple nets similar to figure 10.2:1 but with a wider angle.

Surface finds of tripod fragments almost equal the combined absolute numbers from phases III through V. These fragments are easily recognizable and were collected over the three field seasons as the team members crossed the mound time and again.

In summary, the tripods from phases III, IV, and V are in some cases from levels which are uncertainly attributed to these phases or from contexts reported as mixed. Furthermore, seven of these artifacts appear to represent a legged vessel which is neither triangular nor incised with the usual circles and lines. Nevertheless, on typological grounds, the eleven remaining artifacts are very much a part of the tripod grouping. The incidence of recovery in phases III, IV, and V may be due partly to mixing and rodent activity. The items attributed to phase V may be upcasts or found in phase V due to later soil disturbance. Because the mound was and still is regularly cultivated, subsurface artifacts are more readily exposed. Perhaps tripods continued to be modeled throughout the Sitagroi mound occupation; in fact the form has been reported as extending through the entire Karanovo sequence (Fortier 1981:363).

Several chi-square tests were designed to isolate any relationship between the zones of incision (corner, leg, side), the incised motifs, the forms of the leg and/or corner sides, and chronology (Elster 1971). The biggest problem in the testing sequence was sample size. Chi-square testing, based on the null hypothesis (Sackett 1966:368, 369), is very sensitive to sample number. With the few artifacts employable in many of these tests (because the groupings were composed of fragments) results were statistically inconclusive. However, certain patterns did emerge. In one test (table 10.5) the leg forms—triangular or angular in section—are compared with phases I or II using 62 items. The asterisk beside the chi-square score indicates application of Yates' correction for small sample size (Blalock 1960:220-221). The significant covariants are: (1) angled leg form/phase I, and (2) triangular tapering leg/phase II. Based on the score and with reference to a standard chi-square table (Blalock 1960:218), in less than 1 chance in 1,000 could this covariation be due to chance alone. Thus it may be inferred that the angled leg is the earlier form.

In another test, the angled and triangular legs

Table 10.5. Chi-square Test Comparing Leg Form and Phase Association

	o	e	Chi-square*
Triangular leg, phase I	4	9.87	4.11
Triangular leg, phase II	+30	24.12	1.19
Angled leg, phase I	+14	8.12	3.56
Angled leg, phase II	14	19.87	2.04
	62		10.90

* indicates Yates' correction for small sample size.

segregate at random with the concave or straight corner-rim forms, hence there is no significant isolated covariation. However, the corner zone of these vessels is always incised. There are 57 fragments for which this observation is tabulated. Of these, 45 are decorated with an incised circle repeating in the corner zone, varying at random for both concave and straight-rim corners (Elster 1971:117). Those without corner circles are incised with either a net pattern or multiple angled ladders continuing down the leg. Although statistically the leg forms vary at random with the design motifs, it is only on the angled leg form that the net or ladder pattern is observed. In fact, the rectilinearity of this pattern seems only appropriate on a rectangular zone. It is interesting to note that whereas the angled leg is recovered from both phases I and II, only those with a net or ladder pattern were recovered in phase I contexts. Thus, by inference but without statistical support, this net or ladder pattern is proposed as the earlier design tradition and the use of circles as the innovation.

Very little more may be said with statistical support about these tripods and chronology. The item from the earliest level is a straight rim side fragment, incised with a net pattern (fig. 10.4:7). There is no statistical association for surface color and chronology. The conservative combination of form and surface design spans phases I and II and has little to do with utility.

Distribution

By comparing the Sitagroi tripods with published artifacts, museum collections, and surface finds recovered during the Sitagroi survey of the Drama Plain, an inference concerning contemporaneity of settlement and/or cultural contact or boundaries may be advanced, with the tripod as *fossile directeur*.

Preliminary analysis of the surface collection from sites surveyed by the Sitagroi team indicates that, with the exception of the later bronze age sites of Mikrokampos, Megali Toumba, Kalos Agros, and Kalliphytos, all sites contain neolithic and/or early bronze age materials. Fifteen mounds are located on the plain, with seven more sites close by (see map, p. 321).

A chronological implication of formal similarity is applied wherever possible in the comparisons to follow, using the only statistically significant covariation, the rectangular angled leg/phase I and the triangular, tapering leg/phase II.

Tripod fragments are found at 13 of the 22 sites located on our map (p. 321), in the north: Sitagroi, Mylopotamos, Drama, Chorla, Dhoxaton; to the east: Kephalari, Dikili Tash, Polystylon; to the west: Nea Baphra, Dhimitra, Mikro Soulion, Podochori, and Akropotamos.

An Akropotamos tripod corner-side fragment (pl. LXIX:14) has a straight rim, corner circle, indications of a tapering leg, and is easily parallel in form and designs in zones 1, 3, and 4 to figure 10.2:8; the incised pattern in zone 2, an infilled broad zigzag is, however, unique. Mylonas (1941:563, fig. 6:1-6) has also published other tripod fragments from Akropotamos. This site is approximately 33 km from Sitagroi across the Pangaion range, whereas the easier journey through the Marmaras Valley would be about twice as long.

The low mound of Chorla was first observed by Dr. Jane M. Renfrew during the Sitagroi team survey of the Drama Plain. Several tripod fragments from Chorla are illustrated. Chorla 8 (fig. 10.5:19) is similar to the many Sitagroi triangular legs, not tapering, with an incised frame and linear designs (fig. 10.5:6, 13, 14). Chorla 9 (pl. LXVIII:5) is a complete profile, which in both form and incisions is a close parallel to figure 10.1:1. Chorla 10 (pl. LXVIII:6) lacks the corner rim of a complete profile but what remains indicates a repeat of zone 1 and 4 circles, banding or framing on the slightly tapering leg wherein the triangular zone is incised with oblique lines, very like figure 10.3:5 and in form to plate LXVII:3. Chorla 5 (pl. LXVIII:7) is one face of an angled leg with banding, a large circle in the upper leg zone, and a net pattern separated by an angled reserve across the leg face. The leg is especially broad, similar perhaps to figure 10.3:14 or 17. Dhimitra 1, a nontapering leg (fig. 10.5:20) is very similar in form to figure 10.5:17, also to Drama 13 (fig. 10.5:21), to SF 2536 (pl.

LXVIII:4), and to Chorla 8 (fig. 10.5:19). The incised pattern of Drama 13 (fig. 10.5:21) can be compared with figure 10.3:6. Dhoxaton 14 (fig. 10.5:16) is a wide-angled corner fragment (like fig. 10.6:1), incised with corner circles in a triangular frame offset with radiating lines comparable to figure 10.6:9 or 19. The latter tapering leg form is similar to Dhoxaton 12 (fig. 10.5:22) which itself is compared with figure 10.3:5.

Several tripod fragments from the sites of Mikro Soulion, Nea Baphra, and Kephalari were examined at the Kavalla Museum with the kind permission of Director Dr. Chaido Koukouli-Chrysanthaki. The Kephalari buff matte profile exhibits a straight corner-rim comparable to figure 10.2:7, with triangular tapering leg and incised patterns. Both the Sitagroi and Kephalari artifacts are similar to a Podochori profile (Grammenos 1978:211, 213, fig. 4:12). A triangular tapering leg fragment from Mikro Soulion, red burnished with white-filled incisions, is very similar to figure 10.3:5, earlier compared with Dhoxaton 12 (fig. 10.5:22). Other published parallels (noted below) are from Polystylon, Mylopotamos, and Dikili Tash. The late Prof. J. Deshayes indicated (personal communication 1968) that the form was common at Dikili Tash; a corner fragment had been published earlier (Welch 1918-1919:48 n. 2, fig. 3:o, 1c). The Philippoi Museum exhibited several in 1982. A Mylopotamos corner fragment (French 1964:41, fig. 7:19) and another from Polystylon plus side and leg pieces (Mylonas 1941:563, fig. 6:1-8, 10) complete the current inventory from the Drama Plain sites.

Besides the obvious identity of form, all of these items are banded, with incisions in zones, reserved corner circles, remains of white infill, and repeated motifs. These many sets of similarities are striking and cannot fail to indicate some linkage among the sites within this region. An angled leg fragment was recovered from the site of Chorla (pl. LXVIII:5) which suggests contemporaneity with Sitagroi phase I. Phase II is inferred for the remaining sites as well as Chorla, based on leg form comparisons.

Grammenos (1978:202-204, 219) reports fragments of "tables" or "table legs" from Kalliphytos, Kephalari, and Nea Baphra but without illustration. A tripod fragment, plus a fragment of a square corner vessel on short legs, and a sherd with white-filled excised checkerboard design are all published from Paradimi (Bakalakis and Sakellariou 1981:Taf. 58:7, Taf. 58:8, Taf. 22b:8), as are two tripod angled legs from a site east and south of Paradimi, near Proskynites (ibid.:Taf. 23:5, 6). This last item (ibid.:Taf. 23:6) is very similar to a Sitagroi leg from phase I (fig. 10.5:6). Also comparable are the profiles and corner fragments from Olynthus in central Macedonia (Mylonas 1929:41-43, figs. 60a-c, 62a-c, pl. II), where one of the forms is similar (ibid.:pl. II) although the others appear to be of a wider-angled artifact and all exhibit a freer incised motif of spirals, curving lines, and no banding. A corner fragment from Chaeronea, farther south, incised with a linear motif is also comparable (Soteriades 1908:7, right).

These scattered finds may only be interpreted as suggesting indirect contact during phases I-II for Thessaly, central and east Macedonia. However, at Paradimi in Greek Thrace the ceramic material also included fragments of a shallow plate standing on four cylindrical legs (Bakalakis and Sakellariou 1981:Beil.13.I:1; II:5). These artifacts and the knobbed handles (ibid.:Beil 12:2, 13.I:2) are diagnostic of Karanovo III, the Veselinovo phase (Mikov 1959:93). At Sitagroi this characteristic is noted for phase I (see Keighley, chap. 11), and it is likely that Paradimi and Sitagroi have some connection in this early period.

North of Sitagroi beyond the Greek border in Yugoslavia, Bulgaria, and Romania, there are artifacts with strikingly close parallels. Specific similarities are the triangular vessel shape with a straight corner-rim line and a rectangular angled leg. The surface decoration, however, is variable: burnishing is used on one tripod from Muldava (Fortier 1981:578, fig. 88:54) and another from Gradeshnitsa C (Nikolov 1974: pl. 17, upper); allover incisions without banding, often meandroid, are from Gradeshnitsa B (ibid.: pl. 8), Gradeshnitsa C (ibid.: pl. 17, lower) and from Karanovo (Fortier 1981:580, fig. 90:111, 113).

A Dudeshti tripod, from the site of Cîrcea, Romania (Miclea and Florescu 1980:64, pl. 69) is

heavily excised with a meandroid pattern over the corner-leg zones and triple zigzags on the bowl side; white infill is used, and an incised outline follows the line of the leg-corner-bowl rim. Other tripods are decorated with punctate designs without outlining; these are from, variously, Couche B of Guinova Mogila, Chelopech (Petkov 1948:168, fig. 17), Muldava (Fortier 1981:578, fig. 88:11), and Karanovo (Fortier 1981:580, fig. 90:112). Full outlining is observable on a straight-rim tripod with pointed corners from Gradeshnitsa A (Nikolov 1974:pl. 4, right); haphazard crisscrossings (compare with fig. 10.3:16) are incised within the frame. Another tripod from Gradeshnitsa B (Nikolov 1974:pl. 6) is painted along the bowl side from corner to corner with a black meandroid pattern outlined in white paint on a red-orange body. The corner rim slopes slightly but the leg form is no different from Sitagroi figure 10.1:1.

Tripods and tripod fragments have been found at Mechkur (Seure and Degrand 1906: 412, fig. 51), at Rasev (Gaul 1948:pl. LIV:2), at Guinova Mogila, Chelopech (Petkov 1948:168, fig. 17) and at Yasa Tepe (Detev 1959:31, fig. 45). Although the surface decoration differs, the form is both ubiquitous and durable. The checkerboard pattern is found on Sitagroi fragments (figs. 10.2:2, 10.3:21-23; pl. LXVII:1, 4) and is comparable to artifacts reported from Deve Bargan (Gaul 1948:pl. LIV:5); Baniata, Kapitan Dimitrijevo (Detev 1950b:5, fig. 10) and Yasa Tepe (Detev 1959:31, fig. 45; Vajsova 1966:12, Abb. 3:1, 3, 5, 6). The triangular leg incised with a frame and angled lines (figs. 10.3:6, 10.5:6) may be compared with the Lagitenuvo fragment (Gaul 1948:35, pl.X:31). Gaul reports other "altar" fragments, without illustration, from the sites of Kukova Mogila (1948:74, 194), Kodjadermen (ibid.:37), Ruse (ibid.:111), and Janka mound (ibid.:118). To this list must be added information given to me verbally (1968) by Drs. Marija Gimbutas, G. Georgiev, and Robert Evans, all of whom were impressed by the formal similarity of the material from the Bulgarian Kazanlik site. Approximate measurements of tripods from the Bulgarian sites indicate an average height of 7.37 cm and side width from corner to corner of 14.37 cm, very similar to the Sitagroi assemblage.

In terms of chronology, Dr. Georgiev, excavator of Karanovo, reported (personal communication 1968) that this tripod form is recovered from Karanovo I through VI. However, the forms he illustrates are not identical; the illustrated artifact from Karanovo I (Georgiev 1961: pl. VII:1a, b, c) exhibits the rectangular leg with linear designs, but the form attributed to Karanovo VI (ibid.:pl. XIX:1) exhibits a more triangular leg with curvilinear incisions. In addition, the material reported from Yasa Tepe (Detev 1959:31, 58), Chelopech (Petkov 1948:159-171), and Baniata (Detev 1950b:1-23) was all found in association with Veselinovo ceramics (Karanovo III), which phase is radiocarbon dated to 4400 ± 100 bc (Kohl and Quitta 1966:37). Fortier (1981:301) summarizes the ubiquitous quality of the tripod, describing it as "a common feature of all houses of the Early and Late Neolithic period in Bulgaria." Tripods are noted from both Romanian and Yugoslavian Vinča sites; these include Zorlentsu Mare, Vršac-At 2, Hrtkovci-Gomolava, Vinča, Beograd-Banjica, Smederevska Palanka-Medvednjak, Paraćin-Motel, Crnokalačka Bara, and Gradac-Zlokućani (Chapman 1981:240-241). The fact is that this artifact presents a striking durability which cannot fail to have cultural significance.

Discussion

Excavations in Bulgaria and Yugoslavia have yielded exact findspots within houses, and thus we know these items are part of the repertoire of a household (Fortier 1981:363). The co-association of tripods and "bucranium cult" artifacts in single-family Vinča households (no larger than 50 square meters) suggests to one scholar that the ritual in which these artifacts function is clearly domestic—that is, house oriented (Chapman 1981:68).

In a practical sense, small open bowls filled with vegetable oil or animal fat and a wick provide minimal light. The open hearth provides greater illumination, of course. Tsountas (1908: cols. 181, 183) reports traces of burning in all

but one of the small, legged vessels recovered from Sesklo, which are similar in size to the Sitagroi types. This useful finding correlates with observations made at Sitagroi where a majority of the bowl fragments examined do exhibit burning; however, tests of residue have not been undertaken. Moreover, burning is not conclusive proof of use as a lamp since we may be observing use as a censer or even secondary burning as in a house fire. Potentially, tripods could have been containers for touchwood, powdered rotten wood, which smolders for several hours. The Penobscot Indians of North America kept smoldering touchwood between two clay-lined clam shells, carrying this fire starter in a leather pouch (Speck 1940:99-100). Smoldering rotten wood can be very fragrant; for example, chestnut produces a fine aroma, as does the resin from *Pistachia lentiseus.* The wear marks on every leg base show that the vessels were moved around quite a bit, an indication of some functional role. The fact that elevation was important may be due to tradition and/or expediency. If the tripods held oil, elevation would have been useful since these low-fired artifacts might have seeped oil. By the same token, elevation would have been a safety factor if they held a smoldering resin or aromatic grasses.

On the basis of container capacity, the tripods do qualify as lamps. Measurement of the capacity of six terracotta lamps from Roman through Moslem periods (collection L. Gunther, Los Angeles) indicated a maximum liquid capacity of 1/4 cup. The tripod experimentally modeled by the author has a greater capacity.

Assuming that the tripod is used as a lamp or censer, it is apparent that the manufacture of these small, legged vessels does not change in the direction of increased efficiency. There is no stylistic change, with the exception of the tapering leg. My own attempt to reproduce these items at Sitagroi leaves me with a healthy respect for the prehistoric artisans. It is far easier to form a simple rounded bowl than to fashion a multilegged vessel.

By elimination, then, these vessels can be seen as functioning in the social and/or ritual life of the settlement at Sitagroi mound. The tripods may be small lamps or thuribles, and they may also be symbols with an arbitrary meaning, defined by the form and patterns of incisions. They may represent a clan or a kin group—though not a ruling class since they are ubiquitous. Equally, the tripod may have served in a particular ritual, and the patterns of incision may represent several levels of meaning, though the definition of these is still speculative. The fact that the incised patterns do not appear on the pottery of phases I and II reinforces the inference that these items are unique and set apart, at least at Sitagroi.

PLASTIC VESSELS

Description

A few profiles and many fragments, their surfaces decorated with curvilinear incisions or curving painted lines, represent these small open vessels (fig. 10.1:3; pl. XLIII:2) which often carry zoomorphic attributes (fig. 10.1:2; pl. LXX:1). Items of this type exhibit a range of variability but share several characteristics: first, a plastic, sculptural quality which softens and contours the vessel form so that even if the bowl is rectangular or square, the corners are rounded; second, freely curving surface designs whether incised or painted; and third, the presence of legs. This grouping is most often recovered in phase III (see table 10.1).

The overall height of the zoomorphic vase profile (fig. 10.1:2; pl. LXX:1) is 12.1 cm. The legs are modeled with rounded animal-like haunches, and an animal protome, perhaps a sheep/goat (fig. 10.1:2),[22] bovine, or dog, rises from one corner or is modeled to rise from the slightly inturned rim between the legs (figs. 10.1:2; 10.7:2, 4; pls. LXX:1, LXXI:7). The leg-shoulder (haunch) may be formed with an exaggerated profile line (fig. 10.7:12)[23] or a gently curving profile line (fig. 10.1:2).[24] The zoomorphic vessel handle SF 2370 (fig. 10.7:1; pl. LXXIV:2) which is attached in two places, differs from the protome which needs to be connected to the vessel at or below its neck or rim (fig. 10.1:2; pl. LXX:1).[25]

Hanging lugs or piercings may be found above the leg near the rim (fig. 10.7:7, 8) or centered between the two back legs (fig. 10.7:6; pl. LXX:2). The legs are round in section (fig. 10.7:6);[26] in profile they may be cylindrical (fig. 10.7:16, 17; pl. LXXI:5), tapering (fig. 10.7:10, 11), or widened and/or modeled at the base (fig. 10.1:2)[27] suggesting human feet, animal hooves, or paws. The side and underside of the bowl exhibit rounded articulation.[28]

One fragment (fig. 10.7:5; pl. LXXI:11) represents the angled corner of an open vessel; it is fractured at the point where the leg joins the body as well as on the rim, indicating a broken protome. Evenly spaced angled lines are incised from the rim, meeting at the corner to form a nesting V. The surface is dark gray burnished and the incisions are infilled. Although this item was recovered in a context of phase V, on typological grounds it is clearly related to the plastic vessels of phase III. Another fragment (pl. LXXI:9), displaying an angled corner and open bowl, is fractured at the leg and rim, which probably held a protome; the surface is incised with a spiral on one side of the corner zone with oblique lines in opposition. Three artifacts from phase III clearly represent broken protomes (fig. 10.7:2-4; pl. LXXI:7); all are incised with dots and curving lines of various complexity.

Three incised artifacts are related in form and surface design: a rear profile fragment, SF 868 (fig. 10.7:6; pl. LXX:2), with two legs extending smoothly down at each gently angled corner; and two leg fragments (fig. 10.7:10, 11). They share relative size and the specific overall pattern of incised paired, vertical, and angled lines, exactly repeated on a stand (pl. LXX:3). On the profile SF 868, these lines form a broken chevron centered below the rim lug. This hanging lug modifies the back rim, conveying the impression of an animal tail. All of these, including the stand, were recovered from the MM quadrant in contexts designated as phases III and IV; all are black/gray burnished with infilled incisions.

The single example of a virtually complete plastic vessel, SF 883 (fig. 10.1:3; pl. XLIII:2), has an incurving collared rim. It may be compared with a shoulder fragment, SF 1518 (fig. 10.7:9; pl. LXXI:6), because of the curving profile, exaggerated shoulder, curvilinear incisions of interlocking dotted spirals over the shoulder (see also fig. 10.1:2; pl. LXX:1), dotted ribbons and lines, and the round, tapering leg. The bowl collar is a variation and the protome is lacking in SF 833, but the plastic vessels were not always modeled with a protome. The many similarities suggest that all were developed in a related conceptual tradition. In terms of chronology, SF 833 and SF 1518 were recovered from phase III, square MM. As indicated on table 10.1, the plastic vessels are mainly recovered from phase III.

Two other artifacts are both phase III open vessel profiles with tapering legs rounded in section. The surface of these fragments is burnished, incised, and infilled. Both artifacts probably were fashioned with four legs. SF 3931 (pl. LXXIV:1) is larger, 9.0 cm in height, and incised with interlocking spirals on both sides of the rounded corner. SF 3629 (pl. LXXI:10) is 6.7 cm in height with the tapering conical leg slightly inset and incised with circling lines; three sets of nesting half-circles decorate the bossed shoulder above the leg and give way to slightly curving sets of vertical lines along the side of the bowl. Both exhibit fine craftsmanship. Two last fragments include a tapering, dark gray leg fragment, SF 2826 (MM 43), 5.4 cm preserved height, with random incised lines infilled with white material, and SF 3559 (ZG 22), a gray burnished corner fragment with leg and concave bowl portion and fractured rim; preserved height is 5.0 cm. The incisions are linear on one side of the corner and curvilinear on the opposite section (see also pl. LXXI:9).

Design

The curvilinear designs appear in free fashion seemingly without zone restriction, but frequently interlocking spirals with a dot (fig. 10.7:9; pl. LXXI:6) or without (fig. 10.1:2)[29] are found over the rounded shoulder/haunch. Curving ribbons and wavy lines complete the design pattern (fig. 10.7:7)[30] and are seen in combination with rhomboids or rectangles also with a centered dot (fig. 10.1:3).[31] Surfaces are usually

dark burnished, incisions white-filled (e.g., pl. LXX); light-faced surfaces (figs. 10.1:3, 10.7:18; pl. XLIII:2) are also found. One side-leg fragment exhibits smeared red ocher in the narrow ribbon between infilled incisions (fig. 10.7:8). A few are unburnished or have lost the finish (fig. 10.7:13).[32]

The recognizable animal protomes (figs. 9.72, 9.73) are small sculptures, as is the remarkable animal sculpture SF 1207 (fig. 9.67; pls. LVI:3, B1) measuring 10.6 cm in height and complete except for the fracture on its back. The red slip on the sculpture is burnished and decorated with black spiraling lines, similar to the decoration on the open vessels SF 1517 and SF 3862 (fig. 10.9:7, 10; pl. LXXIII:1). Black-on-Red painted open vessels are noted but are more properly examples of the varied ceramic inventory of phase III (chap. 12). The fractured double bowl, SF 3862 (fig. 10.9:10; pl. LXXIII:1), and SF 1517, a corner profile (fig. 10.9:7), are both from phase III. Both are elevated by rounded tapering legs, similar to SF 1496 (fig. 10.8:21; pl. LXXII:15), which extend the profile in a fairly smooth line. The bowl of SF 1517 opens out as do SF 3629 (pl. LXXI:10) and SF 3931 (pl. LXXIV:1).

Distribution and Discussion

Compared with the tripods, the plastic vessels exhibit a far wider range of attributes and formal expression. This is in line with the range of innovation exhibited in phase III in the ceramic inventory and in the florescence of plastic art as evidenced by the pottery, the figurines, and the animal sculptures. The front profile fragment of what must have been a nicely proportioned plastic vessel (fig. 10.1:2; pl. LXX:1) with an animal protome rising from the rim between two legs, is closely parallel to the Dikili Tash zoomorphic vase (Deshayes 1970:802, fig. 6). Gimbutas (chap. 9) discusses these animal figurines as ritual sculptures. All but one are associated with phase III and all exhibit incisions, except the "dog," SF 2370, which is painted red on a tan burnished surface (fig. 10.7:1; pl. LXXIV:2).

A survey of the Kavalla Museum collection revealed an animal head sculpture, perhaps a protome from a vessel, recovered from Nea Baphra. Other small animal head sculptures fractured at the neck may also be protomes; these are reported from Dikili Tash. Some are actually handles of very large ladles, and these have been on display in the Philippoi Museum. A leg-body fragment, graphite-painted, with the protome fracture on the rim is published from Doxat Tepe (Grammenos 1978:211, 213, fig. 4:10); and an incised leg-body from Doxat Tepe (Grammenos 1978:213, fig. 4:9) may be compared with the leg-shoulder fragment SF 1464 (fig. 10.7:16; pl. LXXI:5); both are incised with curvilinear designs and the profile lines are similar.

The vessel with zoomorphic features is a frequent component in Old Europe ceramic assemblages; some of these can be rightly termed *rhyta,* such as the artifacts from Kodjadermen (Gaul 1948: pl. LXII:1, 2), Gabarevo (ibid.: 4), Sultan (ibid.: 5), and Muldava (Detev 1968:31-32). The profiles and fragments from Sitagroi, though modeled with animal characteristics like the rhyta just referred to, differ in representing artifacts with an open bowl rather than hollow rhyta. Both rhyta and plastic vessels are inherently interesting, requiring skill to model and fire, and they probably played some part in ritual activity (Gimbutas 1974a:172, figs. 167, 168; Chapman 1981:73). From Plateia Magoula Zarkou in Thessaly comes evidence for a definite use: a zoomorphic vase holding skeletal material of a small child, recovered from the late neolithic cemetery (Gallis 1982:100, fig. 17, pl. 32:74).

The finds that most resemble the zoomorphic vessel SF 177 (fig. 10.1:2; pl. LXX:1) are from north of Drama, beyond the borders of modern Greece, at Yasa Tepe (Detev 1948, 1959, 1960) in the Maritsa Valley of Bulgaria. The Yasa Tepe finds include profiles and fragments from a triangular vase with an animal protome rising from the rim between the two legs. The vase is modeled with an open bowl, rounded contours, an exaggerated profile line, and has white-filled curvilinear incisions on a dark burnished surface. This artifact and other fragments of zoomorphic vases are termed "lamps" by their excavators;

the animal is interpreted as a ram (Detev 1948:6; 1959:51, fig. 74:9-10).

Other excellent parallels to SF 177 and SF 883 can be found in the Gradeshnitsa material (Nikolov 1974:pl. 67). Striking are specific sets of attributes to compare with Sitagroi SF 177: (1) protome rising from vessel rim between legs, (2) exaggerated leg to rim profile, (3) incised, infilled curvilinear surface designs, and (4) modeled feet. Unlike the Yasa Tepe finds, Sitagroi SF 177 is not from a triangular vessel, but from an oval or rounded form, like the Gradeshnitsa B zoomorphic vessel. Incised spirals are placed over the exaggerated shoulder on both SF 177 and the Gradeshnitsa model. Sitagroi SF 883, which is an incised, open, collared bowl, is clearly parallel to two collared vessels: both from Gradeshnitsa A, one with a burnished surface (Nikolov 1974:pl. 33, lower) and the other (ibid.:pl. 44, upper) incised with a meandroid. Two Gumelnitsa artifacts are also modeled with open collared bowls and the addition of protomes, which in one case (V. Dumitrescu 1974:253, fig. 279) is of a horned animal, and in the other (ibid.:fig. 280) a schematized zoomorph, more similar to the Gradeshnitsa protome (Nikolov 1974:pl. 67). The rules of modeling these artifacts appear flexible.

As noted above, the majority of zoomorphic items are from phase III which is typically characterized by the Graphite-painted pottery. Earlier phases I and II yielded the greatest percentage of tripods. This chronological correlation is repeated at Yasa Tepe, where zoomorphic items were recovered in levels overlying those from which tripods were recovered (Detev 1959:31, 59). Also at Guinova Mogila, Chelopech in the Sofia Basin, the excavator (Petkov 1948) describes three *couches:* A, B, and C. Tripod vessels were recovered in couche B, along with Veselinovo pottery, whereas the overlying couche A yielded graphite-decorated pottery (Detev 1950b). The relationship in stratigraphy and phase association for these two types in sites of the Drama Plain, the Sofia basin, and the Maritsa Valley is striking and again supports the inference that these regions were linked beginning with Sitagroi phase I.

Other fragments similar to the zoomorph SF 177 are a rear profile from Okol Glava incised with spirals (Gaul 1948:196, pl. XIV: 4); a protome from Donchova Mogila, Bikovo (Detev 1954:184, fig. 65); and a piece from Kapitan Dimitrijevo, Baniata, with a goat head protome and nesting half-circles covering each shoulder-leg (Tringham 1971:158, fig. 26a).

A fragment from a Sitagroi open plastic vessel, SF 483 (fig. 10.7:5; pl. LXXI:11), with oblique linear incisions and a definite corner angle rising to hold a fractured protome, may be compared with similar fragments from Vinča (Vasić 1936, 2:Tab. XIX:40a; LXXXVII:331-332a, b), and one from Predionica (Galović 1959a:65, 66; Tab. 76:4; 77:2,3; 78:1) which has the protome rising from a corner and the surface incised with angled incisions.

Another Sitagroi open plastic vessel, SF 868 (fig. 10.7:6; pl. LXX:2), represented by a rear profile fragment, is modeled with a zoomorphic feature, as indicated by the hanging lug in the form of a tail. This tail lug is also seen on the animal sculpture SF 1207 (fig. 9.67), while shoulder lugs appear on several rounded leg-shoulder fragments (fig. 10.7:7, 8). No exact parallel has been noted for this rare profile, SF 868, but artifacts recovered from Vinča (Vasić 1936, 2:Tab. XX:41a-c) and Zitkovac (Tasić 1957b:Tab. V:6a) exhibit similarities in corner angle, smooth profile, and use of linear rather than curvilinear incisions. A zoomorphic vessel from Donchova Mogila has a square form and a tail lug, but with more curvilinear incised decorations (Detev 1954:184, fig. 65). It is probable that SF 868 is the back portion of a vessel adorned with a protome at the front. The incising pattern repeats on the stand fragment (pl. LXX:3) almost exactly, and both artifacts were recovered from the same context, MM 41, phase III.

Several plastic vessel forms elevated on legs are known from Old Europe. The simplest is the rounded, collared bowl such as SF 884, which is presaged, perhaps, by a representative Körös vessel (Tringham 1971:76, fig. 11n). Subsequent elaboration is seen in the addition of a protome such as found on the Gumelnitsa artifacts (V. Dumitrescu 1974:253, figs. 279, 280) and on SF

177. A variant is the animal sculpture with remains of an offering bowl, SF 1207, which may be compared with the undecorated zoomorphic vase of the Cucuteni A-B culture from Traian Dealul Fintinilov (V. Dumitrescu 1974:223, fig. 241). These vessels had a part in Old Europe's domestic ritual assemblage, along with the figurines.

STANDS

Description

Fragments from stands (13 in all), modeled with angular as well as softened corners, represent 4-legged taborets, 3-legged trivets, or a solid or hollow box, with variously, (1) a flat top, (2) a top opening, (3) a top with rising receptacle. Nine of the artifacts are from phase III, one each from phases II and IV; two pieces were recovered on the surface of the mound.

The artifact may be modeled solidly like a block (pl. LXX:3) or hollow with flat sides as an overturned box (fig. 10.9:3; pl. LXXII:1), or with the sides cut out (figs. 10.1:5, 10.9:5; pl. LXXII:2, 3). Two of the trivets have legs that extend down from a rounded corner (fig. 10.1:4; pls. LXXII:7, 8); a third displays an angled corner (fig. 10.9:9). Another exhibits the fractured remains of a circular bowl rising from the center of the top (fig. 10.1:6; pl. LXXII:4-6); this variant is termed an *offering stand.* The stands recovered as full profiles range in height from 5.2 to 9.2 cm (figs. 10.1:5, 10.9:3, 5; pl. LXXII:1-3).

The most flamboyant artifact in this group is a square pyramidal offering stand, further discussed in chapter 12 (fig. 12.7:1; pls. LXXIV:4, B:3). The hollow base slopes outward; oval cutouts lighten each side. The top of the stand was originally modeled with a round bowl. All that remains is the circular fracture on the solid top, similar to the circling break on the back of the fine animal sculpture (fig. 9.67; pls. LVI:3, B:1). A smooth depression remains on the inside of the bowl, and a fractured circle outlines the bowl's base dimension. The small receptacle rising from the stand could have held oil, water, incense, or a special object.

Design

Surface finish for the entire group of stands varies: smoothed only (pl. LXXII:8), burnished (fig. 10.9:5, 9; pl. LXXII:2) and, most frequently, graphite paint on a black burnished surface (figs. 10.1:5, 6; 10.9:1-4; pl. LXXII:1, 3-6) or on a red burnished surface (fig. 10.1:4; pl. LXXII:7). Graphite decoration on the black, highly burnished surface of the offering stand (fig. 12.7:1; pl. LXXIV:4) consists of a line of sharp triangles facing and framing each corner of the base; the side surface between the corners is decorated with an interlocking, double line spiral. The artisan probably painted this graphite design before cutting the ovals, since part of the spiral curve is absent but the free flowing swirl is uninterrupted. This effect would be difficult to achieve unless each spiral was painted with a single sweep.

Graphite patterns include combinations of parallel lines of varied width (figs. 10.1:5, 10.9:2, 4; pl. LXXII:3, 5, 6) which may be paired with spiral ribbons (fig. 10.9:1, 3; pl. LXXII:1) or geometric motifs (fig. 10.1:6; pl. LXXII:4). These designs reflect the graphite patterns painted on the phase III pottery (see Evans, chap. 12). The graphite paint on the red burnished stand (fig. 10.1:4; pl. LXXII:7) exhibits a style similar to the Black-on-Red painted designs (fig. 10.9:7, 10; pl. LXXIII:1). An unillustrated hollow stand, SF 3404 (MM 16), is incised with encircling, grouped, horizontal infilled lines. This last artifact and two others show the remains of red ocher. In one case, SF 1425 (fig. 10.1:6; pl. LXXII:4), a small depression on the top corner holds traces of ocher while the corner of the other, SF 398 (fig. 10.9:5; pl. LXXII:2), is smeared with red ocher from top to base.

Distribution and Discussion

There are many general parallels to the offering stands, beginning with the graphite-decorated stand from Dikili Tash (Schachermeyer 1955: 125, Abb. 30). A fragment from the top corner of what may have been a pyramidal stand is reported from Doxat Tepe (Grammenos 1978:211, 213, fig. 4:7), but it is gray and incised rather than painted like SF 26/35 (fig. 12.7:1; pl.

LXXIV:4). Some formal similarity can be found in artifacts from Bulgarian sites: surface designs are incised, such as on the trivet leg from Kremikovci (Gaul 1948:29, pl. III:8), or absent, such as at Karanovo (Georgiev 1961:Beil. B). An offering stand from the Tisza culture called a "libation table" (Kalicz 1970:43, pl. 40) is a square pierced pedestal with incised meandroid designs on the sides and a bowl modeled from the top surface; this is comparable to SF 867 (pl. LXX:3). A hollow stand, red burnished, with two top openings and linear incisions on the side, is from the Gumelnitsa site of Vidra Si Zîmbreasca (Miclea and Florescu 1980:87, pl. 224); it is illustrated supporting a round-based figurine in one opening. The comparable Sitagroi stand fragments with top openings are SF 730 (fig. 10.1:5; pl. LXXII:3) and SF 398 (fig. 10.9:5; pl. LXXII:2).

In Yugoslavia, stand fragments are reported from Obre (Gimbutas 1970:290), Gornja Tuzla (Čović 1960-61:133, fig. 5), Starčevo (Fewkes et al. 1933:pl. VIIb), Pristina (Galović 1968:Taf. 3:7), Tečić (Galović 1962-63:Taf. 2:6; 8:4, 6-8), Crnokalačka Bara (Tasić and Tomić 1969:22, fig. 22), and Jakovo in Slavonia (Childe 1929:71, fig. 36). Some of these artifacts are from neolithic contexts earlier than phase III at Sitagroi, although only the general form of an offering stand is present, not the decoration. Yasa Tepe excavations yielded an offering stand fragment (Detev 1960:28, fig. 27) with four leg supports.

Romanian stands from Leţ (Zaharia 1962:17, fig. 7:18-19) are decorated with incisions, excisions, or protuberances (ibid.:34); also from Verbiţa I (Berciu 1961:31, fig. 3:1) and from the 1960 Gumelnitsa stratigraphic sounding (V. Dumitrescu 1966:95, fig. 30:1, 5).

The wider distribution of the Sitagroi trivet with closed top (fig. 10.1:4; pl. LXXII:7, 8) is uncertain. Similar items from Dikili Tash (unpublished) have been on display at the Philippoi Museum. Finds of flat ceramic stand fragments are not uncommon in neolithic and chalcolithic Balkan sites, but the set of similarities is not parallel. However, such artifacts are reported from Kara Bujuk, Dupnica (Gaul 1948:33, pl. IX:2), Gorni Bogorov (ibid.: 57, pl. XX:4), Donchova Mogila, Bikovo (Detev 1954:184), and Yasa Tepe (Detev 1959:58); also from Cernavoda, in association with Gumelnitsa type ceramics (Langsdorff and Nestor 1929:244, Abb. 8/14), and Căscioarele from the upper couche (Stefan 1925:186, fig. 42:1).

There is a clear parallel in the incised designs on two artifacts: the plastic vessel profile, SF 868 (fig. 10.7:6; pl. LXX:2), and the solid stand which exhibits a fracture on the top, SF 867 (pl. LXX:3). The stand may have been modeled with an offering bowl; but even lacking such evidence, these two artifacts—both from the same archaeological context—are linked aesthetically and connect the stands with the zoomorphic vessels and their special place within the social ceramic assemblage of this agricultural settlement.

LARGE INCISED VESSELS

Description

Six incised fragments from phase III represent vessels which must have been considerably larger than those previously described. These artifacts are similar in surface finish and color, coarseness of paste-ware, incised surface decoration, but not pattern. One item was recovered from the surface of the mound, two from phase II, and three from phase III.

Two fragments, SF 2837 and SF 884 (pl. LXXII:2, 3), indicate the complete form: a thick tapered leg rises to an exaggerated, bulging body (forming a large bowl) which curves out and then in toward a nicely banded rim finished with a series of four notches. The surface is red burnished, with deep white-filled incisions of striking composition: two sets of four horizontal incisions separate the reserved areas and circle the legs; another pair of lines encircles the bowl where leg and shoulder merge. Nesting half-circles frame the pair of concentric circles centered on the shoulder bulge above the leg. The bowl rim is decorated with a series of four short, vertical incisions which, based on the fragment, were regularly placed and separated by a single short

incision located at a rise in the rim. Below this are three incised lines which encircle the bowl and form the upper frame of a pattern which is repeated around the vessel; rectangular areas are formed by four vertical incisions which are divided in each case by two pairs of angled lines into a triangular top and bottom with a rhombus between. The areas so sectioned are further decorated with a centered dot. The lower frame is composed of a pair of circling incised lines. The paste-ware is coarse and red-orange. The total effect is of a carefully planned and executed design. Two heavy single legs, broken at the point where leg and body merge, were also recovered from this series. The former was 8.0 cm in height, which would be the approximate leg measurement of SF 884.

Two fragments of incised, red burnished coarseware may be related. The larger piece, SF 508 (fig. 10.8:1), is 9.8 cm high and almost a full profile of an open vessel; to this must be added nearly 6.0 cm if the leg were preserved. The incised design is relatively simple: squares are incised on the bowl above and on the leg; angled lines fill these squares; a similar or possibly triangular design, also incised, extends on an angle from the rim. Observable on the side fragment of SF 2814 (fig. 10.8:2) are lines that cross the thick rim and nest on the side. Both items were recovered in phase II contexts. The large fragment SF 508 represents a vessel which, when complete, must have been at least 15 to 20 cm high, or twice as tall as most of the artifacts heretofore discussed but on a par with SF 884 (pl. LXXIII:3) and SF 2837 (pl. LXXIII:2).

Distribution

Fragments similar to these large incised segments are reported from Dikili Tash (Garašanin and Dehn 1963:19, Abb. 19), Mylopotamos (ibid.:Abb:17, 18), and Dhoxaton (fig. 10.9:11, 12). The similarity of the latter to SF 884 (LXXIII:3) is particularly clear.

PLAIN LEGS, LEG-BODY FRAGMENTS, AND FEET

Description

A group of 37 fragments, 12 legs and 25 feet, are all rounded, plastic items and probably represent several artifact forms. They share an almost total absence of incised patterns and a common plastic quality. They were examined as a group based on these attributes.

Leg fragments suggest a version of the shallow plate on four legs typical of Veselinovo and also recovered at Paradimi in Thrace. Two of these artifacts are from phase III (fig. 10.8:4, 9). Fragments of this type are fully discussed in other chapters of this volume (Keighley, chap. 11; Evans, chap. 12). The preserved height of these items is 8.3 cm; the Veselinovo elevated platters are reportedly 15 cm high (Musée Archéologique Plovdiv 1964:123, pl. 3).

Six leg-body fragments appear to represent a vessel with an inturned shoulder. An example, SF 1433 (fig. 10.9:8), is from phase IV; another, SF 738 (pl. LXXII:17), is from phase III. Two similar, unillustrated pieces were recovered from phase III, SF 877 (MM 43) and SF 729 (MM 12); another, pale gray ware is a surface find, SF 2836. In all cases the legs are rounded and tapering; the leg-to-shoulder height averages 13 cm. Two other leg-body pieces, SF 1707 (pl. LXXI:12) and SF 149 (fig. 11.10:9; pl. LXXI:13), share the roundness of leg and body but do not display the inturned shoulder. Their preserved heights are 10.9 cm and 8.0 cm, respectively. Each is red burnished with traces of red paint. A painted triangle located above and around the leg decorates SF 149. All eight artifacts exhibit an exaggerated bowl concavity. A slightly differing leg segment, a surface find with part of the bowl preserved (fig. 10.8:6) has a preserved height of 8.8 cm. The foot is modeled, a feature observed in 20 of the 25 single foot fragments found.

The single feet are not parts of figurines; some may be the basal section of a leg such as those

described above or may belong to one of the many varieties of plastic vessels known from the Vinča and Gumelnitsa assemblages. Several are illustrated (figs. 10.7:20, 21; 10.8:7, 10-23; pls. LXXII:9-16, LXXIV:3). The preserved foot height ranges from 2 to 7.2 cm; mean is 4.3 cm. Five in the smallest range, 2.0 to 2.9 cm, were recovered from ZA 44 in the sieving project only; Evans refers to a number of foot fragments in chapter 12. Forms of foot fragments are conical (fig. 10.8:21; pl. LXXII:15), or with splayed bases (fig. 10.8:22; pl. LXXII:16), rounded (pl. LXXII:11), or anthropomorphic (fig. 10.8:12-15, 18-20; pl. LXXII:9, 10, 12-14) with toe and/or ankle bone projection (pl. LXXIV:3).

Surface treatment varies: artifacts are smoothed only (fig. 10.8:7), and burnished (fig. 10.8:15, 22; pl. LXXII:16), or painted (fig. 10.8:19; pl. LXXII:10; in the latter case, with graphite paint around the "ankle"). Feet with incisions (pl. LXXIV:3) which may be fragments of plastic vessels discussed earlier were tabulated with those groupings. Surface color of the fabric varies from dark (fig. 10.8:20; pl. LXXII:13) to light (fig. 10.8:14; pl. LXXII:12). Most of the feet and legs are neither painted nor incised.

Distribution

Sitagroi fragments related to the Veselinovo form have been discussed. The undecorated form with an inturned, rounded shoulder (fig. 10.9:8; pl. LXXII:17) is paralleled on the Drama Plain only by a shoulder fragment from the Kalambaki site (Kavalla Museum, unillus.). These artifacts from Sitagroi and Kalambaki exhibit possible similarities to fragments of rounded shoulders from Guinova Mogila (Petkov 1948: 170, fig. 21) in association with graphite-painted ceramics, and to leg supports of a Vinkovci vessel (Dimitrijević 1969: table 16:10) chronologically placed with Vinča (ibid.:63).

The single feet with modeling are rather ubiquitious. Only one Sitagroi item suggests that the feet may have been part of much longer leg supports (fig. 10.8:6). Other single feet are from Mikro Soulion and Dikili Tash (Kavalla Museum). Beyond the Drama Plain, undecorated anthropomorphic feet are reported from the Bulgarian site of Donchova Mogila, Bikovo in association with zoomorphic plastic vases (Detev 1954:37, fig. 54), and with graphite-decorated pottery at Baniata, Kapitan Dimitrijevo (Detev 1950b:15).

Single undecorated anthropomorphic feet are also reported from Vinča (Vasić 1932, 1: pl. XXII; fig. 101a, b; 1936, 3: pl. LIII; fig. 245a, b) along with an incised example (ibid.:58, fig. 319). Possibly they are fragments of figurines, as also may be true for the incised feet reported from Gumelnitsa II sites in Romania such as Ciolanestii din Deal (Petrescu-Dimbovitsa and Sanie 1969:53, fig. 7-8) or Station A, Lake Boian (Christescu 1925:275, pl. XXII:6, 10, 11), found on the surface, and Gumelnitsa II level at Tangîru (Gaul 1948:87). In summary, single feet and legs are ubiquitous and recovered from most neolithic and chalcolithic sites of Old Europe. The assemblage of elevated vessels or bowls includes many varieties but the use of a modeled leg is a common variable.

CONCLUSIONS

Tripods and plastic vessels seem to have been manufactured during separate time periods at Sitagroi (fig. 10.1). Furthermore, curvilinear designs and zoomorphic attributes are reserved for plastic vessels, linear and geometric incisions for tripods. This distinction is not necessarily as clear outside of Drama; several examples show that at other Old European sites, these attributes are interchangeable. For example, a Vinča tripod from Fafos I has leg supports with modeled feet (Renfrew 1969:33, pl. 7:62) very similar to the feet on SF 177 and the single anthropomorphic foot (fig. 10.8:13).[33] A rectangular vessel with four legs from Rudna Glava is adorned with two mask protomes, one set between each pair of legs with horns curving back and attached to the long side rim (Jovanović 1979:Taf. V:6a-b). This artifact has a linear meander design; the bowl

form is not curving but rectangular. The artifacts from Gradeshnitsa demonstrate that the pottery and tripods are both incised with similar designs (compare Nikolov 1974:pl. 20, lower, with pl. 23; pl. 17, lower, with pl. 29, also the square vessel, pl. 64, lower, and the "house" model, pl. 65). Furthermore, tripods and a zoomorphic vessel are found together on a center platform in house V at Muldava (Detev 1968); thus the idea of replacement does not seem to be appropriate outside of Sitagroi. Nevertheless, at Sitagroi plastic vessels do appear to replace tripods during phase III, but this implies a functional equivalence which is not known. We are here dealing with at least three different groupings—tripods, plastic vessels, and stands—separated from the ceramic assemblage of Sitagroi because of the uniqueness of form and decoration. The tripod has a long duration and a widespread distribution; the closest parallels to the Sitagroi items are from the Drama Plain and present-day Bulgaria although the triangular form is ubiquitous over Old Europe. The stands and plastic vessels are not modeled over as long a time period as are the tripods, and there is a much greater variation in their forms, but their distribution parallels that of the tripods.

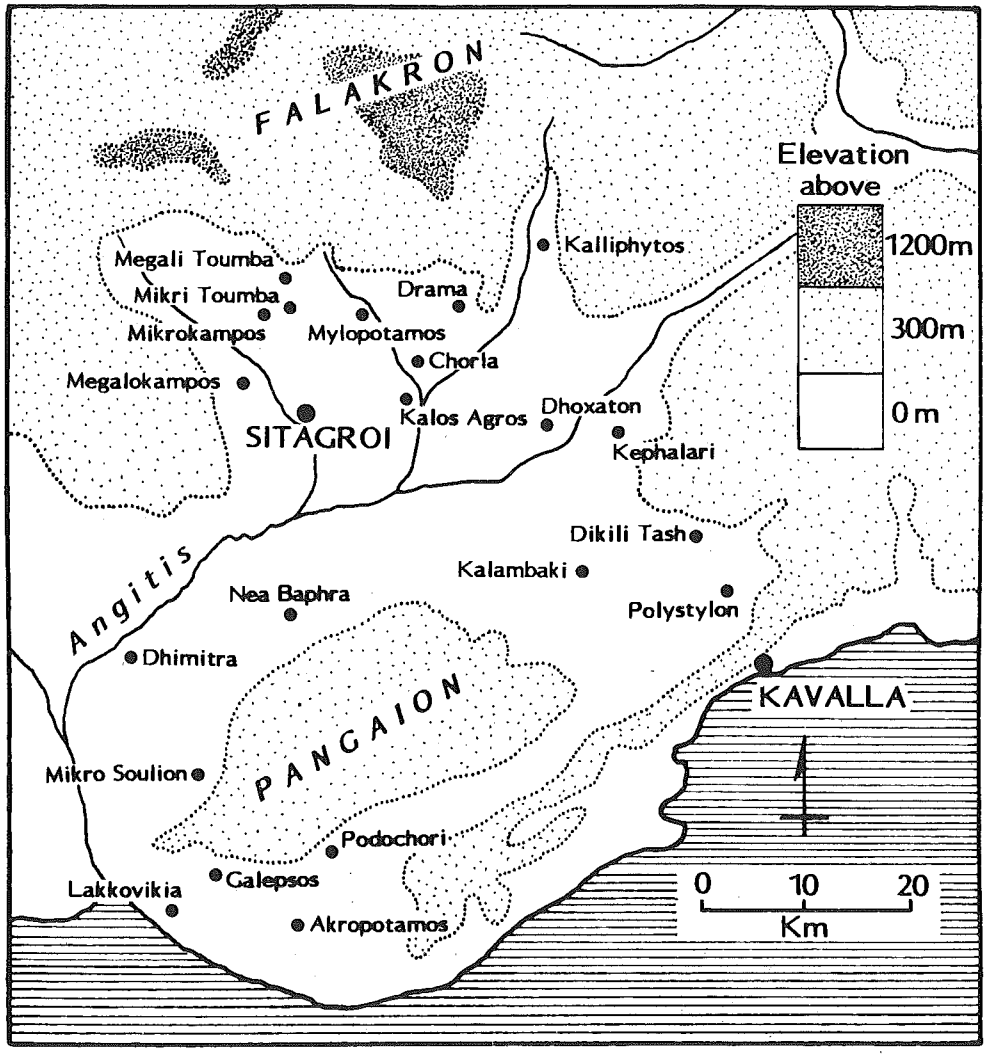
It has already been noted that various prehistoric settlements in the Drama Plain were contemporaneous with the successive phases of settlement on Sitagroi mound; further, the figurines (chap. 9) and artifacts herein discussed indicate many shared forms, so we can assume contact from Sitagroi to the Drama Plain sites. The sources of two raw materials allow inferences to be advanced concerning contact with the wider region of Old Europe. *Spondylus* found in the east and central Balkan sites is from the Aegean/Mediterranean (Shackleton and Renfrew 1970), a source which Sitagroi settlers could have exploited easily. Honey-brown flint, probably from northeast Bulgaria, was a prized raw material for tools used at Sitagroi from phases I through V (Tringham 1984:260; and *Sitagroi* vol. 2). This is evidence for long-term and long-distance trade or exchange and reflects an organization in social relations of extraordinary durability.

The implication of interaction with neighboring settlements within a local region and maintenance of long-term and long-distance trade in a much wider regional system indicates sufficient complexity for regulation to have been part of the society. There is scant evidence for anything but an egalitarian society in Old Europe; thus, in the absence of a political power structure, the regulatory function had to have resided elsewhere. It has been observed that among primitive farming people in New Guinea who lack political power structures, ritual is used as a way of controlling the regional population and regulating the exploitation of the environment (Rappoport 1968:224-225). The people themselves do not see the ritual as a means of social control but rather as needed "to rearrange their relations with spirits" (ibid.:237). The sanctity of the ritual cycle is powerful and ensures that the conventions are followed; thus, this very sanctity "is a functional alternative to political power" (ibid.). It is not inappropriate to apply Rappoport's research to Old Europe's primitive farmers, requiring regulation and obviously regulated. Whether or not social control resided in ritual, the assemblages discussed in this chapter are of considerable importance as further attention is sure to be given to the ritual apparatus of early agrarian settlements.

NOTES

1. For other full profile fragments see figs. 10.1:1; 10.2:5, 7; 10.5:12; pls. LXVII:2, LXVIII:1-3.
2. For other symmetrical tripods with narrow corners, see figs. 10.2:1-8, 10; 10.5:1, 4; pls. LXVII:1, 2; LXIX:13.
3. Other sloping rims can be seen in figs. 10.3:1-3, 8, 9; 10.4:11, 15, 23; 10.5:9; pls. LXVIII:2; LXIX:1, 5.
4. See also figs. 10.2:4, 5-8, 10; 10.3:4; 10.5:1-3; 10.6:1, 5, 13; pls. LXVII:2; LXVIII:1, 3; LXIX:4, 12, 13.
5. See also fig. 10.4:24, 25; pl. LXIX:6, 7.
6. Other tapering legs triangular in section are shown in figs. 10.2:7, 8, 10; 10.5:4, 7, 8, 12; pls. LXVIII:1, 3; LXIX:13.
7. For additional examples of legs triangular in section without tapering, see figs. 10.3:7, 20; 10.5:5, 6, 10, 13, 14, 17; pl. LXVIII:4.
8. For other legs with straight profiles and angled sections see figs. 10.3:2, 6, 10-19, 21, 23; 10.4:8; 10.5:3, 15; pls. LXVI:1-3; LXVII:2, 4-6.

9. Especially observable on artifacts illustrated by figs. 10.2:1, 10.3:20-23.
10. For other examples of irregular edges around incisions, see fig. 10.3:17; pl. LXVII:6.
11. See also figs. 10.2:1-6, 8; 10.6:1, 5; pls. LXVI:2; LXVII:1-3; LXVIII:1-4.
12. For other pieces with a full circle incised in zone 1, see figs. 10.2:6-8, 10; 10.3:1-4, 9, 10, 12, 13; 10.4:4, 11, 15, 23; 10.5:2, 9-12; 10.6:1, 5, 13; pls. LXVIII: 1, 2; LXIX:1, 4, 5, 12, 13.
13. For other pieces with full circles in zone 2, see figs. 10.4:13, 17-20; 10.6:3; pl. LXIX:2, 9-11.
14. See also fig. 10.4:1, 2, 21, 24.
15. Other examples include figs. 10.2:2-4; 10.3:17, 19; 10.4:1-5, 7, 8, 12, 21; pls. LXVI:1, 3; LXVII:1, 6; LXIX:3, 8.
16. See also figs: 10.4:20; 10.6:12, 16.
17. See also figs. 10.3:10, 11, 14, 15, 18; 10.4:6, 11, 14; pls. LXVI:2; LXVII:5.
18. See also figs. 10.4:9, 24; 10.6:18.
19. See also fig. 10.6:3; pl. LXIX:10.
20. See also figs. 10.3:4; 10.6:11,14.
21. See also fig. 10.6:2, 7, 11, 13.
22. Other examples are illustrated in chap. 9, for sheep/goat: figs. 9.69, 9.72, 9.73; pls. LVIII:1, LVII:1; for bovine: fig. 9.78; pl. LIX:3; dog: fig. 9.76; pl. LVIII:4.
23. See also fig. 10.7:14; pl. LXXI:4, 8.
24. See also fig. 10.7:6, 7, 9, 15-19; pls. LXX:1, 2; LXXI:1, 5, 6.
25. See example in chap. 9, fig. 9.72.
26. See fig. 10.7:9-13, 15-21; pls. LXX:1, 2; LXXI:1, 4-6.
27. See also fig. 10.7:13, 18, 20; pl. LXX:1a.
28. Examples: figs. 10.1:2; 10.7:8, 9, 12, 19; pls. LXX:1; LXXI:4, 6, 8.
29. See also fig. 10.7:12, 14; pls. LXX:1, LXXI:4.
30. See also fig. 10.7:8, 13, 15-19; pl. LXXI:5.
31. See also fig. 10.7:7; pl. XLIII:2.
32. Other examples include fig. 10.7:15-17, 19, 21; pl. LXXI:5.
33. See also fig. 10.8:15, 18, 19; pl. LXXII:9, 10, 14.



Location of sites in the Drama Plain and surrounding area.

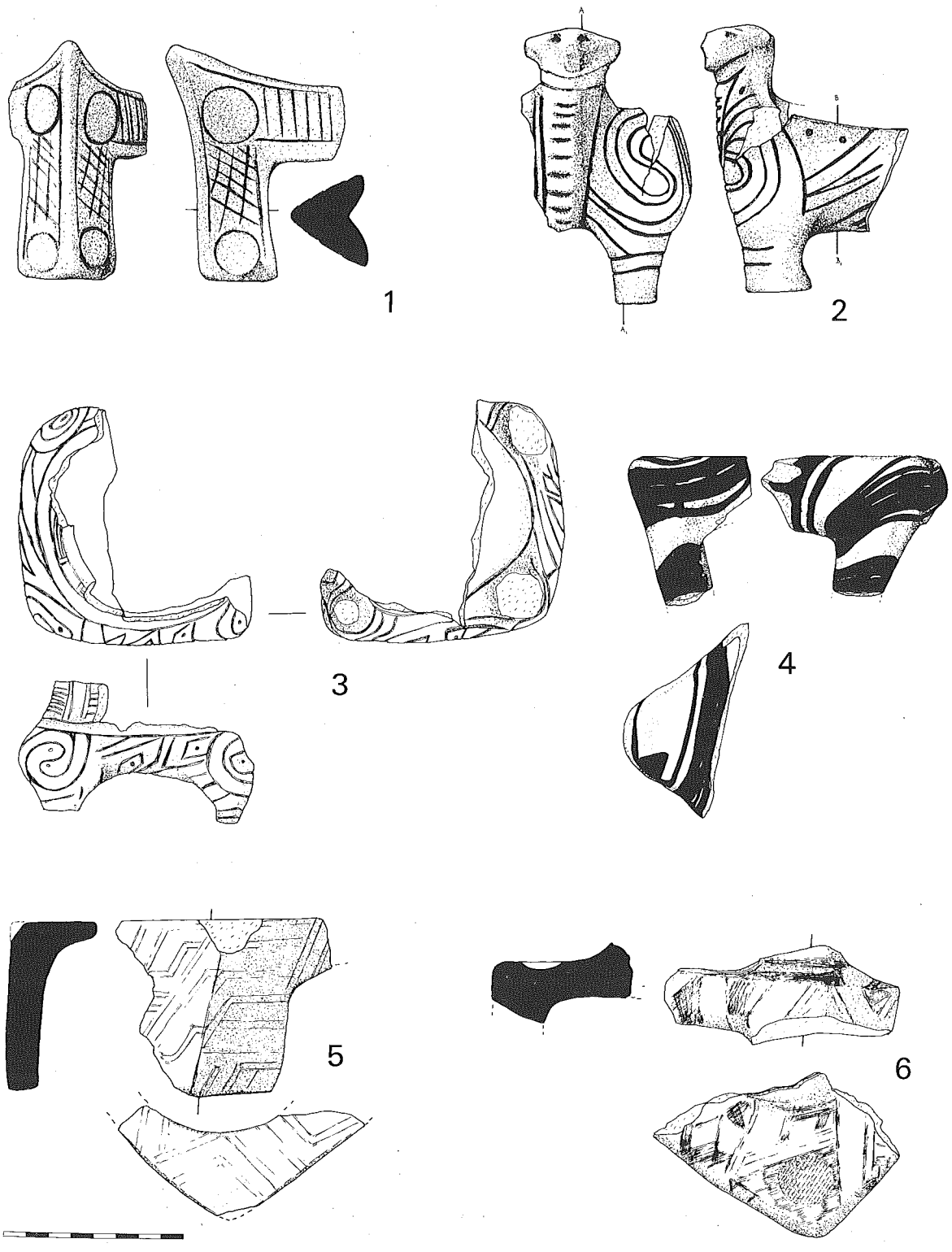


Figure 10.1. Tripod profile (1), zoomorphic (2) and plastic (3) vessels, and stands (4-6), phases III and IV.

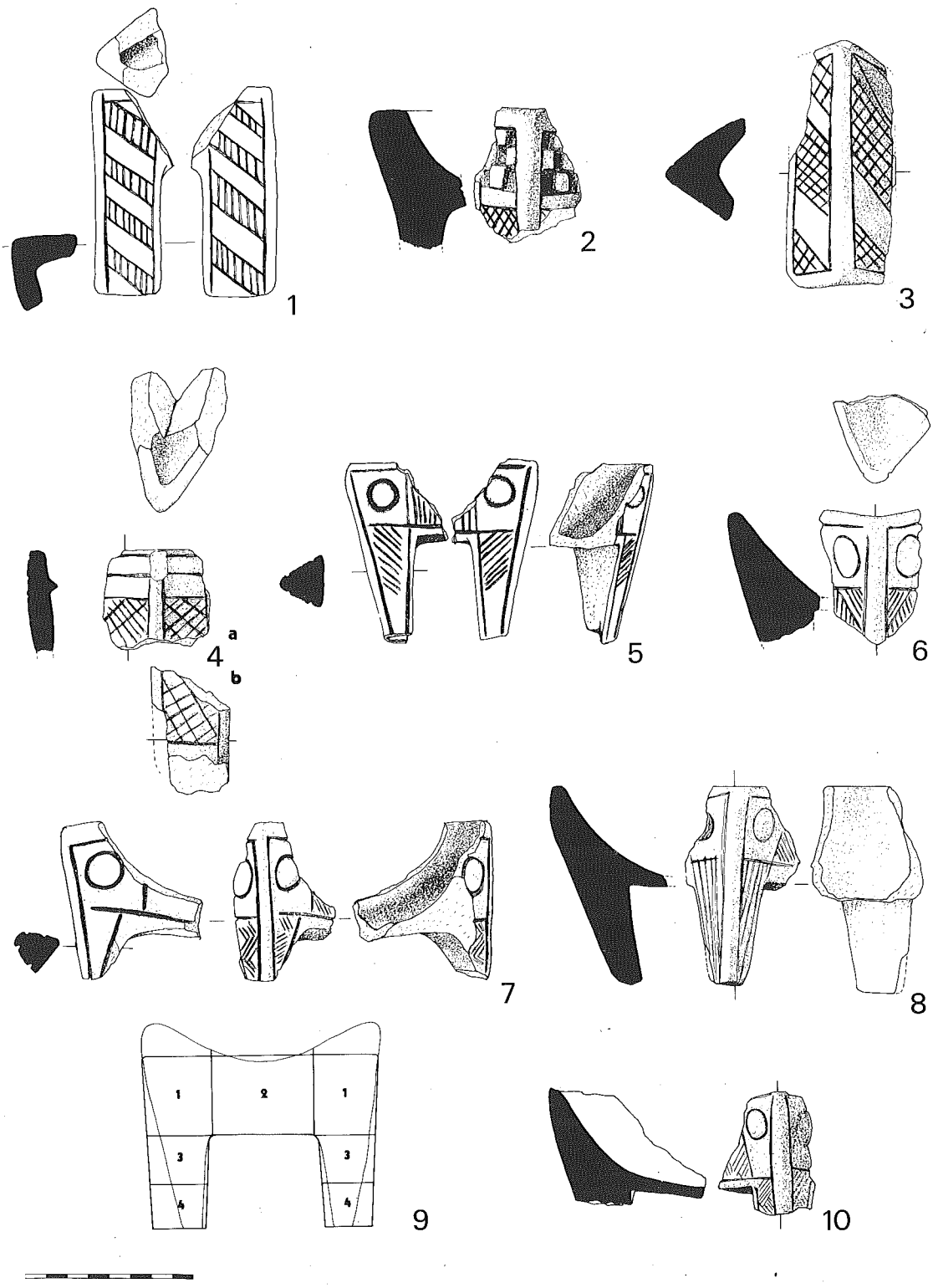


Figure 10.2. Tripod profiles (1, 3, 5, 7, 8), corner fragments (2, 4, 6, 10), and the idealized form (9), phases I, II, and surface.

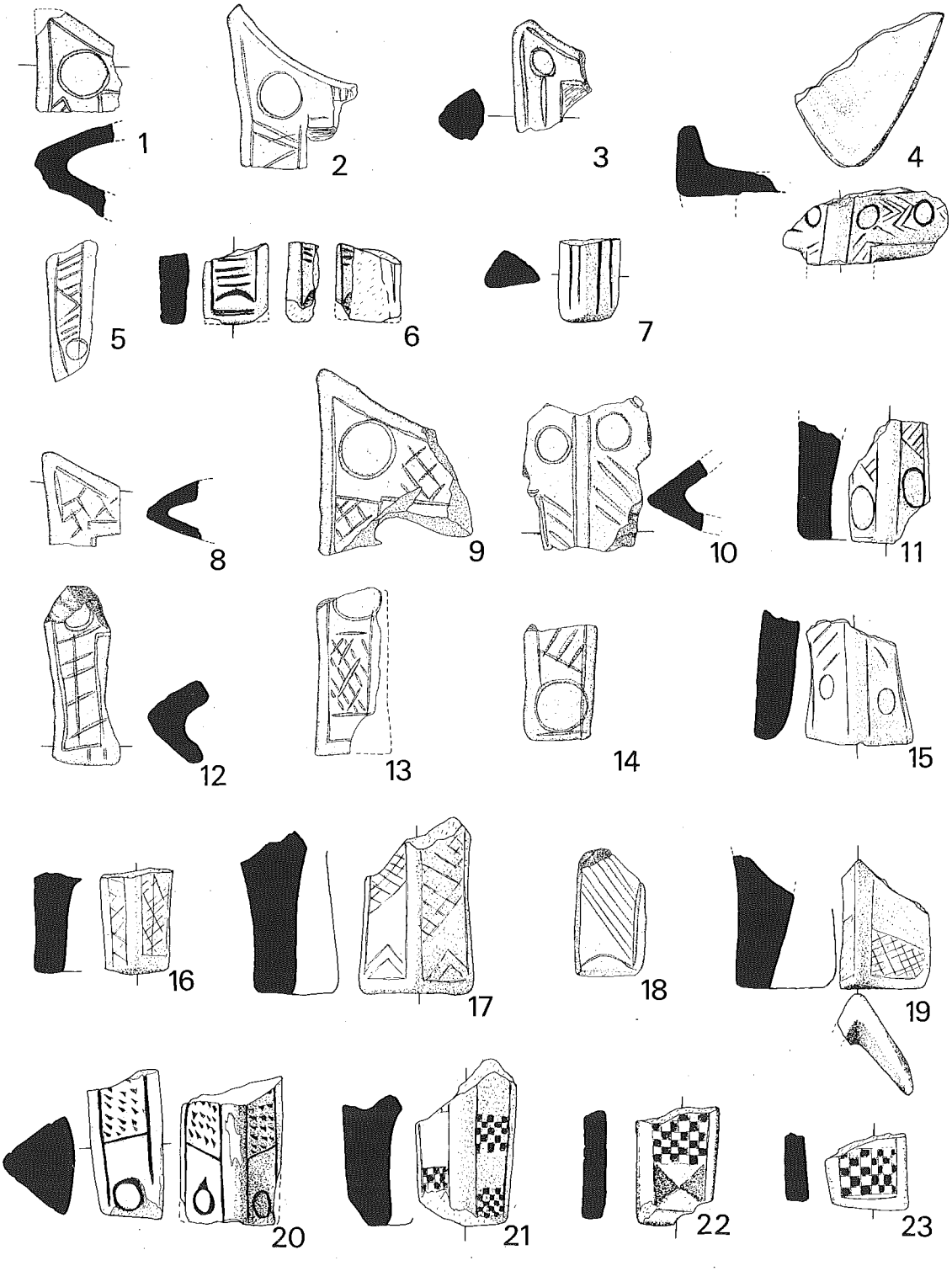


Figure 10.3. Tripod corner (1-4, 8-10) and leg fragments (5-7, 11-23), primarily phases I and II.

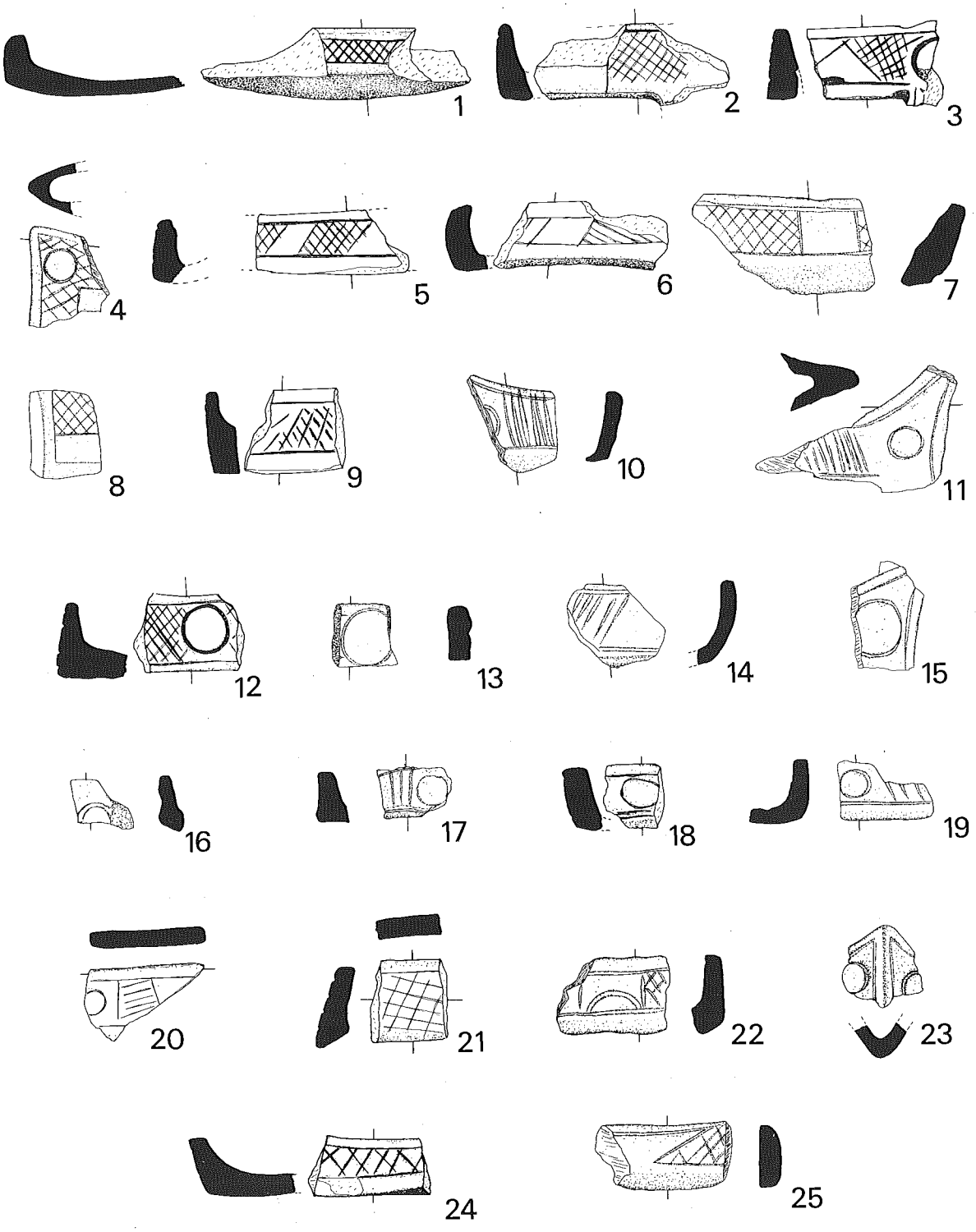


Figure 10.4. Tripod fragments: bowl-sides (1-3, 5-7, 9, 10, 12-14, 16-22, 24, 25), corners (4, 11, 15, 23), and leg (8), primarily phases I and II.

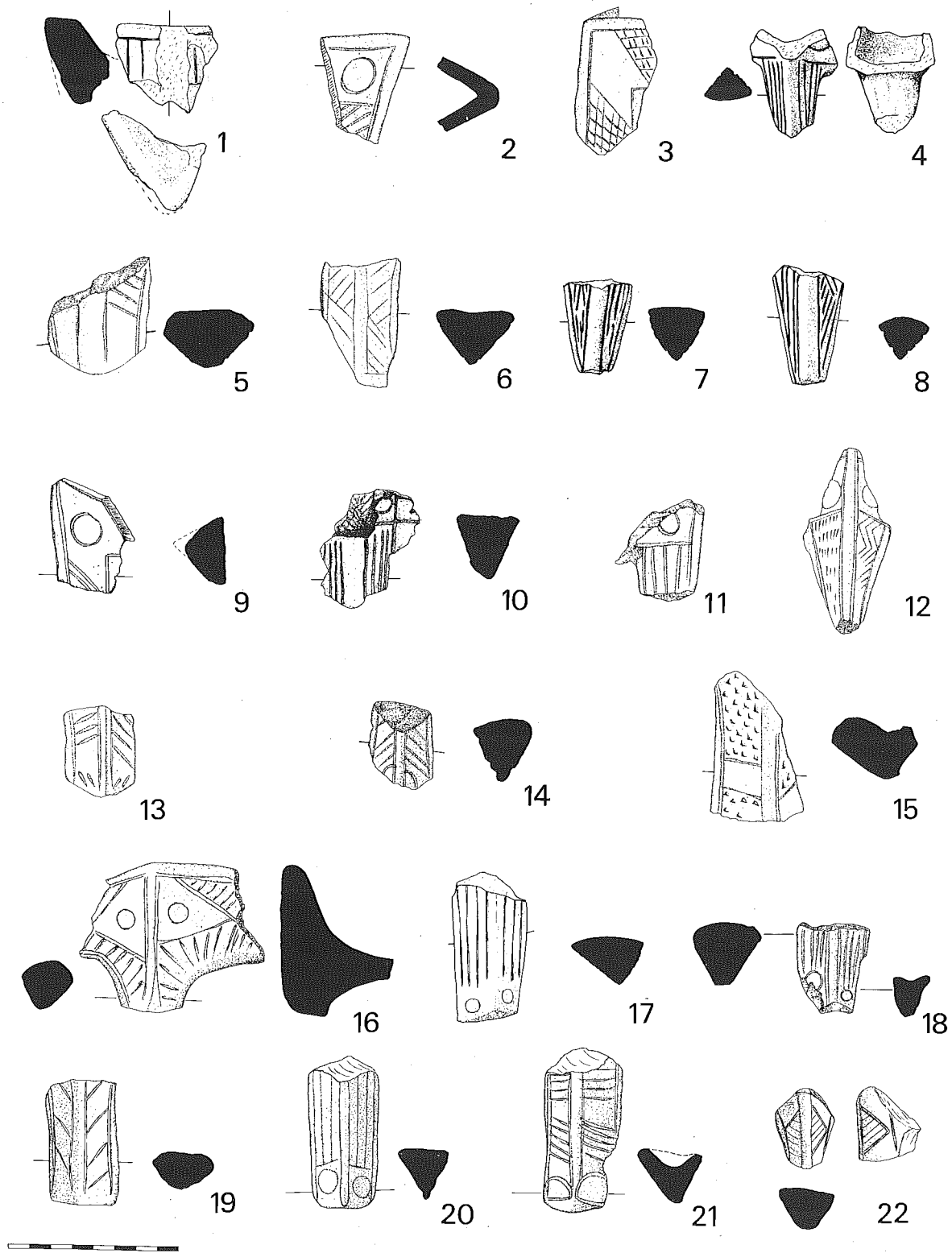


Figure 10.5. Tripod fragments: corners (1-4, 9-12, 16) and legs (5-8, 13-15, 17-22); Sitagroi, primarily phases I and II (1-15, 17, 18), Dhoxaton (16, 22), Chorla (19), Dhimitra (20), Drama (21).

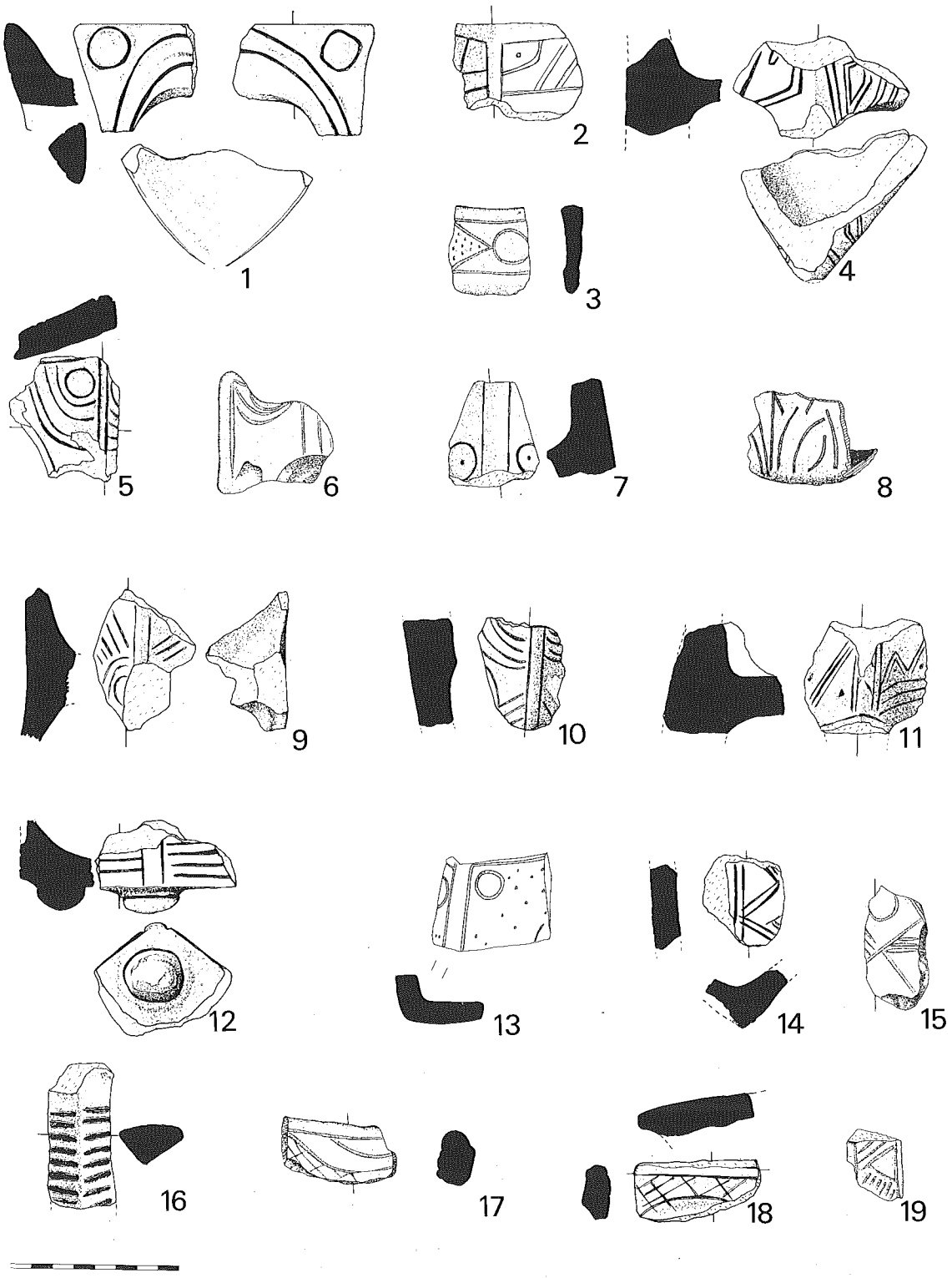


Figure 10.6. Tripod and other open elevated vessel fragments: corners (1, 2, 4-15), legs (16, 19), bowl-sides (3, 17, 18), phases I-III.

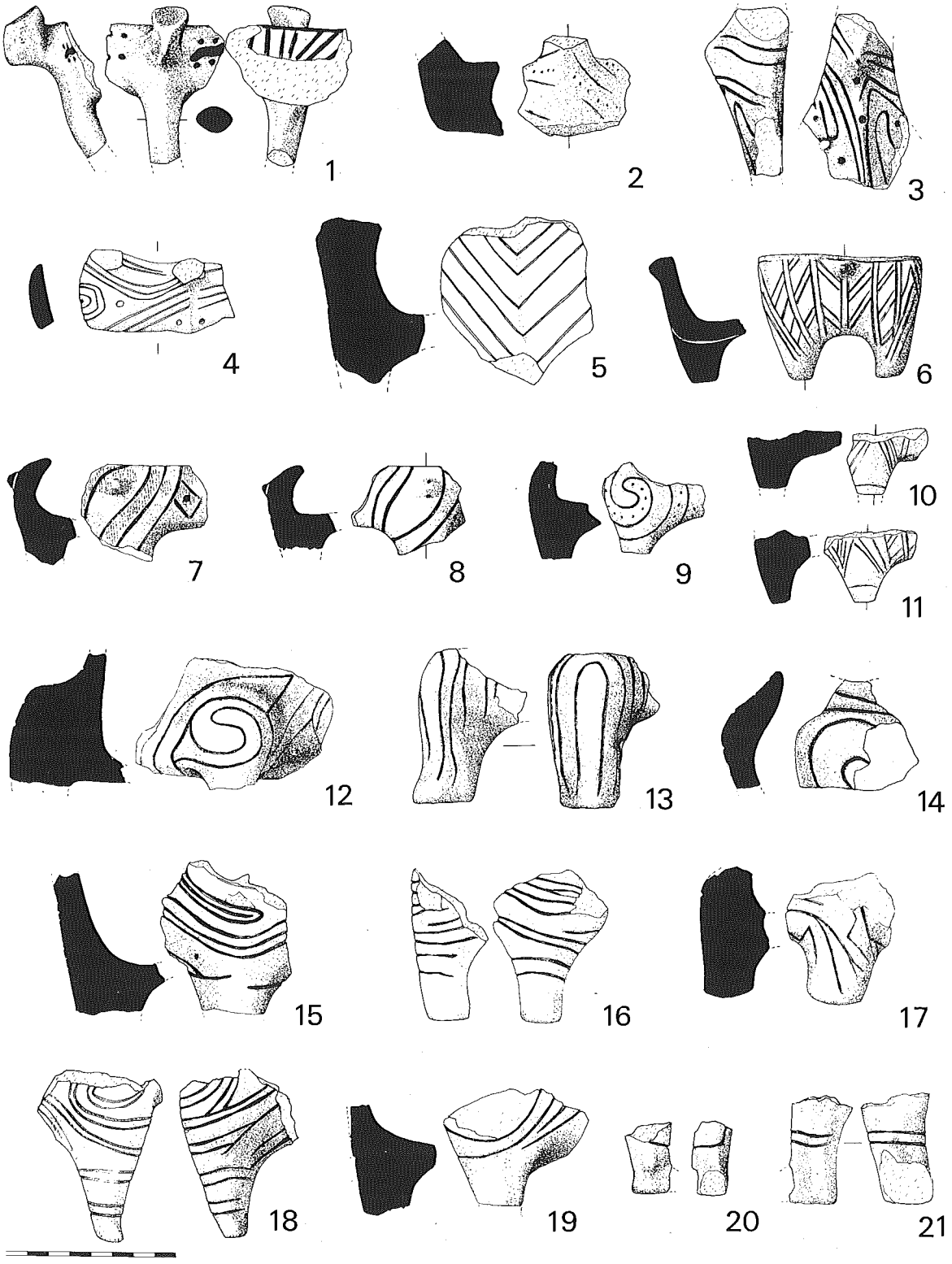


Figure 10.7. Plastic vessel fragments of protomes and protome sections (1-5), bodies (6-9, 12, 14, 15), legs (10, 11, 13, 16-19), and feet (20, 21), primarily phase III.

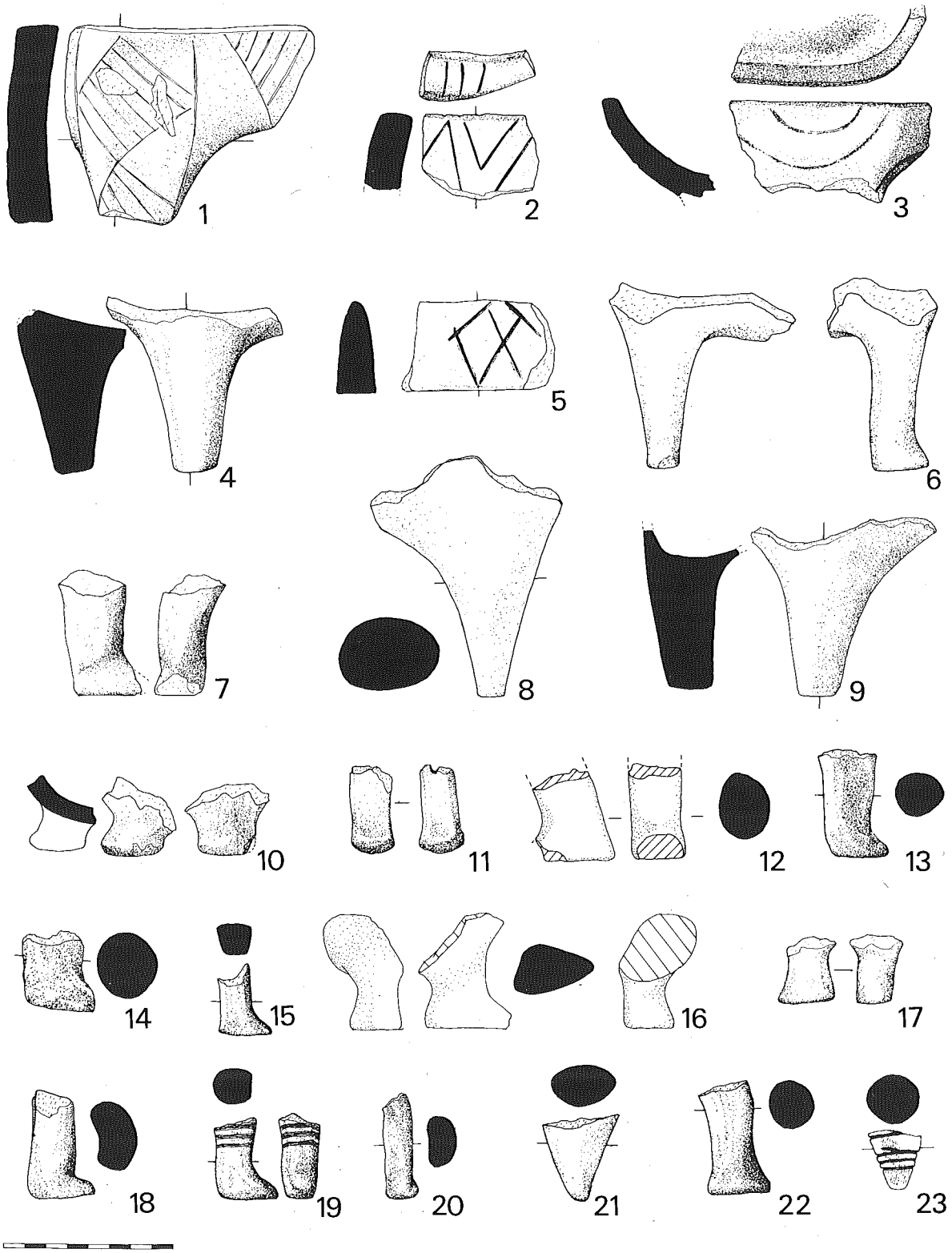


Fig. 10.8. Fragments of large incised vessels (1, 3), miscellaneous side piece (5), legs (4, 6, 8, 9), and foot pieces (7, 10-23), primarily phase III.

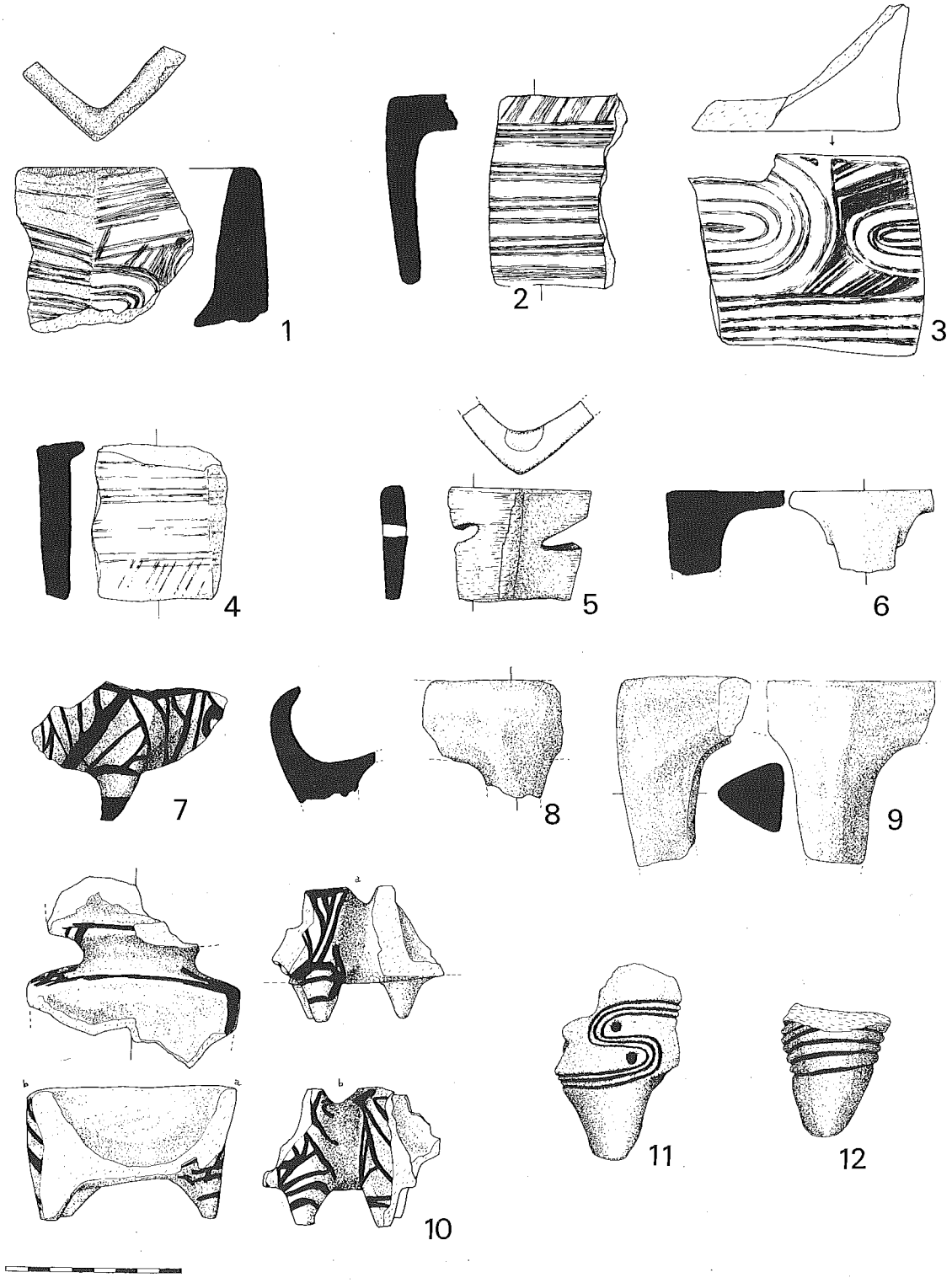


Fig. 10.9. Stands (1-6, 9), fragments of open vessels (7, 8, 10), and legs from large incised vases (11, 12); Sitagroi, primarily phase III (1-10), Dhoxaton (11, 12).

Concordance: Figures to Plates

Figure 10.1
1. SF 339 (pl. LXVI:1)
2. SF 177 (pl. LXX:1)
3. Pot/SF 113/833 (pl. XLIII:2)
4. SF 2236 (pl. LXXII:7)
5. SF 730 (pl. LXXII:3)
6. SF 1425 (pl. LXXII:4)

Figure 10.2
1. SF 135 (pl. LXVII:2)
2. SF 2235, PKa 1 (pl. LXVII:1)
3. SF 2540 (pl. LXVI:3)
4. SF 710/711
5. SF 959 (pl. LXVIII:3)
6. SF 972
7. SF 903
8. SF 112 (pl. LXVIII:1)
9. stylized drawing
10. SF 1503 (pl. LXIX:13)

Figure 10.3
1. SF 419
2. SF 109
3. SF 2378/2380 (pl. LXVIII:2)
4. SF 140
5. SF 2254
6. SF 1115
7. SF 1118
8. SF 1530
9. SF 2696
10. SF 3578
11. SF 1514
12. SF 3585
13. SF 244
14. SF 2297
15. SF 726
16. SF 979
17. SF 1501 (pl. LXVII:6)
18. SF 3582
19. SF 1122
20. SF 119
21. SF 1533 (pl. LXVII:4)
22. SF 763
23. SF 1580

Figure 10.4
1. SF 2845
2. SF 1478
3. SF 1114
4. SF 2326
5. SF 537 (pl. LXIX:3)
6. SF 1477
7. SF 1508
8. SF 79
9. SF 719
10. SF 1532
11. SF 3583
12. SF 507
13. SF 3581
14. SF 720
15. SF 463
16. SF 2294
17. SF 2293
18. SF 456
19. SF 2840
20. SF 1689
21. SF 1637
22. SF 748
23. SF 512
24. SF 502
25. SF 708

Figure 10.5
1. SF 1475
2. SF 549
3. SF 1466
4. SF 902a
5. SF 3609
6. SF 2698
7. SF 2649
8. SF 236a
9. SF 2312
10. SF 1613
11. SF 2818
12. SF 1500
13. SF 2285
14. SF 3577
15. SF 2834
16. Dhoxaton 14
17. SF 1672
18. SF 3584
19. Chorla 8
20. Dhimitra 1
21. Drama 13
22. Dhoxaton 12

Figure 10.6
1. SF 750
2. SF 1577
3. SF 1534 (pl. LXIX:10)
4. SF 1146
5. SF 2807
6. SF 1502
7. SF 975
8. SF 2669
9. SF 121
10. SF 708a
11. SF 1578
12. SF 1119
13. SF 1531
14. SF 1134
15. SF 457
16. SF 423

17. SF 1476
18. SF 1479
19. SF 2278

Figure 10.7

1. SF 2370 (pl. LXXIV:2)
2. SF 1511
3. SF 851
4. SF 1582 (pl. LXXI:7)
5. SF 483 (pl. LXXI:11)
6. SF 868 (pl. LXX:2)
7. SF 1492
8. SF 1124
9. SF 1518 (pl. LXXI:6)
10. SF 1434
11. SF 1432
12. SF 1512 (pl. LXXI:4)
13. SF 218a
14. SF 764
15. SF 852
16. SF 1464 (pl. LXXI:5)
17. SF 1495
18. SF 854
19. SF 1424
20. SF 1467
21. SF 1408

Figure 10.8

1. SF 508
2. SF 2814
3. SF 518
4. SF 1515
5. SF 547
6. SF 2
7. SF 2186
8. SF 270
9. SF 1510
10. SF 3402
11. SF 1483
12. SF 1768
13. SF 722
14. SF 1190 (pl. LXXII:12)
15. SF 1270
16. SF 157
17. SF 1769
18. SF 39 (pl. LXXII:14)
19. SF 204 (pl. LXXII:10)
20. SF 2267
21. SF 1469 (pl. LXXII:15)
22. SF 762 (pl. LXXII:16)
23. SF 860

Figure 10.9

1. SF 480
2. SF 67
3. SF 225 (pl. LXXII:1)
4. SF 1407
5. SF 398 (pl. LXXII:2)
6. SF 1128
7. SF 1517
8. SF 1433
9. SF 2318
10. SF 3862 (pl. LXXIII:1)
11. Dhoxaton 15
12. Dhoxaton 13

APPENDIX F

Catalog of Tripods, Plastic Vessels, Stands, and Miscellaneous Fragments

Ernestine S. Elster

Information given follows this sequence: small find no., phase (in parentheses; "U" designates an unstratified or surface find; phase within quotation marks reflects typology only), context (when more than one context is listed, fragments of this artifact were recovered from these locations), reference to illustration (not all items are illustrated), description, measurements in cm (in brackets). Abbreviations used are H, height, D, bowl depth, W, width, Th, thickness.

2 ("II") KOb 1 Fig. 10.8:6
Plain tapering leg-body with foot modeled; light gray smoothed. [H.8.8]

26/35 (III) ZA 42, 45, ZB 126 Fig. 12.7:1; Pls. LXXIV:4, B:3
Square pedestal stand. Sides extend outward and down; oval cutouts lighten each side; round fracture in center of flat top indicates remains of centered raised container. Graphite decoration on black, highly burnished surface consists of line of triangles facing each other at corner angle and interlocking spirals on each surface. [H.10.0]

39 ("III") OLc 1 Fig. 10.8:18; Pl. LXXII:14
Foot fragment with anthropomorphic modeling; gray-pink burnished. [H. 5.3]

67 (III) MM 46 Fig. 10.9:2
Stand fragment. Graphite linear design on black burnished surface. [H. 8.8]

79 (I) IL 9 Fig. 10.4:8
Tripod angled leg base fragment. Incisions frame crisscross with reserve at leg base, black burnished surface, white infill; brown core. (Compare SF 2326, fig. 10,4:4.) [H. 4.0]

109 (I) JL 8 Fig. 10.3:2
Tripod sloping corner fragment. Corner angle 47°; fracture at angled leg; framed, deep incisions of repeated corner circles; gray burnished; black core. [H. 7.6.]

112 (II) LL 9 Fig. 10.2:8; Pl. LXVIII:1
Tripod profile with straight corner rim, narrow angle, and triangular tapering leg. Rough bowl interior; gray-black-buff burnished; coarse paste; black to brown core; framed incisions of corner circles and angled leg lines; infill. [H. 9.9]

113/833 (III) MM 49 Fig. 10.1:3; Pl. XLIII:2
Plastic vessel profile with incurving collared rim. Buff; incised with snakes, dotted lozenge, and angled lines; infill. [H. 5.8]

118 (I) KL 15
Tripod triangular tapering leg fragment. Buff surface; framed angled incisions. (Compare with SF 236a, fig. 10.5:8, and SF 2649, fig. 10.5:7.) [H. 3.0]

119 (I) JL 15 Fig. 10.3:20
Tripod triangular lower leg, no tapering. Black burnished; coarse paste; mottled core; excised with framed, reserved circles at leg tip, and deep punctate above with band between; infill. [H. 6.3]

121 (I/II) ML 22 Fig. 10.6:9
Tripod (?) angled corner fragment with fractured rim. Wet-smoothed bowl interior; gray matte surface; fine paste; brown core; incised with radiating circles and oblique lines. [D. 6.6]

135 (I) JL 16 Fig. 10.2:1; Pl. LXVII:2
Tripod straight rim profile and angled leg. Narrow angle. Black, highly burnished; medium paste; black core; incised with angled ladders; infill. [H. 9.8]

140 (II) KL 2 Fig. 10.3:4
Tripod corner-side with straight rim. Narrow angle; wet-smoothed bowl interior; buff, rough surface; coarse paste; red to black core; incised frame with circles at corner and side with zigzag between. [D. 3.1]

149 ("III") KL 2 Fig. 11.10:9; Pl. LXXI:13

Plastic vessel leg-body fragment with smooth profile line. Tapering leg; red burnished surface with red painted triangle on and above leg. [H. 8.0]

157 ("III") U Fig. 10.8:16
Foot fragment, anthropomorphic; widening above "ankle"; matte suface; gray-buff. [H. 5.5]

177 (III) MM 16 Fig. 10.1:2; Pl. LXX:1
Zoomorphic plastic vessel profile with animal protome. Head triangular with framed horizontal incisions on neck, curvilinear spirals on bowl shoulder; medium paste-ware; black to buff core; black-gray burnished surface with white infill. (See chap. 9, figurine cat. no. 191.) [H. 12.2, W. of protome head 3.8 cm]

203 (III) ZA 38 Fig. 9.72; Pl. LVII:4
Animal protome. (See chap. 9, figurine cat. no. 200.)

204 (III) ZA 38 Fig. 10.8:19; Pl. LXXII:10
Foot fragment, anthropomorphic; gray-brown burnished; circling graphite lines above ankle. [H. 3.9]

218a (III) ZA 42 Fig. 10.7:13
Plastic curving leg. Probably from zoomorphic vessel; dark smoothed; curvilinear incisions. [H. 7.0]

225 (III) ZA 45 Fig. 10.9:3; Pl. LXXII:1
Stand corner profile. Flat top; graphite paint of spirals offset by angled and horizontal lines; black burnished. [H. 9.2]

236a (II) ZA 50 Fig. 10.5:8
Tripod triangular tapering leg. Buff-pink matte surface; fine paste; red to brown core; framed incised hatchings. [H. 5.6]

244 (II) ZA 52 Fig. 10.3:13
Tripod angled leg fragment with part of corner preserved. Angle 70°; framed incisions; repeated corner circles; banded, crisscross lines with reserve above and below at tip of leg; buff to gray surface; red core. (Compare SF 2696, fig. 10.3:9, and SF 2385, pl. LXIX:1.) [H. 8.1, leg section H. 5.4]

270 ("I/II") U Fig. 10.8:8
Leg of vessel. Tapering; rounded and inturned shoulder; black burnished. (Compare fig. 11.4:3, 4.) [H. 11.4]

339 (IV) SL 12 Fig. 10.1:1; Pl. LXVI:1
Tripod sloping rim profile with angled leg. Wet-smoothed bowl interior; black burnished; fine paste; red to black core; framed incisions of corner circles with net pattern below and circle at leg tip; vertical lines on side of bowl; infill. [H. 10.0]

369 (V) QO 5
Tripod corner fragment without rim or leg. Burnished; no framing or infill; incised. (Compare SF 1578, 1134, and 457, figs. 10.6:11, 14, 15.) [H. 5.5]

398 (III) ML 5 Fig. 10.9:5; Pl. LXXII:2
Stand corner profile. Flat top; dark gray, slightly burnished surface; red ocher along corner edge and on top surface; cutout sections on sides. [H. 5.2]

419 (I) ML 29 Fig. 10.3:1
Tripod sloping rim corner fragment. Corner angle 50°; fracture at triangular leg join; framed, deep incisions; mirror image of reserved corner circles; gray core; gray-black smoothed surface. [H. 4.7]

423 ("II") KM 2 Fig. 10.6:16
Tripod triangular leg. Red surface; deep horizontal incisions. [H. 6.2]

449 (II) KM 14 Pl. LXIX:4
Tripod straight rim corner. Wet-smoothed bowl interior; buff-gray burnished; medium paste; red to brown core; incised corner circles with herringbone on side; infill. [H. 6.9]

456 ("II") KM 2 Fig. 10.4:18
Tripod bowl side. Straight rim; rough bowl interior; black burnished; medium paste; black core; incised with framed circle. [D. 2.3]

457 ("II") KM 2 Fig. 10.6:15
Tripod (?) fragment. Possibly one section of corner with rim and leg missing; part of framed, reserved circle; incisions of bisected angled line with three rays in upper section of this zone; buff-gray burnished surface; red core. [H. 5.3]

463 (III) ZA 47 Fig. 10.4:15
Tripod sloping rim corner fragment. Corner angle 50°; incised, framed, and white-filled reserved corner circles; black burnished surface; brown core. [H. 5.1]

480 (III) ZA 42 Fig. 10.9:1
Stand corner profile. Graphite linear and curvilinear paint on black burnished surface. [H. 7.3]

483 (V) PO 4 Fig. 10.7:5; Pl. LXXI:11
Plastic zoomorphic vessel corner fragment. Leg and protome fractured; open bowl; gray-black burnished; angular incisions forming nesting V; infill. [H. 7.9]

502 (II) KM 9 Fig. 10.4:24
Tripod side. Concave rim; gray surface with graphite wash; medium paste; brown core; incised with framed crisscross. [D. 2.8]

507 (II) KM 14 Fig. 10.4:12
Tripod side. Concave rim; rough bowl interior; gray-black burnished; medium paste; black core; incised with framed circle and net pattern. [D. 3.4]

508 (II) KM 13 Fig. 10.8:1
Large leg-body. Red burnished; incised with squares filled with angled lines; infill. [H. 9.8]

512 (II) ZA 53 Fig. 10.4:23
Tripod corner fragment; sloping rim; corner angle

70°; framed reserved corner circles; gray-black-buff burnished; red core. [H. 3.7]

518 (II) ZA 53 Fig. 10.8:3
Plastic open vessel fragment. Bowl-side; gray-buff surface with curvilinear incisions. [D. 4.2]

537 (II) KM 6 Fig. 10.4:5; Pl. LXIX:3
Tripod side. Rough bowl interior; dark gray burnished with graphite wash; coarse paste; red core; incised with angled net pattern separated by reserve; infill. [D. 3.8]

547 (II) ZA 55 Fig. 10.8:5
Tripod (?) fragment. Buff-gray surface; incised with random angled lines; white infill. [H. 4.4]

549 (II) ZA 55 Fig. 10.5:2
Tripod corner fragment. Straight rim; corner angle 60°; incised with framed reserved corner circles; angled lines in leg zone; white filled; black burnished surface; brown core. [H. 4.8]

550 (II) KM 16
Tripod angled leg fragment; incised net pattern filling frame which outlines leg; no infill; gray-black surface. (Compare incising pattern with SF 2540, fig. 10.2:3 and pl. LXVI:3; SF 1466, 2326, 79, figs. 10.5:3; 10.4:4, 8, respectively.) [H. 3.8]

708 (II) KM 17 Fig. 10.4:25
Tripod bowl fragment. Concave rim; single upper band; incised triangle filled with crossed lines; graphite wash and burnished; white infill; brown core. [D. 2.7]

708a (II) KM 17 Fig. 10.6:10
Tripod (?) corner fragment with fractured rim. Rough bowl interior; buff-gray matte surface; fine paste; red to black core; incised with nesting half circles. [D. 4.8]

710/711 ("I") U Fig. 10.2:4
Tripod corner, with narrow angle, straight rim outlined with double line (710) and angled leg incised with net pattern (711). Gray-black matte surface; coarse paste; brown core; infill. [H. 11.1]

719 (II) ZA 54 Fig. 10.4:9
Tripod bowl-side fragment. Wet-smoothed interior; black burnished; medium paste; brown core; incisions of framed net pattern; infill. [D. 3.9]

720 (II) ZA Fig. 10.4:14
Tripod bowl-side fragment. Straight rim; incised framed angled lines; black surface; black core. [D. 3.6]

722 (IV) MM 9 Fig. 10.8:13
Foot fragment, anthropomorphic; flat base; light matte surface. [H. 5.0]

726 (II) KM 17 Fig. 10.3:15
Tripod angled leg fragment. Gray burnished; medium paste; brown to black core; framed incisions of circles and angled lines; infill. [H. 6.0]

727 (II) ZA 58
Tripod angled leg fragment. Gray-black-buff surface; brown to black core. (For incising pattern compare with Chorla 5, pl. LXVIII:7, without circle.) [H. 3.2]

729 (III) MM 12
Leg fragment, inturned shoulder. Medium-dark gray ware; absent finish. [H. 13.5, H. of leg, 6.6]

730 (III) MM 16 Fig. 10.1:5; Pl. LXXII:3.
Stand profile. Open top; graphite linear design on black burnished surface. [H. 7.4]

738 (III) MM 16 Pl. LXXII:17
Leg-shoulder fragment. Tapering leg; inturned shoulder; medium gray; matte finish. [H. 12.0]

748 (V) QO 7 Fig. 10.4:22
Tripod bowl-side fragment. Concave rim; framed, white-filled incisions of banded crisscross and reserved half-circle; buff-gray surface; red core. [D.3.3]

750 (II) KM 18 Fig. 10.6:1
Tripod (?) profile. Corner angle 90°; straight rim; tapering leg; wet-smoothed bowl interior; black matte surface; medium paste; red core; incised with corner circles, curving lines; no frame. [H. 5.0]

762 (III) MM 16 Fig. 10.8.22; Pl. LXXII:16
Foot fragment. Modeled with widened base; pink-gray burnished. [H. 5.3]

763 (II) ZA 55 Fig. 10.3:22
Tripod angled leg fragment. Gray-black burnished; medium paste; brown core; framed excised checkerboard with *en face* triangles below. [H. 5.3]

764 (III) MM 16 Fig. 10.7:14
Plastic side fragment; curving profile. Dark gray burnished; curvilinear incisions; infill. [D. 5.3]

851 (III) MM 40 Fig. 10.7.3
Protome. Fractured; black burnished; buff core; curvilinear incisions and punches; infill. [H. 7.7]

852 (III) MM 40 Fig. 10.7:15
Plastic leg-body. Dark gray smoothed; curvilinear incisions; infill. (Profile similar to fig. 10.1:2b.) [H. 6.6]

854 (III) MM 40 Fig. 10.7:18
Plastic leg-body. Tapering leg; gray-pink smoothed; curvilinear incisions; infill. [H. 7.0]

860 (III) MM 41 Fig. 10.8:23
Foot fragment. Tapering, cone-shaped; dark gray burnished; incised with circling lines; infill. (Compare with foot of SF 113 and SF 854, figs. 10.1:3, 10.7:18.) [H. 3.1]

864 (III) MM 41 Pl. LXXI:3
Plastic vessel body fragment with exaggerated

shoulder; red-gray burnished; curvilinear spiral incisions. [D. 7.5]

867 (III) MM 41 Pl. LXX:3
Stand profile. Solid sides; top fracture; black burnished; incised with paired vertical lines forming rectangles which are in turn divided by paired angled lines; all incisions infilled with white material. [H. 4.5]

868 (III) MM 41 Fig. 10.7:6; Pl. LXX:2.
Zoomorphic vessel, rear section. Hanging "tail" lug; black burnished; infill. (Incisions comparable to SF 867, pl. LXX:3.) [H. 5.7]

884 (III) MM 43 Pl. LXXIII:3
Large curving leg-body. Rim fractured; coarse paste-ware; deeply incised with grouped circling lines; red-orange surface; infill. [Leg H. 8.5, H. 15.0]

894 (IV) MM 34
Leg and foot fragment. Anthropomorphic foot; pink-gray matte surface; exaggerated shoulder. (Similar to incised leg-shoulder, fig. 10.7:13, and SF 738, pl. LXXII:17.) [H. 6.8]

902a (II) ZA 53 Fig. 10.5:4
Tripod leg-corner with narrow angle. Tapering triangular leg; gray-black-buff matte surface; medium paste; gray core; incised with vertical lines. [H. 4.3]

902b (II) ZA 53
Tripod tapering leg fragment. White-filled incisions; black surface; red to black core. (For incising pattern see SF 2649 and SF 236a, fig. 10.5:7, 8.) [H. 4.2]

903 (II) ZA 54 Fig. 10.2:7
Tripod profile with narrow angle. Straight rim; tapering triangular leg; wet-smoothed bowl interior; buff-pink burnished; fine paste; tan core; framed and banded incisions; corner circles, herringbone on leg. [H. 7.2]

909 (II) ZA 55
Tripod tapering leg fragment. Gray-black-buff surface; gray core; white-filled incisions. (For pattern see SF 2649, fig. 10.5:7.) [H. 4.8]

959 (II) KM 17 Fig. 10.2:5; Pl. LXVIII:3
Tripod profile with narrow angle. Straight rim; tapering triangular leg; wet-smoothed bowl interior; brown burnished; coarse paste; red to black core; framed and banded incisions; corner circles, angled lines on leg; infill. [H. 8.3]

972 (II) KM 20 Fig. 10.2:6
Tripod corner fragment with narrow angle. Straight rim; wet-smoothed bowl interior; buff-gray burnished; fine paste; gray core; framed and banded incisions; corner circles, opposing angled lines on leg; infill. [H. 6.2]

975 (II) KM 20 Fig. 10.6:7
Tripod corner fragment, rim fractured. Black burnished; medium paste; black core; incised with dotted corner circles. [H. 4.7]

979 (II) KM 20 Fig. 10.3:16
Tripod angled leg fragment. Brown burnished; fine paste; red core; crisscross, framed incisions. [H. 4.8]

1114 (I) ZA 60 Fig. 10.4:3
Tripod bowl-side fragment. Straight rim; fracture at corner zone leaving part of incised circle; framed, incised crisscross banded by angled lines forming a reserved triangle; medium paste; graphite wash; gray-black burnished; black core. [D. 3.2]

1115 (II) ZA 53 Fig. 10.3:6
Tripod angled lower leg fragment. Black matte surface; fine paste; buff to black to buff core; framed, horizontal incisions with half circle below. [H. 3.5]

1118 (II) ZA 56 Fig. 10.3:7
Tripod triangular straight leg fragment. Buff matte surface; fine paste; gray core; incised with vertical lines. [H. 3.9]

1119 (III) MM 16 Fig. 10.6:12
Right angle corner fragment; rim broken; inset leg fractured; incisions of white-filled vertical lines framing corner with horizontal lines extending across corner zone; red matte surface. [H. 4.2]

1122 (V) PO 8 Fig. 10.3:19
Tripod angled leg fragment. Buff burnished; medium paste; brown core; framed, banded crisscross incisions at base with reserve above. [H. 5.4]

1124 (III) MM 38 Fig. 10.7:8
Zoomorphic incurving side fragment with hanging lug. Black burnished; red ocher on narrow reserved area between curvilinear incisions; white infill. [D. 4.4]

1128 (II) KM 18 Fig. 10.9:6
Stand corner. Rounded leg support; flat top; burnished. [H. 4.0]

1134 (III) MM 38 Fig. 10.6:14
Tripod (?) fragment. Light gray burnished; incised with paired angled lines; no infill. [D. 4.2]

1146 (III) MM 40 Fig. 10.6:4
Tripod corner with wider angle and bowl; rim fractured. Wet-smoothed bowl interior; black-brown matte surface; coarse paste; brown core; incised with paired nesting angled lines. [D. 4.4]

1190 (III) MM 40 Fig. 10.8:14; Pl. LXXII:12
Foot fragment, anthropomorphic; matte gray surface; red-gray core. [H. 3.5]

1192 (I) ZA 61
Tripod bowl-side fragment. Concave rim; gray-

buff surface; white-filled incisions (Compare SF 719 and SF 1637, fig. 10.4:9, 21, for pattern.) [D. 2.9]

1207 (II/III) ML 8 Fig. 9.67; Pl. LVI:3
Animal sculpture ("Camela"). (See chap. 9, figurine cat. no. 190.)

1270 (III) ML 114 Fig. 10.8:15
Foot fragment, anthropomorphic with "toe" and "heel"; brown burnished. [H. 3.4]

1407 (III) ZA 42 Fig. 10.9:4
Stand fragment. Graphite paint of horizontal and angled lines on black burnished surface. [H. 7.2]

1408 (III) MM 41 Fig. 10.7:21
Foot fragment. Anthropomorphic modeling with "heel" and fractured "toe"; dark smoothed; paired, circling incisions; infill. (Compare with profile of foot of SF 177, fig. 10.1:2b.) [H. 4.9]

1424 (III) MM 19 Fig. 10.7:19
Plastic leg-body fragment. Leg tapering; gray smoothed; curvilinear incisions. [H. 5.9]

1425 (III) MM 19 Fig. 10.1:6; Pl. LXXII:4
Offering stand corner fragment. Fractured central bowl; graphite paint of linear patterns on dark gray burnish; red ocher in depression at corner. [H. 2.5]

1432 (IV) MM 34 Fig. 10.7:11
Plastic tapering leg fragment. Gray-black burnished; linear incisions; white infill. (Compare with legs of SF 113 and SF 868, figs. 10.1:3, 10.7:6.) [H. 3.8]

1433 (IV) MM 34 Fig. 10.9:8
Inturned shoulder fragment. Gray matte surface. (Compare pl. LXXII:17.) [H. 5.0]

1434 (IV) MM 34 Fig. 10.7:10
Plastic tapering leg fragment. Gray-black burnished; linear incisions; white infill. (Compare SF 1432, fig. 10.7:11.) [H. 3.5]

1435 (III) MM 43 Fig. 9.69
Animal protome (?). (See chap. 9, figurine cat. no. 196.)

1450 (III) MM 43
Tripod fragment. Dark gray matte surface. (Similar to SF 1578 and SF 1134, fig. 10.6:11, 14.) [H. 4.1]

1459 (IV) MM 34
Tripod tapering leg fragment. Black surface; red core; white-filled incisions. (For pattern see SF 2649, fig. 10.5:7.) [H. 4.0]

1464 (III) MM 19 Fig. 10.7:16; Pl. LXXI:5
Plastic leg-body. Dark gray burnished; curvilinear incisions; white infill. (Compare SF 852, fig. 10.7:15.) [H. 7.3]

1466 (III) MM 19 Fig. 10.5:3
Tripod straight rim corner fragment. Corner angle 50°; framed, reserved corner set off by net pattern incised on bowl-side and angled leg section; brown core. [H. 6.0]

1467 (III) MM 19 Fig. 10.7:20
Foot fragment. Anthropomorphic modeling; gray smoothed; incised with single curving line. [H. 3.5]

1469 (III) MM 45 Fig. 10.8.21; Pl. LXXII:15
Foot fragment. Anthropomorphic modeling; red smoothed. [H. 4.2]

1475 (I) KL 10 Fig. 10.5:1
Tripod corner fragment with narrow angle. Straight rim; wet-smoothed bowl interior; buff burnished; medium paste; tan core; vertical incisions; infill. [D. 3.4]

1476 (I) JL 16 Fig. 10.6:17
Tripod bowl-side fragment. Straight rim; incised band below rim; curving lines form two reserved "ribbons" below with crisscross incisions beneath; black burnished surface; tan core. [D. 2.9]

1477 (I) KL 18 Fig. 10.4:6
Tripod bowl-side fragment. Wet-smoothed bowl interior; gray burnished; fine paste; tan core; framed, banded incisions of angled lines with reserve between. [D. 2.9]

1478 (I) ML 34 Fig. 10.4:2
Tripod bowl-side fragment. Wet-smoothed bowl interior; black burnished; medium paste; brown core; incised with net pattern; infill. [D. 3.8]

1479 (I) JL 16 Fig. 10.6:18
Tripod bowl-side fragment. Incision along straight rim with crisscross filling and curvilinear line below; black, smooth surface; tan core. (Compare SF 1476, fig. 10.6:17.) [H. 2.5]

1483 (III) MM 19 Fig. 10.8:11
Foot fragment. Widening at base; dark surface. [H. 4.1]

1492 (III) MM 41 Fig. 10.7:7
Zoomorphic vessel, curving side fragment with hanging lug. Black burnished; incised with dotted lozenge and vertically curving lines; infill. (Compare SF 1124, fig. 10.7:8.) [D. 4.7]

1495 (III) MM 50 Fig. 10.7:17
Plastic curving leg-body. Dark gray smoothed; curving and angled incisions. [H. 6.2]

1496 (III) MM 50 Fig. 10.8:21; Pl. LXXII:15
Foot fragment. Tapering to point; pink-gray matte surface. (Compare painted foot on fig. 10.9:7, 10.) [H. 4.0]

1499 ("III") Surface Pl. LXXI:14
Large leg-bowl fragment. Rim fractured; smooth profile line; slightly angled corner; orange-gray burnished; angled incisions cross leg and bowl; no infill. [H. 9.7]

1500 (II) LL 10 Fig. 10.5:12
Tripod profile. Corner angle 65°; triangular tapering leg; framed, white-filled incisions of repeated circles in corner zone; one leg filled with short hatchings, the opposite leg zone incised with nesting zigzag set on side and angled lines below; buff gray burnished surface; brown core. [H. to bowl 3.0; total H. 8.2]

1501 (II) KL 3 Fig. 10.3:17; Pl. LXVII:6
Tripod angled leg fragment. Gray buff burnished; medium paste; black to brown core; framed incisions of net pattern with nesting triangles at leg base. [H. 8.0]

1502 (II) ML 17 Fig. 10.6:6
Tripod corner fragment with fractured rim. Corner angle 75°; incised, white-filled banded design of nested semicircles in corner zone; vertical incisions toward bowl-side zone; dark matte surface. (Compare SF 2807, fig. 10.6:5.) [H. 5.2]

1503 (II) ML 17 Fig. 10.2:10; Pl. LXIX:13
Tripod corner-leg fragment with narrow angle. Straight rim; triangular tapering leg; gray surface; medium paste; red to brown core; framed herringbone incisions with reserved corner circles; infill; mirror image. (Compare SF 972, fig. 10.2:6, for pattern.) [H. 5.1]

1508 (I) ZA 64 Fig. 10.4:7
Tripod bowl-side fragment. Straight rim; wet-smoothed bowl interior; black burnished; coarse paste; mottled core; framed, banded incisions of net pattern separated by reserve; infill. [D. 3.2]

1510 (III) MM 21 Fig. 10.8:9
Tapering leg to body. Dark gray matte surface; fine paste; red core. (Compare SF 1515, fig. 11.8:4 and fig. 11.4:3, 4 from phase I/II.) [H. 8.3]

1511 (III) MM 27 Fig. 10.7:2
Protome with head fractured. Black burnished; buff core; incised with dots between curving lines; infill. [H. 4.5]

1512 (II) KM 8 Fig. 10.7:12; Pl. LXXI:4
Plastic zoomorphic body fragment. Curving profile; dark gray burnished; incised with spirals over leg-shoulder with curvilinear lines over body; infill. (Compare figs. 10.1:2, 10.7:9.) [H. 5.9]

1514 (II) KM 8 Fig. 10.3:11
Tripod angled leg fragment. Buff matte surface; fine paste; red-brown core; framed incision of angled lines with reserved circle at base. [H. 5.7]

1515 (III) MM 51 Fig. 10.8:4
Tapering rounded leg. Dark gray matte surface. (Compare fig. 11.4:3, 4 from phase I/II.) [H. 8.3]

1517 (III) MM 27 Fig. 10.9:7
Plastic vessel profile. Tapering leg and open bowl; burnished red surface with black curvilinear painted design. (Compare SF 3862, fig. 10.9:10.) [H. 5.7]

1518 (III) MM 27 Fig. 10.7:9; Pl. LXXI:6
Plastic curving leg-body. Probably from zoomorphic vessel; black burnished; incised spirals alternately reserved and filled with dots; infill. (Compare fig. 10.1:3.) [H. 4.5]

1530 (III) MM 27 Fig. 10.3:8
Tripod sloping corner fragment. Corner angle 50°; framed corner zone incised with angled lines crossing or meeting; buff matte surface; red core. (Pattern similar to SF 244, fig. 10.3:13.) [H. 3.8]

1531 (I) ML 38 Fig. 10.6:13
Right angle corner fragment with straight rim. White-filled incisions outline rim and corner; unequally sized corner circles with punctate in reserved area; red core; pink-buff burnished surface. [H. 4.5]

1532 (II) KM 19 Fig. 10.4:10
Tripod bowl-side fragment. Sloping rim; framed incisions of white-filled circle and vertical lines; black surface; buff to black to buff core. [D. 3.1]

1533 (I) ML 35 Fig. 10.3:21; Pl. LXVII:4
Tripod angled leg. Black burnished; medium paste; gray core; excised checkerboard designs with reserve area between; infill. [H. 7.6]

1534 (II) ZA 57 Fig. 10.6:3; Pl. LXIX:10
Tripod bowl-side fragment. Straight rim; wet-smoothed bowl interior; gray burnished; fine paste; buff to black to buff core; banded incisions of circle and triangle filled with punctate. [D. 3.9]

1535 (II) KM 20
Tripod angled leg. Black burnished; medium brown core; incised with angled lines and circles at base; infill. (Similar to SF 2297, fig. 10.3:14, and Drama 13, fig. 10.5:21.) [H. 5.5]

1577 (III) MM 52 Fig. 10.6:2
Tripod fragment (?). Light gray burnished; incised with angled lines. [D. 5.0]

1578 (III) MM 52 Fig. 10.6:11
Tripod (?) corner fragment with rim fractured. Pink-gray burnished; incised with double zigzag, vertical lines, and punctate. [D. 4.2]

1580 (II) KM 20 Fig. 10.3:23
Tripod angled leg tip fragment. Black matte surface; coarse paste; black to brown core; excised with checkerboard; infill. (Compare SF 1533 and SF 763, fig. 10.3:21, 22.) [H. 3.4]

1582 (III) ML 102 Fig. 10.7:4; Pl. LXXI:7
Zoomorphic vesssel fragment. Body with fracture at rim and protome; curving profile line; gray-black burnished; curving lines, punctate, circles, spirals; infill. [D. 3.3]

1613 ("II") U Fig. 10.5:10
Tripod corner-leg fragment. Corner angle 55°; fracture at rim and triangular straight leg; banded, reserved corner circle, repeated vertical lines in leg zone; red core. (Compare SF 2818, fig. 10.5:11.) [H. 5.8]

1616 (III) MM 52 Pl. LXXI:1
Plastic leg-body fragment. Smooth profile line; pale gray burnished; curvilinear incisions. (Compare SF 1464, pl. LXXI:5, and SF 852, fig. 10.7:15.) [H. 8.5]

1637 (II) KM 20 Fig. 10.4:21
Tripod bowl-side fragment. Rough bowl interior; gray-black burnished; medium paste; brown core; incised with net pattern. [D. 3.7]

1672 (II) KM 20 Fig. 10.5:17
Tripod triangular straight leg fragment. Black, highly burnished; fine paste; brown core; incised with circles at base and vertical incisions in zone 3; infill. [H. 6.9]

1689 (II) KM 20 Fig. 10.4:20
Tripod bowl-side fragment. Rough bowl interior; brown-red, highly burnished; fine paste; red core; framed incisions of reserved circle and horizontal banded lines; infill. [D. 3.3]

1707 ("III") U Pl. LXXI:12
Large leg-bowl fragment. Body and rim fractured; smooth profile; red paint, burnished; angled, random incisions. [H. 10.9]

1768 ("III") KMd 1 Fig. 10.8:12
Foot fragment. Anthropomorphic; "toe" section broken; medium/coarse paste-ware; buff-gray matte finish. [H. 4.2]

1769 ("III") KMd 1 Fig. 10.8:17
Foot fragment. Widened at flat base; red-black burnished. (See chap. 9, figurine cat. no. 111.) [H. 3.1, W. 1.7-2.6]

2186 ("III") U Fig. 10.8:7
Foot fragment. Anthropomorphic; gray matte surface. [H. 5.9]

2235 ("I") PKa 1 Fig. 10.2:2; Pl. LXVII:1
Tripod corner fragment with narrow angle. Wet-smoothed bowl interior; gray-black burnished; fine paste; black core; excised with framed, banded checkerboard in corner; net pattern at leg fracture. [H. 5.6]

2236 ("III") PFc 1 Fig. 10.1:4; Pl. LXXII:7
Stand fragment. Trivet corner section; rounded leg; flat top; graphite paint swirling across red burnished surface. [H. 6.3]

2254 (II) KL 110 Fig. 10.3:5
Tripod leg fragment. Triangular, slightly tapering at base; white-filled repeated circles at leg tip with framed angled lines filling leg zone and forming reserved triangle; burnished buff surface; brown core. (Compare SF 2610, pl. LXVII:3.) [H. 6.5]

2267 (V) PO 12 Fig. 10.8:20
Foot fragment. Pink-gray matte surface. [H. 5.0]

2277 (II) KL 112
Tripod sloping corner fragment. Angle 45°; buff burnished surface; buff-black-buff core; incised pattern of corner circles, banded and framed as on SF 109 and SF 2696, fig. 10.3:2, 9, and SF 2385 and SF 2681, pl. LXIX:1, 5. [H. 6.0]

2278 (II) KL 106 Fig. 10.6:19
Tripod triangular leg fragment. Not tapering; incisions outline each leg face; oblique lines cross the zone and the lower is met by a perpendicular stroke with rays below; gray burnished surface; infill; red core. (Compare with Dhoxaton 22, fig. 10.5:22.) [H. 3.6]

2285 (II) KL 110 Fig. 10.5:13
Tripod triangular lower leg fragment. White-filled, banded double or triple angled incisions with reserve between; gray-black-buff surface; black core. (For form, compare the larger SF 3609, fig. 10.5:5, and Chorla 8, fig. 10.5:19.) [H. 4.2]

2293 (II) KL 110 Fig. 10.4:17
Tripod bowl-side fragment. Rim broken; incised, framed reserved circle and vertical lines; gray burnished surface; black core. [D. 2.5]

2294 (II) KL 110 Fig. 10.4:16
Tripod bowl-side fragment. Rim broken; incised half-circle; gray surface; brown to black core. [D. 2.6]

2297 (II) KL 114 Fig. 10.3:14
Tripod angled lower leg fragment. Incised, white-filled, banded circle at tip, angled rayed line above with reserve between motifs; burnished dark surface; core black to red to black. (Compare SF 1514, fig. 10.3:11.) [H. 5.3]

2312 (II) KL 107 Fig. 10.5:9
Tripod sloping rim corner fragment. Narrow angle; incisions of framed, reserved, corner circles; angled lines on preserved leg zone; brown burnished surface; black-buff-black core. [H. 5.7]

2313 (II) KL 107 Pl. LXVII:5
Tripod angled leg fragment framed with incisions, angled lines across leg, and half-circle at leg tip. Brown burnished; medium paste; red to gray core; infill. (Compare fig. 10.3:18.) [H. 6.0, H. to bowl join 5.0]

2318 (II) KL 108 Fig. 10.9:9
Stand corner fragment. Flat top; triangular leg; red burnished; black core. [H 7.9]

2323 (II) KL 110

Tripod leg fragment. Brown burnished surface; brown core; incised, white-filled, framed, vertical broken lines with circles in zone 4. (Compare SF 1672, fig. 10.5:17, Dhimitra 1, fig. 10.5:20—but without band above circle, and SF 2610, pl. LXVII:3.) [H. 5.4]

2326 (II) KL 110 Fig. 10.4:4
Tripod sloping corner fragment. Corner angle 60°; framed incisions of corner circles surrounded by crisscrossings; black surface; brown core. [H. 5.7]

2341 (II) KL 110
Tripod tapering leg fragment. Surface buff to gray; gray core. (Incising pattern comparable to leg SF 2380, pl. LXVIII:2.) [H. 3.6]

2342 (II) KL 110
Tripod steeply sloping corner fragment. Angle 40°; gray-black-buff burnished surface; black to brown core; framed, white-filled corner circle. (Compare SF 2696, SF 3583, and SF 2681, figs. 10.3:9, 10.4:11; pl. LXIX:5.) [H. 4.0]

2370 (II) KL 113 Fig. 10.7:1; Pl. LXXIV:2
Zoomorphic handle of vessel. Flat, circular head, pointed nose, no features shown; paired holes drilled into sherd beside handle; buff medium-fine paste-ware; red painted lines on inside of sherd at rim; tan burnished surface. (See chap. 9, figurine cat. no. 90.) [H. 7.0, W. of sherd 5.6, Th. of head 2.6]

2378 (II) KL 113 Fig. 10.3:3; Pl. LXVIII:2
Tripod corner fragment. Narrow angle; sloping rim; tapering leg; wet-smoothed bowl interior; brown smoothed surface; fine paste; red to black core; deeply incised with corner circle and vertical lines on leg; infill; this corner fragment joined to the lower leg of SF 2380 forming full profile. [H. 9.9]

2380 (II) KL 113 Pl. LXVIII:2
Tripod leg fragment. See SF 2378 (fig. 10.3:3), the corner fragment to which it was joined and pictured on pl. LXVIII:2 as a full profile.

2385 (II) KL 114 Pl. LXIX:1
Tripod sloping corner fragment. Wet-smoothed bowl interior; buff-pale gray smooth surface; coarse paste; tan core. (Compare incised infilled patterns of banded and framed corner circles with net pattern on leg and bowl-side to SF 2696 and SF 244, fig. 10.3:9, 13.) [H. 9.2]

2536 (I) JL 105 Pl. LXVIII:4
Tripod triangular straight leg. Black burnished; medium paste; buff to black to buff core; incised with circle at tip and facing triangles; infill. (Leg form is comparable to Chorla 8 and Dhimitra 1, fig. 10.5:19, 20.) [H. 9.3]

2540 (I) JL 105 Fig. 10.2:3; Pl. LXVI:3
Tripod profile with narrow angle. Sloping rim; rough bowl interior; black, highly burnished; medium paste; red core; framed net pattern incisions separated with reserve; infill. (Compare pl. LXIX:8.) [H. 10.9]

2547 (I) JL 105
Tripod angled leg fragment. Black burnished with white-filled, angled, framed lines. (Compare SF 1530, fig. 10.3:18, and especially SF 2313, pl. LXVII:5.) [H. 5.4]

2609 (II) KL 114 Pl. LXIX:2
Tripod straight rim bowl-side. Wet-smoothed bowl interior; black, highly burnished with graphite wash; medium paste; red to black core; framed incised circle, nesting chevrons, radiating lines. [D.3.6]

2610 (II) KL 114 Pl. LXVII:3
Tripod triangular leg fragment. Black, highly burnished; coarse paste; black to red to black core; framed, banded incisions of corner and leg base circles with angled lines between; infill. [H. 8.2, H. to bowl join 5.5]

2649 (II) KL 117 Fig. 10.5:7
Tripod triangular tapering leg fragment. Black-brown burnished; medium paste; red core; incised with framed hatched lines; infill. [H. 4.2]

2662 (II) KL 117 Pl. LXXII:9
Foot fragment. Modeled at base; burnished. [H. 5.2]

2668 (II) KL 117 Pl. LXIX:12
Tripod corner with straight rim. Triangular leg fracture; wet-smoothed bowl interior; black burnished; fine paste; brown core; framed, banded incisions of corner circles; nesting V's on bowl side; vertical lines on leg; infill. [H. 5.2]

2669 (II) KL 117 Fig. 10.6:8
Tripod bowl-side fragment. Rim fractured; gray-pink burnished; incised with curving lines. (Compare incising pattern with SF 547 and SF 2814, fig. 10.8:2, 5.) [D. 4.0]

2675 (II) KLb 118
Tripod tapering leg. Buff surface; buff-black-buff core; incised corner circles and framed angled lines across leg. (Compare SF 959, fig. 10.2:5, pl. LXVIII:3 but without a band defining the corner zone.) [H. 6.1]

2681 (I) JL 8 Pl. LXIX:5
Tripod steeply sloping corner. Wet-smoothed bowl interior; gray-black burnished; fine paste; black core; framed incisions of corner circles with vertical lines on bowl side; infill. [H. 6.3]

2687 (I) KLb 126 Pl. LXIX:8

Tripod profile with sloping rim. Black, highly burnished with green encrustations; medium paste; black to brown core; framed incisions of net pattern; infill. (Compare SF 2540, fig. 10.2:3, pl. LXVI:3.) [H. 8.1]

2690 (I) KLb 128 Pl. LXVI:2
Tripod profile. Angle 55°; slightly sloping rim; angled rim; black burnished; fine paste; tan core; framed, incised pattern of corner and leg base circles, angled lines. [H. 11.2]

2696 (I) Klb 131 Fig. 10.3:9
Tripod sloping corner fragment. Corner angle 40°; part of angled leg and bowl-side preserved; incised, framed repeated corner circles with banded crisscross on leg zone and bowl side; burnished red-pink surface; red core. (Compare SF 244, fig. 10.3:13, and SF 2385, pl. LXIX:1.) [H. 8.5]

2698 (I) KLb 131 Fig. 10.5:6
Tripod triangular straight leg fragment. Framed angled opposing lines fill lower section of leg; black, highly burnished surface; gray core; infill. [H. 6.0]

2807 (II) KL 111 Fig. 10.6:5
Tripod (?) corner fragment with straight rim. Wet-smoothed bowl interior; gray-buff matte surface; fine paste; buff to black to buff core; framed incisions of corner circles surrounded by half-circles; infill. (Compare SF 1502, fig. 10.6:6.) [D. 5.4]

2808 (I) JL 105 Pl. LXIX:6
Tripod side with concave rim. Wet-smoothed bowl interior; black burnished; fine paste; black core; framed incisions of half-circle and vertical lines. (Compare pl. LXIX:7.) [D. 3.3]

2814 (II) KL 105 Fig. 10.8:2
Thick side fragment. Gray smoothed; rim and body incised with lines. (Compare SF 2669 and SF 547, figs. 10.6:8, 10.8:5.) [D. 3.8]

2816 (II) KL 114
Tripod tapering leg fragment. Gray surface and core. (Similar to SF 2649 and SF 236a, fig. 10.5:7, 8.) [H. 3.6]

2817 (II) KL 112
Tripod corner fragment. Rim missing; dark surface; incised with net pattern. (Similar to SF 2540 and SF 1466, figs. 10.2:3, 10.5:3.) [H. 4.1]

2818 ((II) KL 115 Fig. 10.5:11
Tripod corner-leg fragment. Corner angle 60°; rim and triangular tapering leg fractured; incisions white-filled; framed, repeated reserved corner circles; vertical lines fill leg zone; burnished surface; brown core. [H. 4.4]

2824 (II) KL 113
Tripod upper leg fragment. Angle 75°; red-brown burnished; red to black core; incised pattern of framed angled lines like upper portion of SF 3609 and SF 2285, fig. 10.5:5, 13. [H. 3.0]

2829 (II) KL 115
Tripod side fragment minus rim. Black burnished; angled, white-filled incisions. (Similar to SF 720, fig. 10.4:14.) [D. 3.4]

2831 (III) KL 114
Tripod corner fragment minus rim. Gray matte surface; incised without frame. (Similar to SF 1146, fig. 10.6:4.) [H. 4.4]

2832 (II) KL 111 Pl. LXIX:7
Tripod bowl-side with concave rim. Buff-pink burnished; medium paste; black to red core; framed incisions of half-circle and vertical lines. (Compare pl. LXIX:6.) [D. 2.7]

2834 (I) ML 42 Fig. 10.5:15
Tripod angled leg fragment. Midsection only; framed, banded incisions of stabbing with reserved area between; black burnished surface. (Compare SF 119, fig. 10.3:20.) [H. 7.3]

2836 ("III") KL 1
Plastic vessel profile. Cylindrical leg connected to rounded shoulder and open bowl. Pale gray burnished. [H. 8.2]

2837 (III) MM 16 Pl. LXXIII:2
Large vessel body fragment. Red-orange burnished; deeply incised with groups of four lines forming a rectangle which is itself divided by triple angled lines into triangular lozenges and spaces, all with centered dot; three lines circle rim which is decorated with groups of incisions; infill. [D. 10.5]

2840 (II) KL 115 Fig. 10.4:19
Tripod bowl-side fragment. Rim broken; incised, framed, reserved circle and angled lines; fine paste; gray burnished surface; red core. [D. 2.6]

2843 (I) JL 105
Tripod bowl-side fragment. Concave rim; brown burnished; red-to-brown core; framed incisions very comparable to SF 2832, pl. LXIX:7. [D. 2.6]

2845 (I) JL 15 Fig. 10.4:1
Tripod bowl-side. Wet-smoothed bowl interior; black, highly burnished; medium paste; brown core; framed net pattern; infill. [D. 2.3]

2846 (II) KL 117
Tripod corner fragment. Sloping rim; angle 45°; black burnished; brown-black core; framed pattern. (Compare SF 3583, fig. 10.4:11.) [H. 3.5]

2864 (II) KL 117
Tripod bowl-side fragment. Rim fractured; black burnished; red to brown core; white infill; framed

incised pattern of crisscross. (Compare SF 537, pl. LXIX:3.) [D. 3.1]

3400 (III) ZG 17 Pl. LXXII:5
Offering stand corner fragment. Graphite-painted oblique lines on black burnished surface. [H. 6.0]

3401 ("III") U Pl. LXXII:11
Foot fragment. Rounded; burnished. [H. 4.4]

3402 ("III") U Fig. 10.8:10
Foot fragment. Anthropomorphic with widening below and above "ankle"; buff burnished. [H. 3.7]

3409 (II) KL 117
Tripod bowl-side fragment. Rim fractured; graphite washed surface; black core; vertical incised lines. (Compare SF 2293, fig. 10.4:17 without circle.) [D. 2.0]

3417 (III) MM 60a Fig. 9.70; Pl. LVII:2
Animal head (protome?). (See chap. 9, figurine cat. no. 193.)

3429 (III) MMb 61 Pl. LXXII:13
Foot fragment. Anthropomorphic; buff/gray ware; burnished. [H. 5.0]

3432 (III) ZG 17 Pl. LXXII:6
Offering stand corner fragment. Fractured raised center bowl; graphite paint on black burnished surface. [H. 3.5]

3502 (II/III) MMc 61
Large tapering leg fragment; pink–dark gray smoothed; deeply incised with circling lines. (Very comparable to leg of SF 884, pl. LXXIII:3.) [H. 8.0]

3576 (III) MM 27 Pl. LXXI:2
Plastic vessel body fragment with exaggerated shoulder. Probably zoomorphic form; dark gray burnished; curvilinear incisions including spirals and curving lines; infill. (Compare pl. LXXI:4.) [D. 4.7]

3577 (II) KL 3 Fig. 10.5:14
Tripod triangular straight leg fragment. Incised, framed, angled lines in opposition on each leg zone; half-circle near fractured tip; gray-black surface; tan core. (Form comparable to SF 2285, fig. 10.5:13.) [H. 4.3]

3578 (II) KL 4 Fig. 10.3:10
Tripod corner-leg fragment. Corner angle 60°; rim and leg base missing; leg fracture indicates angled form; white-filled incisions of corner circles; framed angled lines on leg zone; gray-black burnished surface; brown core. [H. 6.3]

3579 (III) ZG 21 Pl. LXXI:8
Plastic zoomorphic vessel fragment. Fractured bowl and leg with exaggerated shoulder; gray-black burnished; curving incisions with spirals around leg-shoulder; no infill. (Compare fig. 10.7:14.) [D. 5.9]

3581 (II) KL 2 Fig. 10.4:13
Tripod bowl fragment. Straight rim; single incised circle; fine paste; gray burnished surface; brown core. [D. 2.8]

3582 (II) KL 2 Fig. 10.3:18
Tripod angled lower leg fragment. Framed incisions of half-circle at leg base and angled lines across leg zone; red burnished surface; red to black core. (Compare SF 2313, pl. LXVII:5.) [H. 5.7]

3583 (II) KL 2 Fig. 10.4:11
Tripod steeply sloping corner-side-bowl fragment. Corner angle 45°; framed, white-filled incisions of reserved corner circles, banded angled lines on bowl side; burnished gray-black-buff surface; black core. (Compare SF 2681, pl. LXIX:5.) [H. 5.8]

3584 (II) KL 2 Fig. 10.5:18
Tripod triangular leg. Slightly tapering; framed, vertical incisions with circles of differing diameters near leg base; no traces of infill; fine paste; burnished gray-black-buff surface; red core. [H. 4.4]

3585 (II) KL 2 Fig. 10.3:12
Tripod angled leg fragment including part of corner. Corner angle 67°; framed incisions of corner circle with window-pane design on leg; fine paste-ware; gray burnished surface; brown core. [H. 8.0, leg section H. 5.2]

3591 (I) KLb 126
Tripod corner fragment. Slightly sloping rim; corner angle 40°; framed and banded corner circles; gray-black-buff surface; tan core. (Compare SF 419, fig. 10.3:1, and SF 549, fig. 10.5:2.) [H. 4.4]

3594 (III) ZG 29 Pl. LXXI:9
Plastic zoomorphic vessel fragment. Fractured leg extends from angled corner with rounded contours; fracture where protome would have risen from leg corner; pink-gray burnished; incised with spiral and oblique lines. [H. 4.5]

3609 (II) ZA 57 Fig. 10.5:5
Tripod straight triangular leg fragment. Framed incisions of angled lines across leg zone; reserved tip; rough gray surface; red core. (Compare with smaller scale SF 2285, fig. 10.5:13.) [H. 5.8]

3629 (III) ZG 20 Pl. LXXI:10
Plastic open vessel profile with curving shoulder above inset leg. Pink-gray burnished; incised with banded lines and radiating half-circles around leg-shoulder; infill. [H. 6.7]

3635 (V) ZHt 19
Tripod straight rim corner fragment. Angle 75°;

fracture at angled leg; gray-black-buff surface; incisions white-filled. (For pattern see SF 2540 and SF 537, figs. 10.2:3, 10.4:5.) [H. 4.5.]

3668 (I) KLb 130
Tripod angled leg tip fragment. Black burnished; black core; incised with frame and angled lines. (See SF 2297, fig. 10.3:14, but without circle.) [H. 3.0]

3671 ("II") KL 2
Tripod corner fragment. Angle 55°; black burnished; white infill; tan core; incised with framed corner circles. (Compare SF 463, fig. 10.4:15.) [H. 3.7]

3685 ("I") ZJ 19
Tripod angled leg fragment. Framed incisions of net pattern with excised checkerboard in leg zone; gray-buff smooth surface. (Compare incising pattern of SF 2235, SF 763, and SF 1580, figs. 10.2:2, 10.3:22, 23.) [H. 5.6]

3728 ("II") ZJ 22
Tripod bowl-side with rim fractured. Red, rough surface; incisions are not framed but consist of paired triangles, apex up, filled with crisscrossings. (Compare SF 708, fig. 10.4:25.) [D. 2.6]

3737 ("II") SL 11
Tripod angled leg fragment. Buff matte surface; no banding; random angled lines incised across leg. (Compare SF 547, fig. 10.8:5.) [H. 6.0]

3862 (III) MMd 66 Fig. 10.9:10; Pl. LXXIII:1
Plastic open double bowl. Black paint on red surface. (Compare SF 1517, fig. 10.9:7.) [H. 8.1]

3875 (III) MMa 66
Large incised tapering leg fragment. Rough, gray ware; finish absent; group of circling incisions. (Compare with SF 884, pl. LXXIII:3.) [H. 8.3]

3931 (III) ZJ 30 Pl. LXXIV:1
Plastic open vessel. Angled corner with rounded contours; smooth profile line; wet-smoothed, darkened bowl interior; gray-black burnished; coarse paste-ware; red core; incised with interlocking spirals; infill. [H. 9.0]

4109 (I) KLb 135
Tripod angled leg with fracture below corner. Gray matte surface; incised ladder repeated both leg faces. (Compare SF 135, fig. 10.2:1.) [H. 6.8]

4111 (I) KLb 135 Pl. LXIX:11
Tripod bowl-side with straight rim. Black burnished; medium paste; framed, banded incisions of circle and punctate; infill. [D. 3.4]

4470 ("III") ODb 1 Pl. LXXII:8
Stand. Trivet corner with rounded leg support; gray, smoothed surface. (Compare fig. 10.9:9.) [H. 5.0]

4587 (V) PN/F 264 Pl. LXIX:9
Tripod bowl-side with straight rim. Black burnished; medium paste; framed incisions of angled single ladders flanking circle; infill. [D. 3.5]

5170 (III) ZA 44 Pl. LXXIV:3
Foot fragment. Anthropomorphic modeling; pinching along back of ankle and foot; angled grooves across ankle and leg; red-brown burnished. [H. 5.35]

Akropotamos Pl. LXIX:14
Tripod corner-side fragment. Straight rim; buff surface; framed, banded incisions of corner circles, filled zigzag along bowl-side, and vertical hatching on leg zone. [H. 5.0]

Chorla 5 Pl. LXVIII:7
Tripod angled leg. Gray matte surface; black core; framed incisions of large corner circle; net pattern on leg in two triangular zones separated by reserve; infill. [H. 8.4]

Chorla 8 Fig. 10.5:19
Tripod straight triangular leg. Brown burnished, red core; framed incisions of angled lines; infill. [H. 5.9]

Chorla 9 Pl. LXVIII:5
Tripod profile. Sloping rim; buff-gray burnished; red core; framed incisions of corner and leg base circles with net pattern between; infill. (Compare SF 339, pl. LXVI:1.) [H. 10.6]

Chorla 10 Pl. LXVIII:6
Tripod triangular leg to corner fragment. Red-orange-brown burnished; red core; framed and banded incisions of corner and leg base circles with angled lines on leg; infill. (Compare SF 2610, pl. LXVII:3.) [H. 10.2]

Chorla 11
Tripod concave rim side fragment. Black burnished; gray core; incised; infill. (Similar to SF 537, pl. LXIX:3.) [D. 2.3]

Chorla 12
Tripod corner. Angle 80°; gray-pink surface; buff to black to buff core; incised; no infill visible. [H. 4.7]

Dhimitra 1 Fig. 10.5:20
Tripod triangular leg. Red-black burnished; coarse paste; brown core; framed and banded incisions of circles at leg base, reserve above with vertical lines on leg zone. (Compare SF 1672, fig. 10.5:17.) [H. 6.9]

Dhoxaton 12 Fig. 10.5:22
Tripod triangular mid-leg fragment. Red-orange burnished; red to brown core; incised with triangle filled with angled lines; no infill visible. (Compare with Chorla 10, pl. LXVIII:6.) [H. 3.4]

Dhoxaton 13 Fig. 10.9:12
Large leg. Orange-black surface; deeply incised with circling lines. (Compare SF 884, pl. LXXIII:3.) [H. 5.4]

Dhoxaton 14 Fig. 10.5:16
Tripod profile with straight corner-rim. Gray, rough, weathered surface; red core; framed, banded incisions of reserved corner circles with rayed lines; no infill observable. [D. side 4.8, H. 7.3]

Dhoxaton 15 Fig. 10.9:11
Large leg-body. Pink-orange surface; deeply incised with triple curvilinear lines and punctate; infill. (Compare SF 884, pl. LXXIII:3 and Dhoxaton 13, fig. 10.9:12.) [H. 8.3]

Drama 13 Fig. 10.5:21
Triangular leg from tripod. Brown-red burnished; red to black core; deep, framed incisions of half-circles at leg base and horizontal lines across leg zone; infill. [H. 7]

11.
The Pottery of Phases I and II

Jenifer Marriott Keighley

This chapter is comprised of two parts: descriptive sections for both the phase I and phase II pottery and a concluding section outlining affinities of the early Sitagroi material with that of contemporary sites.

The methodology of the ZA count is described in chapters 2 and 7, and only a few comments need repeating here. The frequencies of shapes and fabrics detailed herein are an expression of sherds per kilogram of pottery; very few whole vessels were recovered from either phase I or phase II. References to vessel shapes (e.g., R1, R2) are those defined for the ZA count, all of which are illustrated schematically in figures 7.11-7.15. It must be stressed that the drawings for the bowls and jars illustrate rims and not complete profiles.

Some fabrics are diagnostic, such as the Gray Lustre wares of phase I and the Black Topped (color pl. C:22) and painted wares of phase II. Except for the appearance of small quantities of Smeared and intrusive painted fabrics, phase I is chiefly notable for its lack of painted wares. This information is based on the ZA and KL counts which, together with material from other phase I and II trenches (e.g., ML, KM), shows that painted wares are not quantitatively significant until phase II. S. Payne's sieving project marginally increased painted ware recovery for phase I.

Important shapes in phase I include biconical bowls, some resembling early Vinča and Veselinovo forms (table 11.1), knob and prong handles (e.g., pl. LXXIX, top:3, 1), small applied feet, pedestal and ring bases (pl. LXXIX, middle: 4), various small strap handles (pl. LXXVIII, bottom: 3, 5, 6, 8)—an unstratified example appears to be modeled with a zoomorphic form on the handle—and lugs (e.g., pl. LXXVIII, top:2, 6), plus applied pellet and channeled decoration. A similar, and therefore corroborative, pattern emerged in trench KL, which yielded the largest sample of phase I pottery. Many of these forms, such as biconical bowls, continue into phase II, but in this later phase jars become more important; channeled, Gray Lustre and Rusticated wares fade out and painted fabrics predominate. Analysis of the ZA shapes for both phases shows that the percentage ratio of closed to open shapes remains constant at 60% open to 40% closed forms.

Diagnostic Features: Phase I

In the earliest phase at Sitagroi, four diagnostic fabrics are defined: Gray Lustre (color pl. C:1), Gray Lustre Channeled (color pl. C:2), Rural (color pl. C:6), and Rusticated (color pl. C:8) wares. The most striking are the Gray Lustre categories, with their series of interesting and well-made shapes: "barrel" jars with finger-impressed decoration, carinated and sinuous bowls of various forms, and knob and prong handles. The Gray Lustre open bowls are nearly always carinated and some are grooved on the carination. Pedestal bases suggest early Vinča and Veselinovo forms (table 11.1), as do the biconi-

cal bowls, some with small pellets (for example the Veselinovo "mugs"). The plates—shallow, open vessels with flat or rolled rims—are also important in Sitagroi I. The rims are often incised with thin, oblique lines. Known at Yasa Tepe (G. Georgiev, personal communication), these were also reported from the earliest levels of Dikili Tash, considered contemporary with Sitagroi I. Biconical bowls, knob handles, and pedestal bases, as well as Barbotine ware, were also attributed to this phase at Dikili Tash.

The specialized handle shapes that typify Sitagroi I, with parallels at Veselinovo, were not numerous in ZA; far more of them were recovered from KL. Knob and prong handles are usually of Gray Lustre ware, but some are Dark Burnished or Smooth. The most accentuated knobs resemble mushrooms in shape, similar to those from Kazanlik, Yasa Tepe, and Karanovo. Various strap handles are in evidence, with the very small ones often placed between rim and carination. Ledge lugs and perforated "tab" handles were also used. Small feet applied to large, open bowls are another link with Veselinovo.

Gray Lustre Channeled, with shallow fluting or channeling on the surface is most probably a variant of Gray Lustre ware and few shapes were recorded for it: predominantly biconical bowls with channeling of oblique, vertical, or horizontal lines, or a combination of these.

Both Rural and Rusticated wares were found in smaller quantities in phase I. Termed "rustic" ware by D. H. French (1964), Rural ware can be easily recognized by its rough, unfinished outer and its well-burnished inner surfaces. The form for this fabric is always a shallow, open plate. Rusticated ware is decorated in a variety of ways: nail impressions, finger-pinching, stabbing with bird bones, or "finger-stroking" the wet clay to produce a series of longitudinal ridges.

The undiagnostic fabrics of phase I, that is, those appearing in all ZA levels, are more difficult to categorize. However, some of the Dark Burnished, Coarse (color pl. C:9), and Smooth ware shapes are identical to those of the diagnostic wares: biconical bowls, open dishes and plates, knob and prong handles, applied pellets, feet, and pedestal bases.

Phase I Fabrics

Gray Lustre Ware. Although the two forms of Gray Lustre ware, plain and channeled, are treated here separately, they share many characteristics: the surface is smooth and feels "soapy" to the touch, the inside is not reduced, and the fabrics are well made with some mica and grit inclusions. Their manufacture involved the deliberate application of powdered graphite which was either burnished or applied as a slip before firing. Unlike some of the Pale and Dark Burnished wares, Gray Lustre is a uniform ware, easy to distinguish except where severely eroded. Some of the sherds are very fine (3 mm), others coarse (6 mm), but the bulk, about 80%, falls between these extremes.

Bowl shapes display considerable variety, are predominantly open, rarely rounded, and nearly always carinated; the latter are sometimes decorated with grooving. Some bowls have pedestal bases. Approximately 80% of the vessel sherds recovered for Gray Lustre ware are bowls.

Of the biconical forms (R11: fig. 11.1:7; R12; R14; R15: fig. 11.1:8), the most common are the sinuous bowls with thickened carination (R11: fig. 11.5:6, 7). Also found is an example of the R10 form (fig. 11.4:1). Some bowls have pellets on the carination (fig.11.3:9) and grooving above it and below the rim. Deep bowls with wide diameters could well be communal vessels rather than part of an individual setting. Pot 32/311 (fig. 11.5:4; pl. XLIV:5) has a maximum diameter of 34.4 cm and is 17.6 cm high. It is carinated, gray lustrous above the carination but smooth and black below it. Only this artifact has a small strap handle attached below the rim to the carination. Most straight-sided examples are undecorated although there is some evidence for oblique excision just below the rim and oblique grooving or dimpling on the carination. A fragment of the ring-footed vase (B3) is illustrated, but in Pale Burnished ware (pl. LXXIX, middle:4).

Plates and shallow dishes are distinctive in Gray Lustre ware. Although there are several variations, the basic Sitagroi form consists of a shallow, open vessel with flat or rolled rim (fig.

11.4:11, 12) but sometimes no marked rim at all.

Many rims are decorated with light grooving in wide, oblique lines; the lines are never vertical (fig. 11.4:8, 9). One sherd, illustrated in Rusticated ware, has very fine, close incisions on its rim (fig. 11.4:13). Ninety percent of the plates are gray lustrous on both sides, but a few have a lustrous inner surface and a coarse, buff outer one.

The plates vary considerably, from approximately 25 cm to as much as 45 cm in diameter. An example from the larger end of the spectrum (about 40 cm) is pot 156 (fig. 11.4:1; pl. XLIV:3) which is footed and has a thickened rim. Since quantities of single feet were recovered from phase I levels (fig. 11.4:2-4; pl. LXXIX, bottom:1, 2, 4), it is probable that many other plates and dishes were footed.

Other shapes are interesting but less common: an open, straight-sided bowl (pot 160:fig. 11.5:8; pl. XLIV:2) which is vertical above the carination (also figs. 11.1:1, 11.3:5) and an incurved open bowl with a spout, ledge lug below the rim, and a rough black surface on its lower half (pot 231: fig. 11.5:3). Although rounded bowls (fig. 7.11: R1, R2) are the most common shape for all bowls in both phases I and II and a popular shape for the undiagnostic fabrics, the Gray Lustre evidence is meager. Some seem to have had special treatment, such as a much finer lustrous coating on the inside or, in another instance, a coarse, buff ware on the outside.

Jars are not a popular shape for Gray Lustre ware; they are more common in Gray Lustre Channeled and in Pale and Dark Burnished. Those jars which do occur are the cylindrical-neck (figs. 11.2:16, 11.3:11, both with shortened neck and the latter with body stabbing), constricted-neck (fig. 11.2:2, 4, 5, 15), beaded-rim (fig. 11.2:6, 14), and hole-mouth. Some of the beaded-rim types are decorated with impressions at the rim (fig. 11.2:10, 12, the latter in Dark Burnished).

Handles are the most strikingly varied category of shapes, with nearly all types defined in the ZA count evident in Gray Lustre ware; Rural and Smooth wares are also noted. Prong and knob handles, although they also appear in Dark and Pale Burnished, are diagnostic for this fabric. There are both less extreme examples (fig. 11.6:2, 5, the latter in Dark Burnished; pl. LXXIX, top:2) and more accentuated, mushroomlike knobs, reminiscent of Veselinovo (fig. 11.6:1, 4, the latter in Dark Burnished; pl. LXXIX,top:4). Plain knobs (fig. 11.6:3), fractured straps (fig. 11.6:8), very long prong handles (fig. 11.6:10, 11, the latter in Pale Burnished), and pointed prongs (fig. 11.6:7) also occur. As on the phase I pot 294 (fig. 11.17:4; pl. LXXXV:4), the handle is placed between rim and carination. Two types of strap handle are popular in Gray Lustre ware: small ones, either elliptical or circular in section (fig. 11.6:12, 15, 19), which may be seen on smaller vessels such as pot 294, and a looped strap which is horizontally elongated (fig. 11.6:20, but here in Smooth ware). "Hand-grip" forms (fig. 11.6:16) are homogeneous in shape although they vary in diameter from 3 to 7 mm. Not common, they probably form handles for drinking vessels (fig. 11.6:14; pl. LXXVIII, bottom:4). The thicker type sometimes projects at the top (fig. 11.6:13, in Dark Burnished, and 17).

Bases are seemingly few, and the most diagnostic is the pedestal base (fig. 11.7:12; pl. LXXIX, middle:1) which varies considerably in height. There are some complete examples from trench KL, and the lustre on these is exceptionally fine and smooth (fig. 11.7:6). At times, gray lustre is applied only to the inside of the base; the outside is then a smooth buff color. Other Gray Lustre bases are flat or rounded.

Other features include an interesting assemblage of feet and legs (fig. 11.4:2-4). Except for one large foot (intrusive from phase III?), the feet are small and divided into two main groups: the longer, slimmer type (pl. LXXIX, bottom:3) and the shorter, squatter variety (fig. 11.4:2; pl. LXXIX, bottom:4). There are also applied pellets, usually in combination with grooving and channeling (fig. 11.5:2 in Gray Lustre Channeled) and always found on carinations. Tripod fragments (see chap. 10) and some incised sherds came from KL.

Gray Lustre Channeled Ware. The channeled ver-

sion of Gray Lustre ware is chiefly of interest by virtue of its combination of vertical and horizontal channeling. Bowls, jars, single carinations, and shallow plates (fig. 11.4:16) were recovered in this fabric.

Bowls are nearly all biconical, thickened at the carination (fig. 11.3:2). Some have horizontal channeling of varying width above the carination (figs. 11.1:5; 11.3:1, 10), while others display channeling in combination with grooving and plastic decoration (pl. LXXV, top:1, 6). Some carinations are decorated with oblique grooving (fig. 11.3:4; 12, 13) and an applied pellet (pl. LXXV, top:4, 5, 7). Ninety-five percent of the channeling is horizontal. Sometimes, however, oblique channeling appears above the carination (fig. 11.3:8, 15; pl. LXXV:3, 4, 8), and other examples, fewer in number, exhibit vertical channeling (fig. 11.3:3, 7; pl. LXXV:9). Many of these varieties resemble Vinča forms. Bowls with lustre above the carination and plain bodies below are intriguing. A striking example in Gray Lustre, pot 231 (fig. 11.5:3), was described above. Such vessels may be precursors of the Black Topped ware of phase II. Another sherd combines a narrow gray lustre band to just below the rim, a smooth white body, and oblique channeling over the entire sherd. The flared bowl has allover horizontal channeling, but it is a rare shape in this fabric. A fragment of a barrel-shaped vessel exhibits a pattern of oblique and angled channeling above the carination (fig. 11.3:14).

Jars with channeled decoration take four shapes. The hole-mouth (J1) is executed with horizontal channeling. Cylindrical-neck jars (J2) have horizontal channeling to the base of the neck and oblique channeling on the body (fig. 11.2:7; pl. LXXV:2). Everted forms (fig. 11.2:3, 13) are decorated as are hole-mouth jars; constricted-neck examples (J3) show vertical channeling. There are no channeled handles, although small, flat strap handles are found on channeled sherds.

Other features consist of carinations decorated either with horizontal channeling and dimple or with a combination of dimple and oblique grooving and channeling.

Rural Ware. This is slightly coarse with a brown, red, or gray biscuit. It is micaceous, a trifle spongy, and fairly hard fired. The inside surface is always well burnished and the outside rough, unfinished, and often straw tempered. Rural ware (color pl. C:6) was recovered only in the plate shape; vessels are either flat with thickened rims (fig. 11.4:15) or shallow dishes without well-demarcated rims. Tab handles were also found: perforated (pl. LXXVII, bottom:2) as well as perforated and fan-shaped (fig. 11.6:21; pl. LXXVII, bottom:1) and without perforation (fig. 11.6:22). Rural ware is found up to level 40 in ZA but occurs mostly in phase I. A phase II example is illustrated (pl. LXXVII, bottom:4).

Rusticated Ware. Rusticated ware occurs chiefly in phase I levels, reaching a peak in ZA 65. It is well fired and fairly coarse with grit inclusions to 3 mm. The inside of the sherd is always well smoothed and undecorated, while the outside displays a rough design created by nail impressions, finger-pinching, stabbing with bird bones, or finger-stroking (fig. 11.7:7; pl. LXXVII, top:1).

Bowl forms include a deep bowl with nail-impressed decoration (fig. 11.7:3, 4, 13; pl. LXXVII, top:9, 11) and a rounded shape with impressed rim and slashed body (fig. 11.7:7, 9, 11; pl. LXXVII, top:1, 7). One whole bowl, pot 137, was recovered from level 45 of trench ML (fig. 11.7:1; pl. XLIV:4). It is a deep, incurving, barrel-shaped bowl executed in pale burnished clay with bands of impression at the rim and middle and a rough, unburnished surface below the middle. This pot bears a strong resemblance to one published by Detev (1959:20, fig. 22) from the Karanovo III (Veselinovo) levels at Yasa Tepe. An example of a shallow vessel with everted rim (R5) is illustrated (fig. 11.1:13).

Jars are confined to the beaded-rim shape (J5); one sherd recovered from trench KL is covered with haphazard stabs (fig. 11.7:2).

Bases are seldom decorated although some have grain impressions and others combine plain and decorated (stabbed) areas (fig. 11.7:4; pl. LXXVII, top:10, 11). One example, a flat base

(B1), has an allover stabbing pattern on the outside (fig. 11.7:3; pl. LXXVII, top:9).

Special Rusticated/Barbotine sherds are those termed "finger-stroked." On a fabric which is smooth and either black or buff in color, the rough ridges of broad, parallel lines were most probably applied with the fingers (fig. 11.7:10; and cf. pl. LXXVII, bottom:5).

The following fabrics appear throughout the five Sitagroi levels; some shapes, however, are diagnostic for phase I.

Dark Burnished Ware. The surface of Dark Burnished ware ranges between brown and black or is reddish, but never gray. Sherds contain no graphite, and grit inclusions are fine and micaceous. There is some evidence of black burnishing on an uneven surface.

Bowl forms include rounded (some with bead rims), flaring, straight-sided (fig. 11.5:1), biconical (fig. 11.1:2), and bucket-shaped vessels. Sinuous bowls with thickened carination (R11: fig. 11.1:3, 4) are a common Dark Burnished shape, and both shallow, open forms (R10: fig. 11.4:7) as well as biconical examples suggest a relationship to Gray Lustre ware. One example is a large, open bowl with slightly thickened rim (fig. 11.9:8); another has an everted rim (fig. 11.1:14). A biconical example is slightly inturned above the carination (fig. 11.5:5).

Jars are either hole-mouth or beaded-rim. Hole-mouth examples are usually thick-walled and sometimes thick-rimmed. One has incisions in chevron form. A beaded-rim jar with slashed rim is illustrated in figure 11.2:12.

Various handle forms resemble Gray Lustre shapes: knob handles (fig. 11.6:4, 5), hand-grips (fig. 11.6:13), and strap handles with prongs or knobs (fig. 11.6:6, 7). Tab handles were also found; one has a slashed edge (fig. 11.8:10). There are large numbers of strap handles (fig. 11.6:9; pl. LXXVIII, bottom:5, 8) as well as ledge handles (pl. LXXVIII, top:9, in Coarse ware).

Bases are usually flat, although there are some pedestals. One phase II pedestal base from KM 20 has a very fine red burnish and channeling encircling it (pl. LXXIX, middle:2).

Other features include rows of applied clay pellets and some cordons (fig. 11.8:2). Spouts are either conical (fig. 11.8:11, a Pale Burnished example) or tapered almost to a point. These are paralleled at both Veselinovo and Vinča. Leg shapes are both thin and squat (e.g., Gray Lustre, fig. 11.4:2, 3; pl. LXXIX, bottom:2, 4).

Pale Burnished Ware. More shapes were recorded for Pale Burnished ware than for Dark Burnished. Pale Burnished has slightly coarser grit inclusions than Dark Burnished, and the surface color ranges between cream and light brown.

Bowls are rounded (R1, fig. 11.9:6), flaring (R6), or straight-sided (R3, fig. 11.4:14), with some biconical examples. Several flaring bowls are incised at the rim, although few have thick rims. Plates and shallow dishes occur (fig.11.4:6), with some plates displaying grooved rims. Pale Burnished is combined with rustication on one barrel-shaped vessel, pot 137 (fig.11.7:1; pl. XLIV:4).

Jars are either hole-mouth (fig. 11.2:8), constricted-neck, or beaded-rim. Of importance is the appearance of Pale Burnished channeled ware, very much like the Karanovo II type (fig. 11.8:16; pl. LXXVI, top:3).

Handles are predominantly of the strap variety (pl. LXXVIII, bottom:6), including the small "Paradimi" strap handle (e.g., in Dark Burnished, fig. 11.6:6), and prong (fig. 11.6:11). Bases are either flat or pedestal (B4). Other features include some thin, tapered legs and the rounded or conical spout form (fig. 11.8:11).

Smooth Ware. Smooth ware is abundant in phase I. The fabric's grit inclusions are of medium texture and the surface color varies considerably: sometimes red, but never dark and usually a dull brownish-grayish pink.

Bowls include rounded (fig. 11.9:1), flaring, and straight-sided (fig. 11.1:11, 12; pot 307: fig. 11.9:3; pl. LXXXV:5), incurved (R4), and biconical shapes. Several rounded examples display impressed rims and one, pot 239, is on a low pedestal base (fig. 11.9:2). One rim fragment illustrates irregular burnishing (fig. 11.19:6). Wall

thickness varies considerably, and this is especially the case for the flaring bowls; two-handled examples are illustrated in figure 11.9:7, 9. Shallow plates with thickened rims are also in evidence (fig. 11.4:5, 10; see also fig. 11.9:4), as are barrel-shaped vessels.

Jars are commonly constricted-neck and often executed in red Smooth ware (fig. 11.2:1). Other shapes are everted and hole-mouth; several of the latter have rims decorated with incision and indentation (fig. 11.2:9). Strap handles, placed either at the rim (fig. 11.9:7) or on the carination (fig. 11.6:18) are common forms. Figure 11.6:20 shows a looped strap which is horizontally elongated. There are also prongs (H10), hand-grips, ledge lugs, tabs (fig. 11.8:3), and pellets. The ledge lugs have varied decoration; apart from the plain examples (fig. 11.8:4), there are oval handles with vertical dents (fig. 11.8:6; pl. LXXVIII, top:4), those with two D-shaped dents (fig. 11.8:8), one with a central hollow (fig. 11.8:9; pl. LXXVIII, top:8), and one with three oblique dents (fig. 11.8:5; pl. LXXVIII, top:1). Bases are usually flat, but there are some pedestal and platform (B7) examples. Other features include a few squat feet, sieve fragments (fig. 11.8:12), and flat cordons (fig. 11.8:1).

Coarse Ware. Coarse ware is more easily identifiable than Smooth ware and has a rough, coarse brown appearance. It tends to be very gritty and is sometimes perfunctorily burnished.

Bowls are either rounded, flaring (these have thick rims), biconical, or a thick plate form. Jar shapes recorded are hole-mouth, constricted-neck, and beaded-rim. An interesting example of a hole-mouth jar with perforations is illustrated in figure 11.2:11.

Several handle shapes were recovered. Plain strap handles are either elliptical (H7; pl. LXXVIII, bottom:3) or circular (H6) in cross-section. There are also horizontal strap handles (fig. 11.6:20, in Smooth ware but from the later early bronze age) and those from carinations (fig. 11.6:15 in Gray Lustre ware). Ledge handles vary; some are circular or circular with a central hollow (pl. LXXVIII, top:3). Others are oval (pl. LXXVIII, top:7) or with vertical dents (fig. 11.8:6; pl. LXXVIII, top:4, in Smooth ware). The pronounced ledge lugs are certainly functional and not merely decorative (pl. LXXVIII, top:9). Tab handles are plain or perforated (fig. 11.6:22 in Rural ware). One type of applied lug is oval with six circular impressions (fig. 11.8:7). Applied clay pellets are common, either singly or grouped together. Cordons are flat, ridged, or even incised (fig. 11.8:1, 2, the latter in Dark Burnished).

Bases are usually flat, with a few platform and pedestal examples. Some of the latter are perforated with one or two large holes (fig. 11.7:5; pl. LXXVII, bottom:6). Other features include a spout with allover perforations. Sieves also occur, including a rounded bowl sherd with unusually fine perforations (fig. 11.7:8; pl. LXXVII, bottom:3).

Phase I Painted Ware

The sparse occurrence of intrusive painted ware in phase I was mentioned earlier. These fabrics are Orange-on-Orange, Red-on-White, Brown-on-Buff, Matte Brown-on-White, Red-on-Brown, and Brown-on-Cream (see fig. 7.9). Apart from Red-on-White, other painted fabrics for both ZA and KL are small fragments (color pl. C:5) and no shapes were recorded for them. One Red-on-White flat base was found in ZA 65a and a hole-mouth jar fragment in ZA 62.

The only "true" phase I painted ware is the so-called Smeared fabric (see color pl. C:10), which is very rare. It is brittle with a fine paste not unlike *Urfirnis* ware. The surface has a mottled or smeared look composed of dark and light browns and is allover burnished. Smeared ware was recovered in levels 60-65 of trench ZA (fig. 11.8:15; pl. LXXVI, top:1) and in KL 121b (two sherds). The only shape recorded is a carination from ZA 60.

DIAGNOSTIC FEATURES: PHASE II

The hallmark of the phase II pottery is the painted ware for which there is a striking range of fabrics and motifs. Fifteen diagnostic painted

fabrics are detailed here. Unpainted wares, including Gray Lustre and Rural, continue from phase I into early phase II, and two important phase II unpainted wares emerge: Black Topped (fig. 11.17:1-3, 5, 6, 8-10; pl. LXXVI, bottom:1-3; color pl. C:21) and Rippled (fig. 11.18:5-8; pl. LXXV:10-12; color pl. C:20). Black Topped begins in late phase I (fig. 7.9) and is expressed in two combinations: black with red/brown, and black with buff. These may be connected to similar wares reported by French (1961) from Dikili Tash. Rippled ware, a finer fabric than the Gray Lustre of phase I, is always highly burnished inside and out and varies considerably in color.

There is a marked homogeneity among the shapes of phases I and II. New to phase II are two bowl shapes—an open bowl with thick, incurved rim and a deep bowl (R17)—and a series of miniature bowls resembling some of the later Vinča types, such as those at Jela near Šabać (which are unpublished and held by the museum at Šabać). Jars become more important in phase II, perhaps indicating a greater emphasis on food storage. None of the phase II jars, however, has as large a capacity as those from the later phase III. Phase I handle types are repeated in phase II. Pedestal bases (such as fig. 11.10:11) are fewer. Other features occurring in phase II are form O2, little tripod fragments ("altars") with incised and infilled decoration (see chap. 10), and more rim cordons.

Phase II Fabrics

This section describes the painted fabrics, the unpainted diagnostic wares, and the undiagnostic material, for which raw counts of phases I and II are compared. As was the case with the analysis of the phase I pottery, the general characteristics of each diagnostic ware introduce a more detailed treatment of the shapes executed in the fabric. Stylistic developments or parallels discerned by the author are also noted. Duration of all wares is shown in figure 7.9.

PAINTED WARES. Several criteria were established according to which the analysis of each painted ware proceeded: paint decoration, wall thickness, fabric color, texture, design position, and design characteristics, that is, motifs. The varieties considered within each of these criteria are as follows:

Paint Decoration. Black matte/dark brown, orange matte/light brown, orange gloss/light brown, red matte/dark purple, red gloss, white matte, white gloss, and polychrome (combinations of the above).

Wall Thickness. Very thin $<$ 3 mm, thin 3–5 mm, medium 5–7 mm, thick 7–9 mm, and very thick 9–11 mm.

Fabric Color. Red, orange, buff, white, gray, black, and combinations of the above. Clay mixture and firing circumstances, when knowledge of these factors could be ascertained, were taken into consideration.

Texture. Fine, medium, and coarse.

Design Position. Inside, outside, base, handles, carination (above and/or below), at rim, inside and outside, outside and base, inside and base, and inside, outside, and base.

Design Characteristics. Restricted cross-hatching (pl. LXXX:7); spirals: circular (pl. LXXXI, top:4, 10-12) or elliptical (fig. 11.15:16; pls. LXXXI, top:7, LXXX:18); spirals combined with lines (pl. LXXXI, bottom: 3); restricted spirals and lines, i.e., spirals within lines (pl. LXXXII, top:7); straight lines: thick (pl. LXXXII, bottom:1, 4), thin (pl. LXXX, top:2), usually grouped (pls. LXXXI, bottom:4; LXXXII, top:1, 8); arcs: thick (pl. LXXXI, top:8), thin (pl. LXXXIII, top:11), single, or grouped (fig. 11.12:5; pl. LXXX:15); wavy lines: thick, thin, single, or grouped (pls. LXXX:4; LXXXI, top:1); chevrons: thick (pl. LXXXII, bottom:6), thin (pl. LXXXI, top:9), single, or grouped (fig. 11.11:7; pls. LXXX:5; LXXXI, top:5); concentric circles (fig. 11.15:6; pl. LXXXI, top:2); "butterfly" motif (fig. 11.15:4); lines with smaller lines at right angles (pl. LXXX:19); ladders (fig. 11.12:7; pls. LXXX:14, LXXXII, top: 2, 6, 8); "blobs" on lines (fig. 11.14:3; pl. LXXXIII, top: 10).

Others are pendant arcs or festoons (pls. LXXX:11; LXXXI, top:6, bottom:11; LXXXII, top:3) and triangles (fig. 11.12:4; pl. LXXXII, top:4); broad infilled areas such as rough lines or

blobs (pls. LXXXI, bottom:12; LXXXIII, bottom:4); overall squares executed in brushstrokes over the burnished surface (pl. LXXXIV, bottom:1); thick or thin intersecting lines (pl. LXXXI, bottom:6); thick (pl. LXXXI, bottom:2) or thin (pl. LXXXII, top:5) lines meeting, but not intersecting (these were perhaps applied by fingertip); painting combined with punctate decoration (pl. LXXXIII, top:4); and painting combined with excision or incision (pl. LXXXIII, top:8, 12).

The painted wares to be described according to these sets of criteria are: Brown-on-Cream (color pl. C:11), Brown-on-Orange/Red, Brown-on-Buff (color pl. C:12), Fine and Heavy Brown-on-Buff, Orange-on-Orange (color pl. C:14), Red-on-White (color pl. C:25), White-on-Red (color pl. C:15, 24), Matte Brown-on-White (color pl. C:13), Red Slipped, Red Crusted, Brown Slipped, Other White Painted, Black-on-Red, and Red-on-Brown. The painted wares Brown-on-Orange (color pl. C:23), Red and Brown Slipped, and Red Crusted are included on figures 7.9 and 7.10 with the "Other Painted" wares (color pl. C:16, 17).

Brown-on-Cream Ware. This is a very fine ware; the cores are red, well fired, and micaceous, and the surface displays a cream slip or wash. Paint is basically dark brown but color varies among brown, purplish-brown, and black. The surface and paint are allover burnished, and sometimes the paste is a chalky white color. Decorative motifs are always in narrow lines (pl. LXXX:8, 9), about 3-4 mm wide, and there is a rich display of spirals and concentric circles (fig. 11.15:6; pl. LXXXI, top:2). Vessels are at times painted both inside and out and combine geometric and sinuous motifs.

The closest parallels are thought to be with the middle and late neolithic of Thessaly, although further work needs to be undertaken in Bulgaria before this can be confirmed. Stojanova-Serafimova (1970: fig. 3) has published a series of sherds nearly identical with some of the Sitagroi Brown-on-Cream examples. Two sherds from Balgarčevo are strap handles from rims (Sitagroi H5) and show two motifs common at Sitagroi: the enclosed spiral, and ladder elements. Another sherd, from Strumsko, also exhibits the enclosed spiral motif, and several other examples from these sites are similar to Sitagroi Brown-on-Cream ware.

The shape range of phase II Brown-on-Cream is limited, although there are some interesting bowls, jars, and handles. No full profiles were recovered.

Bowls include rounded ones with oblique lines about 3 mm wide which cover the entire sherd from the rim downward. Flared sherds have finer decoration, sometimes on both surfaces: oblique lines in groups of six or horizontal lines at the rim combine with cross-hatching just below.

Jar shapes are cylindrical-neck, constricted-neck (fig. 11.11:8), and hole-mouth. The decoration on these is often a complex of lines and spirals. The design characteristics for each jar rim shape are treated separately. These characteristics always include two or more lines, the maximum combination being six. Larger numbers of lines are grouped and often in arc form.

For cylindrical-neck jars: thin rows of lines at neck and body join (fig. 11.12:6; pl. LXXX:3).

For constricted-neck jars: groups of three parallel lines running horizontally around the rim combined with ladder motifs strung obliquely across the sherd (pl. LXXX:14); groups of arcs in threes combined with wavy and straight lines (fig. 11.12:5; pl. LXXX:15); groups of lines in threes running horizontally around the rim or just below it, sometimes stopping short of encircling the entire rim, ending abruptly, and always rounded off (pl. LXXXI, top:1); two or three simple horizontal lines at the rim (pl. LXXX:17); and a very complex design of circled spirals and wavy lines within two parallel straight lines (fig. 11.14:6; pl. LXXXI, top:3).

Hole-mouth jars display a similar range of decoration: oblique, straight lines about 4 mm thick running in groups of three from the neck; horizontal lines, again in threes, at the rim; round-ended lines in twos running obliquely across the sherd; and ladder and chevron motifs.

Handles are predominantly (90%) strap handles and display complex patterns, the most interesting of which are the "butterfly" motif, con-

centric circles, and wavy lines. Examples on large, flat strap handles are: wavy lines on the central upper surface of the handle (fig. 11.15:1); concentric circles (fig. 11.15:6; pl. LXXXI, top:2); and lines in groups of three with handle modeled from vessel rim (fig. 11.15:3).

Other designs include very complex spirals combined with groups of lines on vessels with a double stringhole on the carination (figs. 11.14:6, 11.15:16; pls. LXXXI, top:3, 7; LXXX: 12). Strap handle designs include groups of three parallel lines running the length of the handle combined with horizontal lines at the rim (fig. 11.15:5); ladder motif in combination with arcs (pl. LXXX:20); arcs and straight lines (fig. 11.15:8); butterfly motif on upper part of strap (fig. 11.15:4); elongated figure-eight with wavy lines on strap handle in combination with concentric circles beneath and to side of handle (fig. 11.15:13; pl. LXXX:13); and vertical lines running the length of the handle (pl. LXXX:1). The only other type of decorated handle is a small lug with very hazy painted lines (fig. 11.15:9).

Few bases were preserved and all are flat. Decoration consists of vertical lines in groups of three.

Other features include one leg from early phase II in trench LL. It has a restricted spiral design running vertically from the base of the leg to the vessel base. Although there are no complete carinated profiles, many separate carinations are thickened like those of phase I Gray Lustre ware. Carination designs include: elongated spirals (fig. 11.15:16; pl. LXXXI, top:7); ladders (fig. 11.14:11; pl. LXXX:21), some with restricted blobs; thin arcs on one side of the carination (pl. LXXX:10); oblique lines on one side of the carination (pl. LXXX:5); lines in groups of four with ladders on one side of the carination (pl. LXXX:12); and framed lines and circle on the lug which is on the carination (fig. 11.15:15).

Brown-on-Cream ware shows a noticeable trend in motif development from simple designs in either straight or curved lines (pl. LXXX:6), sometimes combined, to the more complex chevrons, ladders, spirals, and butterflies. Thick, straight lines occur chiefly in early phase II although they persist. Spirals and ladders begin in the middle of phase II, but only really get underway late in the phase. Although the motifs grow more sophisticated, the fabric remains fine and thin throughout phase II.

Brown-on-Orange/Red Ware. There is only half as much evidence for this fine ware as for the Brown-on-Cream. All the sherds are a uniform orange-red color (pl. LXXXII, top:11), completely through-fired and allover burnished. The core is very fine in texture, and the wall thickness of the sherds is nearly always around 3 mm, although rarely 4-6 mm. Designs are executed in very thin (2 mm) purplish-brown lines. This ware cannot be a firing variant of Brown-on-Cream. About 95% of the motifs are on the outside of the sherds and 5% on both inside and outside.

Bowls are straight-sided, flaring, and rounded, and often decorated in thin, grouped, oblique lines (fig. 11.13:7). Bowls were recovered exclusively from the ZA trench.

Jars are of the same three shapes found in Brown-on-Cream and have complex design characteristics. Cylindrical-necked forms include: restricted spirals within lines and thin vertical lines in bands (fig. 11.12:8; pl. LXXXII, top:12); chevrons and groups of lines around the vessel neck (fig. 11.12:4; pl. LXXXII, top:4); and arcs in multiple groups (pl. LXXXII, top:3).

Constricted-neck forms include: restricted vertical lines in bands combined with arcs (pl. LXXXII, top:9, 10); ladders (fig. 11.12:7; pl. LXXXII, top:2, 6, 8, also seen in Brown-on-Cream ware); and spirals in restricted bands of vertical lines (pl. LXXXII, top:7).

Hole-mouth sherds are decorated inside and out with thin parallel lines, usually painted in groups (fig. 11.12:3; pl. LXXXII, top:1).

Few handles were recovered; these are strap handles, both circular and elliptical in section. One strap handle scar on a constricted-neck rim is located just below the rim and probably represents one of two handles (fig. 11.12:3). There are also some small lugs, one with unclear decoration, from trench KL. Design characteristics for handles are: slightly wavy lines in groups of three as found in Brown-on-Cream ware (fig. 11.15:5); and chevrons at the base of the handle,

with vertical lines on the handle (pl. LXXXII, top:5).

The only other feature is a carination combining thin arcs on one side with paired lines on the other side (e.g., pl. LXXX:10 in Brown-on-Cream).

Brown-on-Buff Ware. There are two varieties of Brown-on-Buff ware: a finer fabric and a coarser, heavier type. These are discussed below in their individual sections. Common to both, however, are a great many decorative elements, and many motifs are distinguished. Color of both paint and fabric and presence/absence of burnishing vary: matte brown-on-cream/buff paint; very dark brown matte paint with a fine grit; cream/buff surface with a red core, highly burnished; much darker brown paint on lightly burnished sherds; very dark brown paint with cores varying from white to light brown to brown; chestnut brown paint, burnished; reddish-brown paint with a red core; burnished reddish-brown paint with a white core.

The sherds of Brown-on-Buff ware vary considerably, and it is difficult to determine how the patterns were applied. They could have been made by scraping away the brown paint which was applied directly to the ground without any intervening slip. The pots would then be heavily polished after firing, which would give a blurred appearance to the fabric. Occasionally the surface appears reddish when the buff slip has worn off, especially on sherds with a red core.

Among the design characteristics are parallel lines of broad, uneven thickness, about 6 mm apart although often merging. They are on a reddish ground, both burnished and unburnished. The core is gritty and the pattern looks "scratched" (pl. LXXXI, bottom:5). Also observed are complex lines, not always evenly executed, resembling parts of chevron patterns in dark Brown-on-Buff paint with allover burnishing (pl. LXXXI, bottom:9); chocolate brown paint on a cream/buff surface burnished all over, with designs of thick arcs (fig. 11.11:1, 4; pl. LXXXI, bottom:11, 12); matte chocolate brown paint on a reddish-buff ground with thin lines and white cores as on a Matte Brown-on-White example (pl. LXXXI, bottom:4); thick, dark brown converging lines on a very pale buff ground (pl. LXXXI, bottom:6); wavy, horizontal lines in an allover pattern, with lines between 6 and 10 mm wide (fig. 11.11:6); lines with rounded, curved ends (pl. LXXXI, bottom:7, 8); oblique lines painted across open bowls (fig. 11.14:10; the former example is also painted on the inside); brown paint in vertical lines covering a boss on a flat-based bowl (fig. 11.14:9); and brown paint decorating a strap handle fragment (pl. LXXXI, bottom:10).

Fine Brown-on-Buff Ware. The glaze of the finer variety of Brown-On-Buff ware varies from matte black to brown, with the fabric color orange, buff, gray, or a mixture. The grit is fine to medium, and wall thickness ranges from 3 to 9 mm. Designs are in straight lines, although these are often fuzzy and ill defined. There is a scraped effect on some sherds. A few examples show clear, wide lines. The decoration never seems to form any coherent pattern as it does for the previously discussed wares. Ninety-seven percent of the motifs are on the outside of the sherds, 1% on both outside and base, 1% on both outside and inside, and 1% on the inside only.

Bowls are commonly rounded and always roughly decorated in thick, uneven lines running at an oblique angle. Some inside surfaces display uneven arcs (fig. 11.13:6), and one late phase II example has thick lines parallel to the rim: sometimes lines tend to look like arcs. One rounded sherd from KM has faint buff lines outside and orange chevrons inside. Flaring bowls are decorated with thick lines in chocolate brown paint on a light buff surface. Deep bowls display red/brown paint on a cream/buff ground with decorations of broad, hazy arcs also extending to the interior of the sherd (fig. 11.14:4).

Jars are confined to constricted-neck and holemouth. The latter seem to exhibit the greatest variety of design characteristics, very similar to those listed above: thick, wavy lines all over a thick-rimmed, highly burnished surface; concentric circles on a thick-rimmed jar; faded thick arcs; roughly executed, thick oblique lines; one

thick line parallel to the rim, decorated with faint lines inside; parallel oblique lines, as if executed with fingertips; and very hazy, thick lines.

Constricted-neck motifs include broad banding at the rim, hazy chevrons at the vessel neck, and vague vertical lines.

Handles are predominantly of the strap variety. The prong handle type of phase I is decorated on one example from phase II with an interesting pattern which focuses on the tip of the prong (fig. 11.15:14). Strap handles at carinations pointing up toward the rim have decoration difficult to define; it is generally linear in form with either oblique or vertical patterning on the upper part of the handle. Major strap-handle design characteristics are concentric circles within lines; straight lines and arcs which cover the handle at the rim; thick, wavy lines; thick spirals; two parallel lines running vertically along the handle; oblique lines across the handle.

Bases are few and decorated with indistinct parallel lines.

Other features are confined to carinations decorated with thick, parallel lines coming away from the carination on each side; uneven, thick lines, parallel to the carination; thick, roughly executed spirals, probably a late form.

It is inadvisable to conjecture a developmental sequence for this ware since the motifs are, for the most part, homogeneous throughout phase II. It is interesting, however, that in the few instances where spirals, concentric circles, and chevrons occur, these are always in late contexts.

Heavy Brown-on-Buff Ware. The glaze varies from matte black to dark brown, wall thickness averaging 9 mm. Fabric color is buff or orange and core texture medium to coarse. The decoration is always in rough-edged, incoherent lines about 9 mm thick. Ninety-two percent of the designs are on the outside of the sherds, the remainder on both inside and outside.

Heavy Brown-on-Buff seems to have far less surface variation, basic colors being dark brown on a warm reddish buff. Cores are gray and the fabric burnished inside and out. Few shapes were recorded; there are cylindrical-neck jars and constricted-neck jars with thickened rims such as the one decorated with wavy brown lines (fig. 11.11:3). There is also a large biconical bowl with a small strap handle at the carination, from the later phase II levels of KL.

Orange-on-Orange Ware. The ground, a very pale orange, and the orange paint, applied in thick, ill-defined lines, tend to make this fabric look monochrome; although it is patterned, it never quite achieves a full bichrome technique. The Orange-on-Orange resembles both Brown-on-Buff and Red-on-White, although the burnish is not as fine as that of Red-on-White ware. The glaze is either orange matte or gloss on light brown. Variations include hazy orange lines about 6 mm thick on a light buff-orange ground, the sherds allover burnished; smudged orange lines on an orange ground, matte surface; dark orange-brown on cream, allover burnished, with thick, uneven lines; highly burnished, streaky orange lines on a brown-gray ground; matte orange on light orange; matte orange on orange in very thin, shaky lines; very light orange on mushroom; streaky brown-orange on cream-orange; very dark orange on dark orange, the design merging with the background (making identification difficult), the sherds allover burnished; and coarse, straw tempered ware with designs in orange on red-orange, very red cores, and motifs of even, parallel lines.

Wall thickness varies from very thin to very thick, although medium thickness is the norm. Medium grit texture is preponderant although here, too, there is a full range of differentiation. Approximately 85% of the designs are applied to the outside of the sherds, 14% to outside and inside, and 1% to bases. Design characteristics include even zigzags on a red-orange ground, a unique type from KL (fig. 11.11:9; pl. LXXXIV, top:7); allover burnished orange-red on light orange with well-defined lines of 12 mm tending toward arcs (fig. 11.13:8; pl. LXXXIV, top:4); fairly well-defined orange chevrons on a buff-orange ground (fig. 11.13:5; pl. LXXXIV, top:2); and a single chevron framed with angled lines, also from KL (pl. LXXXIV, top:5).

Bowls are rounded, flaring, biconical, and

open. A one-handled bowl exhibits curving lines extending vertically from the rim (fig. 11.13:4). Many rounded examples are decorated inside and out with oblique lines (fig. 11.14:5); others have a plain, matte buff outside. Several flaring bowls are decorated only on the inside, with either vertical or horizontal lines. When both sides are painted,the inside lines are horizontal and the outside lines vertical. Biconical bowls are straight-sided (R12) and never sinuous as in phase I. They have very light orange paint on a buff-orange ground. Note the two-handled biconical bowl (fig. 11.13:1) and the carinated constricted-neck example (fig. 11.13:5; pl. LXXXIV, top:2). Trench KL yielded an interesting biconical bowl with a small handle from rim to carination, pale burnishing on the outside, and thick orange-red arcs on the inside (fig. 11.13:2; pl. LXXXIV, top:1). Open bowls, also straight-sided, are rare and decorated with oblique lines or with thick arcs (fig. 11.13:8; pl. LXXXIV, top:4).

Jars with constricted necks are the most common Orange-on-Orange jar shape. They are decorated with oblique, horizontal, or vertical lines and sometimes arcs or chevrons near the vessel rim (fig. 11.12:1; pl. LXXXIV, top:3). Holemouth sherds are similarly painted, and the few cylindrical-neck examples display oblique lines. Everted sherds are also rare, some with pendant arcs (fig. 11.12:2) from the rim. There is one thick-rimmed sherd painted on the flat top of the rim in evenly spaced pairs of lines (fig. 11.11:5).

Handles are of the strap and prong varieties (fig. 11.15:11, 12). Much of the decoration on both types is hazy—in broken, uneven lines for the former and rough, oblique lines for the latter. Unpainted strap handles are attached to rims of small biconical cups, and extend from carination to rim (fig. 11.15:10). Some are elliptically sectioned. A prong handle occurs on a rounded bowl (fig. 11.13:2; pl. LXXXIV, top:1), and a later phase II carinated bowl from trench KM also has a prong handle (fig. 11.15:7).

Bases are mostly flat and decorated with smudged oblique or vertical lines (pl. LXXXIV, top:6).

Other features consist of many carinations and an interesting bowl with feet. The carinations vary from pale orange lines on buff-orange to very dark Orange-on-Orange. Pot 166 (fig. 11.10:4) is a straight-sided, open bowl on a small, slim foot. It is vaguely decorated on the outside with red paint. Its interior, however, displays an orange-red arc on a red burnished ground.

Red-on-White Ware. This uncommon painted ware resembles the red of Red Slipped ware with the basically white ground having red streaks. Some sherds have thicker red lines and a finer burnish than others. Wall thickness runs the gamut of thin to thick, medium being the norm; grit texture is fine to coarse. About 50% of the decoration is on the outside of the sherds only, 45% on both surfaces, and the remainder on bases. Design characteristics include red-pink on white, with a gray core, highly burnished surface, and flaring, hazy, wide lines which are painted underneath and bracket the handle (pot 172: fig. 11.13:3); orange-red on white, allover burnished with a motif of thick, oblique lines (fig. 11.14:2); very dark red-brown, hazy lines on an allover burnished fabric with a gritty, gray core (fig. 11.14:3; pl. LXXXIII, top:10); strong, red spiraling or circular lines both inside and outside of vessel (pot 144: fig. 11.14:8; pl. XLIII:5); and grouped circular lines, finely drawn (pl. LXXXIII, top:11).

None of the decoration is well defined, and all lines tend to merge into the background.

Bowls are rounded, flaring, and open. Rounded examples are decorated inside and out with oblique lines in orange-red on white. Some sherds have small ledge lugs below the rim, others prong handles. One complete vessel with a prong handle, pot 172, is a small, rounded, deep bowl with traces of red-pink paint on a smooth white ground (fig. 11.13:3). Another whole bowl, pot 144, has both surfaces painted with red arcs and is allover burnished (fig. 11.14:8: pl. XLIII:5). Flaring bowls are common for Red-on-White ware and are frequently decorated on both sides, although there are sherds painted exclusively either inside or outside in blood red or orange-red bands. Burnishing is present. One

example from trench KM has a slightly black top as if anticipating true Black Topped ware. Open, straight-sided bowls are decorated either in rough arcs or smudged lines on the inside only.

No jars were recovered by hand collecting; one hole-mouth sherd came from ZA 55s. Handles include small strap and prong handles, both painted with rough, red blobs. Bases are flat and sometimes decorated with red lines (fig. 11.14:3; pl. LXXXIII, top:10).

Several sherds in the Red-on-White ware are unique insofar as the "red" is a deep blood-color slip executed in similar forms. The painted decoration is sometimes combined with punching, incision, and excision (pl. LXXXIII, top:4, 8, 12).

Bowls in this unusual red are flaring, rounded, incurved, and biconical. Flared bowls seem best to display the design of this fabric. One such sherd has a tab and two rows of punching around the red-banded rim (pl. LXXXIII, top:4). Other examples are decorated with arcs on the inside and a red band at the rim (pl. LXXXIII, top:3). Designs also include short, wide, vertical lines around the rim (pl. LXXXIII, top:7), and red-brown blobs at the rim, with a red-orange slip over the body (pl. LXXXIII, top:5). Rounded bowl sherds are decorated with red slipped linked blobs (pl. LXXXIII, top:9); an arc at the rim with blobs at the edge of the arc (pl. LXXXIII, top:6); a "bracket" design on a red slip with painted beads at the rim (pl. LXXXIII, top:2); red slipped arcs on the interior; and a red slipped surface with punching. Only one incurved example was recorded: a "leaves on a stem" motif in orange-red slip on a buff ground. One straight-sided biconical sherd has a red band at the rim and a curious mushroom-shaped motif hitherto unknown at Sitagroi (pl. LXXXIII, top:1).

One hole-mouth jar was recovered, from trench KL. It is decorated with two rows of punching at the rim and a red slip interior. One small prong handle was recorded from trench KM. Bases are all flat. One, from ML 16, is decorated with three red slipped oblique lines. Another sherd, from KM 20, has a combination of red slipping and excision (pl. LXXXIII, top:12). A body sherd from level 109 of trench KL (late phase II) is red slipped with excised triangle decoration (pl. LXXXIII, top:8).

White-on-Red Ware. This rare fabric is very distinctive, a striking cerise coloring with a white slip painted in thin or thick, frequently paired lines. Wall thickness varies from thin to thick, and paste from fine to medium. About 40% of the motifs are on the outside, the remainder on both sides. The illustrations demonstrate the linear quality of the painted decoration (pl. LXXXIII, bottom).

Very few shapes were recorded owing to the scarcity of this ware, and no sherds were found in the sieving experiment. The only bowl shape is open and straight-sided. One sherd from ZA, decorated on both sides, is burnished on the outside only, and the rim is black topped (fig. 11.14:1; pl. LXXXIII, bottom:1). Another has both sides burnished and the outside decorated with thin, oblique lines grouped in threes (fig. 11.14:7). One jar, hole-mouth, has a ladder motif and thin oblique lines in groups of four on the outside of the sherd only.

Matte Brown-on-White Ware. This fabric has three variants: black-brown on chalky white, brown on yellowish white, and purple-brown on chalky white. Glaze varies from a dark matte brown to light brown, wall thickness from thin to medium, and grit texture from fine to medium. All motifs are on the outside of sherds and consist of broad linear patterns.

Bowls are either rounded, decorated with pendant arcs, lines (fig. 11.11:10; pl. LXXXI, bottom:1, 2), and chevrons, or open and straight-sided, decorated in heavy, broad lines. Jars are commonly restricted and patterned with smeared brown lines, chevrons, and arcs. Hole-mouth jars have pendant arcs at the neck and thick lines (fig. 11.8:14, an example from phase I). Very few handle shapes were preserved, and the sieved material did not increase the sample. Strap handles, located at the rims of rounded bowls, are decorated with broad lines. One prong handle, an uncommon shape, came from the late phase II levels of trench KM and is decorated with arcs. Another fragment, with a broken

handle, exhibits a fine spiral plus linear design (pl. LXXXI, bottom:3). Bases are all flat; one has vertical decoration extending up the body of the vessel. Other features include carinations which generally have lines running at right angles to the carination. Some have oblique lines on one side of the carination, often with the other side plain (pl. LXXXI, bottom:4).

Red Slipped Ware. The surface color ranges between orange-red and dark cerise, and the slip is thinly applied. Wall thickness varies from very thin to medium and the paste texture from fine to medium. Fifty percent of the sherds are slipped on the outside and the other 50% on both exterior and interior. One example, discussed in chapter 10, is a painted leg (fig. 11.10:9; pl. LXXI:13).

Bowls and jars are few. However, the sieved pottery sample, especially from ZA 52s, produced the rounded bowl, the open, straight-sided bowl, and the hole-mouth jar. Rounded bowls tend to have both sides slipped, and the jars have V bands on the inside. The prong handle is the only handle shape recorded. Bases are flat or pedestal, with the former slipped on both sides. A sherd with white-filled decoration is the only other feature.

Red Crusted Ware. The sample for Red Crusted ware is small and was increased only slightly by sieving. The sherds have a thick, allover crusting of red ocher which rubs off with friction. Some sherds also are incised and, in some cases, the incisions are infilled with white. Wall thickness varies from medium to thick and grit texture from medium to coarse. Eighty percent of the sherds have crusting on the outside only, the remainder on both inside and out.

Bowls are biconical, straight-sided, and thick-walled. Another example is a small, straight-sided cup (fig. 11.16:8). Rounded bowls are decorated with excised arcs on a smooth buff ground with alternate arcs of red crusting within the excised lines. Bases are either flat or pedestal.

Brown Slipped Ware. Like the Red Slipped ware, Brown Slipped is an uncommon fabric. It is rather brittle, and shades ranging from light sand to nearly black combine to produce a mottled effect. Wall thickness varies from very thin to medium, fabric color is buff-gray and the grit texture very fine. About 90% of the slip is on the outer surface, 10% on both surfaces.

Only rounded and flaring bowls and cylindrical-neck and hole-mouth jars were recorded.

Other White Painted Ware. This is a coarse painted ware. The surface has a thin white wash, and the ground, a buff-brown, looks faded and pale. Designs are in uneven patterns of lines, arcs (pl. LXXXIV, bottom:3), and chevrons. There is also a curious Black Burnished ware decorated with thin white lines (pl. LXXXIV, bottom:4). It is possible that what appears to be a white slip is, in fact, graphite paint. French (1964) also noticed what he thought could be a badly fired or poor quality graphite ware at Dikili Tash. At Sitagroi there is an interesting sherd with a checkerboard design in white paint over a brown burnished ground (pl. LXXXIV, bottom:1).

Only flaring bowls, with thick oblique lines in a white slip on the exterior, were recorded. Jars are cylindrical-neck, constricted-neck, and hole-mouth. A very thick-walled (9 mm) cylindrical-neck vessel with a tab at the rim is decorated with pendant arcs, a white circle below the handle, and vertical white lines below the circle (pl. LXXXIV, bottom:2). The remaining two jar shapes are decorated with oblique white lines.

Black-on-Red Ware. Phase II Black-on-Red, although it could possibly be a prototype, is unlike the phase III fabric of the same name. The earlier version was found in all the major phase II trenches: ZA, KL, KM, and JL. Black matte paint is applied to a brick red fabric. Paste texture varies from medium to coarse and wall thickness from thin to medium. All the designs are found on the outside of the sherds (pl. LXXXII, bottom).

A separate group of nine sherds from ML, KL, and ZA more closely resembles true phase III Black-on-Red. However, these lack boldness and have paste and design characteristics more in

keeping with phase II. They were all recovered from late phase II contexts.

Few shapes were recorded, as only fragments were preserved. However, a rounded bowl fragment exhibits an interesting pattern in two registers: on the upper is what can be identified as a bird; the lower register was noted earlier for the infilled triangle with circles on either side (fig. 11.12:9; pl. LXXXII, bottom:3).

Red-on-Brown Ware. The Red-on-Brown sample was meager but considerably increased with sieving. Cores are red, well fired, and somewhat micaceous. The sherds are painted in a thick, dull red matte on an orange-brown ground. Designs are broad arcs or lines; very few shapes were recorded. One constricted-neck jar came from KL (fig. 11.11:2), a rounded bowl from ZA 58s, an open, straight-sided bowl and a carinated shape from ZA 52s.

DIAGNOSTIC UNPAINTED WARES

Black Topped Ware. Black Topped ware is a significant component in the overall phase II inventory. Both outside and inside surfaces are highly burnished and black, combined with either red-brown or a pale buff color. Some examples of the black with red-brown have an unburnished lower part. The cores are gray or black, well fired, and micaceous.

Bowls are rounded and open (fig. 11.17:8-10; pls. LXXVI, bottom:2; XCV:2), both burnished and unburnished. Rounded forms tend to be shallow, about 4.5 cm high, and rather open. Open, straight-sided bowls with a pale burnished body are carinated, vertical above the carination, and stand on a short pedestal base (fig. 11.17:3; pot 43: fig. 11.17:5). Two-handled bowls are also represented with the handle connected at rim and carination (fig. 11.17:2). One sherd represents a bowl form with a sharply inset, shallow neck (pl. LXXVI, bottom:3). It is from late phase I and may be compared with the form of a biconical Gray Lustre bowl from that phase (fig. 11.3:6).

Among other features, two fragments should be mentioned: a Black Topped red burnished body sherd with a large applied disc above the carination (fig. 11.17:1) and a Black Topped red burnished rim sherd with the black area rippled (fig. 11.17:6).

It must be noted that a few sherds were recovered from a painted Black Topped ware; two fragments exhibit wide painted lines below the carination (pl. LXXVI, bottom:6, 8); and on another, narrower lines may be observed below the darkened rim (pl. LXXVI, bottom:4). Examples of the Black Topped with differential burnishing are two sherds from carinated bowls (pl. LXXVI, bottom:5, 7).

Rippled Ware. Cores of Rippled Ware are gray or black and well fired. Both surfaces are very highly burnished, and the predominant surface color is black, although there are some examples of pale buff or even gray lustrous coloring. The latter should not be confused with the coarser Gray Lustre Channeled ware. Few shapes were recorded; Rippled ware is most interesting for its decorative features consisting of very shallow, even ripples in various designs.

Two interesting bowl sherds came from ZA 52: a biconical, sinuous form decorated with a vertical zigzag and an allover gray lustre wash (pl. LXXV:10), and a rounded example with an oblique rippled decoration, gray lustre wash, and a handle on the shoulder (fig. 11.18:5; pl. LXXV:5).

Constricted-neck jars have several varieties of Rippled decoration: oblique rippling (fig. 11.18:6), curved rippling (fig. 11.18:7), angled chevron rippling (fig. 11.18:8; pl. LXXV:11, 12), circular rippling, especially on a sherd from KL 110 (fig. 11.18:9), and combinations of all these. One pale sherd with a very high burnish has Karanovo parallels (fig. 11.18:6; see also Georgiev 1969b:fig. 7).

Fine Black Burnished Ware. The black burnishing on this ware is easily distinguishable from Dark Burnished ware, and the surface is always uniform and sometimes even looks slipped. The cores are gray or black, well fired, and micaceous.

Bowls are commonly biconical (fig. 11.1:6, 9,

both from phase I) and straight-sided (fig. 11.19:13), sinuous (fig. 11.19:12), or deep and sinuous (fig. 11.20:6). Shallow dishes, probably a phase I survival, and both rounded and flaring bowls are uncommon (fig. 11.16:4). Hole-mouth jar sherds are the most numerous, but there are some cylindrical-neck and constricted-neck examples also. Handles are of the strap variety, either Paradimi (H1) handles or straps from rims to carinations, lugs (circular or elliptical in section), or prong handles. All bases recorded are flat. Other features have sherds stamped in a triangular design which may have been executed with the articular ends of bones.

Incised Ware. Incised ware (color pl. C:18) is slightly coarse and decorated on the outside with broad, open incised lines. Cores vary from red or brown to gray and are micaceous and rather gritty. A fragment from phase I exhibits a finer incised pattern of curvilinear and circling lines (fig. 11.8:13) such as observed on fragments of zoomorphic vessels (cf. chap. 10, fig. 10.7:4; pl. LXXI:7).

Bowls most in evidence are rounded, elevated, shallow, thick-walled and often have incised spiral decoration (fig. 11.10:2, 5, 6). Others bear linear decorations as on pot 145, a very shallow pedestaled bowl with four circular perforations (fig. 11.10:1). It is roughly incised and has white infill. A very comparable pedestaled example differs in that the surface design is excised (fig. 11.10:3). Flaring bowl sherds are fewer in number but display the same designs. A rounded bowl sherd from phase I exhibits square incisions (pl. LXXVI, top:2). The familiar phase I barrel form with a cordon (fig. 11.7:1; pl. XLIV:4) is reflected in an example from this phase with curvilinear incisions above the cordon (fig. 11.17:11). A unique fragment from a rounded vessel exhibits incised horizontal "beading" with a single vertical incision at a 90° angle (pl. LXXVI, top:4).

NON-DIAGNOSTIC WARES

Dark Burnished Ware. Phase II Dark Burnished ware (color pl. C:3) has the same characteristics as that of phase I, with one exception: whereas phase I is surfaced in a homogeneous brown-black, in phase II approximately 45% of the sherds are red burnished. This color variation, especially noticeable in KL, also occurs for the Smooth and Coarse wares and sometimes makes identification difficult.

Bowl shapes, more in evidence in phase II than in phase I, are the rounded, incurved, open, straight-sided, and biconical forms (fig. 11.19:11). Flaring examples are uncommon in both phases. Everted bowls (R5), shallow, open dishes (R10), and thickened-rim bowls (R7, R8, R9) also occur in phase II but are more common in phase I. Pot 243 (fig. 11.16:11) illustrates a rounded bowl (R1; see also fig. 11.19:8), and an incurved example can be seen in pot 152 (fig. 11.19:10). Many of the phase II open, straight-sided bowls are red burnished, and this shape exhibits the greatest difference in numbers when comparing examples in the two phases: 2 examples from the ZA count for phase I and 162 in phase II (pot 242: fig. 11.16:3; and a small example, pot 18: fig. 11.19:2; pl. XLIII:6).

Five jar types were recovered for phase II Dark Burnished ware: hole-mouth (J1, fig. 11.20:2), 146 examples in phase II as opposed to 8 in phase I; cylindrical-neck jar (J2), also more common in phase II; constricted-neck (J3, fig. 11.20:7), with 22 sherds in phase II, none in phase I; open-neck, (J4), 7 in phase II, 0 in I; and form J6, the thickened-rim jar, also occurring only in phase II. Most of the jars are thick-walled—more so than in phase I—and they probably served as storage vessels. Examples of the beaded-rim jar (J5) and a near thickened-rim type (J6) are illustrated (fig. 11.20:3, 4).

The most common handle form is the strap handle (pl. LXXVIII, bottom:1, 2), both in circular (H6) and elliptical (H7) sections. Both were recovered in higher numbers in phase II. Handles having about equal distribution in both phases are the Paradimi form (fig. 7.14:1) and various lugs, horizontally and vertically pierced, plus ledges. A Dark Burnished red-brown example of a strap handle is illustrated in figure 11.18:1.

Bases occurring more frequently in phase II

are the flat (pl. LXXXV:1), platform (pl. LXXXV:3), and pedestal forms (pl. LXXIX, middle:2, 3). The rounded base, B5, was recovered only from phase II.

Among other features are 136 carinations; spouts, one from LL 4 being tapered and red burnished (fig. 11.18:4); and dark red burnished applied discs. The separate legs (fig. 11.18:2, 3) recovered in Dark Burnished ware are more often the fat legs of phase III rather than the small, tapered variety found in the phase I Gray Lustre ware.

Pale Burnished Ware. Although there are minor shape differences, this ware is essentially the same for both phases I and II. It is uncommon in both phases (color pl. C:4).

Bowl shapes are mainly confined to R1, R3, R12, and R13. Illustrated is a handled example (fig. 11.19:5). The rounded and straight-sided forms are more common in phase II, while the latter two shapes have the same distribution in both phases. An example of the R16 shape is seen in figure 11.19:7 and of a thickened rim, R7, in figure 11.19:9.

Jars appear in the same shapes for phase II as for phase I: hole-mouth, constricted-neck, and beaded-rim, with the first being more prevalent in phase II. There are no channeled jars.

Bases are commonly flat and rarely platformed or pedestaled (but see fig. 11.10:7). Form O9, the sinuous carination, is a further common feature.

Smooth Ware. Smooth ware (color pl. C:7) is found in a variety of colors: black, brown, buff, white, and red, with far more red Smooth ware in phase II than in phase I. Some sherds are straw tempered. Several whole vessels were recovered.

Rounded bowls are common. A small example is pot 149 (fig. 11.16:6). The R3 shape is illustrated with a Smooth red bowl resting on a flat base (fig. 11.16:2); the R6 shape by a large example (fig. 11.16:5). Pot 165 is a miniature (fig. 11.19:1). The side of one small bowl is pierced (fig. 11.10:14). Incurved and everted forms are rare, but both flaring and open, straight-sided bowls are executed in the Smooth fabric.

Several open, straight-sided bowls are preserved in their entirety: pot 148, with thickened rim, resting on a flat base (fig. 11.16:1); pot 182 from phase III but typologically closer to phase II (fig. 11.16:10; pl. XCV:3); and pot 147, which is red, vertical above the carination, and rests on a short pedestal base (fig. 11.10:8). One flaring bowl, pot 163 (fig. 11.16:7), is a miniature. Biconical forms are in evidence (R12, R13, R15: fig. 11.1:8), and there is one whole bowl, pot 169 (fig. 11.16:9). This is unique and might almost be classified as a miniature jar. It is about 7 cm high with a cylindrical opening at the neck and a single ledge lug at the carination. Other bowl shapes include a few thickened-rim dishes (R7) and some open, shallow dishes (R10) and miniatures.

Jars are hole-mouth (fig. 11.20:2), open-neck, thickened-rim, and constricted-neck, including a large pithos fragment (fig. 11.20:1) in Smooth red fabric. The cylindrical-neck form executed in the more delicate painted wares is not found in Smooth ware. As in phase I, hole-mouth jars are red. One unique constricted-neck example came from KL 110 and has an applied vertical "pie crust" below the rim.

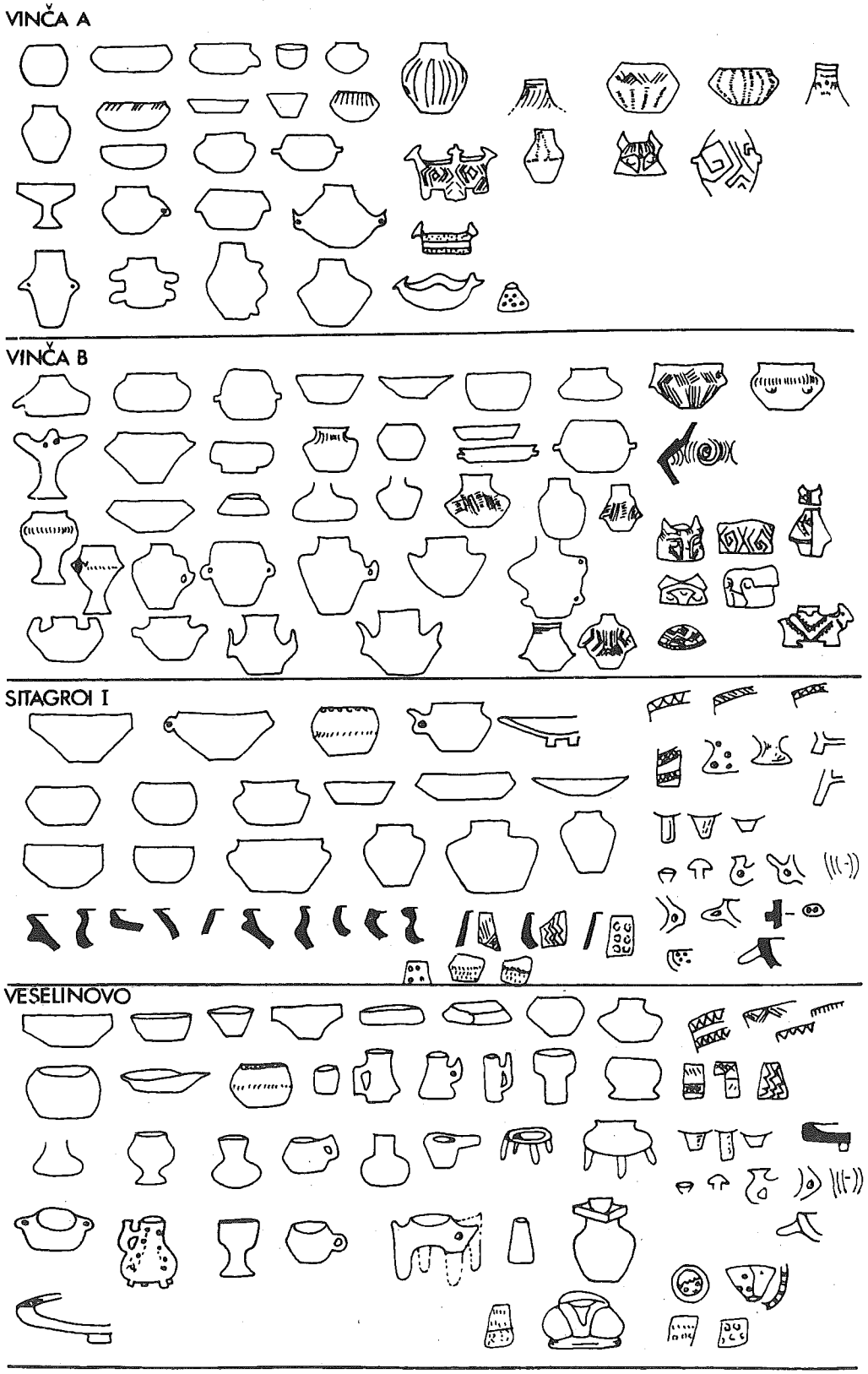
Strap handles are the most common (fig. 11.15:2), although knobs, prongs, and ledge lugs are also in evidence, the last horizontally pierced as well as unpierced.

All of the base shapes—flat, platform, and pedestal (fig. 11.10:10, 13)—are more common in phase II than in phase I. Other features include the heavier variety of legs (in red), sieves, and carinations. There is a Smooth red lid with a circular knob at the center and a Smooth red, circular spout, both from KL 110.

Coarse Ware. In phase I, Coarse ware is predominantly a brown-buff color. This continues in phase II, but a reddish color is added to the repertoire.

Four bowl forms were recorded: rounded, biconical, slightly incurved, and open, straight sided. The two biconical profiles are pot 108 (fig. 11.19:4; pl. LXXXV:6), straw tempered with an open spout; and pot 170 (fig. 11.19:3; pl.

Table 11.1. Comparison of Vinča A and B, Sitagroi I, and Veselinovo.



LXXXV:2), a cup, also straw tempered, with a small strap handle from rim to carination.

Only two jar shapes were recorded—holemouth and constricted-neck—and these are very thick walled, probably for storage vessels. There are no beaded-rim jars as in phase I. The most common handles are the strap handle and several varieties of horizontal, unpierced, ledge, and horizontally pierced lugs (H20, H22, H24, and H19). Bases are mostly flat, with some platform and pedestal examples; pot 22 (fig. 11.10:12) is a thickened miniature form. Among other features are some legs, rim cordons, sieves (fig. 11.10:15), and a few carinations.

PHASES I AND II POTTERY AFFINITIES

Sitagroi is situated in an important position between Turkey, the Aegean, and Europe, but the area in which it lies has not undergone intensive archaeological investigation. Indeed, East Macedonia is represented only by Sitagroi, Dikili Tash, and various surface collections; Paradimi provides the main information for Thrace. The pottery of Sitagroi I and II represents a stable ceramic tradition: not only have parallel wares been found at other nearby tell sites on the plain of Drama, but close similarities exist between the pottery of the earliest phase at Sitagroi and the widespread and well-known Vinča and Veselinovo cultures (table 11.1).

The Veselinovo culture, also known as the Karanovo III period, has been widely investigated (Georgiev 1961:45f., 1969b). It was first discovered in 1939 at Veselinovo near Jambol by V. Mikov (Mikov 1939a, 1939b, 1959), but the finds were not distinguished from those of the bronze age (Georgiev 1961:66). When Karanovo was excavated, the Veselinovo culture was allocated to its correct position in the middle neolithic period, and further excavations at Yasa Tepe (Detev 1948, 1960) near Plovdiv have shown that Veselinovo can be divided into several phases.

The sites with materials comparable to Veselinovo are distributed mainly in the southern Balkans and also recorded on the Thracian coast of the Aegean at Paradimi near Komotini (French 1961:103, 105; Bakalakis and Sakellariou 1981), at Dikili Tash (French 1961, 1964; Deshayes 1970, 1973) and at Sitagroi I. Twenty years ago Comşa (1962) named 56 such locations in the east Balkans, but the southernmost Veselinovo sites are at Gjumurdzina and Makri in Aegean Thrace. Veselinovo has also been discovered as far north as the Danube, at Preslaveč (Georgiev 1969b:216), and in the northeast, finds are scattered along the Kamchiya River (Georgieva 1952:259-268). In western Bulgaria the culture is recorded on the Pirdop Plains at Chelopech (Petkov 1948) and Chevdar (Georgiev 1969b:218; Petkov 1948:53).

In the Rhodope Mountains, Veselinovo has been located in the Mesta Valley near Yakoruda (Georgiev 1969b:218; Maslarova 1959:figs. 126-127), along the natural route from Thrace to the Aegean. Veselinovo deposits have also been found in the Immamova Dupka caves (Georgiev 1969b; Nikolov 1969) near Yakoruda and at various locations of differing depths in the Plovdiv region, notably at Graf Ignatievo (Detev 1950a:221-227, 1966:29; Georgiev 1969b:218), Lenovo (Detev 1962:49-53, 1966:33; Georgiev 1969b:218), Muldava, and Banja, and in the Pazardžik district, at Donchova (Georgiev 1969b) and Rakitovo. Some sites—for example, Karanovo, Kapitan Dimitrievo (Detev 1950b:1-25; Georgiev 1959, 1961), Yasa Tepe, Vetren (Georgiev 1961, 1969b:218), Chelopech (Georgiev 1961:45f., 1969b), Ezero/Dipsis (Georgiev and Merpert 1966:33-37; Detev 1966:31), and Stara Zagora—have deep stratigraphies. Georgiev (1961) provides a general summary of these sites.

At Yasa Tepe I and Kazanlik (Detev 1959:figs. 15, 18, 21a, 21b; 1960: figs. 10, 12, 16, 19; Georgiev 1969b; Mikov 1931), a transitional phase clearly illustrated by the pottery differences was discovered between Karanovo II and III. Precursors for some of the Veselinovo shapes also occurred at Tell Azmak (Georgiev 1962, 1963, 1969a), suggesting that Veselinovo was a direct development from its predecessors; one notes that the distribution is a similar one and that at most Karanovo culture sites the early levels are overlain by Veselinovo deposits. At Yasa Tepe

and Kazanlik, vessels have been found bearing traits characteristic of both Karanovo II and III: low, round bases and rodlike handles. This is not documented for Karanovo I; Vajsova (1966) divides the Veselinovo culture into two developmental stages: stage I, represented at Yasa Tepe; and stage II, represented at Veselinovo and Karanovo.

It is in the first of these stages that we see a relationship with the preceding Karanovo II phase. This is most apparent in the tubular, pear-shaped vessels, the nail impressions, and the use of three or four small feet (Detev 1959:13, fig. 16). The wares of stage II, on the other hand, exhibit the "classic" Veselinovo traits: tall, cylindrical mugs with huge handles (see, e.g., Detev 1959:13, fig. 16; 29, fig. 43); pear-shaped vessels with or without handles and three or four small feet (Detev 1959:13, fig. 16); flat, slightly rounded dishes with thick, grooved rims and four feet (Georgiev 1969b; Detev 1959); cylindrical handleless mugs (Detev 1959:13, fig. 16; 33, fig. 73); and dish-shaped vessels with vertical walls (Detev 1959:33, fig. 73). Many of these shapes are also found in Sitagroi I. The wares are a drab gray-brown color, and some are gray lustrous as at Sitagroi I. The buttons and grooves, often thought to be so characteristic of Veselinovo, are not so common in the Bulgarian variant, but at Sitagroi I they decorate the rims of shallow plates and the carinations of some vessels.

The Veselinovo domestic wares have fingernail-impressed decoration. According to Georgiev (personal communication), only the "ritual vessels" or altars (Detev 1959:31, fig. 45) bear the typical encrusted lattice designs. All elements of the culture—houses, tools, pottery, and figurines—are a continuation of the preceding period.

The resemblance of the pottery of Sitagroi I and Veselinovo to Vinča is, perhaps, somewhat less obvious, but certain similarities cannot be ignored. For example, the deposit known as Vinča A at the type site contained dark burnished and lustrous slipped wares, burnished and incised wares, channeled wares, domestic coarse fabrics, black topped ware, and the so-called fruitstands and biconical bowls (Dimitrijević 1968:58). Many of these features continued into the next Vinča phase (Vinča B), where, however, black topped ware disappeared and new finewares came in. As Vinča B evolved further, the vessels became more markedly carinated, and the channeling or rippling technique became more refined. Hole-mouth jars and rounded and biconical bowls all appeared between 9.0 and 7.8 m (i.e., in Vinča A) as did pale burnishing and channeling combined and lustrous wares. These parallels serve to link Sitagroi I, Veselinovo, and Vinča A/B.

Regional Comparisons

MACEDONIA. In the eastern half of Greek Macedonia there is some archaeological evidence from the earlier surface surveys of sites in the Angista Plain (French 1961, 1964, 1965, 1973). The area was also reinvestigated during the Sitagroi excavations and some new sites were located (see Davidson, chap. 3, and Blouet, chap. 6). Like French's, these were surface surveys, and some sites with material akin to Sitagroi I and II were recorded, as were others representing the later periods at Sitagroi (see more recent reports by Grammenos 1978, 1981).

Sites with Sitagroi I and II material include the mound of Dhimitra, about 50 m long by 7 m high on a natural gravel ridge above the left bank of the Angitis River, which has Sitagroi II Brown-on-Cream ware and also Matte Red-on-Brown ware of this period. The presence of Graphite-painted and Black-on-Red wares shows Sitagroi III influence. Sostis, a mound about 100 m in length by 4 m in height in the middle of the plain, has some possible Veselinovo-type sherds—for example, four-footed bowls—but there are also tubular Troy lugs. Much Rippled ware was reported at Mylopotamos (about 200 by 100 m), but the relation to Veselinovo is not clear; the wares at Mylopotamos are very fine, thin, and evenly fired, and the surface looks almost glazed, being very shiny and black. This is unlike the Sitagroi I or Veselinovo Black Burnished ware. Chorla, Drama, Nea Baphra, and possibly Polystylon all exhibit Sitagroi I materials.

Dikili Tash (Deshayes 1970; French 1964; Seferiades 1981), with about 8 m of deposition, is located on the edge of what once may have been wet, marshy ground. The wares can be clearly compared with Sitagroi I as well as with later Sitagroi phases, especially phase III (see Evans, chap. 12). The middle neolithic levels are about 2.5 m thick, and materials from the deepest level give a radiocarbon date of 4850 ± 150 bc. The middle neolithic level is homogeneous and equated by Deshayes to the Vinča A to C2 periods. The deepest middle neolithic levels have produced gray burnished ware and carinated bowl shapes suggesting Vinča A features. These levels also provide footed vessels, isolated pottery feet (as at Sitagroi I), and incised tripod fragments—all typical Veselinovo forms. Parallels to the Vinča Tordoš forms include the black burnished and gray slipped wares, the channeled wares, everted-rim bowls, large plates, and various biconical vessels. The footed bowls, knob and prong handles, and incised altars are closer to Veselinovo, but the open, carinated bowls and black topped ware link Dikili Tash with Sitagroi I, Vinča A, and Veselinovo. The relationships among all these wares will not be fully solved until more detailed work is carried out, but it is interesting to note that at Gornja Tuzla, for example, fine thin-walled monochrome ware and black topped ware occurred together in upper layer VI (5.45-4.90 m), and in layer V of this site (4.90-4.25 m) black topped ware was found in association with footed and conical bowls and channeled ware (Čović 1960-61). At the site of Vinča itself, black topped ware is known in Vinča A contexts (at 8.5 m), and this is again in association with channeled and footed wares (Keighley 1975:191-192).

Still in Macedonia but west of the Drama Plain is the site of Stivos (formerly called Gioumenitza), where French (1961:108-109) reported two separate mounds (A and B) about 100 m apart. The mounds are situated on the edge of an escarpment overlooking the river Derveni. French reported a few black burnished and fine black burnished sherds but claimed that they are different from the Drama and Dikili Tash type. He also made a rather vague reference to a type of black burnished ware for which the shapes are wide globular bowls with short necks. He did not say, however, whether this black burnished ware is very fine, thus with possible Sitagroi II-Mylopotamos links, or whether it is of the coarser Sitagroi I type. Sitagroi II is probably represented because brown-on-cream wares are mentioned, and it is likely that some of the sherds from Stivos have a general relationship with Sitagroi I and Dikili Tash. No coarse gritted wares are reported at Stivos although these are common both at Sitagroi and Dikili Tash. However, the Stivos sample was surface-collected and the absence of coarseware may therefore be accidental.

In western Macedonia, at Servia in the Haliakmon Valley (Ridley and Wardle 1979), the excavations by Cressida Ridley (personal communication) suggest that the site represents only part of the late neolithic sequence, possibly equating with the pre-Dhimini phases at the Thessalian sites. It is impossible to say yet whether Sitagroi phases I and II are represented, but probably only the second phase is. Servia's pottery suggests closest connections first with Thessaly, next with Yugoslav Macedonia, then with western/eastern Macedonia, and lastly with Bulgaria.

THRACE. At Paradimi, overlooking the Boklontza River, black and fine burnished wares have been reported (Bakalakis and Sakellariou 1981; French 1961:103, 105). Some material from this site is on display in the Thessaloniki Museum. A strong affinity is noted between the Paradimi wares and those of Sitagroi, especially for Sitagroi phases I and III (Bakalakis and Sakellariou 1981:27-40). The dark burnished fabrics are similar to Sitagroi I, Veselinovo, and Vinča; the graphite-painted wares to Sitagroi III (see chap. 12).

The unpainted wares from Paradimi show considerable variability. Fine black burnished ware and black topped ware occur in carinated bowl form (French 1964:fig. 131). Rippled or channeled ware is present and perhaps links Sitagroi I, Vinča, and Veselinovo, although there are individual differences between the sites. For example, the Rippled ware shape at Sitagroi I is nei-

ther a sharply carinated bowl nor a straight-sided bowl as it is at Paradimi. Black burnished ware is common at Paradimi as it is in both Vinča and Veselinovo assemblages. Parallel also with Sitagroi I is uneven pattern burnishing, which is also reported at Vinča. Four-footed shallow, open bowls are common at Paradimi (Bakalakis and Sakellariou 1981:Taf. 24b:1, 2, Taf. 47:1, 2, Taf. 48:1; cf. legs from Sitagroi, pl. LXXIX, bottom). Parallels can also be seen between a high-handled bowl found at Paradimi (French 1964:fig. 131) and two from Sitagroi (for one of these, see fig. 11.5:4). Knob-handled forms are also similar at these two sites, Paradimi (Bakalakis and Sakellariou 1981:Taf. IV:C, 2, 4) and Sitagroi (fig. 11.6:2, 3, 5; pl. LXXIX, top:1-3).

Incising with white infill occurs at both Paradimi and Sitagroi I although the mode of decoration seen at Paradimi is unlike that at Sitagroi. Coarseware, a very generalized and rather undiagnostic fabric, occurs at Paradimi, Sitagroi I, Vinča, and Veselinovo. At Paradimi the rims of vessels are often decorated with impression; this is uncommon in Sitagroi I although it is known in the Veselinovo levels at Chevdar and Kazanlik (Georgiev, personal communication).

CENTRAL MACEDONIA AND THESSALY. To the west, black burnished ware is represented at other sites such as Nea Nikomedeia; these wares are all in Thessalian or Macedonian late neolithic contexts. The Thessalian Dhimini and Larisa complexes are not earlier than the Vinča Tordoš and Veselinovo groups, as the only Dhimini date, 3680±150 bc, confirms (Milojčić 1958: 446). There are no Larisa dates available at this time.

The relevance of early Vinča and Veselinovo to the Anatolian material seems slight; black burnished ware occurs in middle and late chalcolithic contexts in Anatolia, but there are very few Vinča A and Veselinovo shapes, and the published pottery from Beycesultan (French 1964: fig. 137) confirms this. Similarly, the Vinča A pottery is very unlike that at Beycesultan. Indeed, there is enough independent evidence to demonstrate that Vinča A and Veselinovo pottery forms are derived from indigenous early neolithic prototypes.

CONCLUSION

The typological similarities which at present can be said to exist between the Sitagroi I, Vinča, and Veselinovo pottery cannot be quantitatively assessed for all sites. In many instances, the pottery available from a given site is a random surface collection and thus the presence or absence of particular types of sherds is fortuitous. Some points may be made, however, about the evidence. First, the middle neolithic fabrics are extremely homogeneous throughout the area in question, and while there may be differences between individual sites owing to firing conditions, the categories of wares at middle neolithic sites are few in number and easy to identify. The coarsewares include barbotine or rusticated ware and "rural" ware; these are often grit tempered and sometimes, as at Sitagroi and Kazanlik, straw tempered. Another group is dark burnished, which is common at all middle neolithic sites in the area under consideration. Many of these wares are highly burnished and sometimes have a half-slip as, for example, the gray lustre wares so common in Phase I at Sitagroi and at all the Veselinovo period sites in Bulgaria. A subdivision of the dark burnished group is the category of fine channeled wares, typical of Sitagroi I, many Veselinovo period sites, and some Vinča sites. Channeling on red slipped vessels is known in this period, but the evidence so far suggests that these forms occur only in the Transylvanian Tordoš culture.

The dark burnished, carinated, and channeled wares which occur at the middle neolithic sites of the Vinča and Veselinovo periods suggest relationships of some kind. Of equal importance, however, is the suggestion, based on these pottery elements, that a series of coherent and continuous developments took place from the early to middle neolithic periods in the Balkans, since relationships may be postulated not only among, for example, Sitagroi I, Vinča, and Veselinovo,

but between these groups and their earlier neolithic antecedents. For example, level IV at Anzabegovo (Gimbutas, personal communication) near Štip contained almost all black burnished ware and many carinated shapes and channeled decoration, preceded by mixed Starčevo-Vinča wares in level III. Moreover, at the site of Vinča itself, "transitional" channeled wares occur in the mixed Starčevo-Vinča levels (Letica 1972:pl. III). Many other sites also show such a transition (Keighley 1975:113-130, 135-163).

Both the dark burnished and gray lustre wares of the middle neolithic period in the Balkans are decorated with channeling and, indeed, this ware was recorded at many of the middle neolithic sites throughout the area under review. Examples identical to the channeled wares at Sitagroi were seen at Dikili Tash, Chevdar (in the earlier Karanovo II levels), and Kazanlik. At all these sites, channeling decorates the same shapes: biconical bowls of various forms and, on the Veselinovo period sites, pear-shaped vessels. All examples of these shapes seen at Kazanlik are channeled. There is a greater variety of channeling on the Vinča pots at Vinča (Keighley 1975:388-391; Vasić 1932-1936, 4:nos. 50, 52), such as combinations of zigzag channeling and oblique, horizontal, and vertical channeling, than there is on some of the other Vinča period sites (e.g., Gornja Tuzla, where the channeling is either vertical or oblique). The channeling at Sitagroi I (pl. LXXV:1-9) and at the Veselinovo period sites also shows considerable variability. Common to all the middle neolithic Balkan sites where channeled wares have been recorded is the position of the channeling—always on the upper half of the vessel if it is biconical and all over its body if it is pear-shaped.

The channeled forms in Sitagroi I are all of Gray Lustre ware. At other sites, especially those of the Veselinovo period, channeling also occurs on the dark burnished categories, and at Kazanlik, channeled ware is stated to be later than the gray lustre and burnished wares (Georgiev, personal communication). At this site, there was apparently a period of "pure" gray lustre and burnished wares, without channeling, although all the other typical Veselinovo features occur throughout the Veselinovo levels.

Further fabrics linking Sitagroi I, Vinča, and Veselinovo are barbotine or rusticated ware and rural ware. Rural ware is common to Sitagroi I, Vinča, Yasa Tepe, Kazanlik, Chevdar, Karanovo, Veselinovo, and Dikili Tash and probably occurs on many more sites of the middle neolithic period. Rusticated ware is also common in the early neolithic, and the middle neolithic wares do not seem to be very different from those of the early neolithic, apart from two features: the so-called finger-stroked barbotine ware, known in Vinča A contexts, in Sitagroi I, at Yasa Tepe, Karanovo, Veselinovo, Kazanlik, and Chevdar; and the technique of producing vessels with only the upper half burnished and the lower half roughened. Two vessels, one from Yasa Tepe (Detev 1959:20, fig. 22), the other from Sitagroi (fig. 11.7:1; pl. XLIV:4), are almost identical.

The other wares known to have been produced on sites of the Vinča and Veselinovo groups are the less diagnostic coarse and smooth wares. These were made in large quantities (they usually constitute about one-third of all wares represented on a site), which suggests their use as common domestic pottery.

Several important shapes link Sitagroi I, Vinča, and Veselinovo. Rounded bowls occur at most middle neolithic sites, though they are more typically early neolithic features. They do, however, occur early at Vinča (Keighley 1975: 190) and are more common in Sitagroi I than II. Straight-sided bowls are found in Sitagroi I and Vinča A, also at Kazanlik, Chevdar, and Yasa Tepe. Another important linking shape is the shallow, open plate with thickened rim (e.g., fig. 11.4:1; pl. XLIV:3) which occurs at Sitagroi I and at some Vinča sites (e.g., Vinča, Gornja Tuzla, Anzabegovo, Vršnik, Zelenikovo). This plate form is, however, more common at the Macedonian and Bulgarian sites; it is very uncommon in areas such as the Banat, for example, where many Vinča Tordoš sites are known. It is, perhaps, another pottery feature more typical of Greek and Yugoslav Macedonia and Bulgaria.

The other shape common to all the Balkan

middle neolithic sites is the carinated or biconical bowl (both sinuous and with straight sides). These bowls are very often channeled, as in Sitagroi I and at Dikili Tash. At Sitagroi, some of the biconical bowls in phase I are very large in diameter (30-40 cm) (e.g., fig. 11.5:4; pl. XLIV:5); those at Dikili Tash were also of similar dimensions. Small clay pellets placed on the carinations of vessels is a feature common to Sitagroi I and to Vinča where it occurs well within the Vinča A period and is known at 10.03 m. At Yasa Tepe these pellets decorate "mugs" of the Veselinovo period (Georgiev 1969b).

The ratio of jar to bowl forms has already been estimated for Sitagroi I and II (80% of the phase I vessels were bowls). This phenomenon is also apparently true for sites of the Veselinovo period. Georgiev (personal communication) states that at Veselinovo, Karanovo, Yasa Tepe, and Kazanlik, a large percentage of the vessels are bowls and there are many more bowl than jar forms. Whether this is also true of the Vinča Tordoš period sites cannot be determined, although at Vinča itself bowls are important in Vinča A.

Handles with knobbed terminals are common to Sitagroi I, Dikili Tash, Paradimi, Veselinovo, Karanovo, Yasa Tepe, Chevdar, and to Kazanlik, where the examples seen are identical with those from Sitagroi I and Dikili Tash. These forms do perhaps illustrate a departure from Vinča since there seem to be very few examples of knob handles in the Vinča Tordoš complex (two were seen at the site of Selevać, but this was dated to the Pločnik phase). Small handles placed from rim to carination occur in Sitagroi I, Vinča A, and at Kazanlik, Chevdar, Karanovo, and Veselinovo. Other features common to these sites include tab handles, ledge lugs, and various applied discs. The discs are often made in coarse fabrics; examples are those from Vinča A (Vasić 1932-1936, 4:nos. 156-159).

Pedestaled vessels seem to have originated in the early neolithic period, but they are also thought to be a diagnostic Vinča and Veselinovo form. Pedestaled vessels were recorded in Sitagroi I and at some of the Veselinovo period sites in Bulgaria (e.g., Kazanlik, Yasa Tepe, Karanovo, and Veselinovo). They are a Vinča A feature (Vasić 1932-1936, 4: nos. 248-460, 248-461, 248-462) and occur on many Vinča A period sites: for example, at Gornja Tuzla (Benac 1961-62:28-37; Čović 1960-61), Anzabegovo (Gimbutas 1976) and Vršnik, and quite a large number of the Banat Vinča Tordoš sites: for example Ban, Brestovac (Brukner 1968:84), Banja Dubica (Grbić 1968:64; Simovjević 1958-59:376), and Aradac (Brukner 1968:84; Grbić 1968:68), and some of the Bačka sites, e.g., Apatin, Bač, and Bogojevo (Brukner 1968:84).

Vessels with applied feet link Sitagroi I with the Bulgarian and Yugoslav Macedonian sites. These feet, usually on open bowl forms, are not really a Serbian Vinča Tordoš feature, though they are known in the early neolithic period in Starčevo contexts. Brukner (personal communication) suggests that in Serbia feet are a more typical Vinča Pločnik feature; he states that they are known at Predionica and Fafos and at Gomolava, Medvednjak, and Selevać in such later Vinča contexts.

Sieve fragments were recorded in Sitagroi I although they appear to have become a more important form in Sitagroi III. They are known in Vinča A contexts at Vinča between 8.5 and 2.98 m (e.g., Vasić 1932-1936, 4:no. 619) and at Predionica (Galović 1959a:fig. 48, no. 3). They also occur at Veselinovo, Yasa Tepe (Detev 1960), and Karanovo but do not seem to be as important a shape as biconical bowls. Tripod vessels ("altars") were recorded from Sitagroi I and II and are discussed with parallels in chapter 10.

Although none of these similarities can be documented quantitatively, it is felt that the relationships between the pottery forms of Vinča, Veselinovo, and Sitagroi are strong. It would be most informative to trace the middle neolithic pottery back into the early neolithic period in this area, as may be done, to a limited extent, for the early to middle neolithic in Yugoslavia (Keighley 1975:156-163) and Bulgaria (ibid.: 114-130). For example, the pottery of Karanovo I very closely resembles that of Karanovo II, and already in the Karanovo II levels at Chevdar there are large quantities of dark burnished

wares and the characteristic feet and knob handles of the Veselinovo phase. In addition, the transitional phase between Karanovo I and III has actually been established at some sites, notably Kazanlik and Yasa Tepe. This transition has been most clearly established by the pottery evidence, and some pots have the characteristic traits of both periods: for instance, low, round bases and rodlike handles together on the same vessel. It is indeed unfortunate that no prototypes were found at Sitagroi for Sitagroi I forms, especially since the other phases at the site do show internal continuity—particularly the evolution already referred to from phase I to II and from phase II to III. Sitagroi thus cannot yet be fully understood: a rich deposit of over two meters has been found at the site, with many close links both to Veselinovo and to Vinča Tordoš, and another very similar deposit has been excavated at nearby Dikili Tash, which likewise sheds no light on the early neolithic period in the region. What caused the middle neolithic settlement on the Drama Plain and why has no early neolithic been discovered? None of the sites in the vicinity of Sitagroi have produced early neolithic material, although it must be admitted that these have so far been only superficially investigated. It is possible that Sitagroi I represents an expansion of settlement from Yugoslavia or, more probably, Bulgaria at some stage during the neolithic period. These issues cannot be clarified in terms of the priority of any one region over another since the dates so far determined for the early and middle neolithic periods in Yugoslavia, Bulgaria, and East Macedonia are all very similar and material traits in these areas are very alike, suggesting a series of parallel developments. Moreover, not enough sites have been excavated to provide the detailed knowledge required to explain the relationships between settlements of the same period.

The variety of painted wares which characterize phase II are not unique to Sitagroi. As discussed earlier, brown-on-cream has been noted at several Drama Plain sites: Dikili Tash, Dhimitra, Stivos, and recently from Podochori (Grammenos 1981:210, fig. 2). Reflecting on Dikili Tash, Seferiades (1981:55) wrote that the fine bichrome ceramics decorated with designs which were recovered at that site are not found in Bulgaria, Thrace, or Yugoslavia. He, too, suggested parallels to Thessaly at the end of the middle neolithic period. That the Drama Plain sites were in contact with Thessaly would not be surprising; black-on-red and graphite-painted sherds of phase III date have been unearthed from the earliest levels at Pevkakia Magoula located on the Bay of Volos. Contact between the plain and Thessaly is thus documented during Sitagroi III. Further research may indicate an earlier phase II origin. In the light of present evidence it is quite clear that Sitagroi cannot be isolated in any way and must be interpreted as part of a continuous process of neolithic development.

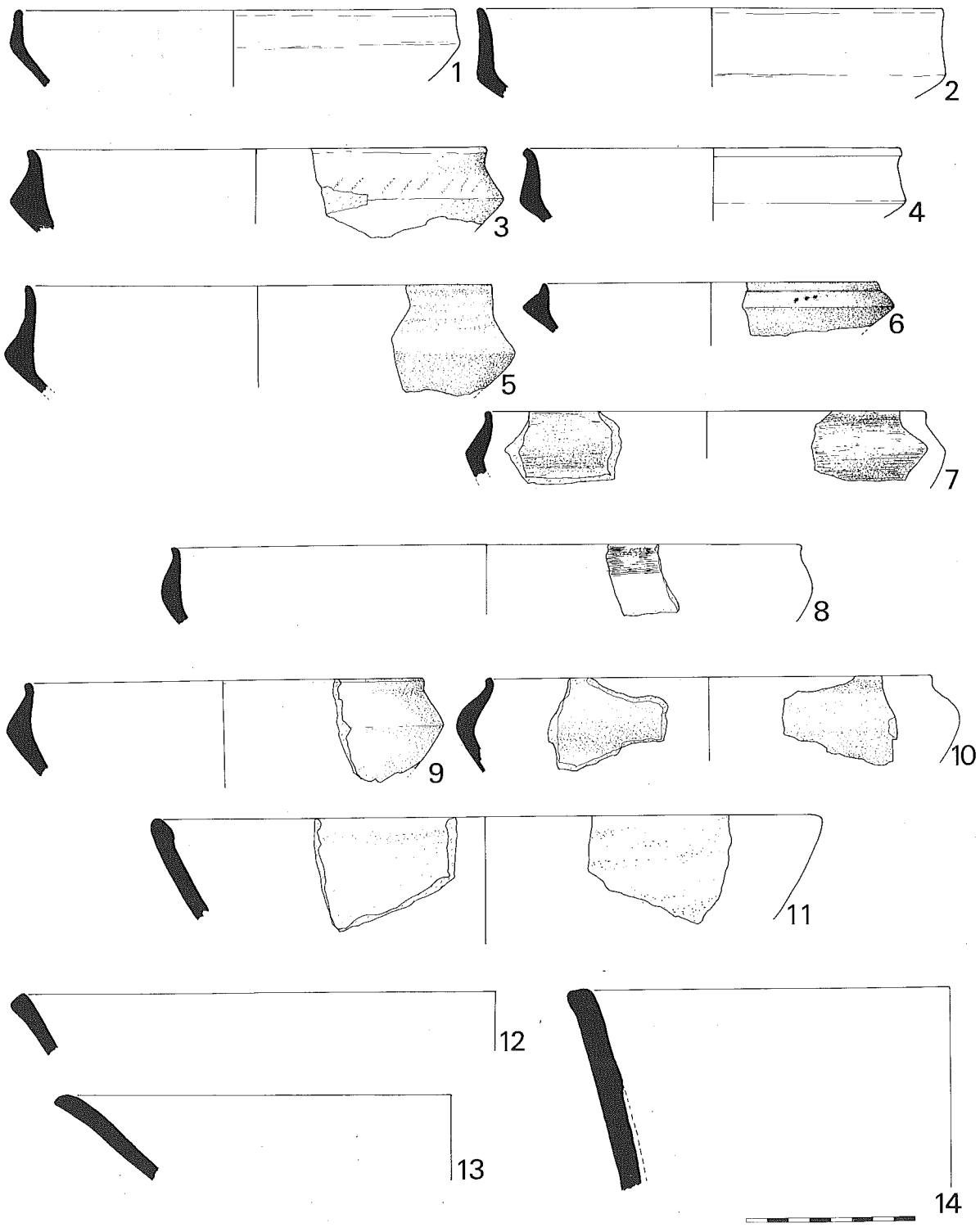


Figure 11.1. Phase I. Bowl rim fragments (GrL: 1, 7, 10; DB: 2-4; GLC: 5; FBB: 6, 9; GrL/Sm, gray: 8, 11; Sm: 12; Rst, roughened surface:13; DB, red/brown: 14).

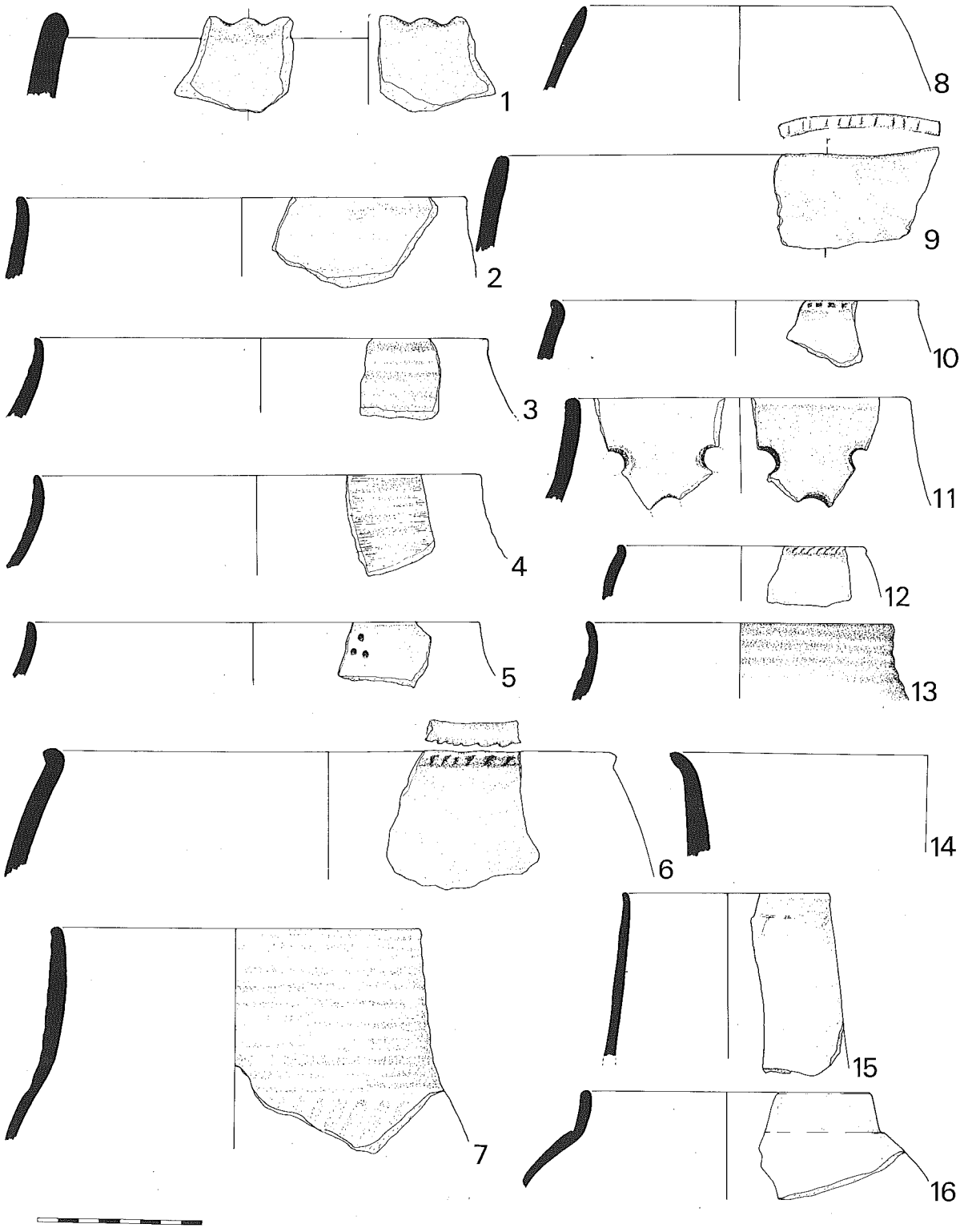


Figure 11.2. Phase I. Jar rim fragments (Sm, red: 1; GrL: 2, 4-6, 10, 14-16; GLC: 3, 7, 13; PlB: 8; Sm: 9; C: 11; DB: 12).

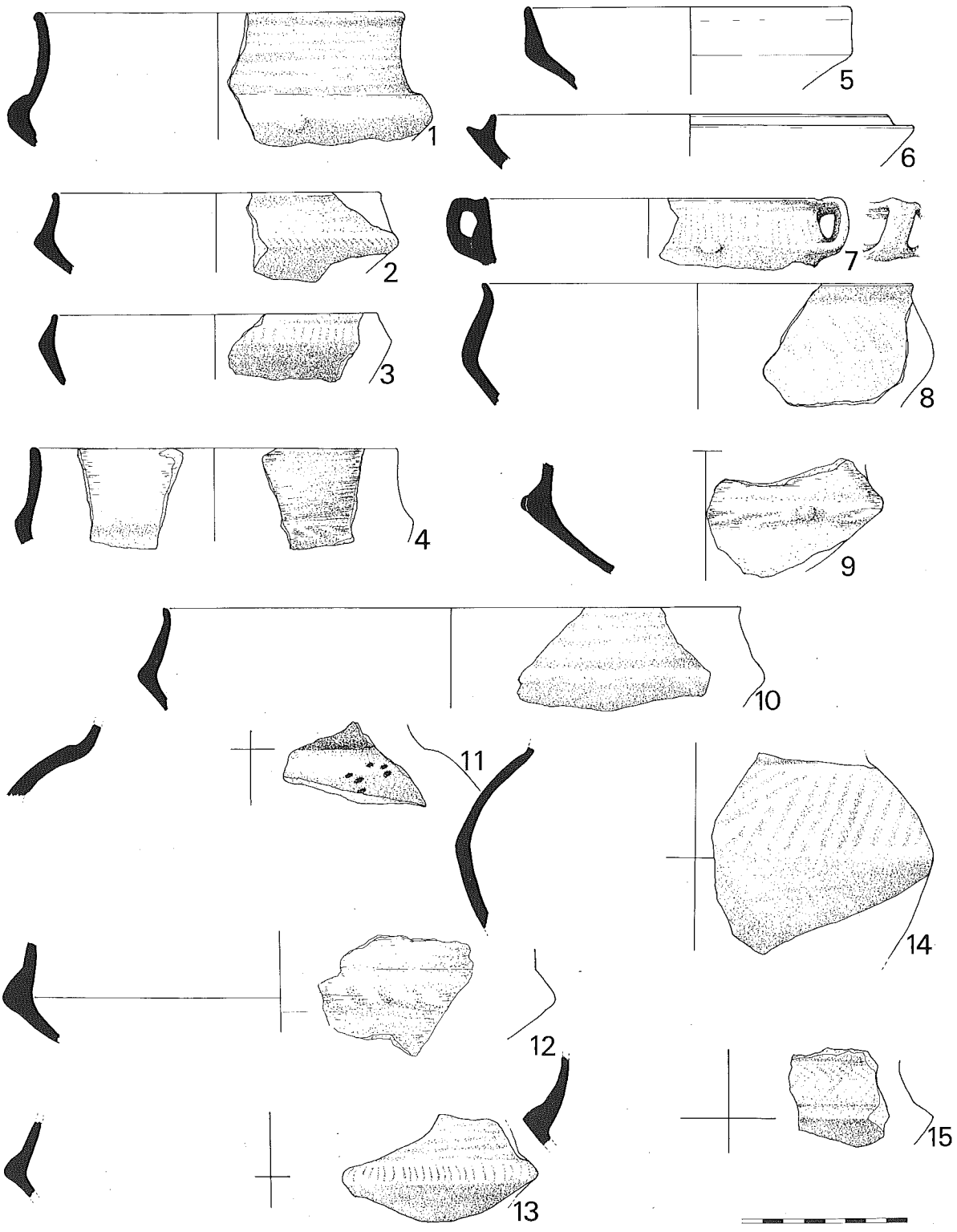


Figure 11.3. Phase I (no. 8, phase II). Fragments of biconical bowls (GLC: 1, 3, 4, 7, 8, 10, 12-15; GLC, white under shoulder: 2; GrL: 5, 6, 9, 11).

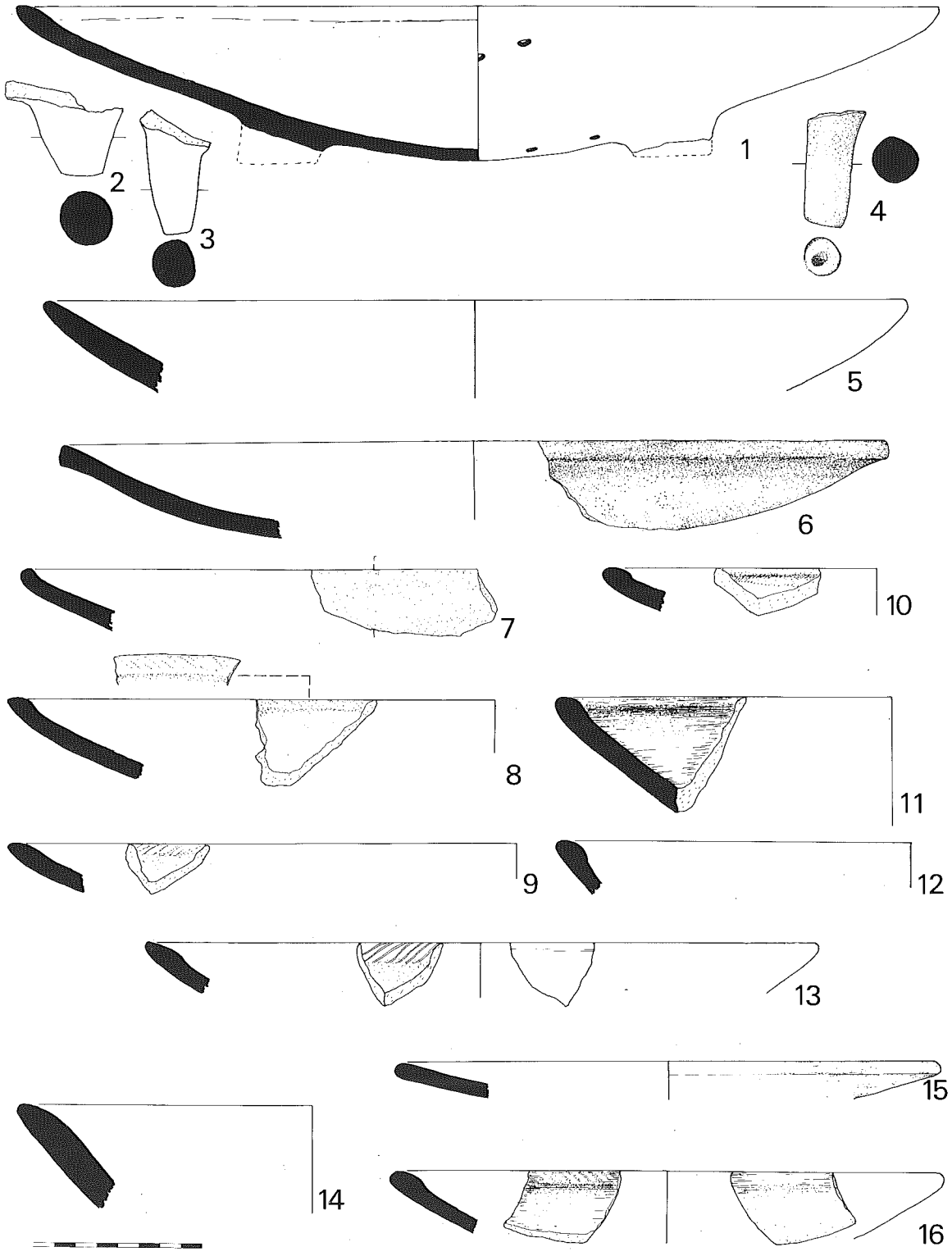


Figure 11.4. Phase I. Fragments of open bowls and plates (GrL: 1, 8, 9, 11, 12; Sm: 5, 10; PlB: 6; DB: 7; Rst: 13; PlB, light red: 14; Rrl: 15; GLC: 16), legs (GrL: 2-4).

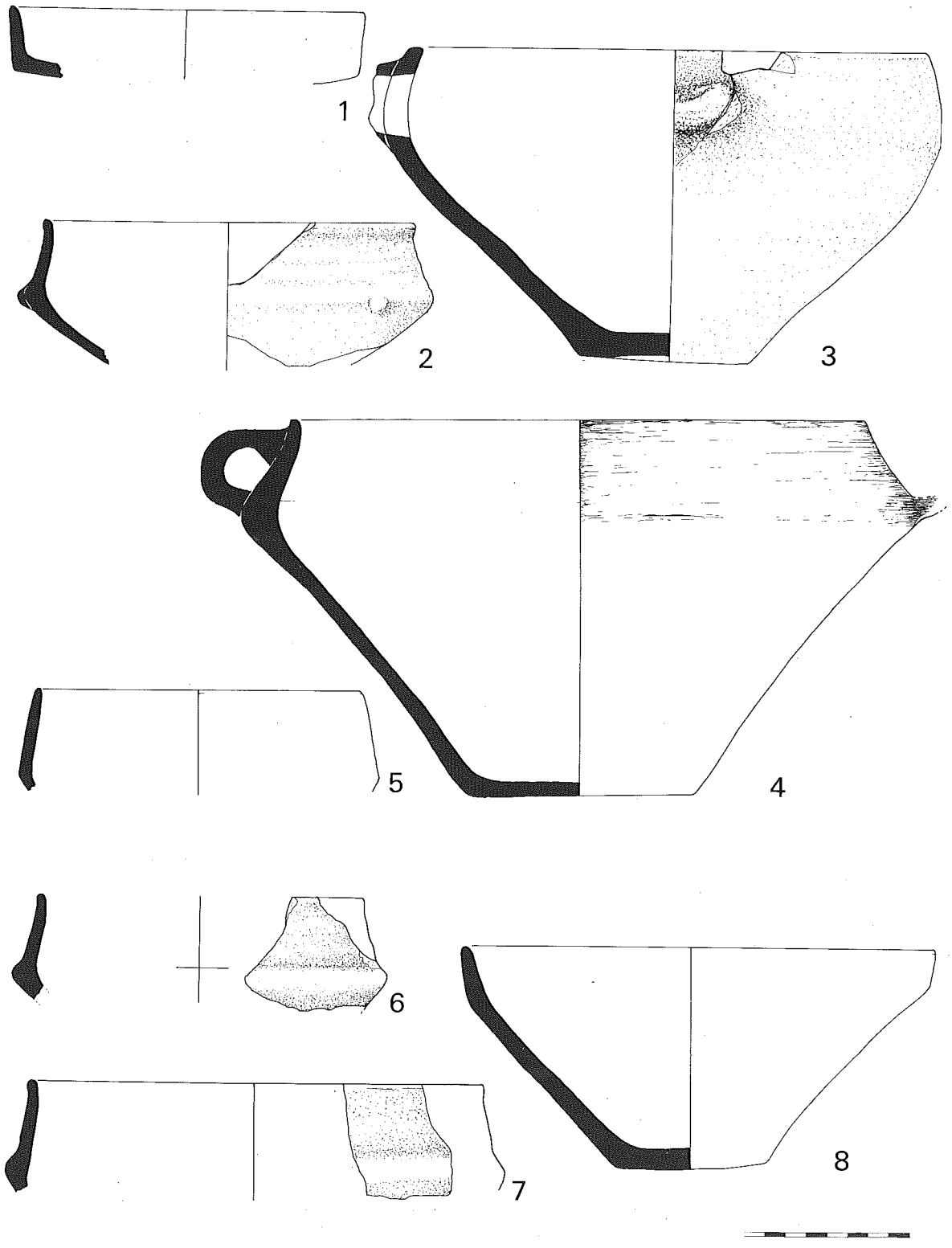


Figure 11.5. Phase I (no. 3, phase II). Biconical bowls and fragments (DB: 1; GLC: 2; GrL, rough black: 3; GrL: 4, 6-8; DB, red: 5).

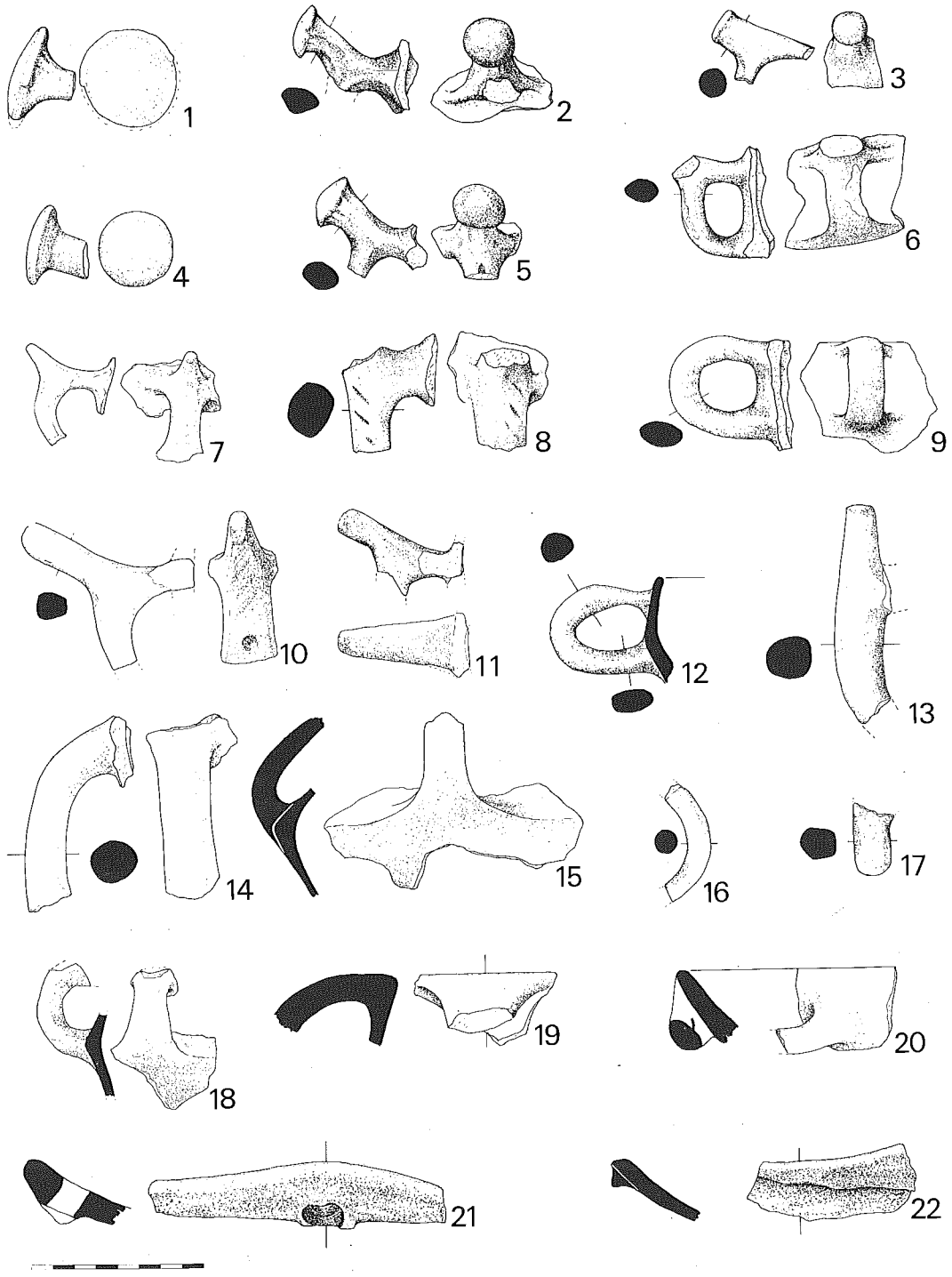


Figure 11.6. Phase I. Handles (no. 10, phase II; no. 20, phase V). Knobs (GrL: 1; DB: 4), knobbed strap handles and fragments (GrL: 2, 8; DB: 5; DB, red: 6), handles with square or tapering prong (GrL: 3, 7,10; PIB:11), strap handles (DB: 9; GrL: 12), hand-grip straps (DB: 13; GrL: 14), carination strap (GrL: 15; Sm: 18), rim strap (GrL: 19), tabs (Rrl: 21,22), miscellaneous handle fragments (GrL: 16,17), horizontal handle (Sm: 20).

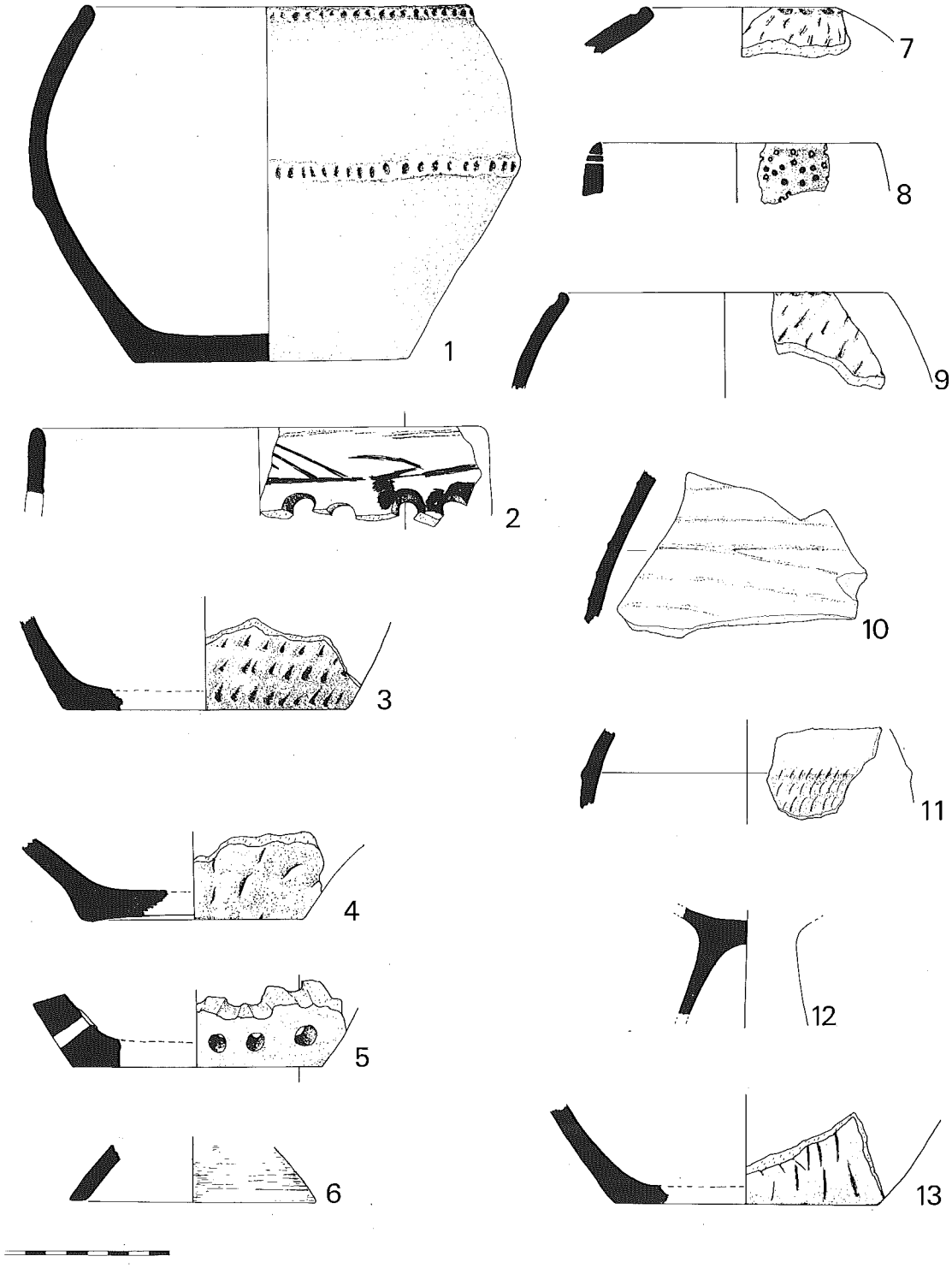


Figure 11.7. Phase I. Barrel-shaped bowl (PlB/Rst: 1), flat-based fragments (Rst: 3, 4, 13; C: 5), sherd from open rim (Rst: 2), pedestal bases (GrL: 6, 12), inturned rims (Rst: 7, 9), rim sherd from sieve (C: 8), body sherds (Rst/Barbotine: 10; Rst: 11).

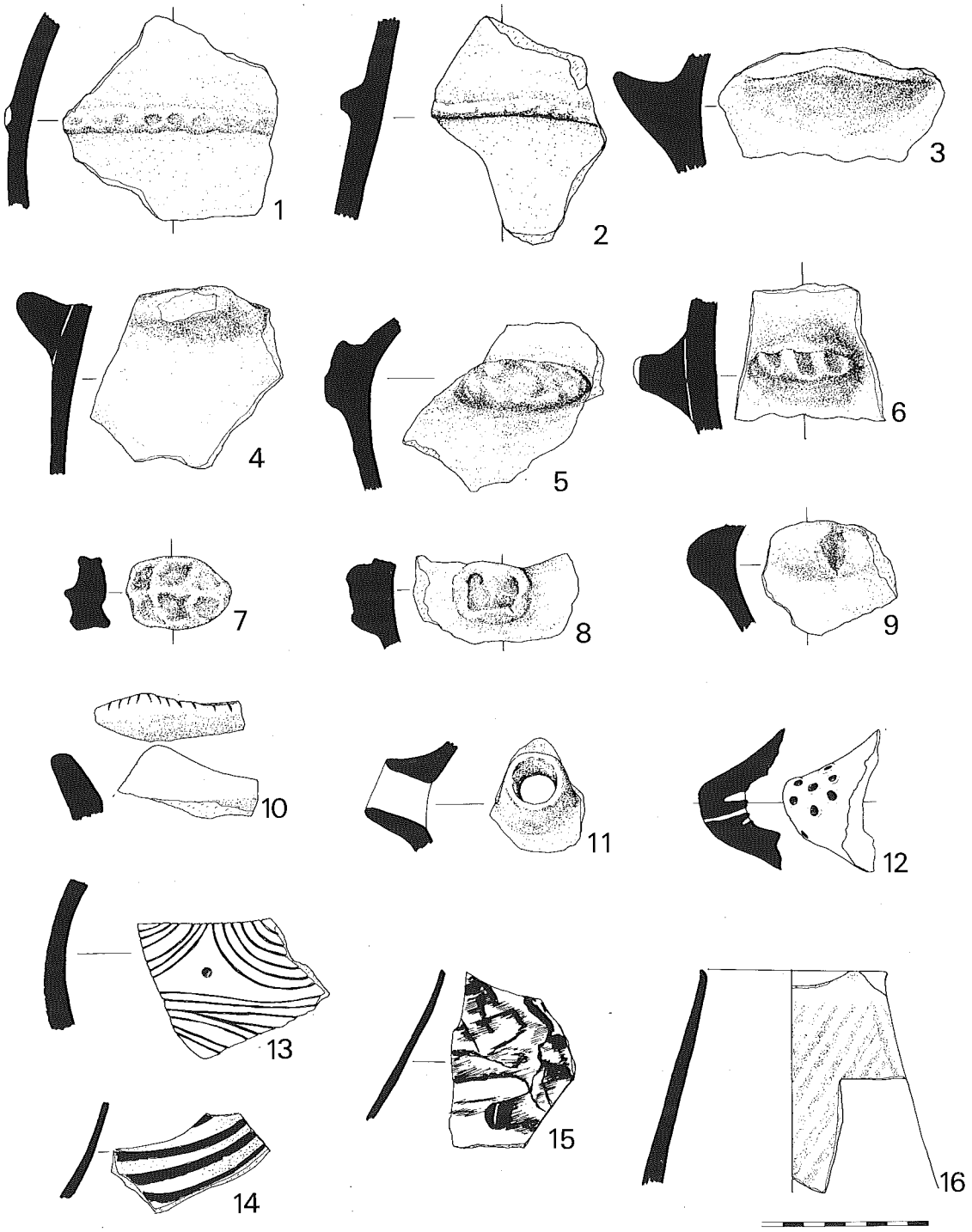


Figure 11.8. Phase I. Body sherds with cordons (Sm/C: 1; DB, red: 2), tabs, lugs, and ledges (Sm, red: 3, 6; gray: 4, 9; Sm: 5; C: 7; Sm, tan?: 8; DB: 10), pouring spout (PlB: 11), sieve fragment (Sm: 12), miscellaneous sherds (I: 13; MBr/W: 14; Srd: 15; PlB/Rp: 16).

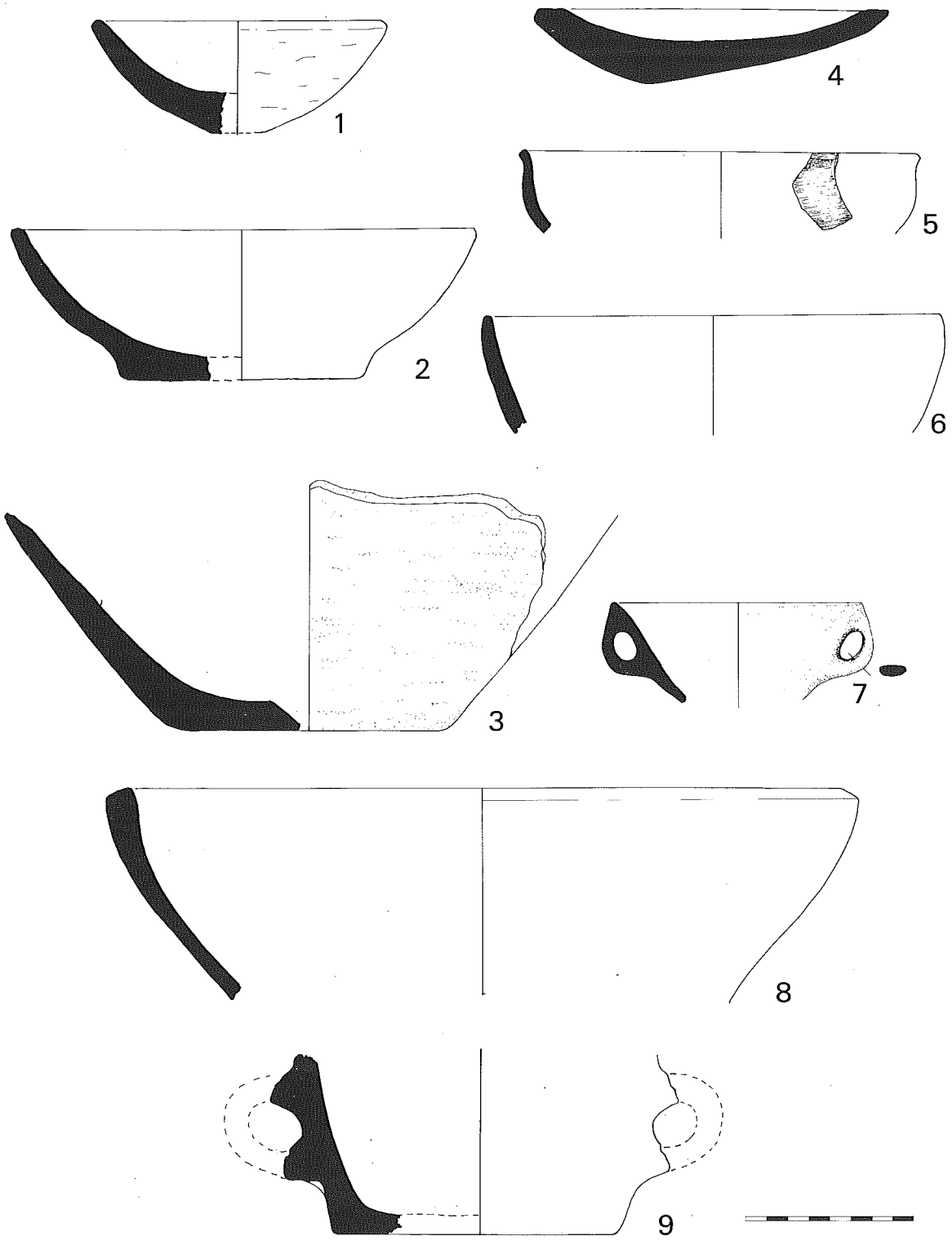


Figure 11.9. Phase I. Bowl forms (Sm: 1-4; GrL: 5; PlB: 6; DB:8) with double handles (Sm: 7, 9).

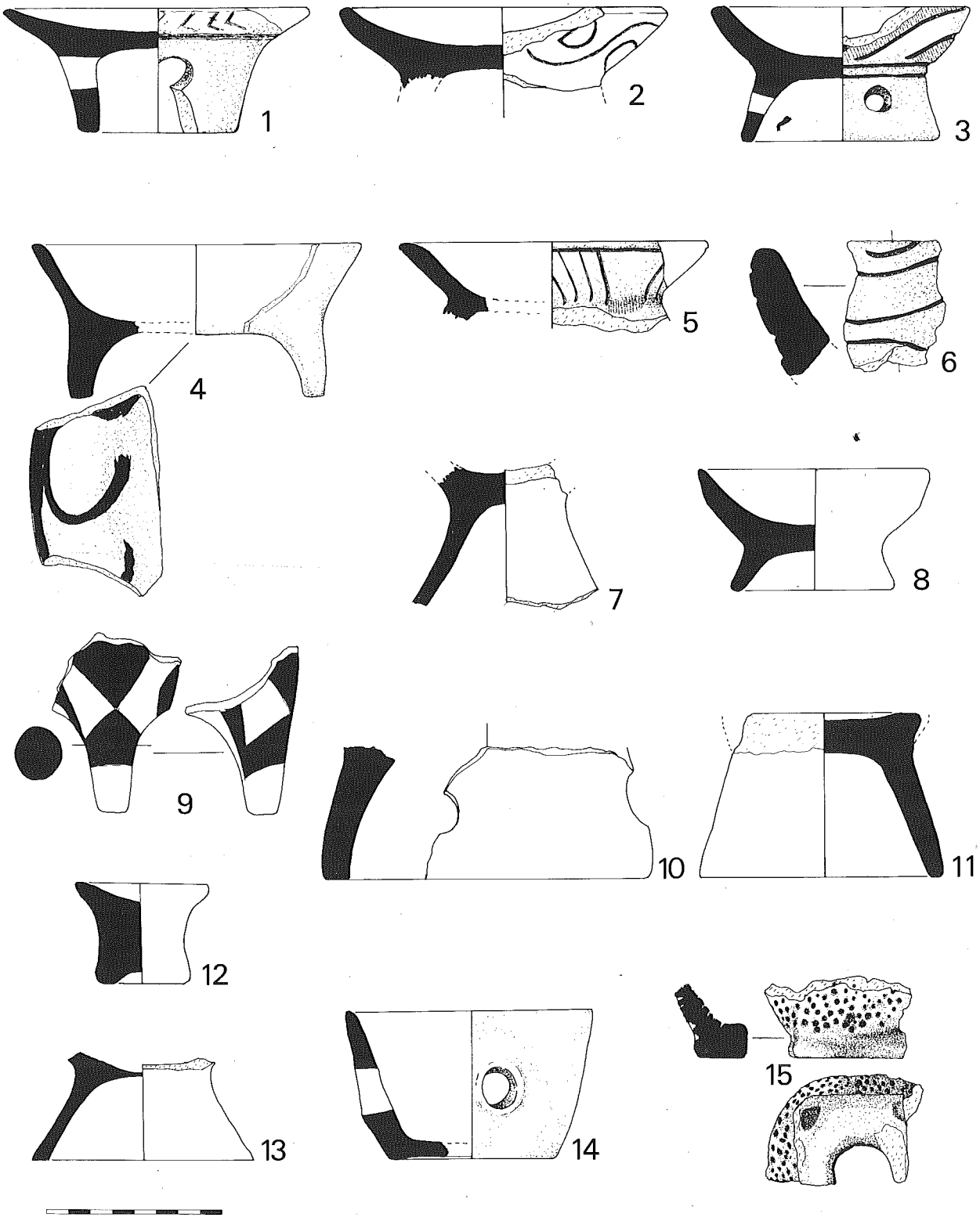


Figure 11.10. Phase II (no. 4, mixed). Pedestal (I: 1, 2, 5; Exc: 3; PlB: 7; Sm: 8, 10, 11, 13; red slip, red/brown: 9), and footed bowls (O/O: 4), miscellaneous fragment (I: 6), miniature (C: 12), small bowl with opening (Sm: 14), sieve (C: 15).

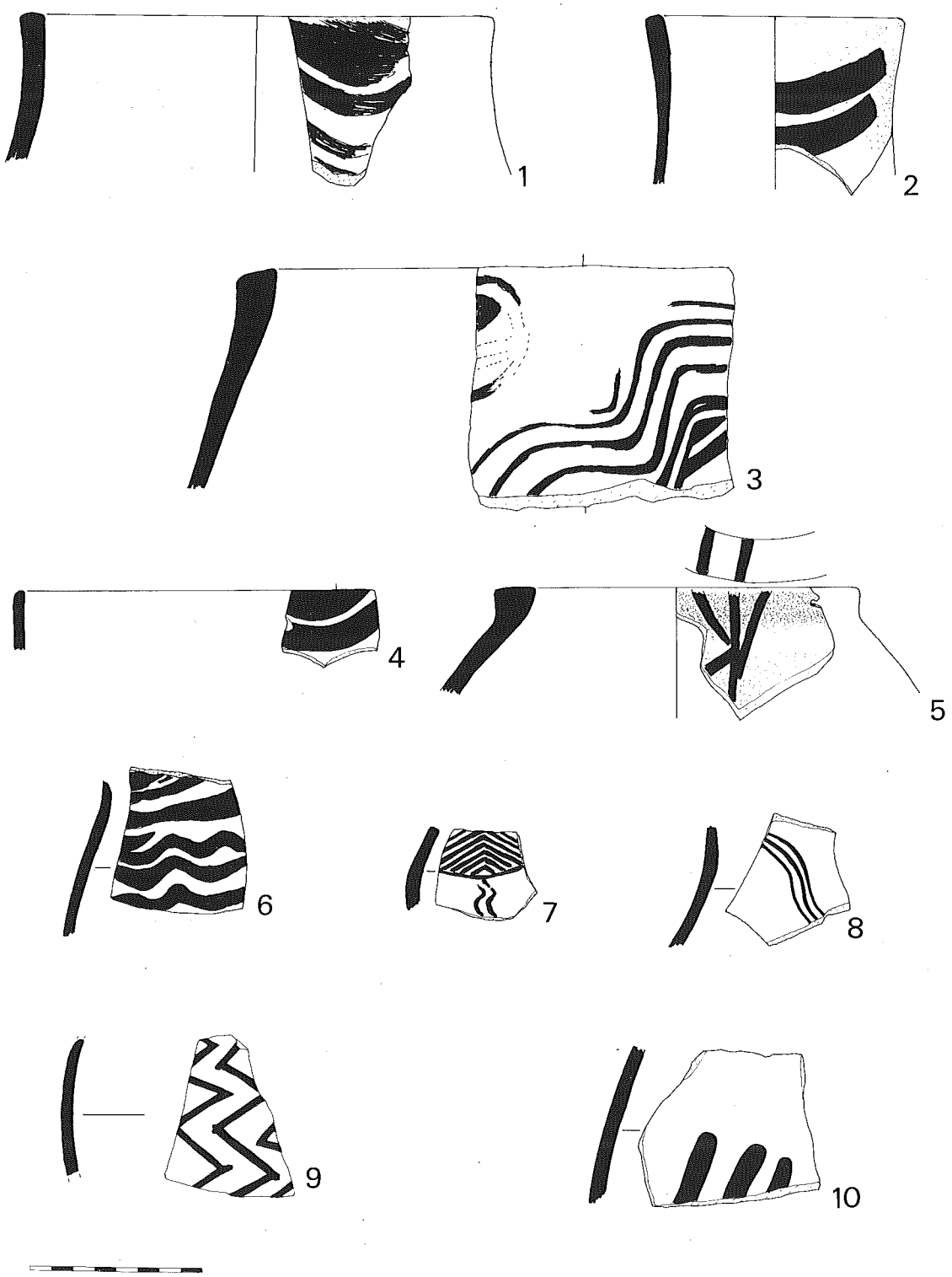


Figure 11.11. Phase II. Fragments of various painted vessels (Br/Bf: 1, 4, 6; R/Br: 2; Heavy Br/Bf: 3; O/O: 5, 9; Br/C: 7, 8; MBr/W: 10).

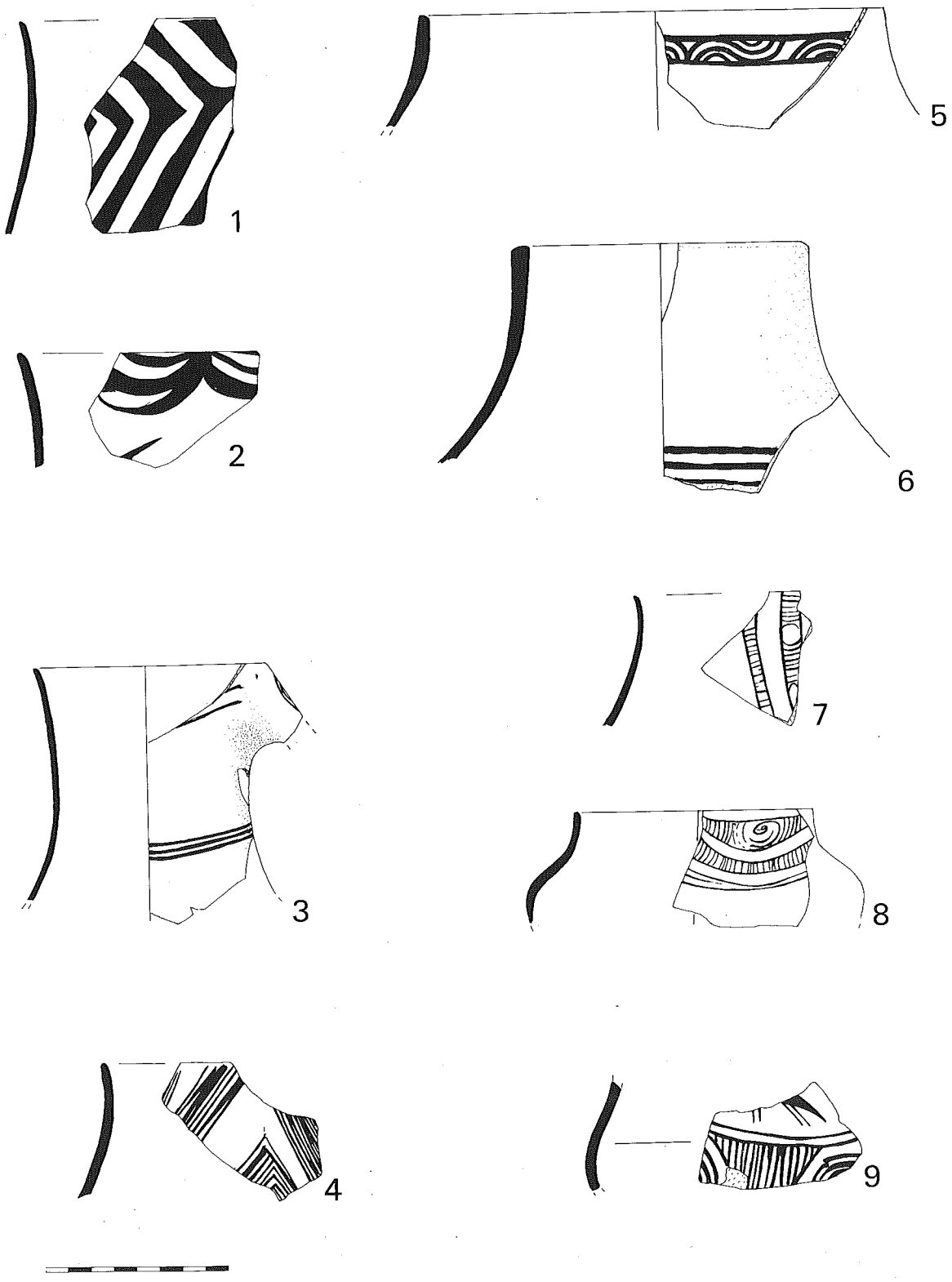


Figure 11.12. Phase II (no. 9, mixed). Fragments of painted jars (O/O: 1, 2; Brown-on-Orange/Red: 3, 4, 7; Br/C: 5, 6) and bowls (Brown-on-Orange/Red: 8; Bl/R: 9).

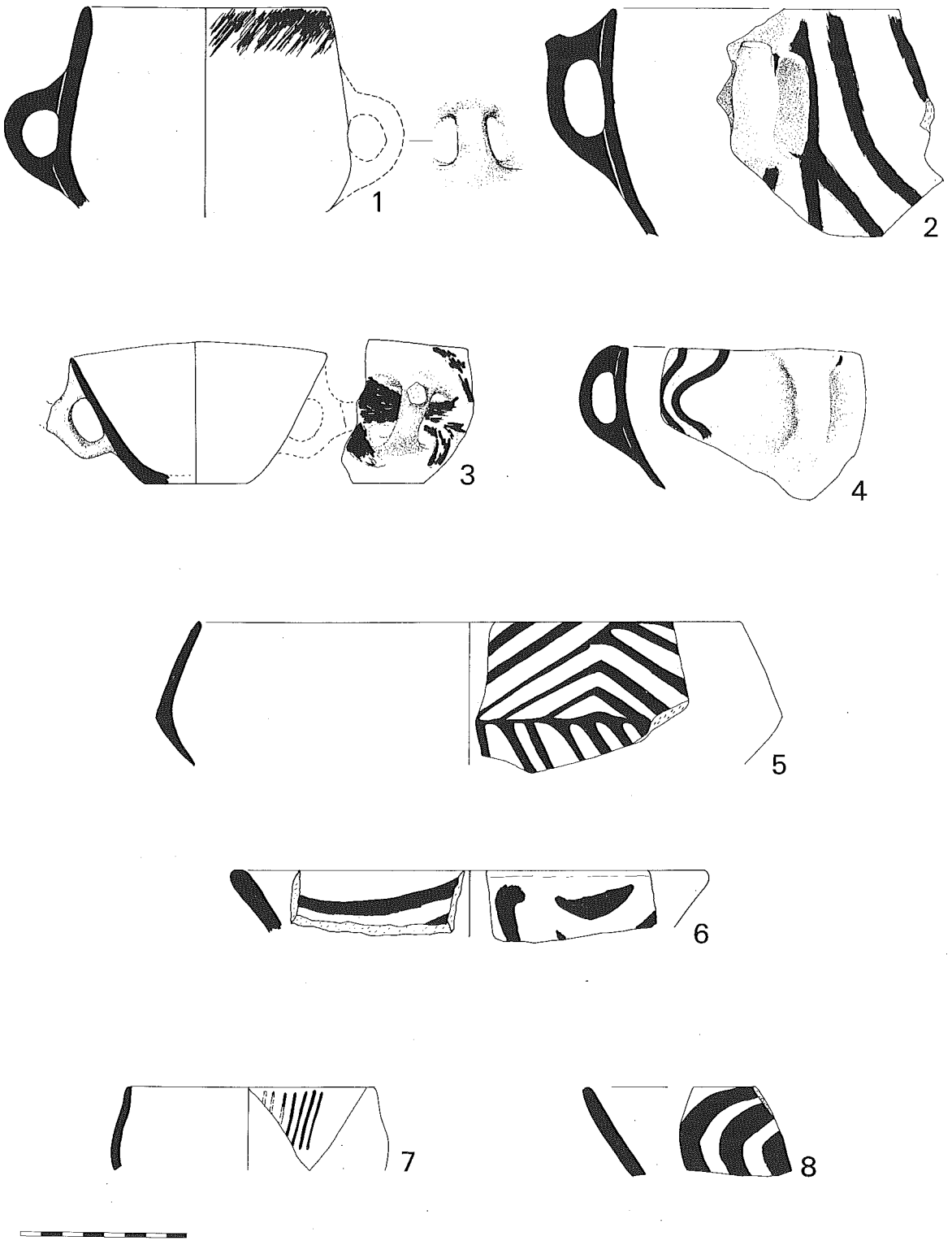


Figure 11.13. Phase II. Painted wares. Handled bowls (O/O: 1, 2, 4; R/W: 3); rim fragments: biconical (O/O: 5), open (Fine Br/Bf: 6; O/O: 8), rounded (Brown-on-Orange/Red: 7).

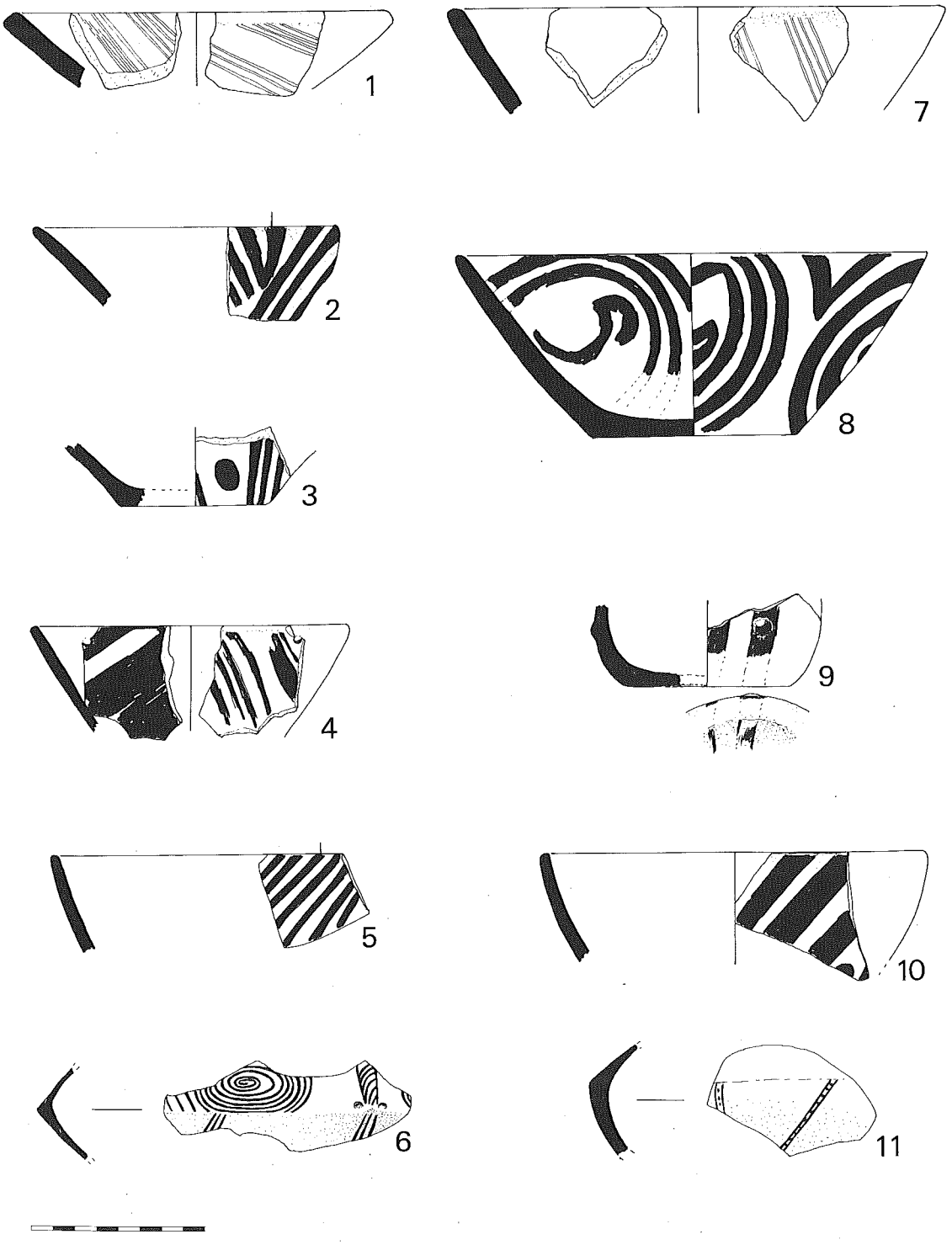


Figure 11.14. Phase II. Painted wares. Open bowl (R/W: 8) and fragments (W/R: 1, 7; R/W: 2; Fine Br/Bf: 4; O/O: 5; Br/Bf: 10), flat base fragments (R/W: 3; Br/Bf: 9), and carinated body sherds (Br/C: 6, 11).

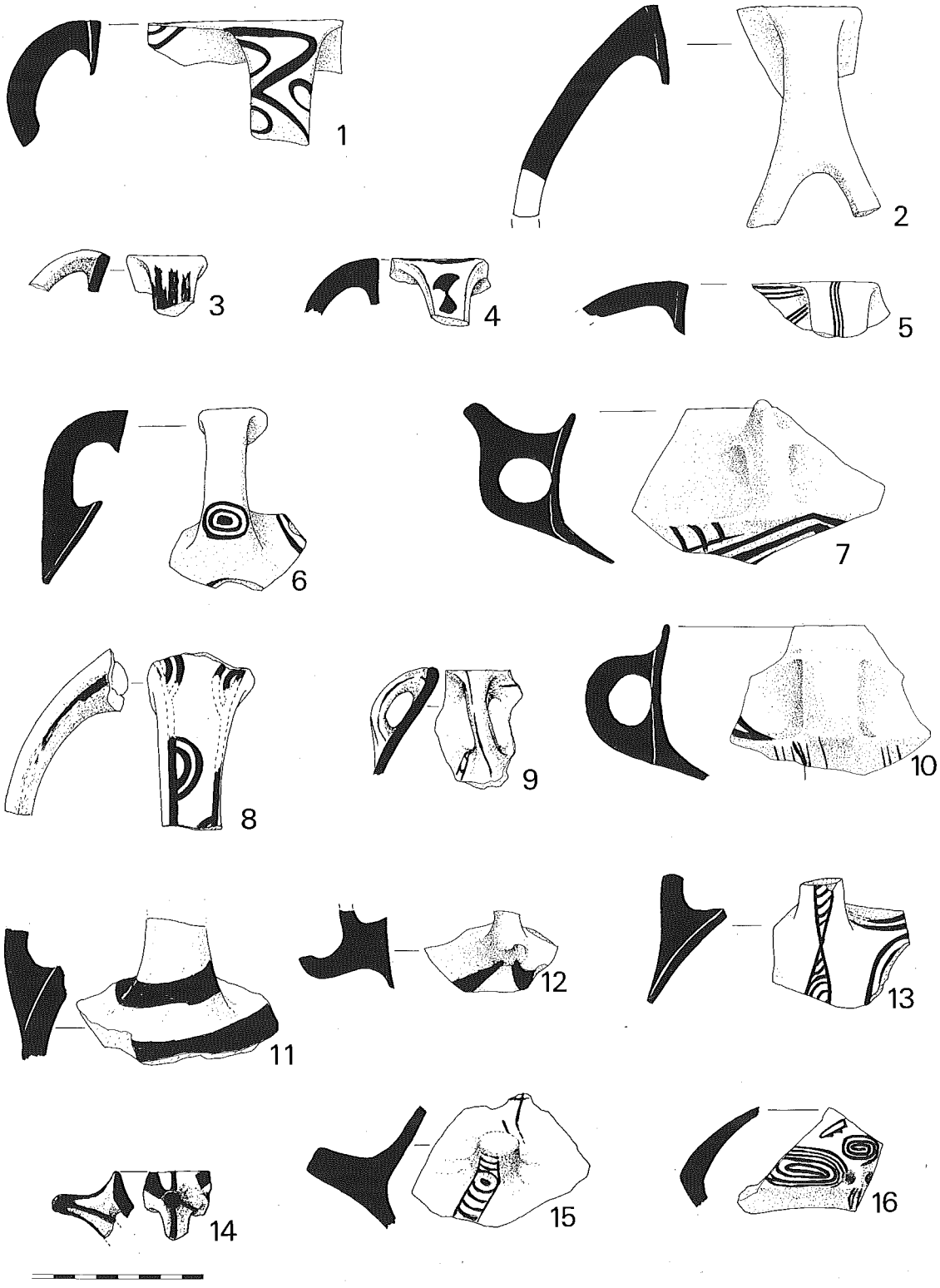


Figure 11.15. Phase II (nos. 5, 6, 10, 13 from mixed contexts). Painted handles. Strap from rim (Br/C: 1, 3-6, 9), elongated strap (Sm: 2; Br/C: 8); strap (O/O: 10), and strap fragments (O/O:11, 12; Br/C: 13), prong (O/O: 7; Fine Br/Bf: 14; Br/C: 15), body sherd with stringhole (Br/C:16).

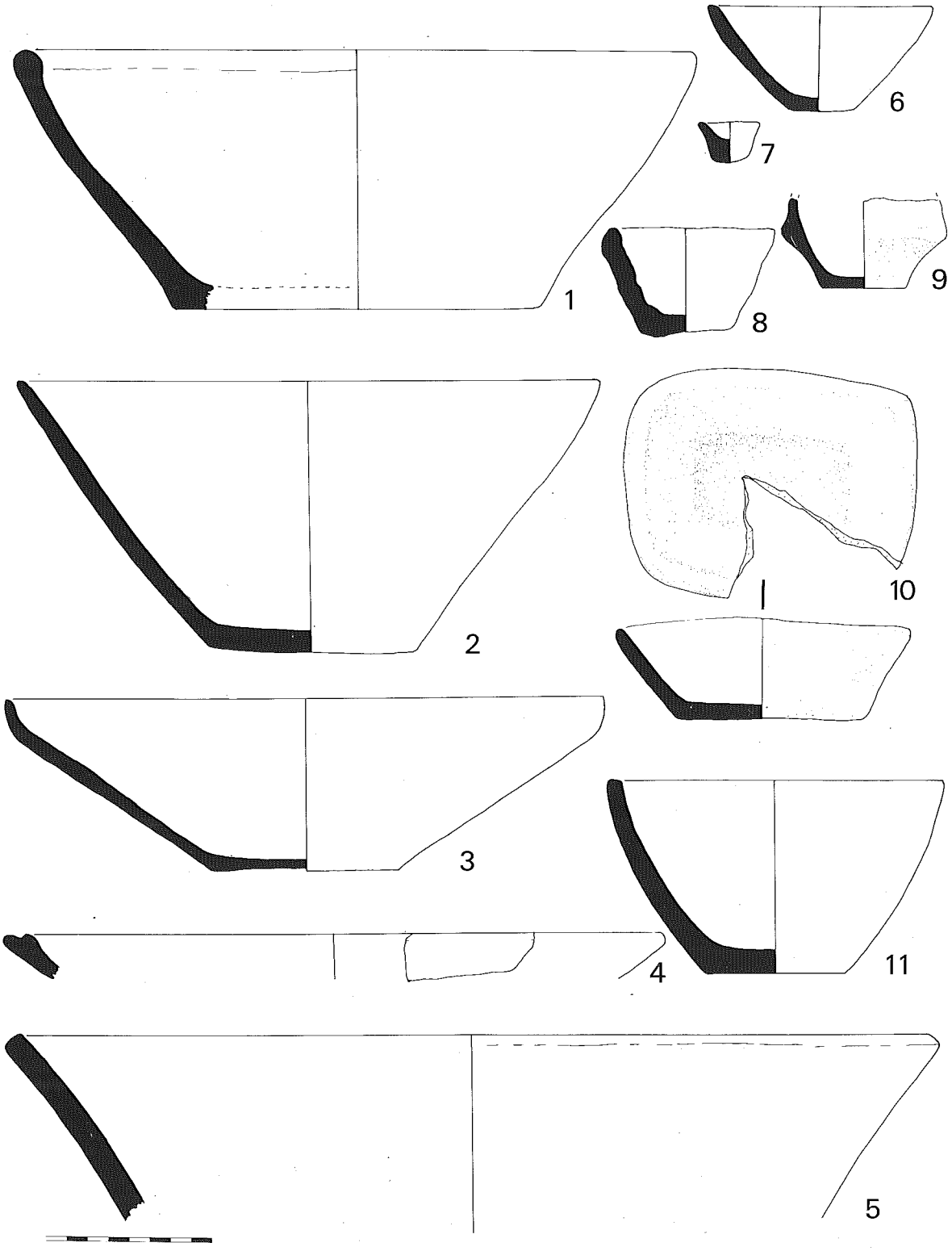


Figure 11.16. Phase II (no. 10, phase III). Open bowls with flat bases (Sm, red: 1, 2, 10; DB, red: 3; Sm: 6; DB: 11), rim fragments (FBB: 4; Sm, red: 5), and miniatures (Sm, black: 7; Red Crusted: 8; Sm: 9).

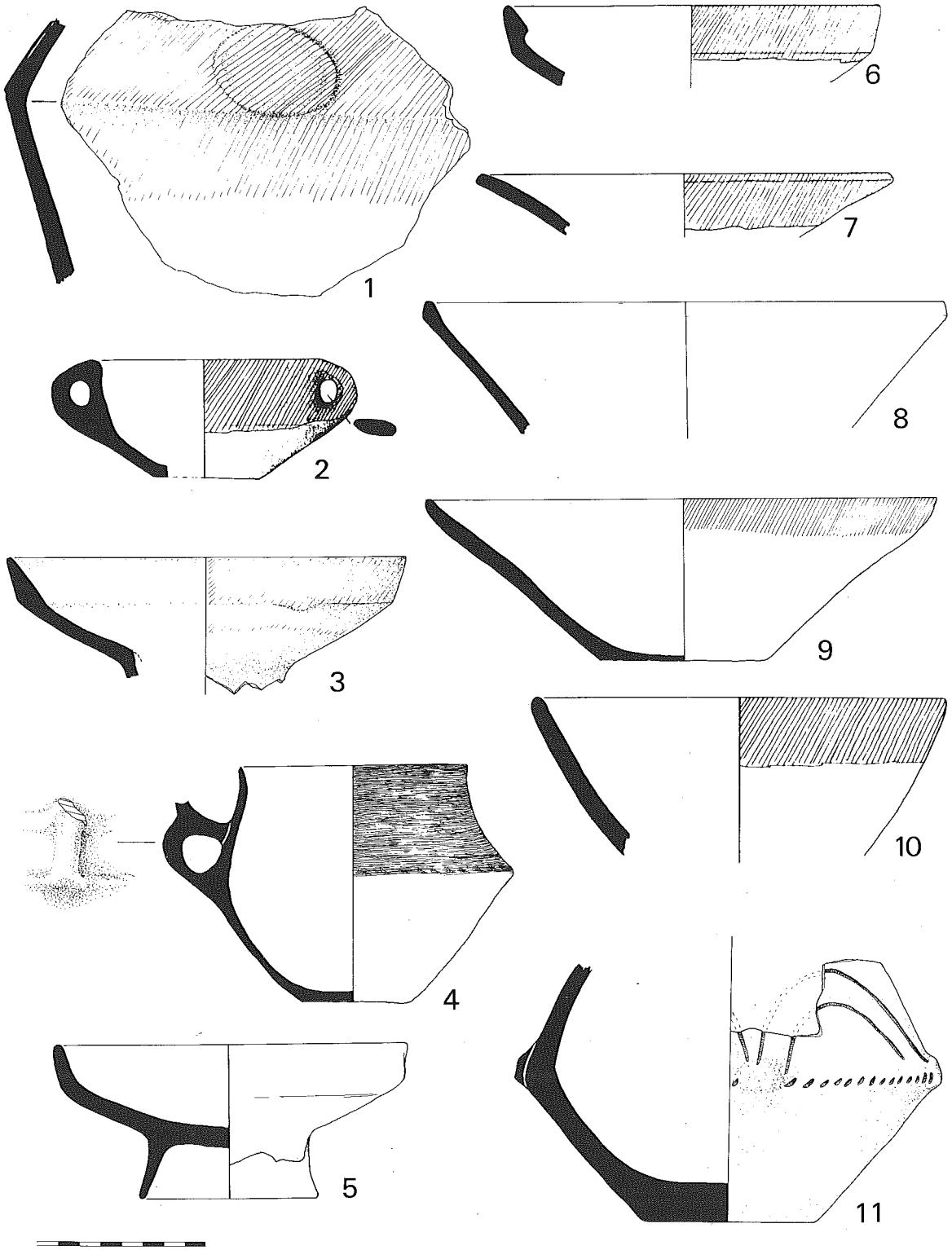


Figure 11.17. Phase II (nos. 4, 7, phase I). Vessels in carinated forms (BT: 1, 3, 6) with handles (BT: 2; GrL, red: 4), on pedestal (BT: 3, 5); open bowls (BT: 7-10) and barrel-shaped (C/Exc: 11).

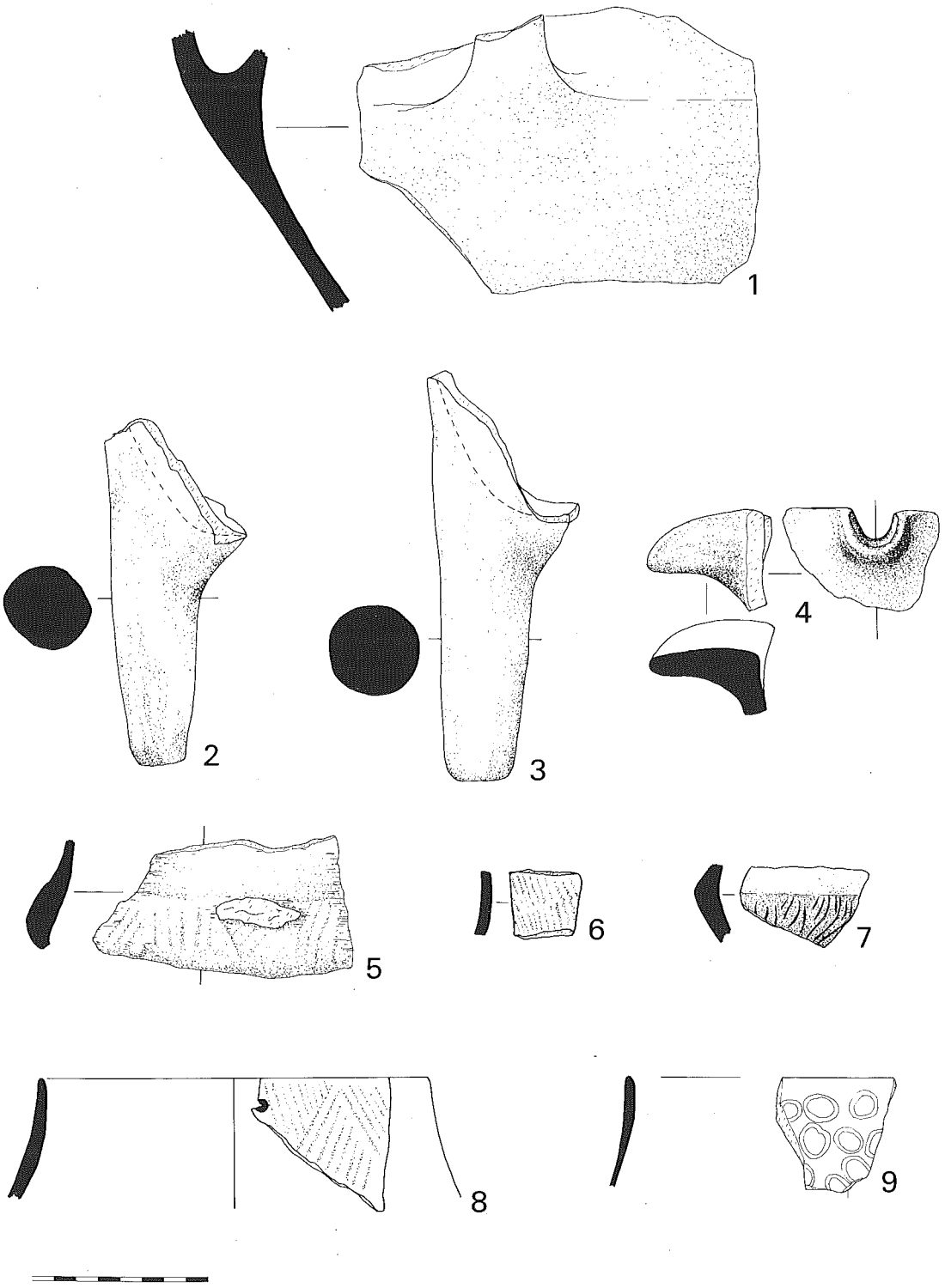


Figure 11.18. Phase II. Carination strap handle (DB, red-brown burnish: 1), legs (DB: 2, 3), rim spout (DB, red: 4), and miscellaneous fragments (Rp/GrL: 5, 6; Rp/DB: 7; Rp: 8; Rp/PlB: 9).

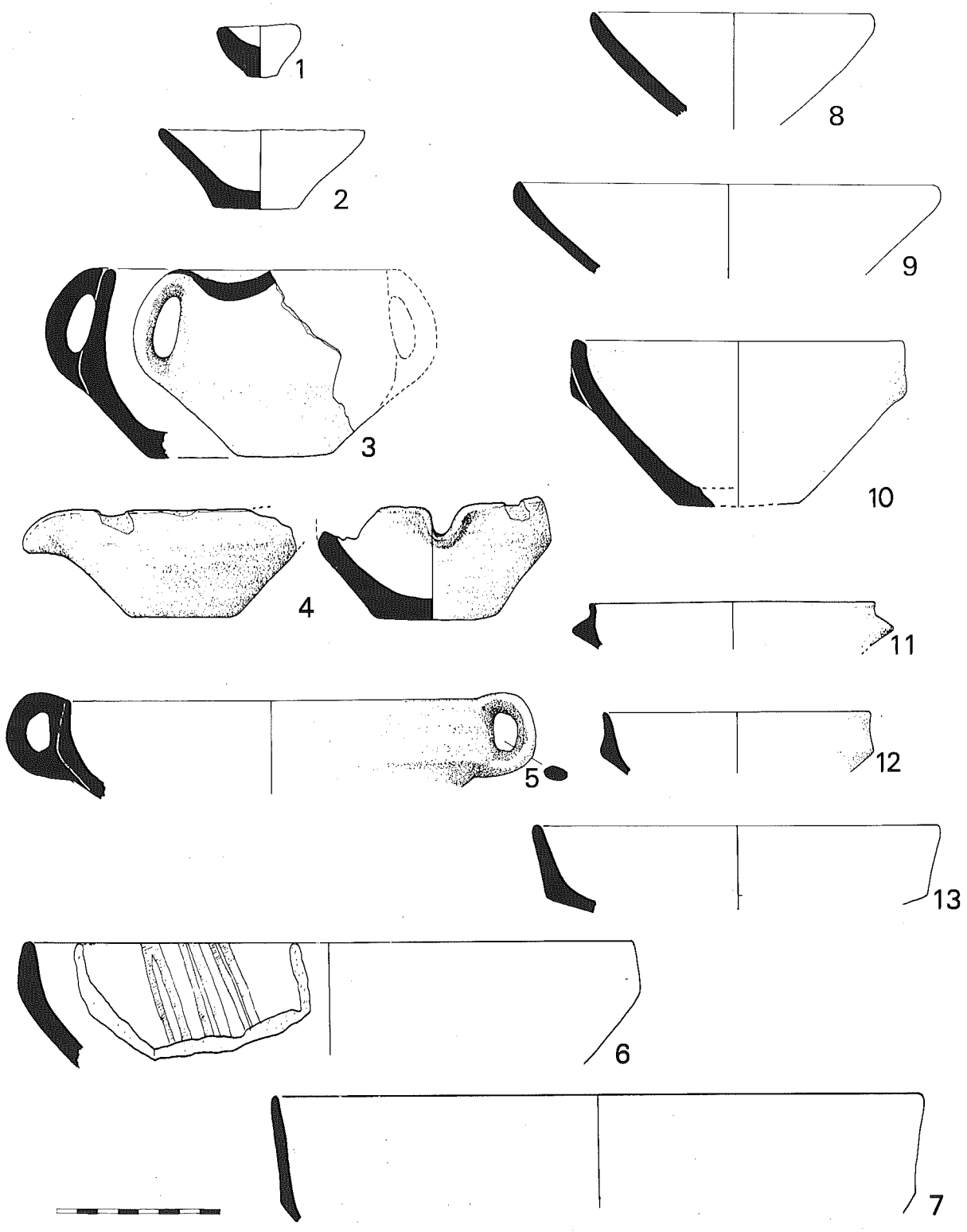


Figure 11.19. Phase II (no. 6, phase I). Miniature (Sm: 1), open bowls (DB, red: 2; DB: 8; PlB: 9), bowl with spout (C: 4), carinated vessels (Sm, red, irregularly burnished: 6; PlB: 7; FBB: 13), with handles (C: 3; PlB: 5), with lugs or ledges (DB, red: 10; DB: 11; FBB: 12).

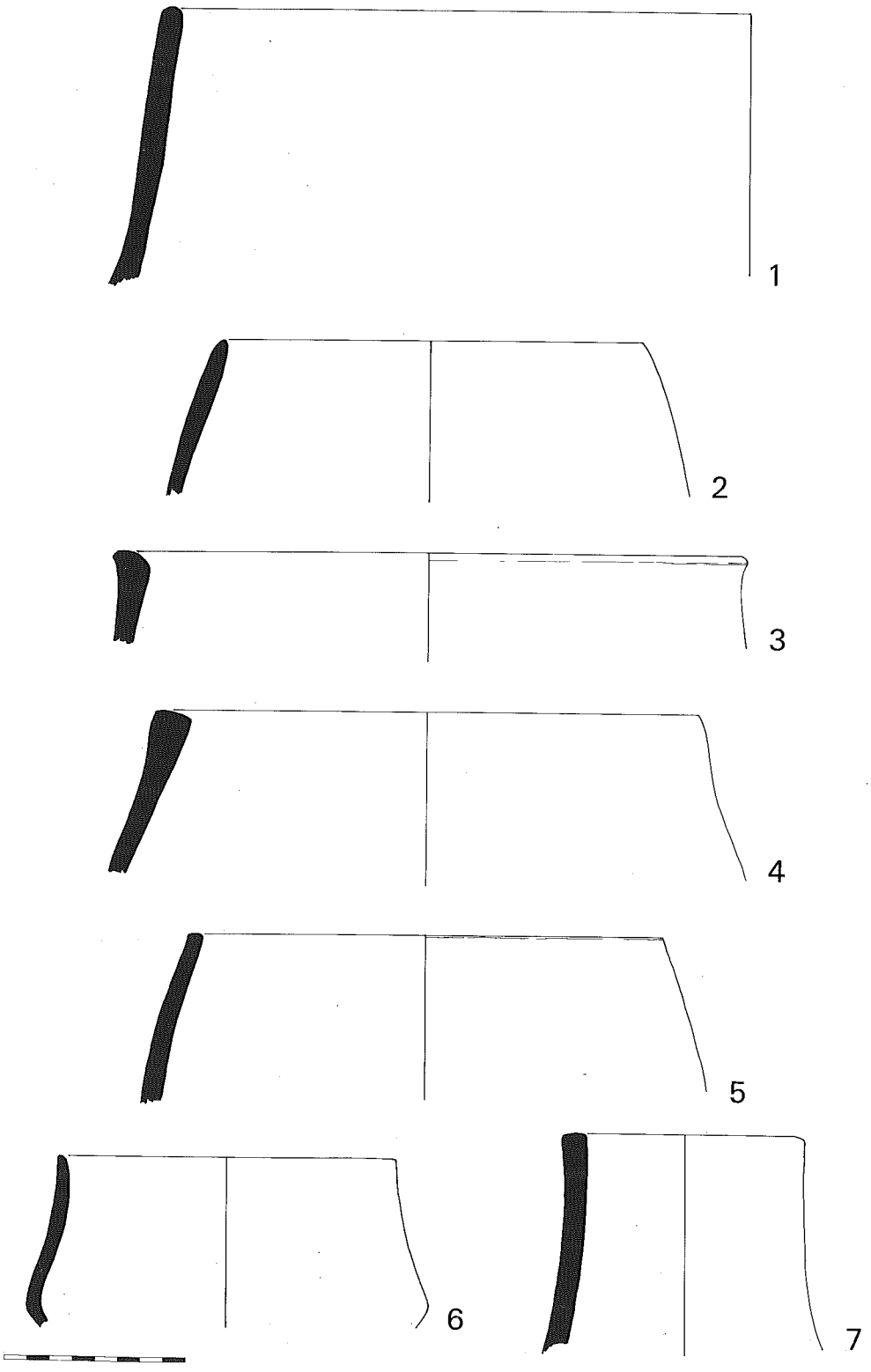


Figure 11.20. Phase II. Various rim fragments. Pithos (Sm, red: 1), vessels with inturned rim (Sm: 2; DB: 5), thickened rim (DB: 3, 4), carination (FBB: 6), and constricted neck (DB: 7).

Concordance: Figures to Plates

Figure 11.1
1. ZA 62
2. ZA 62
3. IL 10
4. ZA 62
5. KL 21
6. KL 12
7. KL 29
8. ZA 62
9. KL 14
10. KL 13
11. KL 12
12. KL 12
13. KL 19
14. KL 10

Figure 11.2
1. ZA 68
2. KL 21
3. KL 21
4. KL 13
5. KL 20
6. ZA 65
7. KL 20 (pl. LXXV:2)
8. JL 10
9. ZA 72
10. KL 19
11. KL 10
12. ZA 66
13. KL 18
14. KL 22
15. ZA 68
16. JL 11

Figure 11.3
1. JL 16
2. KL 9
3. KL 12 (pl. LXXV:9)
4. ZA 62
5. ZA 62
6. ZA 60
7. KL 12
8. ML 20 (pl. LXXV:3; color pl. C:2)
9. No provenience
10. KL 26
11. KL 18
12. ZA 62
13. KL 12
14. KL 21
15. KL 15

Figure 11.4
1. Pot 156, ML 45 (pl. XLIV:3)
2. JL 13 (pl. LXXIX, bottom:4)
3. KL 20 (pl. LXXIX, bottom:2)
4. ZA 65 (pl. LXXIX, bottom:1)
5. Pot 157, KL 26
6. ML 28
7. ZA 67
8. ZA 69
9. JL 15
10. KL 20
11. KL 21
12. No provenience
13. ZA 62
14. KL 13
15. ML 31
16. ZA 62

Figure 11.5
1. KL 135
2. KL 21
3. Pot 231, KM 20/21
4. Pot 32/311, KL 20/21 (pl. XLIV:5)
5. ML 26
6. KL 21
7. JL 11
8. Pot 160, KL 10 (pl. XLIV:2)

Figure 11.6
1. JL 13 (pl. LXXIX, top:4)
2. KL 10/ML 28 (pl. LXXIX, top:2)
3. KL 18
4. JL 13
5. KL 16
6. ML 30
7. ZA 60
8. KL 20
9. JL 14 (pl. LXXVIII, bottom:8)
10. KL 100
11. No provenience
12. KLb 133
13. ZA 62
14. JL 17 (pl. LXXVIII, bottom:4)
15. ML 28
16. JL 9
17. KL 21
18. KL 20
19. JL 13
20. PO 7
21. ML 31 (pl. LXXVII, bottom:1)
22. ML 28

Figure 11.7
1. Pot 137, ML 45 (pl. XLIV:4)
2. KL 12
3. KL 19 (pl. LXXVII, top:9)
4. KL 23 (pl. LXXVII, top:11)
5. KL 12 (pl. LXXVII, bottom:6)
6. KL 21
7. JL 13 (pl. LXXVII, top:1; color pl. C:8)
8. ZA 67 (pl. LXXVII, bottom:3)

9. JL 15
10. KLb 135 (pl. LXXVII, bottom:5)
11. ZA 62 (pl. LXXVII, top:7)
12. KL 19
13. IL 8

Figure 11.8
1. KL 21
2. KL 21
3. IL 10
4. JL 8
5. ML 34 (pl. LXXVIII, top:1)
6. ZA 64 (pl. LXXVIII, top:4)
7. ZA 62
8. JL 12
9. KL 13 (pl. LXXVIII, top:8)
10. ZA 68
11. ML 28
12. KL 20
13. KL 21
14. ZA 62
15. ZA 64 (pl. LXXVI, top:1; color pl. C:10)
16. KLb 141 (pl. LXXVI, top:3)

Figure 11.9
1. ZA 62
2. Pot 239, KLb 145
3. Pot 157/307, ML 44/45 (pl. LXXXV:5)
4. ML 44
5. KL 26
6. KL 10
7. ML 26
8. ZA 62
9. KL 18

Figure 11.10
1. Pot 145, ZA 54
2. ZA 52
3. ML 15
4. Pot 166, ML 1
5. LL 6
6. ZA 52
7. ML 17
8. Pot 147, ZA 52
9. KL 2 (pl. LXXI:13)
10. LL 10
11. KM 5
12. Pot 22, ZA 51
13. Surface
14. ML 17
15. ML 6

Figure 11.11
1. LL 5
2. KL 3
3. ML 11
4. No provenience
5. ML 18
6. LL 7
7. LL 7 (pl. LXXXI, top:5)
8. LL 7
9. KLb 118 (pl. LXXXIV, top:7)
10. ML 18 (pl. LXXXI, bottom:1)

Figure 11.12
1. KL 107 (pl. LXXXIV, top:3)
2. KM 13
3. ZA 54/56
4. ZA 52 (pl. LXXXII, top:4; color pl. C:23)
5. KL 2 (pl. LXXX:15)
6. ML 14 (pl. LXXX:3; color pl. C:11)
7. ZA 52 (pl. LXXXII, top:6)
8. ZA 50 (pl. LXXXII, top:12)
9. MM 10 (pl. LXXXII, bottom:3)

Figure 11.13
1. ZA 50
2. KL 105 (pl. LXXXIV, top:1)
3. Pot 172, KL 107
4. ZA 52
5. KM 20 (pl. LXXXIV, top:2; color pl. C:14)
6. ZA 50
7. No provenience
8. KL 6 (pl. LXXXIV, top:4)

Figure 11.14
1. ZA 50 (pl. LXXXIII, bottom:1; color pl. C:24)
2. LL 9
3. ML 16 (pl. LXXXIII, top:10; color pl. C:25)
4. KM 18
5. LL 9
6. KL 103 (pl. LXXXI, top:3)
7. ZA 51
8. Pot 144, KM 9 (pl. XLIII:5)
9. ML 11
10. ML 12/KM 20 (color pl. C:12)
11. ZA 52 (pl. LXXX:21)

Figure 11.15
1. KM 15
2. ZA 54
3. ML 21
4. ML 8
5. Surface
6. KL 2 (pl. LXXXI, top:2)
7. KM 19
8. ML 12
9. ML 10
10. Surface
11. ML 11
12. KM 16
13. KL 2 (pl. LXXX:13)
14. LL 7
15. LL 7
16. LL 4 (pl. LXXXI, top:7)

Figure 11.16
1. Pot 148, ZA 52
2. KM 13
3. Pot 242, ZJ 35
4. ML 10

5. ML 18
6. Pot 149, ZA 52
7. Pot 163, KL 107
8. KM 9
9. Pot 169, KL 113
10. Pot 182, ML 151 (pl. XCV:3)
11. Pot 243, ZA 55

Figure 11.17
1. ZA 52
2. LL 4
3. ZA 51
4. Pot 294, JL 105 (pl. LXXXV:4)
5. Pot 43, ZA 52
6. ML 11
7. KM 6 (pl. LXXVI, bottom:1)
8. ML 17
9. Pot 233, KL 115 (pl. XCV:2)
10. ML 16
11. KL 102

Figure 11.18
1. ML 11
2. LL 5
3. LL 4
4. LL 4
5. ML 18/23 (pl. LXXV:5)
6. ML 11
7. ML 12
8. ML 17 (pl. LXXV:11)
9. KL 110

Figure 11.19
1. Pot 165, KL 106
2. Pot 18, KM 9 (pl. XLIII:6)
3. Pot 170, KL 104 (pl. LXXXV:2)
4. Pot 108, KM 20 (pl. LXXXV:6)
5. ML 12
6. IL 7
7. ML 21
8. ML 11
9. LL 9
10. Pot 152, ML 8
11. KM 18
12. KM 18
13. LL 9

Figure 11.20
1. ML 12
2. ML 13
3. ML 17
4. ML 11
5. ML 12
6. KL 106
7. LL 5

12.
The Pottery of Phase III

Robert K. Evans

Excavations at the mound of Sitagroi have uncovered a very informative deposit from the phase III levels (ca. 3800-2700 bc; see table 7.3). This phase was named Dikili Tash because of affinities with material from earlier excavations at the site of Dikili Tash, near ancient Philippoi, and its documentation in the stratigraphic sequence is one of the most important results of the Sitagroi project. The ceramic assemblage provides an adequate sample for quantitative and descriptive analyses of both shape and fabric. It also offers enough evidence to suggest spatial, temporal, and cultural relationships between the Drama Plain and the contemporary cultures of the east Balkan area.

Phase III (levels 49-33) has been defined by the analysis of materials from the ZA sounding and from other trenches (ZB, ZE, ZG, ZJ, ML, and MM), with characteristic fabrics serving well to determine lower and upper boundaries. The ZA count is described in chapters 7 and 8, but it is relevant here to point out again that the ZA count takes each pottery fabric and interprets it according to a set of generalized shape categories (figs. 7.11-7.15). These data, represented in table 12.1, provide a quantitative picture of the shape and fabric distributions in phase III. While the shape analysis depends on feature sherds from the ZA sounding only, the description of the fabrics, based on the ZA collection, also utilizes evidence from the other phase III excavation units.

The decorated pottery from phase III receives a great deal of attention in this report because these wares, exhibiting changes in style, provide chronological sequencing. Counts of body sherds were taken for the decorated fabrics only, and therefore the detailed discussion that follows will concentrate on the decorated wares. The undecorated wares, however, are also of interest and considerable importance.

The two most distinctive fabrics for the definition of the Dikili Tash phase are Graphite-painted (pl. D:1) and Black-on-Red painted wares (pl. D:2). Two additional wares, Excised and Excised-with-Graphite (pl. D:3, 4), also deserve notice although their frequency is much lower. Decorated fabrics which occur in still lower frequencies are Incised, Pithos, Grooved (and the variations Clumsy Grooved [pl. D:5], Grooved-with-Graphite), Polychrome, Barbotine (pl. D:6), and Shell-stamped. The two most frequent undecorated fabrics are Dark Burnished and Smooth. Others in this category—Coarse, Fine Black Burnished, Pale Burnished, and Rural wares—occur in smaller quantities.

As reflected in the sherd counts, the most popular phase III bowl and jar shapes—for both decorated and undecorated fabrics—were the rounded bowl (R1), the flaring bowl (R6), the Kritsana bowl (R19), the straight-sided bowl (R3), and the hole-mouth jar (J1). The Dikili Tash bowl (R18) is significant in Graphite-painted ware.

Table 12.1. Frequency Table: Shapes by Fabric

Shape		Gr		Bl/R	Exc	ExG	I	Gvd	Cl Gvd	Pi	DB	Sm	C	FBB	PlB	Rrl	Total no. of sherds	% of shape category
Bowls "R"	1	44	(18.6)	19 (32.2)	4	6					104	73	1	1*	3		255	28.2
	2	11	(4.6)	1 (1.7)							20	8	1		3		44	4.9
	3	24	(10.1)	13 (22.0)	6	3				1	74	46	6	1			174	19.3
	4										3						3	.3
	5										2			1			3	.3
	6	56	(23.6)	17 (28.8)		1					15	7					96	10.6
	7	2	(0.8)	3 (5.1)							33	5	2				45	5.0
	8										7				1		8	.9
	9a										9	1			1		11	1.2
	9b	1	(0.4)								35	3		3	1		43	4.8
	10	3	(1.3)	4 (6.8)							8	4				20	39	4.3
	11										3	1					4	.4
	12	1	(0.4)								1						2	.2
	13	1	(0.4)								1						2	.2
	14																0	0
	15	2	(0.8)	1 (1.7)							1	1					5	.5
	16										1	2			1		4	.4
	17										2*						2	.2
	18	34	(14.3)	1 (1.7)							17	1					53	5.9
	19	57	(24.1)								36	11		1	1		106	11.7
	20	1	(0.4)					1			1			1			4	.4
Subtotals		237		59	10	10	0	1	0	1	373	163	10	8	11	20	903	99.7

Shape		Gr		Bl/R	Exc	ExG	I	Gvd	Cl Gvd	Pi	DB	Sm	C	FBB	PlB	Rrl	Total no. of sherds	% of shape category
Jars "J"	1	25	(48.1)	7 (63.6)		2					102	64	2	4	2		208	52.3
	2	2	(3.8)								6	2					10	2.5
	3	20	(38.5)	3	1				1		55	58	2	2	1		143	35.9
	4	4	(7.7)	1							6	4					15	3.8
	5										1	3					4	1.0
	6										6	9					15	3.8
	7	1	(1.9)														1	.3
	8										1	1					2	.5
Subtotals		52		11	1	2	0	0	1	0	177	141	4	6	3	0	398	100.1
Bases "B"	1	20		5	3	1	2		1		115	269	47		1		464	87.4
	2			4	1						8	17	5				35	6.6
	3			2							2	6					10	1.9
	4	3		2	1						3	3	1	1			14	2.6
	5										1	6					7	1.3
	6											1					1	.2
	7																0	0
Subtotals		23		13	5	1	2	0	1	0	129	302	53	1	1	0	531	100.0

Table 12.1 (continued)

Shape		Gr	Bl/R	Exc	ExG	I	Gvd	Cl Gvd	Pi	DB	Sm	C	FBB	PlB	Rrl	Total no. of sherds	% of shape category
Handles "H"	1	1									1*		1			3	0.6
	2															0	0
	3															0	0
	4															0	0
	5	12								5	6	1	1			25	5.0
	6	6	4			1	1			18	29	6				65	12.9
	7	54	16							70	84	9	4			237	47.1
	8															0	0
	9	1	1								2*					4	0.8
	10		1							1*						2	0.4
	11	1								1*						2	0.4
	12															0	0
	13	1														1	0.2
	14	2						1		4						7	1.4
	15															0	0
	16	3	1													4	0.8
	17		1							1*	1*					3	0.6
	18	8	1	1						4	5	1				20	4.0
	19	1								1*	1*					3	0.6
	20									1*						1	0.2
	21	2	3							4	1*		1*			11	2.2
	22	39	3	2						17	23	1				85	16.9
	23									1*						1	0.2
	24	2	1							9	9	2				23	4.6
	25									1*	1	1				3	0.6
Subtotals		133	32	3	0	1	1	1	0	138	163	21	7	0	0	500	99.5

Shape		Gr	Bl/R	Exc	ExG	I	Gvd	Cl Gvd	Pi	DB	Sm	C	FBB	PlB	Rrl	Total no. of sherds
Other "O" Features	1	2								28	46	13				89
	2															0
	3									1	6	3				10
	4															0
	5															0
	6										3					3
	7										1					1
	8															0
	9	30	3						1	28	25			3		90
	10	31								10						41
Subtotals		63	3	0	0	0	0	0	1	67	81	16	0	3	0	234
Body Sherds		488	227	120	36	12	9	30	213	0	0	0	0	0	0	1135

Note: Shapes (figs. 7.11-7.15) and fabrics are both described in chapter 7, and the fabric abbreviation key appears in figure 7.10. Numbers followed by the asterisk (*) indicate uncertainty; where computed, the percentage of a given shape and fabric is indicated in parentheses. Body sherds for undecorated fabrics not counted, only feature sherds counted.

Table 12.2. Feature Sherds per Kilogram of Pottery from the ZA Count

Fabrics	%
Dark Burnished	2.71
Smooth	2.56
Graphite-painted	2.52
Black-on-Red painted	0.91
Pithos	0.54
Excised	0.53
Coarse	0.28
Excised-with-Graphite	0.12

Using the ZA stratigraphic section and the quantitative data from the ZA count, it is possible to suggest a division of the phase III levels into three subphases: a, b, and c. This working hypothesis may indicate culturally meaningful periods, but it must be clearly understood that this partitioning is applicable only for the ZA sequence. The recognition of floor levels exclusively in subphase IIIb deposits implies the operation of local factors. To extend this tripartite division to the sequence in other trenches is therefore impossible.

Further discussion of the ceramic evidence is divided topically into analyses of shape categories and then of fabric distinctions. Both aspects of the data, however, are treated in tandem throughout this report, the separation serving solely as a descriptive convenience. Major shapes and fabrics are treated fully, but not every category is detailed here. Readers are directed to consult figures 7.9 and 7.11-7.15 and additional relevant material, both textual and illustrative, in chapters 7 and 8.

THE SHAPES

Bowls

It seems all but one of the general bowl shapes (R14) were found in the phase III levels. The rounded bowl (R1: 28.2%) is found in nearly all the characteristic fabrics of the phase but, like the straight-sided bowl (R3: 19.3%), was manufactured primarily in three fabrics—Dark Burnished, Smooth, and Graphite-painted. The Kritsana bowl (R19: 11.7%; French 1964:36), although virtually limited to phase III, is found in small quantities in phases IV and V. It occurs predominantly (87.8%) in two fabrics: Graphite-painted and Dark Burnished. One of the characteristic bowl forms, the flaring bowl (R6: 10.6%), is most frequently found in Black-on-Red, followed by Graphite-painted and Dark Burnished. The Dikili Tash bowl (R18: 5.9%) is especially interesting because it occurs only in phase III levels and primarily in two fabrics: Graphite-painted sherds account for 64.2% and those of Dark Burnished make up 32.1%. Nearly three-quarters (73.3%) of form R7 (5.0% of all bowl shapes) occur in Dark Burnished ware. This bowl, combined with other thickened-rim varieties (R8, R9a, b), all of which also appear in Dark Burnished, total 11.9% of all the bowl forms. R9b (4.8%) and R8 (0.9%) are found only in the phase III levels, and R9a (1.2%), evident in the earlier phases I and II (see chap. 11), terminates in phase III. Of those bowl shapes whose presence accounts for less than 0.5% of the bowl assemblage, two may be of some interest: the biconical sinuous bowl (R15), which ends in phase III, and the necked bowl with bulging carination (R20), which occurs primarily in phase III and, as is suggested below, may be underrepresented by the ZA count.

Jars

The phase III levels of ZA contain at least one representative of each of the jar shapes. The hole-mouth (J1: 52.3%) and constricted-neck (J3: 35.9%) jars account for 88.2% of this shape which generally is manufactured in three fabrics: Dark Burnished, Smooth, and Graphite-painted.

Bases

Except for B7, all the base shapes are represented in phase III. By far the most common form is the flat base (B1: 87.4%). Of the decorated examples, the Graphite-painted ones are the most numerous. The undecorated fabrics, however—Dark Burnished, Smooth, and Coarse—clearly constitute the majority of the bases. The base B2

is illustrated (pl. LXXXIX:14) in an open bowl of Dark Burnished fabric. The pedestal base (B4), represented as only 2.6% of the aggregate, is discussed below since this figure may underrepresent the shape.

Handles

Nineteen of the 25 Sitagroi handle shapes were recovered from phase III levels. Among these, the strap handle with rectangular or elliptical section (H7: 47.1%) predominates numerically and is the most common shape in the Black-on-Red fabric. This form and the lug handle (H22: 16.9%) occur most often in three fabrics: Graphite-painted, Smooth, and Dark Burnished. The tab handle (H16: 0.8%) is found only in phase III.

Other Features

Carinated sherds (O9) were the most common miscellaneous feature; a total of 90 rounded or angled examples were recovered. Again, Graphite-painted, Dark Burnished, and Smooth are important fabrics. The ribbed carination (O10) occurs 41 times in only two fabrics: Graphite-painted and Dark Burnished. Three incised and three finger-impressed carinations were recorded. Eighty-nine pottery legs, most in Smooth ware, and ten sieve fragments (O3: fig. 12.10:6; pl. XCIII: top left) were also included in this category.

Other items, not included in this tabulation, are a number of miniature vessels, in both Incised (pot 88: pl. XCV:5) and Smooth wares (fig. 13.27:8; pl. XCV:6-9); several lids (pl. LXXXVI:11-13), one decorated with graphite paint (pl. LXXXVI:13); and ladle fragments (pl. XCI, bottom right:1, 2).

PHASE III FABRICS

Decorated Wares

Description of the pottery fabrics follows the order presented in table 12.1, which tabulates the relative frequencies of fabrics in the Sitagroi ceramic assemblage. A discussion of each ware as it is expressed in the shape categories follows a general description of each of the most common fabrics.

Graphite-painted. This fabric is the most characteristic of the Dikili Tash phase and is found in all phase III levels of the ZA sounding. Occurring primarily on black burnished or dark brown burnished surfaces, graphite decoration is sometimes also found on lighter surfaces: various shades of brown and a few red or yellow shades.

Although the term "graphite-painted pottery" is used widely in the literature and in this volume, it should be noted that the graphite decoration at Sitagroi may have been applied in more than one way. Studies conducted by Gardner (1979, and *Sitagroi* vol. 2) have shown that it is possible to see brush marks in the applied graphite, thus demonstrating that painting was used as an application technique. It is also clear that graphite was applied by drawing, with a lump of natural graphite shaped like a crayon or pencil (R. K. Evans 1973; Gardner 1979). Natural graphite occurs in three forms—flake, plumbago, and amorphous (Gwinn 1967; Jensen and Bateman 1979; Mantell 1968)—and cones of natural graphite have been found in sites with this pottery (Gardner 1979; Mikov 1966; Popov 1912). Thus, if the graphite were applied with pieces of pure graphite in a drawing technique (which would seem likely for some of the designs), this fabric should more properly be referred to as "graphite-decorated." And if both painting and drawing are confirmed, the term "graphite-decorated" is more general and appropriate.

The decorative style is quite dynamic; it varies from rather simple lines to various combinations of lines and geometric motifs. The common decorative elements are sets of straight or curvilinear lines: spirals, meanders, circles, triangles, quadrangles, lozenges, and various other positively and negatively executed designs (fig. 12.1a). Lines are paired (pl. LXXXVII, top:12, 15), tripled (pls. LXXXVII, top: 3; LXXXIX:1), and of different widths (pl. LXXXIX:5); also angled (pl. LXXXVII, top: 2-4), curving (pl.

LXXXVII, top:8), and spiraling (fig. 12.5:3; pls. LXXXVII, top: 7, 13, 19; LXXXIX:8-11) with negative triangles between (pl. LXXXVII, top:17); also filled triangles (pl. LXXXVII, top:18), hanging triangles (fig. 12.5:3; pl. LXXXIX:9), and combinations of the above (pl. LXXXVII, top:16) frequently forming geometrical frames for circles (pl. LXXXVIII, bottom:2-7) and checkerboards (pl. LXXXIX:6). Two examples demonstrate the combination of graphite decoration with grooving (pls. LXXXVII, top:2, LXXXIX:4); in both cases the neck is painted and the shoulder or carination is grooved.

In fact, the variation seen in the graphite painting often leads one to think of each design as a unique creation. Nevertheless, it is possible to make some general statements with reference to the decoration found on particular forms.

BOWLS. The Kritsana bowl (R19), for example, always has some sort of graphite decoration on the upper part of the outer surface. This is generally a series of lines running from the rim to the carination or slightly below the carination (fig. 12.2:1-3; pl. XVI:4). In a few examples, this decoration on the outer surface becomes more complex, with curvilinear lines and even triangles, circles, and other elements. In these examples the handles are incorporated into the design (pl. LXXXVII, top: 6).

Graphite decoration on the inner surface of the Kritsana bowl occurs in about 75% of the examples. Here again, the decoration generally consists of fairly simple linear and curvilinear patterns (fig. 12.2:1-3; pl. XVI:4). No example of the Kritsana bowl with graphite decoration exclusively on the inner surface has been observed. One may see (fig. 12.2:1-4; pls. XVI:4, XCII, bottom left) that the Graphite-painted Kritsana bowls exhibit some slight variation in shape and size. However, the distinguishing feature of this bowl is the slightly inturned rim set apart from the body by a rounded, or slightly angled, carination. These vessels tend to break along the carination and, therefore, the distinctive rim element is often found separate from the body.

The Graphite-painted flaring bowl (R6) is decorated on both inner and outer surfaces in about 85% of its occurrences. An example, pot 133, shows a curvilinear pattern on both surfaces, with the addition of triangles and circles in the design of the inner surface (fig. 12.3:2; pl. XXXIX:4). This curvilinear motif is also present on pot 49, decorated only on the outer surface (fig. 12.3:3).

Over the range of shapes with flaring rims, including R6, R15, and R18, the decoration seems nearly always to occur on both surfaces and in general seems to be more complex than in the two examples noted above. On the outer surfaces we find sets of two lines (pl. LXXXVI:1a, 2a, 3a, 7a), sets of three lines (pl. LXXXVII:9, 10, 11), paired lines (pl. LXXXVI:5a), spirals (pl. LXXXVIII, top:2a), meanders (pl. LXXXVIII, top:1a), lines and quadrilaterals (pl. LXXXVIII, bottom:1), and complex patterns (pls. LXXXVI: 4a; LXXXVIII, top:3a). On the inner surfaces there are sets of two lines (pl. LXXXVII:14), sets of thin and thick lines (pl. LXXXVI:8b), meanders (pl. LXXXVIII, top:4b), nets (pl. LXXXVIII, top:1b), more complex linear patterns (pls. LXXXVI:1b-3b,5b-7b; LXXXVIII, top:3b, 5b, 6b), and curvilinear patterns (pl. LXXXVI:4b, 9b).

The rounded bowl (R1), the slightly inturned rounded bowl (R2), and the straight-sided bowl (R3) seem to be decorated either on the outer or on both outer and inner surfaces. They thus seem to follow the pattern of the bowls discussed so far, especially the Kritsana bowl. Design motifs are also similar. Straight-sided bowls decorated on both surfaces occur about as often as those decorated only on the outer surface, while those decorated only on the inner surface are much less in evidence.

A very large flaring bowl with a slightly sinuous profile (pot 67: fig. 12.4; pl. XLI:3) is noteworthy. It has a zone of graphite decoration below the rim on the outer surface and a zone of graphite decoration with crusted red ocher on the inner surface. It probably stood on a standbase of some sort and, when complete, must have been a very striking vessel.

Thickened-rim bowls with graphite decoration do not occur frequently at Sitagroi, but examples such as that shown in figure 12.3:1 and plate XV should be mentioned. This vessel, pot 126, has

a curvilinear meander pattern on the outer surface executed in graphite and a pattern of graphite lines on the thickened rim itself. On the inner surface of the body there is a pattern of alternating areas of graphite and red ocher. Another interesting Graphite-painted, thickened-rim bowl shows a combination of curvilinear lines with triangles and negative circles on the inner surface of the bowl (pl. LXXXVIII, bottom:8).

The necked bowl with a bulging carination (R20) was noted only once among Graphite-painted pottery from the ZA sounding. However, this occurrence does not adequately represent this particular form; it occurred more often in the pottery from other trenches. Because of its tendency to break just above the carination, most examples have been ascribed to other categories in the ZA count. Two examples demonstrate this shape (fig. 12.2:6, 7; pl. LXXXIX:3). Both show decoration on the outer surface of the neck and graphite lines with ribbing on the carination. Figure 12.2:6 (pl. LXXXIX:3) also has a band of red ocher below the rim on the inner surface of the neck. Unfortunately, neither of these have retained the lower part of the vessel. The complete lower shape is the same, however, as in figure 12.2:3 and in the Pale Burnished example (fig. 12.12:3; pl. XCIV, top:9) with grooving over the carination.

JARS. The outer surfaces of jars are decorated and only very rarely are the insides. The most common forms, the hole-mouth jar (J1) and the constricted-neck jar (J3), are decorated on the outside only. Figure 12.5:2, plate XXXIX:3, shows an open-neck jar, pot 33, with two handles and a graphite pattern consisting of horizontal and oblique lines on the upper- and mid-body and the handles. A similar design is found on a small constricted-neck jar, pot 17, with two handles and a spout (fig. 12.5:5; pl. XVI:1). A more complex pattern of lines and filled areas is found on a large, two-handled, constricted-neck jar, pot 306 (fig. 12.5:1; pl. XLI:2). A third two-handled, open-neck jar (fig. 12.5:3; pl. LXXXIX:9) exhibits lines and filled quadrangles on the neck, with a row of hanging triangles below, and a curvilinear meander pattern on the body. This jar also has three lines of graphite below the rim on the inner surface. A few further examples of Graphite-painted jars may be briefly mentioned here. A pattern consisting of horizontal sets of three lines on a cylindrical-neck jar is shown in plate LXXXVII, top:1. The interesting and unique pattern of positive and negative areas on the neck is seen in plate LXXXIX:12. Another unique pattern is shown on the lower body of pot 12 (fig. 12.5:4; pl. XIII:5).

BASES. For the most part, Graphite-painted bases do not require much discussion. They are simply the undecorated bases of pottery vessels with graphite decoration; only two of the seven base shapes were noted. Several examples of the flat base are illustrated (figs. 12.2:3, 12.5:4, 5; pls. XIII:5, XVI:1). The one exception worthy of attention is the pedestal base. Like the Graphite-painted necked bowl, the graphite-decorated pedestal base is probably underrepresented in the ZA count. This situation is the result of an incomplete understanding of this shape at the time the ZA count was carried out; a sherd from the lower part of a pedestal base is quite easily confused with a sherd from the rim of a rounded bowl (e.g., the Black-on-Red, pl. XC, bottom:1). The distinguishing features of the pedestal base, which we came to recognize later, are the thickness of the sherds and the flatness of the "rim" and the rough, unfinished inner surface.

The graphite decoration on the pedestal bases often takes the form of a series of curvilinear meanders connected by filled areas with or without negative elements (figs. 12.1a, 12.6:3; pl. XLII:1). Sets of oblique lines are seen with filled quadrilaterals which have positive-negative motifs inside (fig. 12.6:2; pl. XLII:2). Quadrilateral openings (apparently cut out before firing) are a common feature of these bases (fig. 12.6:3; pl. XLII:1) and generally have red ocher on their edges.

HANDLES. Like bases, the handles may or may not show graphite decoration even though other parts of the vessel are ornamented. Pierced or unpierced lugs are commonly found on carinated bowls such as the Kritsana bowl (fig. 12.2:1-3; pl. XVI:4) or the necked bowl (fig. 12.2:6; pl. LXXXIX:3) which is also found with an elegant strap handle arching above the rim (fig. 12.2:7).

An example of a Pale Burnished necked bowl with perforated lugs, similar to but smaller than figure 12.2:6, is seen in figure 12.12:3 and plate XCIV, top:9. A strap handle is characteristic of those jar forms which have handles extending from the neck to the mid-body (fig. 12.5:1-3, 5; pls. XVI:1, XXXIX:3, LXXXIX:9, XLI:2).

There are a few examples of special interest which fall outside of the categories discussed above. For example, the large Graphite-painted "amphora" (or globular urn), pot 290 (fig. 12.6:1; pl. XXXIX:2), exhibits a series of curvilinear meanders connected with triangular filled areas with negative elements within them. Unfortunately, the full shape of this vessel could not be reconstructed; neither rim nor base elements are present and it is uncertain which end is the top. This vessel may have been some kind of storage jar, although the thinness of the walls might argue against this.

One of the most striking pottery shapes from the phase III levels is the hemispherical lid with handle (fig. 12.7:2; pl. XLI:1). It has two areas of graphite decoration, with oblique lines and triangular filled areas, separated by an undecorated area; the handle of the lid spans this undecorated zone and connects the two areas of decoration. A more modest square lid with Graphite-painted linear decoration (pl. LXXXVI:13) is paralleled by similar forms which are smoothed only (pl. LXXXVI:11, 12).

Perhaps the most curious of the Graphite-painted pottery shapes is the four-sided or pyramidal stand (fig. 12.7:1; pls. LXXIV:4, B:3). This unique item is square at the base, with rounded corners, and square at the top. On the top is a circular area which suggests that some sort of vessel or receptacle has been broken off. A portion of the inner surface of this attached vessel remains intact in the very center of the stand top and shows traces of red ocher. Each side of the stand is decorated with graphite in a curvilinear meander (probably two on each side in the original) and a series of triangles on each border. Each side has two cutout oval openings, the sides of which, like those of the openings in the stand bases discussed above (fig. 12.6:2, 3; pl. XLII:1, 2), show traces of red ocher.

This stand is unique in the assemblage of Sitagroi pottery and may well be unique in the entire distribution of graphite-decorated pottery. As for its function, it may be given—with hesitation—that designation reserved for such unique items: "ritual." Other unique stands are discussed in chapter 10; most are decorated with Graphite-painted designs (figs. 10.1:5,6; 10.9:1-4; pl. LXXII:1, 3-6).

Black-on-Red. These sherds are found in the same levels of the ZA sounding and other trenches as the characteristic sherds of Graphite-painted ware. There is no doubt that these two fabrics are contemporaneous. In fact, Black-on-Red ware defines the third phase of the Sitagroi sequence quite as well as does Graphite-painted.

The Black-on-Red painted fabric consists of a black or dark brown paint on a reddish surface. The surface color varies from a dark red, with burnishing, to a light orange which is smoothed. The most commonly occurring surface color is a pale red which has usually been burnished.

The Black-on-Red painted decoration has been divided into two styles, I and II, with style I displayed on a wider range of vessels. Style I consists of various curvilinear patterns (lines, spirals, meanders, circles), rectilinear patterns, various filled motifs (rectangles, triangles, quadrangles) and combinations of all three (figs. 12.1b, 12.8, 12.10:1-4; pls. XLII:3, 5; XC; XCI, top). Style II consists of broad curvilinear lines which often give a floral appearance (fig. 12.9:1, 3; pls. XIV; XVI:3; XCI, bottom left). Style I is found on all the open shapes and some closed shapes, while style II is found only on closed shapes. The vessels with style II decoration frequently also have noncircular rims and bodies, and the bodies often possess rounded protuberances (virtually hips). The best example is seen in figure 12.9:1 and plate XVI:3.

BOWLS. Some generalizations may be made for the various bowl shapes displaying Black-on-Red decoration. The most numerous, the rounded bowl (R1), is always decorated on the outer surface and about 80% are decorated on the inner surface as well. Patterning on both surfaces is curvilinear, with lines, spirals, and meanders

(fig. 12.8:8). The spiral is the most common motif found on the rounded bowls (fig. 12.1b).

The flaring bowl (R6) is decorated on both surfaces in approximately 83% of the examples. The internal decoration is often curvilinear lines (fig. 12.8:3, 9; pl. XC:3b) and/or spirals (fig. 12.8:5; pl. XCI:3b) with a few examples of filled area motifs. The decoration on the external surfaces is similar, with curvilinear lines and meanders (fig. 12.8:3, 5, 9; pls. XC:1a, 3a, 6a; XCI:3a) and spirals (pl. XC:2a, 5a).

The sinuous bowl (R15), which is nothing more than a deep bowl with a flaring rim, was not well represented in the ZA levels, although it seems to be a characteristic Black-on-Red painted bowl shape in terms of examples found in other trenches. Decoration is found on both surfaces in all examples (figs. 12.8:1, 2; 12.10:3; pl. XLII:3). The internal decoration varies from a single-line curvilinear meander (fig. 12.8:2) to a complex of lines, positive and negative areas, and the like (fig. 12.10:3; pl. XLII:3). The external decoration is also primarily curvilinear (figs. 12.8:1, 12.10:3; pls. XLII:3a, XC:4a). However, one example (fig. 12.8:2) shows a combination of curvilinear meanders on the lower body and oblique lines and triangles on the upper body.

The straight-sided bowl (R3) seems always to be decorated externally, and approximately three-fourths of the examples are decorated on both surfaces. The internal decoration is simply patterns of lines, while the external decoration is somewhat more complex, with spirals occurring on about 50% of the external surfaces.

Examples of the Dikili Tash bowl (R18) are too few to allow generalizations. Figure 12.8:4, however, shows a curvilinear pattern on the outer surface and a rectilinear pattern with triangles on the inner surface.

JARS. The Black-on-Red painted jars are always decorated on the outer surface, and any internal decoration is restricted to the area just below the rim. The hole-mouth jar designs seem to be limited to simple curvilinear patterns. Examples of the constricted-neck jar appear to have more complex patterns, such as oblique lines with positive and negative areas and a spiral (fig. 12.10:1). However, the open-neck jar exhibits the greatest amount of variation and complexity—from the broad line or floral pattern of style II (fig. 12.9:1, 3; pls. XIV, XVI:3) to the complex of curvilinear lines, oblique lines, and filled triangles (fig. 12.8:6; pl. XCI:5a).

BASES. Painted bases require no detailing. It is sufficient merely to point out some of the examples of the recognized base forms among the illustrations of the Black-on-Red painted bases: the flat base (fig. 12.8:2), the ring-footed base (figs. 12.9:3; 12,10:3, 4; pl. XIV), and the pedestal base (pl. XC, bottom: 1).

HANDLES. The handles of Black-on-Red painted vessels, decorated or undecorated, are incorporated in the overall pattern. The strap handles are the best examples of this. Gently arching strap handles are found on the large jars or pitchers which, as mentioned above, frequently are decorated in style II (fig. 12.9:1, 3; pls. XIV; XVI:3). Smaller, more sharply curved strap handles are found on the open sinuous or flaring bowls (figs. 12.8:1, 2; 12.10:3; pl. XLII:3a). Lugs also occur on some of the open forms. The vertically and horizontally pierced lugs are illustrated in figures 12.8:8 and 12.10:4.

OTHER FEATURES. Although Black-on-Red painted legs were not found in abundance, the curvilinear meander pattern on one sherd is worth noting (pl. XC, bottom:4). The spiral and the meander are the most frequently occurring Black-on-Red painted motifs. Examples of these have been pointed out above, and they are shown in figure 12.1b. In addition to these, less common Black-on-Red painted motifs are shown in figure 12.1b and on plate XC, bottom:2, 3, 6.

The square open vessel (fig. 12.10:2; pl. XLII:5) is unique in the Dikili Tash pottery assemblage from Sitagroi. The decoration on this vessel is similar to style II, but its shape and two other open forms elevated by legs, described in chapter 10 (fig. 10.9:7, 10), must be considered separately from the classifications discussed above.

Excised. This fabric, also found in all phase III ZA levels, is much less abundant than the fabrics discussed above. It is defined by the presence of lines and patterns of lines made by removing a

small amount of clay from the pot with some sort of sharp tool. The excised lines are often filled with a white material (pl. XCII, top left:4). The patterns of excised lines vary (pl. XCII, top left). Our knowledge of the complete design is hampered by the absence of whole vessels of this fabric. A large portion of the Excised fabric sample consists of body sherds.

BOWLS. The two bowl shapes recorded in the ZA count are alike in the pattern and location of decoration. The excision always occurs on the outer surface and generally is found as a zone of excised decoration between an undecorated zone below the rim and an undecorated zone above the base (pl. XCII, top left:3). The excised pattern itself may be linear, curvilinear, and/or composed of triangles, quadrangles, lozenges, or circles.

OTHER SHAPE CATEGORIES. As for the other categories of Excised pottery, the examples are either too few (in the case of the jars) or, although found on vessels with excision, the features (such as bases and handles) are not themselves decorated.

However, one item of Excised fabric does deserve mention: a base that is excised on either the internal or external surface. Several examples of internal excision are known from the Dikili Tash levels (pl. XCIII, bottom right). The pattern of decoration is basically linear, with triangles, quadrangles, and sometimes dots (pl. XCIII, bottom right:2, 4, 6). Another example seems to be an anthropomorphic design (pl. XCIII, bottom right:1). Examples of the external excisions are shown on plate XCIV, bottom:7, 8.

Excised-with-Graphite. This fabric is also characteristic of the Dikili Tash phase. It is found in small quantities and only in levels of this phase. Essentially, it is a combination of the Excised fabric with a graphite pattern appearing in a band circling the rim (pl. XCII, top right) and/or with graphite smeared in the areas between the excised lines (fig. 12.11:1, 2; pl. XCII, top left:1, 2, 4-6). Less commonly, graphite occurs between sets of excised lines, with fine incised lines also filling the spaces between the lines of the set (fig. 12.11:5; pl. XCII, bottom right). Red ocher and rows of punched depressions are sometimes added (fig. 12.11:4; pls. XCII, top right:3, 4, 6; XCIV, bottom:1).

Rounded bowls and straight-sided bowls are best represented. As with the Excised bowls, they commonly have a zone of nonexcised surface below the rim and a similar zone above the base (fig. 12.11:1, 2; pl. XCII, top left:1, 2, 6; top right:1-6, bottom right:2, 3, 4). The Excised patterns include sets of straight lines (pl. XCII, top left:6; top right:6), curvilinear meanders (fig. 12.11:1; pl. XCII, top left:1), and a maze motif (fig. 12.11:2; pl. XCII, top left:2). The graphite pattern in the zone below the rim varies from oblique lines (pl. XCII, top right:3) to curvilinear meanders (pl. XCII, top right:1). The variety with added fine incised lines shows similar motifs, with the presence also of excised-incised circles (pl. XCII, bottom right:3, 4).

Incised. This decoration is simply the result of scratching the surface of the pottery vessel with a sharp tool before firing. The furrow that results is sometimes filled with a white material (pls. XCIV, bottom:3; XCV:5). This fabric is a minor one in the Dikili Tash phase. Only fifteen Incised sherds were recorded in the ZA count. With this limited number of examples it is impossible to make any generalizations. Incision does occur, however, both in curvilinear (fig. 12.11:6; pls. XIII:4; XCIV, bottom:5) and rectilinear (pl. XCIV, bottom:3, 4) patterns, and curvilinear incisions are a feature of the "zoomorphic" vessel fragments of phase III discussed in chapter 10 (pls. LXX:1, 2; LXXI:1-11) and other "ritual" artifacts (pls. LXX:3, LXXIV:1).

Grooved. This fabric is more common in phase IV but is found in small quantities in the upper levels of phase III. Grooved decoration consists of a series of elongated depressions on the pot surface which have been smoothed or burnished with the remainder of the pot surface. From the limited number of examples of shape features for the Grooved ware from ZA and other trenches, it seems that the necked bowl (R20) is most common (fig. 12.11:3; pl. XCIV, top:3). The grooving on this vessel is found on the body

below the neck. The grooves may be vertical (pl. XCIV, top:4, 11), oblique (pl. XCIV, top:1, 2, 10), or arched (pl. XCIV, top:6, 8).

Clumsy Grooved. This fabric is related to the Grooved fabric; the former is found in greater quantities than the latter in the Dikili Tash levels of ZA. Though similar to the Grooved, Clumsy Grooved has not been as neatly executed or as well finished. The grooves are not smooth or burnished, but have been left rough. Data from the other trenches indicate that the necked bowl is the common form. The clumsy grooving occurs in patterns like those of the Grooved fabric (pl. XCIV, top:5, 7, 12).

Pithos. This fabric is defined on the basis of its size and shape, the thickness of the vessel wall, and its assumed function. Decoration does not figure in this definition. Essentially the design is excised lines. Frequently these lines are filled with white and may be linear or curvilinear. However, the patterns are much less dense and much simpler than the patterns of the Excised fabric itself (pl. XCIV, middle). One large pithos was partially reconstructed and shows a linear pattern on the neck and a curvilinear meander pattern on the body (pl. XIII:2).

Polychrome. A very small number of Polychrome sherds were discovered in the Dikili Tash levels. This fabric occurs so infrequently—merely a "trace"—that it was not included in the list of fabrics for the ZA count. Represented by only two sherds, this is a trichrome fabric with black and red paint on an orange surface. On the two examples, areas or wide lines of red paint are outlined with black paint (figs. 12.9:2, 12.10:7). The proveniences (ZA 42 and MM 60) connect this fabric with the early or middle part of phase III.

Other Decorated Ware

Three decorated fabrics which did not occur in the ZA levels but which have been found in small quantities in other soundings of the Dikili Tash levels include: Grooved-with-Graphite, Shell-stamped, and Barbotine.

Grooved-with-Graphite. The Grooved-with-Graphite fabric is obviously the combination of grooved and graphite decoration. Very few sherds of this fabric were found, although one complete vessel was reconstructed. This is a small, necked bowl with graphite on the neck and lower body and grooving on the main part of the body (pot 236: fig. 12.2:5; pl. XXXIX:1). This particular vessel also has a pierced lug handle. Another example of this fabric is seen in plate XCIV, bottom:6.

Barbotine. The Barbotine fabric is the result of applying a coarse slip to the surface of a vessel. This finish is generally finger-streaked to produce a series of parallel ridges (pl. XCIII, top right:2, 3). A fragment of a necked bowl with a smoothed neck and a Barbotine body is illustrated in plate XCIII, top right:1.

Shell-stamped. Only one Shell-stamped sherd was discovered in the Dikili Tash levels (pl. XIII:6). This unique piece (in terms of the Sitagroi assemblage) deserves individual attention. It was found in level 35 of trench ZA. This fabric may be of chronological significance in other parts of the Balkans and may represent an import.

Crucible

Crucible ware is uncommon in the Dikili Tash levels of Sitagroi. The term "crucible" is used to define a unique shape which somewhat resembles a modern laboratory or foundry crucible. It is also possible that these vessels were somehow connected with the copper technology. Similarly shaped vessels containing copper residue or traces of copper have been reported in Bulgaria. It is a very thick-walled fabric which may or may not be decorated; identification is based only on its characteristic shape. The body of the vessel is conical and comes to a blunt point. Also, the body thickens from top to bottom. These vessels have a large rim, or lip, which curves out and down (fig. 12.14:2; pl. XCIII, top right: 4-6). The

outer surface of the body sometimes has incised or excised decoration (pl. XCIII, top right:4, 5) or clumsy grooves (pl. XCIII, top right:6). Several examples also have internal lugs or show the ends of broken internal handles.

Undecorated Ware

Several illustrations are provided of the undecorated vessels manufactured in Dark Burnished, Pale Burnished (fig. 12.12), and Smooth ware (figs. 12.13, 12.14). These include the flat-based, one-handled mug (fig. 12.14:5); the carinated bowl (fig. 12.14:6) with handle (H11); and the flat-based (B2) jug (fig. 12.14:8) with lug (H22). A small open bowl with a pouring lip (fig. 12.14:7) is comparable to a flaring Smooth ware example (fig. 12.13:3) without a lip, and another in Graphite-painted (fig. 12.3:3). The Smooth ware jar (fig. 12.13:1; pl. LXXXVI:10) with a ledge lug (H24) has been referred to in chapter 8. Open dish (R10) or plate fragments with thickened rims (R7) which are themselves incised, grooved, rolled, or twisted, and/or decorated with punctate or combinations thereof (R8, R9a, b) were manufactured in Pale Burnished (fig. 12.12:4; pl. LXXXVII, bottom: 1, 2, 6, 7) and Dark Burnished wares (pl. LXXXVII, bottom:3-5, 8). The rounded bowl (R1) may be noted in a Dark Burnished fabric (pl. LXXXIX:13), also used for B3, an open bowl (fig. 12.12:7; pl. LXXXIX:14).

DEVELOPMENT WITHIN THE DIKILI TASH PHASE

One of the goals of the detailed pottery analysis was to divide the data into chronologically meaningful subphases which, in turn, could be extended to the other trenches with Dikili Tash levels. Unfortunately, this has not proved possible to the degree originally desired. Nevertheless, a tentative tripartite subdivision of the ZA sequence, which appears meaningful for the distribution of various fabrics and shapes, is presented here. In the absence of direct and intervening stratigraphic links, it is impossible to adopt this division for other phase III trenches.

Isolating the floor complex (ZA 41–43) from the other phase III levels above and below produces the following proposed subphases: IIIa, from ZA 49 to ZA 44; IIIb, from ZA 43 to ZA 41; and IIIc, from ZA 40 to ZA 33. Obviously, by separating this one phase III floor complex from non-floor deposits, it can be argued that the observed variations discussed below reflect differences between floor deposits and refuse dumps. However, the time span indicated by the radiocarbon dates for the phase III sequence (ca. 3800-2700 bc) allows one to expect some differentiation over this long period, and our one floor complex may prove a useful indicator toward this goal.

In the tables for the fabrics that follow, the figure given for each subphase is an average of the relevant statistics for the strata comprising the subphase. It should be noted that there is considerable variation from layer to layer.

Fabric Distribution

As the discussion of various phase III fabrics has shown, the Graphite-painted fabric best defines the levels of phase III (see fig. 7.16, upper). This is also demonstrated by the distribution of these sherds in the three subphases of ZA. The frequency distribution for this fabric (expressed as the number of sherds per kilogram of pottery) resembles a normal bell-shaped curve, with subphase IIIb having the highest frequency of Graphite-painted sherds. One other phase III fabric, Excised, shows this same shape of frequency distribution.

	IIIa	IIIb	IIIc	Average
Graphite-painted:	1.76	3.75	2.08	2.53
Excised:	0.38	0.46	0.23	0.35

While it might be expected that the frequency distribution of the Black-on-Red sherds would follow the same pattern, this is not the case. The highest frequency of Black-on-Red occurs in subphase IIIa; it decreases in IIIb and IIIc. This suggests that the Black-on-Red painted fabric may be a continuation of the phase II painted fabrics.

	IIIa	IIIb	IIIc	Average
Black-on-Red painted:	1.13	0.88	0.72	0.91

The Excised-with-Graphite and the Pithos wares also show decreasing frequency distributions from IIIa to IIIc. In fact, the Excised-with-Graphite fabric is virtually absent from IIIc and the Pithos ware is very rare in IIIb and IIIc. Both of these are present in low frequencies in the levels immediately preceding ZA 49 (levels which may be considered as terminal phase II or transitional II/III).

	IIIa	IIIb	IIIc	Average
Excised-with-Graphite:	0.27	0.10	0.007	0.12
Pithos:	1.62	0.03	0.03	0.56

A third frequency distribution shape shows an increase from subphase IIIa to IIIc. The most striking example of this pattern is the Dark Burnished fabric. Other wares exhibiting this distribution are the Grooved and Clumsy Grooved, which are absent from subphase IIIa.

	IIIa	IIIb	IIIc	Average
Dark Burnished:	0.62	3.36	4.03	2.67
Grooved:	–	0.04	0.04	0.03
Clumsy Grooved:	–	0.02	0.21	0.08

The fourth variation is that which has its lowest frequency in subphase IIIb. Two of the common undecorated fabrics show this pattern—Smooth and Coarse.

	IIIa	IIIb	IIIc	Average
Smooth:	3.10	2.14	2.44	2.56
Coarse:	0.27	0.15	0.41	0.28

Shape Distribution

Similar patterning may be detected among some of the representative shapes. Those that have their highest frequency in subphase IIIb include the rounded bowl (R1), the thickened-rim bowl with spiraling on the rim (R9b), the unpierced ledge lug (H22), and the constricted-neck jar (J3).

	IIIa	IIIb	IIIc	Average
Rounded bowl:	0.55	0.77	0.64	0.65
Thickened-rim bowl with spiraling:	0.06	0.19	0.08	0.11
Unpierced lug:	0.14	0.40	0.14	0.23
Constricted-neck jar:	0.40	0.50	0.25	0.38

The Dikili Tash bowl (R18) is the best example of the pattern of increasing frequency distribution through the three subphases. The thickened-rim bowls (R7, R8, R9a, b) likewise show this increasing pattern. Thickened-rim bowls continue into phase IV but the Dikili Tash bowl does not.

	IIIa	IIIb	IIIc	Average
Dikili Tash bowl:	0.05	0.12	0.23	0.13
Thickened-rim bowl:	0.11	0.33	0.36	0.27

The other characteristic Dikili Tash phase shape, the Kritsana bowl (R19), increases and then levels off. This pattern is not unexpected since this form also occurs in phase IV. However, it is worth noting that the Graphite-painted Kritsana bowls have their highest frequency in subphase IIIb, thus following the trend of the graphite-decorated pottery in general rather than of the Kritsana bowls.

	IIIa	IIIb	IIIc	Average
Kritsana bowl:	0.09	0.36	0.36	0.27
Graphite-painted Kritsana bowl:	0.06	0.23	0.14	0.14

Motifs

There are also a few indications of subphase differences which have been derived from an analysis of the Graphite-painted decorative motifs. Motif no. 1, thick and thin lines, sometimes in combination (fig. 12.1a:8, 11, 15), occurs in subphases IIIa and IIIb. The spiral, motif no. 2 (fig. 12.1a:12), occurs also in IIIa and IIIb, as does motif no. 3, composed of three-line sets forming concentric flattened circles (fig. 12.1a:13). The one- or two-line meanders, motif no. 4 (fig. 12.1a:14), increase in frequency from IIIa to IIIc, and the set of three lines with a very thick middle line, motif no. 5 (fig. 12.1a:16), shows a strong peak in IIIb.

Motif	IIIa	IIIb	IIIc	Average
1	0.06	0.10	–	0.05
2	0.04	0.02	–	0.02
3	0.03	0.07	–	0.03
4	0.04	0.05	0.09	0.06
5	0.008	0.26	0.04	0.10

Summary of Subphase Characteristics

SUBPHASE IIIA. Subphase IIIa has the highest frequencies of Black-on-Red, Excised-with-Graphite, and Pithos sherds. It has the lowest frequency of Dark Burnished sherds and no examples of the Grooved and Clumsy Grooved fabrics. Among the various shape categories sufficiently represented to warrant consideration, only the leg (O1) and the bowls of Black-on-Red show their highest frequencies in this subphase. Thickened-rim bowls (R7, R8, R9), Dikili Tash (R18) and Kritsana bowls (R19), and all jars have their lowest frequencies at this time.

	IIIa	IIIb	IIIc	Average
Leg:	0.41	0.14	0.13	0.22
Black-on-Red painted bowl:	0.21	0.12	0.12	0.15
All jars:	0.75	0.99	1.34	1.03

SUBPHASE IIIB. This subphase is characterized by the highest frequencies of Graphite-painted and Excised sherds. Graphite-decorated shapes having their highest frequencies here are jars and bowls, especially the rounded (R1), Dikili Tash (R18), and Kritsana bowls (R19). Grooved and Clumsy Grooved fabrics occur in very low frequencies. For all fabrics, the rounded bowl, the thickened-rim bowl with spiraling on the rim, and the unpierced lug show their highest percentages here.

	IIIa	IIIb	IIIc	Average
Graphite-painted				
Rounded bowl:	0.09	0.17	0.07	0.11
Dikili Tash bowl:	0.04	0.12	0.10	0.09
Kritsana bowl:	0.06	0.23	0.14	0.14
All bowls:	0.36	0.88	0.56	0.60
All jars:	0.07	0.18	0.14	0.13

SUBPHASE IIIC. Subphase IIIc is marked by increased evidence for Grooved and Clumsy Grooved fabrics and the highest frequencies of Dark Burnished and Coarse sherds. It also shows the lowest frequencies for Black-on-Red painted, Excised, and Excised-with-Graphite. The highest frequencies of several characteristic phase III shapes occur in this terminal subphase: all thickened-rim bowls (R7, R8, R9), the Dikili Tash bowl (R18), and the Kritsana bowl (R19), the frequency of which is identical with that of IIIb. Other frequently occurring shapes here are the hole-mouth jar (J1), the combined categories of all jars, the flat base (B1), Dark Burnished bowls and jars, and the Graphite-painted carinations (O9, O10).

	IIIa	IIIb	IIIc	Average
Hole-mouth jar:	0.20	0.42	0.95	0.52
All jars:	0.75	0.99	1.34	1.03
Flat base:	0.91	1.21	1.40	1.17
Dark Burnished bowls:	0.21	1.07	1.49	0.92
Dark Burnished jars:	0.10	0.44	0.77	0.44
Graphite-painted carination:	0.11	0.16	0.19	0.15

SPATIAL RELATIONSHIPS

One of the fundamental objectives of the Sitagroi research project was to identify cultural parallels which had been discussed in the literature for the plain of Drama, other sites in northern Greece, and other parts of the Balkans. The pottery assemblage from phase III suggests a few comments.

These suggestions are based on the study of the Sitagroi materials, various observations of prehistoric pottery in museums of the Balkans, and the published literature. It has not been possible to conduct a rigorous analytic study of the prehistoric relationships throughout the Balkans; lack of access to collections and unpublished materials is a major obstacle. It is possible, however, to comment on apparent cultural parallels from central Greece to the lower Danube area of Bulgaria and Romania.

The discussion deals with several of the characteristic pottery fabrics and shapes. A selection of a number of the important sites has been based on the accessibility of collections plus the quality and availability of the publications. Within the plain of Drama, sites related to Sitagroi include Dikili Tash (Deshayes and Theocharis 1962; French 1961; Garašanin and Dehn 1963), Drama (French 1961, 1964), Mylopotamos (Garašanin and Dehn 1963), and several sites visited by the Sitagroi staff (see chaps. 3, 6). To the east in Greek Thrace parallels are known at Paradimi (French 1961; Garašanin and Dehn 1963; Bakalakis and Sakellariou 1981) and to the

west in eastern Macedonia at Akropotamos (Mylonas 1941), Dhimitra (French 1964), and Galepsos (French 1964; Weisshaar 1979b).

Similarities are also found in Chalkidiki at Aghios Mamas and Kritsana (Heurtley 1939) and at Olynthus (Mylonas 1929); in West Macedonia at Servia and Vardina (Heurtley 1939) and at Stivos A and B (Heurtley 1939; French 1961). Only general similarities are seen in Thessaly at Dhimini and Sesklo (Tsountas 1908; Wace and Thompson 1912), Otzaki Magoula (Hauptmann 1981), and Rachmani (Wace and Thompson 1912); see also general works for Thessaly (Theocharis 1973; Christopoulos 1970; Papathanasopoulos 1981).

Close parallels are found to the north (Todorova 1978, 1979), in western Bulgaria at Slatino (Čohadžiev 1983), and to the northwest at Sofia (Georgiev 1959), Zaminets (Nikolov 1975), Gorni Pasarel (Petkov 1959), and Gradeshnitsa (Nikolov 1974). One of the richest areas for parallels during this time period is Bulgarian Thrace with a number of sites including Karanovo (Georgiev 1961), Azmak (Georgiev 1965, 1967), Yasa Tepe (Detev 1959; Vajsova 1966), Ezero (Georgiev and Merpert 1965), and Kapitan Dimitrijevo (Georgiev 1961).

The northeastern area of Bulgaria has produced a rich cultural inventory for this period with the Varna cemetery (I.S. Ivanov 1978a, 1978b) being the richest. However, sites such as Goljamo Delchevo (Todorova et al. 1975), Kodjadermen (Popov 1918), Hotnitsa (Angelov 1959, 1961), Ruse (Georgiev and Angelov 1952, 1957), Vinitsa (Raduncheva 1976a), Polyanitsa (Todorova 1979), and Ovcharovo (Todorova et al. 1983) provide large quantities of informative material.

North into Romania, parallels may be seen in sites such as Hirşova (Galbenu 1962, 1963) in the east, Gumelnitsa (V. Dumitrescu 1966) and Tangîru (Berciu 1961) across the Danube, and Salcutsa (Berciu 1961) to the west. Finally, parallels may be mentioned in eastern Yugoslavia at Bubanj and Velika Humska Čuka (Garašanin 1958).

The single most characteristic feature of nearly all the sites mentioned above is the presence of the graphite-painted pottery (except for the sites in Thessaly). Within the plain of Drama this fabric is certainly the most important for the recognition of the Dikili Tash phase, and the characteristic graphite-decorated shapes are found throughout the plain. Examples of the Kritsana bowl (R19) are found at Dikili Tash (Garašanin and Dehn 1963:figs. 29, 30) and at Drama (French 1961:fig. 11, nos. 4, 5); examples of the flaring-rim bowl (R6) are found at Dikili Tash (French 1961:fig. 8, nos. 1, 6-9, 12; Garašanin and Dehn 1963:fig. 33); examples of the Dikili Tash bowl (R18) naturally are found at the eponymous site (French 1961:fig. 9, nos. 1, 2, 4) and at Drama (French 1961:fig. 10, nos. 6, 8, 12, 13, 16; fig. 11, nos. 1-3); the sinuous bowl (R15) at Dikili Tash (French 1961:fig. 8, no. 14; Garašanin and Dehn 1963:fig. 36), Drama (French 1961:fig. 10, nos. 14, 15), and Mylopotamos (Garašanin and Dehn 1963:fig. 34); and examples of the pedestal base (B4) at Dikili Tash (Garašanin and Dehn 1963:figs. 46, 47).

The Black-on-Red painted fabric is also widely seen in the plain of Drama. As at Sitagroi, it is present at all sites, together with graphite-decorated fabric, and seems to occur in approximately the same proportions as at Sitagroi, where Graphite-painted is about three times more common than Black-on-Red painted fabric. The characteristic Black-on-Red painted shapes are found throughout the plain. Examples of the flaring-rim bowl (R6) are found at Dikili Tash (French 1961:fig. 9, no. 28; Garašanin and Dehn 1963:figs. 53, 59) and Drama (French 1961:fig. 12, nos. 3, 9). The decoration is generally of style I as defined at Sitagroi. Style II does occur elsewhere in the plain, as for example at Drama (French 1964:fig. 12, no. 7), but is rare.

Most of the other fabrics do not find such close parallels within the plain of Drama. The Excised fabric, however, is known at Dikili Tash (French 1961:fig. 9, no. 36; Garašanin and Dehn 1963:figs. 19, 20, 23, 24, 28) and Mylopotamos (Garašanin and Dehn 1963:figs. 17, 18, 27). The Excised-with-Graphite fabric is also known at Dikili Tash (Garašanin and Dehn 1963:fig. 26) and possibly the Grooved ware also (French 1961: fig. 9, no. 37).

It is clear that the more distant relationships of the Graphite-painted fabric are found in the Maritsa, Kodjadermen, Karanovo VI, Boian, Gumelnitsa, Salcutsa, and Bubanj-Hum cultural complexes of Bulgaria, Romania, and Yugoslavia (e.g., Berciu 1967; Garašanin 1958; Raduncheva n.d; Todorova 1978, 1979). Pottery decorated with gold from the Varna cemetery also shows characteristic graphite-decorated patterns (I. S. Ivanov 1978a:ill. 43, 1978b; Gimbutas 1977:49).

In other parts of Greece graphite-decorated pottery is common only to the east, as at Paradimi (Bakalakis and Sakellariou 1981; personal observation 1970, Thessaloniki Archaeological Museum). A small amount is known in western Macedonia, but it is certainly not common there. A trace of this ware may even be present in Thessaly; a few Thessalian sherds on display in the National Museum in Athens have what appears to be graphite decoration (personal observations 1970, 1983). A published example from Pevkakia Magoula is interpreted as an import (Weisshaar 1979b:Abb. 3, 6).

The characteristic Kritsana bowl (R19) with graphite decoration is the most widely occurring shape. Examples are known from Paradimi (French 1961: fig. 6, no. 5, fig. 9, nos. 20, 21), Dhimitra (French 1964:fig. 5, no. 12), Gioumenitsa A, that is, Stivos A (Heurtley 1939:nos. 128, 129), Stivos B (French 1961:fig. 13, nos. 25, 26), Kritsana (Heurtley 1939:no. 133, fig. 27c), Vardina (Heurtley 1939:no. 116, pl. VII), Morovitsa Cave (Djambazov 1959:fig. 7, lower right), Ovcharovo (Todorova et al. 1983:Tab. 79, 9, 13), Bubanj (Garašanin 1958:Taf. 9, 1), and from Ruse (personal observation 1970, Ruse Archaeological Museum depot).

Other graphite-decorated shapes common at Sitagroi and other sites in the plain of Drama also have a few parallels elsewhere. The Dikili Tash bowl (R18) has been found in at least two other sites in northern Greece: Dhimitra (French 1964:fig. 5, nos. 10, 11) and Stivos B (French 1961:fig. 13, no. 12). The distribution of this graphite-decorated shape may be even wider; for example, one bowl from a site within the city of Sofia appears to have this form (Georgiev 1959:fig. 2, no. 1) and perhaps also one from Devetaskata Pestera (Gaul 1948:pl. XIV, no. 7).

The graphite-decorated deep bowl (R17) appears at Ovcharovo (Todorova et al. 1983:Tab. 62, 4), and other bowls seem to show similarities with Sitagroi (Tab. 61, 1-11, 16). The thickened-rim bowl (R7) with graphite decoration may have a wider distribution as examples from Velika Humska Čuka (Garašanin 1958:Taf. 10, 5) and Tangîru (Berciu 1961:fig. 227, 3) indicate. Also, the graphite-decorated necked bowl (R20) occurs several times at Ruse (Georgiev and Angelov 1957:fig. 39; personal observation 1970, Ruse Archaeological Museum depot) and appears to be present at Ovcharovo (Todorova et al. 1983:Tab. 69, 14; Tab. 80, 12, 16). The graphite-decorated pedestal base (B4) is known in the Maritsa Valley, for example, at Azmak (personal observation 1970, Azmak depot near Stara Zagora) and in the Sofia area from Okol Glava (Gaul 1948:pl. XLVI, no. 11).

A number of close parallels may be seen in the material from salvage excavations at Slatino, Kustendil district (Čohadžiev 1983). A beautiful example of the complete form of pedestal base and vessel (ibid.:ill. 4) with graphite decoration is perhaps the most impressive form, the base very similar to those in figure 12.6:2, 3 and plate XLII:1, 2. Other important forms with graphite decoration include a "storage vessel" (ibid.:ill. 8) which is very similar to figure 12.6:1 and plate XXXIX:2; a two-handled jar (ibid.:ill. 1) similar to figure 12.5:2-5 and plates XIII:5, XVI:1, XXXIX:3, LXXXIX:9; and a grooved two-handled jar with graphite decoration (ibid.:ill. 7). In the brief text Čohadžiev mentions the relationship with Dikili Tash.

An excised fabric is also found outside the plain of Drama to the north and east. An example from Paradimi (Garašanin and Dehn 1963: Abb. 16) is similar to those from Sitagroi. And this fabric is certainly well represented in the Maritsa Valley of Bulgaria. There, many of the excised patterns are quite similar to those from the Drama Plain. Examples come from Yasa Tepe (Detev 1959:fig. 69, 1), Azmak (Georgiev 1967:Abb. 23—note especially the excised pat-

tern on the upper vessel which is also seen in Raduncheva n.d.:Abb. 28), Kapitan Dimitrijevo (Georgiev 1961:pl. XXI, 23), and Kukova Mogila (Gaul 1948: pl XXVII, nos. 2, 3); other examples are found in displays in the museums in Plovdiv, Stara Zagora, and Nova Zagora (personal observation 1970).

What appear to be related excised wares are found in northwestern Bulgaria, for example, at Gradeshnitsa (personal observation 1970, Vratsa Museum; Nikolov 1974) and at Gorni Pasarel (Petkov 1959:figs. 1, 2). In northeastern Bulgaria the excised wares are abundant at Goljamo Delchevo (personal observation 1970, Varna Museum; Todorova et al. 1975—note especially Tab. 31, 1-5, 8-9) and at Ovcharovo (Todorova et al. 1983). The excised wares from Rast in southwestern Romania also appear to be similar (V. Dumitrescu 1980:pls. XLVI, XLVII, L, LI).

Examples of excised-with-fine-incision fabrics, with or without graphite decoration, appear to be found in a wider area of northern Greece, such as at Dhimitra (French 1964:fig. 5, no. 20) and at Paradimi (Bakalakis and Sakellariou 1981:Taf. IV, f 4-5). Decoration of this kind is common during the Maritsa period in southern Bulgaria; examples are from Karanovo (Raduncheva n.d.:Abb. 26; 1976b:fig. 25; Römisch-Germanisches Museum 1979:15, no. 12; personal observation 1970, Sofia Museum depot), Yasa Tepe (Detev 1959:fig. 70; Vajsova 1966:fig. 5), Tell Maritsa (Vajsova 1966:fig.12), Chaltaka and Azmak (personal observation 1970, Stara Zagora Museum depot), and Deve Bargan (Gaul 1948:pls. XXVII, no. 1; XXVIII).

Among the undecorated wares there are also relationships for certain shapes. The Kritsana bowl (R19) may extend as far to the east as Kanalli Köprü in Anatolia (French 1961:fig. 6, no. 3). Other examples are found to the west of Gioumenitza A (Stivos A) (Heurtley 1939:cat. no. 130) and, of course, Kritsana (Heurtley 1939:cat. nos. 134, 136). In addition, a number of examples come from Salcutsa (Berciu 1961:fig. 89, nos. 11-13, 18, 25; fig. 96; fig. 113, nos. 1, 3, and 5; fig. 142, no. 2).

Examples of the undecorated necked bowl (R20) are known from Drama (French 1961:fig. 13, nos. 4, 5), Ovcharovo (Todorova 1976: 104, no. 1, right), Salcutsa (Berciu 1961: fig. 85, no. 10; fig. 89, no. 7; fig. 98, no. 6), Tangîru (Berciu 1961:fig. 235, no. 23), and Rast (V. Dumitrescu 1980:pls. XVIII, 28, 29; XXII, 33, 36; XXIII, 1). Thickened-rim bowls (R7) are seen at Stivos (French 1961:fig. 13, nos. 23, 24), Kritsana (Heurtley 1939:cat. no. 135), Goljamo Delchevo (Todorova et al. 1975:Tab. 112, 7; 115, 3), Salcutsa (Berciu 1961:fig. 85, nos. 1, 2; fig. 89, no. 26; fig. 98, nos. 3, 4; fig. 142, no. 12), and Tangîru (Berciu 1961:fig. 234—examples from Boian V to Gumelnitsa IV levels). Examples of the undecorated Dikili Tash bowl (R18) are found at Salcutsa (Berciu 1961:fig. 85, nos. 6, 11).

The Grooved or Clumsy Grooved fabric is not easy to recognize in the literature, but a few possibly related examples may be mentioned. From northern Greece examples come from Dikili Tash (French 1961:fig. 9, no. 37) and Galepsos (French 1964:fig. 2, no. 12). In Bulgaria examples include Sofia (Georgiev 1959:fig. 2, no. 5), Gradeshnitsa (Nikolov 1974:ill. 31, lower right; ill. 49, both), Zaminets (Nikolov 1975:ills. 51, 86, possibly clumsy grooved, 87), Hotnitsa (Todorova 1979: ill. 15, right), and Sava (ibid.:ills. 16, left [caption missing], 38b). A number of possibly related vessels are illustrated from the site of Rast in southwestern Romania (V. Dumitrescu 1980:pls. XXXIII-XL). One other example of Grooved-with-Graphite appears from Ovcharovo (Todorova 1979:ill. 24, center).

The Crucible fabric (with its unique shape) is found in several locations in Bulgaria: for example at Karanovo (personal observation 1970, Nova Zagora Museum display, Sofia Museum depot), Mechkur (Gaul 1948:pl. XL, no. 5), Zavet (Mikov 1961:fig. 22), Ruse (Georgiev and Angelov 1957:fig. 51; personal observation 1970, Ruse Museum display and depot), Gradeshnitsa (Nikolov 1974:ill. 33, upper left), Zaminets (Nikolov 1975:ill. 37), Goljamo Delchevo (personal observation 1970, Varna Museum display and depot; Todorova et al. 1975:Tab. 35, no. 4; 36, no. 1; 47, no. 22; 48, no. 16; 58, nos. 20, 27; 67,

no. 10; 68, no. 4; 76, nos. 14, 17, 18; 77, nos. 19, 23, 30; 82, no. 9; 94, no. 12; 95, nos. 5, 12; 107, nos. 26-27; 108, nos. 4, 25-26), and Vinitsa (Raduncheva 1976a:Obr. 5, 8). In Romania the crucible fabric has been noted at Salcutsa (Berciu 1961:fig. 84, no. 6; personal observation 1970, Archaeological Institute Museum, Bucharest).

As mentioned above, the single sherd of Shell-stamped pottery from Sitagroi indicates relationships outside the plain of Drama, specifically with Bulgaria and Romania. Several examples of this decorative technique may be noted from Bulgaria at Karanovo (personal observation 1970, Nova Zagora Museum display, Sofia Museum depot), Nova Zagora (Raduncheva n.d.:Abb. 50), Ezero (Georgiev and Merpert 1965:fig. 1), Zaminets (Nikolov 1975:ills. 61, 62, both with graphite decoration, and 95, probably shell-stamped), Hotnitsa (personal observation 1970, Veliko Turnovo Museum display; Todorova 1979:ill. 31, center), Ruse (Georgiev and Angelov 1957:fig. 33, no. 1, fig. 42, nos. 2, 4), Zavet (Mikov 1961:fig. 16i), and Ovcharovo (Todorova 1979:ill. 27, with graphite). Examples from Romanian sites include Gumelnitsa (V. Dumitrescu 1966:fig. 10, no. 3; fig. 16, nos. 3, 5; fig. 19, nos. 5, 7; personal observation 1970, Oltenitsa Museum display), and Salcutsa (personal observation 1970, Archaeological Institute Museum, Bucharest).

Relationships with the Black-on-Red painted fabric are found to the south and southwest of the plain of Drama. As one moves in this direction out of the plain, the proportion of black-on-red painted in the pottery assemblages increases significantly. For example the surface collections at Dhimitra and Akropotamos recovered much more black-on-red than graphite-decorated pottery (at Akropotamos sherds of graphite-decorated pottery were particularly rare).

The Dhimitra black-on-red painted pottery is quite similar to that from Sitagroi and other sites in the plain of Drama. Shapes in this fabric at Dhimitra include the straight-sided bowl (French 1964:fig. 3, nos. 15, 22, 23), the flaring bowl (ibid.:fig. 3, nos. 16, 18, 19, 21, 24, 25; fig. 4, nos. 10-12), the rounded bowl (ibid.:fig. 4, nos. 13-15), and the Kritsana bowl (ibid.:fig. 4, nos. 17, 18). Decorative style II is also found at Dhimitra (ibid.:fig. 4, no. 7).

The only examples of black-on-red painted ware to the east of the plain of Drama come from Paradimi (French 1961:fig. 6, no. 11; personal observation 1970, Thessaloniki Archaeological Museum displays; Bakalakis and Sakellariou 1981). To the west a black-on-red or dark-on-red painted ware is commonly found. Selected findspots in west Macedonia include Kritsana (Heurtley 1939:figs. 28, 29), Olynthus (Mylonas 1929:pl. I, figs. 66, 67, 69; Heurtley 1939:fig. 32), Saratse (Heurtley 1939:fig. 20), Aghios Mamas (Heurtley 1939:fig. 25c, d), and Stivos B (French 1961:fig. 13, nos. 28, 30, 31, 34).

Some 62 sherds of black-on-red painted (*Galepsoskeramik*) have been published from the excavations of Pevkakia Magoula in Thessaly. Weisshaar (1979b) reports these as imports into Thessaly from the north.

In Thessaly there are also painted fabrics which may be related to the black-on-red painted fabric of the plain of Drama. The relationships are seen in the paint and in the paste of the fabric but not in the vessel shape or the painted design. The paint is dark brown or black on a red or orange-red surface. The paste is a very fine clay with little or no grit observable to the eye. The patterns of decoration in these Thessalian painted wares are more complex, more rigidly geometric, and perhaps denser than the patterns of the Black-on-Red painted fabric at Sitagroi and the neighboring sites. An example from Rachmani (Wace and Thompson 1912:pl. 1) is a good illustration. These wares, and their similarities with the black-on-red painted fabric from the Dikili Tash phase of the plain of Drama, are well represented in the museum displays in Larisa and Volos (personal observation 1970) and in the National Museum in Athens (personal observations 1970, 1977, 1983).

Parallels to the few sherds of Polychrome pottery from Sitagroi have been found at Dhimitra (French 1964:fig. 4, nos. 20-22; fig. 5, nos. 1-3) and at Akropotamos (Mylonas 1941). This material seems to be related to the various polychrome wares in Thessaly, such as the pot from Dhimini (Christopoulos 1970:81; Papathanaso-

poulos 1981:79). The paste of this fabric is quite similar to that of the black- or dark-on-red painted wares discussed above.

CONCLUSIONS

The preceding descriptive analysis of the pottery from the Dikili Tash phase at Sitagroi has provided both quantitative and qualitative detail. It is possible to summarize the results and to emphasize some of the main features of this very informative pottery assemblage.

Among the fabrics of phase III, Dark Burnished and Smooth are the most frequent in terms of feature sherds per kilogram of pottery (see tables 12.1, 12.2). However, the most distinctive fabrics of the Dikili Tash phase are the Graphite-painted and the Black-on-Red painted wares.

Although the rounded bowl (R1) and the straight-sided bowl (R3) are the most frequent in terms of the relative percentages of phase III bowls, the Kritsana bowl (R19), the Dikili Tash bowl (R18), the flaring bowl (R6), and the combined category of thickened-rim bowls (R7, R8, R9) are the most distinctive of the phase. Although individual examples stand out, the shapes of jars, bases, and handles are much less characteristic in terms of the classes defined for the ZA count.

Of course, the single most distinctive feature is the Graphite-painted fabric. It is found only in this phase, and the normal curve of its frequency distribution through the three proposed subphases indicates its significance. It is also of great interest because of the wide distribution of graphite-decorated pottery in the eastern Balkan area. The spatial relationships have been discussed above, and it is clear that the graphite-decorated pottery from Sitagroi is closely related to that found to the north in Bulgaria, Yugoslavia, and Romania in the Kodjadermen, Bubanj-Hum, and Gumelnitsa cultural complexes.

Many characteristics of graphite-decorated pottery extend over the large area of its distribution; sets of two or three lines in curvilinear patterns and meanders, both positive and negative circles and triangles, spirals, and other elements are seen from northern Greece to southern Romania. Shapes such as the rounded bowl and flaring bowl are widely known, while the Kritsana bowl and the Dikili Tash bowl seem to be local shapes with a few examples known elsewhere.

Graphite decoration is found on both inner and outer surfaces of most of the examples of the two most common graphite-decorated shapes, the Kritsana bowl and the flaring bowl. The decoration appears to be virtually a unique creation for each vessel. In examples with small lug handles the handles are incorporated into the design. A striking example of the flaring bowl is shown in figure 12.4 and plate XLI:3, with a zone of graphite decoration on the outer surface plus areas of crusted red ocher on the inner surface.

Two distinctive Graphite-painted shapes which are probably underrepresented in the ZA count are the necked bowl with bulging carination (R20) and the pedestal base (B4). In addition, there are three Graphite-painted vessels worthy of special note. The first is the large "amphora" illustrated in figure 12.6:1 and plate XXXIX:2; the second is the hemispherical lid, figure 12.7:2 and plate XLI:1; and the third is the pyramidal stand, figure 12.7:1 and plates LXXIV:4 and B:3. These truly distinctive shapes illustrate the uniqueness of the potter's art.

While the Black-on-Red fabric equally well defines the phase III levels, it occurs in much lower frequencies than the Graphite-painted ware and is probably more of a local phenomenon. Its geographical distribution seems to be more restricted, although there may well be relationships with the Dhimini-Rachmani area to the southwest. The Black-on-Red painted fabric may be a development from the tradition of the phase II painted wares; this is suggested by its decreasing frequency through the proposed phase III subphases.

The three most common shapes of the Black-on-Red pottery are the rounded bowl (R1), the flaring bowl (R6), and the straight-sided bowl (R3). Other shapes, however, such as the sinuous bowl (R15) are also distinctive. Decoration

on these shapes is of style I Black-on-Red painted and occurs on both internal and external surfaces of most of the examples. Examples of the flaring bowl in the Black-on-Red painted fabric are seen in figure 12.8:3, 5, 9; and plates XC, top:3; XCI, top:3.

The category of Black-on-Red painted jars includes some large jars or pitchers with style II Black-on-Red decoration. The most striking example is the large, two-handled jar or "amphora" (fig. 12.9:3; pl. XIV) or pitcher (fig. 12.9:1; pl. XVI:3).

The other two characteristic fabrics of phase III are the Excised and the Excised-with-Graphite fabrics which, although found in only a few shapes, are very distinctive. The Excised-with-Graphite fabric with fine incisions, or Maritsa ware (pl. XCII, bottom right), is very similar to pottery found in the Maritsa Valley of Bulgaria.

Of the undecorated fabrics, the Dark Burnished is of interest because some of its characteristic shapes are also those which characterize the graphite-decorated fabric. Although the Dark Burnished round and straight-sided bowls are the two most frequent, the similarities with graphite-decorated pottery may be seen in the frequencies of the Dark Burnished Kritsana bowl, the group of thickened-rim bowls, and the Dikili Tash bowl. It is clear that some of the graphite-decorated pottery is the Dark Burnished fabric with the addition of graphite decoration.

Temporal development within the Dikili Tash phase is suggested by the range of radiocarbon dates from these levels and from the depth of the deposit. The floor complex in trench ZA (41-43) was isolated as a unit, and it was suggested that it formed subphase IIIb as discussed above. This division does seem to show some temporal development. However, it should be clearly stated that other factors may have contributed to the observed differences and that problems associated with a small sample may be important.

The Graphite-painted fabric exhibits the characteristics of a normal curve in its frequency distribution throughout the three subphases, that is, it is most common in the middle of its temporal range. On the other hand, it could be argued that one might expect the graphite-decorated fabric, assuming it was a fine and/or status ware, to be most common in the context of the structure indicated by ZA 41-43. This might be linked to the observation that both the Smooth and Coarse fabrics have their lowest frequencies in phase IIIb. That is, one might expect that the Coarse and Smooth fabrics would not be common in structures where graphite-decorated pottery was frequent.

The Black-on-Red fabric decreases from IIIa to IIIc. This would be expected if it developed from the painted wares of phase II. At the same time, the Grooved and Clumsy Grooved fabrics are absent from IIIa. They appear in IIIb, with the Grooved remaining the same in IIIc, while the Clumsy Grooved increases in IIIc. This would be expected if they are in some way related to the fabrics of phase IV. Thickened-rim bowls also increase in frequency through the subphases of phase III and are found in phase IV. The Kritsana bowl is also found in phase IV, and it increases from IIIa to IIIb and remains the same in IIIc.

In summary, three of the four most common fabrics of the Dikili Tash phase show very informative frequency distributions in support of the suggestion of temporal development from subphase IIIa to IIIc:

1. Black-on-Red painted declines, suggesting a continuation from phase II.
2. Graphite-painted follows a normal curve with its maximum in subphase IIIb.
3. Dark Burnished increases, suggesting a development toward phase IV.

The overall picture resulting from the discussion of the spatial relationships of the pottery assemblage is as follows: the closest parallels of the phase III pottery are with the eneolithic cultural complexes to the north of the plain of Drama. Specifically these relationships are seen in the Graphite-painted, the Excised, and the Excised-with-Graphite with fine incision fabrics. There are also specific relationships among the vessel shapes recorded for these fabrics. On the other hand, the relationships of the phase III painted fabrics (Black-on-Red painted and Polychrome)

are clearly to be found to the west and south of the plain of Drama.

Thus, in terms of the pottery assemblage of the Dikili Tash phase at Sitagroi, the settlement's strongest ties are with the Kodjadermen, Bubanj-Hum, and Gumelnitsa cultural complexes. The secondary ties are with the Dhimini and Rachmani cultural complexes. Phase III pottery may be said to be dominated by the graphite-decorated tradition of the Balkan eneolithic. Certainly the Graphite-painted and related fabrics characterize the Dikili Tash phase. The painted fabrics may well represent a continuation of the development of painted fabrics during phase II when relationships were probably stronger with the west and south.

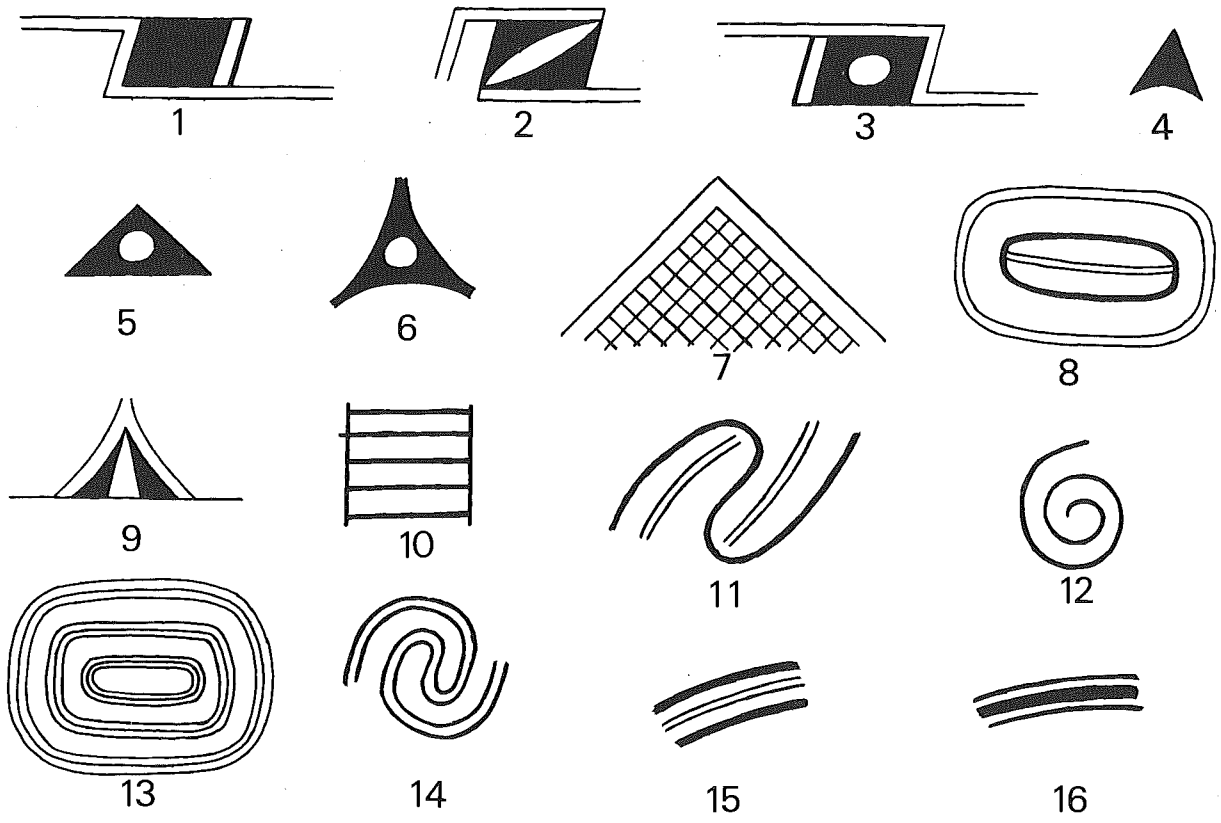


Figure 12.1a. Phase III. Graphite-painted motifs.

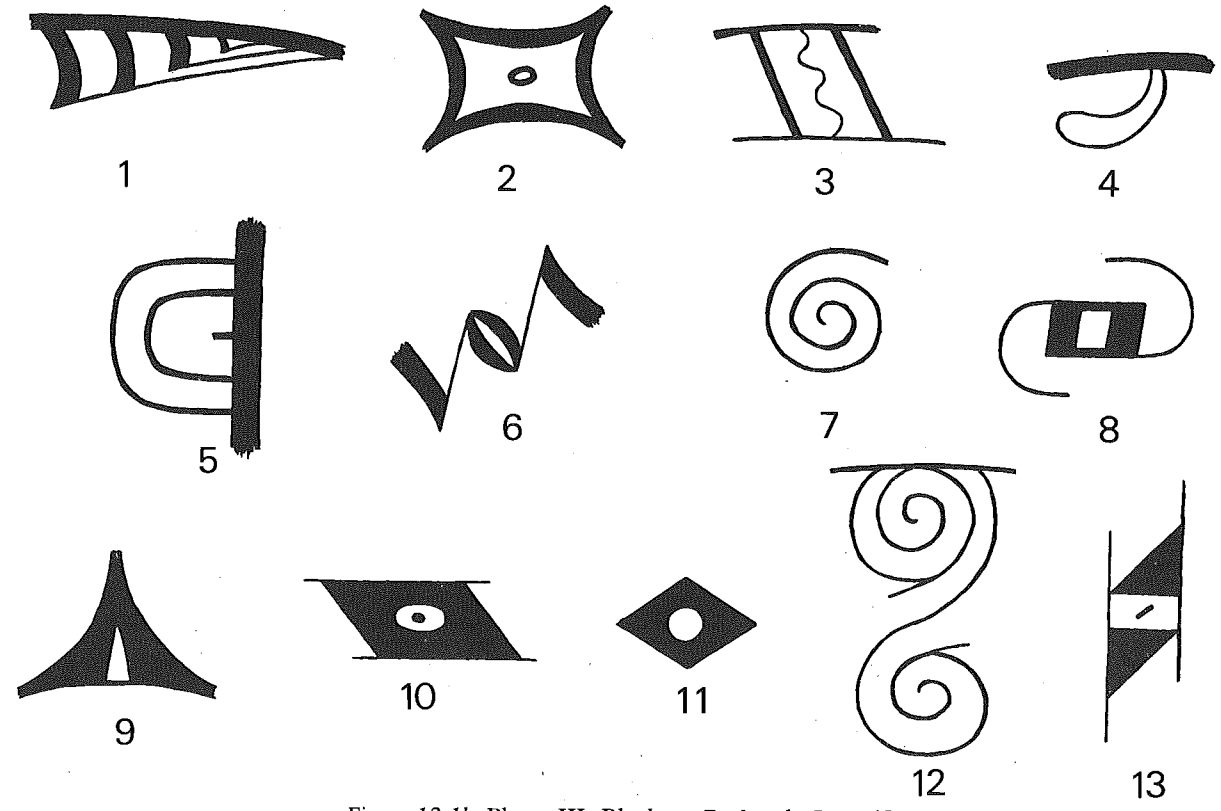


Figure 12.1b. Phase III. Black-on-Red style I motifs.

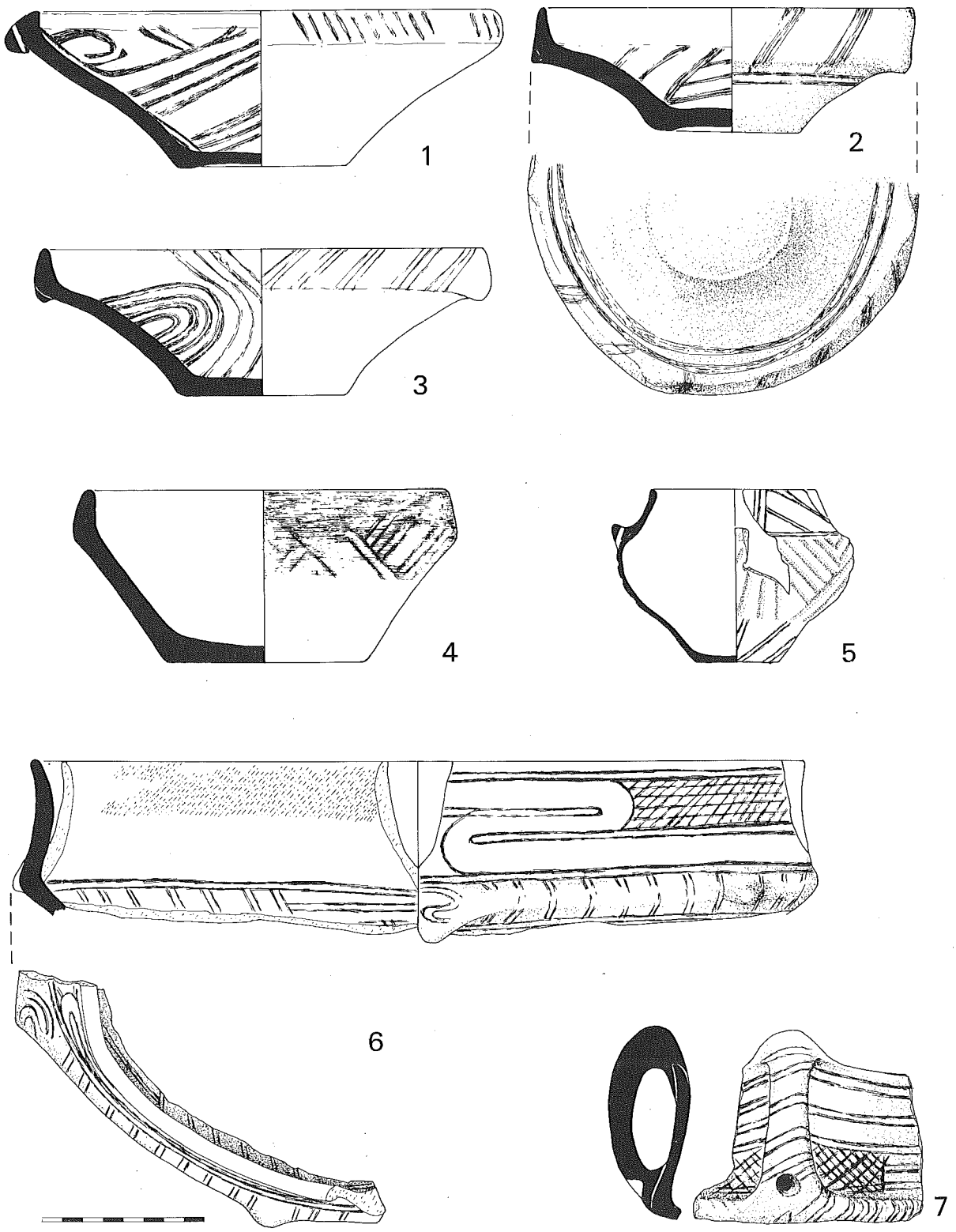


Figure 12.2. Phase III. Graphite-painted ware: Kritsana forms (1-4), necked bowls (5-7); exterior designs on right, interior designs on left.

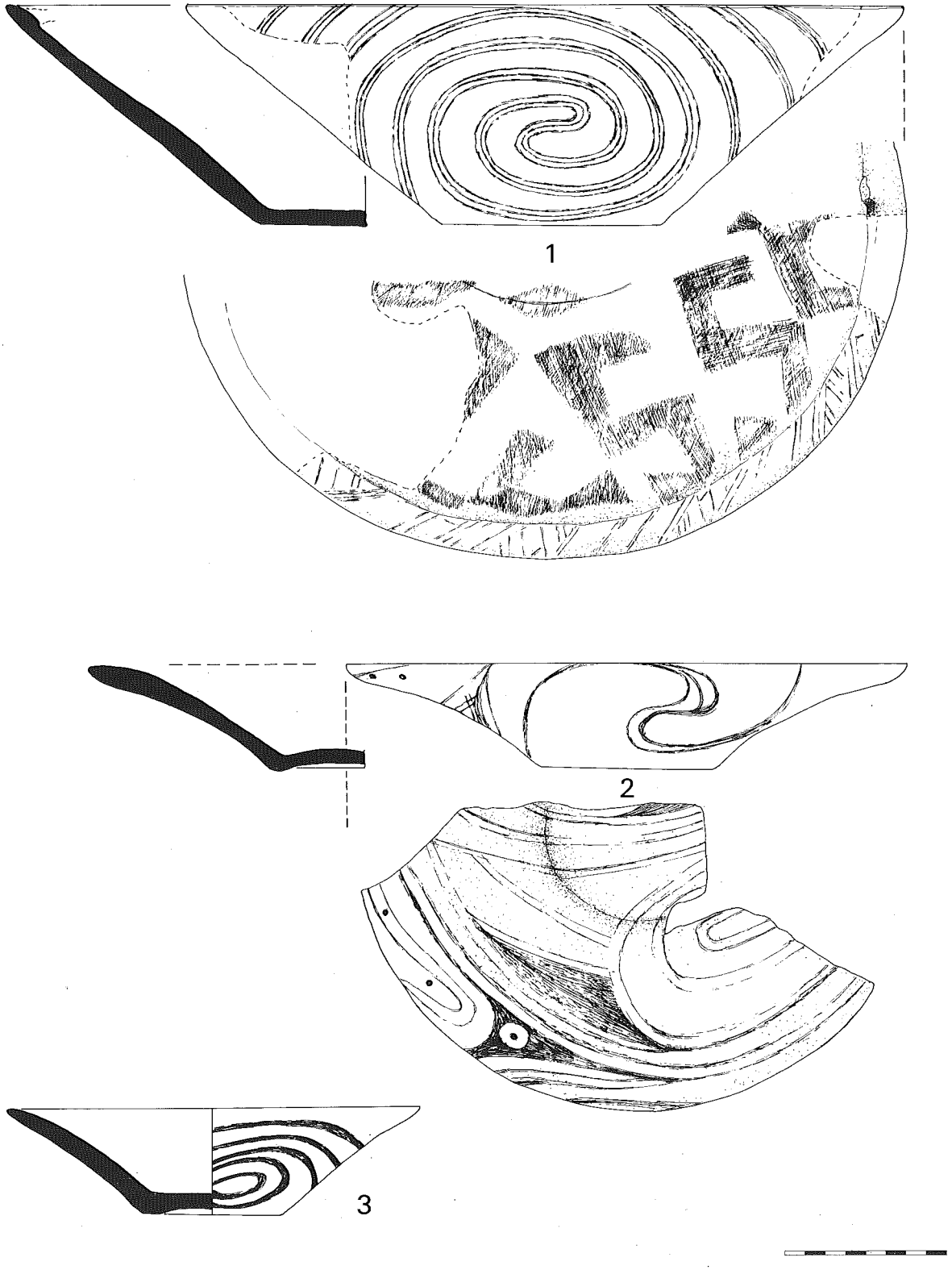


Figure 12.3. Phase III. Graphite-painted ware, open bowls.

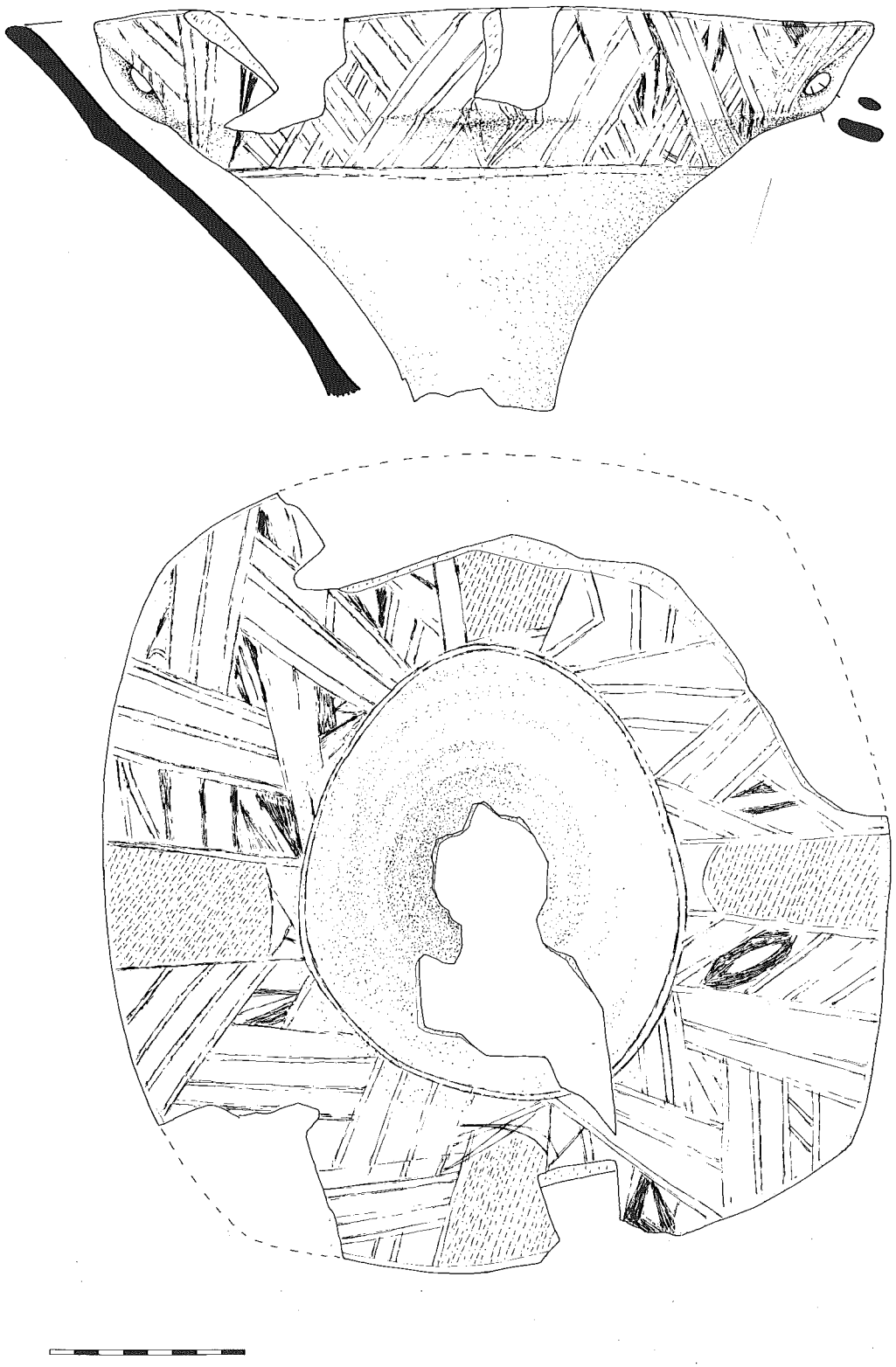


Figure 12.4. Phase III. Large Graphite-painted bowl, base missing.

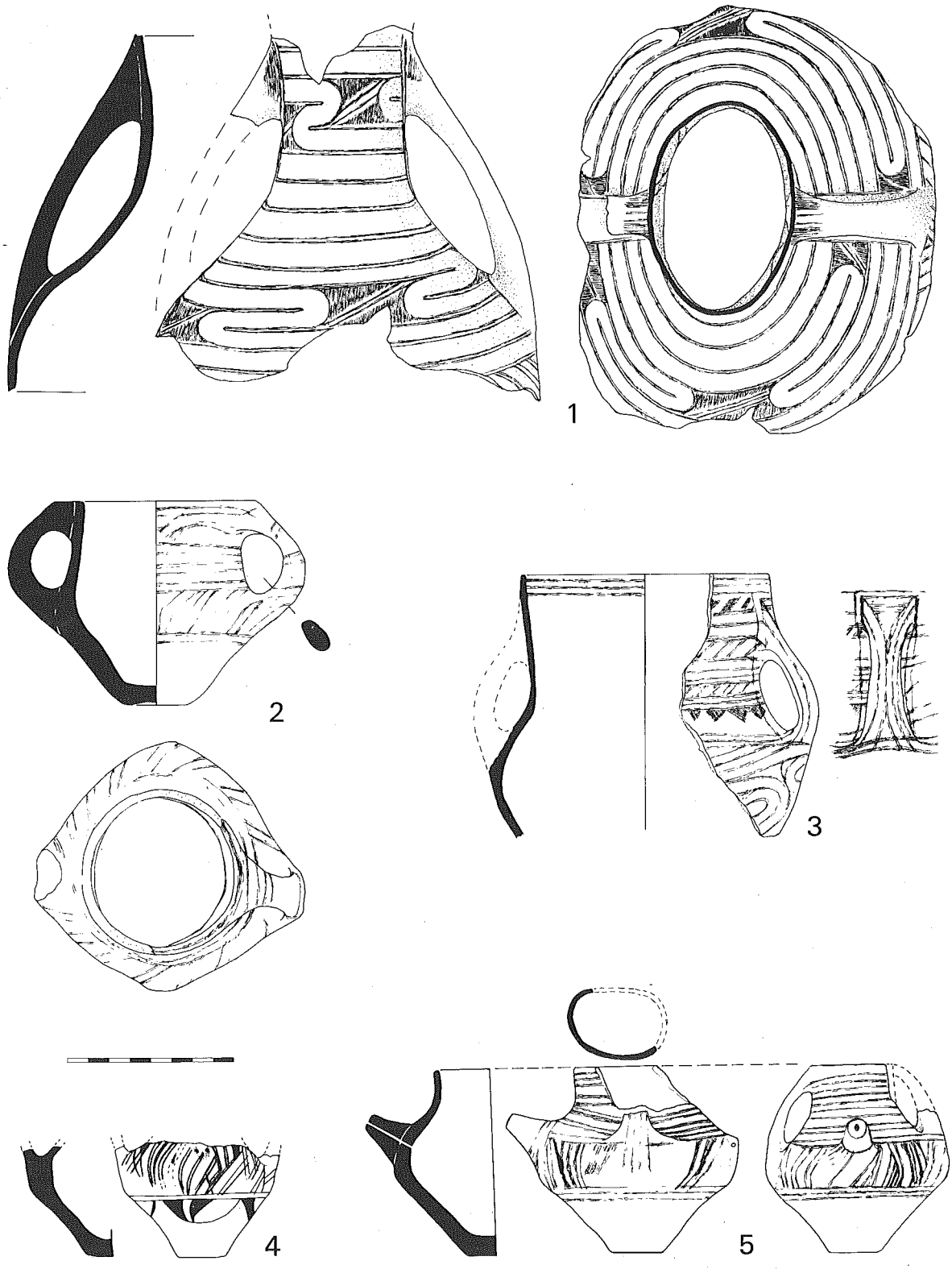


Figure 12.5. Phase III. Graphite-painted ware: two-handled vessels (1-4), with spout (5).

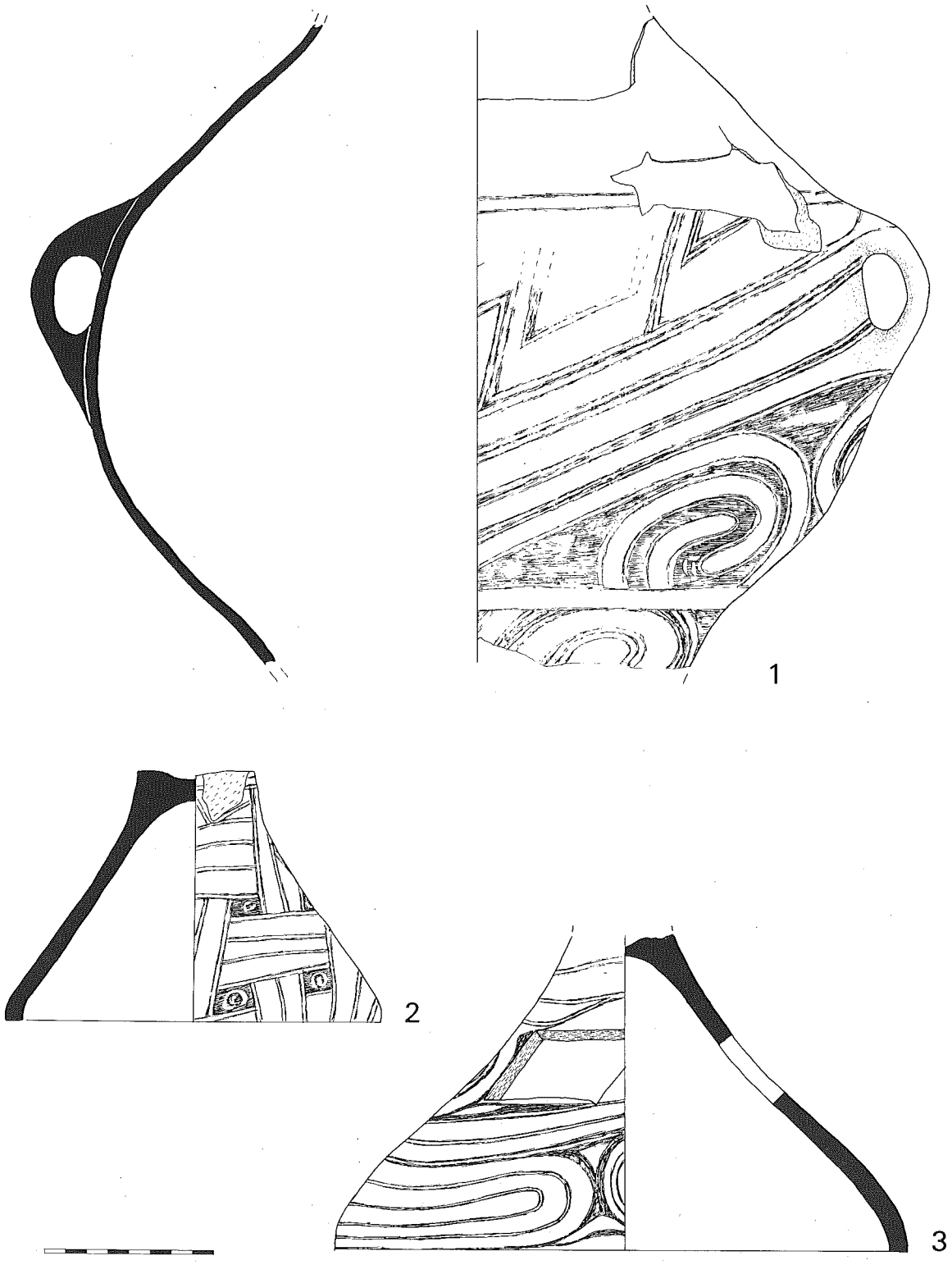


Figure 12.6. Phase III. Graphite-painted large "amphora" (1), pedestal bases (2, 3).

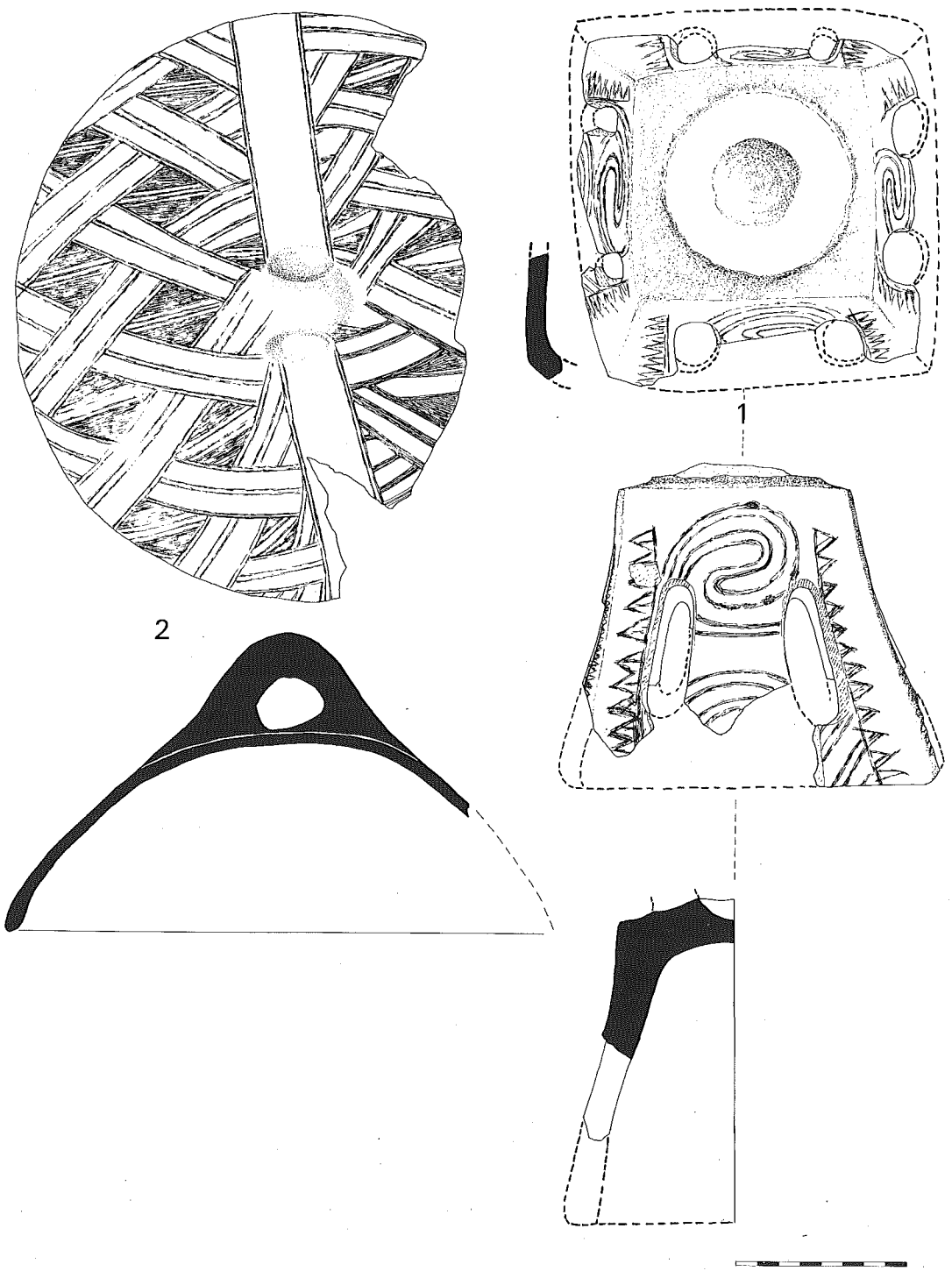


Figure 12.7. Phase III. Graphite-painted stand (1), large lid (2).

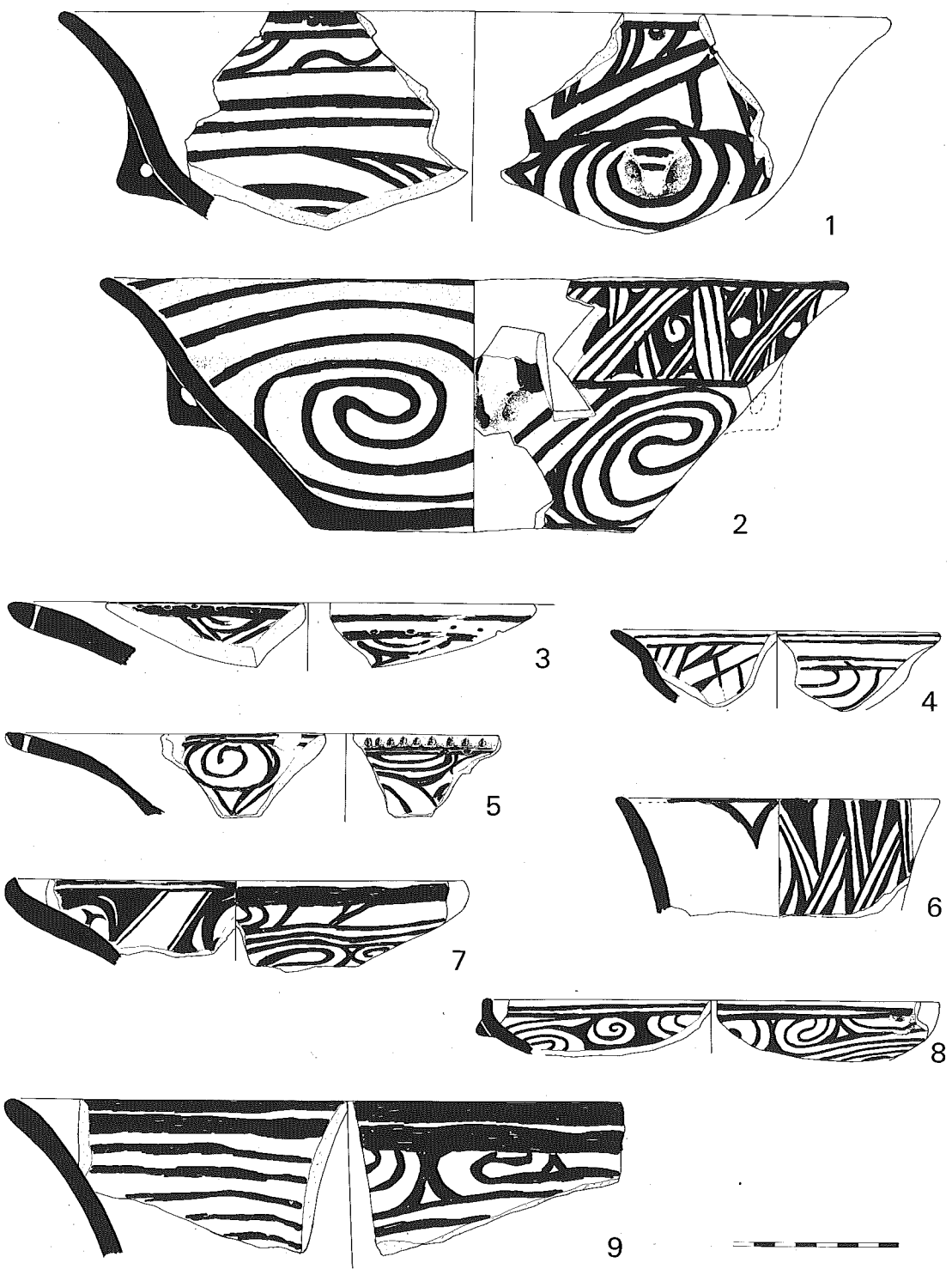


Figure 12.8. Phase III Black-on-Red style I, interior view (*left*), exterior view (*right*): sinuous form (1, 2), Dikili Tash bowl (4), open forms (3, 5-7, 9), rounded bowl with stringhole lug (8).

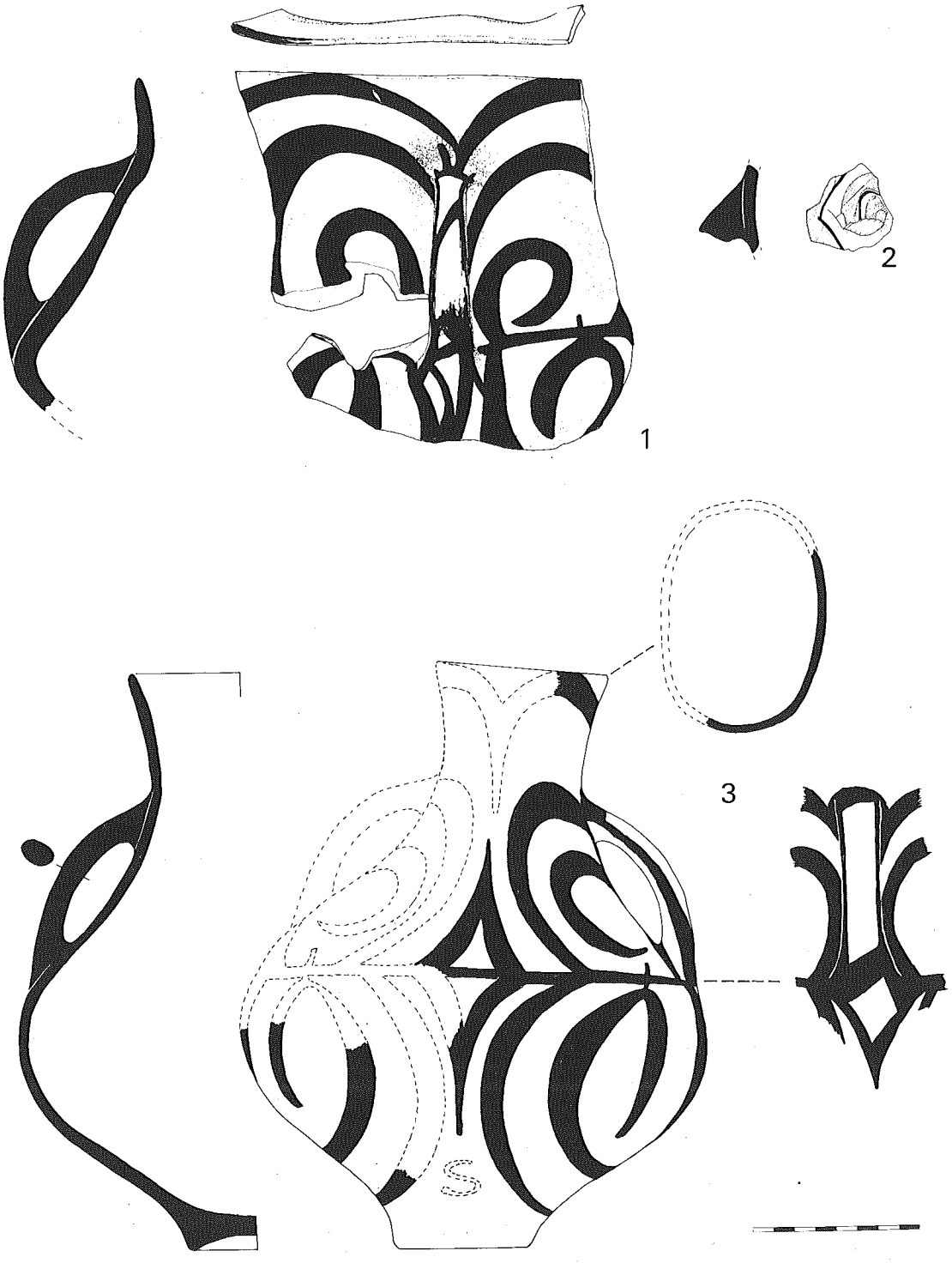


Figure 12.9. Phase III. Black-on-Red style II two-handled vessels (1, 3); Polychrome handle fragment (2).

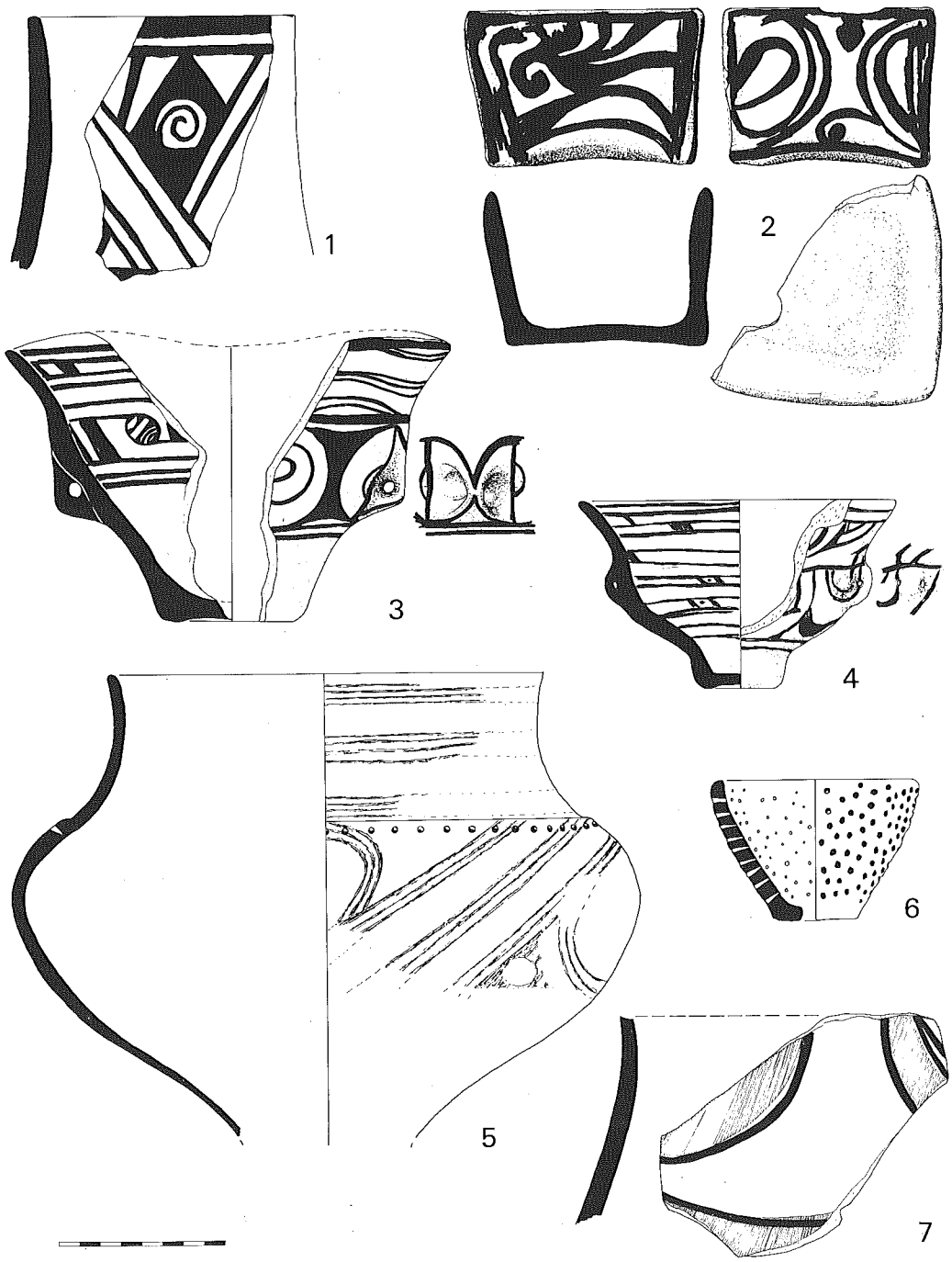


Figure 12.10. Phase III. Black-on-Red style I: constricted neck fragment (1), square bowl (2), sinuous bowl (3), Dikili Tash Bowl (4); Graphite-painted globular urn (5); bowl with allover perforations (6); Polychrome sherd (7). Interior designs on left, exterior designs on right.

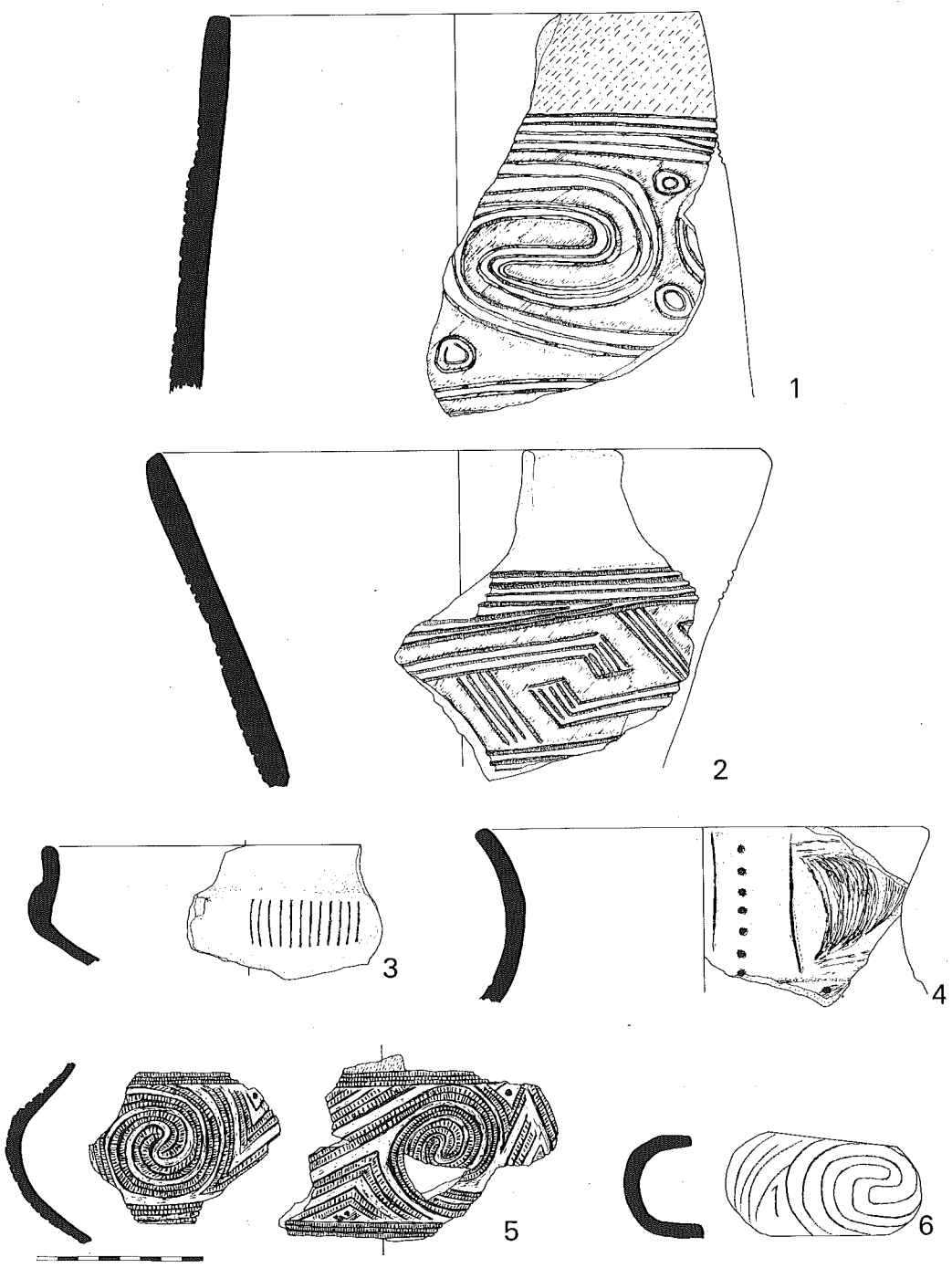


Figure 12.11. Phase III. Excised-with-Graphite bowl fragments: deep (1), deep with flaring rim (2), outturned rim (4), squat and inturned (5); Grooved, necked bowl (3); Incised pyxis (6).

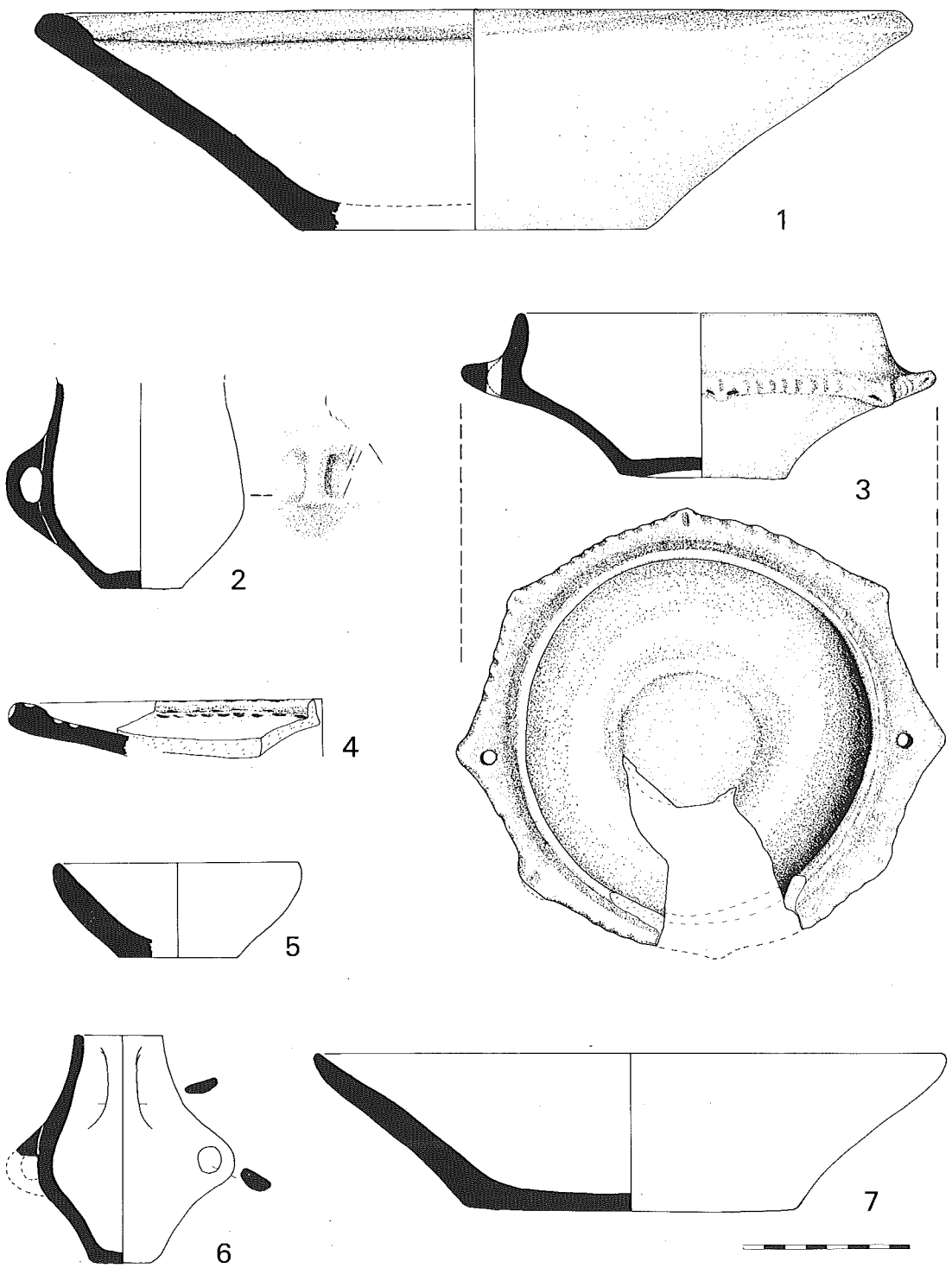


Figure 12.12. Phase III. Open bowl with twisted inturned rim (1), deep jar with two handles (2), Pale Burnished necked bowl with grooved carination and stringhole lugs (3), plate fragment with rim incisions (4); Smooth ware open bowl (5), Dark Burnished amphora with three handles (6), Dark Burnished open bowl (7).

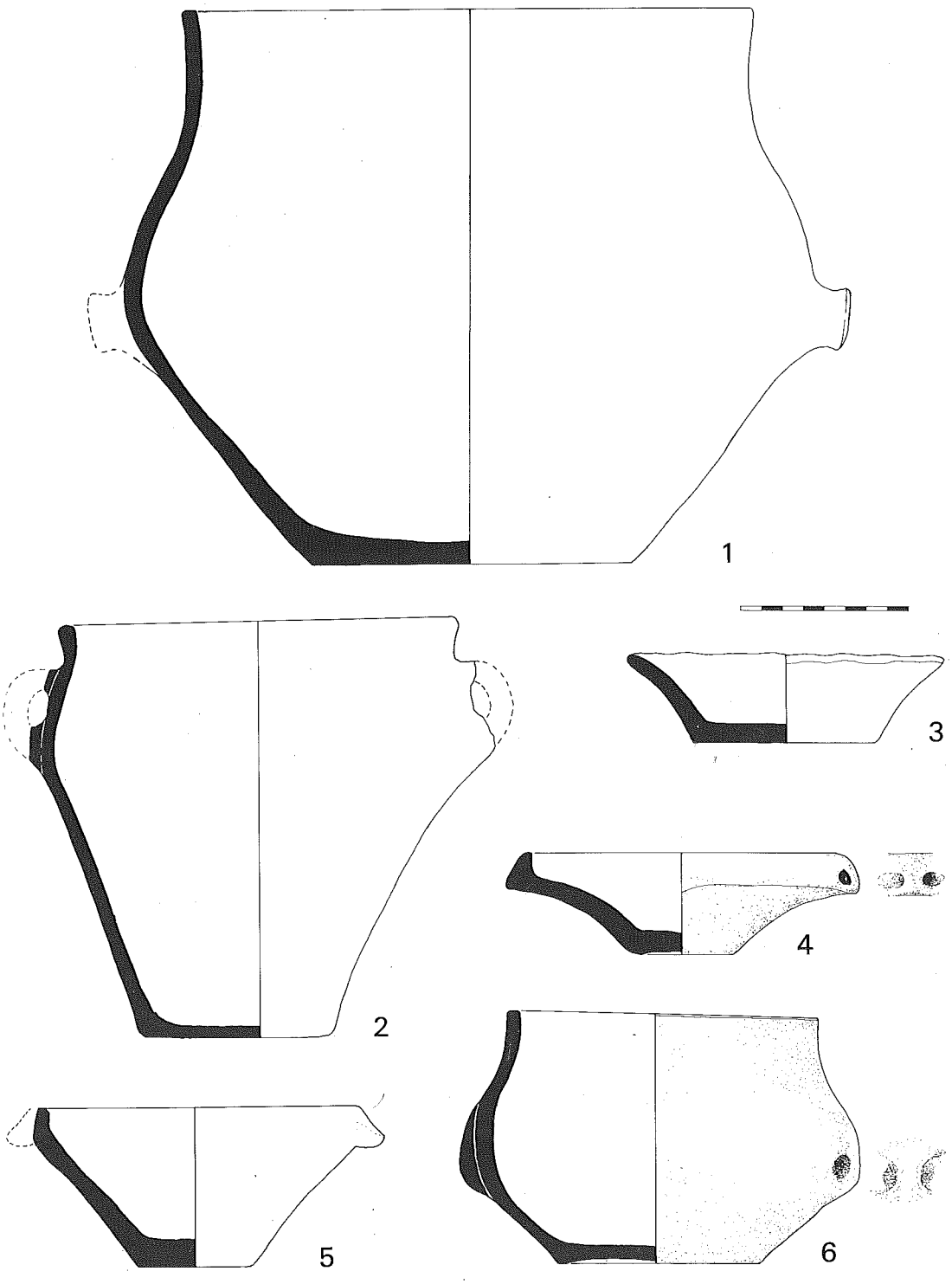


Figure 12.13. Phase III. Smooth ware: globular jar with ledge lug (1), conical jar with short neck and double handles (2), flaring bowl (3), Kristsana bowls (4, 5), rounded bowl with vertical neck and two strap handles (6).

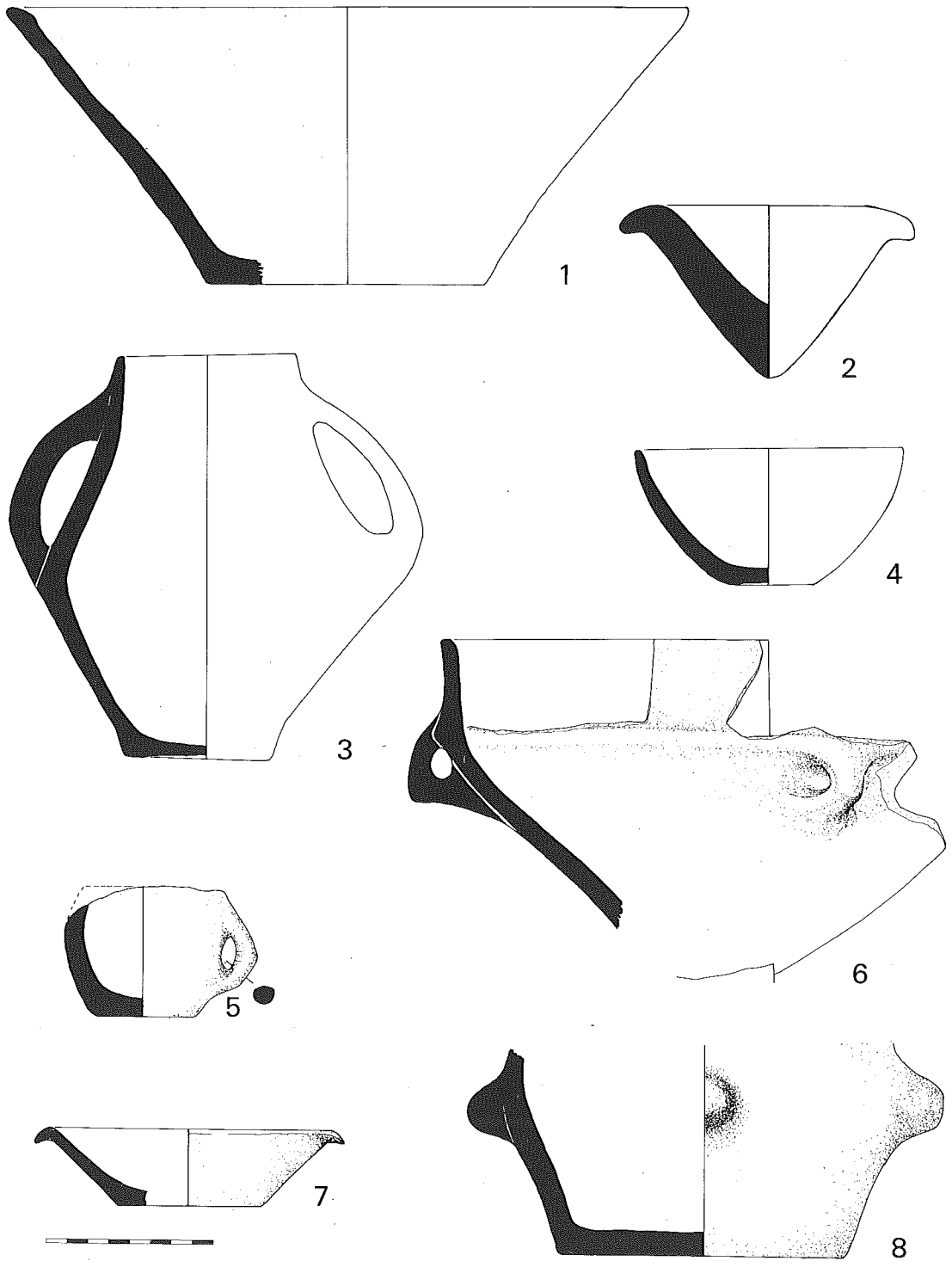


Figure 12.14. Phase III. Smooth ware: open vessel with straight (1) or rounded (4) side, two-handled amphora (3), one-handled mug (5), carinated and necked bowl with ring handle (6), bowl with pouring lip (7), flat-based jug with lugs (8); Crucible (2).

Concordance: Figures to Plates

Figure 12.2
1. Pot 99, ZA 45 (pl. XVI:4)
2. Pot 142, ML 116
3. Pot 104, ML 106
4. Pot 48, MM 16 (pl. XCII, bottom left)
5. Pot 236, MM 27 (pl. XXXIX:1)
6. MM 54 (pl. LXXXIX:3)
7. Pot 53, MM 40

Figure 12.3
1. Pot 126, ZA 43 (pl. XV)
2. Pot 133, ML 109 (pl. XXXIX:4)
3. Pot 49, ML 107

Figure 12.4
Pot 67, MM 20 (pl. XLI:3)

Figure 12.5
1. Pot 306, MM 65 (pl. XLI:2)
2. Pot 33, MM 12 (pl. XXXIX:3)
3. ZA 42 (pl. LXXXIX:9)
4. Pot 12, ZA 41 (pl. XIII:5)
5. Pot 17, ZA 45 (pl. XVI:1)

Figure 12.6
1. Pot 290, MM 68 (pl. XXXIX:2)
2. Pot 308, MM 16 (pl. XLII:2)
3. Pot 292, MM (pl. XLII:1)

Figure 12.7
1. Pot 26/35, ZA 42, 45 and ZB 126 (pls. LXXIV:4, B:3)
2. Pot 254, MM 64 (pl. XLI:1)

Figure 12.8
1. No provenience
2. No provenience
3. No provenience
4. No provenience
5. ML 107 (pl. XCI, top:3)
6. ML 2 (pl. XCI, top:5)
7. No provenience
8. No provenience
9. MM 50 (pl. XC, top:3)

Figure 12.9
1. Pot 75, ZA 44 (pl. XVI:3)
2. ZA 42
3. Pot 38, ZA 41 (pl. XIV)

Figure 12.10
1. No provenience
2. Pot 56/146, ML 107 (pl. XLII:5)
3. Pot 112, MM 49 (pl. XLII:3)
4. No provenience
5. Pot 313, MM 21 (pl. XLIII:4)
6. No provenience
7. Pot 191, MM 60

Figure 12.11
1. ZA 42/44 (pls. XCII, top left:1; D:4)
2. ZG 35 (pl. XCII, top left:2)
3. MM 52 (pl. XCIV, top:3)
4. MM 39 (pl. XCIV, bottom:1)
5. ZA 47 (pls. XCII, bottom right:1; D:3)
6. Pot 9, ZA 41 (pl. XIII:4)

Figure 12.12
1. No provenience
2. Pot 230, MM 19
3. MM 16 (pl. XCIV, top:9)
4. MM 40 (pl. LXXXVII, bottom:6)
5. Pot 72, MM 50
6. Pot 8, ZA 41 (pl. XIII:1)
7. Pot 117/159, ZA 44 (pl. LXXXIX:14)

Figure 12.13
1. Pot 76, ZA 44 (pl. LXXXVI:10)
2. Pot 29, MM 12
3. Pot 110, ML 116
4. Pot 109, MM 48 (pl. XCV:1)
5. Pot 27, MM 12
6. Pot 111, ZA 44

Figure 12.14
1. Pot 57, MM 43
2. No provenience
3. Pot 16, ZA 44 (pl. XVI:2)
4. No provenience
5. No provenience
6. No provenience
7. No provenience
8. No provenience

13.
The Pottery of Phases IV and V: The Early Bronze Age

Andrew Sherratt

The pottery of the early bronze age at Sitagroi differs most strikingly from that of preceding periods in its lack of painted wares, and hence in a relatively undifferentiated set of fabrics as a whole. Owing to this fundamental contrast, the early bronze age material is described differently from the pottery of earlier periods.

Although more limited in variability, the sample is larger since the bronze age levels represent the latest phase of occupation on the mound and were thus accessible over a wide area on its summit. Moreover, a major part of the sample came from definable architectural contexts—notably the Long House and the Burnt House. Complete or reconstructable vessels are thus available to supplement and clarify the evidence of sherds.

The bronze age fabrics are handmade and do not carry painted decoration. They are generally dark except where burned secondarily in destruction levels. There is a gradation between the blacker, burnished finewares and the less finely finished coarsewares. Decoration on the former usually takes the form of channeling or incision (usually filled with white encrustation); on the latter it consists of applied cordons or conical projections. These methods of ornamentation are not exclusive to the bronze age levels, but they occur there in characteristic patterns and arrangements so that the pottery is recognizable by both its decoration and fabric. The range of shapes is also distinctive, including handled cups and jugs, and bowls with expanded stringhole lugs characteristic of the early bronze age both in Greek Macedonia (Heurtley 1939) and neighboring areas (Georgiev and Merpert 1979). The earlier part of the bronze age sequence at Sitagroi, however, has produced material not described before either from Macedonia or central Bulgaria, and which sheds new light on the earliest phase of the bronze age in this area. Its links are with south-central Europe, notably the southern part of the Carpathian Basin.

The Stratigraphic Contexts and Phase Divisions

Three phases have been defined within the early bronze age: IV, Va, and Vb. The definition of these phases and the assignment of the numbers and letters used to denote them were based on material from ZA and took place before specialist study of the bronze age pottery had begun. The validity of these divisions has been fully confirmed by further study, but the distinction between Va and Vb can now be seen as equally (if not more) important than that between IV and Va.[1] What have been called "Va" and "Vb" therefore are not subphases within a relatively uniform body of material, but each is a distinctive phase in its own right even though both may have been shorter in duration than phase IV, as the radiocarbon dates indicate.

Bronze age levels on the mound were exposed in the central area and on the southern and western sides above the 62 m contour (figs. 2.2, 8.2). At the summit, these levels reached a depth of just over 4 m in ZA; 20 m to the west, in ROc (fig. 8.15), they came to something over 3 m. These depths imply a slight upward slope from west to east in the surface of the phase III levels so that the highest point of the phase III mound was somewhat to the east of its present summit.

The levels are made up of sequences of floors and intervening featureless layers. The floors may occur as isolated horizons or in sequences of a meter or more. Although some of the floors and rubble levels can be traced laterally for several meters (e.g., fig. 8.7), there are no "marker horizons" linking all the exposures of bronze age levels. The three phases into which the bronze age has been divided are based on consistent differences in pottery shapes, fabrics, and decoration that can be recognized throughout the bronze age levels. In some cases these coincide with clear-cut stratigraphic changes in particular trenches, but they do not always do so.

The trenches from which bronze age material is available are as follows. The complete sequence, including the III/IV interface, is revealed only in ZA (3 m x 3 m). The greater part of it, however, is also present in ROc (5 m x 5 m). Levels of phases Va and Vb were exposed in the 10 m x 10 m squares and subsequent trenches of the Main Area. Levels of phase IV were exposed on the western slope of the mound in ZH (12 m x 8 m) and on the southern slope in SL/ZE (9 m x 9 m/4 m x 4 m). The stratigraphic contexts of this material are discussed in chapter 8. Bronze age pottery was also produced in trenches MM, ZD, ZG, and ZJ. Destruction levels preserving complete pots were encountered in the larger exposures, though there is no means of testing whether within a phase such destructions were exactly contemporary in different areas of the mound.

The exposures that are most useful for examining the succession of bronze age material are the deeper trenches on the summit, ZA and ROc, and these are discussed first in detail to provide an objective definition of the phases. The wider range of material from the area excavations is then adduced in an examination of the structure of these assemblages.

The ZA Sequence

The ZA deep sounding is the only trench that covers the phase III/IV transition and also has layers belonging to Va and Vb. The general outline has already been discussed (chaps. 7, 8; fig. 7.9) and only brief comments will be added here.

The painted fabrics characteristic of phase III terminate around layer 33 at a depth of about 4.2 m from the surface (figs. 7.1, 8.2). Their sporadic occurrence in overlying layers is reasonably explained in terms of upcasts. The final layers of phase III (40-33) are represented at this point on the mound by a fine, featureless fill without evident traces of construction (fig. 8.2). The levels attributed to phase IV (32-21) form a continuous block of floors and burned building debris some 1.5 m thick, within which about half a dozen constructional cycles (floors and fill) may be recognized. The radiocarbon date of 2600 ± 100 bc (Bln 879) comes from the lower part of this sequence, that of 2440 ± 100 bc (Bln 773) from the middle. The sharp transition from painted to unpainted wares, corresponding to a stratigraphic change at the beginning of phase IV, indicates an occupational discontinuity between phases III and IV while the repeated parallel strata suggest continuous occupation within the phase. Although the stratification is disturbed by pits, these are mainly from within the phase.

The levels attributed to phase Va (20-11) are about 1.3 m thick; three floors (more widely separated than those of phase IV) can be discerned on one side of the trench. These levels are interrupted by pits from layers of Vb. The radiocarbon date of 2360 ± 100 bc (Bln 782) comes from an undisturbed context near the beginning of this phase. The final floor probably corresponds to the level of the Burnt House in PO 158-164 (figs. 8.10-13). The stratigraphy suggests somewhat more intermittent occupation than in phase IV, but with some continuity between them.

The levels of Vb (10-2) are about 1.5 m thick and begin with a relatively featureless layer from which large pits were dug. This suggests that occupation was not continuous at this point. The middle of the phase Vb levels is occupied by a set of three floors, partly removed by later pits, which probably corresponds to the Long House of PO 23 (2015 ± 100 bc: Bln 876). Above this lies the complex of discontinuous floors and bins (cf. PO 9, 1920 ± 100 bc: Bln 780) and on top of this the disturbed surface layers with sporadic later sherds and burial pits. The Vb levels seem thus to include two kinds of occupational debris, representing both domestic structures and open working areas, and perhaps with a break in occupation before the beginning of the period.

The ROc Sequence

Since the large trenches of the Main Area lacked fine stratigraphic control while the precise stratigraphic excavations of the deep soundings were too small to produce sufficient material for fine definition of phases, a trench of intermediate size was excavated and precisely recorded. This was ROc. For this trench a recording system was devised that has since gained wider currency: excavation units such as levels and features within them were given separate numbers and their relationships expressed in a stratigraphic tree diagram (given in simplified form as fig. 8.15). These were compared both with stratigraphic sections (fig. 8.2) and records of the layers as dug (not illustrated here) and combined into counting units. The 73 excavated units were thus conflated into 30 larger units of precisely contemporary material, with mixed levels and box-sections being omitted. The relationship between the stratigraphic and analytical (counting) units is given in table 13.1.

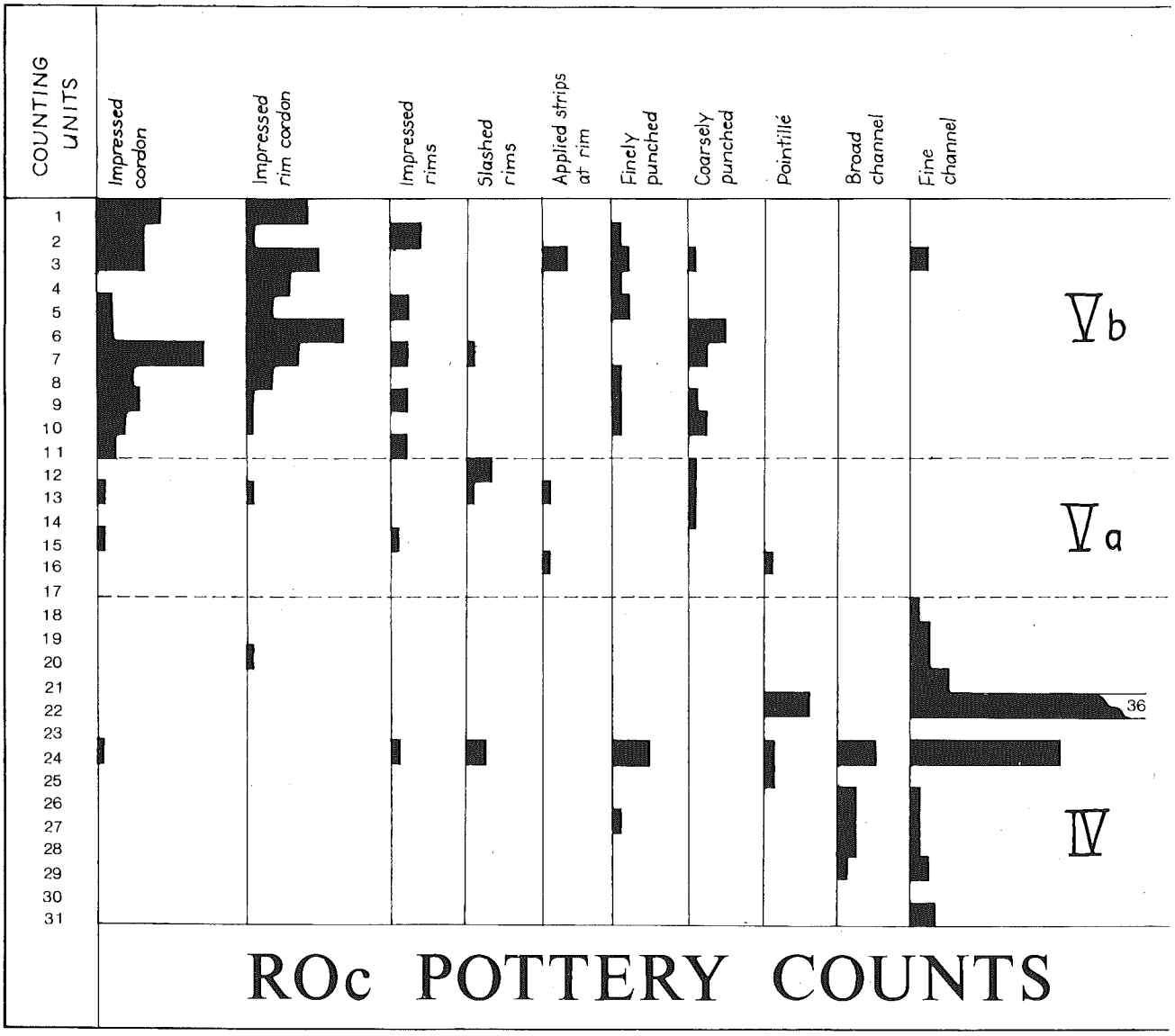
As reference to figure 13.1 shows, counts of decorative features confirmed the tripartite division of the bronze age sequence but did not indicate any finer subdivisions. The stratigraphic contexts of this material will thus be discussed in terms of these three divisions.

The ROc trench did not reach the base of the phase IV levels, although by comparison with the relative depths in ZA it covers the greater part of the phase. The lower 1.80 m (layers 73–49) are represented by a more or less continuous sequence of about eight parallel floors. Only the lowermost 1.30 m of these belong to phase IV; the upper floors (49-33) have material of Va. Stratigraphically, therefore, there seems to be a large measure of continuity between these two phases at this point on the mound and continuity of occupation within phase IV. The radiocarbon date of 2445 ± 100 bc (Bln 878) came from the upper-middle part of the phase IV floors, fitting well with the sequence from ZA.

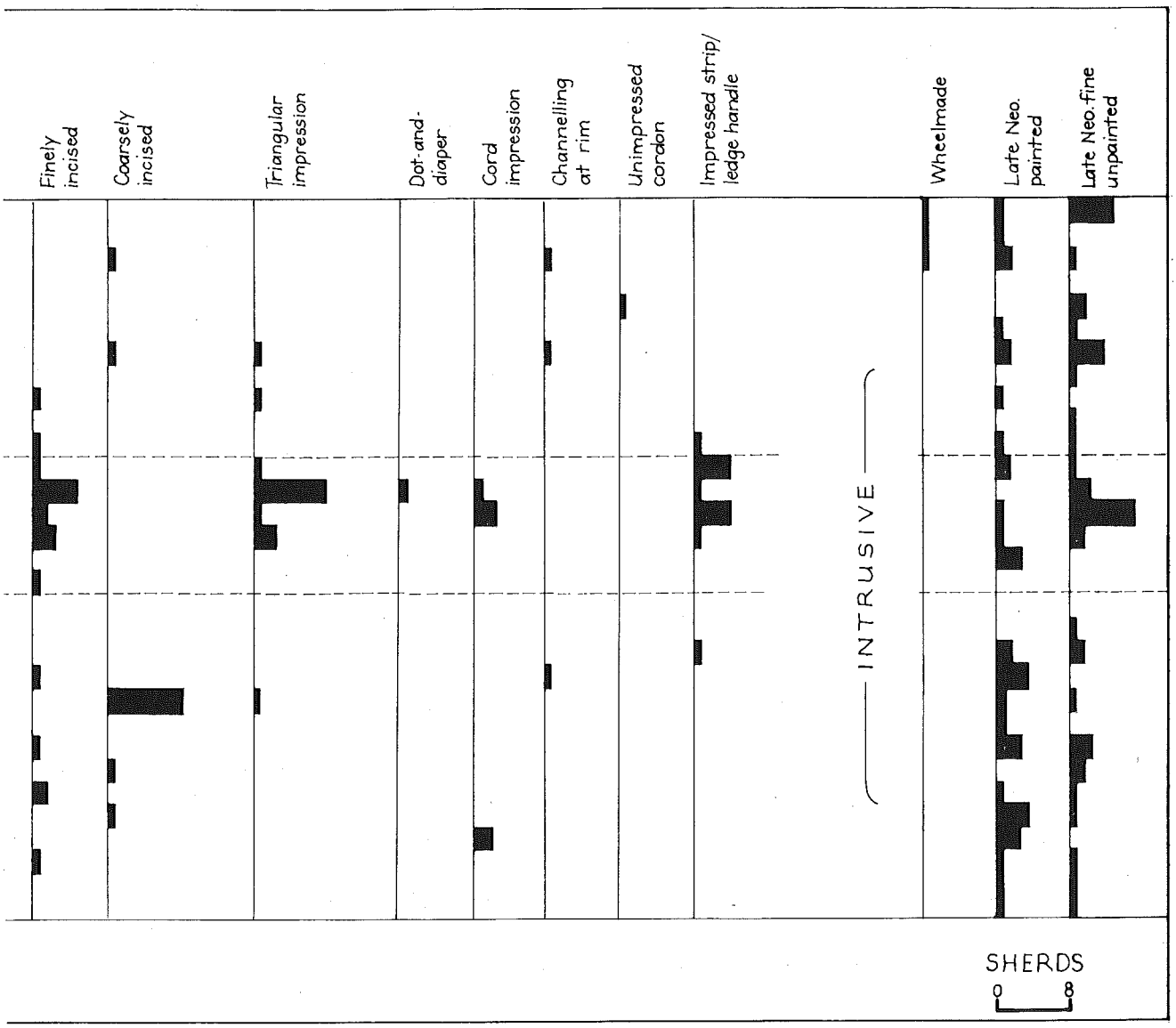
The levels attributed to Va, some 0.7 m of the section, begin with the upper members of the block of floors described above and continue up to layer 34. The layers 46-34 consist of a homogeneous fill without traces of structures, broken only by pits from overlying Vb levels. Material of

Table 13.1. Trench ROc: Stratigraphic and Analytical Units

Counting unit	Layer number
1	2, 3 (pit)
2	4
3	5
4	6
5	7, 8 (pit)
6	9
7	12, 13, 16 (ditch), 21-22 (ditches)
8	14, 15
9	17, 19, 20
10	23, 25, 26, 28 (wall)
11	27, 29-32, 33 (pit), 36-40 (ditches)
12	34
13	41, 48
14	42-44, 46, 47 (wall), 50 (pit)
15	49
16	51
17	52
18	53
19	54, 56
20	55, 57
21	58
22	59
23	60
24	61
25	62
26	63
27	64
28	65, 68 (hearth), 69-71 (ditches)
29	67
30	72



(On facing pages):
Figure 13.1. ROc pottery counts.


Finely incised
Coarsely incised
Triangular impression
Dot-and-diaper
Cord impression
Channelling at rim
Unimpressed cordon
Impressed strip/ledge handle
INTRUSIVE
Wheelmade
Late Neo. painted
Late Neo. fine unpainted
SHERDS
0
8

phase Va thus comes from two sorts of contexts: floor/debris layers or featureless fill.

The levels attributed to Vb begin at level 30 (and associated pits/ditches) with a new block of floors that occupy the lower half of the 0.7 m belonging to this phase. Some discontinuity between Va and Vb is therefore probable. The upper part of Vb (layers 12-2) again consists of featureless fill.

The sequence thus agrees with ZA in suggesting occupational continuity between phases IV and Va, with some discontinuity between Va and Vb.

The ROc Counts

The number of decorative feature sherds from the bronze age layers was not large. Even where amalgamated into counting units, these ranged from 0 to 40 sherds, with an average of about 8. (The total weight of pottery from each unit ranged from 4 to 35 kg, averaging about 10 kg). A series of 18 decorative features was selected for quantitative treatment, and intrusive and upcast material was also counted. The results are shown in figure 13.1.

The dominant decorative element of phase IV is channel decoration (figs. 13.4:1-5; 13.6:8, 9; pls. XII:3; XCVI, top; D:7), which is present from the beginning of the ROc sequence. It rises to a peak in levels corresponding to floors in the middle of the sequence (units 24-22, layers 61-59) and effectively comes to an end with unit 18 (layer 53). A minor decorative element of this phase is finely punched ornament either in lines (fig. 13.6:7) or areas of pointillé sometimes combined with linear incisions (fig. 13.6:4).

In phase Va the broad channeling is replaced by more deeply incised or impressed ornament capable of holding white encrusted paint (pls. XCVII, XCVIII; D:10), as on the pedestal in figure 13.13:5 and plate XCVII:20. The several varieties of this mode of decoration—finely incised lines (fig. 13.10:1; pl. XXXIII:1; cf. D:11), triangular impressions (fig. 13.13:4; pl. XCVII:18), "dot and diaper" (fig. 13.13:9; pls. XXXII:6, XCVII:1, 3)—appear gradually, following the disappearance of channeled decoration. They reach a peak in unit 13 (layer 41) which is in the middle of the featureless fill overlying the block of Va floors. Among the coarser fabrics, short ledge handles bearing finger impressions (fig. 13.16:1) are characteristic.

The fine pottery of Vb is less sharply distinguished from the coarser ones and bears little ornament. White-filled impressed ornament consists of rows of coarsely punched dots (fig. 13.23:3; pls. XXII:4; C, bottom:3, 4, 10) or areas of somewhat more finely punched pointillé ornament (fig. 13.21:7). Impressed cordons (figs. 13.21:6, 13.23:1; pl. C, top:1-8, 12), either on the body (fig. 13.22:4; pl. XXII:3) or rim (figs. 13.22:5; 13.23:6; pls. C, top:6; D:12) of the pot form the main type of applied decoration, and the rims may be directly impressed (fig. 13.23:4, 7; pl. C, top:1, bottom:1, 2). These features are present from the beginning, becoming somewhat more frequent in the featureless layers 9-4 above the block of Vb floors.

Intrusive elements in the form of wheelmade wares appear from layer 5 upward (unit 3), while neolithic finewares, identifiable either by paint or fabric, maintain a constant low background level. These upcasts are occasionally more plentiful than diagnostic decorated bronze age sherds because of their relative frequency in the neolithic layers. The numbers of neolithic sherds show no tendency to decline through time, suggesting that their presence was constantly being reinforced by fresh material from early bronze age pit-digging elsewhere on the mound.

Having thus defined the phases and their diagnostic forms of decoration, the structure of the pottery assemblages as they have been recovered from the whole of the site can now be described.

THE POTTERY OF PHASE IV

Fabrics

The fabrics of phase IV are exclusively dark in color and form a continuum between fine Dark Burnished wares and thicker coarsewares with a

higher proportion of grit and less careful surface treatment. The finewares are very dark and carefully burnished, closely resembling the fabric that in phase III bears graphite paint, though they are now somewhat coarser and less well finished.

Shapes

Fewer complete vessels were preserved from this phase than from the succeeding early bronze age phases, especially in the medium capacity range (see below); however, the similarity in the structure of the assemblage to that of Va gives an overall impression of the forms represented in sherd material.

SMALL BOWLS AND CUPS. Some of the most finely produced forms are drinking and eating vessels of less than a liter in capacity (figs. 13.4, 13.5), with upright (fig. 13.5:4; pl. CII:6), sinuous (fig. 13.4:2, 5; pl. XII:3), or incurving rims (fig. 13.5:1). Those with a differentiated profile, having a marked belly zone and upright or somewhat everted rim, are often distinguished by a zone of vertical channeling at the maximum diameter of the vessel (fig. 13.4:1-5; pls. XII:3; XCVI, top:6, 8). These types continue a bowl tradition well represented in phase III. Larger forms of the same shape, with a capacity of 2 to 3 liters (fig. 13.5:5, 6; pl. XI:4, 5), have a similar arrangement of decoration though this is now executed by incision to give horizontal panels of chevrons separated by applied vertical pellets.

A particular group of small bowls, with hemispherical or weakly differentiated profiles, carry a high-flung strap handle. They do not bear decoration. These may be distinguished as "cups" or "dippers" (fig. 13.4:6-12; pls. XI:1, 2; XII:2), although by comparison with the handled cups of Vb (fig. 13.20) they are still flat, shallow forms that closely resemble contemporary types of bowl. They are, in effect, a traditional bowl type with the addition of a strap handle, perhaps suggesting the influence of metal prototypes for the handles (cf. Mozsolics 1968).

A rather different decorative syntax is typical of the incurved rim bowls, which range from less than a liter to around 3 liters in capacity. These are often undecorated or bear vertical decoration on the incurving slope of the rim. This may take the form either of applied pellets (fig. 13.6:5) or lines of impressed dots (fig. 13.6:7). These forms anticipate the types of bowl which later come to be dominant in bronze age assemblages. In the larger examples, open or somewhat incurving bowls, generally less finely made, grade into the adjacent "urn" category (e.g., fig. 13.7:3).

JUGS AND JARS. Some closed shapes are represented among the fineware sherds, such as the one in figure 13.6:6 with a cylindrical neck. These indicate the occurrence of jars and probably also handled jugs (fig. 13.14:1, 4, 6; pl. CII:4) among the repertoire of phase IV.

URNS. Upright, bucketlike vessels in the 3-10 liter range are only roughly burnished and generally have a tall, conical shape and gently incurving rim (fig. 13.7:1, 5; pl. CII:3). Bases are flat (fig. 13.7:2).

STORAGE VESSELS. Two large storage vessels were preserved in a destruction level in ZE (fig. 13.8; pl. XXXVI:2) and indicate the forms represented by coarsewares with a wall thickness of 1-1.5 cm. Both vessels are conical with slightly incurving or upright rims and rim diameters of 35 and 46 cm. Their capacities are about 12.5 and 15 liters respectively. Both examples have a pair of opposed lug handles in the middle of the pot.

HANDLES. The types of handles represented in the pottery of phase IV include strap handles, represented on jugs and handled bowls; tunnel lugs without expanded ends occurring on fineware bowls; horizontal (figs. 13.6:1-3; 13.9:3-5, 9, 10) and vertical (fig. 13.9:6, 8, 11) stringhole lugs and ledge lugs (fig. 13.7:4) occurring on larger bowls and urns; and lug handles that occur on urns and storage vessels (fig. 13.9; pl. XCVI, bottom). Perforated rim tabs also occur (fig. 13.9:7).

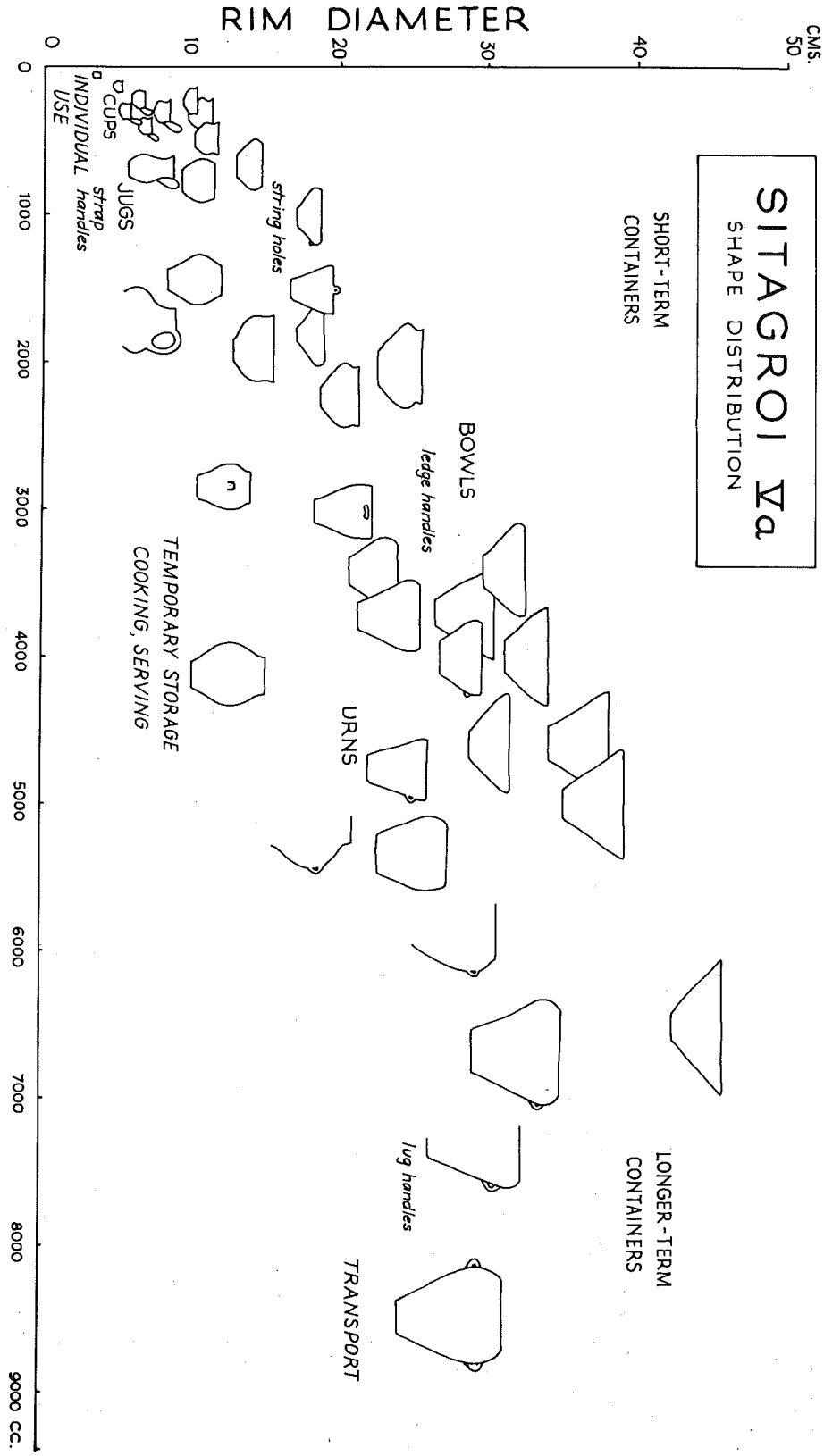


Figure 13.2. Phase Va shape distribution.

THE POTTERY OF PHASE VA

Fabric

The finest fabrics of phase Va are again very dark, with a high burnish and contrasting white-filled impressions replacing channeling as the main form of ornament. There is a gradual transition in surface finish from these decorated wares, through the roughly burnished (pl. D:8, 9) plainware bowls of medium capacity, to the smoothed (but not burnished) (pl. D:13) surfaces of the urns and larger storage vessels.

Shapes

The analysis of vessel forms from this phase is greatly helped by the large number of whole pots preserved in the Burnt House and other destruction contexts. These show that the vessels do not fall into neat, typological divisions but that certain basic shapes are transformed into different functional and stylistic categories over a range of sizes. To define this variability, figure 13.2 was constructed by placing schematic outlines of vessel shape on a two-dimensional array corresponding to rim diameter on the x-axis and vessel capacity on the y-axis. The basic structure of the diagram is thus a series of nonlinear regression curves representing partially continuous transformations of shape over a range of increasing size. As well as separating functional categories by shape and volume, therefore, it also differentiates stylistic groupings by the clustering of certain forms and decorative elements in characteristic ranges along the regression curves.

The range of volumes extends from individual and communal eating and drinking vessels acting as short-term containers to larger vessels used for the longer-term storage and transport of food within the settlement; in between lies the range of vessels used in food preparation and serving. The relation of diameter to volume distinguishes the open shapes, which give easy access to the container during use, from the closed shapes, which prevent spillage. For each zone in the diagram there is a characteristic type of handle, such as the strap handles of cups and jugs, the stringholes of smaller bowls, the ledge handles of larger bowls and small urns, and the lug handles of the large urns. The three main regression curves correspond to: *bowls*, with sinuous small forms (including "cups"), larger, incurving forms, and large straight-rimmed conical forms; *urns*, which gradually differentiate from the medium-sized bowls and have a characteristically incurving rim; and *jugs*, which with increasing size lose their strap handles to become globular jars.

The diagram in figure 13.2 is not, of course, based upon a representative (i.e., random) sample of the range of vessels in use at the time, and is more complete for certain categories than others: larger vessels, like those in the 12-15 liter range known from phase IV, may for instance have existed in Va. Nevertheless, it provides a framework within which to interpret the categories described below.

SMALL BOWLS AND CUPS. Among the finest ceramic products of this phase are the small sinuous bowls with omphalos bases (fig. 13.10:1-5; pls. XXXII:8, 9; XXXIII:1-3; B:4). These are small enough to be hand-held for drinking and may suggest a metal prototype. The decoration is centered on the base (i.e., the pots were meant to be seen upside down) and in three cases consists of a "filled cross" arrangement of lines or hatched zones (fig. 13.10:1b, 2b, 3b; pl. XXXIII:1, 3). The two decorative techniques employed are fine incised lines, used to hatch bands or pendant triangles, and rows of fine triangular impressions linked into lines by a "stab and drag" method. These bowls bear a striking similarity to Kostolac material, such as from Pivnica near Odžak in Yugoslavia (Benac 1962). The radiocarbon date from Pivnica, 2160 ± 160 bc (KN 145), accords perfectly with the dates for phase Va and serves to parallel this material with a late phase of the Baden complex farther north.

One cup, apparently from this phase, is an archaic type with a high strap handle and channel decoration (fig. 13.10:9; pl. XXXV:3). Other small sinuous bowls with a capacity of less than

a liter (fig. 13.11:1 pl. CV:2) are either undecorated or have conical projections, *mammelons* (fig. 13.11:2; pl. CIV:5).

A distinctive class of somewhat larger sinuous bowls, with a capacity of about 2 liters, is also very finely finished and decorated (fig. 13.13:9; pl. XXXII:6, 11). These have opposed suspension tabs with multiple perforations at the rims, suggesting that the vessel was suspended. Two types of decoration may be noted, both confined to the lower half of the bowl: panels of incised cross-hatching alternating with the "dot and diaper" motif, and alternating bands of "stab and drag" and triangular impressions.

A more numerous class of bowls in the 1-2 liter range consists of the incurved rim forms (fig. 13.11:3, 4; pl. CV:1) which are less finely made and undecorated and intergrade with other conical bowls and small urns (figs. 13.11:5-7, 13.15:3, 13.16:2; pls. CII:1, 2, CIII:6).

JUGS AND JARS. The jugs (fig. 13.14:5; pl. XXXII:7) are globular forms with tall cylindrical or flaring necks and strap handles, and a capacity of 1 to 2 liters. A handled lid (fig. 13.14:3) was recovered with one of the jugs (fig. 13.14:5; pl. XXXII:7). Somewhat similar in shape though larger in capacity are the well-finished, globular jars (fig. 13.14:2; pl. CIV:6). These are undecorated except for a rippled effect produced by fine channeling.

URNS. These less finely finished vessels diverge from the tall, conical bowls (fig. 13.15:1) above 3 liters and may have ledge handles (fig. 13.16:1) or lug handles (figs. 13.16:3, 13.18:2, 13.19:2; pl. CIII:2, 4, 5) at the larger (5-10 liter) end of the range. The ledge handles have finger impressions, and some of the larger urns have impressed rims or applied cordons with finger impressions (fig. 13.16:4) which anticipate aspects of the Vb assemblage.

LARGE BOWLS. Bowls with a capacity of 3 liters or more are all conical in shape. This class includes both less finely finished forms which are generally deep, and the very fine decorated examples which are somewhat shallower. The former are usually only roughly burnished and have a somewhat rounded profile with a simple rim (fig. 13.15:1), beveled rim (fig. 13.15:2; pl. CIV:2), or upright rim (fig. 13.18:1; pl. CIV:4), or in some cases the rim is sharply inverted to provide an internal beading (fig. 13.17:1; pl. CV:4). The fine decorated examples are magnificent pieces up to 44 cm in diameter (fig. 13.12) with a dark surface and even burnish. The simple rims carry a band of decoration 3-5 cm deep on the internal surface just below the rim (e.g., fig. 13.12:1; pl. XXXII:2) which may consist of rows of impressed triangles or rectangles, sometimes interspersed with "stab and drag" lines or combined with incised, crosshatched triangles (fig. 13.13:1-4, 8, 10, 11; pl. XCVII:9, 11, 12, 18). One example of a simple rim has four lines of cord impressions (fig. 13.13:6; pl. XCVIII, bottom:1); other sherds with corded decoration from ROc 34, PN, and elsewhere (fig. 13.13:7; pl. XCVIII, bottom:3) may be from similar vessels. The other rim type on this form of vessel is the thickened rim, ornamented with filled pendant triangles (fig. 13.12:2; pl. XXXV:5).

HANDLES. The types of handles represented in the pottery of phase Va include strap handles, tunnel lugs without expanded ends, horizontal and vertical stringhole lugs, and lug handles. Ledge handles may be simple bars (sometimes decorated with finger impressions) or curved and horseshoe shapes.

THE POTTERY OF PHASE VB

Fabrics

The fabrics of phase Vb are generally coarser than those of the preceding bronze age phases; the coarsewares are more heavily gritted, and the finewares less finely finished. Surfaces of even the finest pots are neither so uniformly dark nor so highly burnished as before, and the division between fine and coarse is even harder to define. The role of pottery as a prestige material had evidently declined.

Shapes

Fewer complete vessels are available from this phase than from Va (with the exception of small, resistant forms such as cups: pl. XCIX, top). While the basic categories used in describing the earlier material are still useful, there are some shifts of emphasis in the typology; shapes are generally simplified and some functions may have been transferred to other media.

SMALL BOWLS, CUPS, JUGS, AND JARS. One of the most distinctive forms of this phase is the small, one-handled cup holding about 100 cc. This is no longer simply a bowl with a handle, but an integrated form in its own right (fig. 13.20:1-24; pls. XXII:2, 5; XCIX: top, 1-18). A single example, from relatively high in the Vb levels, has two handles (fig. 13.20:25; pls. XXII:1; XCIX, top: 2). The basic design, with a rounded base and a narrow strap handle rising above the rim, is common to all; but there are many variants, from globular to sharply carinated. A distinctive example, also from relatively late in the phase, has a pointed base similar to the form common at Yunatsite in Bulgaria (fig. 13.27:3).

Rather different from these are the conical bowls holding about 200-600 cc which sometimes have handles (fig. 13.24:1-4; pl. CI:1, 2); and there is also a range of small urns or bowls (fig. 13.25:1-6; pl. CI:6) and beakers (fig. 13.25:8, 9). Small, closed shapes include the amphora, necked jar, and jug (fig. 13.25:10-12). The last of these was found to contain carbonized grains (grain sample 222), mainly of einkorn. Among the suspension jars (fig. 13.10:6; pl. CI:3-5) was an example (fig. 13.25:7; pl. CI:3) which also contained grain sample 218. Such usage of forms more appropriate for liquids may be connected with ritual practices rather than the everyday function of the vessels. Cylindrical necks (fig. 13.21:1-3, 6; pl. C, top:12) and possible lids (figs. 13.21: 4, 5; 13.22:7) indicate the existence of larger closed vessels, whose shape is a matter of conjecture.

As in phase III (pl. XCV:6-8), a number of miniature vessels were recovered (fig. 13.27:4-7), their function unknown.

LARGER BOWLS. There are apparently no bowls of the dimensions of the larger conical forms of the preceding phase, but conical bowls with incurved rims form an important part of the assemblage over a wide range of sizes (fig. 13.26:1-3). These sometimes carry simple decoration in the form of applied pellets (fig. 13.26:7, 8), and some bear stringhole lugs (fig. 13.26:21; pl. C, bottom:6, 8). The more elaborate of these have expanded ends, producing the "trumpet lug" that is one of the hallmarks of this period (fig. 13.26:13-16; 18-20; pl. XCIX, bottom:1, 4, 7). Some of the conical, incurving bowls have distinctive T-section rims (fig. 13.26:9-12).

URNS. Urns, now more cylindrical than conical, form another important part of the assemblage (figs. 13.22:4, 5; 13.23:3; 13.24:11; pl. XXII:3, 4). Profiles are generally slack, including barrel-like shapes and weakly incurving or outcurving rims with generally flat but occasionally protruding-foot bases (fig. 13.22:8). These forms bear a characteristic set of simple decorative elements, usually at the rim or shoulder: rows of fingernail impressions or impressed dots (fig. 13.23:2, 3, 8; pl. XXII:4), applied cordons (fig. 13.23:1; pl. C, top:4), and "pie crust" rims with finger impressions (fig. 13.23:7; pl. C, top:1). The smaller vessels have ledge handles (fig. 13.25:5; pls. CI:6; C, bottom:5); the larger ones, from 2 liters upward, have lug handles. The continuous cordons (fig. 13.23:6; pls. C, top:6; D:12) may have a functional significance in securing flexible organic (e.g., skin) covers with a string tied around the neck of the vessel, or they may be simply skeuomorphic reflections of such strings or ropes. Slack biconical pails with such applied cordons are a common feature of European bronze age assemblages and presumably reflect widespread similarities in diet and food preparation practices.

HANDLES. The elaborate, high-flung strap handles have disappeared by this phase; the focus of elaboration seems to have shifted to the tunnel lugs with their expanded ends (fig. 13.26:13-16, 18-20; pl. XCIX, bottom:1, 4, 5, 7). There are fewer simple stringhole lugs (fig 13.26:17, 21; pl.

C, bottom:8). Lug handles (figs. 13.22:1-3, 13.24:5-10) are more common and occur on smaller types of vessels than previously noted.

LATER BRONZE AGE POTTERY

The uppermost, disturbed levels of PO yielded a series of sherds (fig. 13.27:10-21; pl. XCIX, bottom:3, 6, 9) which relate to an insubstantial bronze age occupation of the mound in the period following phase Vb. These are not sufficient to justify the definition of a further phase of occupation but offer some idea of the subsequent development of the Vb pottery tradition. Almost all are fragments of incurved rim bowls, four of which bear horizontal loop handles (figs. 11.6:20; 13.27:16, 18, 19; pl. XCIX, bottom:6, 9) instead of the tunnel lugs of Vb. A more substantial horizontal handle (fig. 13.27:20) and a large perforated lug (fig. 13.27:21), both probably from urns, show a characteristic trapezoid shape. Several sherds have deeply incised linear decoration (fig. 13.27:10-12), and two sherds from incurved rim bowls have a dot and circle motif on the shoulder (fig. 13.27:14, 15).

DEVELOPMENT OF THE EARLY BRONZE AGE POTTERY

Material from the early bronze age levels at Sitagroi falls into three phases, of which the first two show greater similarity than the third. Phases IV and Va show some measure of continuity in their range of shapes and fabrics with those of the preceding phase. Although the light fabrics bearing dark painted decoration disappeared, the finewares have their basis in the dark fabric used earlier as a background for graphite paint. The shapes of the fine pottery are slacker versions of the angular contours characteristic of the Graphite-painted bowls. Instead of painting, the channeled surface treatment that was becoming increasingly common in the latest stage of phase III becomes the predominant mode of decoration. Instead of the curved channels or cabling of phase III, however, the channel decoration of phase IV is a simpler, vertical use that often degenerates into a perfunctory grooving around the maximum diameter of the body of the vessel. The main innovation in vessel form is the jug/cup combination associated with the manipulation of liquids—a feature common to many assemblages of this period and a characteristic of the early bronze age in general (Renfrew 1972:282-284).

In phase Va the channeled decoration was largely replaced by a new range of incised, white-filled motifs that had no direct precursor in earlier traditions (although this technique had existed in the tripods of phases II and III and alongside painting in the earlier part of phase III). Its introduction in the second phase of the early bronze age arguably reflects new impulses from outside. The structure of the assemblage, however, remains basically similar.

Innovations outside the local tradition are also indicated by the appearance of specific features such as the high-flung strap handles of phase IV, which are joined to a traditional bowl form, and the occurrence of omphalos bases on the small decorated bowls of Va. Both of these may have their origin in the types of metal vessels known to be in contemporary use, for instance at Troy. The overall impression, therefore, is of a ceramic assemblage undergoing a long-term shift in usage, due to changes either in diet or in social practices, into which particular innovations intrude from outside to introduce new shapes and types of decoration.

A somewhat greater difference is evident in the pottery of Vb. This continues the trend toward coarser fabrics and less differentiated shapes but is marked by the emergence of two new features: the small, handled cup—no longer just a bowl with handles—and the use of finger-impressed cordons and pie-crust rims on the ubiquitous urns. These complete the conversion of a lingering late neolithic tradition of pottery making into a typical (if somewhat rustic) bronze age assemblage.

Before outlining some of the possible reasons for this transformation, it might be useful to clarify the continuity of the record at Sitagroi and its stratigraphic basis. It has long been realized that

tell sites, although providing well-preserved samples of material conveniently arranged in temporal order, do not necessarily give a continuous record of material culture. The stratigraphy and associated radiocarbon dates suggest the possibility of an interruption in the record between phases III and IV of potentially up to 300 years, though it is probably more like 100. This gap probably explains the abrupt termination of features such as painted decoration that were, in any case, already in decline, and it suggests that the model of gradual transformation is probably valid for the III/IV transition as well as for development within the early bronze age phases.

Within the early bronze age, the transition between IV and Va probably has a continuous stratigraphic record, as demonstrated by the continuing build-up of the blocks of floor levels represented in ZA and ROc. This is supported in the pottery record by the fact that despite the division evident in the histogram showing the frequency of decorative elements, it is possible to point to archaic or transitional types within the Va assemblage, such as the handled cup with channel decoration from ZHt 13 (fig. 13.10:9; pl. XXXV:3).

The change from Va to Vb, however, may be accentuated by a slight stratigraphic discontinuity. The radiocarbon dates indicate that this is unlikely to be longer than 50-100 years, but the association in ROc of the first material of phase Vb with an episode of pit digging before the beginning of a new block of floors indicates that the record is probably less continuous than that between IV and Va.

The more marked changes in pottery assemblages are thus likely to be in part due to breaks in the record, though the contrasts between phases remain valid and, in the case of the IV/Va transition where a continuous record is available, a relatively sudden injection of new features seems to have taken place.

The most interesting question, then, is the interpretation of the overall decline in the quality of pottery and the emergence of a new standard repertoire of early bronze age forms. The economic evidence indicates that the subsistance practices of early bronze age groups differed significantly from those of their predecessors. This is evident from phase IV onward both in the animal and plant remains (Bökönyi, chap. 5; J. M. Renfrew, *Sitagroi* vol. 2). The proportions of animal bones changed radically, with higher percentages of pig and deer, and the increased mean size of sheep limb bones suggests exploitation for secondary products. One effect of this could be an increased use of milk. Plant foods became more diverse; there was a shift to barley, more vetches and lentils, and striking occurrences of acorns. (The type of "soup" that perhaps resulted is shown in the phase IV grain sample, GS 231 from SL 11, which contained acorns, *Polygonum* seeds, and cockle shells.) Freshwater mussels also became more frequent in bronze age layers. Of direct relevance is the change in the morphology of grape pips from phase IV onward, indicating the appearance of a domestic form possibly used for winemaking (J. M. Renfrew, *Sitagroi* vol. 2). This is particularly significant in relation to the cups and jugs.

In addition, the patterns of grain storage on the site may have changed with the appearance of large numbers of clay bins in Vb. These may have taken over some of the functions of the large storage vessels (about 15 liters) known from phase IV. The quantities of grain required by a household over a year would be larger than could be stored within a building such as the Burnt House. Vessels such as urns, therefore, could well have been used for carrying supplies within the site (perhaps using a rope slung through the lug handles) and being stored on a daily or weekly basis within the house. These organizational factors are likely to have influenced the composition of pottery assemblages over the period in question.

Equally fundamental, however, are the social contexts within which pottery was made and used. The bronze age pottery as a whole did not carry the density of messages encoded in the prolific ornamentation of the neolithic painted wares, and arguably the pottery in general was less a vehicle for the expression of prestige. Some of this devaluation may have resulted from the appearance of metal vessels in adjacent areas (Bittel 1959); certain features of the IV and Va

pottery seem to reflect this. Significantly, these are connected with the fine vessels associated with drinking; and this jug/cup/dipper/bowl complex is a distinctive feature of the elite burials with paired oxen in the Baden culture (Sherratt 1981:282). What seems to be emerging as the main set of prestige pottery types is a group of vessels concerned with drinking, and perhaps (in the case of the large conical bowls) communal eating. In communities rich enough to support the technology required, these vessels were made of metal, and details of the metal forms influenced the design of the pottery ones. The pottery forms were not simply copies of metal ones, however; both were a reflection of a social practice.

It is probably simplistic to attribute such forms to specific commodities such as wine (which could not have been produced at that time in the central European area of the Baden culture); no doubt a variety of intoxicating drinks were used. It is their use in a particular practice (perhaps, like the classical Greek *Symposion*, essentially a male drinking club) that explains their widespread appearance in third millennium assemblages. It is significant that drinking vessels became the symbol of male elites in the Corded Ware and Bell Beaker complexes—northern rustic echoes of the Anatolian and southeast European drinking cups. The common factor behind these developments is likely to have its roots in the fundamental changes in sexual roles as a result of the increasing pastoral element in European agricultural systems (Sherratt 1981).

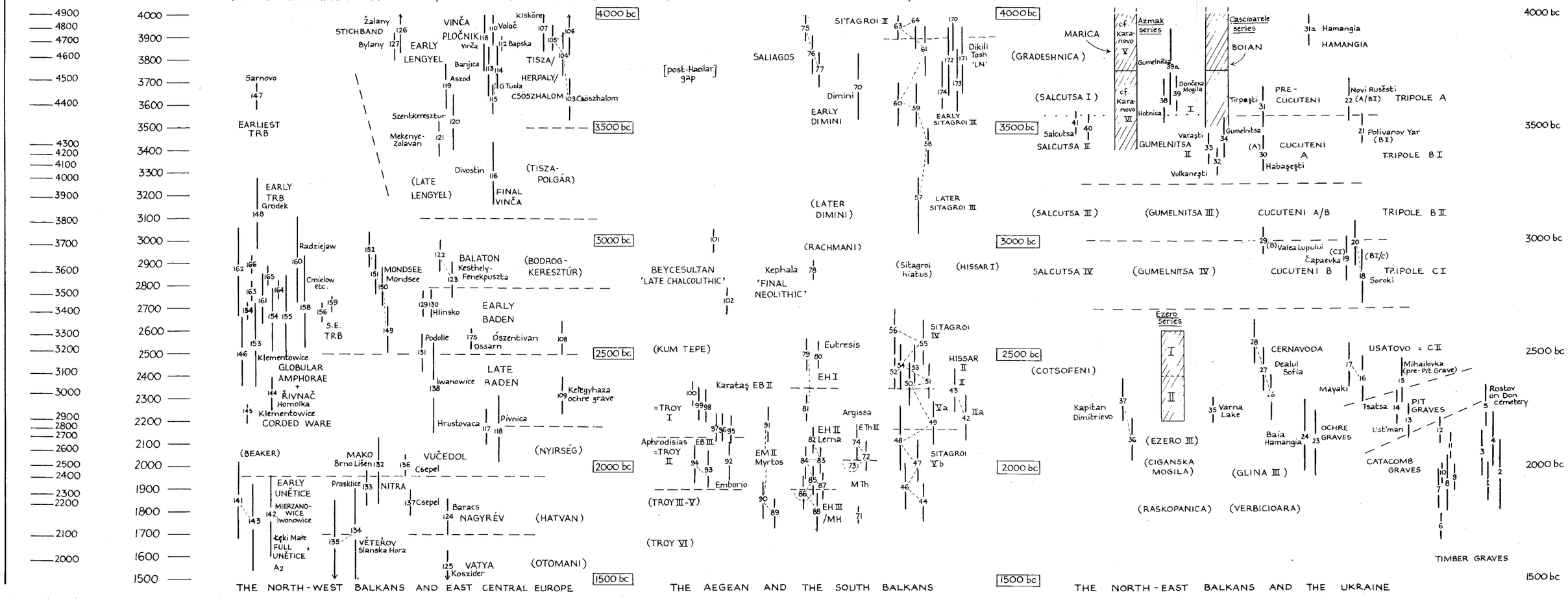
COMPARISONS WITH OTHER AREAS

As a result of his surveys and fieldwork, Heurtley (1939) was able to describe an early bronze age assemblage typified by finger-impressed coarsewares, trumpet lugs, and small, handled cups. This assemblage has been taken as representative of the whole of the Macedonian early bronze age (e.g., Mellaart 1960). As a result of the Sitagroi excavations, this material can now be seen as characteristic of the latest stage in a long sequence of pottery assemblages which can be described as early bronze age and within which three divisions can be recognized.

The use of radiocarbon dating allows this sequence to be compared with those of adjacent areas (fig. 13.3). The early bronze age material from Sitagroi covers a period from ca. 2600 bc to 1900 bc (ca. 3400-2400 BC). This parallels the Early Helladic I, II, and III periods in the southern mainland of Greece, the Baden and Vučedol (Zók) cultures of central Europe, and the three phases of the Bulgarian early bronze age as represented at the site of Ezero (Dipsiska Mogila). On the eastern side of the Aegean, this is represented by Poliochni Black to Yellow phases and Troy I-II, with the earlier material from Kum Tepe. These sequences can now be compared in more detail with that from Sitagroi (table 13.3; cf. Sherratt 1976).

The Carpathian Basin

The late neolithic and copper age cultures of the Carpathian Basin are characterized by a twofold geographical division, corresponding to the catchments of the Danube and the Tisza. In the west, on the Danube, the various phases of the Lengyel culture run parallel to the Tisza and Tiszapolgár cultures of the east. These develop into the Balaton group and the Bodrogkeresztúr cultures, respectively. At a time corresponding to the beginning of the early bronze age in the Aegean sense,[2] the Boleraz group appears in both areas, though with a greater density and continuity in the west. It is characterized by channeled decoration (cf. Sitagroi IV), some finger-impressed cordons, handled jugs, and wide conical bowls, and coincides with important technological developments: the pottery box with two cattle protomes from Radošina (Němejcová-Pavúková 1973) is the first indication of paired-ox traction in Europe. The Classic Baden phase (Banner 1959; Chropovský 1973) that succeeds it also has plentiful channel decoration, and the tall jugs now have high-flung strap handles. This is the time of the well-known cemeteries of Alsónémedi and Budakalász, with their cart model cups, paired-ox burials and accompanying elite drinking set of jug, dipper, cup, and bi-



Uncorrected dates are the radiocarbon estimates.

Calibrated dates use the MASCA scale ; the difference between these and the uncorrected dates shows the overall trend of the calibration curve ; the closeness of individual calibrated dates shows shorter-term fluctuations.

Thin dotted lines link dates from the same site.

Thick dotted lines represent extrapolations to cognate groups.

Brackets denote interpolated phases not directly dated.

Dates as published in Sept. 1974, on the 5568 half-life. Interpretation by A.G.S.

THE RADIOCARBON CHRONOLOGY OF SOUTH-EAST EUROPE AND NEIGHBOURING AREAS, 4000 - 1500 bc.

Figure 13.3a. Radiocarbon chronology of southeast Europe and neighboring areas, 4000-1500 bc.

Figure 13.3b. Radiocarbon dates from southeast Europe, 4000-1500 bc. (Key to dates plotted on chronological chart, figure 13a; numbers below correspond to those on chart.) All dates are expressed as uncorrected radiocarbon determinations.

1.	Rostov on Don (U)	Le 624	1930 ± 90
2.	Rostov on Don (U)	Bln 693	1975 ± 160
3.	Rostov on Don (U)	Bln 696	2055 ± 100
4.	Rostov on Don (U)	Bln 697	2115 ± 120
5.	Rostov on Don (U)	Bln 694	2265 ± 100
6.	Demitrovski (U)	Le 823	1730 ± 60
7.	Demitrovski (U)	Le 822	1900 ± 90
8.	Gireyeva Mogila (U)	RUL 136	1920 ± 130
9.	Ust Dzhegutinskaya (U)	Le 692	1950 ± 60
10.	Demitrovski (U)	Le 824	1970 ± 50
11.	Ust Dzhegutinskaya (U)	Le 687	2090 ± 60
12.	Ust Dzhegutinskaya (U)	Le 693	2160 ± 60
13.	Ust'man (U)	UCLA 1271	2200 ± 80
14.	Tsatsa (U)	UCLA 1270	2260 ± 80
15.	Mihailovka (U)	Bln 630	2380 ± 100
16.	Majaki (U)	Le 645	2390 ± 95
17.	Majaki (U)	Bln 629	2450 ± 100
18.	Soroki II (U)	BM 494	2842 ± 116
19.	Čapaevka (U)	Bln 631	2920 ± 100
20.	Soroki II (U)	BM 495	2990 ± 105
21.	Polivanov yar (U)	GrN 5134	3490 ± 70
22.	Novi Rushesty (U)	Bln 590	3615 ± 100
23.	Baia Hamangia (R)	KN 38	2110 ± 160
24.	Baia Hamangia (R)	Bln 29	2140 ± 160
25.	Hamangia (R)	GrN 1995	2580 ± 65
26.	Dealul Sofia (R)	Bln 62	2310 ± 100
27.	Dealul Sofia (R)	Bln 61	2435 ± 100
28.	Dealul Sofia (R)	Bln 61a	2555 ± 100
29.	Valea Lupului (R)	GrN 1982	3000 ± 60
30.	Hăbăşeşti (R)	GrN 1985	3380 ± 80
31.	Tîrpeşti (R)	GrN 4424	3590 ± 85
31a.	Hamangia (R)	GrN 1986	3930 ± 70
32.	Vulkanşhti (U)	Le 640	3350 ± 60
32a.	Vulkanşhti (U)	Mo 417	3860 ± 150
33.	Vărăşti (R)	GrN 1987	3410 ± 70
34.	Gumelnitsa (R)	GrN 3028	3450 ± 90
35.	Varna (B)	KI 89	2260 ± 60
36.	Baniata (B)	Bln 405	2125 ± 100
37.	Baniata (B)	Bln 202	2292 ± 100
38.	Hotnica (B)	Bln 125	3610 ± 100
39.	Doncheva Mogila (B)	Bln 337	3640 ± 80
39a.	Gumelnitsa (R)	GrN 3025	3765 ± 170
40.	Sălcutsa (R)	GrN 1989	3500 ± 55
41.	Sălcutsa (R)	GrN 1990	3525 ± 55
42.	Hissar (J)	Bln 351	2220 ± 100
43.	Hissar (J)	Bln 350	2340 ± 100
44.	Sitagroi (G) Vb	BM 653	1840 ± 78
45.	Sitagroi (G) Va	BM 652	1853 ± 59
46.	Sitagroi (G) Vb	Bln 780	1920 ± 100
47.	Sitagroi (G) Vb	Bln 876	2015 ± 100
48.	Sitagroi (G) Vb	Bln 781	2135 ± 150
49.	Sitagroi (G) Va	Bln 877	2220 ± 100
50.	Sitagroi (G) IV/ Va	Bln 782	2360 ± 100
51.	Sitagroi (G) IV	BM 651	2382 ± 79
52.	Sitagroi (G) IV	BM 650a	2413 ± 56
53.	Sitagroi (G) IV	Bln 773	2440 ± 100
54.	Sitagroi (G) IV	Bln 878	2445 ± 100
55.	Sitagroi (G) IV	Bln 880	2560 ± 100
56.	Sitagroi (G) IV	Bln 879	2600 ± 100
57.	Sitagroi (G) III	Bln 774	3150 ± 120
58.	Sitagroi (G) III	Bm 650b	3417 ± 85
59.	Sitagroi (G) III	Bln 883	3595 ± 100
60.	Sitagroi (G) III	Bln 881	3605 ± 100
61.	Sitagroi (G) III	Bln 882	3845 ± 100
62.	Sitagroi (G) II	Bln 776	3770 ± 100
63.	Sitagroi (G) II	BM 649	3954 ± 66
64.	Sitagroi (G) II	Bln 777	3970 ± 120
70.	Dhimini (G)	H (?)	3680 ± 150
71.	Argissa (G)	GrN 4470	1790 ± 35
72.	Argissa (G)	GrN 4143	2050 ± 70
73.	Argissa (G)	GrN 4471	2010 ± 60
74.	Argissa (G)	GrN 4144	2110 ± 80
75.	Saliagos (G)	P 1368	3959 ± 87
76.	Saliagos (G)	P 1353	3825 ± 84
77.	Saliagos (G)	P 1393	3766 ± 85
78.	Kephala (G)	P 1280	2876 ±56
79.	Eutresis (G)	P 306	2496 ± 69
80.	Eutresis (G)	P 307	2492 ± 57
81.	Eutresis (G)	P 317	2262 ± 56
82-88.	Lerna series (G)	P 318	2120 ± 72
		P 321	1990 ± 68
		P 300	1920 ± 61
		P 303	1800 ± 112
		P 319	2030 ± 66
		P 320	1980 ± 65
		P 312	1890 ± 72
		P 299	1800 ± 97
89.	Myrtos (G)	Q 951	1785 ± 80
90.	Myrtos (G)	Q 950	1855 ± 85
91.	Myrtos (G)	Q 953	2192 ± 80
92.	Emborio (G) IV	P 273	2025 ± 92
93.	Aphrodisias (T)	P 1654	1993 ± 86
94.	Aphrodisias (T)	P 1652	2037 ± 61
95.	Karataş (T)	P 919	2176 ± 60
96.	Karataş (T)	P 918	2180 ± 60
97.	Karataş (T)	P 921	2188 ± 60
98.	Karataş (T)	P 917	2271 ± 60
99.	Karataş (T)	P 923	2278 ± 62
100.	Karataş (T)	P 920	2324 ± 62
101.	Beycesultan (T)	P 298	3010 ± 58
102.	Beycesultan (T)	P 297	2740 ± 62
103.	Csöszhalom (H)	Bln 509	3625 ± 100
104.	Csöszhalom (H)	Bln 512	3825 ± 100
105.	Csöszhalom (H)	GrN 1993	3895 ± 60
106.	Csöszhalom (H)	Bln 510	3925 ± 100
107.	Kisköre-Gát (H)	Bln 515	3940 ± 120
108.	Ószentiván (H)	Bln 476	2565 ± 80
109.	Ketegyháza (H)	Bln 609	2315 ± 80
110.	Valač (J)	Bln 436	3945 ± 80
111.	Vinča (J)	GrN 1537	3895 ± 160
112.	Bapska (J)	Bln 348	3870 ± 30
113.	Banjica (J)	GrN 1542	3760 ± 90
114.	Gornja Tuzla (J)	Bln 349	3760 ± 100
115.	Gornja Tuzla (J)	GrN 1974	3630 ± 60
116.	Divostin (J)	BM 574	3297 ± 144
117.	Hrvstovaca (J)	Bln 564	2175 ± 50
118.	Pivnica (J)	KN 145	2160 ± 160
119.	Aszód-Papiföldek (H)	Bln 607	3670 ± 100
120.	Szentkeresztdomb (H)	Bln 585	3510 ± 120
121.	Mekénye Zalavá (H)	Bln 502	3450 ± 80
122.	Keszthely Fenékpuszta (H)	Bln 501	2940 ± 80
123.	Keszthely Fenékpuszta (H)	Bln 500	2830 ± 80
124.	Baracs (H)	Bln 340	1785 ± 80
125.	Dunaújváros-Koszider (H)	Bln 341	1555 ± 80
126.	Zalany (H)	Bln 240	3931 ± 100
127.	Bylany (Cz)	GrN 4751	3860 ± 65
128.	Bylany (Cz)	LJ 2053	3850 ± 300
129.	Hlinkso (Cz)	GrN 6941	2720 ± 45
130.	Hlinkso (Cz)	GrN 6942	2720 ± 40
131.	Podolie (J)	Bln 556	2505 ± 80
132.	Brno-Lišen (Cz)	Bln 433	1975 ± 150
133.	Prasklice (Cz)	Bln 475	1895 ± 80
134.	Budkovice (Cz)	LJ 2048	1700 ± 200
135.	Slanska Hora (Cz)	LJ 2047	1650 ± 200
136.	Csepel (H)	GrN 6900	1995 ± 40
137.	Csepel (H)	GrN 6901	1820 ± 55
138.	Iwanowice (P)	M 2166	2350 ± 200
139.	Łeki Małe (P)	GrN 5037	1655 ± 35
141.	Iwanowice (P)	M 2328	1850 ± 170
142.	Iwanowice (P)	M 2168	1770 ± 180
143.	Iwanowice (P)	M 2325	1750 ± 170
144.	Homolka (Cz)	GrN 4065	2310 ± 70
145.	Klementowice (P)	GrN 5046	2220 ± 300
146.	Klementowice (P)	KN 225	2490 ± 160
147.	Sarnovo (P)	GrN 5035	3620 ± 60
148.	Gródek (P)	KN 243	3100 ± 160
149.	Mondsee (A)	VRI 250	2610 ± 100
150.	Mondsee (A)	VRI 68	2800 ± 90
151.	Mondsee (A)	VRI 119	2850 ± 90
152.	Mondsee (A)	VRI 37	2960 ± 90(?)
153.	Niedźwiedź (P)	M 2321	2520 ± 190
154.	Radziejów (P)	M 1845	2640 ± 190
155.	Niedźwiedź (P)	M 2322	2650 ± 190
156.	Cmielow (P)	GrN 5088	2665 ± 35
157.	Zarębowo (P)	GrN 5044	2675 ± 40
158.	Niedźwiedź (P)	M 2323	2690 ± 190
159.	Cmielow (P)	GrN 5036	2700 ± 40
160.	Radziejów (P)	M 1845	2910 ± 200
161.	Cmielow (P)	M 566/592	2725 ± 110
162.	Złotniki (P)	M 1847	2860 ± 200
163.	Radziejów (P)	GrN 5045	2760 ± 40
164.	Cmielow (P)	GrN 5090	2770 ± 40
165.	Cmielow (P)	GrN 5089	2825 ± 40
166.	Cmielow (P)	GrN 5087	2875 ± 40
170.	Dikili Tash (G)	Gif 1736	3990 ± 160
171.	Dikili Tash (G)	Gif 1424	3800 ± 140
172.	Dikili Tash (G)	Gif 1425	3800 ± 140
173.	Dikili Tash (G)	Gif 1423	3700 ± 140
174.	Dikili Tash (G)	Gif 1738	3650 ± 150
175.	Ossarn (A)	GrN 6940	2570 ± 40

ADDENDA
(not on chart)

Lefkandi EB III (G)	LJ 1823	2070 ± 60
Lefkandi EB III (G)	LJ 3042	1980 ± 40
Lefkandi EB III (G)	LJ 3047	2060 ± 40
Lefkandi MH II (G)	LJ 3053	1780 ± 50

KEY

U = USSR
G = Greece
T = Turkey
J = Jugoslavia
B = Bulgaria
P = Poland
A = Austria
H = Hungary
R = Romania

Sources: The Azmak (B) series is listed in *Radiocarbon* 8:32-35; the Cascioarele (R) and Ezero (B) series are listed in Kohl and Quitta (1969) in the *Zeitschrift für Archaeologie 3:239.*

Table 13.2. Schematic Chart of Sitagroi and Neighboring Sequences

Radiocarbon years bc	Northwest Europe	Baden area	Ezero	Sitagroi	Southern Greece	Poliochni	Troad	Near East	Calendar years BC.
			Ciganska Mogila	Surface material		"Brown"		Akkadian	
2000						"Yellow"	– Troy III		2500
	Beaker	Vučedol	Late Ezero	Vb	E.H. III	"Red"	IV, V Troy II	Early Dynastic III	
2200						"Green"			
	Corded ware	Late Baden (Kostolac)	Middle Ezero	Va	E.H. II	"Blue"	Troy I	Early Dynastic I + II	3000
2400									
	Passage grave	Classic Baden	Early Ezero	IV	E.H. I	"Black"	Kum Tepe	Jemdat Nasr (Uruk III)	
2600									
		Boleráz	hiatus	hiatus				Uruk IV	3500
2800	TRB Early Neolithic	Balaton		late III?					
3000				III					

partite bowl. The Baden sequence is paralleled by the closely comparable Cotsofeni culture in Transylvania. In the late phase of the Baden culture, represented by Bošáca in the north and Kostolac in the south, the channeling gives way to impressed linear or panel ornament, especially pendant triangles, and the somewhat more squat shapes include small bowls with omphalos bases (cf. Sitagroi Va). These groups coexisted with peoples of Pit-grave tradition with ocher burials under tumuli which are especially dense in the center of the Great Hungarian Plain in eastern Hungary.

From a fusion of these two groups there arose the Zók culture, with its regional groups Vučedol, Makó and Nyírség, which begins the Hungarian early bronze age, contemporary with Sitagroi Vb. The transformation of the copper industry to one based on arsenical alloying and two-piece mold casting on Caucasian models took place at this time, which is contemporary with the spread of Bell Beakers farther west.

This sequence indicates the significance of the Danube axis in Hungary in the third millennium bc as an important focus of developments from which stylistic impulses reached as far as Macedonia. This is manifested in a general way in the channel decoration of Sitagroi IV and more specifically in the Kostolac bowls of phase Va. Thereafter its influence is less marked. The high-strap handles which appeared in both areas at the time of Sitagroi IV may indicate the appearance of similar metal prototypes in both areas at this time.

The Lower Danube and Bulgaria

The final phases of the painted pottery tradition represented by the Gumelnitsa culture are poorly understood, and many of the major tells in central Bulgaria have a hiatus at this point. In northern Bulgaria there are many fortified promontory sites belonging to the Sălcutsa culture, and a late phase (Sălcutsa IV) has been

identified by a particular kind of handle (*scheibenhenkel*) that also appears in the final phase of Bodrogkeresztúr. The Sălcutsa IV culture is paralleled in the eastern part of the Lower Danube basin by the Cernavoda I culture, which still has a chalcolithic appearance in its shapes and fabrics, though it lacks painted decoration. It was contemporary with Cucuteni B in Moldavia and the Ukraine.

The most marked change occurred at the time of the emergence of Baden and Sitagroi IV, with the appearance of three well-defined complexes: Cernavoda III along the Lower Danube, Folteşti (including "Cernavoda II" material) in the former Cucuteni area, and Ezero in central Bulgaria. These all have the typical finger-impressed cordons and coarser fabrics of the bronze age wares, and a tendency toward urnlike shapes with fairly slack profiles. The most relevant sequence from the standpoint of Sitagroi is that from Dipsiska Mogila, Ezero, where this material is labeled "early bronze age" as in the Aegean system (Georgiev and Merpert 1979).

The 3 meters of early bronze age deposit at Dipsiska Mogila have been divided into twelve levels (numbered from top to bottom), which have been grouped into three phases. The first is Early Ezero ("Ezerovo I"); the second, Middle Ezero ("Mihalich"); and the third, Late Ezero ("Kyrilmetodievo"). These are separated by a hiatus from the underlying Gumelnitsa levels and have a series of radiocarbon dates. Unfortunately this series of dates, which runs from ca. 2500-2100 bc (Quitta and Kohl 1969) correlates rather poorly with the stratigraphic sequence, and several interpretations are possible. The most plausible is that the range of dates is correct although the levels and phases are incorrectly ordered: this is the interpretation given in table 13.3. (This problem does not occur with earlier tell sequences from this area, such as those from Azmak and Căscioarele: Quitta and Kohl 1969.) In this case the sequence (allowing for undated portions at the top and bottom) runs largely in parallel to levels IV, Va, and Vb at Sitagroi.[3]

The dominant forms throughout are the incurved rim bowl and urn forms with finger-impressed cordons. These, and the occasional tunnel lugs and T-rim bowls, resemble material from Sitagroi Vb more closely than that from the preceding phases. Indeed, the occasional loop handles which occur even in the earliest EBA phase at Ezero are only represented at Sitagroi in the surface scatter of post-Vb bronze age pottery. Conical bowls with thickened rims suggest analogies with Sitagroi Va, but features such as ribbed or knobbed handles and beak-spouted jugs have an Anatolian appearance without parallels at Sitagroi.

Thus either the Ezero sequence represents a short occupation toward the end of the Sitagroi early bronze age sequence, which seems unlikely in view of the depth of deposit, or else it represents a regional tradition running parallel to the early bronze age phases at Sitagroi and impinging on it only in its later part, that is, in Vb. In either case, Sitagroi can be seen as linked to the Baden sphere (via the Strymon and Axiós) in phases IV and Va, reorienting its external links in Vb toward central Bulgaria. This represents a return to the pattern of external links which dominated its development in phase III (especially its earlier part) when analogies with Maritsa and Gumelnitsa material are clearly evident.

The Aegean

By comparison with the close links that can be inferred between Sitagroi and its northern neighbors, its connections with the Aegean (mainland Greece, the islands, and western Anatolia) are less striking. It has long been noted that trans-Aegean links at this time, such as those between Troy and Lerna, were essentially maritime and that these currents scarcely impinged upon the Macedonian littoral. Thus although both southern mainland Greece and western Anatolia increasingly adopted wheelmade pottery in the later part of the early bronze age, this development did not occur in Macedonia until the iron age.

In addition, the sequences from the Aegean are less well defined and dated for the crucial period of the early third millennium bc. Although the start of the early bronze age in the Aegean has been conventionally defined by the begin-

ning of the sequence at Hissarlik (Troy), this has always been recognized as an arbitrary point even within the sequence of northwest Anatolian assemblages. The lower part of the sequence at Poliochni and the material from Kum Tepe show earlier phases of the Troy tradition, although the lack of radiocarbon dates has made it difficult to be precise about the chronology. Controversy has also attended attempts to parallel the succession at Troy both with the rest of Anatolia and with mainland Greece.

The most continuous record for this period is from Beycesultan (Lloyd and Mellaart 1962) which may be used as a general indication of the development of west Anatolian assemblages. Here, a late chalcolithic phase dating to the later fourth and early third millennium bc should be contemporary with the later phases of Gumelnitsa and the final neolithic in Greece. It is characterized by bowls and jugs in simple globular forms in a dark, lightly burnished fabric with sparing white linear paint. This is followed by early bronze age levels that show striking innovations in shape and fabric. This is most notable in the spherical jugs with a cylindrical neck and sloping rim which are made in a fine, thin, black fabric with superlative burnish and wide, even channeling. They are precisely comparable to the gold jugs from Alaca Hüyük, whose fluting is exactly reproduced in the channeling. The second phase of the early bronze age has a great variety of new forms, many of which have analogies with contemporary metal vessels. Bowls, many on pedestals, have sharply incurved rims with high-flung strap handles or cabled loop handles. Jugs now include forms with sloping or cutaway rims and spouts. The third phase is distinguished by the introduction of wheelmade vessels (including many two-handled cups), and by spouted "teapots" and handled ewers with metal prototypes at Troy and Alaca. The general progression is thus from a relatively simple assemblage to one with shapes and fabrics clearly influenced by contemporary metal vessels, and then to one increasingly made up of wheelmade wares.

The sequence from Poliochni on Lemnos (Brea 1964), together with Kum Tepe and Troy itself (Blegen et al. 1950-51), provides a succession for the early bronze age of northwest Anatolia and its subsequent development. The earliest phase, Poliochni Black, has bowls with tunnel lugs and simple jugs as well as specific local features such as pedestals and stand rings. The only echo of metallic forms are the high-flung strap handles, as in Sitagroi IV. The succeeding "blue" phase adds sloping-rim jugs, beak spouts, and cylindrical spouts. There are occasional tunnel lugs with expanded ("trumpet") ends, and also loop handles. The "green" phase compares closely with Troy I, with forms such as the tripod bowl on cylindrical legs and the lidded pyxis with suspension tabs. Although probably broadly contemporary with Sitagroi Va, there are few specific points of comparison.

The second phase at Troy shows some parallelism with Sitagroi Vb. Bowls took on more rounded profiles, with incurving rims and trumpet lugs which were increasingly replaced by loop handles. Toward the end of the phase, wheelmade forms appeared along with a variety of handled drinking vessels—like the famous *depas amphikipellon*—that have circular-sectioned rather than strap handles. Wheelmade wares play a larger part in the third phase (Troy III, IV, V), although handmade forms continue, and by the middle bronze age (Troy VI) the assemblage is dominated by gray wheelmade wares in the shapes and fabrics appropriate to this technique. There is thus a gradual development away from the "rustic" bronze age assemblages like those of Macedonia and Thrace toward mass-produced types of pottery.

These sites, and the other early bronze age sites in Anatolia where metal vessels have been found (Alaca, Horoztepe, Mahmatlar, and Kayapinar), indicate the role of metal prototypes in acting as models for prestige pottery shapes, especially those forming part of the drinking complex. Metal vessels are known in gold, silver, and bronze; the gold ones were probably the easiest to manufacture. The first known examples from Europe date from the early second millennium: County Bihar (Hungary), Fritzdorf (Germany), and Rillaton (England), all of which are cups with riveted strap handles (Mozsolics 1968).

Similar pieces may have circulated in southeast Europe in the third millennium, perhaps as imports from Anatolia, and this is the most plausible explanation of the widespread appearance of strap handles in Sitagroi IV and in the Baden area. (Already by Troy II, however, flat "ribbon" handles had been partly superseded in Anatolian workshops by tubular ones—as on the *depas amphikipellon*—soldered rather than riveted.)

The early bronze age sequence from central and southern Greece has several features in common with that of west Anatolia: an early phase (Early Helladic I) with simple globular shapes including jugs and high-handled cups; a middle phase (Early Helladic II) with further echoes of metal forms, including the gold "sauce-boat"; and a late phase (Early Helladic III) with the first wheelmade wares and other Anatolian features such as two-handled forms. Fabrics continue the generally light colors of earlier traditions but carry a distinctive red slip which becomes the dark, lustrous *Urfirnis*. No sherds of this easily recognizable ware were observed at Sitagroi, though a brown-painted EH III sherd was found at Kritsana in a context comparable to Sitagroi Vb (Heurtley 1939:fig. 43). In general terms, therefore, this tripartite sequence parallels phases IV, Va, and Vb at Sitagroi.

The early bronze age sequence in Thessaly has also been divided into three phases (Milojčić 1959). The first has shallow cups with high-flung handles as in Sitagroi IV, and the second is associated both with *Urfirnis* imports and impressed decoration (including the use of cord) related to Sitagroi Va. The third phase has large incurved-rim bowls with horizontal loop handles, T-rims, and two-handled cups, covering both Sitagroi Vb and the later surface scatter. Of all the neighboring areas, this Thessalian material, not unsurprisingly, most closely resembles that from Macedonia.

This survey thus suggests that the tripartite sequence of early bronze age material from Sitagroi conforms in broad terms to EB I, II, and III stages as these terms are used in the Aegean. Its general content, however, has more in common with Thessaly and the northern Balkans than with more dynamic parts of the Aegean, though stray metal vessels from these areas may have inspired one or two of its more distinctive forms. The first two phases have their closest analogies in Yugoslavia and southern Hungary, while the third phase shows closer links with central Bulgaria and so, indirectly, with northwest Anatolia.

CONCLUSION

The change in the character of pottery assemblages at Sitagroi between phases III and IV is part of a general pattern affecting much of southeast Europe. The stable pattern of development within Balkan neolithic and chalcolithic cultures was radically changed in the third millennium by the rising importance of two areas: the steppes and the Aegean/Anatolian area. Both of these ultimately reflected changes within the Near East and the increased scale and complexity of urban societies there. These contacts resulted in economic diversification and, in the case of the Aegean, also the formation of direct trading links with more advanced communities in Anatolia. Southern Greece thus attained a new prominence, while Macedonia became something of a backwater.

Innovations in subsistence practices which may be indirectly related to Near Eastern developments can be dated to the time of Sitagroi IV (Aegean EB I). Evidence from central Europe, including cart models and plow marks, show that paired-ox traction was in use by this time. The economic evidence from Sitagroi indicates that major changes in subsistence took place between phases III and IV, and these may be part of this widespread horizon of change in agricultural systems. The appearance of alloying in the copper metallurgy of this period at Sitagroi suggests that innovations were reaching this area from Anatolia, and this may also be true of subsistence developments such as viticulture and the plow.

The divergence between southern Greece and Macedonia accelerated during the time of Sitagroi Va (EB II), when specific trans-Aegean trading links between the Argolid, the Cyclades, and western Anatolia were reflected in the appear-

ance of gold and silver plate and jewelry and an increased scale of copper metallurgy in these areas. The appearance of these new features in EB II times can be related to the westward extension of trade routes across Anatolia, bringing new conditions of production for metalwork (specialist craft workshops) and pottery (bulk production on the wheel). Anatolian features in the southern Aegean became even more prominent in EB III, perhaps because of more direct intervention, while at the same time in the northern Balkans, connections with the steppe area were increasingly evident in the typology of bronzework. The trade routes across the Aegean conspicuously avoided Macedonia, setting the pattern for subsequent bronze age development in which Mycenean Greece formed part of an international maritime world whereas Macedonia had a more local role, closely related to her northern neighbors.

NOTES

1. Indeed, with hindsight, it would have been more expressive of their affinities if the material called "Va" had instead been designated "IVb," since it is closer in character to IV than to Vb.

2. Boleraz and Baden are labeled "Late Copper Age" in the Hungarian system, while this period is known in Romania as the "Period of Transition" *(Perioada de Tranzitsia)* despite its duration of more than a millennium.

3. However, some features of the Ezero early bronze age material, such as clay hooks and elaborate handle forms, are more typical of EB III contexts in the Aegean.

ADDENDUM

Volumetric Measurements in Cubic Centimeters

Vessel	Volume
Fig. 13.4:2; pl. XII :3	350*
Fig. 13.4:5	350
Fig. 13.4:6; pl. XI:1a	125
Fig. 13.4:7	135
Fig. 13.4:8; pl. XI:1c	120
Fig. 13.4:9; pl. XI:2	75
Fig. 13.4:10; pl. XII:2	125
Fig. 13.4:11; pl. XI:1d	110
Fig. 13.4:12; pl. XI:1b	380
Fig. 13.5:1	200*
Fig. 13.5:2; pl. XI:3	500
Fig. 13.5:6; pl. XI:5	2,500*
Fig. 13.7:1; pl. CII:3	3,750*
Fig. 13.7:4	4,000
Fig. 13.8:1; pl. XXXVI:2	12,500*
Fig. 13.8:2; pl. XXXVI:2	15,000*
Fig. 13.10:1; pl. XXXIII:1	250
Fig. 13.10:2; pl. XXXIII:3	325
Fig. 13.10:3; pl. XXXIII:2	100
Fig. 13.10:4; pl. XXXII:9	125
Fig. 13.10:5; pl. XXXII:8	75*
Fig. 13.10:8	125*
Fig. 13.10:9; pl. XXXV:3	150
Fig. 13.11:2	500
Fig. 13.11:3; pl. CV:1	1,000
Fig. 13.11:4	1,250
Fig. 13.11:6; pl. CIII:6	900
Fig. 13.11:7; pl. CII:2	500-1,000*
Fig. 13.12:1; pl. XXXII:2	5,000*
Fig. 13.12:2	6,500
Fig. 13.13:9; pl. XXXII:6	2,000
Fig. 13.14:1; pl. CII:4	700
Fig. 13.14:2; pl. CIV:6	5,000*
Fig. 13.14:5; pl. XXXII:7	1,500
Fig. 13.14:6	1,000-1,500*
Fig. 13.15:1	2,500*
Fig. 13.15:2; pl. CIV:2	3,500*
Fig. 13.15:3	2,000*
Fig. 13.16:2; pl. CII:1	1,500
Fig. 13.15:3; pl. CIII:4	5,000*
Fig. 13.17:1; pl. CV:4	3,750
Fig. 13.19:1; pl. CIII:3	4,000*
Fig. 13.19:2; pl. CIII:2	8,500
Fig. 13.22:4; pl. XXII:3	5,000
Fig. 13.23:3; pl. XXII:4	2,500
Fig. 13.24:1	270
Fig. 13.24:2	800*
Fig. 13.24:4	300*
Fig. 13.24:11	1,750
Fig. 13.25:5	140
Fig. 13.25:6	350*
Fig. 13.25:7	160

* Approximate

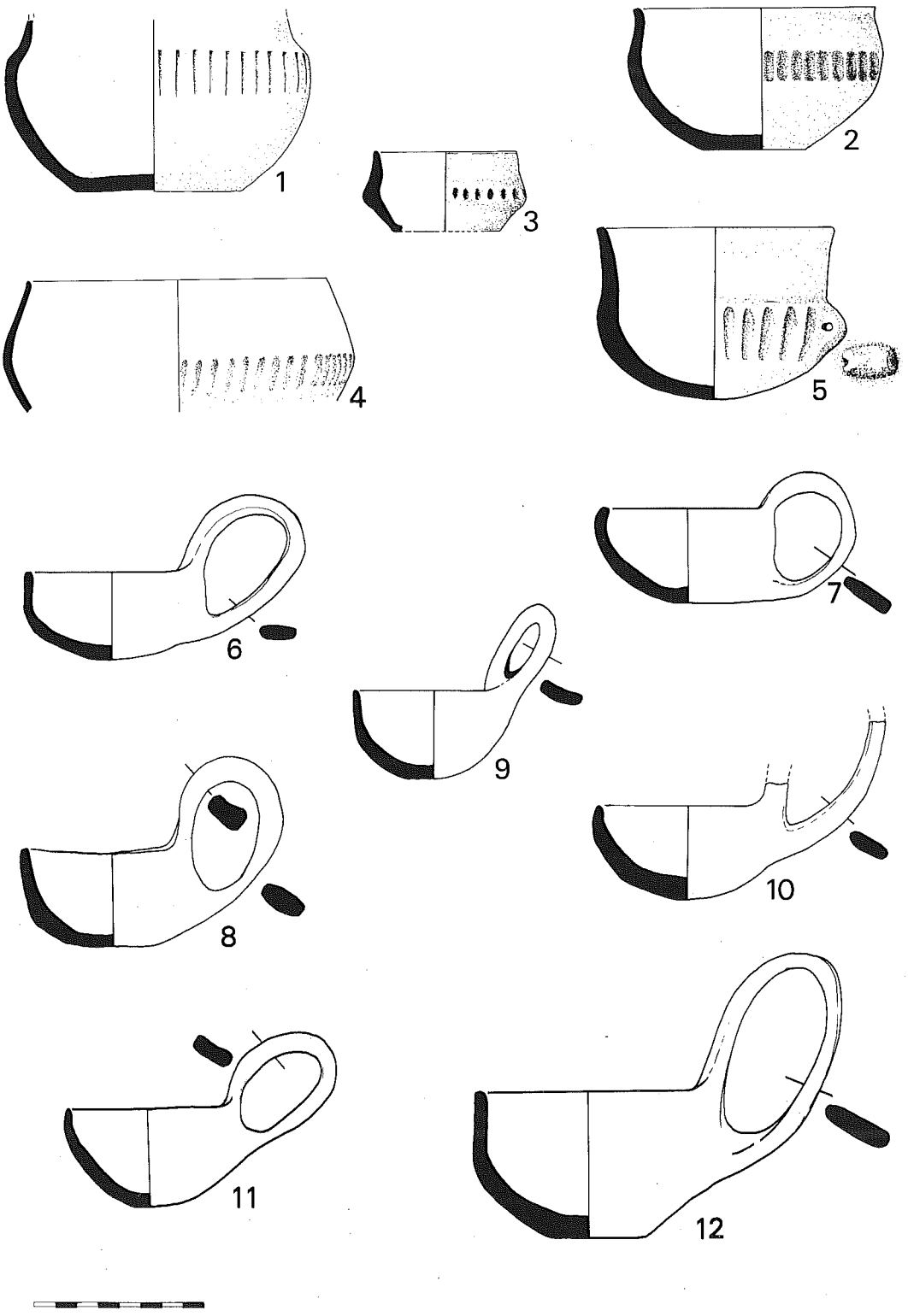


Figure 13.4. Phase IV. Bowls with channeling (1-5), and cups or scoops with high-flung strap handle (6-12). All burnished except nos. 3, 4.

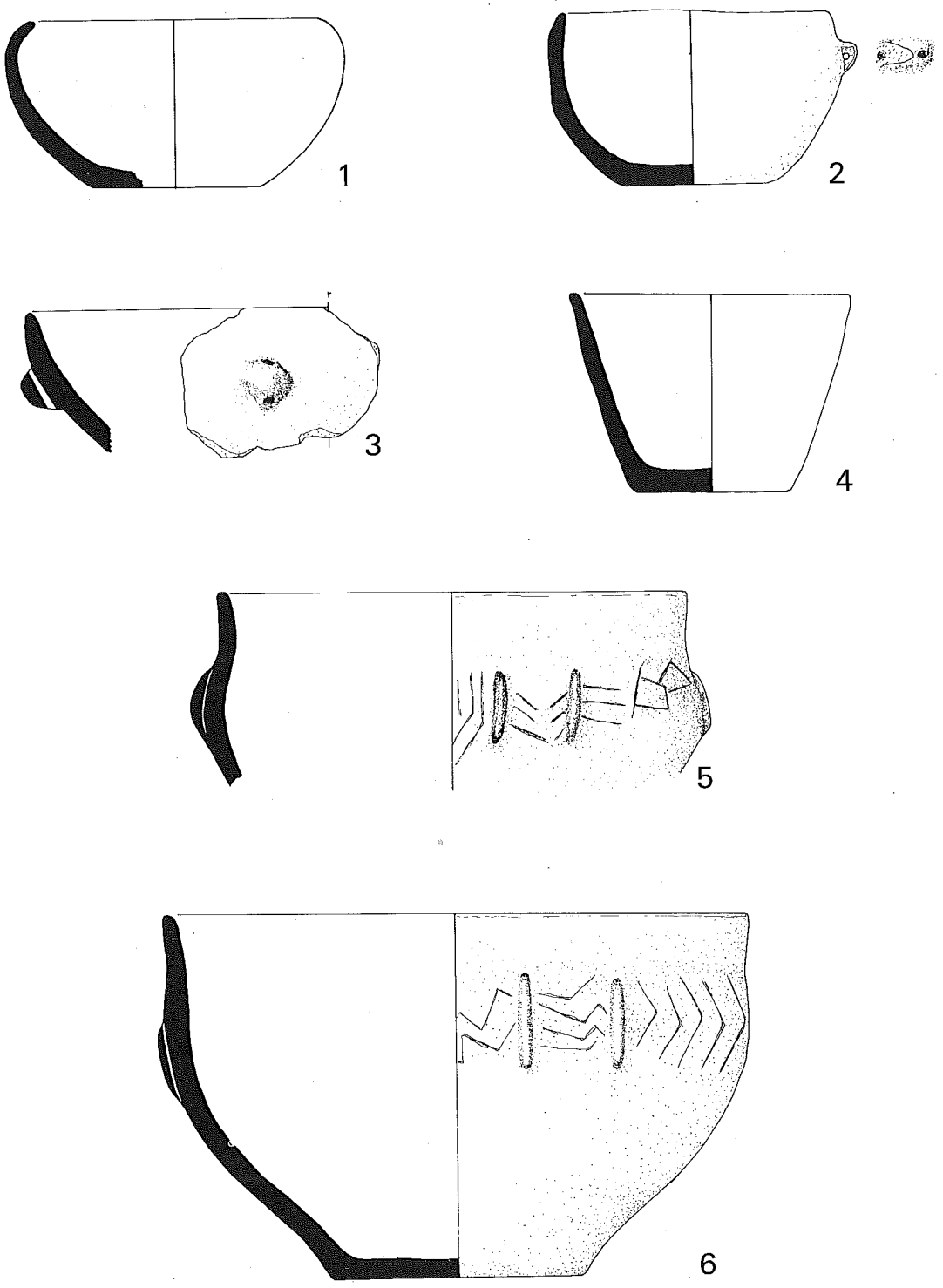


Figure 13.5. Phase IV. Bowls with incurved (1) and upright rims (4), with stringhole lugs (2, 3), and with vertical pellets and incisions (5, 6). Burnished examples: 1, 2, 6; smoothed: 4.

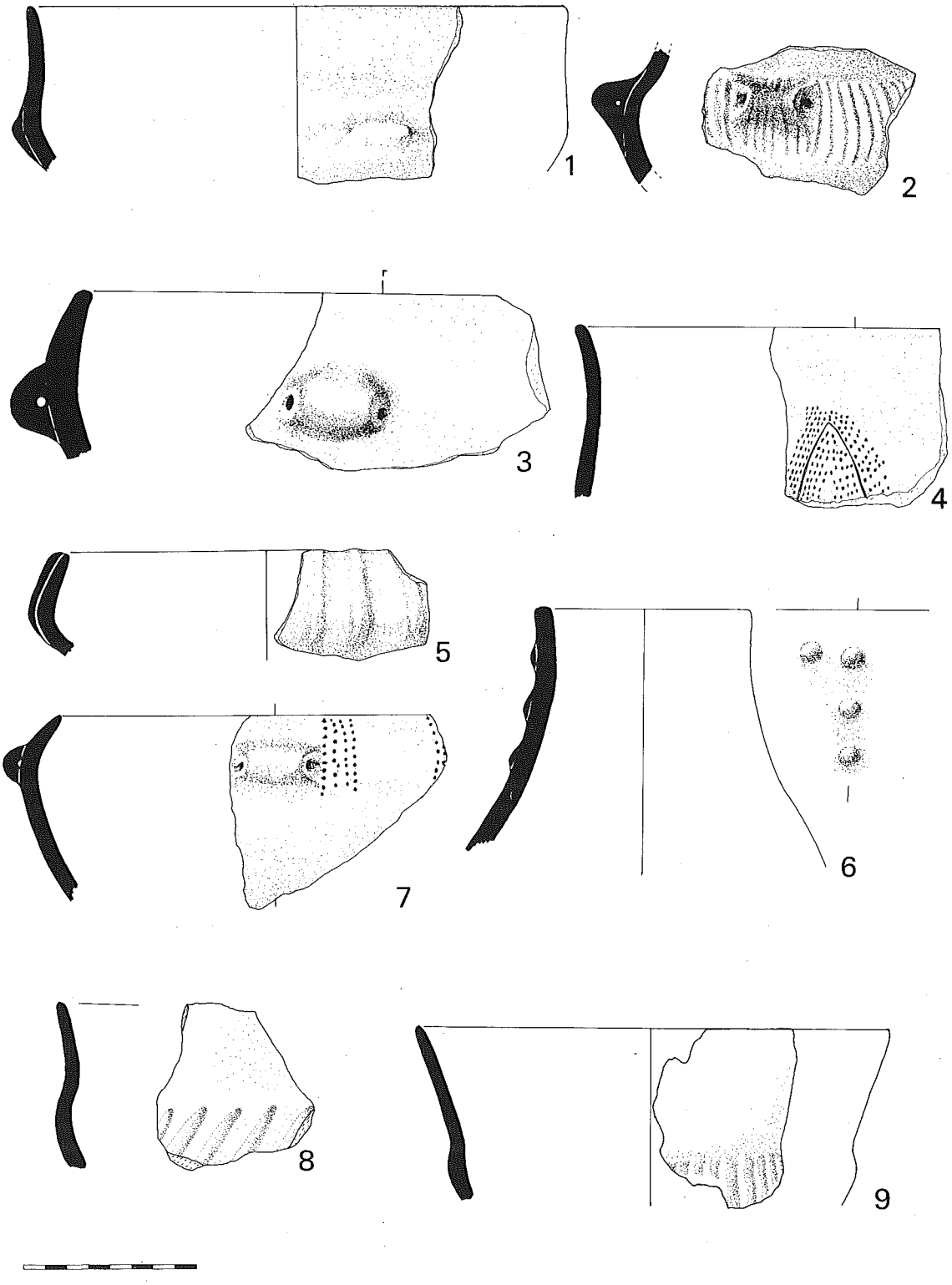


Figure 13.6. Phase IV. Rims with stringhole lug (1, 3) and pointillé decoration (7); everted form with incisions and pointillé (4) or with body channeling (8, 9); incurved form with vertical pellets (5). Body sherd with channeling and stringhole lug (2). Jar neck with knobs (6).

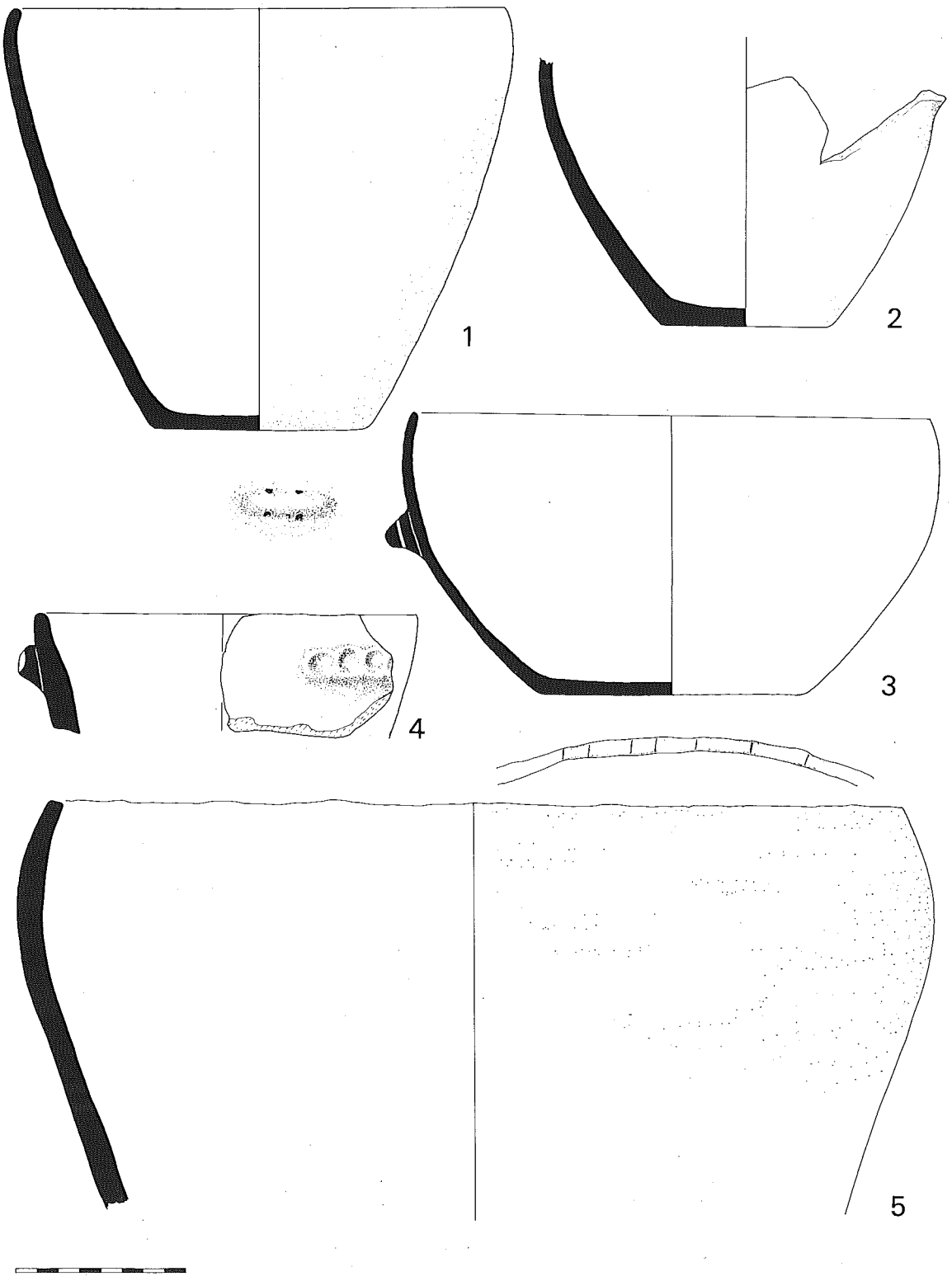


Figure 13.7. Phase IV. Roughly burnished urns (1, 2, 5), rim fragment with ledge lug (4); bowl with stringhole lug (3).

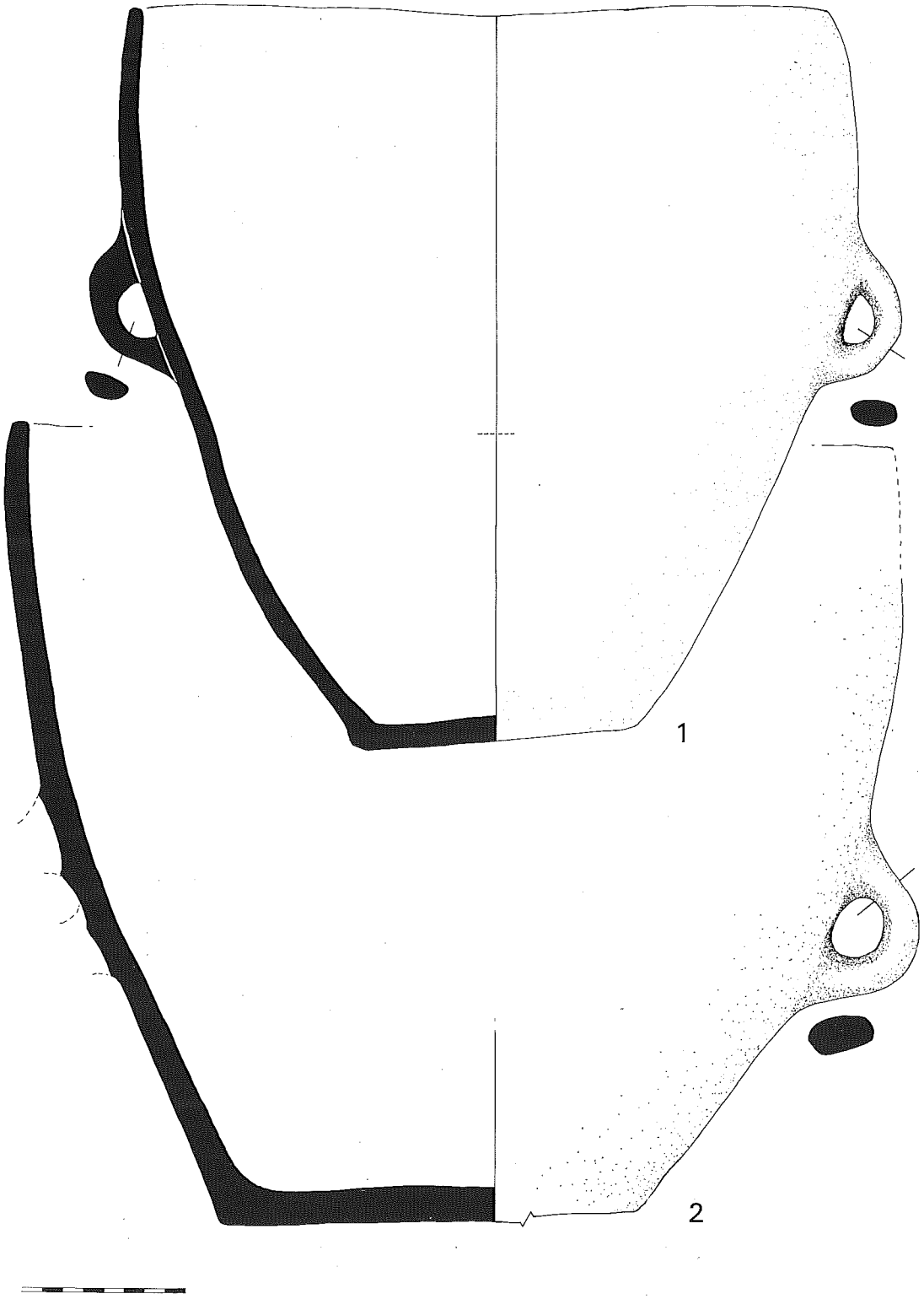


Figure 13.8. Phase IV. Large, roughly burnished storage vessels with handles.

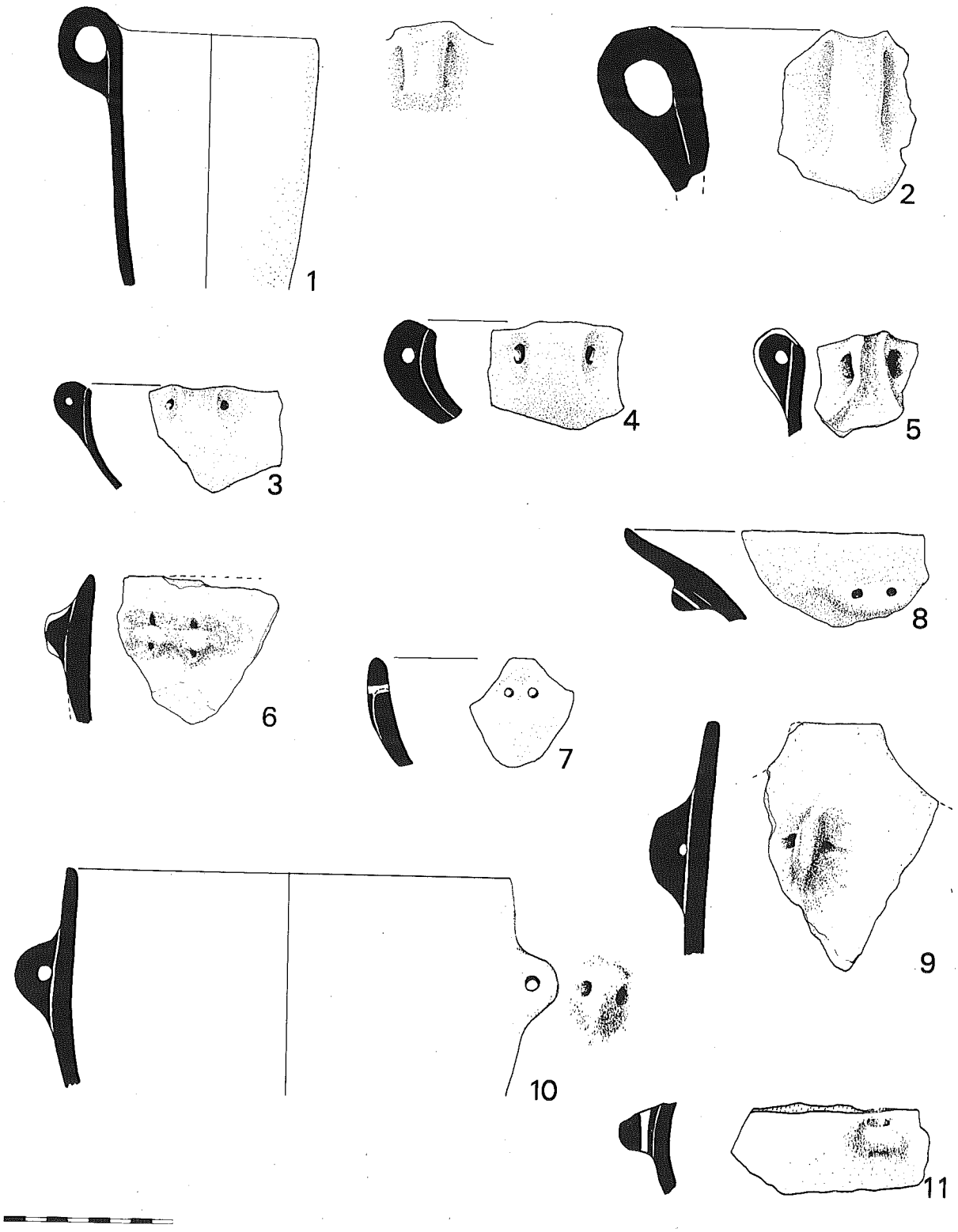


Figure 13.9. Phase IV. Lug types, at rim (1, 2), horizontal stringhole at rim (3-5), ledge handle with vertical stringhole (6, 8), horizontal stringhole below rim (9, 10), perforated rim tab (7), and vertical stringhole (11).

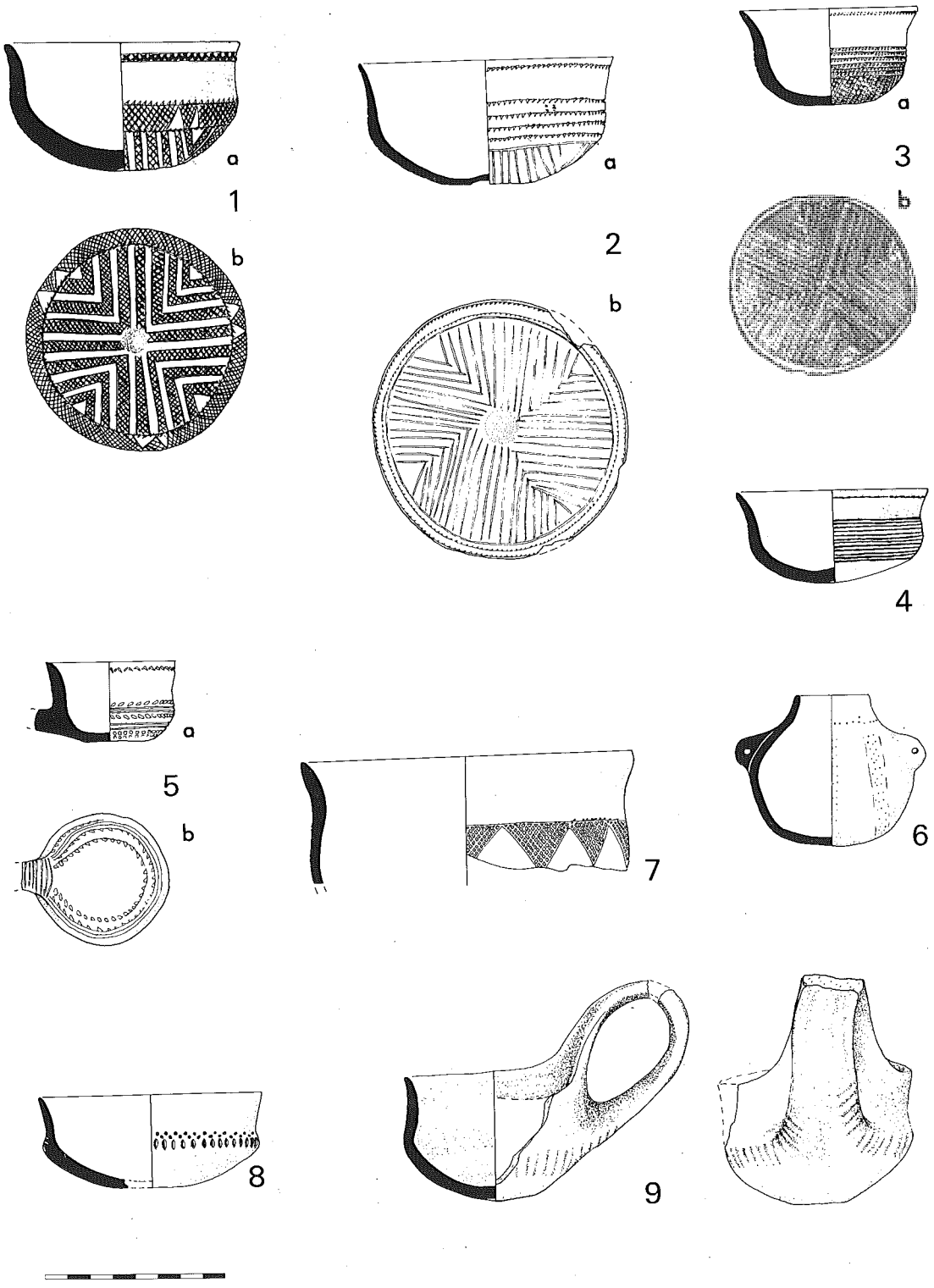


Figure 13.10. Phase IV/Va. Small bowls with sinuous profile, incisions, and impressions (1-4, 7), and with handle (5), and burnished (8); suspension jar with pointillé decoration (6); burnished high-handled cup with channeling (9). Omphalos bases: 1-5, 9.

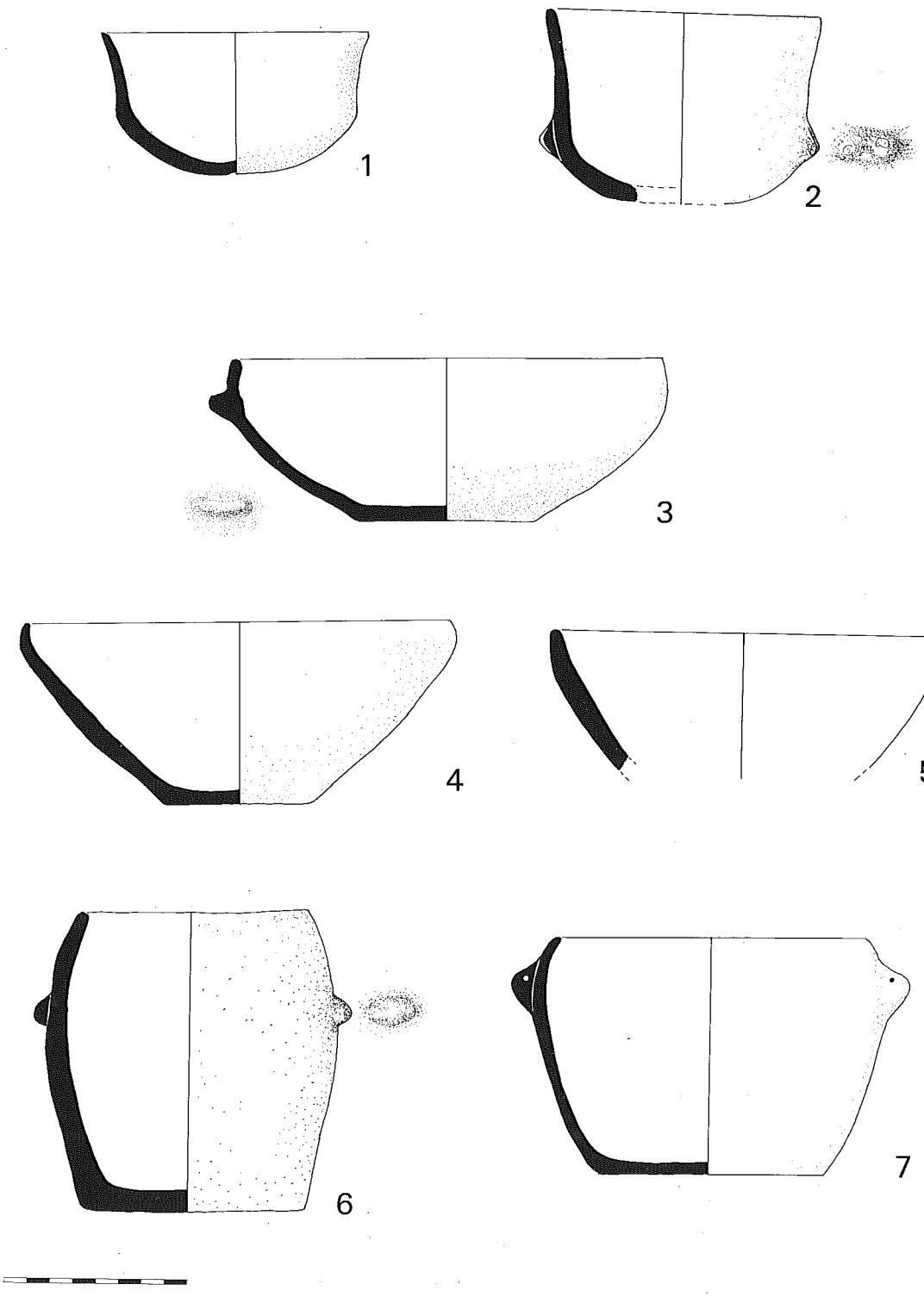


Figure 13.11. Phase Va. Bowls with sinuous profile (1), with *mammelons* and flat base (2), with incurved rim (4) and with ledge lugs (3); small conical form (5). Urns with ledge lugs (6) and stringhole lugs (7). Smoothed: 1-4, 6; burnished: 7.

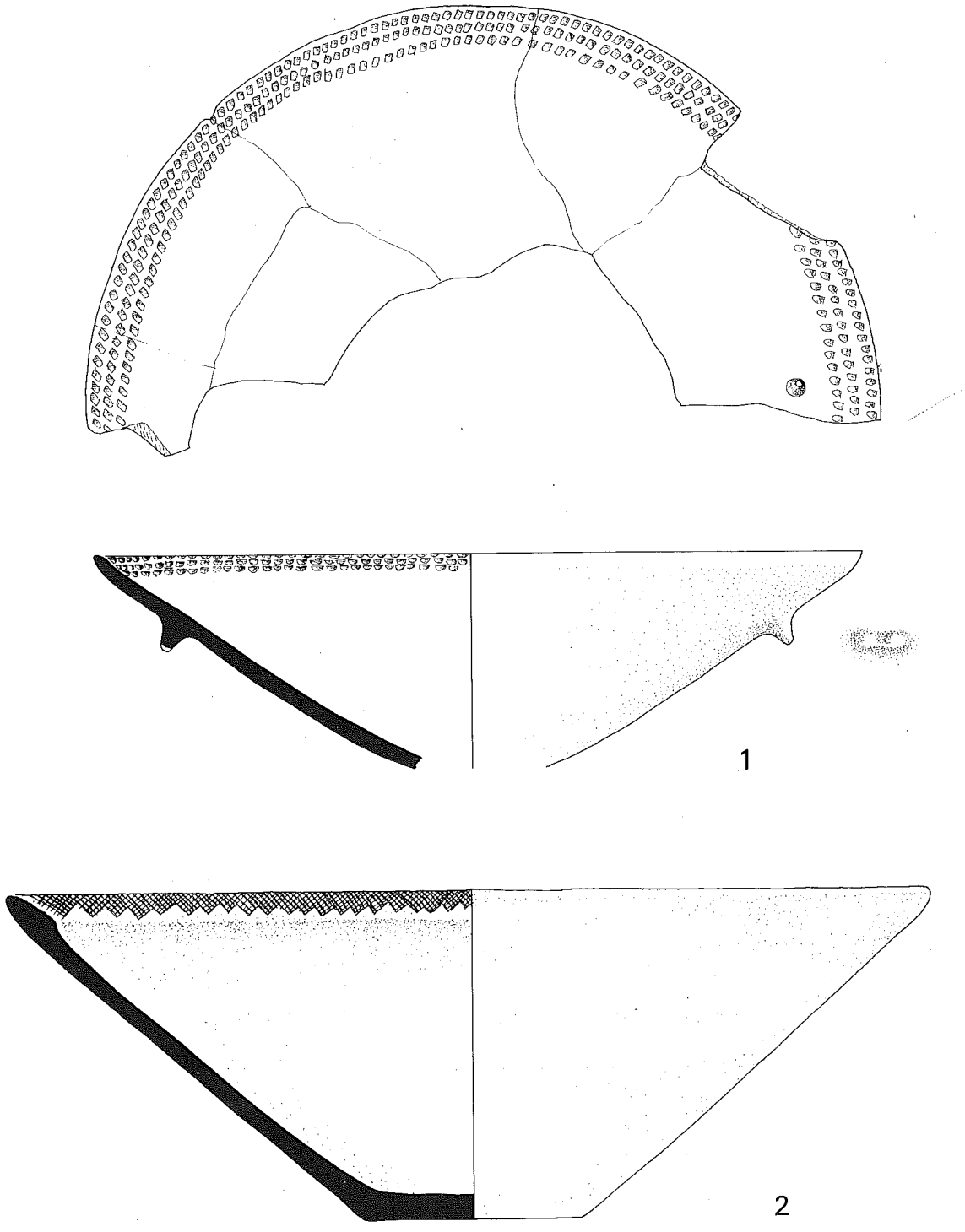


Figure 13.12. Phase IV/Va. Conical bowls. Finely burnished decoration, ledge lugs, and repair hole (1); thickened rim with incised decoration, burnished (2).

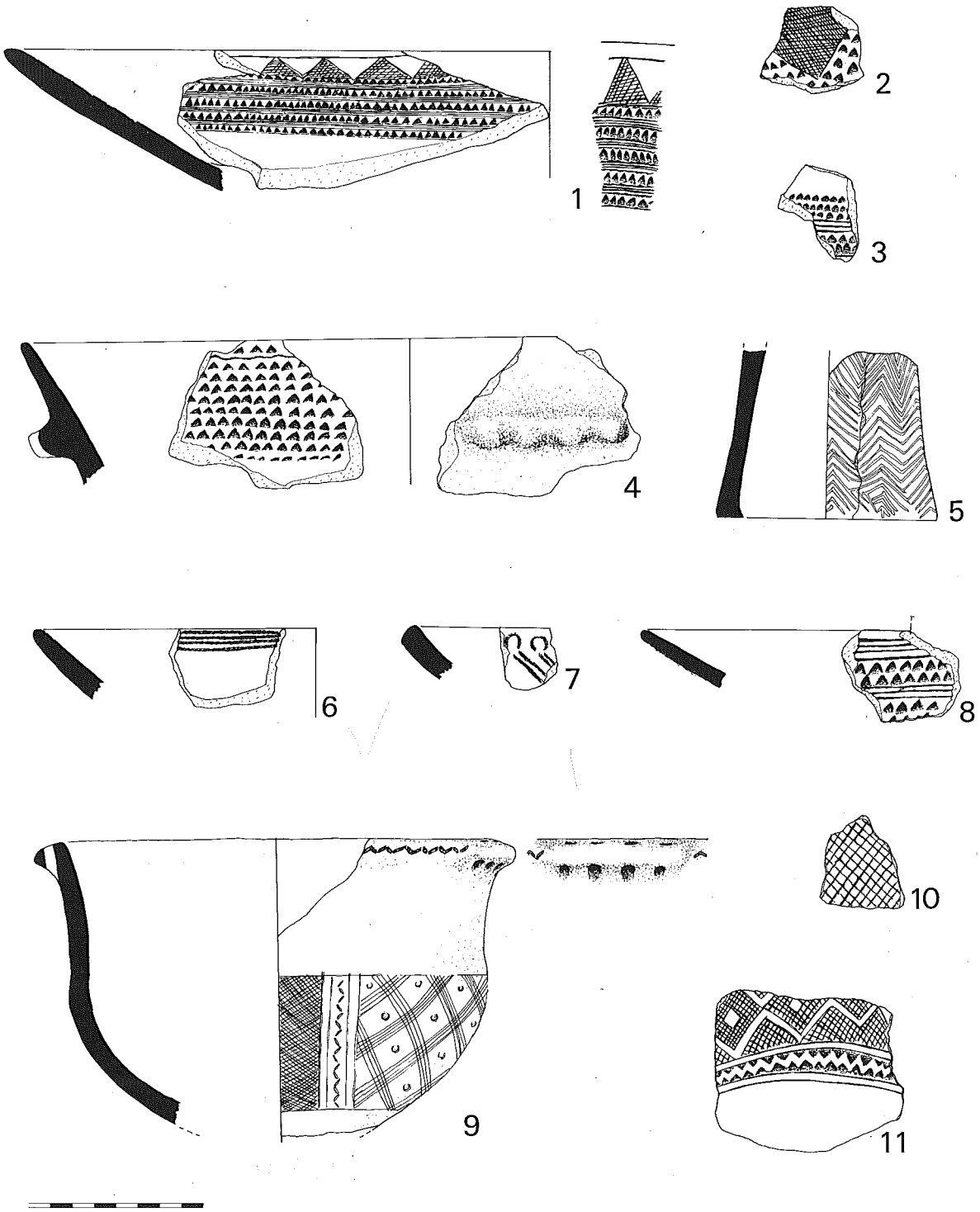


Figure 13.13. Phase Va. Decorated bowls. Conical bowl rims with incisions and impressions (1, 8) or with cord impressions (6, 7) or with impressions and ledge handle (4); finely burnished sinuous bowl with incisions, impressions, and perforated rim lugs (9); fragments with incisions (10) and impressions (2, 3, 11); pedestal with zigzag incisions (5).

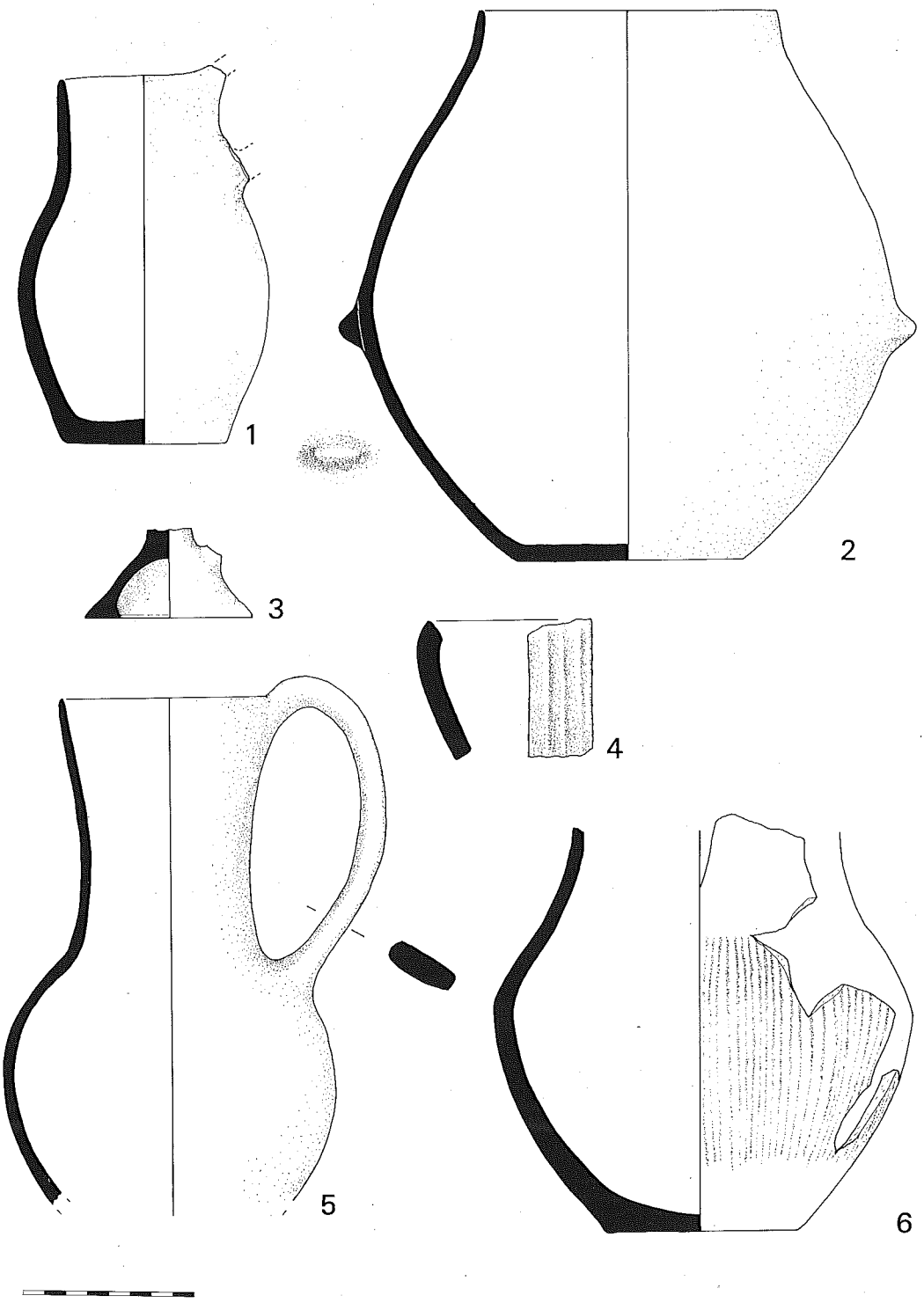


Figure 13.14. Phase IV/Va. Closed shapes. Burnished jugs (1, 5), jar well burnished inside and out, with ledge handles (2), burnished jar with fine channeling (6), handled lid (3), strap handle fragment (4).

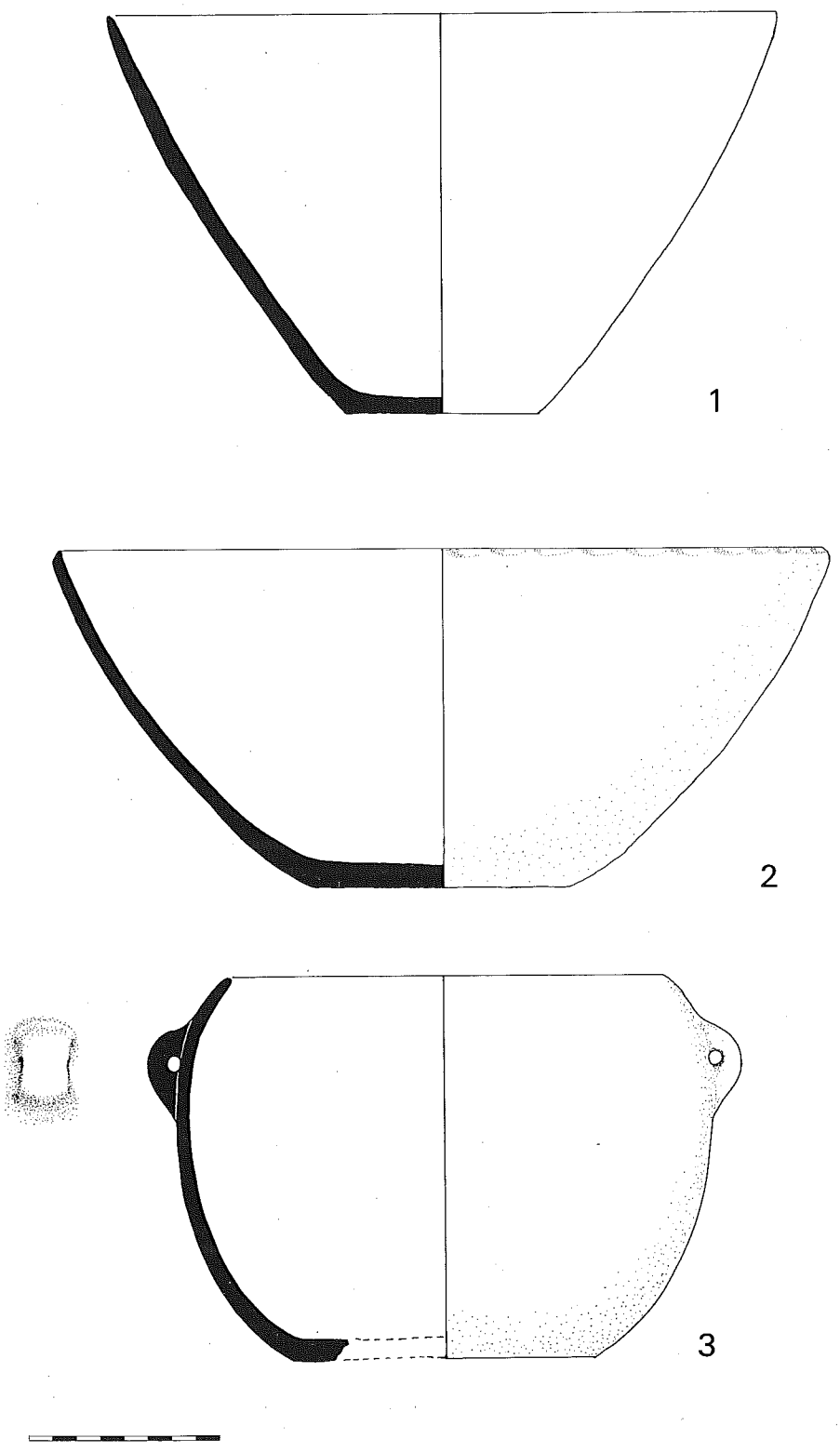


Figure 13.15. Phase IV/Va. Bowls. Conical (1, 2); squat form with incurved rim and lug handles (3). Rough burnish: 1, 3.

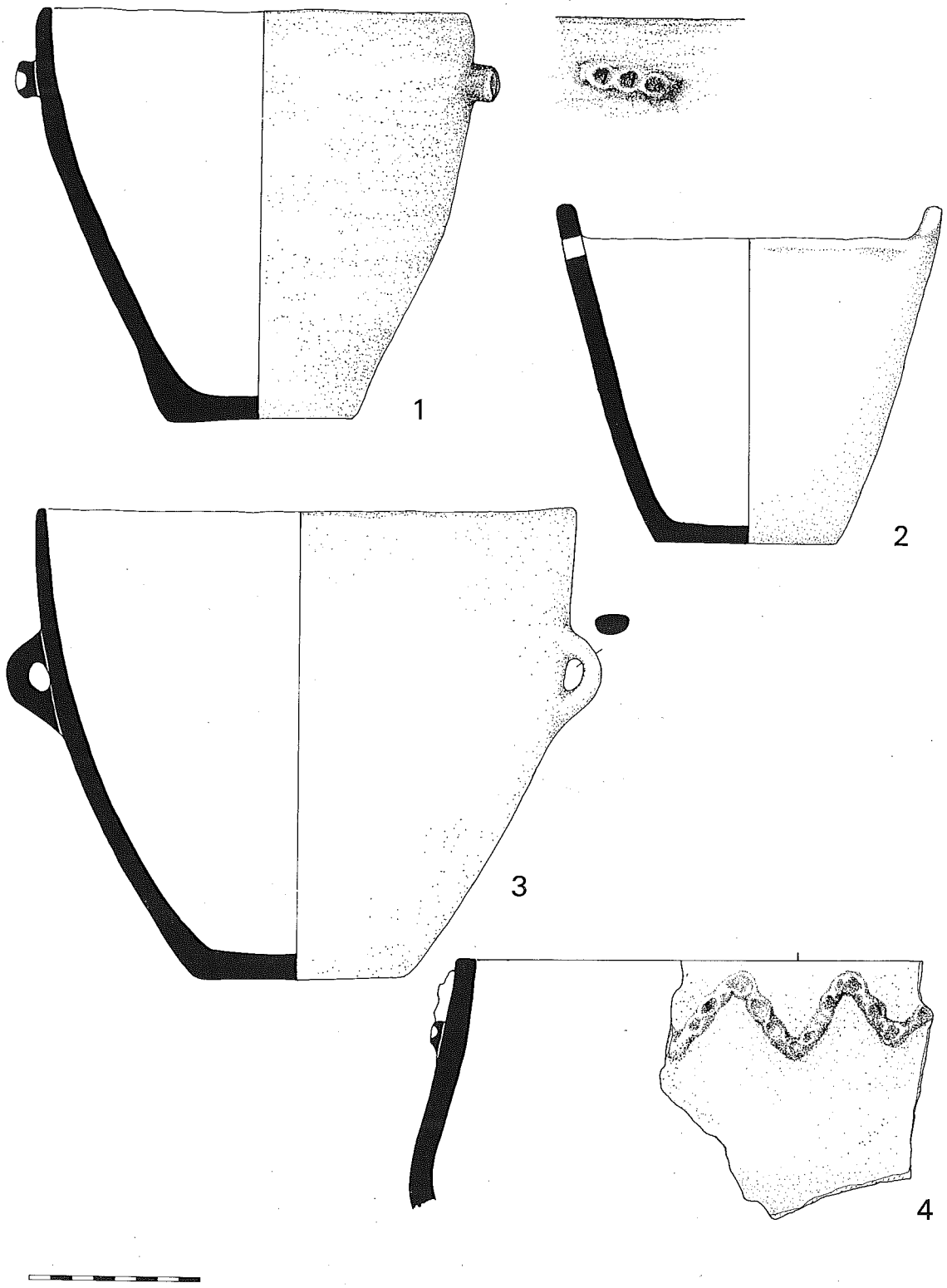


Figure 13.16. Phase IV/Va. Processing vessels/urns. With ledge handles (1), with rough burnish and perforated tabs (2), smoothed and roughly burnished with lug handles (3); fragment of urn with applied zigzag cordon (4).

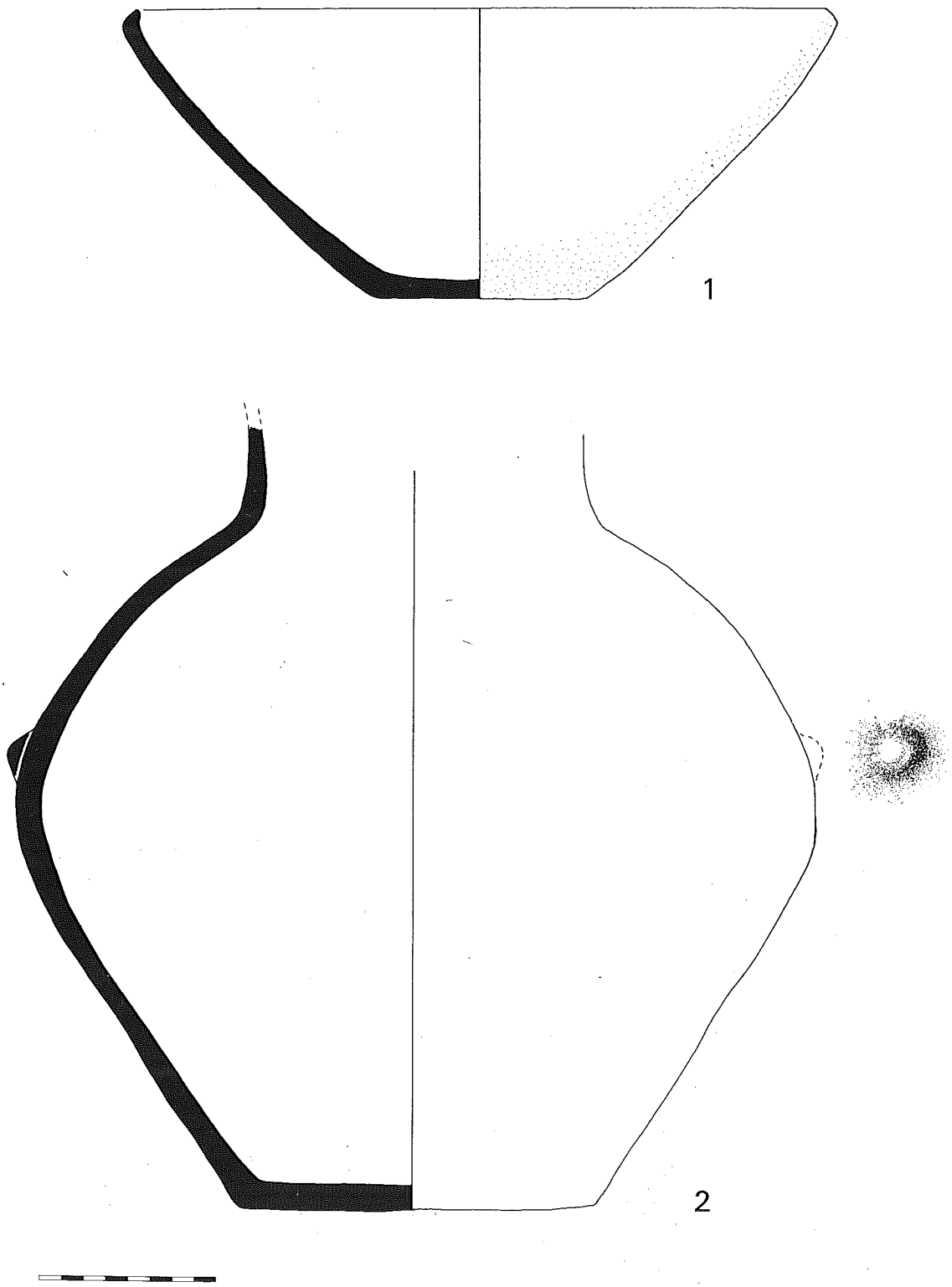


Figure 13.17. Phase Va. Large conical bowl with rough burnish (1), and jar with conical knobs (2).

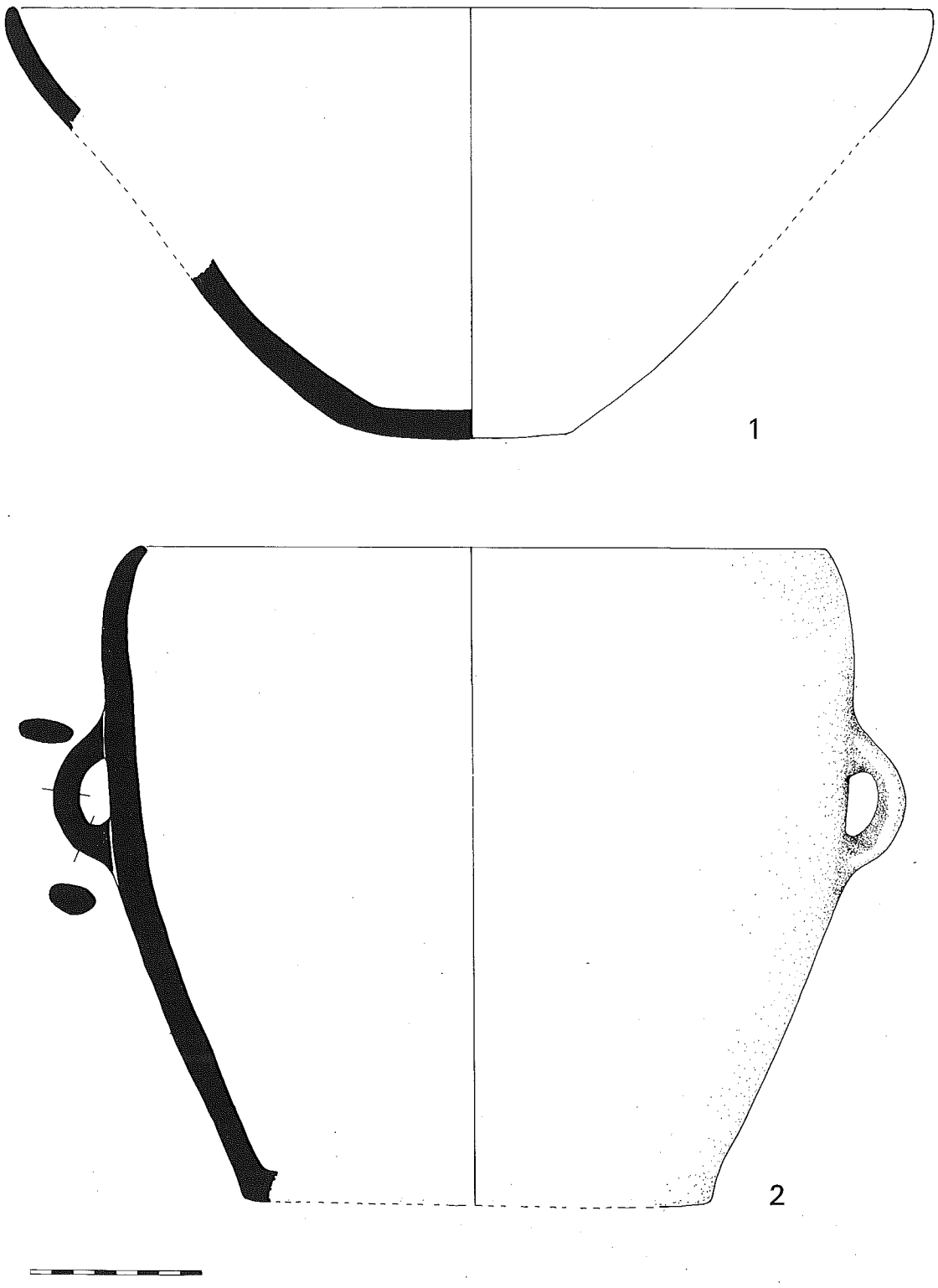


Figure 13.18. Phase Va. Large vessels. Conical bowl (1), and urn with lug handles (2).

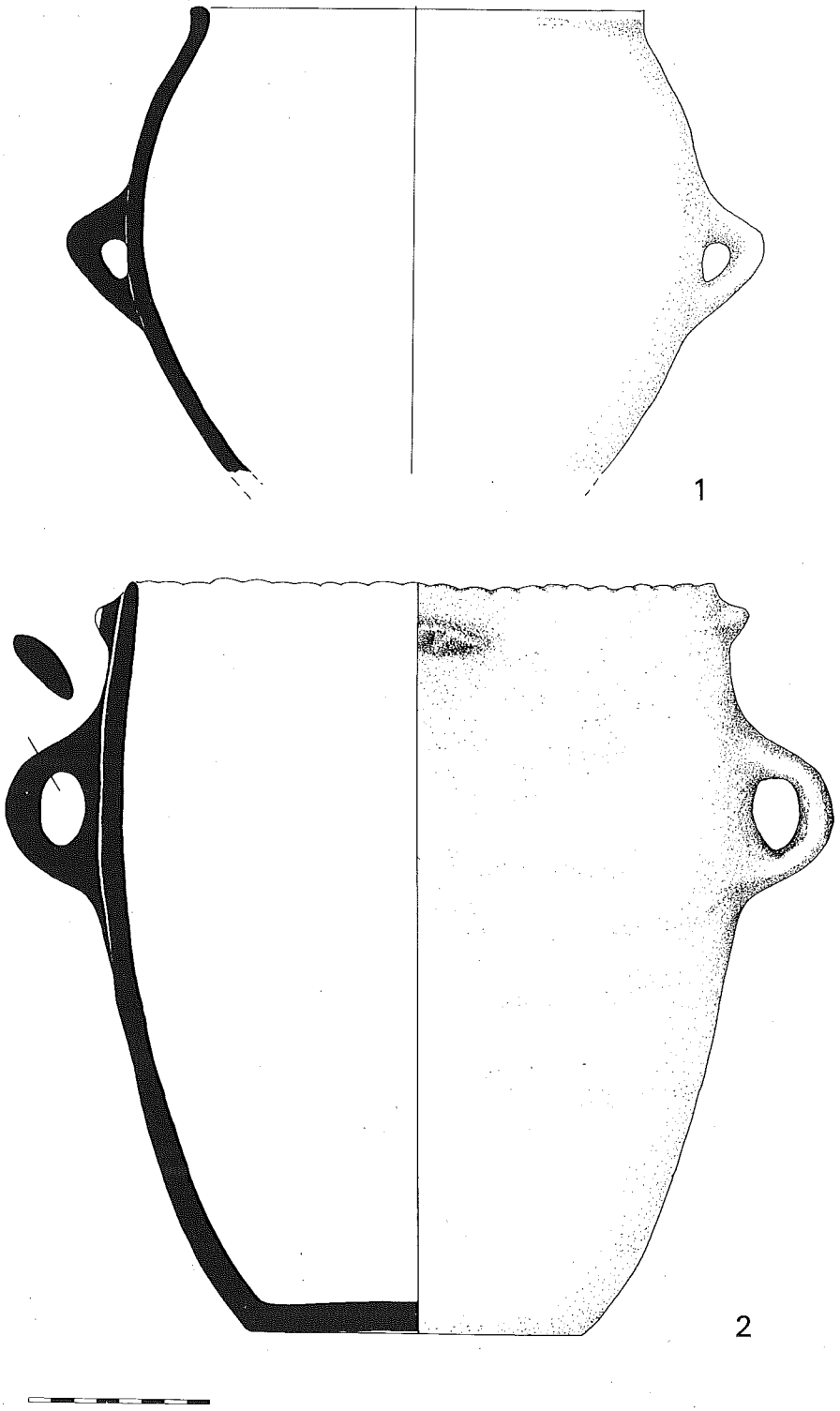


Figure 13.19. Phase Va. Large smoothed vessels. Jar with lug handles (1), and urn with high handles (2).

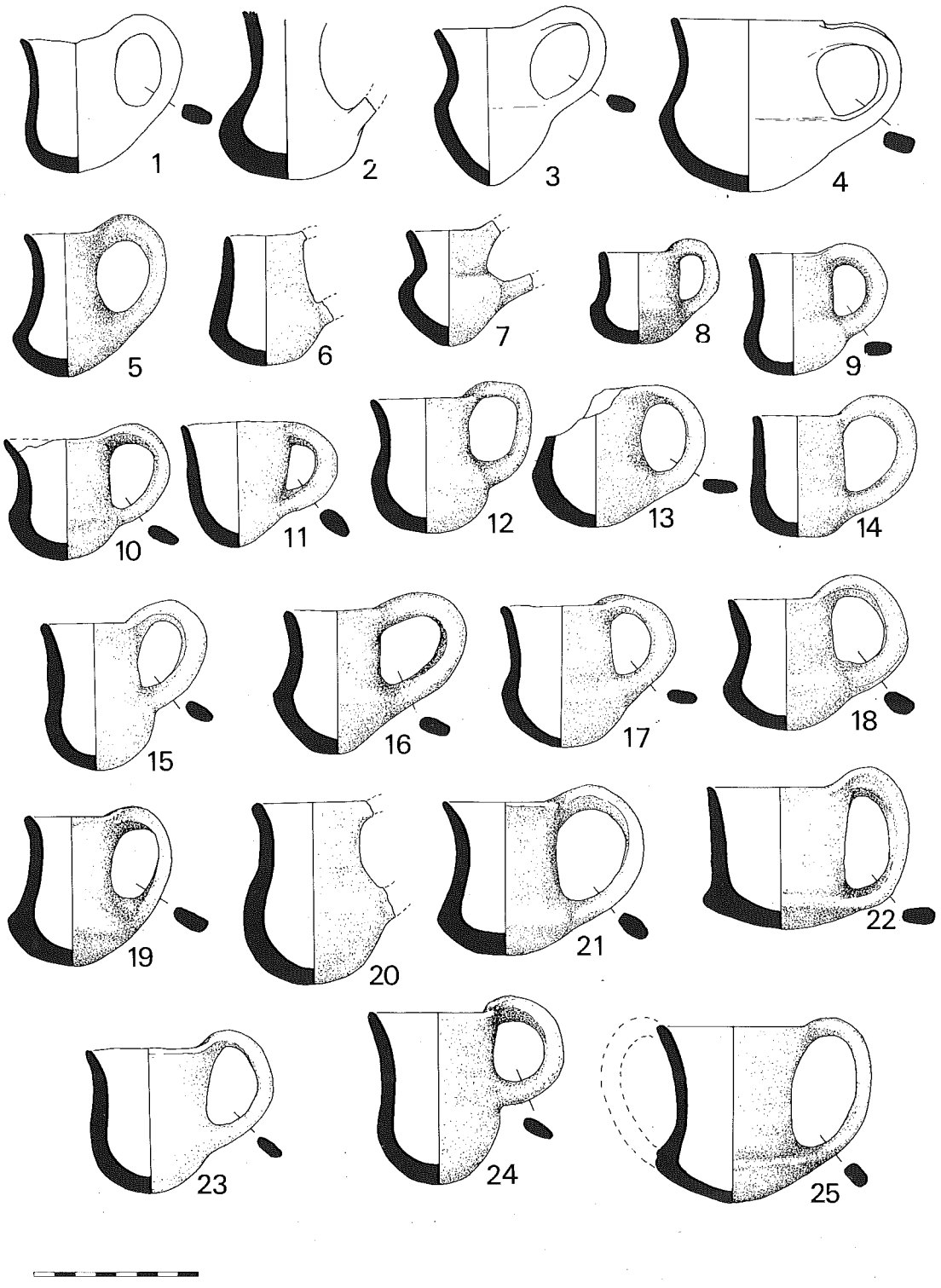


Figure 13.20. Phase Vb. Small handled cups. One-handled (1-24); two-handled (25).

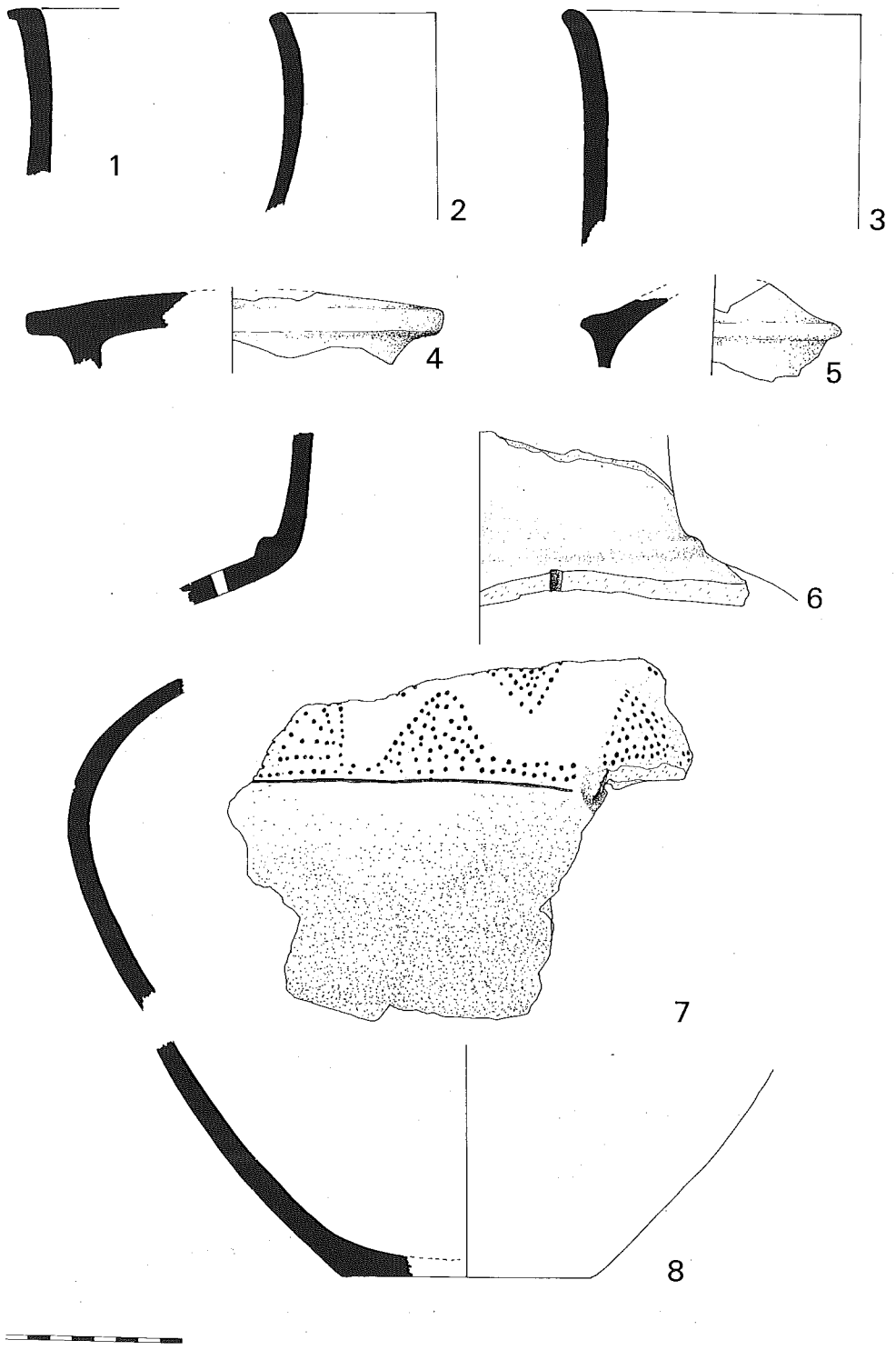


Figure 13.21. Phase Vb. Fragments of vessels with cylindrical neck. Rims (1-3, 6), lids (4, 5); body of urn/jar with pointillé decorations (7), and base (8).

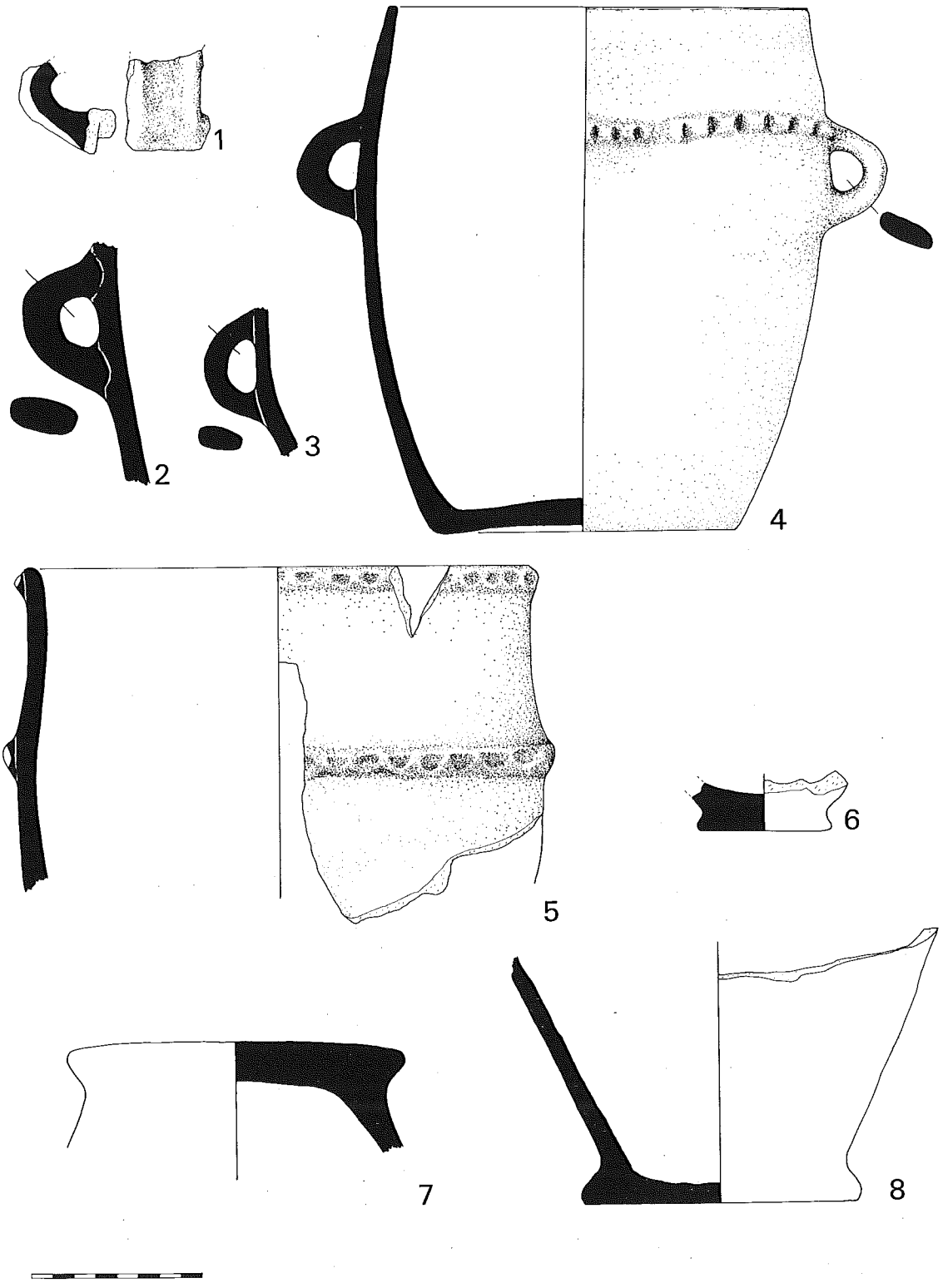


Figure 13.22. Phase Vb. Urn and urn fragments with lug handles (1-3), impressed cordons (4, 5), protruding base (6, 8), and inverted lid (7).

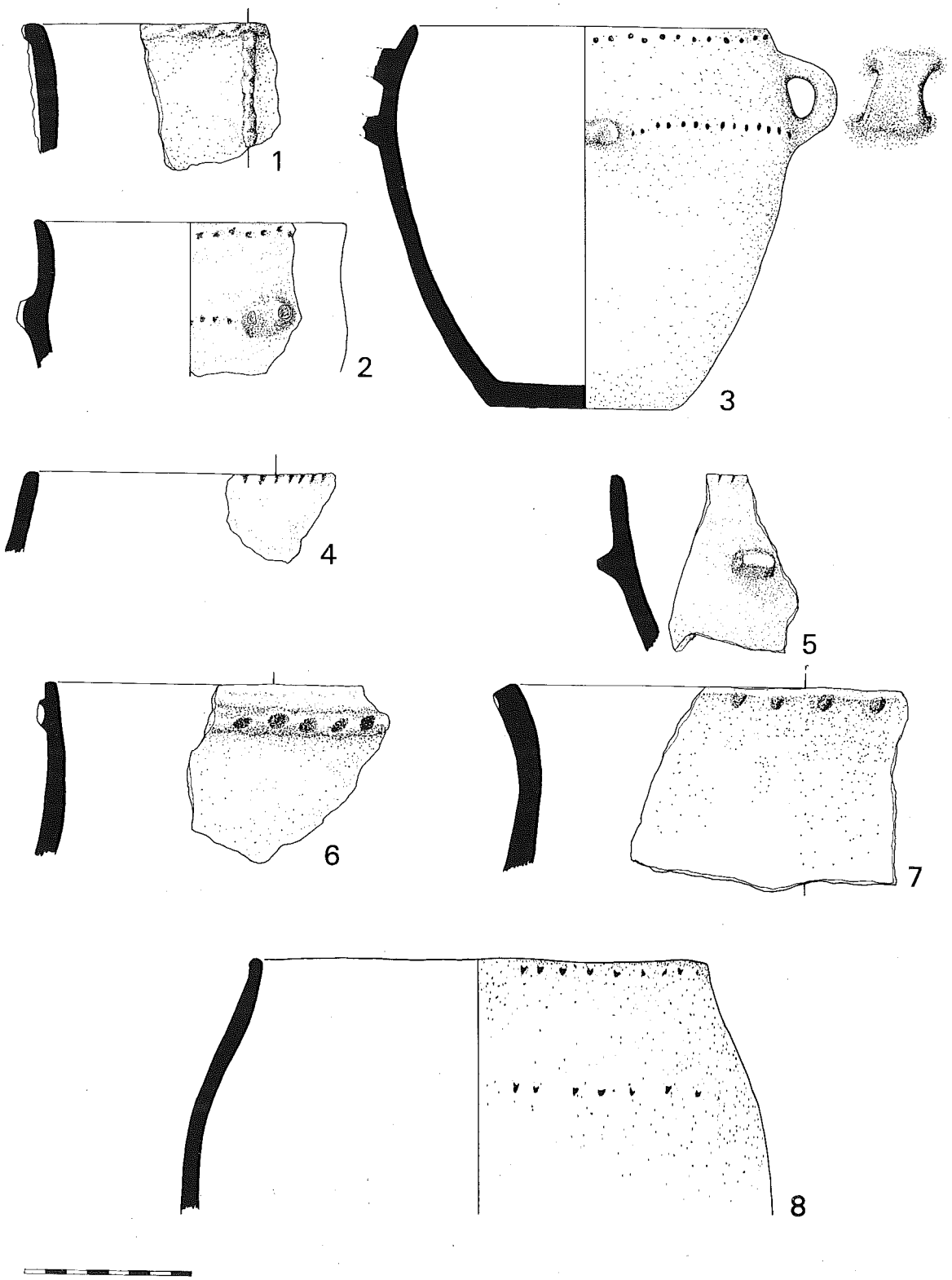


Figure 13.23. Phase Vb. Urn with lug handles, rough burnish, and rows of impressed dots (3) and rim fragments with applied cordons (1), knobs and impressed dots (2), slashed rim (4) and ledge handles (5), impressed cordons (6), finger impressions (7), and impressed dots (8).

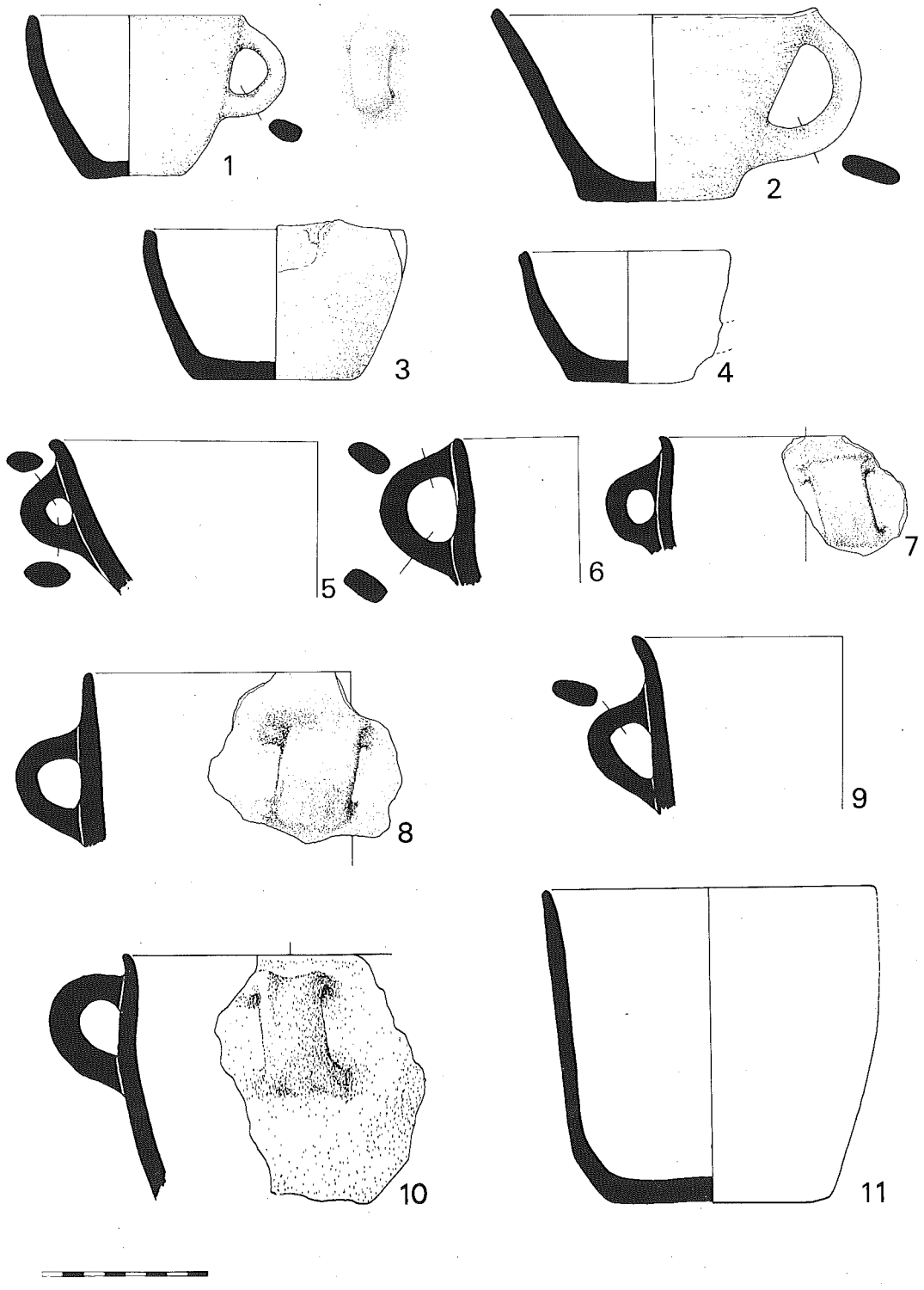


Figure 13.24. Phase Vb. Bowls with handles (1, 2, 4, 5), without handles (3); upright bowl rim fragments with handle (6-10); upright urn with rough burnish (11). Smoothed: 1, 4; burnished: 2.

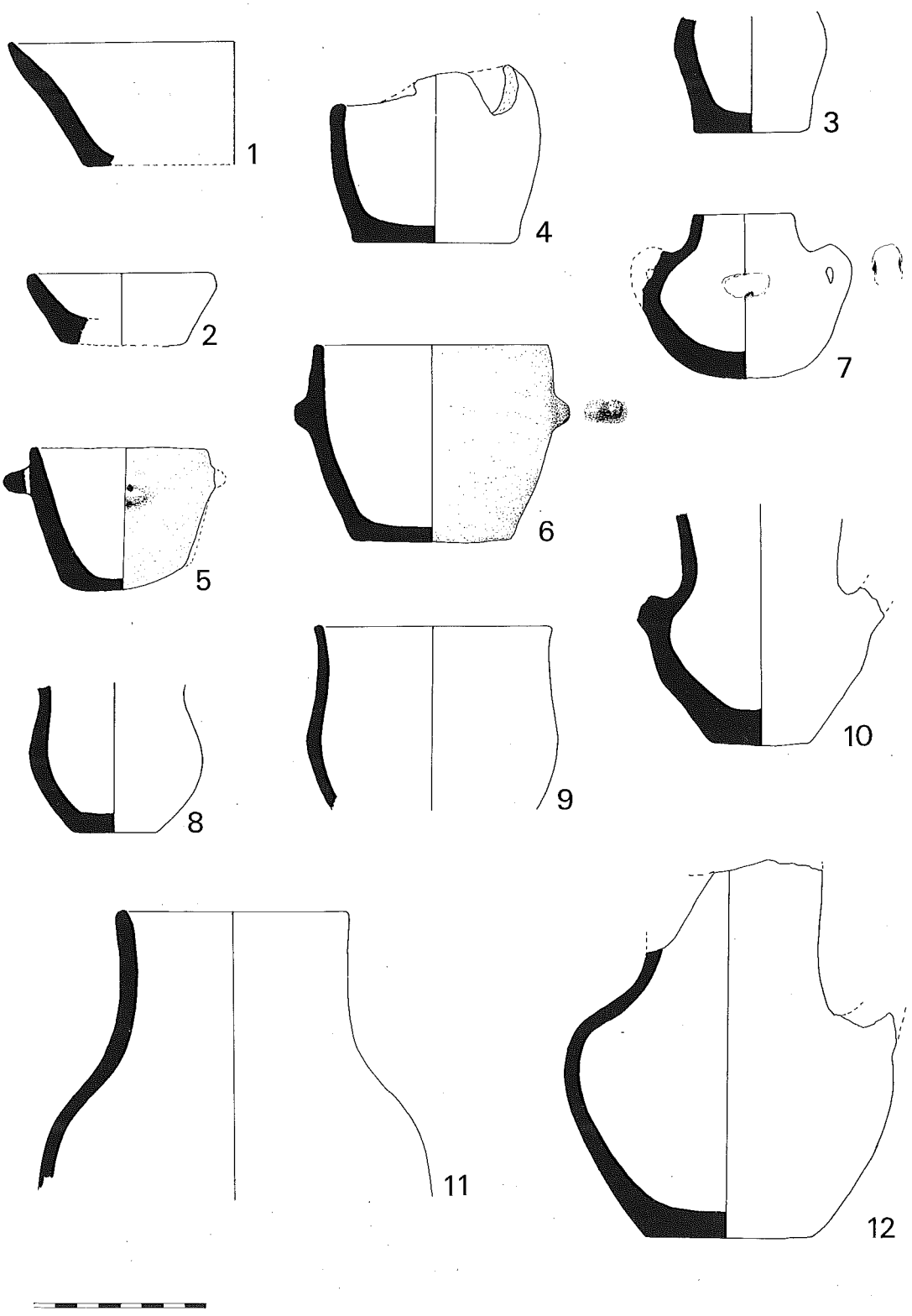


Figure 13.25. Phase Vb. Bowls (1-6), suspension jar with round base and grain sample 218 (7), beakers (8, 9), amphora (10), necked jar (11), and jug with grain sample 222 (12). Smoothed: 4, 5; lightly burnished: 6.

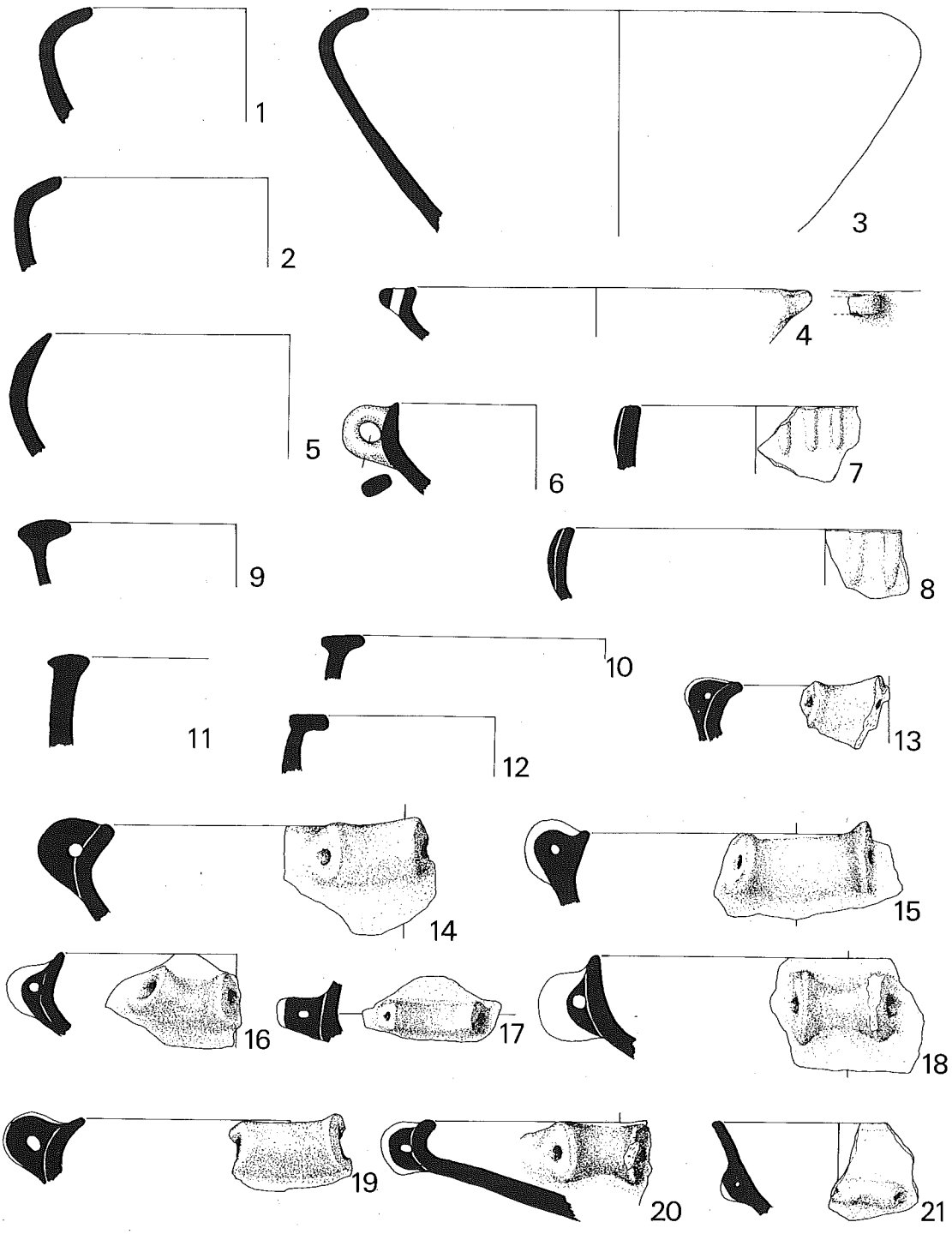


Figure 13.26. Phase Vb. Fragments of bowls with incurved rims (1-3, 5) and vertical lug (4) or handle (6); rims with applied pellets (7, 8), T-rims (9-12), rims with trumpet lugs (13-16, 18-20) or stringhole lugs (17, 21).

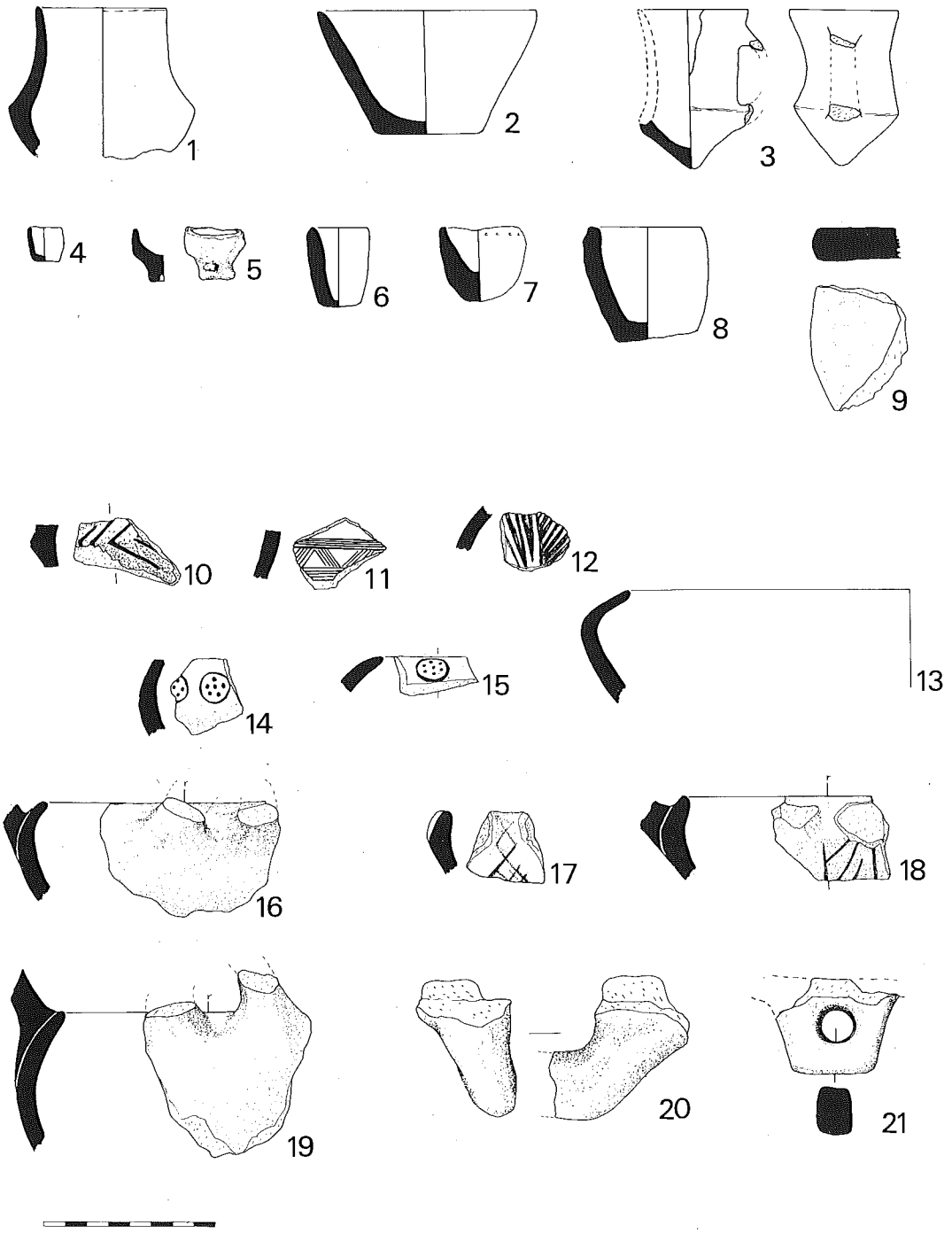


Figure 13.27. Phase Vb. Beaker (1), bowl (2), cup with pointed base (3), miniatures (4-8), fragment of plate or lid (9). Later bronze age fragments with incised decoration (10-12, 14); incurved rim (13), rims with incised decoration (15, 17), with horizontal handles (16, 19) and incisions (18); horizontal handle (20); large perforated lug (21).

Concordance: Figures to Plates

Figure 13.4
1. Pot 332, ZHt 26
2. Pot 6, ZA 31 (pl. XII:3)
3. Pot 26, ZA 25
4. ZE 49
5. Pot 28, ZE 7
6. Pot 20 ZA 31 (pl. XI:1a)
7. Pot 7, MM 6
8. Pot 23, ZA 31 (pl. XI:1c)
9. Pot 5, ZA 26 (pl. XI:2)
10. Pot 19, ZA 31 (pl. XII:2)
11. Pot 24, ZA 31 (pl. XI:1d)
12. Pot 21, ZA 31 (pl. XI:1b)

Figure 13.5
1. Pot 103, ZA 26
2. Pot 63, ZA 26 (pl. XI:3)
3. ZE 80
4. Pot 91, SL 11 (pl. CII:6)
5. Pot 325, ZA 26 (pl. XI:4)
6. Pot 80, ZA 28 (pl. XI:5)

Figure 13.6
1. ZE 80
2. ZHt 23
3. ZE 80
4. ZE 80
5. ZHt 18
6. SL 14
7. ZHt 21
8. ZE 53
9. ZH 19

Figure 13.7
1. Pot 346, ZHt 26 (pl. CII:3)
2. ZE 76
3. Pot 248, ROc 73
4. ZHt 1
5. ZE 61

Figure 13.8
1. Pot 227, ZE 76 (pl. XXXVI:2)
2. Pot 226, ZE 76 (pl. XXXVI:2)

Figure 13.9
1. ZHt 5
2. ZHt 21
3. ZHt 13
4. ZHt 20
5. ZHt 1
6. ZHt 27
7. ZHt 24
8. ZHt 19
9. ROc 55
10. ZHt 17
11. ZE 79

Figure 13.10
1. Pot 291/287, PN/D 80 (pl. XXXIII:1)
2. Pot 224, PO 161 (pls. XXXIII:3; B:4)
3. Pot 209, PO/A 54 (pl. XXXII:9)
4. Pot 246, PN/C 90 (pl. XXXIII:2)
5. Pot 221, PO 158 (pl. XXXII:8)
6. Pot 245, PN/B 104 (pl. CI:5)
7. PO/C 41
8. Pot 213, ZHt 16
9. Pot 206, ZHt 13 (pl. XXXV:3)

Figure 13.11
1. Pot 252, PN/F 264 (pl. CV:2)
2. Pot 268, PO 161 (pl. CIV:5)
3. Pot 251, PN/F 264 (pl. CV:1)
4. Pot 222, PO 158
5. ZHt 21
6. Pot 262, PO 161 (pl. CIII:6)
7. Pot 330, ZHt (pl. CII:2)

Figure 13.12
1. Pot 289/270, PN/F 264 (pl. XXXII:2)
2. Pot 329, ZHt 17/18/19 (pl. XXXV:5)

Figure 13.13
1. KL 2
2. PO 15 (pl. XCVII:11)
3. PO 9
4. PO/A 154 (pl. XCVII:18)
5. PO 49 (pl. XCVII:20)
6. Pot 177, PN/A 92 (pl. XCVIII, bottom:1)
7. Pot 186, NL 1 (pl. XCVIII, bottom:3)
8. PO 10
9. Pot 286, PN/F 264 (pl. XXXII:6)
10. PO 17 (pl. XCVII:12)
11. PO/A 54 (pl. XCVII:9)

Figure 13.14
1. Pot 334, ZHt 23 (pl. CII:4)
2. Pot 271, PN/F 264 (pl. CIV:6)
3. Pot 282, PN/C 90
4. ZHt 23
5. Pot 282, PN/C 90 (pl. XXXII:7)
6. Pot 335, ZHt 23

Figure 13.15
1. Pot 242, ROc 55
2. Pot 260, PO 159 (pl. CIV:2)
3. Pot 288, PO 157

Figure 13.16
1. Pot 333, ZHt 19
2. Pot 345, ZHt 26 (pl. CII:1)
3. Pot 258, PO 159 (pl. CIII:4)
4. PO 154

Figure 13.17
1. Pot 235, PO 158 (pl. CV:4)
2. Pot 280, PN/F 264

Figure 13.18
1. Pot 276, PO 159 (pl. CIV:4)
2. Pot 257, PO 159 (pl. CIII:5)

Figure 13.19
1. Pot 264, PO 160 (pl. CIII:3)
2. Pot 228, PO 159 (pl. CIII:2)

Figure 13.20
1. Pot 45, QO/C 8 (pl. XCIX:12)
2. Pot 55, QO 7
3. Pot 74, PN 12 (pl. XCIX, top:7)
4. Pot 41, PO 8 (pl. XCIX:17)
5. Pot 128, QO 8 (pls. XXII:2; XCIX, top:4)
6. Pot 118, QO 8
7. Pot 106, QO 8
8. Pot 102, PN 21 (pl. XCIX:14)
9. Pot 34, PO 8 (pl. XCIX:15)
10. Pot 95, PO 11 (pl. XCIX:11)
11. Pot 120, PN 28 (pl. XCIX:13, 20)
12. Pot 122, PN 28 (pl. XCIX:10)
13. Pot 124, QO 8
14. Pot 107, PN 21
15. Pot 116, PN 14 (pls. XXII:5; XCIX:16)
16. Pot 96, PO 11 (pl. XCIX, top:6)
17. Pot 129, QO 8 (pl. XCIX, top:8)
18. Pot 119, PN 28 (pl. XCIX, top:9)
19. Pot 78, PN 14 (pl. XCIX, top:5)
20. Pot 123, QO 8
21. Pot 73, QO 8 (pl. XCIX, top:1)
22. Pot 64, PO 9 (pl. XCIX, top:3)
23. Pot 79, PN 19
24. Pot 93, PO 11
25. Pot 89, QO 8 (pls. XXII:1; XCIX, top:2)

Figure 13.21
1. PO 14
2. PO 17
3. PO 23
4. PO 8
5. PO 8
6. PO 10 (pl. C, top:12)
7. PO 8
8. QO 8

Figure 13.22
1. PO 8
2. PO 8
3. PO 8
4. Pot 155, QO 8 (pl. XXII:3)
5. PO 8
6. PO 7
7. PO 7
8. Pot 70, PO 5/6

Figure 13.23
1. PO 10 (pl. C, top:4)
2. QO 8
3. Pot 86, QO 8 (pl. XXII:4)
4. PO 8 (pl. C, bottom:1)
5. PO 8
6. PO 10 (pl. C, top:6; color pl. D:12)
7. PO 19
8. PO 13

Figure 13.24
1. Pot 85, QO 8
2. Pot 143, PN 11 (pl. CI:2)
3. Pot 140, PN 20
4. Pot 139 QO 8
5. PO 8
6. PO 8
7. PO 8
8. PO 7
9. PO 9
10. PO 15
11. Pot 193, PO 6

Figure 13.25
1. PO 15
2. PO 7
3. PO 8
4. Pot 97, QO 8
5. Pot 175, QO (pl. CI:6)
6. Pot 127, surface
7. Pot 44, PN 6 (pl. CI:3)
8. Pot 52, PO 9
9. PO 8
10. Pot 195, PO 7/8
11. PO 8
12. Pot 1, ZA 3

Figure 13.26
1. PO 8
2. PO 8
3. PO 5/6
4. PO 24
5. PO 19
6. PO 8
7. PO 11
8. PO 8
9. PO 8
10. PO 8
11. PO 8
12. PO 8
13. PO 8
14. PO 17
15. PO 7 (pl. XCIX, bottom:7)
16. PO 8
17. PO 7
18. PO 7 (pl. XCIX, bottom:1)
19. PO 12
20. PO 19
21. PO 8 (pl. C, bottom:8)

Figure 13.27
1. Pot 141, QN 7
2. Pot 136, QO 8
3. Pot 31, QO 6
4. Pot 362, QO 5
5. Pot 51, QO 7
6. Surface
7. Pot 114, PN 12
8. Pot 61, MM 43

9. SF 15, No provenience
10. PO 3
11. PO 7
12. PO 3
13. PO 3
14. PO 3
15. PO 4
16. PO 3 (pl. XCIX, bottom:6)
17. PO 2
18. PO 2
19. PO 4 (pl. XCIX, bottom:9)
20. PO 2
21. PO 15

14.

Sitagroi in European Prehistory

Colin Renfrew

The excavations at Sitagroi were conducted with two prime aims. The first of these was to investigate the environment and the material culture of the area in order better to understand the nature and the economic and social bases for the richness and diversity seen in the prehistoric remains. The second aim was to resolve, on the basis of a firm stratigraphy, the critical dispute over Balkan chronology which was calling into question the entire development of the European early bronze age. Sitagroi was selected for excavation because of its key position, at the northern limit of the Aegean basin and in contact with the cultures of Balkan Europe, as surface finds initially indicated. The problem also involved the validity of applying radiocarbon dating to the prehistoric cultures of the Aegean and the rest of Europe.

Sitagroi has provided abundant evidence on these important questions. It is the purpose of this short résumé to summarize the principal lessons of the excavation for European chronology and cultural relations. The publication in this volume of the stratigraphy, the pottery, and the figurines offers a sound data base, and the radiocarbon dates presented in chapter 7 can now be set in their broader context. Many of the important finds, however, including objects of terracotta, metal, shell, stone, and bone, as well as the plant remains, are held over to the second volume of the report. Integrated consideration of the entire assemblage in relation to subsistence and environment must be deferred until the complete publication of that material.

The basic chronological question faced by the excavators is illustrated diagrammatically in figure 1.1. There the earlier chronological relationship, established by Childe, Milojčić, Garašanin, and others, is clearly indicated. It rests upon the suggested derivation of the cultures of the southeast European copper age (Vinča, Gumelnitsa, etc.) from those of the Aegean early bronze age, notably the earlier levels of Troy. The evidence for such a relationship and the nature of the so-called Balkano-Anatolian complex of cultures had been called into question (Renfrew 1969), and the first radiocarbon dates for southeast Europe were suggesting a much earlier dating. It was becoming clear that the later neolithic (chalcolithic) of the Balkans was the contemporary not of the Aegean early bronze age but of the Aegean later neolithic. It was possible to suggest that all the supposed Aegean early bronze age influences upon the Balkan chalcolithic were, without exception, either indigenous to the Balkans or of a much earlier date in the Aegean sequence. The fundamental importance of these matters for the early development of Europe can hardly be exaggerated. The independent invention of copper metallurgy in Europe is only one of several significant implications.

The first results of the excavations at Sitagroi were striking. It was at once clear that the materials of Sitagroi phase III, named by us the "Dikili Tash phase" as a mark of respect for the work of Professor Deshayes and his colleagues at the nearby mound of that name, had numerous

points of resemblance with those of the Bulgarian Gumelnitsa culture. It was clear, too, that the finds of Sitagroi phase V could be related to those of the Aegean early bronze age. A preliminary but perfectly clear-cut answer to the main problem was thus available on purely stratigraphic grounds. The finds confirmed the equivalence of the late neolithic of the north Aegean and the Balkans and offered no support for any suggestion of relationships (or chronological equivalence) between the Aegean early bronze age and the Balkan chalcolithic (see Renfrew 1969). The second of the two alternatives offered in figure 1.1 was strikingly confirmed.

The first radicarbon dates for Sitagroi became available at precisely the time that the consequences for European prehistory of the tree-ring calibration of radiocarbon were becoming established. It was at once possible to show (Renfrew 1970a) that the Sitagroi data and the calibrated dates harmonized well with the hypothesis of an early southeast European chalcolithic but were in direct and irreconcilable conflict with the earlier and traditional view of the equivalence of Troy with Vinča and Gumelnitsa. As the complete Sitagroi date list became available (see chap. 7), it was possible to show, at a more detailed level, how readily Sitagroi could be assimilated to the emerging radiocarbon chronology for Greece and for the Balkans (Renfrew 1971). In particular, the contemporaneity of Sitagroi phases IV and V with the Bulgarian early bronze age, as documented at Ezero, confirms the emerging picture. A more recent plot of the Sitagroi radiocarbon dates together with those from neighboring regions is given by Sherratt in chapter 13 (fig. 13.3). It comprehensively documents the solution to the troublesome problem which initially prompted our excavations at Sitagroi.

The validity of the chronological relationship reiterated here is now very widely accepted, in southeast Europe and more generally. Nevertheless, a few Balkan writers continue to prefer the traditional, pre-radiocarbon chronology (e.g., Makkay 1975). The clear picture which Sitagroi gives of chronological relations between the Aegean and the Balkans has, however, been questioned by Weisshaar (1979a). At the site of Pevkakia in Thessaly, finds of the Early Helladic II culture have been reported in supposed association with black-on-red painted pottery of the Aegean later neolithic in what have been termed levels of the "Late Rachmani" culture (Weisshaar 1979b). The Early Helladic II pottery includes sherds of characteristic shape and fabric—sauceboats in *Urfirnis* ware—and could hardly be dated earlier than 2700 or 2800 BC on a calibrated chronology (see Renfrew 1972:221). The black-on-red painted pottery is classed by the excavators as "Galepsos Ware" and would thus be similar in style and date to the Black-on-Red pottery of Sitagroi phase III. Following the calibrated chronology as set out in chapter 7 (see table 7.3), this must be dated before 4000 BC. The finds reportedly in association at Pevkakia thus appear to occupy a time span of at least 1,000 and perhaps 1,500 years. More detailed comment is not possible without a more comprehensive publication of the finds from that site. My own suggestion would be that the finds cited do indeed come from a range of well over a millennium, both from the later neolithic and from the developed early bronze age. The clay anchors from Pevkakia, for instance (Weisshaar 1980), belong no doubt to the Early Bronze 2 or Early Bronze 3 period of the Aegean, as indeed do those from Sitagroi phase Vb (Renfrew 1970b: pl. 43). This view would imply that the supposed Late Rachmani period at Pevkakia would span the later neolithic, final neolithic and Early Bronze 1 and 2 periods of the Aegean—at Sitagroi the equivalent of phases III, IV, Va, and Vb. It should be noted that even at Sitagroi there is no presumption of continuity since a hiatus is possible between phases III and IV. The obvious solution which one might tentatively advance is that the excavators at Pevkakia have failed to detect a substantial and significant hiatus within their so-called Late Rachmani levels. It may be that, overlooking the absence of materials equivalent to Sitagroi phase IV and perhaps Va, they have been led by the physical propinquity of materials (contemporary with Sitagroi periods III and Vb) to propose a chronological equivalence. Certainly there are clear indications of the intervening material from the earlier excavations of

Milojčić in Thessaly. The high-handled cups typical of Sitagroi phase IV, for instance, may be equated with Early Thessalian I as documented at Argissa Magoula (Milojčić 1959:fig. 21, 11-13; Hanschmann and Milojčić 1976:Taf. 8, 1-4). Unfortunately, the finds from the earlier part of the early bronze age at Argissa itself are very few; they come solely from *Gruben* 2/3, which appears to span phase IV and probably Va at Sitagroi. For this reason, perhaps, and the reluctance of the excavators to use calibrated radiocarbon dates, the problem of Rachmani is not adequately resolved (see Hanschmann and Milojčić 1976:148, Abb. 5 and 226, Abb. 11). My expectation would be that Early Helladic II *Urfirnis* sherds would be found in association with Early Thessalian II material, while the black-on-red sherds, found at Pevkakia alongside graphite-painted ware (Theocharis 1973:fig. 236—but note that fig. 232 is from Sitagroi, not Pevkakia), should be from the Thessalian Dhimini phase or whatever immediately succeeds it. The Pevkakia reports may thus be interpreted in two ways. Either they indicate inconsistencies in the chronology of southeast Europe as presented here and with the pattern of radiocarbon dates as it has emerged, or they imply local stratigraphic difficulties and some confusion in interpretation within the Thessalian later neolithic. I would argue for the second alternative and would urge that the important initiative taken by the late Professor Theocharis in obtaining radiocarbon dates for the neolithic of Thessaly be followed by all other excavators in the region.

SITAGROI I AND THE EARLIEST NEOLITHIC OF EAST MACEDONIA

The earliest pottery from Sitagroi, the material from Sitagroi phase I, has been discussed by Keighley in chapter 11. There are clear parallels with pottery from Dikili Tash and with surface finds from other sites in East Macedonia (French 1964; Grammenos 1975; Grammenos and Photiadis 1980). Beyond the plains of Drama and Serres, however, one must look north and east for closely comparable material. To the east, the abundant finds in the earlier levels of Paradimi in Thrace, now handsomely published (Bakalakis and Sakellariou 1981) are of great interest. The characteristic knobbed handles and the bowls with cylindrical feet form an excellent point of comparison. There is no painted pottery from layers 17 to 8 (Paradimi phases I–IIIb), and while the later levels in this range may well be contemporary with Sitagroi phase II, the lower levels (Paradimi phases I and II) are no doubt contemporary with Sitagroi phase I.

To the north it is of course with the Veselinovo culture of Bulgaria (Karanovo III) that the analogies in the pottery are most striking, and Keighley (chap. 11) indicates the points of comparison with the earlier Vinča culture also. The terracotta tables of Sitagroi phase I are discussed by Elster in chapter 10, and again the points of resemblance are with the north. These tables do not seem present in significant quantities at Paradimi, but the form does occur there in the lowest levels (Bakalakis and Sakellariou 1981: Beil. 10:5).

We have no stratified finds from East Macedonia or the Thracian littoral which are anterior to these. Photiadis (Grammenos and Photiadis 1980:20-22) has drawn attention to several sherds, surface finds from the site of Toumba in the *nome* of Serres, which he would see as resembling finds of the Starčevo-Kremikovci complex of the Balkan early neolithic. It may be, then, that evidence will emerge for a phase of farming occupation in East Macedonia prior to that of Sitagroi I.

At present, however, there is no indication in the plain of Drama, nor in the north Aegean areas to the east, of earlier occupation. This must then be regarded as a time of initial colonization. We have no evidence at present of an equivalent of Sitagroi phase I in western Anatolia, and although this could emerge as soon as the neolithic of that region is at last explored, the surface surveys of French have not revealed the clear, diagnostic surface sherds already so evident in East Macedonia. The provisional conclusion thus seems warranted that the culture of Sitagroi I and early Paradimi has a Balkan origin,

almost certainly in the Maritsa Valley of Bulgaria. The initial farming colonists, if such they were, may have expanded in successive generations down the Maritsa (Evros) Valley and then west along the coast. But more probably, in view of the closer similarities between the Sitagroi finds and those of Karanovo III, the movement would have been down the Struma (Strymon) River to the plain of Serres and then east. Such a view is perfectly consonant with earlier farming occupation of the Serres area suggested by Photiadis.

This view of the earliest farming settlement of the north Aegean coast at first sight seems a surprising one, when evidence of much earlier neolithic occupation is so readily available in West-Central Macedonia (Nea Nikomedeia) and in Thessaly. The evidence does not, however, suggest a farming occupation of the north littoral of the Aegean at so early a date.

The interesting implication may be that the plant domesticates essential to agriculture came to Thessaly and West Macedonia by sea, rather than along the north Aegean coast. It is widely agreed that these domesticates reached Yugoslavia and then Bulgaria from Greece by the Vardar (Axiós) route. And it was, of course, from the Starčevo-Kremikovci culture of Karanovo I that the Veselinovo culture of Karanovo III evolved. Only then, by a movement southward, was the north Aegean coastal area effectively occupied by a farming population.

THE DEVELOPMENTS OF SITAGROI PHASE II

The pottery assemblages of Sitagroi phases I and III may be precisely matched to the north, in the Maritsa Valley. The very close affinities of Sitagroi I with Karanovo III have just been discussed, and the equation between Sitagroi phase III and Karanovo phases V and VI is amply documented in chapter 12. There is no such clear-cut equivalence for Sitagroi phase II.

Its pottery has very little in common with the pottery of phase II at Karanovo, which is not painted. Sherds from Sitagroi (pl. LXXV:10-12) with the ripple decoration so characteristic of Karanovo II, should, however, be noted. Moreover, the wide range of painted fabrics seen at this time in the plain of Drama is not encountered at Paradimi to the east, where there are no close parallels although the undecorated red-topped ware is found there. It is, perhaps, to Thessaly that one should turn at this time. The great range of painted fabrics perhaps inevitably finds some points of resemblance with those of Sitagroi. Brown-on-cream ware is one of the long-established fabrics (B3e) of the Thessalian later neolithic (Wace and Thompson 1912:17). The confusion in the later neolithic of Thessaly, noted earlier, and in particular the lack of a clear radiocarbon chronology for the Dhimini and post-Dhimini periods, makes fuller analysis very difficult. Indeed, there is an interesting doctoral dissertation to be written one day on the pottery of Sitagroi phase II in relation to that of Thessaly. Our radiocarbon dates of ca. 4300 bc-3800 bc for phase II, calibrating to 5200-4600 BC, would place it, in Thessalian terms, after the end of the middle neolithic at Sesklo, and hence in the Tsangli (Dhimini I) and probably Arapi (Dhimini II) phases of the earlier part of the Thessalian late neolithic. The radiocarbon dates suggest that Sitagroi I is contemporary with Late Sesklo, and it is perfectly logical that Sitagroi II should have links with the immediately succeeding phases.

There are certainly analogies between Sitagroi and Thessaly to be seen in form as well as in fabric at this time. The carinated jar with strap handle so common at Sitagroi (fig. 11.19:3; pl. LXXXV:2) is seen at Arapi-Magula (Milojčić 1959: fig. 13, 19), and there are various comparable bowl forms (Hauptmann and Milojčić 1969: pls. 1, 2). Several of the painted fabrics of Sitagroi phase II may be compared with the "neolithic matt painted" styles of the Tsangli (Dhimini I) phase, and it is significant that this comparison was already anticipated by Hauptmann when he likened pottery found at Akropotamos in East Macedonia with the finds from Arapi-Magula (Hauptmann and Milojčić 1969:43).

It is relevant to note also that in Sitagroi phase II there is a highly polished black burnished ware, sometimes with rippled decoration, as also noted in the plain of Drama at Mylopotamos. Such pottery was described by Hauptmann from the Tsangli phase at Arapi-Magula (Hauptmann and Milojčić 1969:20-26). There he found himself in some difficulty, since this pottery proved difficult to distinguish from the black burnished ware of the Larisa phase, which Milojčić (1959:19) firmly placed at the *end*, not the beginning, of the Dhimini period, although earlier excavations by Grundmann (1932) had not supported such a view. Excavations by Gallis at the mounds of Souphli and Platia Magoula Zarkou (Gallis 1982:234) are thus of the greatest interest, for his 1976 season led to the suggestion that the Larisa phase might not have been correctly placed. More recent excavations (Gallis, personal communication) have now led to the conclusion that the Larisa-style pottery should be assigned to the Tsangli (Dhimini I) phase, and that the identification of a separate Larisa period at the end of Dhimini is a mistake arising from imperfect stratigraphic interpretation during the Milojčić excavations, the original conclusions of Grundmann being more appropriate. This is a rectification of great importance since it begins to lead us out of the confusion into which interpretations of the Thessalian later neolithic had brought us, and it conveniently overcomes the anomaly whereby dark-faced wares were common in Vinča at this time but not frequent in Thessaly until much later. That the Larisa phase should fall within the time span of the Vinča culture rather than toward the end of that period is much more convenient.

This important rectification by Gallis clears the way for a reinterpretation of the Thessalian later neolithic. The points of comparison of Sitagroi phase II now fall firmly with the Tsangli and Arapi phases of the Dhimini culture and are no longer confused by the similarities with Larisa-type material. These, too, now belong in that same period.

It remains to be seen whether there are any direct imports from Thessaly to East Macedonia during the Sitagroi II period (or indeed imports to Thessaly from East Macedonia). During the developed Dhimini period, imports of Macedonia black-on-red ware like that of Sitagroi phase III are certainly seen, as noted above, and these fit well within the clearer picture of the Thessalian later neolithic as it is now beginning to emerge.

The relations with Bulgaria at this time are less easy to analyze. One suspects that there may be a good deal of regional variety, and finds from the area west of the Maritsa Valley are not well documented. It may be significant, therefore, that brown-on-cream pottery clearly resembling that of Sitagroi II has been found at the site of Strumsko near Blagoevgrad, in the Struma Valley (Stojanova-Serafimova 1970:70, fig. 3). Once again we see the Strymon Valley as an important line of communication.

The important series of figurines, studied by Gimbutas in chapter 9, begins at this time: they are virtually absent from phase I. As she documents, they may be compared both with the figurines of Bulgaria and with those of Thessaly. Both areas do, of course, have plastic representations during the early neolithic. It is clear that during phase II Sitagroi developed religious beliefs, or at least imagery, analogous to those of the north and the southwest. The nature of the interactions which brought about these developments in the plain of Drama remains to be elucidated.

THE SITAGROI III CLIMAX

The abundance and variety of the finds from Sitagroi phase III amply justify the emphasis which Gimbutas places upon the imagery of Old Europe. The figurines from Thessaly at this period may be compared with those of Sitagroi or Dikili Tash and these, in turn, with the abundant finds of the Gumelnitsa culture of Bulgaria and Romania (using this term in the broadest sense to include contemporary finds of the Maritsa and Salcutsa cultures) and those of the developed Vinča culture of Yugoslavia and neighboring lands.

The ceramic affinities are much more specific. The Graphite-painted wares and the Incised

wares established close links with the Gumelnitsa-Kodjadermen culture of Karanovo V and VI, as Evans documents in chapter 12. We may note very comparable finds from the coastal strip to the east of Sitagroi, at Paradeisos (Hellström and Holmberg 1978), and from Paradimi (Bakalakis and Sakellariou 1981:Taf. 30, 31, 58) where incised decoration is perhaps more in evidence than painted. Here, and at Kritsana to the west (Heurtley 1939:158), one appears to be on the fringe of the distribution of richly decorated wares, which seems centered on the plain of Drama and the Balkan sites to the north. The most closely comparable of these sites, as Evans shows, is that of Chardako at the village of Slatino near Kjustendil in the upper Struma Valley. There are other resemblances with sites in west Bulgaria, notably Gradeshnitsa near Vratsa.

At this time, then, we can discern a larger area, termed Old Europe by Gimbutas, embracing much of Greece and the Balkans, within which richly decorated pottery and prolific mythical imagery are found. Within this area is a more narrowly defined one, which does not now include Thessaly or West Macedonia or Yugoslavia, in which the graphite-painted pottery and the ornate incised decoration are particularly notable.

We can also begin to see a more narrowly definable territory within East Macedonia itself, where regional features are seen, most notably in the black-on-red painted ware. It is a rare occurrence, as an import, in Thessaly and is not a regular feature of the Gumelnitsa culture of Bulgaria and Romania, although its distribution in the Struma Valley and in west Bulgaria generally remains to be explored. As Evans indicates, it is particularly common immediately to the south and southwest of the plain of Drama, at Dhimitra and other neighboring sites. The affinities of this ware are described by Evans in chapter 12: it was well discussed by Deshayes and Garašanin (1964) and Garašanin and Dehn (1963:12-14). Within the broad black-on-red category are several subgroups. One of these (our Style I, pls. XC, XCI, top) has close stylistic resemblances with the Graphite-painted pottery from Sitagroi, and another (Style II), with less elaborate decoration, is also well documented at our site (pl. XCI, bottom left). A third group has long been known from Akropotamos (Mylonas 1941:fig. 2), although this may be, as Garašanin and Dehn (1963:13) suggest, rather earlier in date and contemporary with Sitagroi phase II. There are different kinds of interaction operating here, and at different scales.

Fortunately, the material is abundant and varied, and there is much scope for further investigation. The plastic vessels (see Elster, chap. 10) are relevant here, and there is a whole series of other terracotta objects of symbolic significance, to be discussed in volume 2. The evidence of the finds of *Spondylus* shell bracelets at Sitagroi is also important in view of the wide range of the *Spondylus* exchange system in southeastern and central Europe.

Although the metal objects will be published in detail in the second volume, it is relevant to note that a series of small copper objects, together with indications of metalworking, comes from Sitagroi phase III. These are amongst the earliest signs of metallurgy in the Aegean, and they will need to be interpreted within the context of the other interactions of the time (see Chernykh 1978). At present it seems likely that the knowledge of the basic metallurgical techniques involved reached Sitagroi from the north.

SITAGROI IN THE EARLY BRONZE AGE (PHASES IV, VA, AND VB)

The finds of phase IV at Sitagroi are very different from those of the preceding phase. There is no longer any painted decoration on the pottery, and there are no more terracotta objects of evidently symbolic significance. The radiocarbon dates make clear (Renfrew 1971) that this is the time of the Eutresis culture (Early Helladic I) and perhaps already of early Troy I. They suggest also the clear possibility of a hiatus in the occupation of the site between phases III and IV, although it should be remembered that radiocarbon samples were not available from the upper levels of phase III.

When first writing of phase V at Sitagroi (Ren-

frew 1970b), I provisionally suggested "the chronological equivalence of Sitagroi phase V with the Trojan early bronze age, probably with cities I and II at Troy." However, the subsequent excavation of the Burnt House of phase Va and the provision of a more complete series of radiocarbon dates allowed the revision of this view (Renfrew 1971). Sitagroi phase V was then equated with the Early Helladic II and III periods: Sherratt develops this view in chapter 13. Sitagroi phase Va may be regarded as Early Bronze 2 in Aegean terms and phase Vb as Early Bronze 3. It is not, however, until phase Vb that the assemblage shows recognizably Aegean features, such as tunnel-lug handles and one-handled cups, seen also in West Macedonia. It is at this time, too, that numerous resemblances with the important finds at Ezero are apparent (Georgiev et al. 1979). Unfortunately the radiocarbon dates for that site are difficult to interpret in detail (ibid.: 513), and they suggest a chronological equation with Sitagroi IV and perhaps Va rather than Vb. The solution may be, as Sherratt suggests, that in Sitagroi IV and Va, the orientation of relations was with the northwest (Baden) rather than with the northeast (Ezero). Following this view, it was only with Sitagroi Vb, in the Aegean Early Bronze 3 period, that closer links with the Maritsa Valley and with the rest of the Aegean were established.

I should note also the relevance of recent excavations at Pentapolis near Serres by Grammenos (1981). Pentapolis I includes the ribbed decoration and the cup with high handle characteristic of Sitagroi IV (ibid.:147, no. 522) and yielded two radiocarbon dates: 2285 ± 50 bc (Bln / 2392) and 2075 ± 50 bc (Bln / 2393). These are certainly consonant with a date in the Sitagroi IV/Va time range. Pentapolis II has several forms seen at Sitagroi Vb, as well as others (e.g., Grammenos 1981:131, no. 78) seen in the later surface scatter at Sitagroi rather than in the stratified Vb levels. The radiocarbon dates for Pentapolis II are 2005 ± 55 bc (Bln / 2395); 1900 ± 50 bc (Bln / 2454); 1870 ± 55 bc (Bln / 2394); and 1855 ± 50 bc (Bln / 2396). These certainly harmonize with Sitagroi Va/Vb and the immediate aftermath.

The evidence for this period from the site of Dikili Tash was summarized by Deshayes (1973) in a useful article which, without the aid of many radiocarbon determinations, indicated for the first time a number of the conclusions now outlined here. Relying principally on the sequence from *carée* Q24 at Dikili Tash, he defined as Early Bronze I the material from levels 19–12 which may certainly be compared with Sitagroi phase IV (e.g., the grooved sherds; Deshayes 1973: fig. 18). His Early Bronze IIa, represented at Dikili Tash by levels 12–8 and perhaps IIb (levels 8–5), are perhaps contemporary with Sitagroi Va, and his Early Bronze IIc (levels 5–2) perhaps contemporary with Sitagroi Vb. Deshayes rightly saw that many of the significant links at the time were with the Baden culture.

In a general sense, as indicated in chapter 13, the channeled wares of Sitagroi IV do have resemblances with those of the Baden culture of Hungary and neighboring lands to the north (Neustupný 1973), and Sitagroi IV is undoubtedly contemporary with middle Baden. In her useful recent article Němejcová-Pavúková (1981) places Sitagroi IV as contemporary with Baden phase I, as well as with Cernavoda III and Ezero 13-17. The more profusely decorated vessels of later Baden (Neustupný 1973:327, fig. 5) may likewise be compared with those of the Burnt House at Sitagroi (phase Va). Němejcová-Pavúková (1981) would set Sitagroi Va as the contemporary of Baden II, and Cotsofeni I with Sitagroi Vb, perhaps spanning the time occupied by Baden II and IV. But these are somewhat abbreviated comments, and there is a need now for a more thorough study of the material in southeast Europe as a whole to document these proposed relationships in a more detailed manner.

The problem of the origin of the Baden culture has been much discussed, and the presence in the plain of Drama of a culture with many resemblances to it might at first sight give heart to those who have proposed a southeastern or Anatolian origin for it (e.g., Kalicz 1963). But I feel that Deshayes (1973:37) was right in stressing the likely autonomy of the developments in the two areas, an autonomy which led them into contact and mutual interaction. Indeed the Baden

culture and its relations in other lands in southeast Europe (Němejcová-Pavúková 1981) may now be seen as a broad complex as wide in its scope as the earlier Gumelnitsa-Salcutsa group. Neither may plausibly be ascribed to influences external to the region, nor can one easily define a single point of origin within it for either. We are faced with the emergence of a new complex by a process of what I have elsewhere termed "peer-polity interaction" (Renfew 1986).

It is within this broad perspective that we should view the few sherds of cord-decorated pottery found at Sitagroi. Corded decoration is seen first in phase Va (pl. XCVIII, bottom:1 from PN/A layer 92; pl. XCVIII, bottom:2 from ROc layer 34; and pl. XCVIII, bottom:6 from PN/B layer 262). There is one stratified sherd from phase Vb (pl. XCVIII, bottom:8 from PO/C layer 36). And there are several sherds from surface or near-superficial levels (pl. XCVIII, bottom:3-5, 7). Cord-impressed decoration has been a matter of much discussion (e.g., Hanschmann and Milojčić 1976:231-235), and in the Aegean occurs occasionally in contexts of Early Bronze 2 and 3 date. There seems no special significance in relation to its scanty occurrence at Sitagroi.

It is fair to say that the broad outlines of the northern Greek bronze age are only now becoming clear. The publication of the important Thessalian material from Argissa Magoula (Hanschmann and Milojčić 1976), and now that from Sitagroi, should allow an assessment based on a corpus of well-stratified material which may now be compared with the full publication of the Ezero finds (Georgiev et al. 1979). These bodies of material and the development of the radiocarbon chronology will help us to define more precisely the characteristics of the period. They open the way, also, toward a more detailed examination of the transitional period following late neolithic/chalcolithic. This period, which I have termed the "final neolithic" in Greece (Renfrew 1972:68) and which Balkan colleagues refer to as the *Übergangszeit*, remains problematic. No site in southeast Europe yet affords us a good sequence of strata spanning the "missing millennium" of ca. 3100 bc to 2600 bc in radiocarbon years, equivalent to ca. 4200 BC to 3300 BC when calibrated. Indeed, at present a complete sequence over this time period seems available only in the Carpathians, in Hungary and Slovakia. This difficulty, which our work at Sitagroi has allowed us clearly to identify, no doubt applies with equal force in Thessaly, hence the various difficulties associated with the concept of "Late Rachmani," which supposedly spans this final neolithic period. Once again, the publication of new material raises as many problems as it solves. But at least the problems are becoming increasingly well defined.

CONCLUSION

In this brief summary of the first volume of this final report, we have been perhaps excessively concerned with chronology and with relationships between neighboring areas. This is not unnatural, however, inasmuch as a major initial impetus for the excavation was one central chronological problem in European prehistory, a problem we have been able to resolve in a manner we would claim as definitive. With the old Troy-Vinča relationship laid to rest, and the autonomy of the southeast European copper age firmly established, the way lies open for a reconsideration of those processes which led to the end of that complex of cultures termed "Old Europe" by Gimbutas—the processes which allowed the development of very different cultures, represented in Bulgaria by early Ezero, in east-central Europe by Baden, and in the plain of Drama by Sitagroi phase IV.

For this purpose we still need to return to the first aim indicated at the outset of this volume: the investigation of the economic and social bases of change in the area. Here the geomorphological investigation of Davidson and the pollen work of Turner and Greig will be of fundamental importance. The study of the faunal remains by Bökönyi gives a much clearer insight into the transition from Sitagroi III to IV, and this will be reinforced when the study of the plant remains is published in our second volume.

Social questions will come to the fore at that stage, and more emphasis can then be placed on some special features, notably the remarkable assemblage of pottery and other finds recovered from the Burnt House of phase Va. This material—the complete contents of a house, allowing us to study, for instance, the relationship in spatial arrangement between coarse and fine wares—constitutes the richest collection of undoubtedly contemporary material available from an early bronze age settlement in Thessaly or Macedonia. It deserves to be studied in greater detail for the insights it offers into the life of the time and into the role of fine and coarsewares within the domestic context.

Above all, we should not lose sight of the long time range represented by the tell at Sitagroi, some 3,500 years. The changing patterns of interaction between this site and neighboring areas are of particular interest:

Phase I with the Struma and Maritsa Valleys of Bulgaria and with Aegean Thrace;
Phase II, less markedly, with Thessaly;
Phase III, with the Gumelnitsa-Salcutsa complex of Bulgaria and Romania;
Phase IV with early Baden in Hungary and Czechoslovakia;
Phase Va with classic Baden in Hungary and Czechoslovakia; and
Phase Vb with the Maritsa Valley, West Macedonia, and the Troad.

There is no suggestion here that any of these contacts, after initial colonization from the north, was of dominant significance, and the interactions were no doubt always in both directions. The pattern is of varying degrees of interaction, sometimes leading to the development of a complex symbolism. The role of the Struma (Strymon) Valley as a major channel of communication, comparable in importance with the Vardar (Axiós), emerges clearly. This is already well documented for phases II and III at Sitagroi, and the same is likely to be found for the initial settlement of phase I and perhaps for the early bronze age cultures of phases IV and V also. The publication of this rich material now indicates a series of further questions of great general interest for the prehistory of Europe.

Bibliography

Abbreviations

AA	*American Antiquity*. Washington, D.C.
AAASH	*Acta Archaeologica Academiae Scientarium Hungaricae*. Budapest.
AD	*Archaiologikon Deltion*. Athens.
AJA	*American Journal of Archaeology*. New York.
Am. Anth.	*American Anthropologist*. Washington, D.C.
AS	*Anatolian Studies*. London: British Institute of Archaeology at Ankara.
BAN	Bulgarska Akademiia na Naukite.
BAR	British Archaeological Reports. Oxford.
BASPR	*Bulletin of the American School of Prehistoric Research*. Cambridge.
BCH	*Bulletin de Correspondance Hellénique*. Paris.
BRGK	*Bericht der römisch-germanischen Kommission*. Frankfurt am Main.
BSA	*Annual of the British School of Archaeology at Athens*. London.
GMKM	*Glasnik Muzeja Kosovo i Metohije*. Priš-tina.
GMPO	*Godishnik na Muzeite v Plovdivski Okrug*. Plovdiv.
GNAM	*Godishnik na Narodni Arkheologicheski Muzeĭ*.
GZMS	*Glasnik Zemaljskog Muzeja*. Sarajevo.
IAI	*Izvestiia na Arheologicheskiia Institut*. Sofia.
IBAD	*Izvestiia na Bulgarskoto Arkheologichesko Druzhestvo*. Sofia.
IPEK	*Jahrbuch für prähistorische und ethnographische Kunst*. Berlin.
JRGZ	*Jahrbuch des römisch-germanischen Zentralmuseums*. Mainz.
KSIA	*Kratkie soobshcheniia Instituta arkheologii*. Moscow.
MCA	*Materiale şi Cercetări Archeologie*. Bucharest.
MIA	*Materialy i issledovaniia po arkheologii*. Moscow-Leningrad.
PPS	*Proceedings of the Prehistoric Society*. London.
PZ	*Prähistorische Zeitschrift*. Berlin.
SCIV	*Studii şi Cercetări de Istorie Vechie*. Academia Republicii Populare Romîne, Institutul de Istorie şi Filosofie. Bucharest.
SM	*Saügetierkundliche Mitteilungen*. Munich.
ZNM	*Zbornik Narodnog Muzeja*. Belgrade.

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Concordance to Color Plates

Plate A

1. SF 4409 (cat. no. 42), fig. 9.25, pl. L:3
2. SF 5 (cat. no. 202), fig. 9.74, pl. LVIII:2
3. SF 154 (cat. no. 147), fig. 9.7, pl. XLVI:1b
4. SF 1216 (cat. no. 127), fig. 9.46, pl. LIII:2

Plate B

1. SF 1207 (cat. no. 190), fig. 9.67, pl. LVI:3
2. SF 3927 (cat. no. 169), fig. 9.14, pl. XLVIII:2
3. SF 26/35, fig. 12.7:1, pl. LXXIV:4
4. Pot 224, fig. 13.10:2, pl. XXXIII:3

Color Plate C*

1. GrL, KL 21
2. GLC, ML 20 (fig. 11.3:8; pl. LXXV:3)
3. DB, ML 10
4. PlB, KL 3
5. PFP, ZA 61
6. Rrl, KL 19
7. Sm, ML 21
8. Rst, JL 13 (fig. 11.7:7; pl. LXXVII, top:1)
9. C, KL 131
10. Srd, ZA 64 (fig. 11.8:15; pl. LXXVI, top:1)
11. Br/C, ML 14 (fig. 11.12:6; pl. LXXX:3
12. Br/Bf, KM 20/ML 12 (fig. 11.14:10)
13. MBr/W, ZA 52 (pl. LXXXI, bottom:2)
14. O/O, KM 20 (fig. 11.13:5; pl. LXXXIV, top:2)
15. W/R, KM 20 (pl. LXXXIII, bottom:3)
16. OP (red crusted), KL 107 (pl. LXXXIII, bottom:8)
17. OP (red slip), KL 117
18. I (red ocher), KM 20
19. Srd, KL 108
20. Rp, ZA 52 (pl. LXXV:12)
21. BT, ML 11 (pl. LXXVI, bottom:2)
22. BT with paint, LL 3 (pl. LXXVI, bottom:6)
23. Thin Brown on Orange, ZA 52 (fig. 11.12:4; pl. LXXXII, top:4)
24. W/R, ZA 50 (fig. 11.14:1; pl. LXXXIII, bottom:1)
25. R/W, ML 16 (fig. 11.14:3; pl. LXXXIII, top:10)

Plate D

1. Gr, ZG 31 (pl. LXXXVIII, top:3a)
2. Bl/R, ZA 44 (pl. XC:4a)
3. ExG (Maritsa), ZA 47 (fig. 12.11:5; pl. XCII, bottom right:1)
4. ExG, ZA 42/44 (fig. 12.11:1; pl. XCII, top left:1)
5. Gvd (or ClGvd), MM 20 (pl. XCIV, top:12)
6. Barbotine, MM 20 (pl. XCIII, top right:3)
7. DB (channeled), ROc 65 (cf. pl. XCVI, top:6)
8. DB, ZA 18
9. PlB, ROc 49
10. StP (and DB), ROc 41
11. I, ZHt 19 (pl. XCVII:6)
12. C (with rim cordon), PO 10 (fig. 13.23:6; pl. C, top:6)
13. Sm, PO 8

* Editors' note: Throughout this book, to distinguish between the black-and-white plate C (= 100 in the Roman numerals series) and the color plate C (in the alphabetic series A-D), the editors have used "color plate C" for the color plate references and "plate C" only for references to the black-and-white plate.

Concordance: Plates to Figures (Pottery)

Plate XI
- 1a. Pot 20, ZA 31/32 (fig. 13.4:6)
- 1b. Pot 21, ZA 31/32 (fig. 13.4:12)
- 1c. Pot 23, ZA 31/32 (fig. 13.4:8)
- 1d. Pot 24, ZA 31/32 (fig. 13.4:11)
- 2. Pot 5, ZA 26 (fig. 13.4:9)
- 3. Pot 63, ZA 26 (fig. 13.5:2)
- 4. Pot 325, ZA 26 (fig. 13.5:5)
- 5. Pot 80, ZA 28 (fig. 13.5:6)

Plate XII
- 2. Pot 19, ZA 31/32 (fig. 13.4:10)
- 3. Pot 6, ZA 31/32 (fig. 13.4:2)

Plate XIII
- 1. Pot 8, ZA 41 (fig. 12.12:6)
- 2. ZA 41
- 3. Pot 11, ZA 41
- 4. Pot 9, ZA 41 (fig. 12.11:6)
- 5. Pot 12, ZA 41 (fig. 12.5:4)
- 6. ZA 35

Plate XIV
- Pot 38, ZA 41 (fig. 12.9:3)

Plate XV
- Pot 126, ZA 43 (fig. 12.3.1)

Plate XVI
- 1. Pot 17, ZA 45 (fig. 12.5:5)
- 2. Pot 16, ZA 44 (fig. 12.14:3)
- 3. Pot 75, ZA 44 (fig. 12.9:1)
- 4. Pot 99, ZA 45 (fig. 12.2:1)

Plate XXII
- 1. Pot 89, QO 8 (fig. 13.20:25; pl. XCIX, top:2)
- 2. Pot 128, QO 8 (fig. 13.20:5; pl. XCIX, top:4)
- 3. Pot 155, QO 8 (fig. 13.22:4)
- 4. Pot 86, QO 8 (fig. 13.23:3)
- 5. Pot 116, PN 14 (fig. 13.20:15; pl. XCIX:16)

Plate XXXII
- 1. Pot 337, PN/C 89
- 2. Pot 270/289, PN/F 264 (fig. 13.12:1)
- 3. Pot 274, PO 161
- 4. Pot 273, PO 161
- 5. Pot 255, PO 159
- 6. Pot 286, PN/F 264 (fig. 13.13:9)
- 7. Pot 282, PN/C 90 (fig. 13.14:5)
- 8. Pot 221, PO 158 (fig. 13.10:5)
- 9. Pot 209, PO/A 54 (fig. 13.10:4)
- 11. Pot 223, PO 161

Plate XXXIII
- 1a, b. Pot 291/287, PN/D 80 (fig. 13.10:1)
- 2a, b. Pot 246, PN/C 90 (fig. 13.10:3)
- 3a, b. Pot 224, PO 161 (fig. 13.10:2; pl. B:4)

Plate XXXV
- 2. Pot 247, ZH 24
- 3. Pot 206, ZH 13 (fig. 13.10:9)
- 4. Pot 305, ZH 26
- 5. Pot 329, ZH 19 (fig. 13.12:2)

Plate XXXVI
- 2. Pot 227, ZE 76 (fig. 13.8:1)
  Pot 226, ZE 76 (fig. 13.8:2)

Plate XXXIX
- 1. Pot 236, MM 27 (fig. 12.2:5)
- 2. Pot 290, MM 68 (fig. 12.6:1)
- 3. Pot 33, MM 12 (fig. 12.5:2)
- 4a, b. Pot 133, ML 109 (fig. 12.3:2)

Plate XLI
- 1. Pot 254, MM 64 (fig. 12.7:2)
- 2a, b. Pot 306, MM 65 (fig. 12.5:1)
- 3a, b. Pot 67, MM 20 (fig. 12.4)

Plate XLII
- 1. Pot 292, MM (fig. 12.6:3)
- 2. Pot 308, MM 16 (fig. 12.6:2)
- 3a, b. Pot 112, MM 49 (fig. 12.10:3)
- 4. Pot 312, MM 21
- 5. Pot 56/146, ML 107 (fig. 12.10:2)

Plate XLIII
- 1. Pot 66, ML 111
- 2. Pot 113/833, MM 49 (fig. 10.1:3)
- 3. Pot 237, MM 21
- 4. Pot 313, MM 21 (fig. 12.10:5)
- 5. Pot 144, KM 9 (fig. 11.14:8)
- 6. Pot 18, KM 9 (fig. 11.19:2)

Plate XLIV
- 2. Pot 160, KL 10 (fig. 11.5:8)
- 3. Pot 156, ML 45 (fig. 11.4:1)
- 4. Pot 137, ML 45 (fig. 11.7:1)
- 5. Pot 32/311, KL 20/21 (fig. 11.5:4)

Plate LXVI
- 1a, b. SF 339 (fig. 10.1:1)
- 2a, b. SF 2690
- 3a, b. SF 2540 (fig. 10.2:3)

Plate LXVII
- 1a, b. SF 2235 (fig. 10.2:2)
- 2a, b. SF 135 (fig. 10.2:1)
- 3a, b. SF 2610
- 4a, b. SF 1533 (fig. 10.3:21)
- 5a, b. SF 2313
- 6a, b. SF 1501 (fig. 10.3:17)

Plate LXVIII
- 1a, b. SF 112 (fig. 10.2:8)
- 2a, b. SF 2378/2380 (fig. 10.3:3)
- 3a, b. SF 959 (fig. 10.2:5)
- 4a, b. SF 2536
- 5. Chorla 9
- 6. Chorla 10
- 7. Chorla 5

Plate LXIX
- 1. SF 2385
- 2. SF 2609
- 3. SF 537 (fig. 10.4:5)
- 4. SF 449

5. SF 2681
6. SF 2808
7. SF 2832
8. SF 2687
9. SF 4587
10. SF 1534 (fig. 10.6:3)
11. SF 4111
12. SF 2668
13. SF 1503 (fig. 10.2:10)
14. Akropotamos

Plate LXX

1a, b. SF 177 (fig. 10.1:2)
2. SF 868 (fig. 10.7:6)
3. SF 867

Plate LXXI

1. SF 1616
2. SF 3576
3. SF 864
4. SF 1512 (fig. 10.7:12)
5. SF 1464 (fig. 10.7:16)
6. SF 1518 (fig. 10.7:9)
7. SF 1582 (fig. 10.7:4)
8. SF 3579
9. SF 3594
10. SF 3629
11. SF 483 (fig. 10.7:5)
12. SF 1707
13. SF 149, KL 2 (fig. 11.10:9)
14. SF 1499

Plate LXXII

1. SF 225 (fig. 10.9:3)
2. SF 398 (fig. 10.9:5)
3. SF 730 (fig. 10.1:5)
4. SF 1425 (fig. 10.1:6)
5. SF 3400
6. SF 3432
7. SF 2236 (fig. 10.1:4)
8. SF 4470
9. SF 2662
10. SF 204 (fig. 10.8:19)
11. SF 3401
12. SF 1190 (fig. 10.8:14)
13. SF 3429
14. SF 39 (fig. 10.8:18)
15. SF 1469 (fig. 10.8:21)
16. SF 762 (fig. 10.8:22)
17. SF 738

Plate LXXIII

1. SF 3862 (fig. 10.9:10)
2. SF 2837
3. SF 884

Plate LXXIV

1. SF 3931
2. SF 2370 (fig. 10.7:1)
3. SF 5170
4. SF 26/35 (fig. 12.7:1; pl. B:3)

Plate LXXV

1. ML 18
2. KL 20 (fig. 11.2:7)
3. ML 20 (fig. 11.3:8; color pl. C:2)
4. KL 133
5. ML 18/23 (fig. 11.18:5)
6. ML 45
7. ML 131
8. KL 124
9. KL 12 (fig. 11.3:3)
10. ZA 52
11. ML 17 (fig. 11.18:8)
12. ZA 52 (color pl. C:20)

Plate LXXVI

Top:

1. ZA 64 (fig. 11.8:15; color pl. C:10)
2. KLb 164
3. KLb 141 (fig. 11.8:16)
4. KL 121

Bottom:

1. KM 6 (fig. 11.17:7)
2. ML 11 (color pl. C:21)
3. KL 10
4. KL 108
5. KM 14
6. LL 3 (color pl. C:22)
7. ZA 54
8. KL 108

Plate LXXVII

Top:

1. JL 13 (fig. 11.7:7; color pl. C:8)
2. JL 14
3. KL 19
4. ZA 65
5. ZA 62
6. KL 26
7. ZA 62 (fig. 11.7:11)
8. KL 19
9. KL 19 (fig. 11.7:3)
10. IL 7
11. KL 23 (fig. 11.7:4)

Bottom:

1. ML 31 (fig. 11.6:21)
2. KLb 133
3. ZA 67 (fig. 11.7:8)
4. KM 9
5. KL 135 (fig. 11.7:10)
6. KL 12 (fig. 11.7:5)

Plate LXXVIII

Top:

1. ML 34 (fig. 11.8:5)
2. ZA 72
3. ML 34
4. ZA 64 (fig. 11.8:6)
5. ML 45
6. JL 15

7. ML 35
8. KL 13 (fig. 11.8:9)
9. KL 135

Bottom:

1. KM 14
2. KM 8
3. JL 7
4. JL 17 (fig. 11.6:14)
5. KL 128
6. ML 26
7. Surface
8. JL 14 (fig. 11.6:9)

Plate LXXIX

Top:

1. KL 133
2. KL 10/ML 28 (fig. 11.6:2)
3. KL 130
4. JL 13 (fig. 11.6:1)

Middle:

1. KL 139
2. KM 20
3. ML 13
4. KL 135

Bottom:

1. ZA 65 (fig. 11.4:4)
2. KL 20 (fig. 11.4:3)
3. KL 30
4. JL 13 (fig. 11.4:2)

Plate LXXX

1. KL 115
2. KL 115
3. ML 14 (fig. 11.12:6; color pl. C:11)
4. KM 9
5. KL 114
6. KL 115
7. ZA 54
8. KL 115
9. KL 115
10. KM 13
11. KM 14
12. ZA 51
13. KL 2 (fig. 11.15:13)
14. KM 3
15. KL 2 (fig. 11.12:5)
16. ZA 51
17. KL 2
18. ZA 52
19. KM 2
20. ML 10
21. ZA 52 (fig. 11.14:11)
22. KM 2

Plate LXXXI

Top:

1. KL 107
2. KL 2 (fig. 11.15:6)
3. KL 103 (fig. 11.14:6)
4. ML 150
5. LL 7 (fig. 11.11:7)
6. ZA 51
7. LL 4 (fig. 11.15:16)
8. No provenience
9. ZA 52
10. KL 2
11. KL 2
12. ZA 51

Bottom:

1. ML 18 (fig. 11.11:10)
2. ZA 52 (color pl. C:13)
3. KL 106
4. LL 9
5. KL 2
6. KL 2
7. KL 2
8. KM 5
9. KL 100
10. KL 2
11. KL 106
12. ZA 53

Plate LXXXII

Top:

1. ZA 64
2. ML 9
3. ZA 47
4. ZA 52 (fig. 11.12:4; color pl. C:23)
5. KL 2
6. ZA 52 (fig. 11.12:7)
7. ZA 59
8. KL 2
9. No provenience
10. ZA 54
11. ZA 54
12. ZA 50 (fig. 11.12:8)

Bottom:

1. KL 110
2. KM 20
3. MM 10 (fig. 11.12:9)
4. ML 18
5. KL 3
6. ML 14

Plate LXXXIII

Top:

1. ZA 47
2. KL 121
3. KL 100
4. KL 2
5. KL 117
6. KL 113
7. KL 121
8. KL 109
9. KL 114
10 ML 16 (fig. 11.14:3; color pl. C:25)
11. No provenience
12. KM 20

Bottom:
1. ZA 50 (fig. 11.14:1; color pl. C:24)
2. KM 20
3. KM 20 (color pl. C:15)
4. KM 20
5. ZA 20
6. KM 18
7. KL 2
8. KL 107 (color pl. C:16)

Plate LXXXIV

Top:
1. KL 105 (fig. 11.13:2)
2. KM 20 (fig. 11.13:5; color pl. C:14)
3. KL 107 (fig. 11.12:1)
4. KL 6 (fig. 11.13:8)
5. KL 102
6. KM 2
7. KLb 118 (fig. 11.11:9)

Bottom:
1. KL 106
2. KM 9
3. KL 113
4. KL 117

Plate LXXXV
1. Profile no. 249, ZJ 37
2. Pot 170, KL 104 (fig. 11.19:3)
3. Pot 25, KM 8
4. Pot 294, JL 105 (fig. 11.17:4)
5. Pot 157/307, ML 44/45 (fig. 11.9:3)
6. Pot 108, KM 20 (fig. 11.19:4)

Plate LXXXVI
1. ZA 40
2. MM 30
3. MM 16
4. MM 44
5. ZA 41/42
6. MM 40
7. MM 16
8. ZA 44
9. MM 41
10. Pot 76, ZA 44 (fig. 12.13:1)
11. SF 856, MM 40
12. SF 1200, MM 40
13. SF 1296, MM 53

Plate LXXXVII

Top:
1. ZA 41a
2. MM 53
3. MM 41
4. MM 30
5. ZA 43
6. MM 11
7. MM 52
8. ZA 42
9. MM 52
10. ZA 38
11. ZA 42
12. MM 30
13. ZA 40
14. MM 27
15. ZA 41a
16. MM 40
17. ZA 38
18. MM 20
19. MM 16

Bottom:
1. MM 18
2. MM 20
3. MM 19
4. ZA 40
5. MM 21
6. MM 40 (fig. 12.12:4)
7. MM 31
8. ZA 41

Plate LXXXVIII

Top:
1. ZA 42
2. ZA 42
3. ZG 31 (pl. D:1)
4. MM 47
5. MM 30
6. MM 43

Bottom:
1. ZA 43
2. ZA 44
3. MM 11
4. MM 16
5. ZA 38
6. ZA 44
7. ZA 45
8. MM 21

Plate LXXXIX
1. ZA 44
2. MM 16
3. MM 54 (fig. 12.2:6)
4. MM 16
5. MM 10
6. MM 16
7. ZA 46
8. ZA 47
9. ZA 42 (fig. 12.5:3)
10. ZA 43
11. MM 50
12. MM 20
13. Pot 81, ZA 34
14. Pot 117/159, ZA 44 (fig. 12.12:7)

Plate XC

Top:
1. MM 27
2. MM 52
3. MM 50 (fig. 12.8:9)
4. ZA 44 (pl. D:2)
5. MM 40
6. MM 50

Bottom:
1. MM 16
2. ZA 44
3. MM 43
4. No provenience
5. MM 45
6. MM 41

Plate XCI
Top:
1. ML 103
2. MM 52
3. ML 107 (fig. 12.8:5)
4. ZA 42
5. ML 2 (fig. 12.8:6)
6. MM 41

Bottom left:
1. ZG 30
2. ZA 44
3. MM 50
4. ZG 30
5. ZA 43
6. ZA 45
7. MM 12
8. ZA 43
9. MM 24

Bottom right:
1. SF 3418, MM 60
2. SF 186, MM 19

Plate XCII
Top left:
1. ZA 42/44 (fig. 12.11:1; pl. D:4)
2. ZG 35 (fig. 12.11:2)
3. MM 41
4. MM 52
5. MM 19
6. ZA 38

Top right:
1. MM 60
2. MM 43
3. ML 100
4. MM 31
5. ZA 42
6. MM 20

Bottom left: Pot 48, MM 16 (fig. 12.2:4)
Bottom right:
1. ZA 47 (fig. 12.11:5; pl. D:3)
2. ZA 38
3. KL 2
4. KL 2
5. MMa 63
6. MM 35
7. ZA 44
8. ZA 44

Plate XCIII
Top left: SJ 32/33
Top right:
1. MM 27
2. MM 11
3. MM 20 (pl. D:6)
4. ML 111
5. MM 11
6. MM 41

Bottom left: Pot 216, MMd 66
Bottom right:
1. SF 1726, no provenience
2. MM 41
3. ZA 41
4. MM 40
5. ZA 43
6. ML 110

Plate XCIV
Top:
1. MM 21
2. MM 43
3. MM 52 (fig. 12.11:3)
4. MM 36
5. MM 40
6. ZA 38
7. ZA 49
8. MM 27
9. MM 16 (fig. 12.12:3)
10. MM 16
11. MM 16
12. MM 20 (pl. D:5)

Middle:
1. MM 41
2. MM 27
3. ZA 42
4. ZA 47
5. MM 28

Bottom:
1. MM 39 (fig. 12.11:4)
2. MM 6
3. MM 43
4. ZA 41a
5. MM 27
6. MM 21
7. ML 40
8. MM 40

Plate XCV
1. Pot 109, MM 48 (fig. 12.13:4)
2. Pot 233, KL 115 (fig. 11.17:9)
3. Pot 182, ML 151 (fig. 11.16:10)
4. SF 755, MM 16 (fig. 8.20a; pl. XL:1a-c)
5. Pot 88, MM 52
6. Pot 115, MM 51
7. Pot 205, MM 20
8. Pot 61a, MM 43
9. Pot 58, MM 43

Plate XCVI
Top:
1. ROc 59
2. ROc 59
3. ROc 59

4. ROc 59
5. ROc 59
6. ROc 59 (pl. D:7)
7. ROc 61
8. ROc 61
9. ROc 61
10. ROc 61
11. ROc 61

Bottom:

1. ROc 59
2. ROc 59
3. ROc 61
4. ROc 61
5. ROc 59
6. ROc 59
7. ROc 59
8. ROc 59

Plate XCVII

1. PN/C 88
2. ZHt 17
3. ZHt 12
4. ZHt 1
5. ZHt 17
6. ZHt 19 (pl. D:11)
7. ZHt 1
8. ZHt 1
9. PO/A 54 (fig. 13.13:11)
10. ZHt 17
11. PO 15 (fig. 13.13:2)
12. PO 17 (fig. 13.13:10)
13. ZHt 17
14. ZHt 5
15. PN/C 88
16. ZHt 24
17. PN/D 80
18. PO/A 154 (fig. 13.13:4)
19. PN 89
20. PO 49 (fig. 13.13:5)

Plate XCVIII

Top:

1. ZHt
2. PN/D 79
3. ZHt 27
4. KM 2
5. ZHt 1
6. ZHt 24
7. ZHt 18
8. ZHt 17
9. ZHt 24

Bottom:

1. Pot 177, PN/A 92 (fig. 13.13:6)
2. ROc 34
3. Pot 186, NL 1 (fig. 13.13:7)
4. NM 1
5. PN/E/F
6. PN/B 262
7. PN/PO
8. PO/C 36

Plate XCIX

Top:

1. Pot 73, QO 8 (fig. 13.20:21)
2. Pot 89, QO 8 (fig. 13.20:25; pl. XXII:1)
3. Pot 64, PO 9 (fig. 13.20:22)
4. Pot 128, QO 8 (fig. 13.20:5; pl. XXII:2)
5. Pot 78, PN 14 (fig. 13.20:19)
6. Pot 96, PO 11 (fig. 13.20:16)
7. Pot 74, PN 12 (fig. 13.20:3)
8. Pot 129, QO 8 (fig. 13.20:17)
9. Pot 119, PN 28 (fig. 13.20:18)
10. Pot 122, PN 28 (fig. 13.20:12)
11. Pot 95, PO 11 (fig. 13.20:10)
12. Pot 45, QOc 8 (fig. 13.20:1)
13, 18. Pot 120, PN 28 (fig. 13.20:11)
14. Pot 102, PN 21 (fig. 13.20:8)
15. Pot 34, PO 8 (fig. 13.20:9)
16. Pot 116, PN 14 (fig. 13.20:15; pl. XXII:5)
17. Pot 41, PO 8 (fig. 13.20:4)

Bottom:

1. PO 7 (fig. 13.26:18)
2. PO 8
3. PO 4
4. PO 8
5. PO 7
6. PO 3 (fig. 13.27:16)
7. PO 7 (fig. 13.26:15)
8. PO 10
9. PO 4 (fig. 13.27:19)

Plate C*

Top:

1. PO 8
2. PO 8
3. PO 4
4. PO 10 (fig. 13.23:1)
5. PO 8
6. PO 10 (fig. 13.23:6; pl. D:12)
7. PO 10
8. PO 8
9. PO 8
10. PO 11
11. PO 8
12. PO 10 (fig. 13.21:6)

Bottom:

1. PO 8 (fig. 13.23:4)
2. PO 14
3. PO 3
4. PO 8
5. PO 11
6. PO 7

* Editors' note: Throughout this book, to distinguish between the black-and-white plate C (= 100 in the Roman numerals series) and the color plate C (in the alphabetic series A-D), the editors have used "color plate C" for the color plate references and "plate C" for the references to the black-and-white plate.

7. PO 8
8. PO 8 (fig. 13.26:21)
9. PO 7
10. PO 10
11. PO 9

Plate CI

1. Pot 185, ROc 25
2. Pot 143, PN 11 (fig. 13.24:2)
3. Pot 44, PN 6 (fig. 13.25:7)
4. Pot 244, PN ext. S
5. Pot 245, PN/B 104 (fig. 13.10:6)
6. Pot 175, QO section trimming (fig. 13.25:5)
7. SF 2737, ZE 64
8. SF 309, PO 3
9. SF 1301, PN 7
10. SF 1087, QN 8
11. SF 1351, PN 25
12. SF 1646, PN 12

Plate CII

1. Pot 345, ZHt 26 (fig. 13.16:2)
2. Pot 330, ZHt 11 (fig. 13.11:7)
3. Pot 346, ZHt 26 (fig. 13.7:1)
4. Pot 334, ZHt 23 (fig. 13.14:1)
5. Pot 328, ZHt 19
6. Pot 91, SL 11 (fig. 13.5:4)

Plate CIII

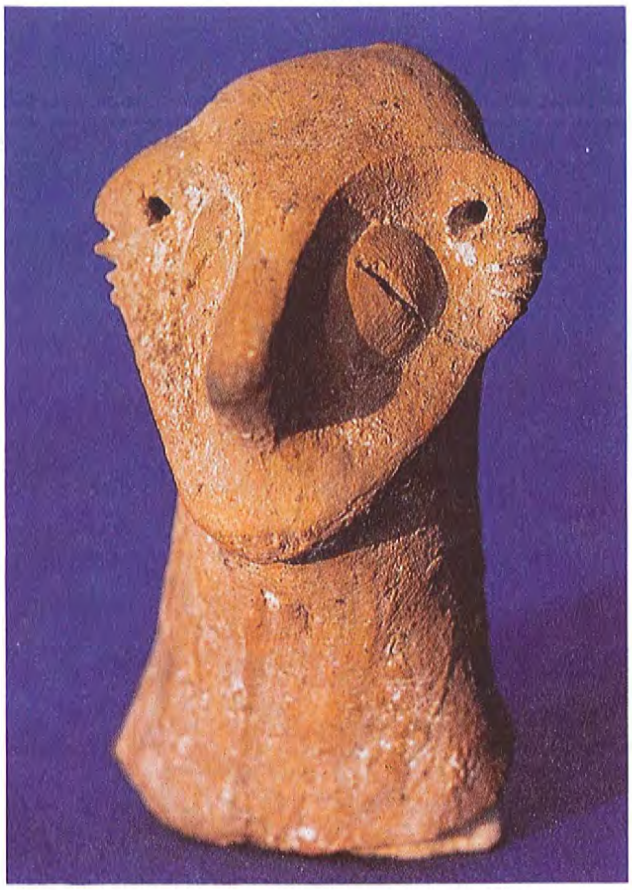
1. Pot 269, PO 161
2. Pot 228, PO 159 (fig. 13.19:2)
3. Pot 264, PO 160 (fig. 13.19:1)
4. Pot 258, PO 159 (fig. 13.16:3)
5. Pot 257, PO 159 (fig. 13.18:2)
6. Pot 262, PO 161 (fig. 13.11:6)

Plate CIV

1. Pot 263, PO 159
2. Pot 260, PO 159 (fig. 13.15:2)
3. Pot 210, PN/C 60
4. Pot 276, PO 159 (fig. 13.18:1)
5. Pot 268, PO 161 (fig. 13.11:2)
6. Pot 271, PN/F 264 (fig. 13.14:2)

Plate CV

1. Pot 251, PN/F 264 (fig. 13.11:3)
2. Pot 252, PN/F 264 (fig. 13.11:1)
3. Pot 267, PO 160
4. Pot 235, PO 158 (fig. 13.17:1)
5. Pot 261, PO 161
6. SF 4750, PO 159



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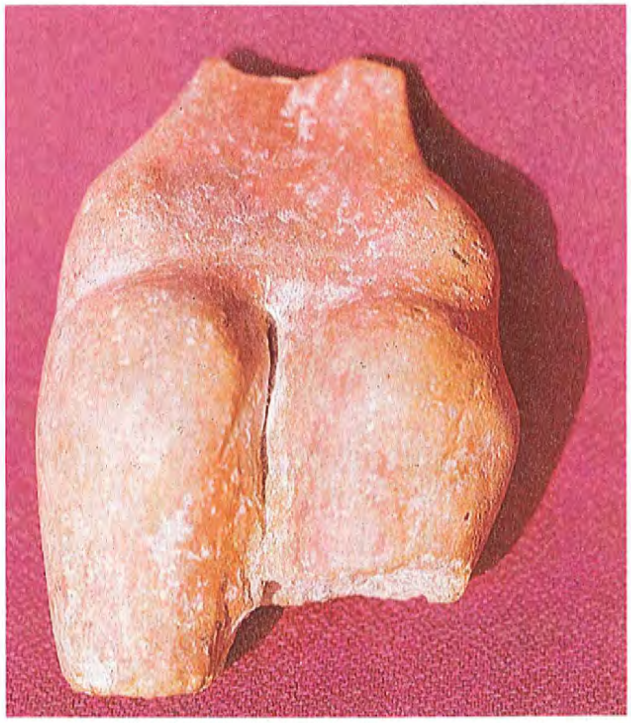

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Plate A. (1) Masked human head of figurine. (2) Masked human/animal horned head. (3) Naturalistic lower female torso. (4) Birdlike stylized and incised figurine.

1

2

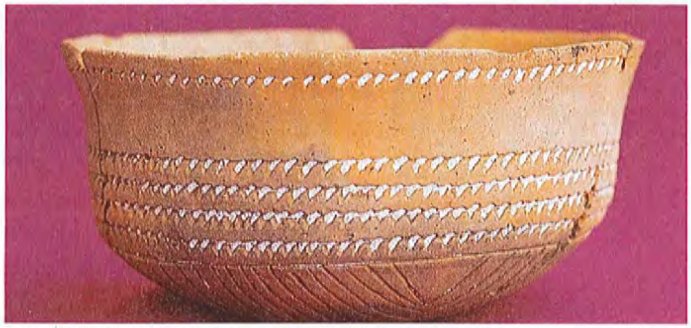

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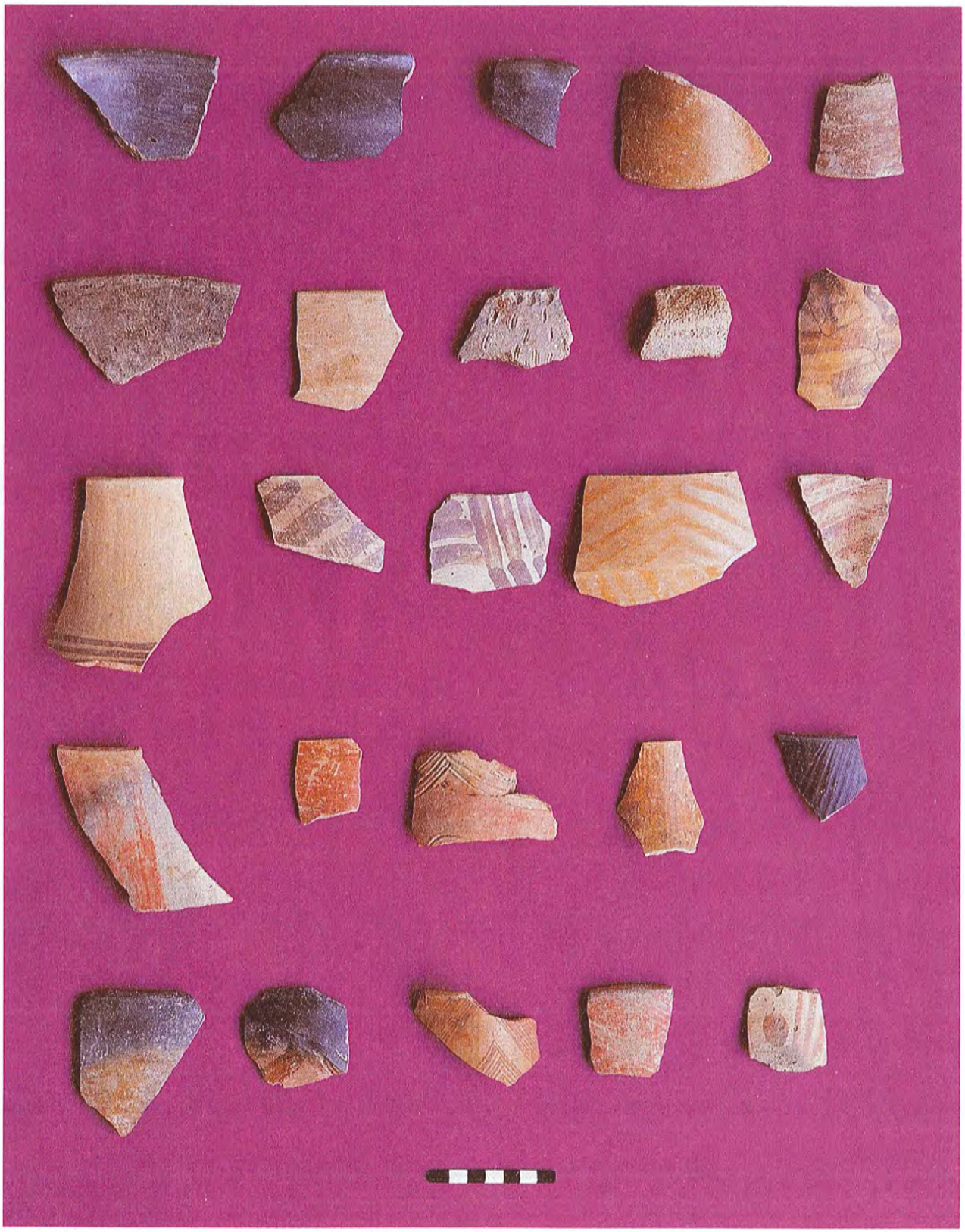
Plate B. (1) Mythical animal, black-on-red painted. (2) Seated lower torso, black-on-red painted. (3) Bowl with impressed and incised decoration and white infill. (4) Pyramidal stand, graphite-painted.



Color Plate C. Various wares representing phases I and II.

1-3

4-6

7-9

10-13

Plate D. Various wares representing phases III, IV, and V.

1

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Plate I. The site of Sitagroi and its environs. (1) The plain of Drama, seen from the west near Alistrati, with a fault escarpment in the foreground and Mount Pangaion in the background. (2) Sitagroi mound before excavation, seen from the north.

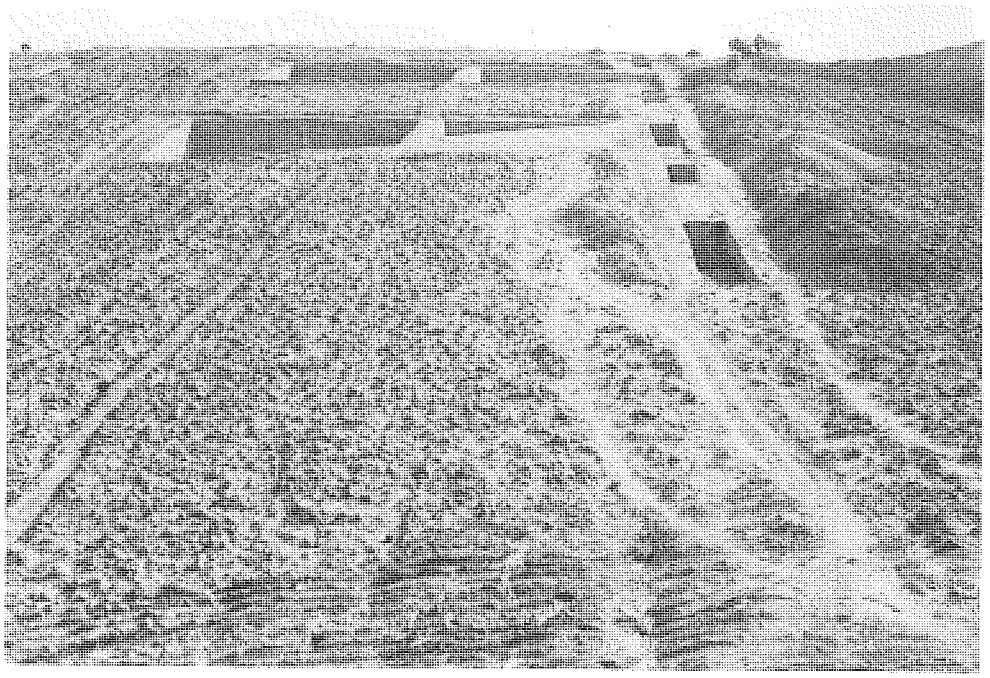

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Plate II. (1) Excavation trenches at Sitagroi, seen from the west. (2) Portable spraying machine (*randistiki michani*) being used to clean excavation surfaces with compressed air.

Plate III. Trench in the upper part of an alluvial fan near Prosotsani, showing the coarse texture of the material.

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Plate IV. Vegetation in the Drama region. (1) Pseudomacchie dominated by *Quercus coccifera.* (2) *Pinus halepensis* woods with *Pistacia lentiscus* in the foreground, growing along the coast of the Chalkidiki peninsula.

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Plate V. Plant species natural to the Mediterranean region. (1) *Abies cephalonica,* the natural climax forest above 800 m. (2) *Quercus frainetto* woods near Thessaloniki.

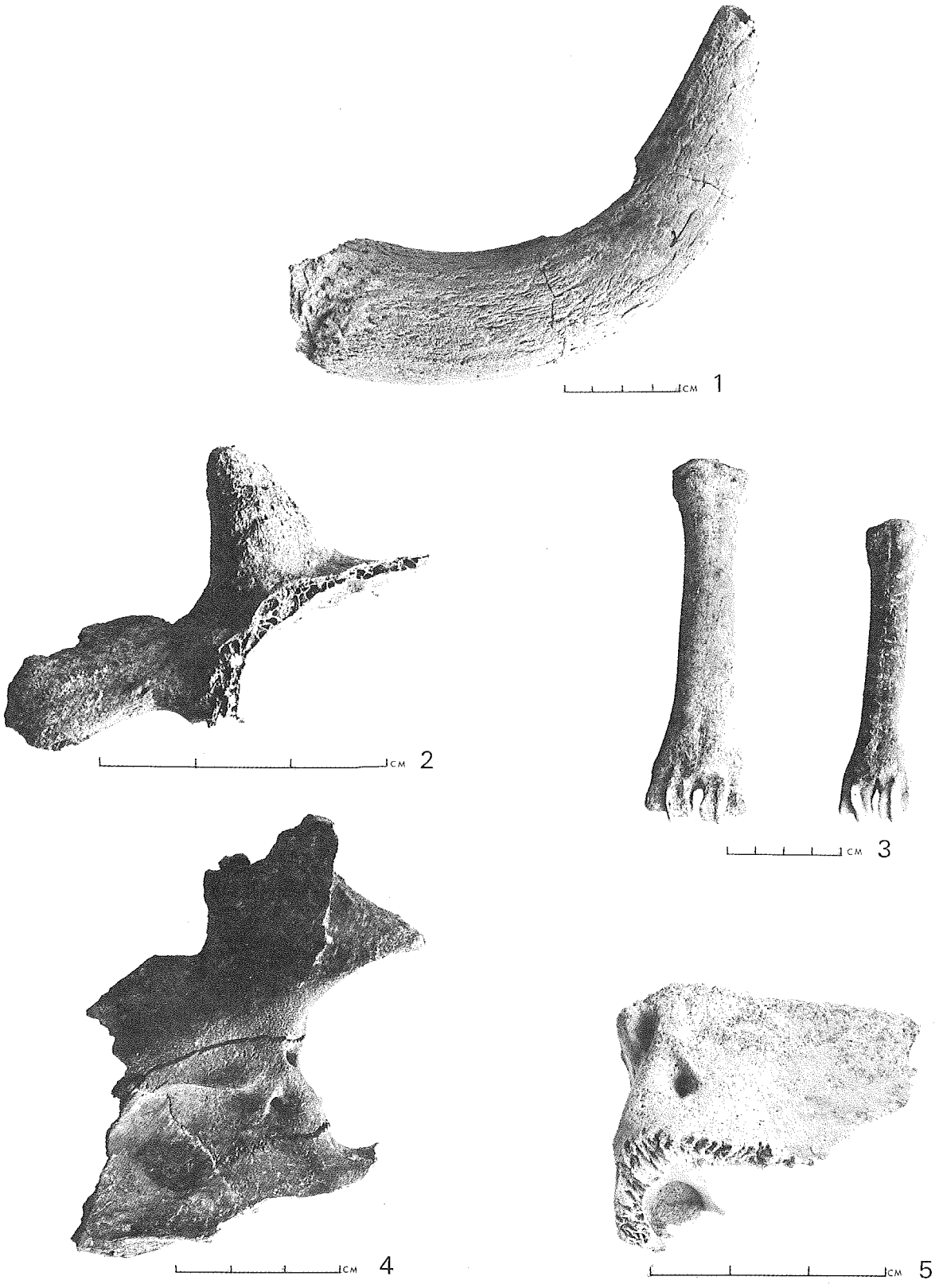

Plate VI. (1) Horn-core of *primigenius* type domestic cattle (MM 27, phase III). (2) Skull fragment of sheep with rudimentary horn-core (ROc 61, phase IV). (3) Comparison of goat metacarpals: *left*, large (ZG 18, phase III); *right*, average size (ZE 62, phase IV). (4) Skull fragment of pig with lachrymal bone (KL 115, phase II). (5) Lachrymal bone of pig (ML 116, phase III).

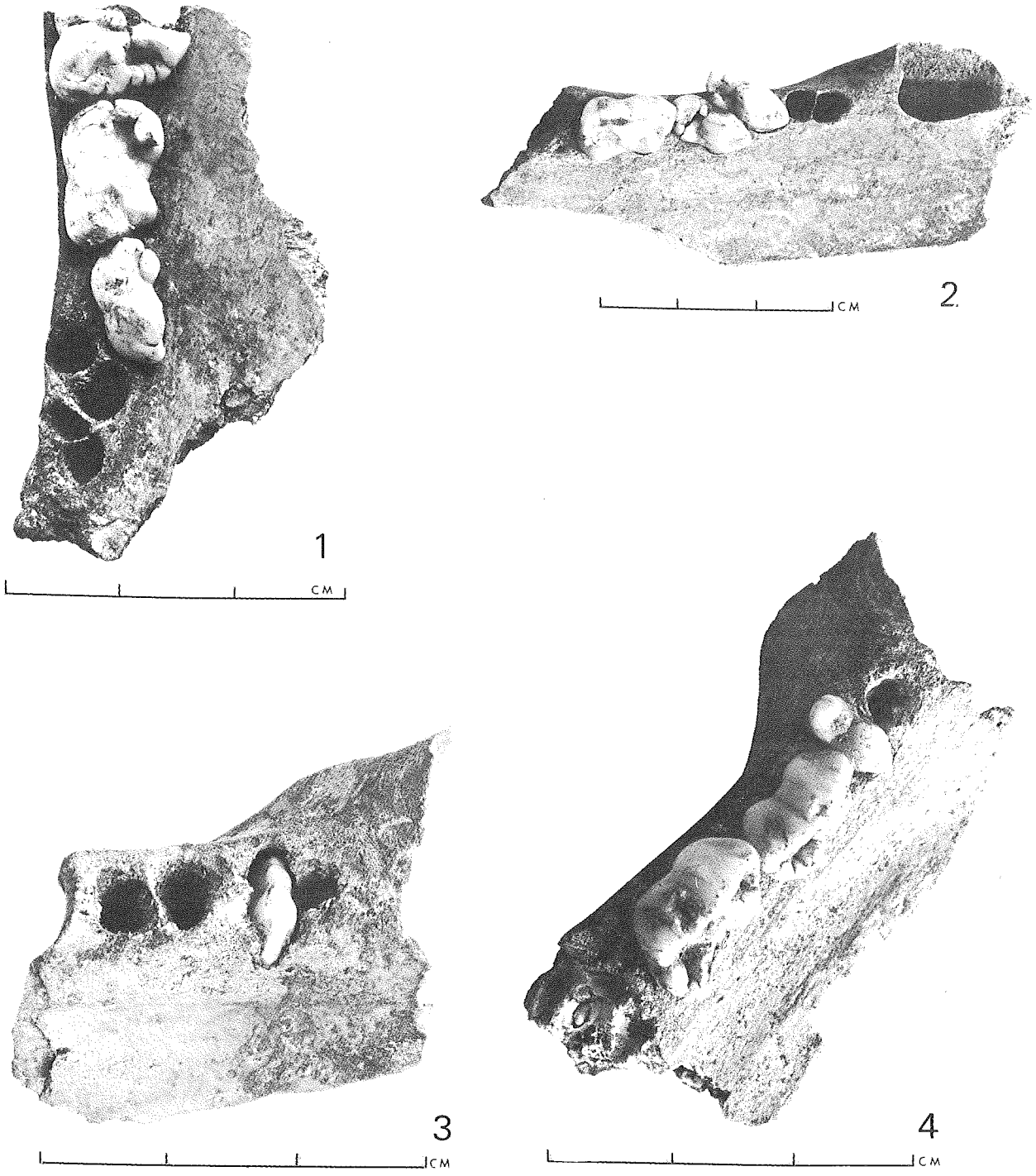

Plate VII. Skull fragments of pig. (1) With alveoles of crowded premolars (KL 132, phase I). (2) With crowded premolars (KL 115, phase II). (3) With P_2 standing crosswise in row of teeth (ZE 80, phase IV). (4) With P_2 standing crosswise in row of teeth (QO 8, phase V).

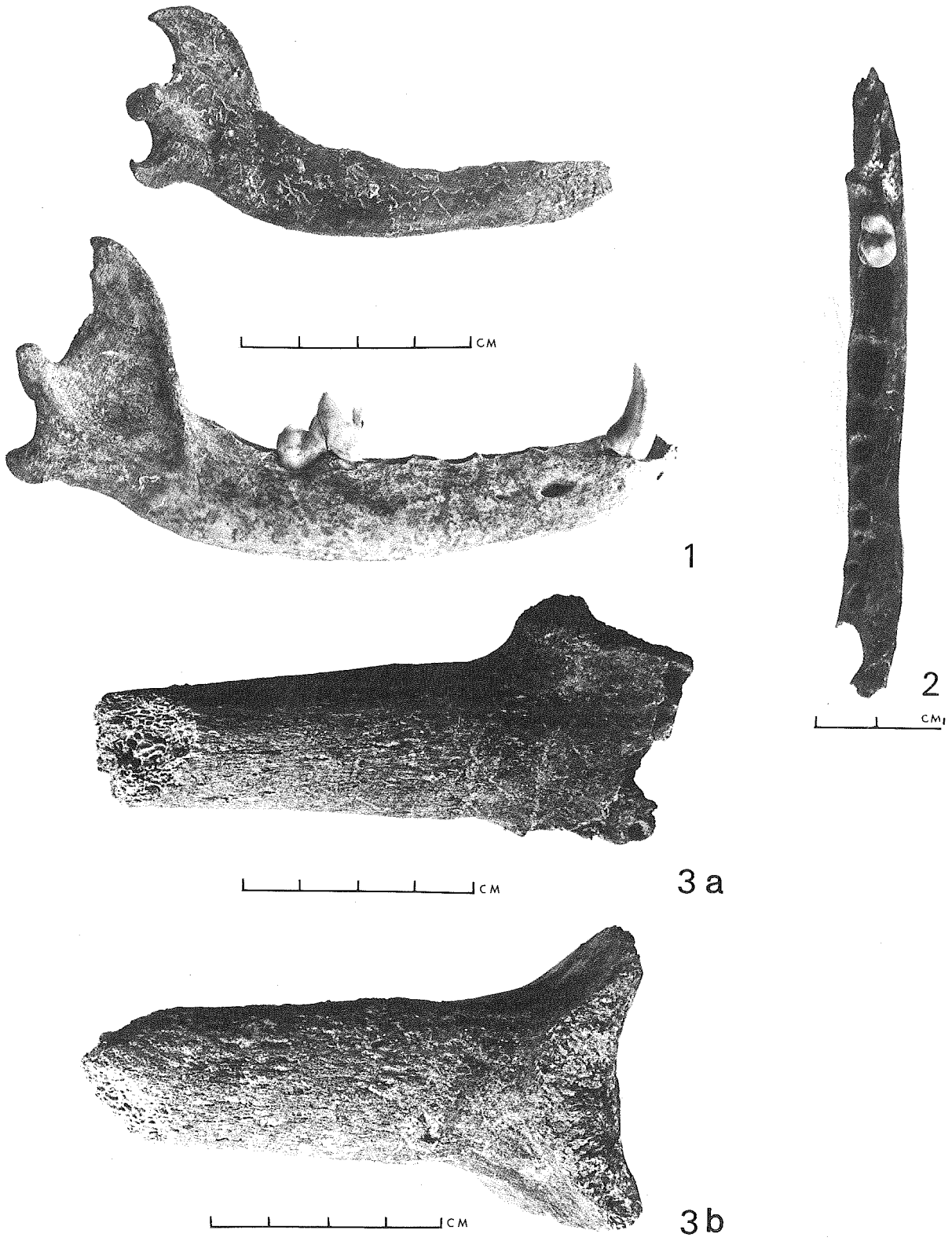

Plate VIII. (1) Dog mandibles. (2) Dog mandible with alveoles of crowded Ps (JL 105, phase I). (3) Chamois horn-core with skull fragment: *a*, side; *b*, top (MMb 65, phase III).

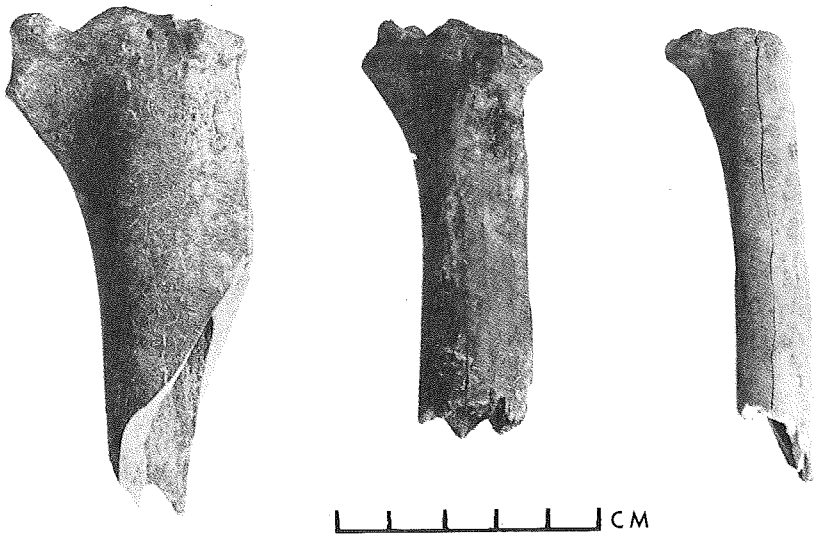

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Plate IX. (1) Proximal radius fragments: *left*, red deer; *center*, fallow deer; *right*, roe deer. (2) Roe deer antlers (MM 21, phase III). (3) Brown bear canine (MM 27, phase III).

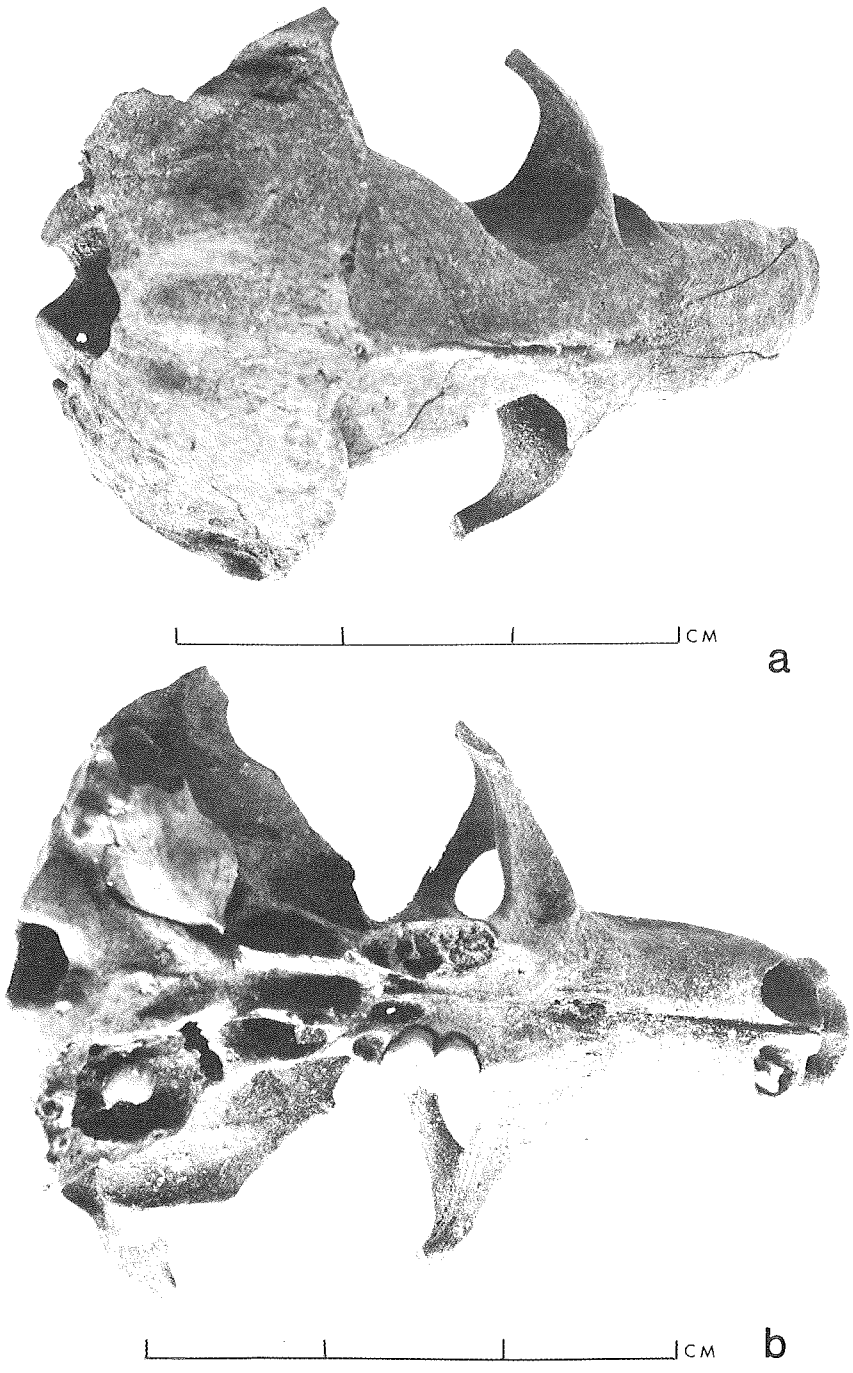
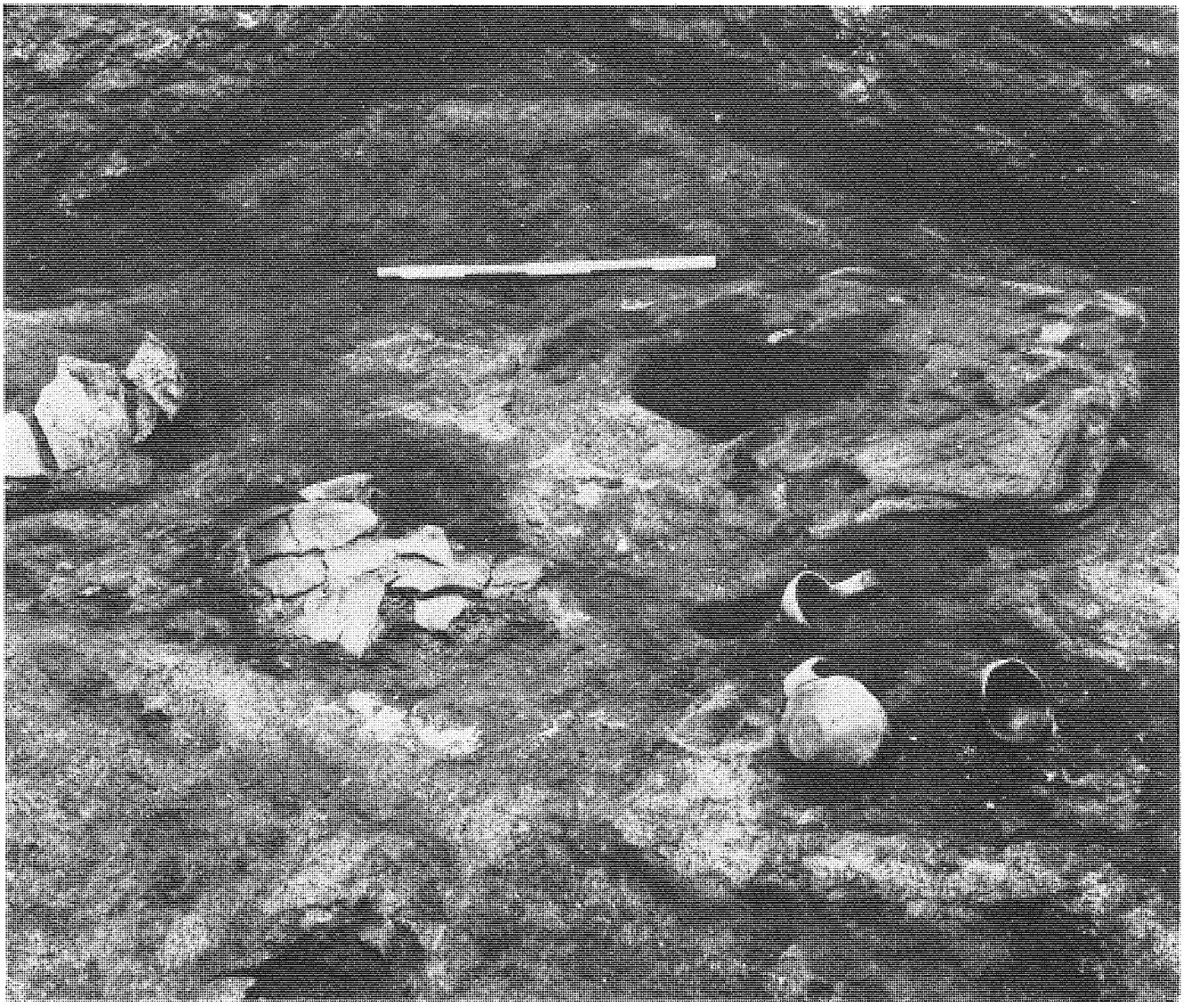


Plate X. Lesser mole rat skull (MM 44, phase IV).

Plate XI. Pottery of phase IV, square ZA. Scoops or cups with projecting handles: (1a) pot 20, (1b) pot 21, (1c) pot 23, (1d) pot 24, (2) pot 5. Rounded bowl: (3) pot 63. Piriform bowls: (4) pot 325, (5) pot 80.



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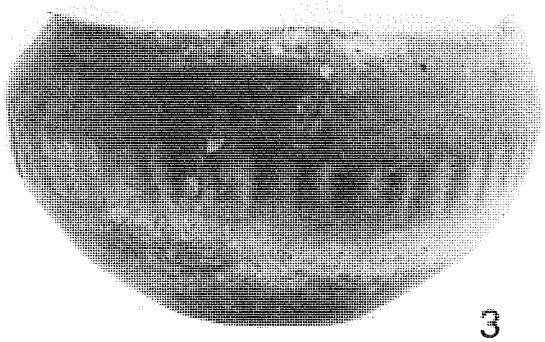

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Plate XII. (1) Destruction deposit of phase IV on floor 14 in ZA. Associated pottery: (2) bowl with projecting handle, pot 19; (3) rounded bowl, pot 6.

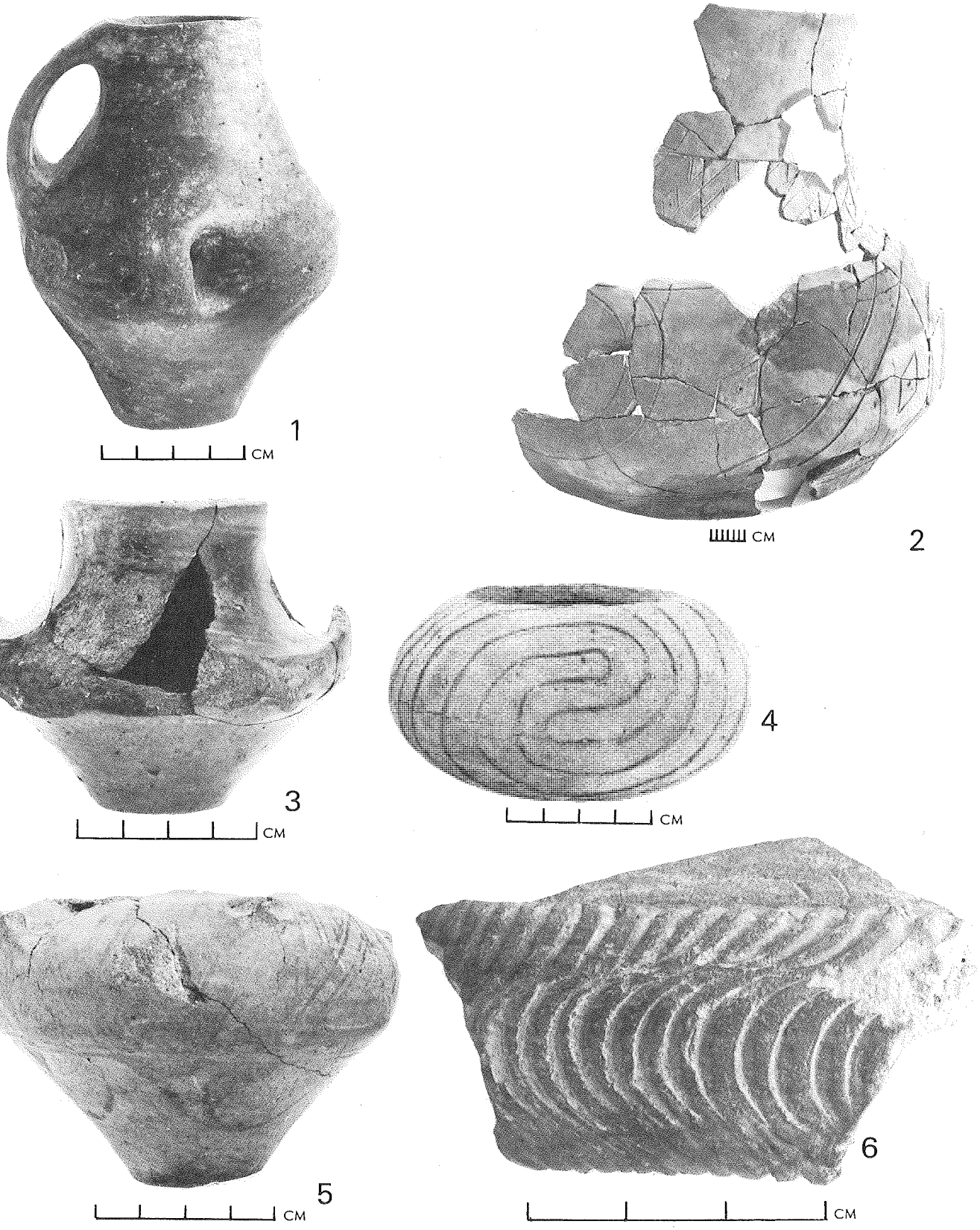


Plate XIII. Pottery of phase III from ZA (1-5 from floor 15). (1) Amphora, pot 8. (2) Pithos. (3) Amphora, pot 11. (4) Pyxis, pot 9. (5) Two-handled jar, pot 12. (6) Shell-impressed sherd.

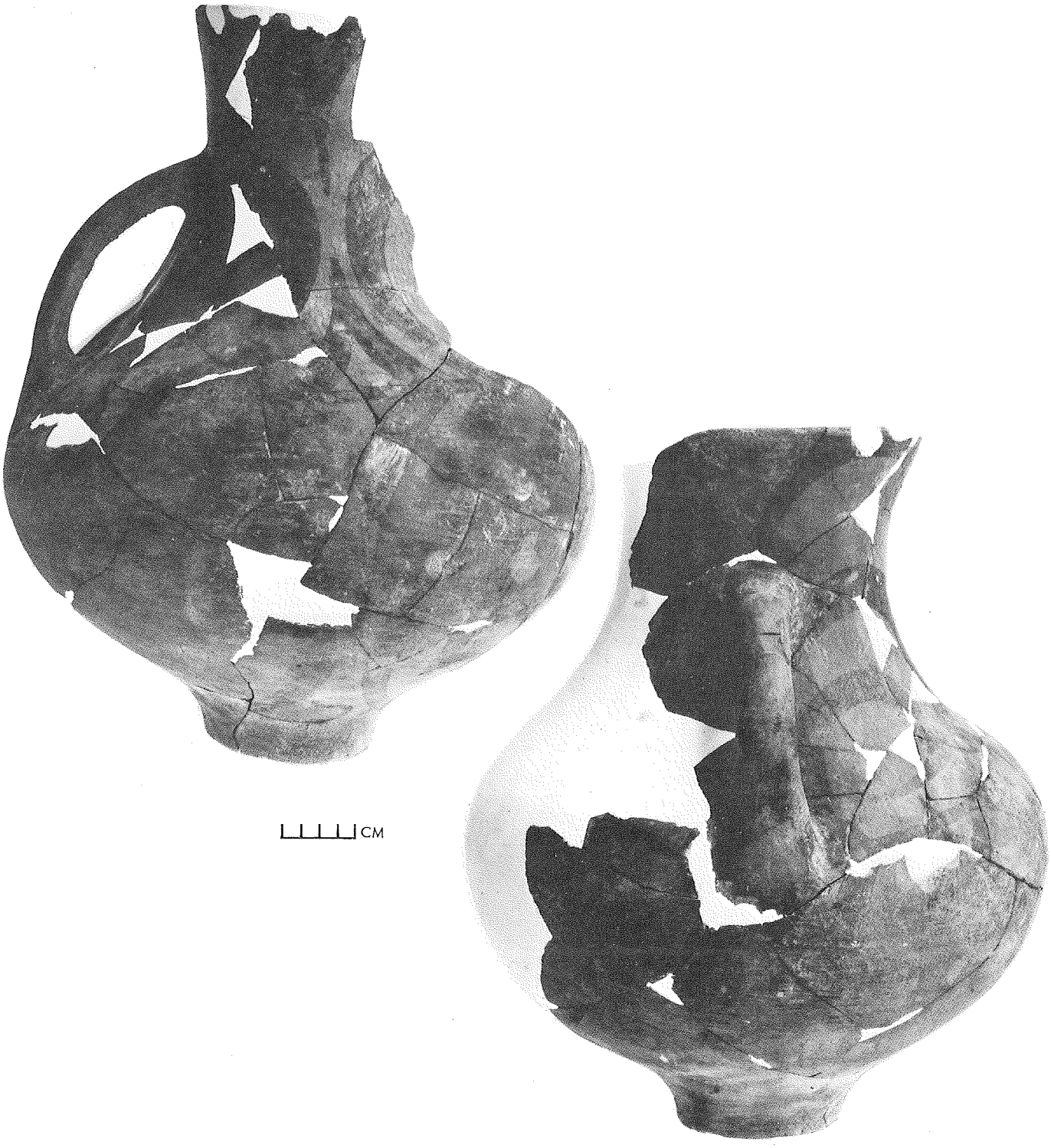


Plate XIV Black-on-Red amphora, pot 38, from phase III, ZA 41, floor 15.

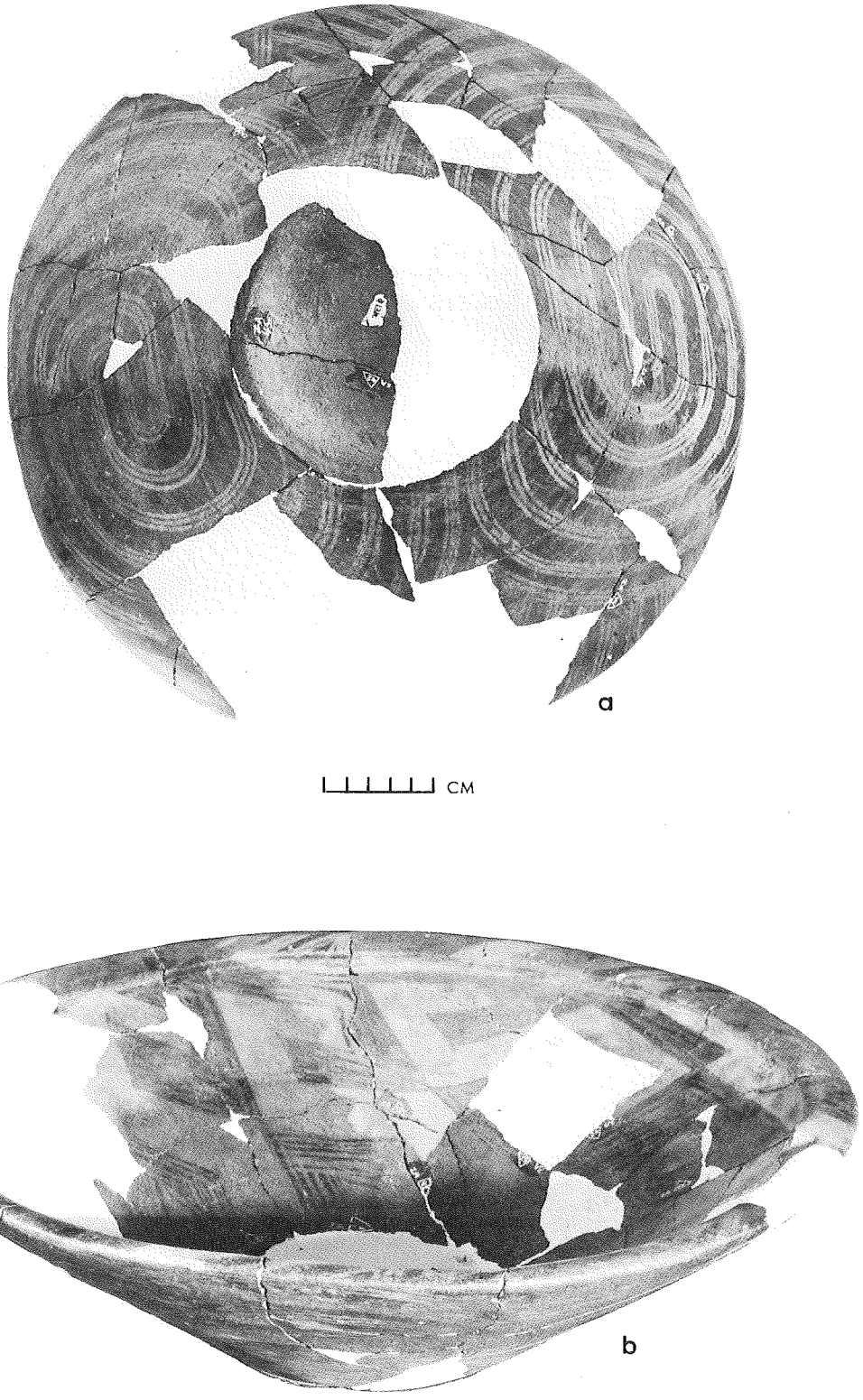
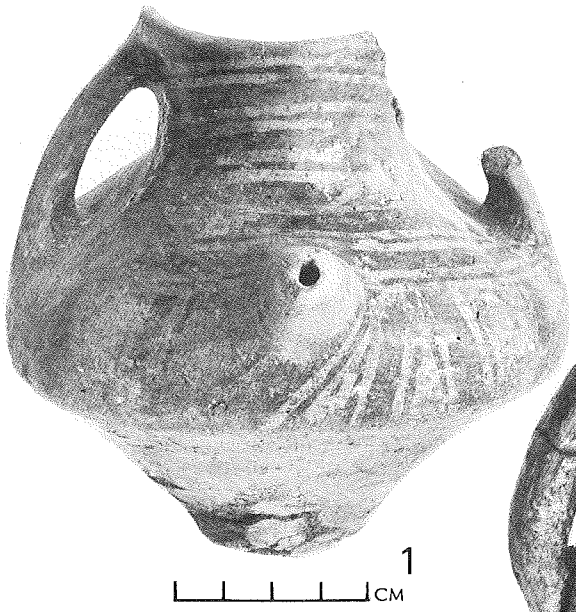
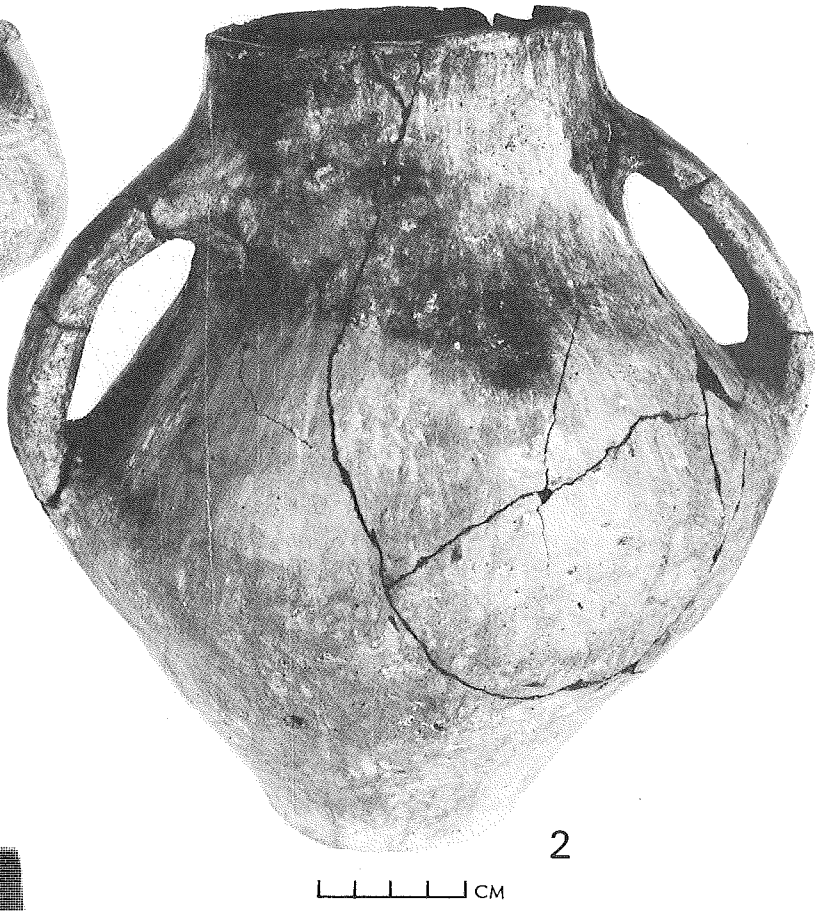
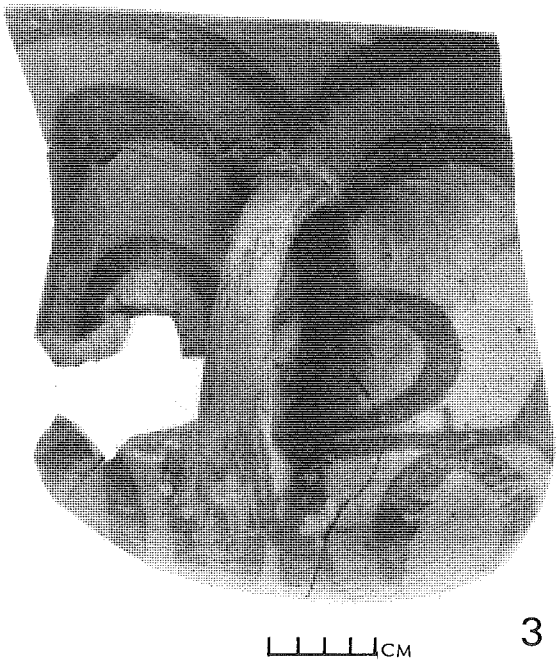


Plate XV. Graphite-painted open bowl, pot 126, from phase III: *a*, outer surface; *b*, inner surface.







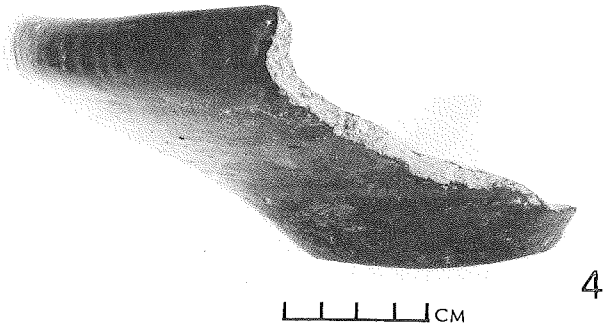


Plate XVI. Pots from ZA 42-45, phase III. (1) Two-handled jar, pot 17. (2) Amphora, pot 16. (3) Oval pitcher, pot 75. (4) Kritsana bowl, pot 99.

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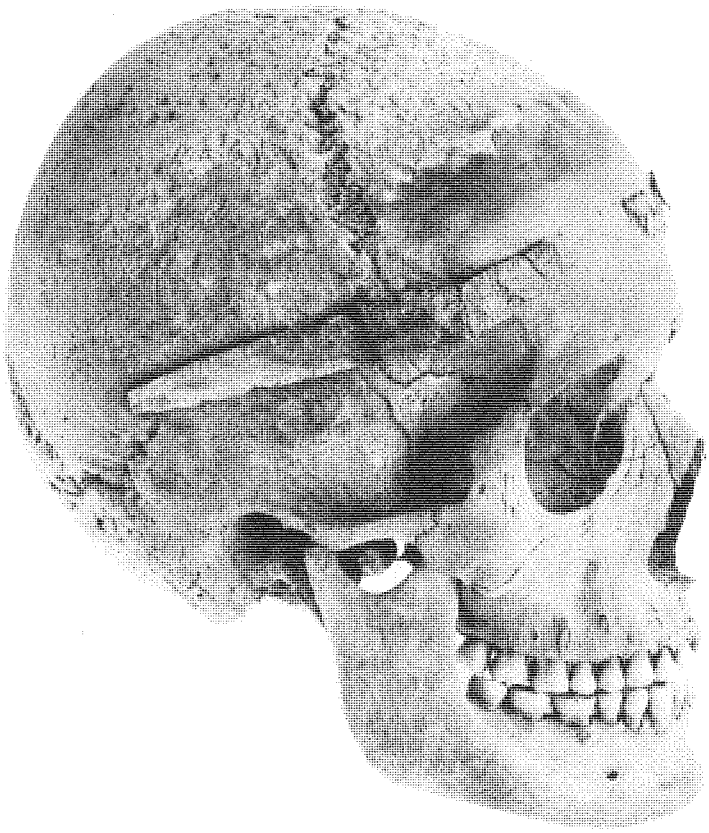

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Plate XVII. Burial 3 of the iron age cemetery. (1) Seen from the east. (2) Skull with bronze headband, SF 2107.

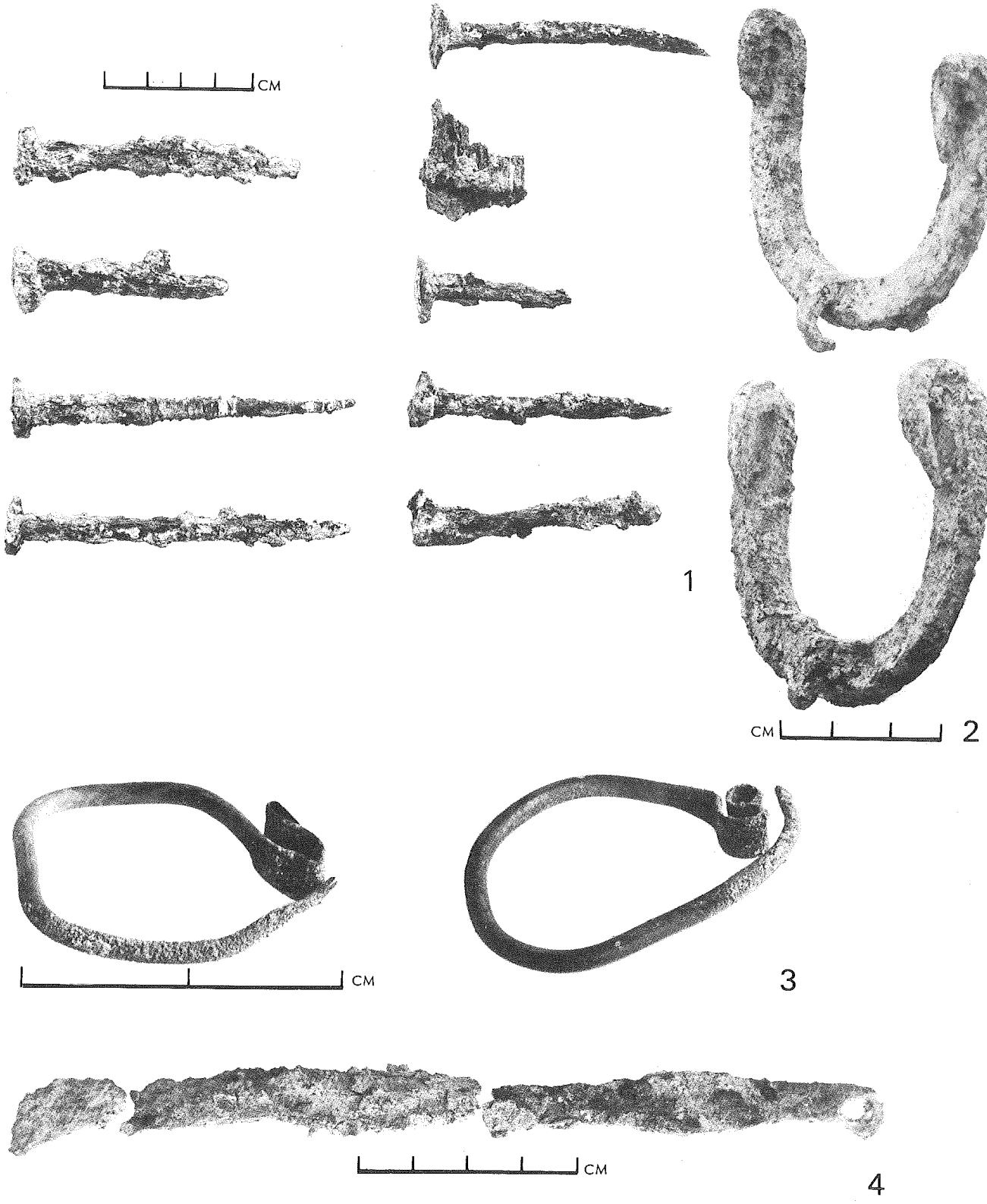


Plate XVIII. Objects from the iron age cemetery. (1) Iron coffin nails, SF 2100-2106. (2) Iron heel plates, SF 1348/9. (3) Metal earrings, SF 11. (4) Iron knife, SF 12.

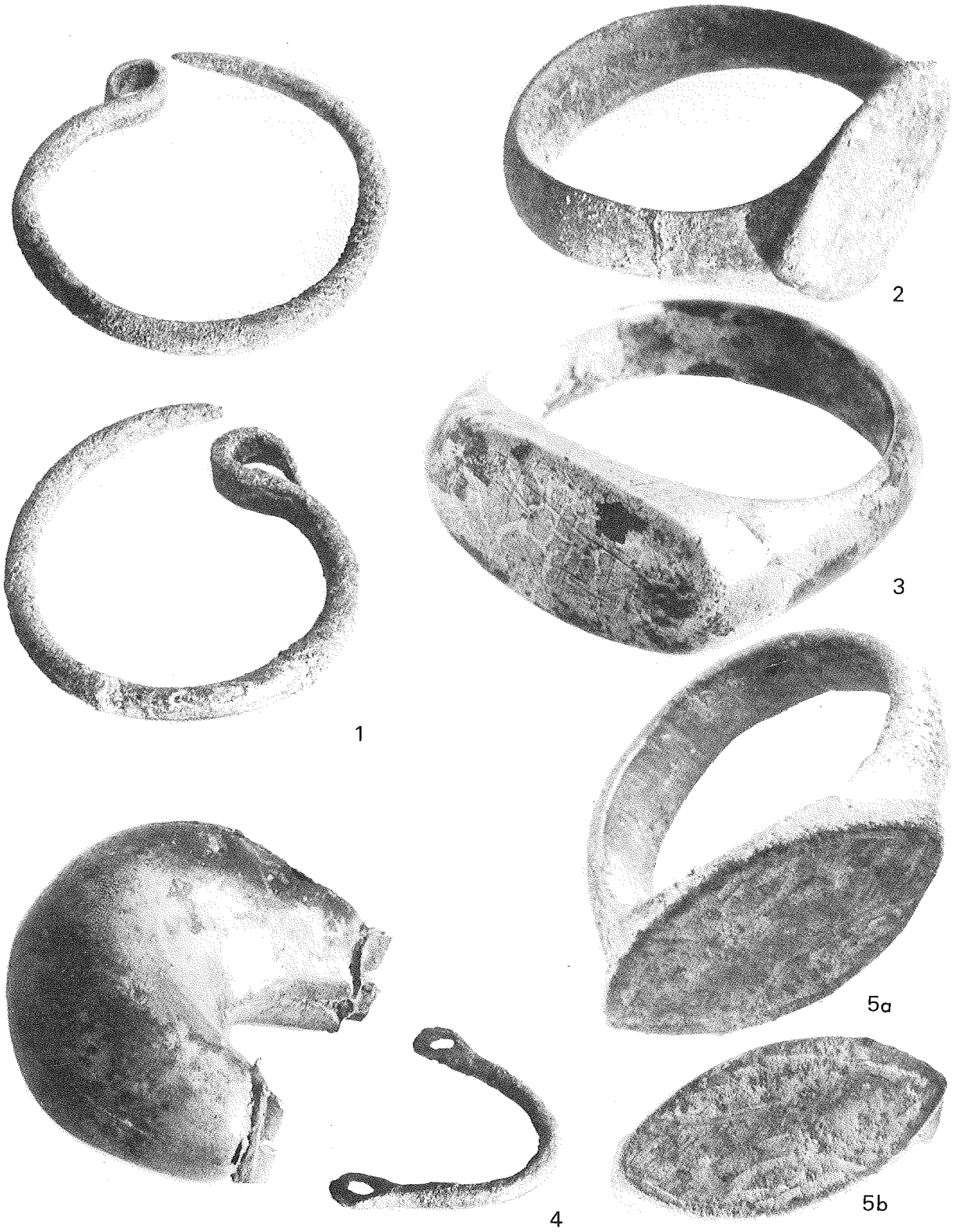
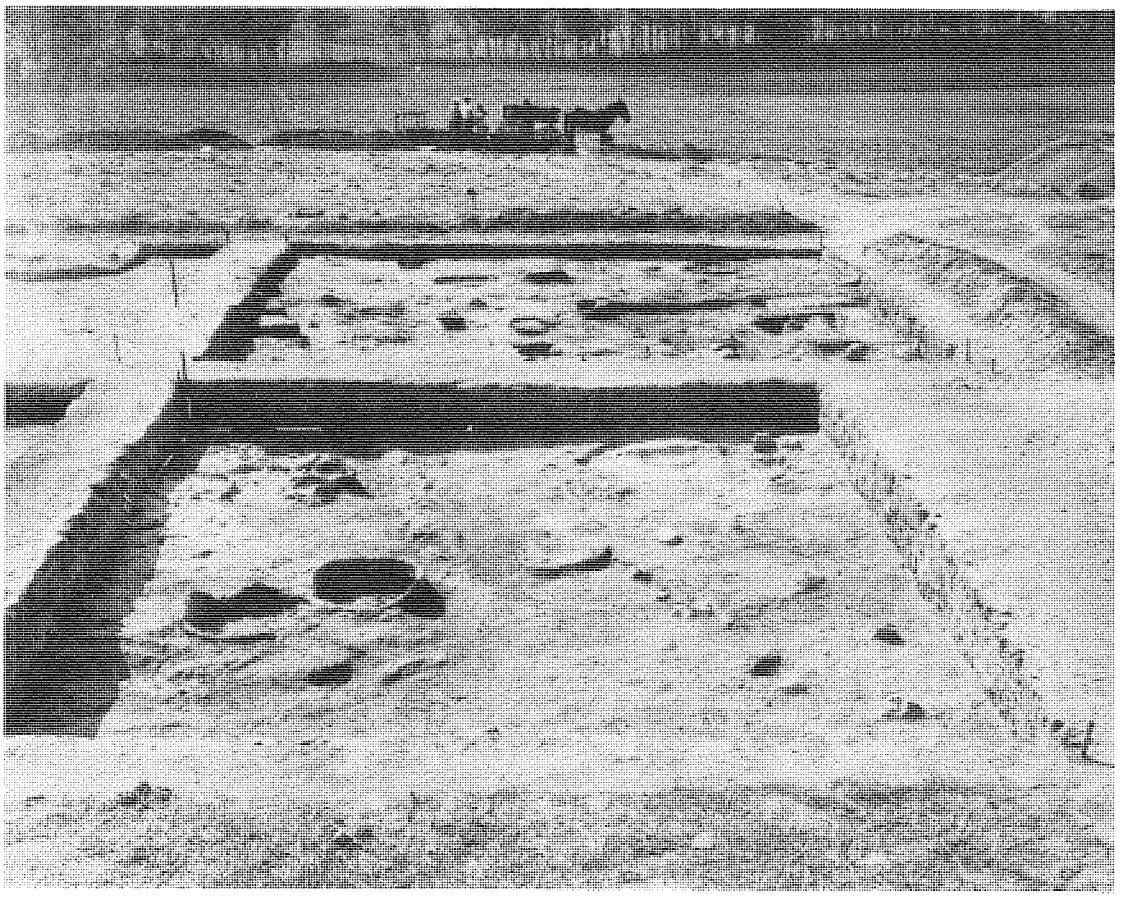


Plate XIX. Jewelry from the iron age cemetery. (1) Bronze earrings, SF 1008. (2) Bronze ring with bezel, SF 13. (3) Silver ring, SF 1006. (4) Silver earrings with link, SF 1007. (5a, b) Metal ring with incised bezel, SF 2842. Enlargement 3:1.



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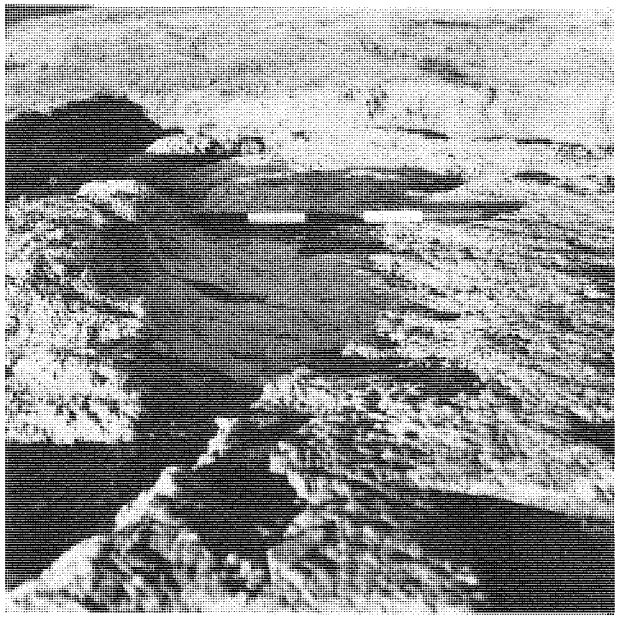

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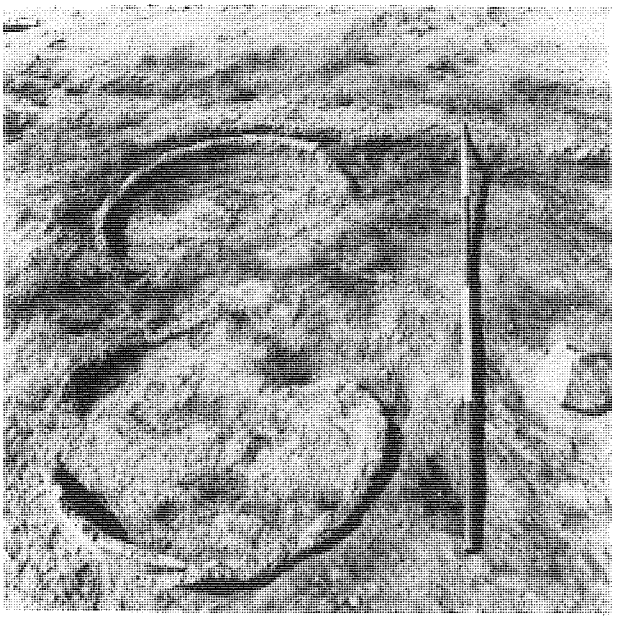

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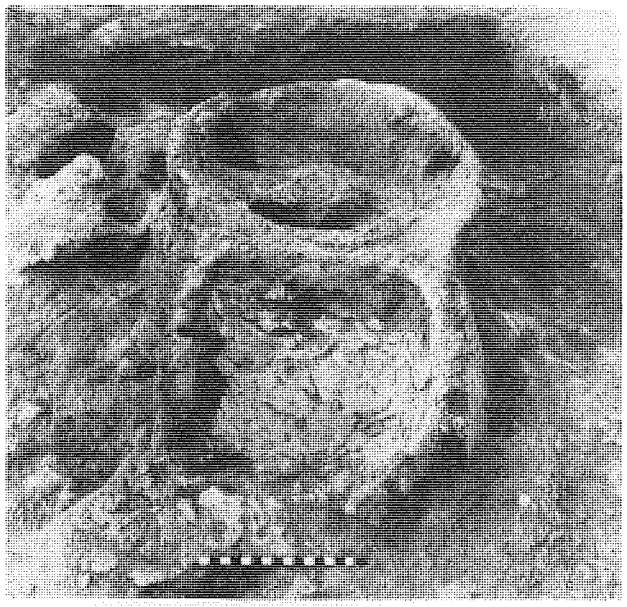
Plate XX. (1) The Bin Complex from the north. (2) Hearth ridge, feature C of QO. (3) Bins in square PO.



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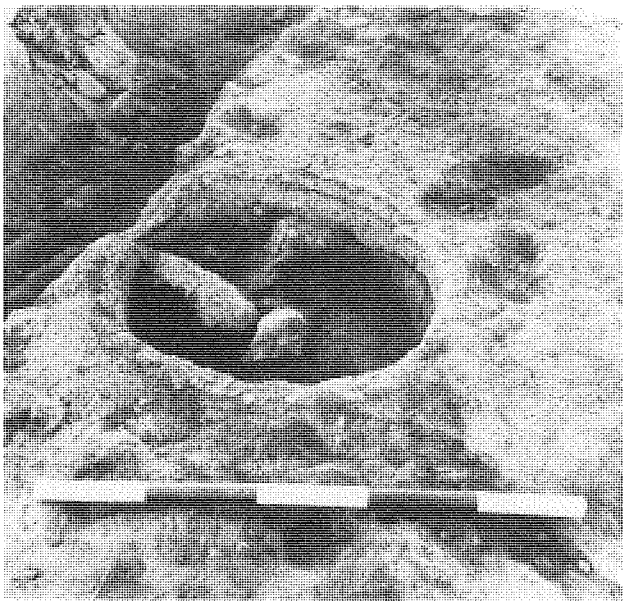

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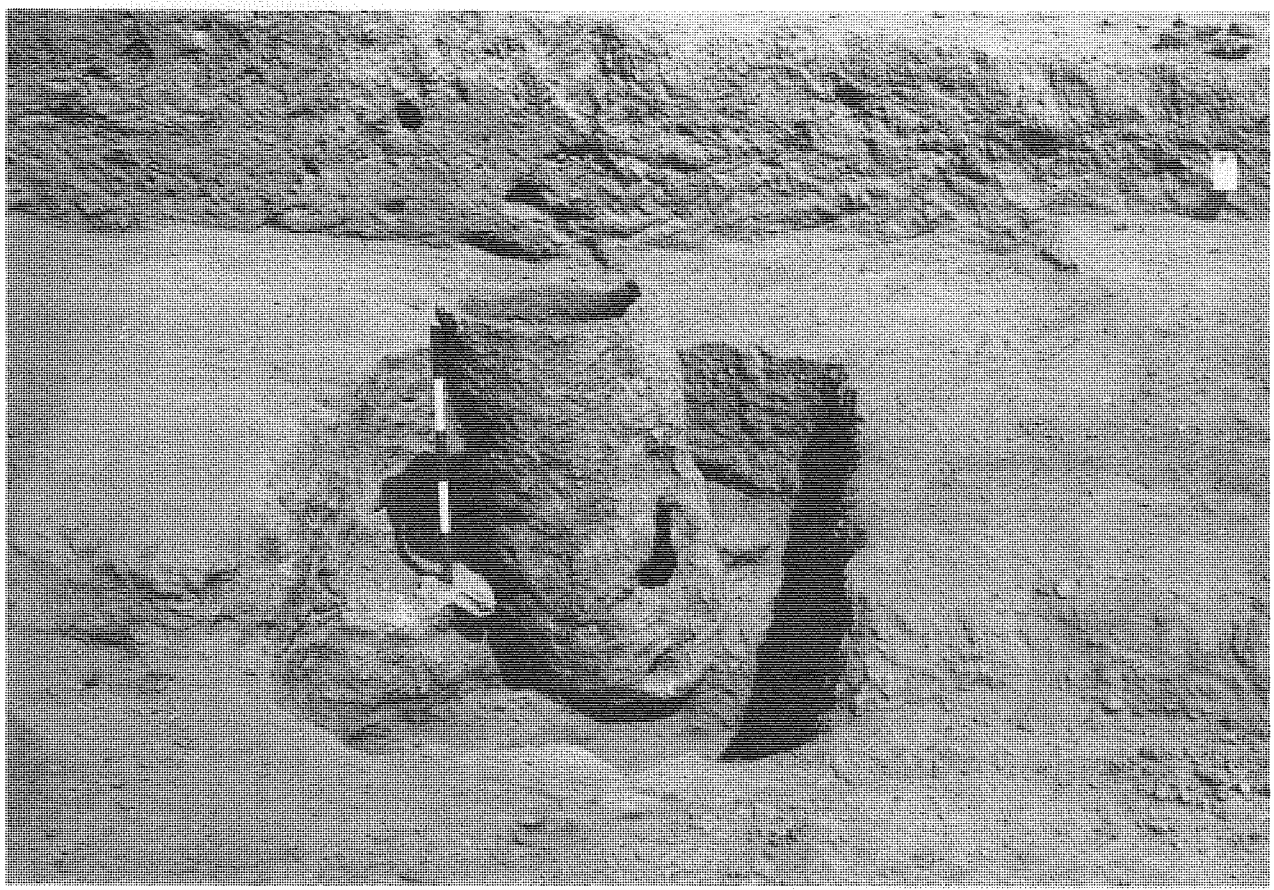


3

Plate XXI. Features and finds of the Bin Complex. (1) Circular bin with adjoining oval bin, feature C/D of PO. (2) Top of clay-lined pit, feature A in QO. (3) Feature A after final excavation.

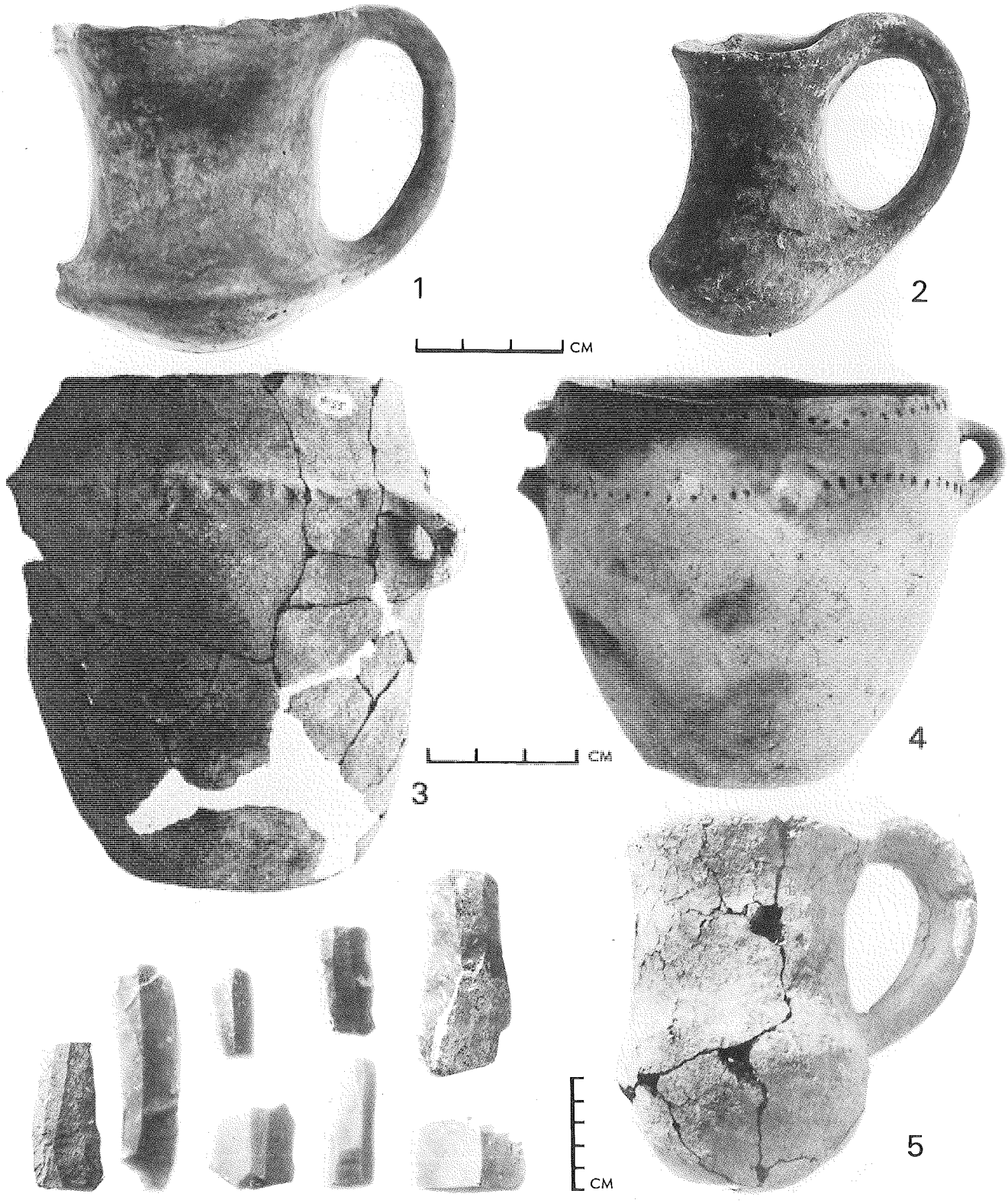
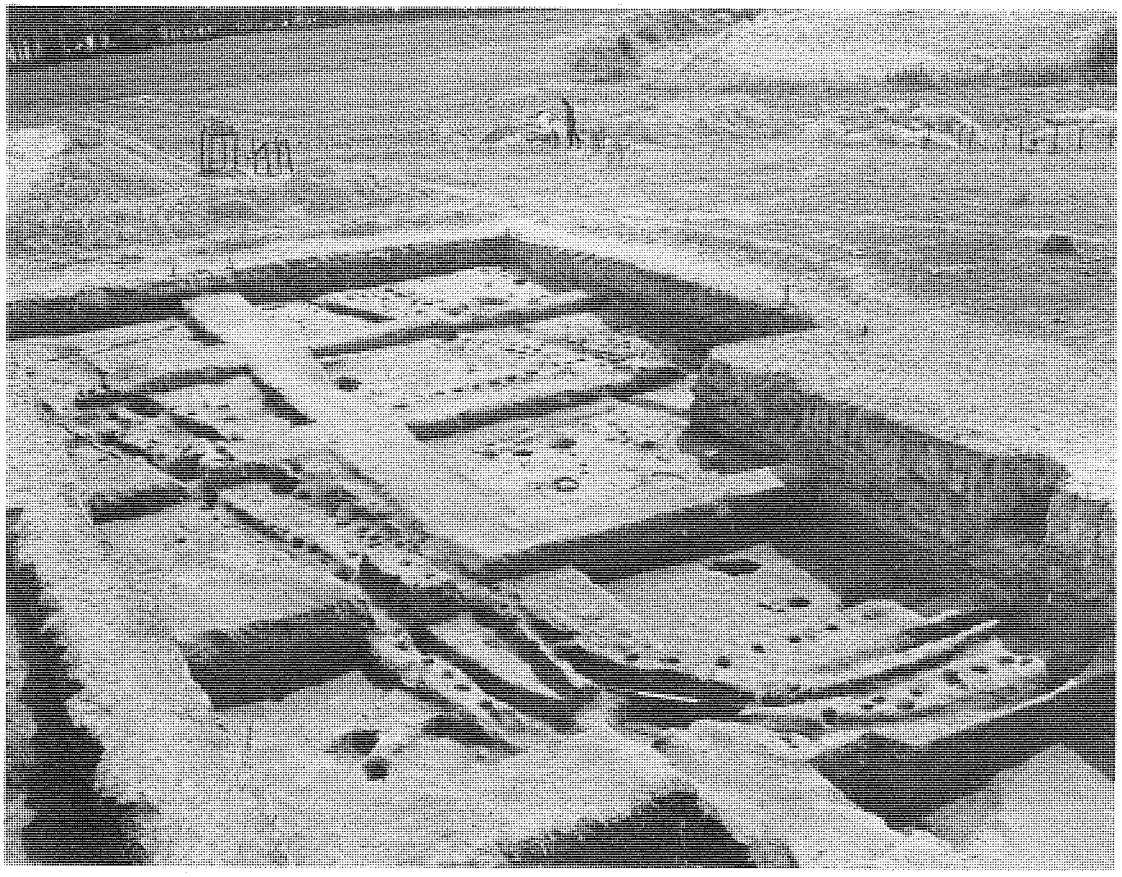


Plate XXII. Pots from QO 8 and PN 14. (1) Two-handled cup, pot 89. (2) One-handled cup, pot 128. (3) Barrel-shaped urn, pot 155. (4) Barrel-shaped urn, pot 86. (5) One-handled cup, pot 116, with associated flints.



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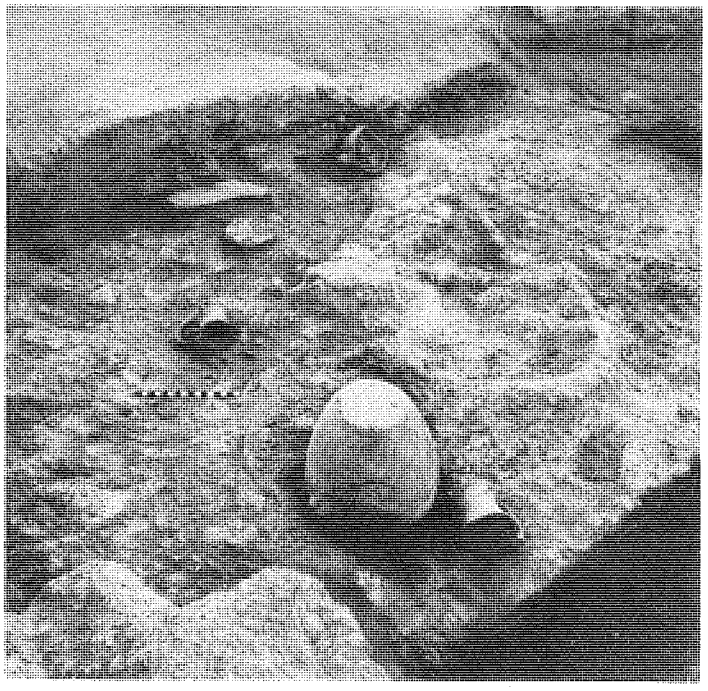

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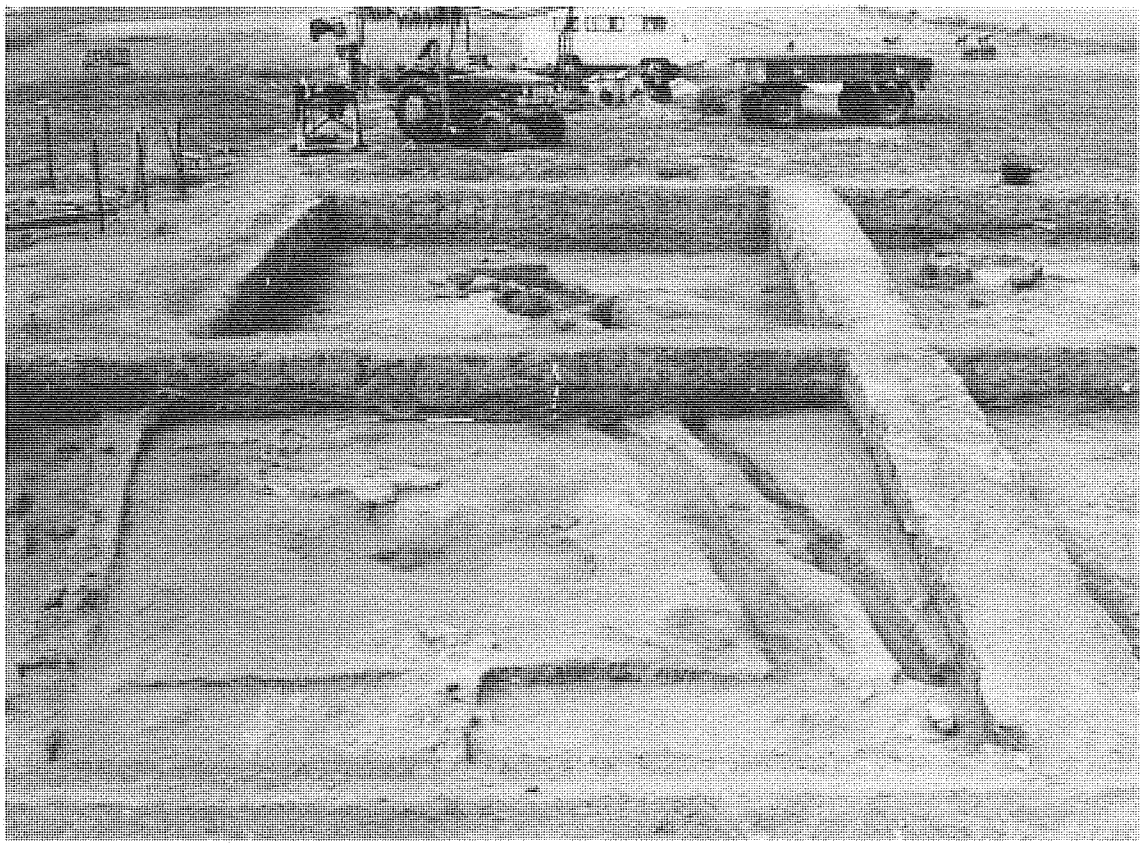
Plate XXIII. (1) The Long House from the north. (2) Virtually complete pots found in association with the Long House in QO 8.



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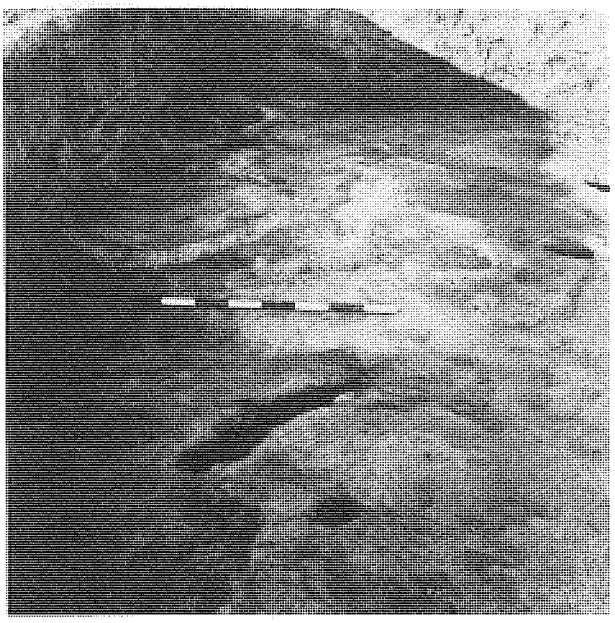

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Plate XXIV. (1) The Long House from the south during excavation. (2) Hearth ridges and bins in the Long House, PO 23, seen from the east.

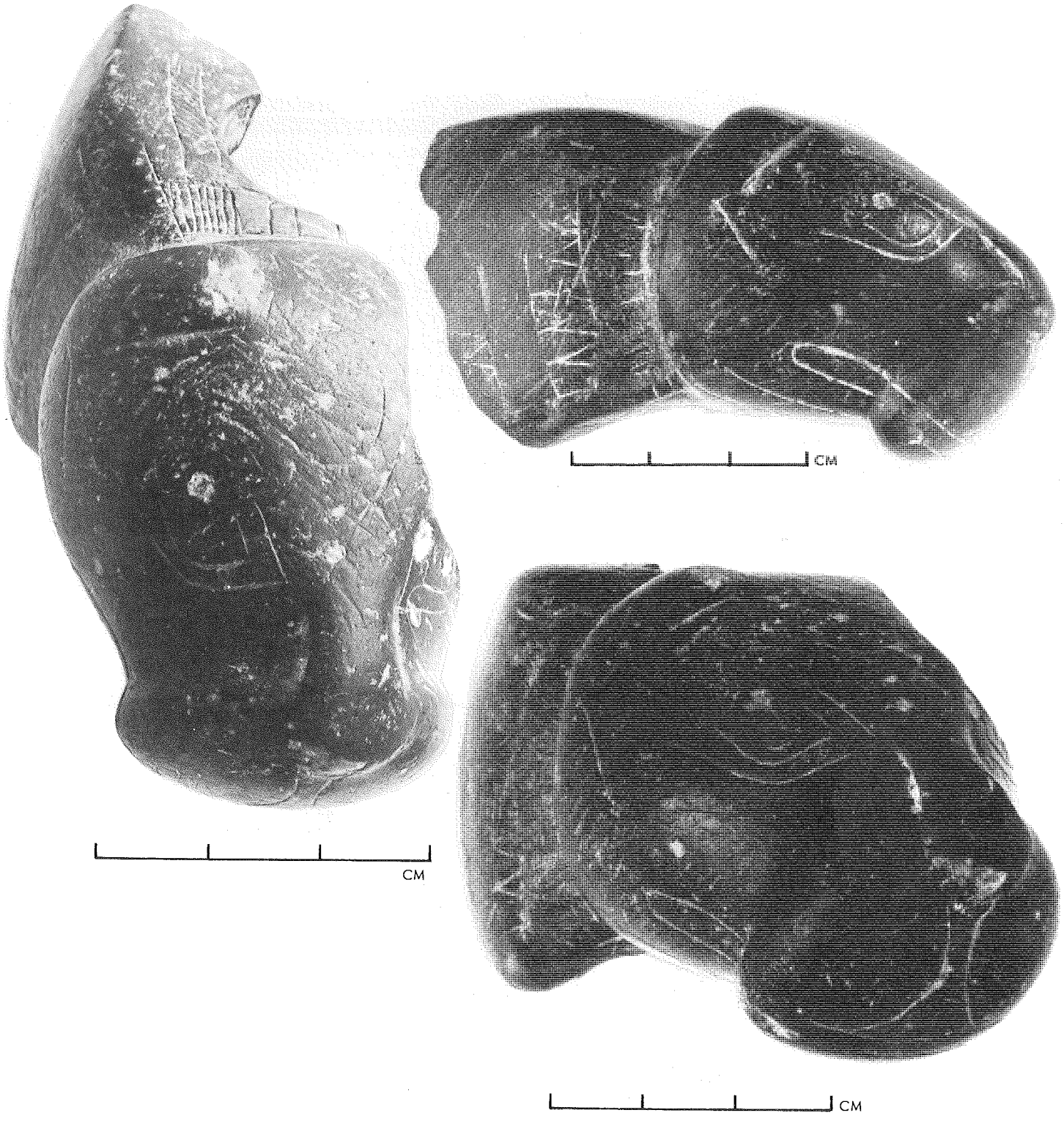
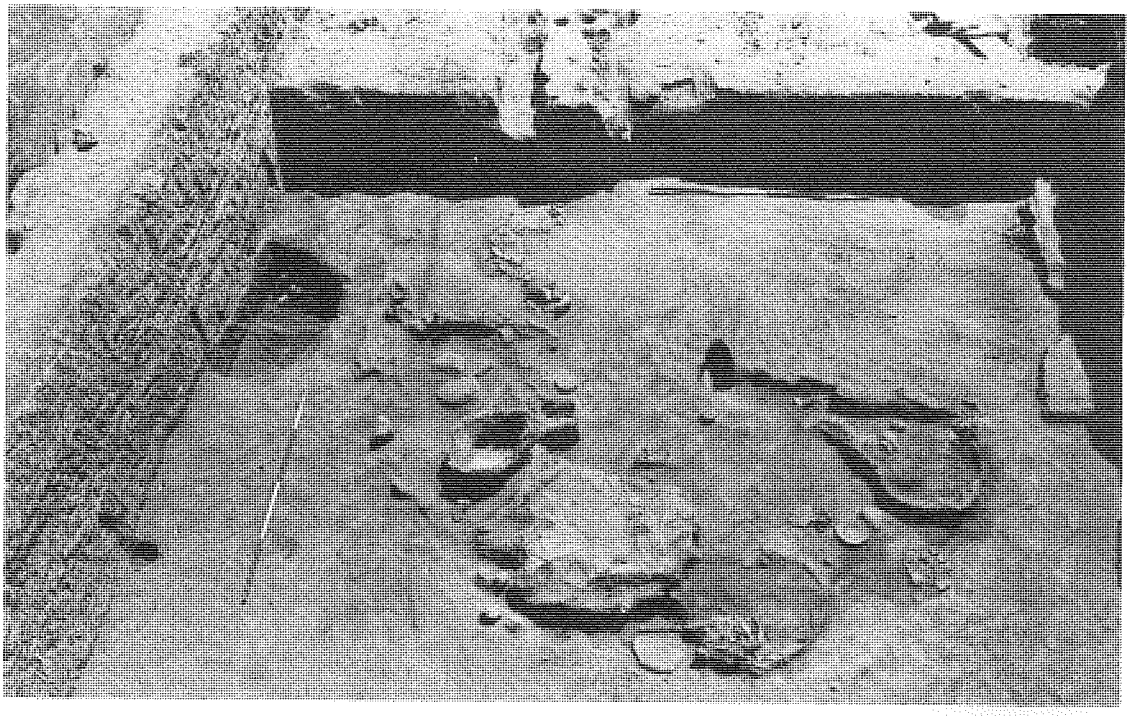


Plate XXV. Stone axe head, SF 2409, resembling feline animal from PN/C 80.



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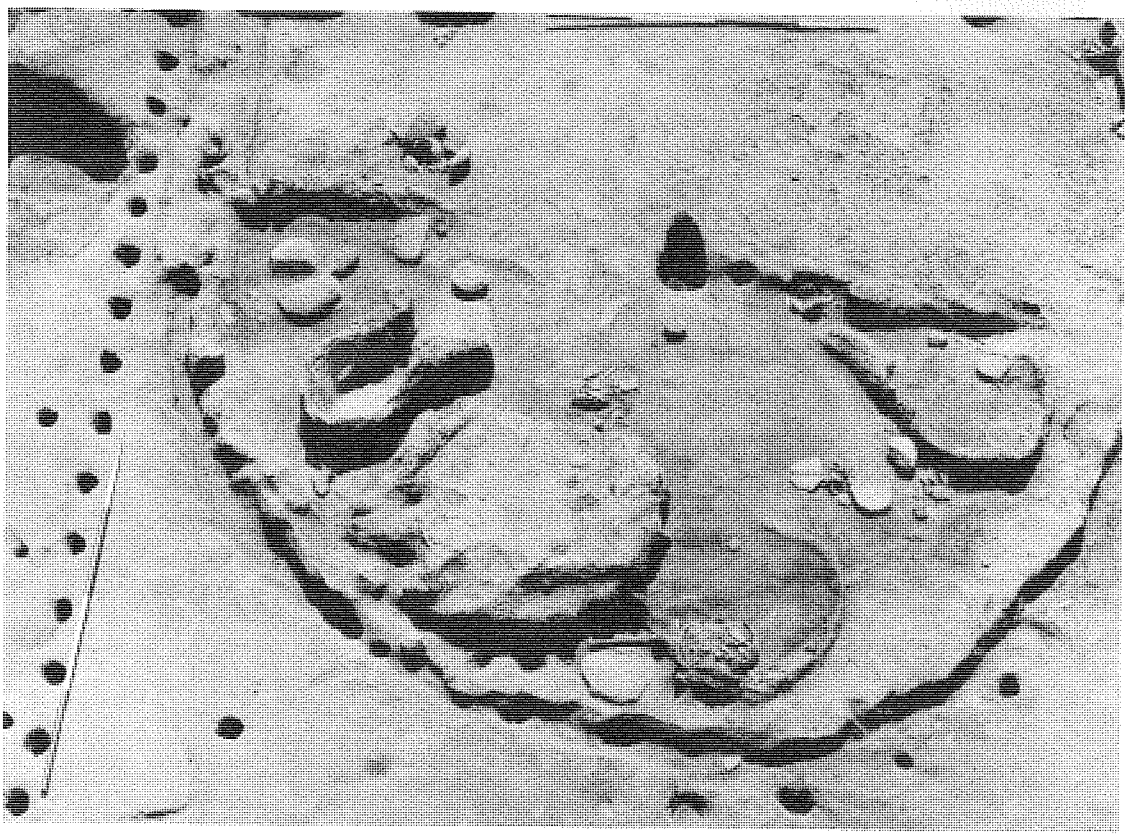

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Plate XXVI. Apsidal end of the Burnt House at two stages of excavation, seen from the north.

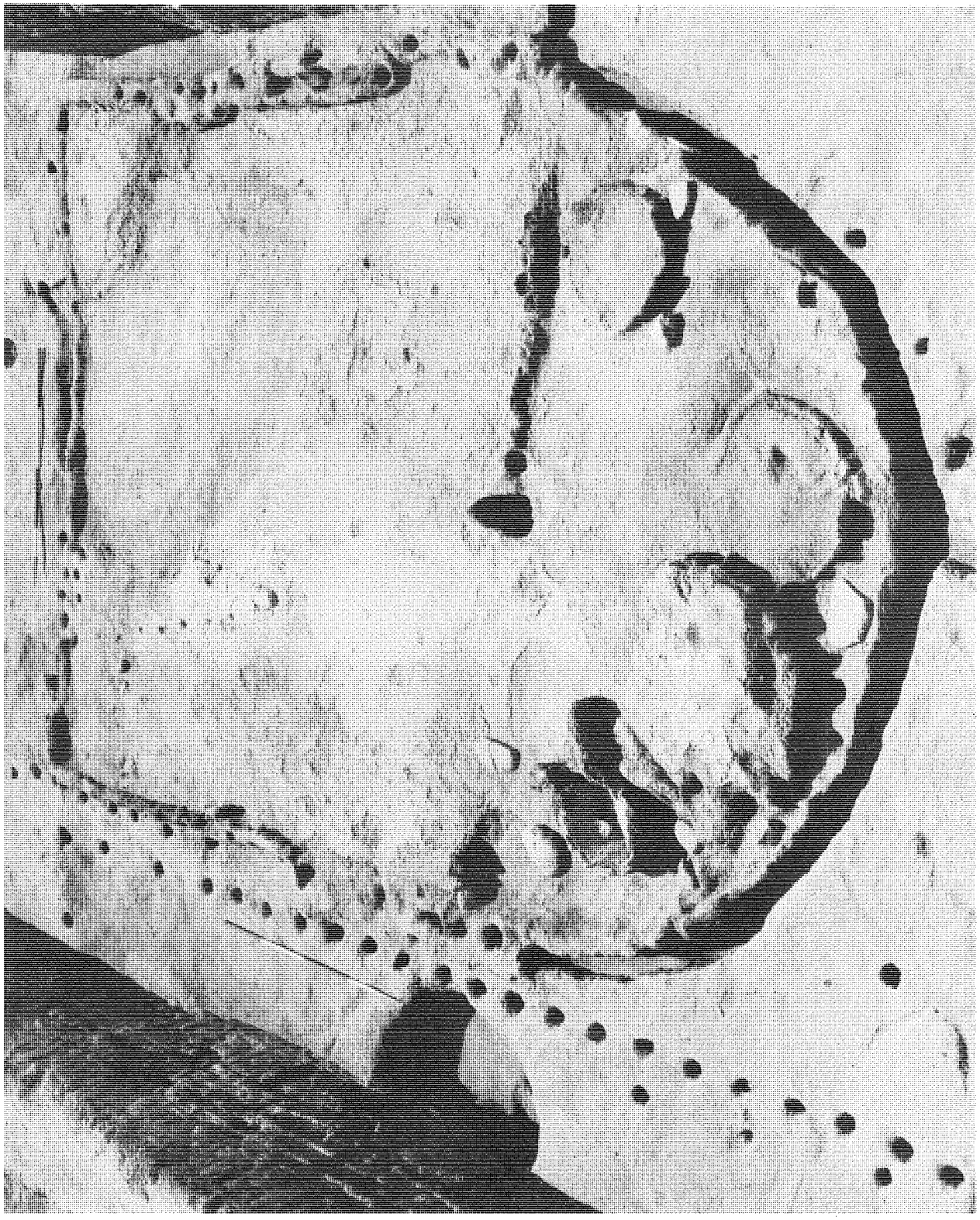
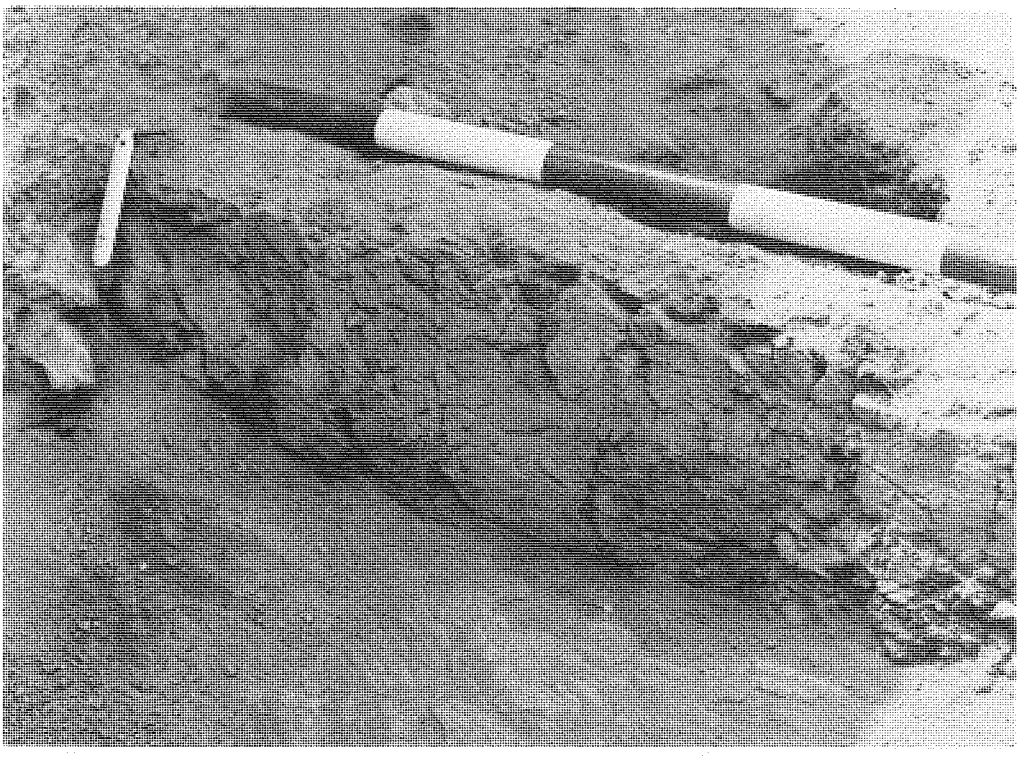


Plate XXVII. Completed excavation of the Burnt House, seen from the north.



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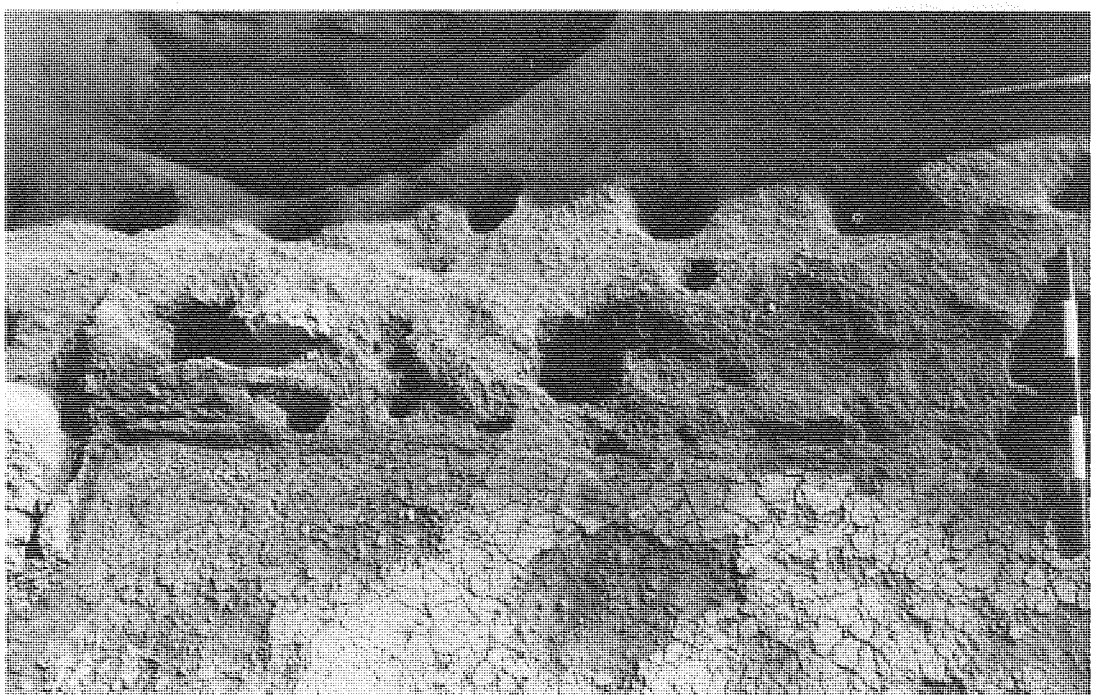

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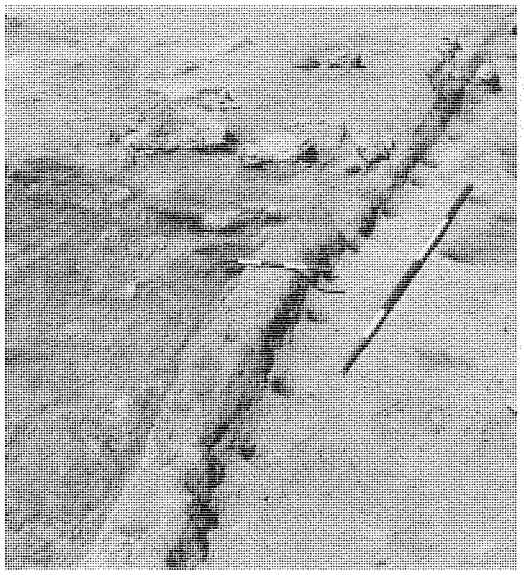
Plate XXVIII. Features of the Burnt House. (1) Plaster at inside of wall. (2) Small stake holes at inner side of east wall.



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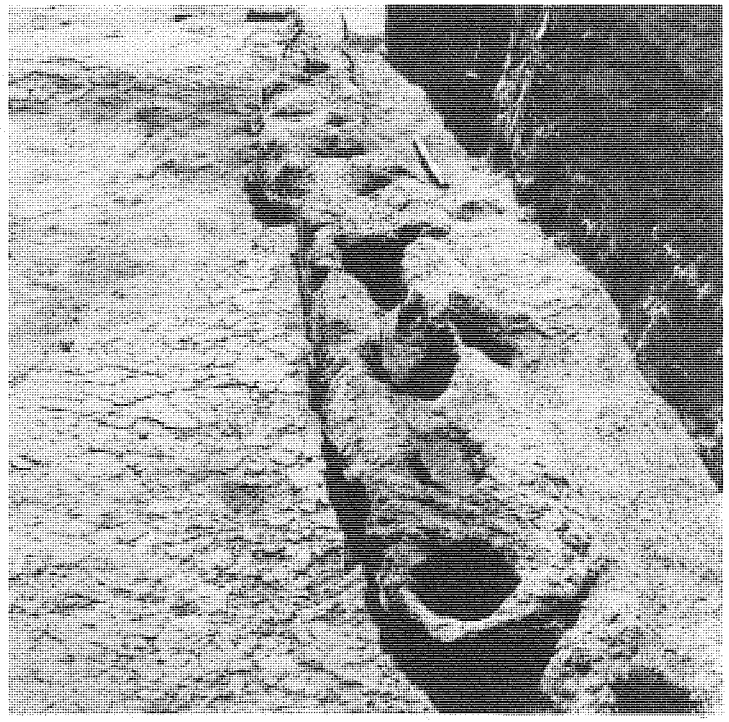

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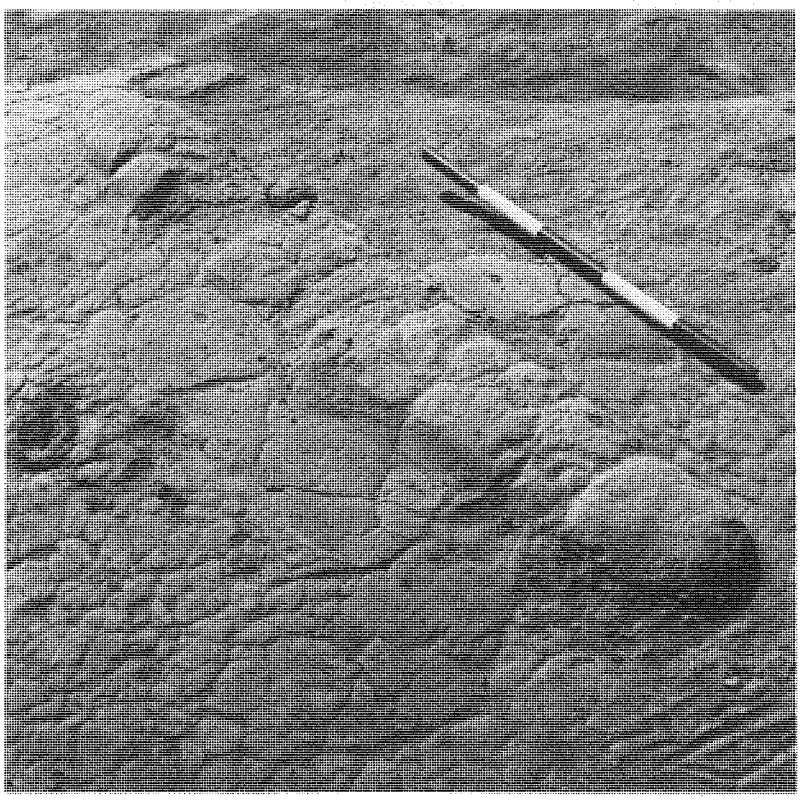

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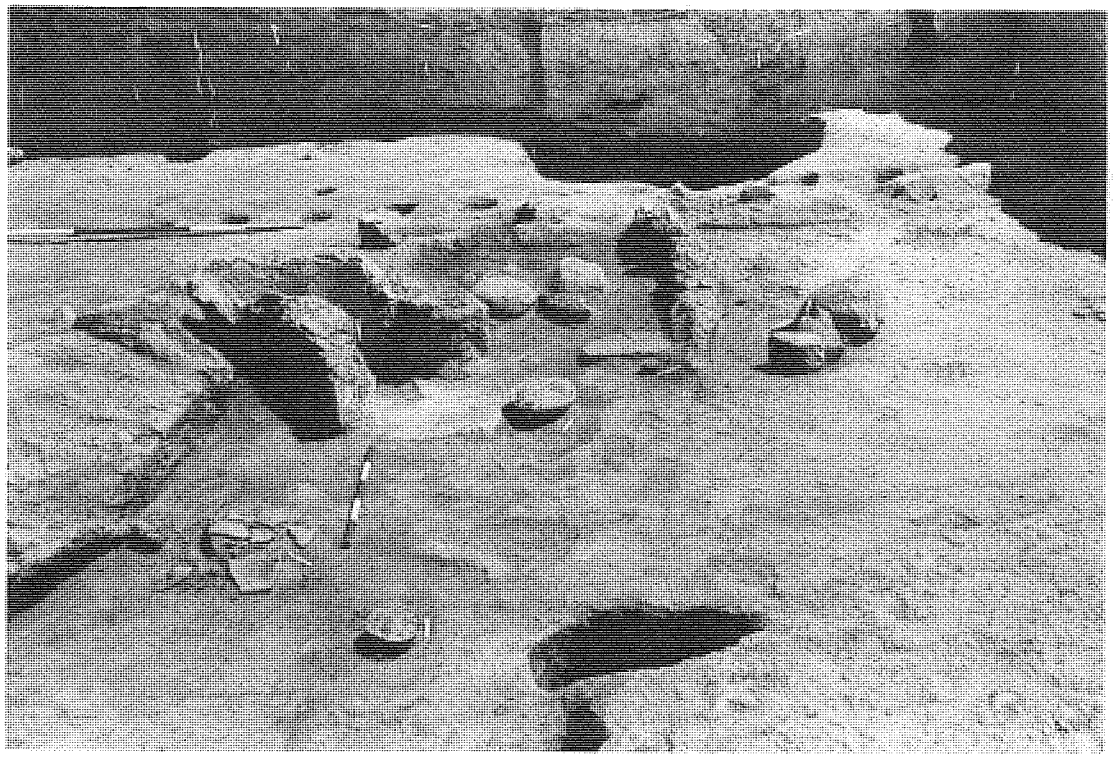
Plate XXIX. Features of the Burnt House. (1) Postholes at the outside of the east wall. (2) West wall with postholes. (3) Hearth ridge from the main room.



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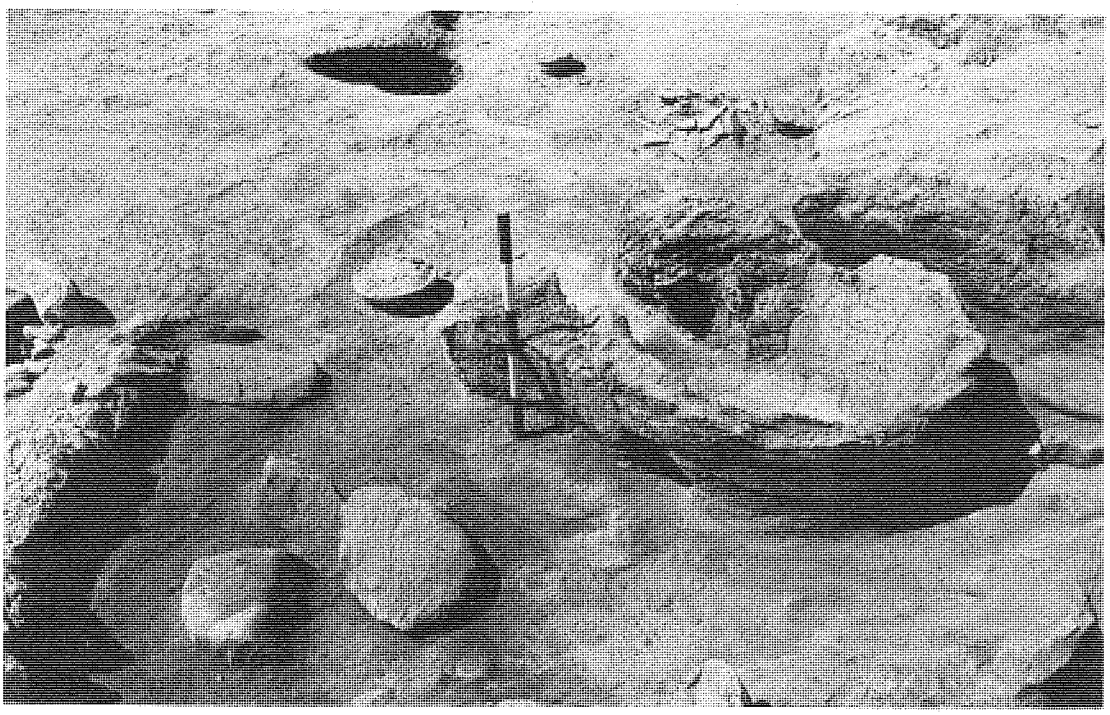

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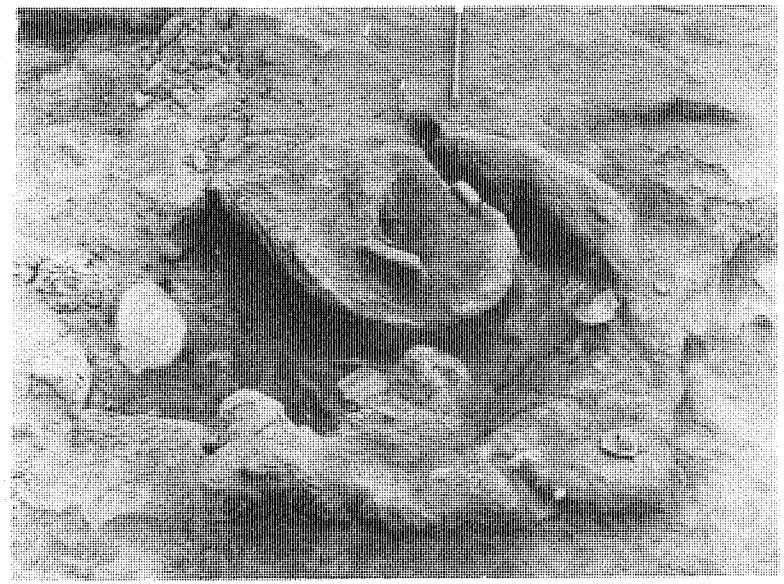
Plate XXX. (1) The apsidal room with finds, seen from the south. (2) Oven 2 after excavation, seen from the southeast.



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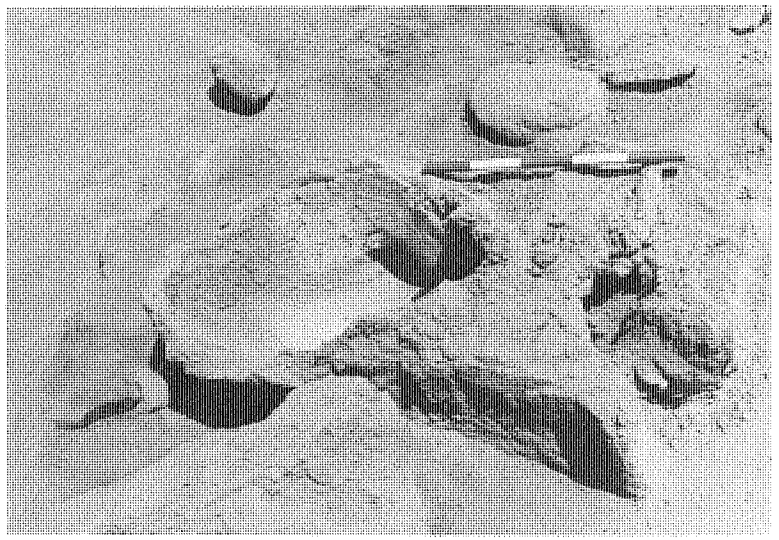

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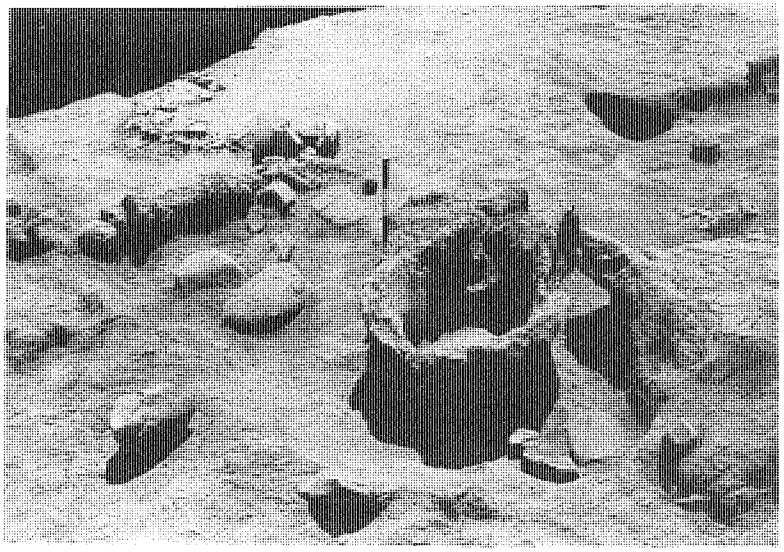

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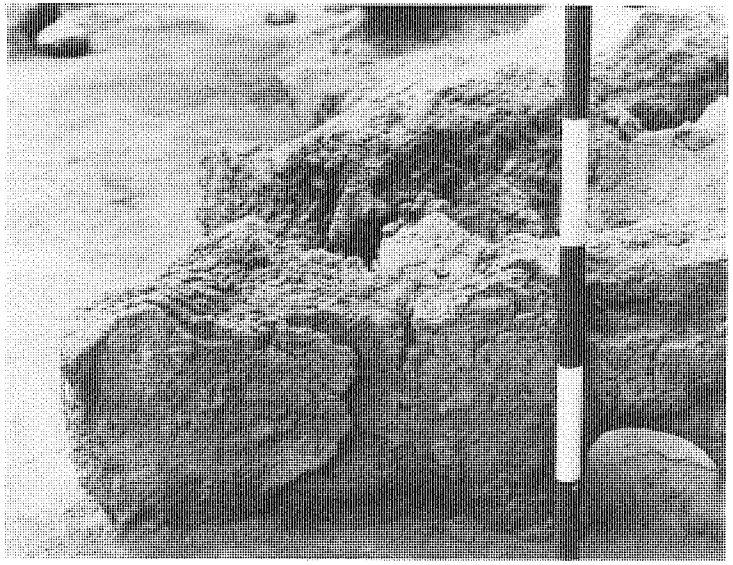

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Plate XXXI. Oven 2 during various stages of excavation.

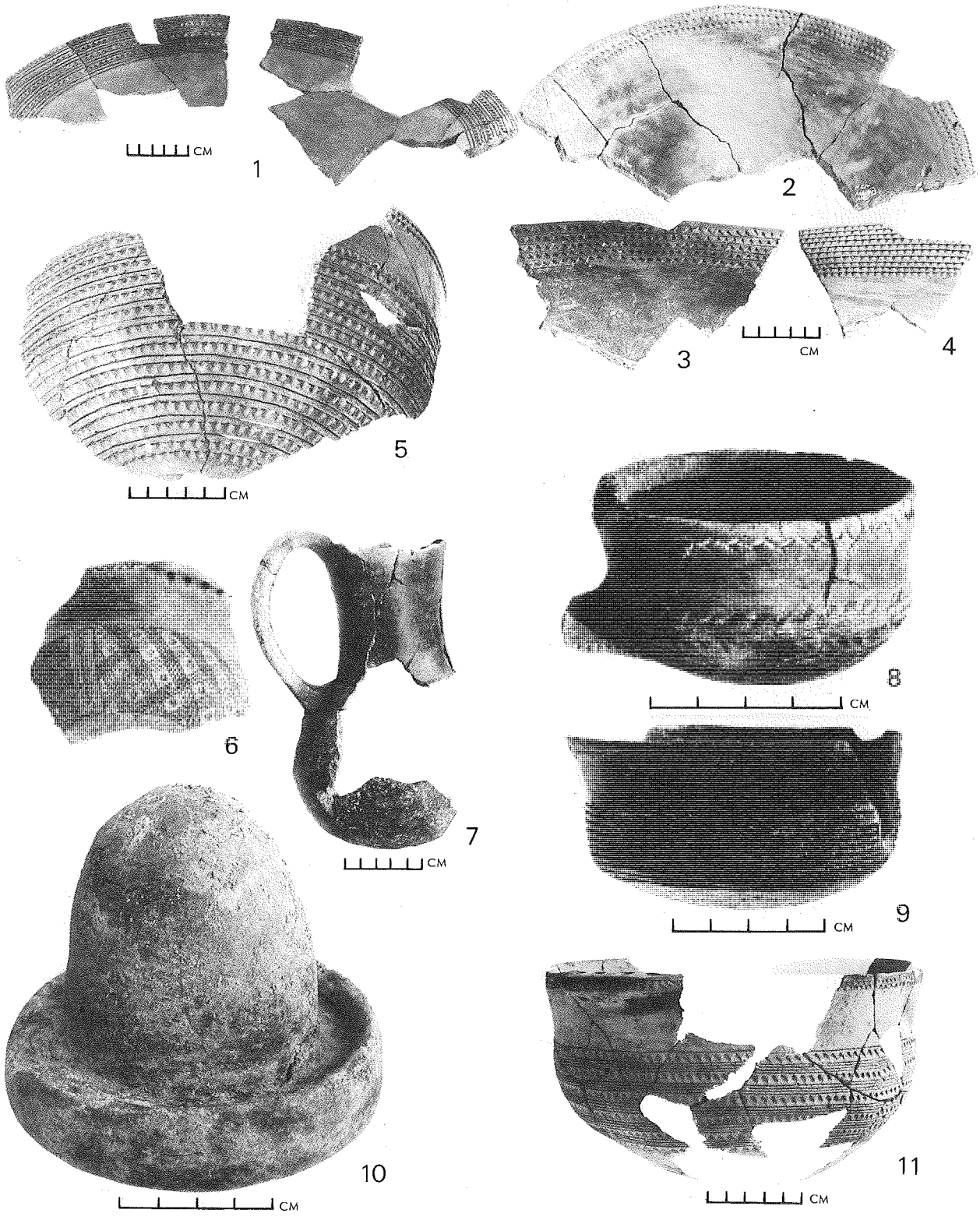

Plate XXXII. Pottery from the Burnt House. (1) Sherd from conical bowl, pot 337. (2) Shallow conical bowl, pot 270/89. (3) conical bowl, pot 274. (4) Sherd from conical bowl, pot 273. (5) Deep bowl, pot 255. (6) Sinuous bowl, pot 286. (7) Globular jug, pot 282. (8) Sinuous bowl, pot 221. (9) Sinuous bowl, pot 209. (10) Clay object, SF 4306. (11) Sinuous bowl, pot 223.

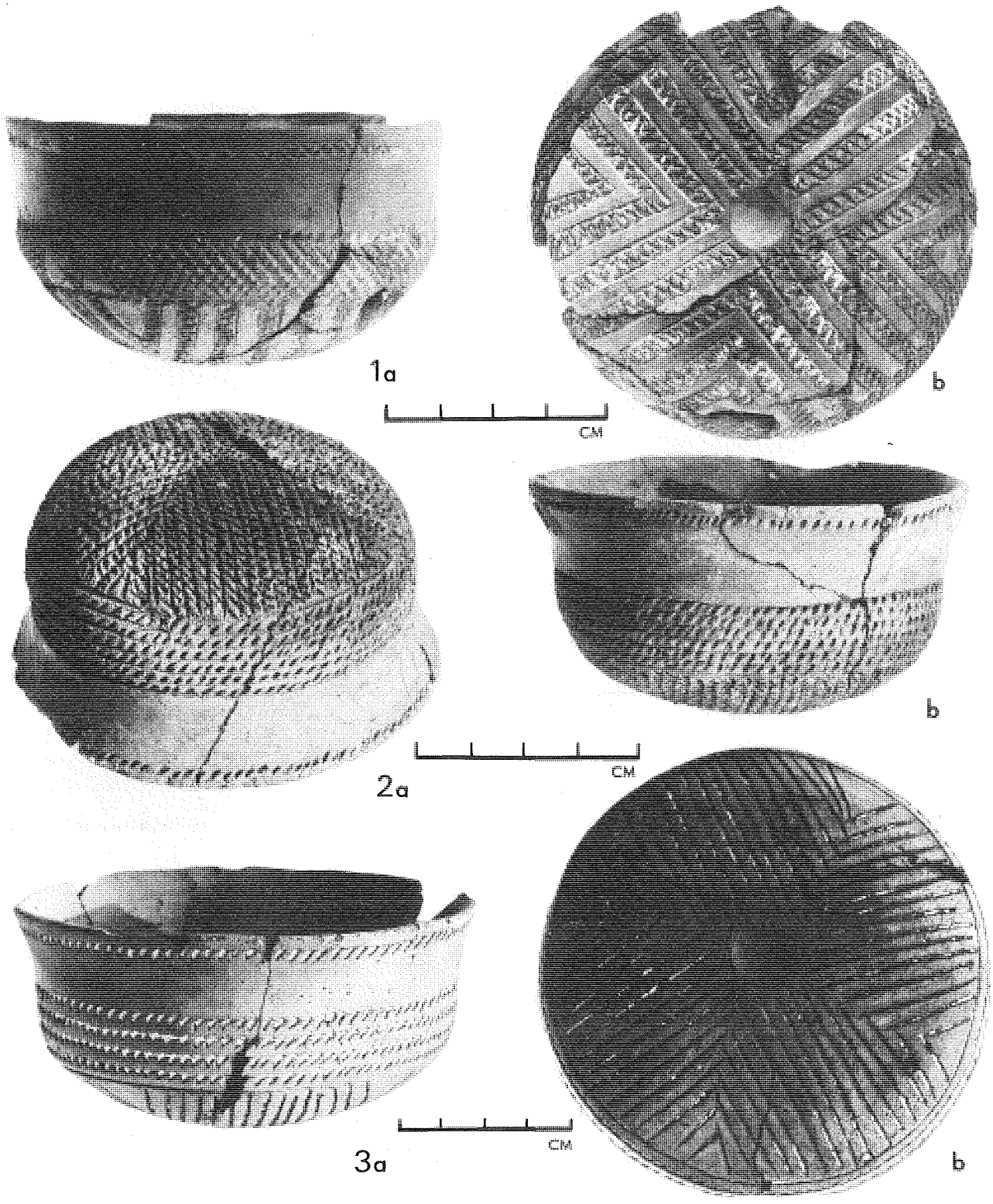

Plate XXXIII. Incised sinuous bowls from the Burnt House. (1a, b) Pot 291/287. (2a, b) Pot 246. (3a, b) Pot 224.

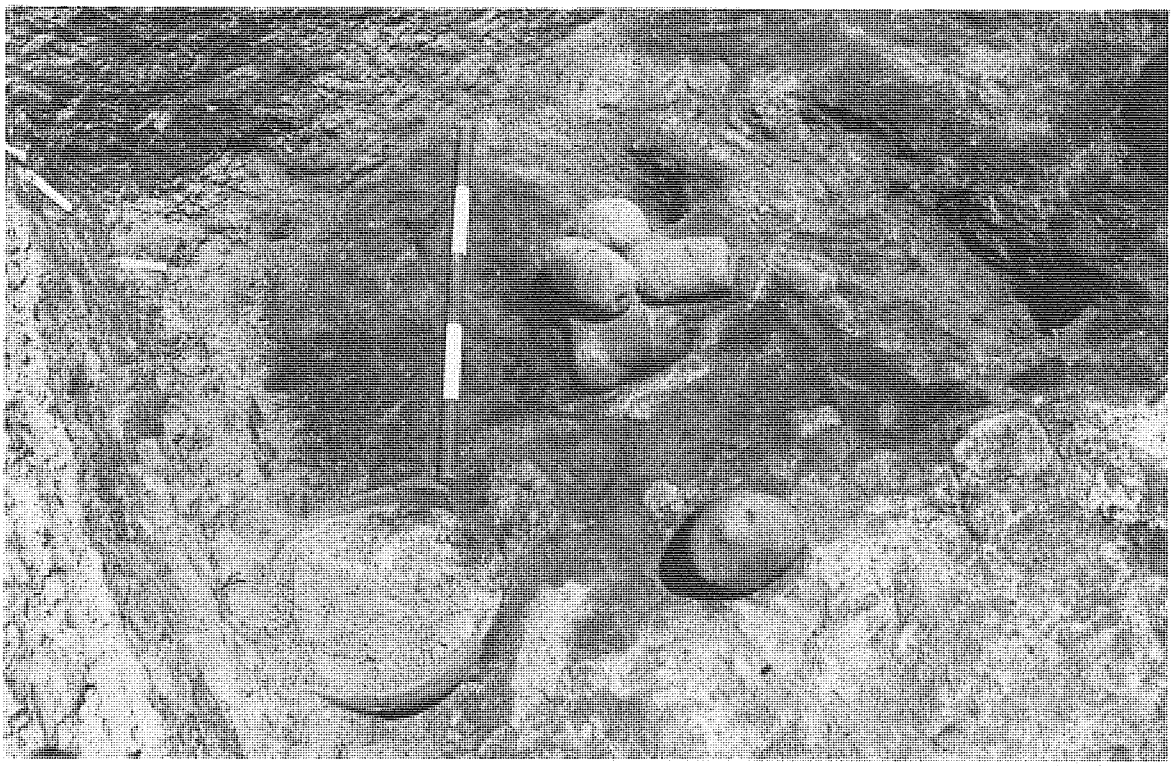

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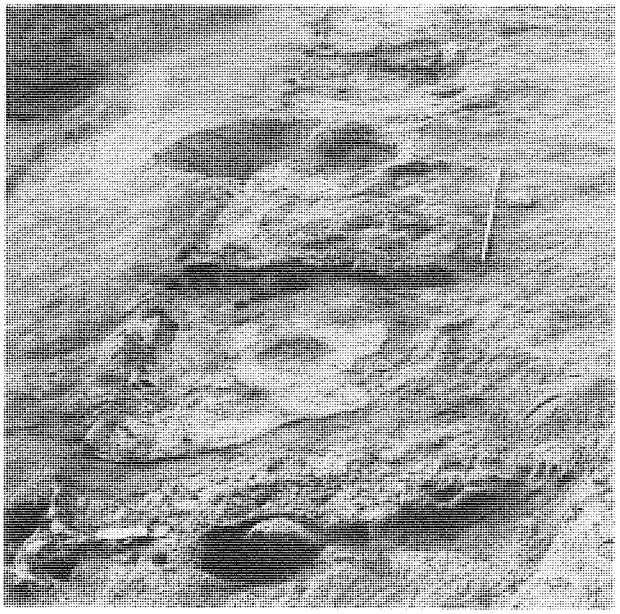
Plate XXXIV. (1) Assemblage of loom weights and a bowl from phase IV, ROc 23. (2) Remains of phase IV walls in area ZH, seen from the southeast.



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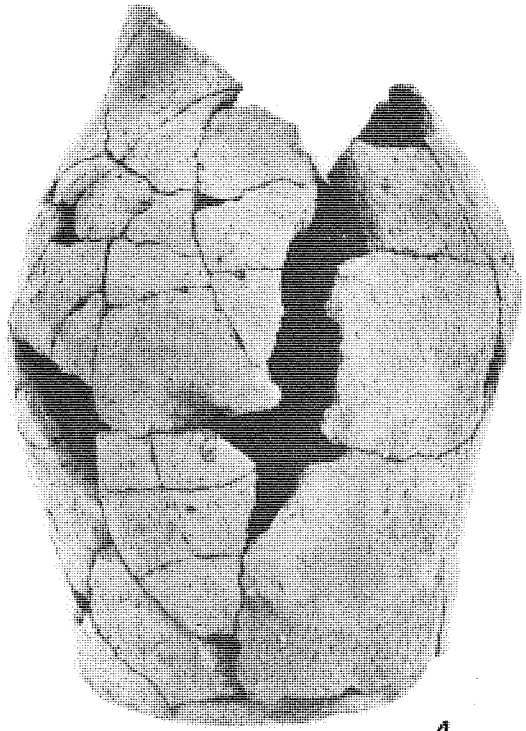

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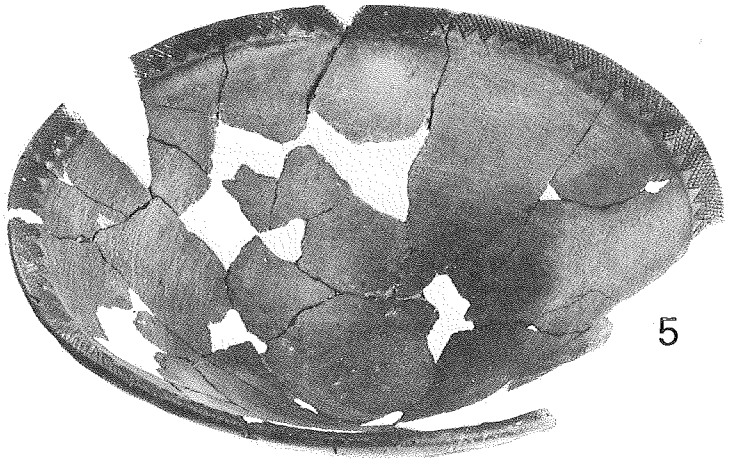

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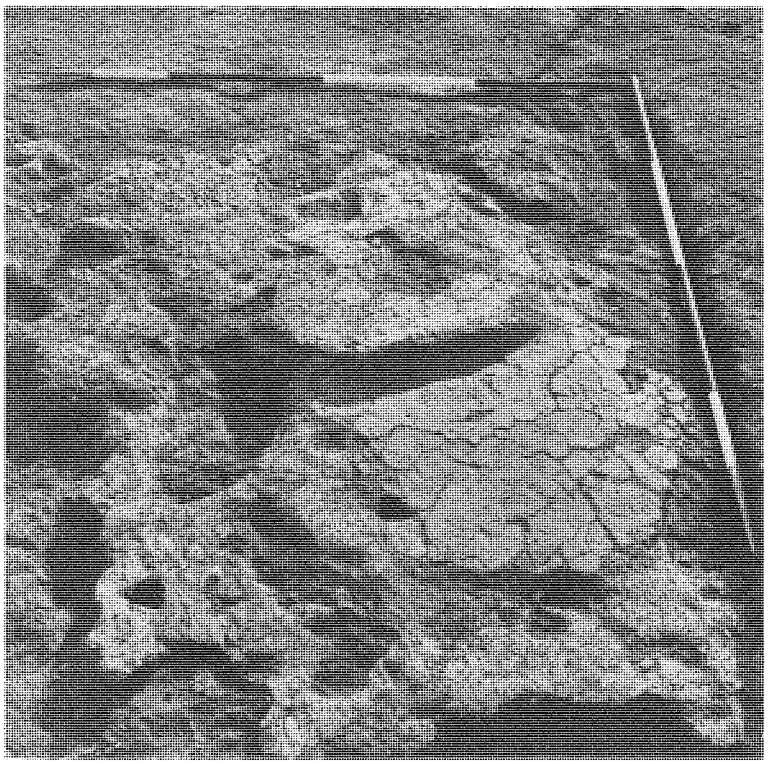
CM

Plate XXXV. Features and finds from phase IV levels in area ZH. (1) Interior dividing walls of house. (2) Sinuous bowl, pot 247. (3) High-handled bowl, pot 206. (4) Piriform storage vessel, pot 305. (5) Conical bowl, pot 329.



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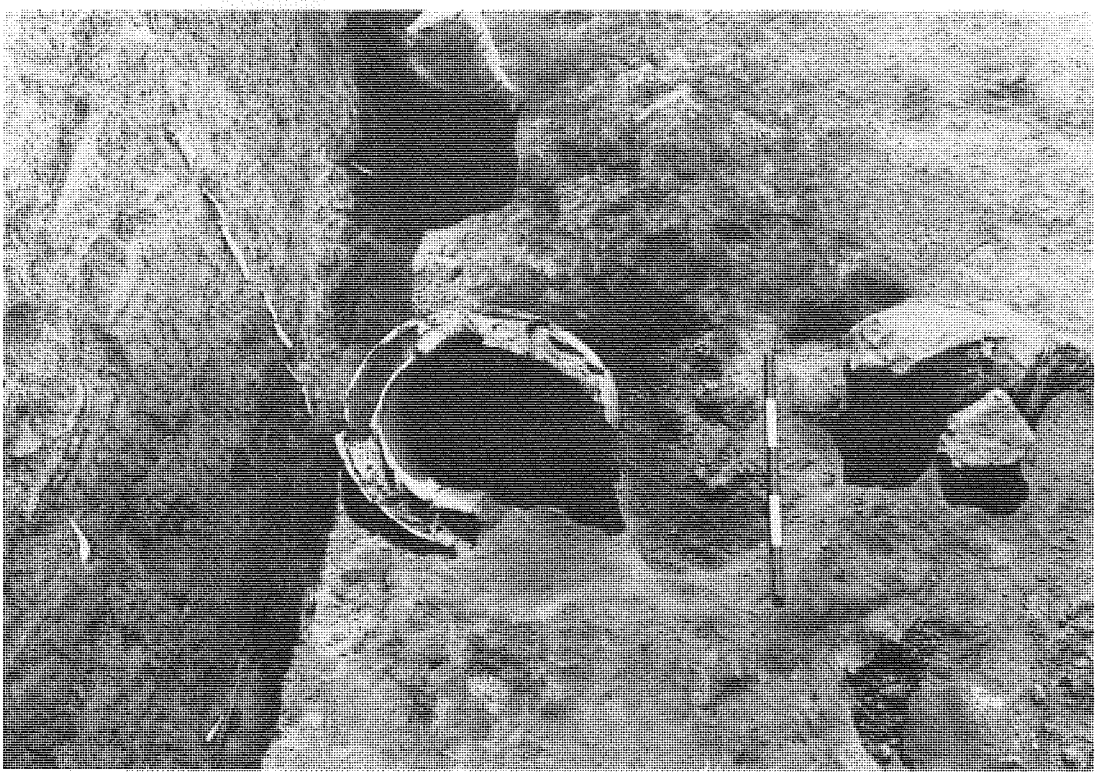

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Plate XXXVI. (1) Hearth ridge in square SL. (2) Pithos, pot 226, containing pot 227 and carbonized grain, from phase IV.

1

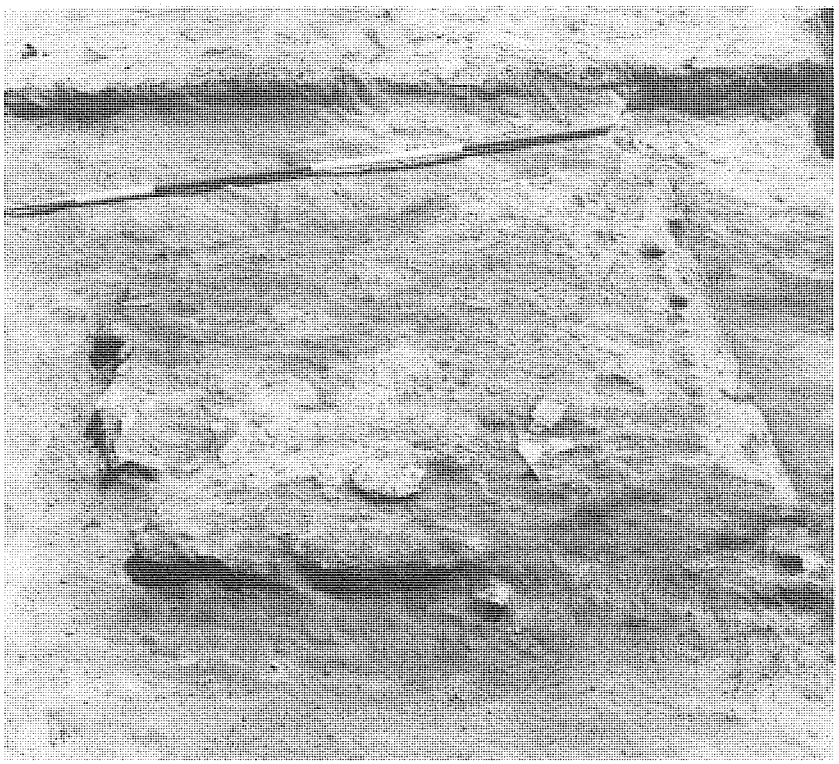

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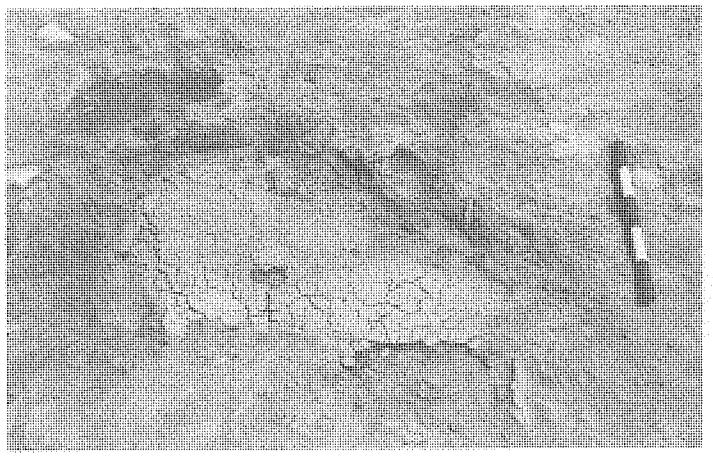
Plate XXXVII. Features of phase III in square MM. (1) Rubble, seen from the west. (2) Structure in MM 18-20 enclosing a hearth.



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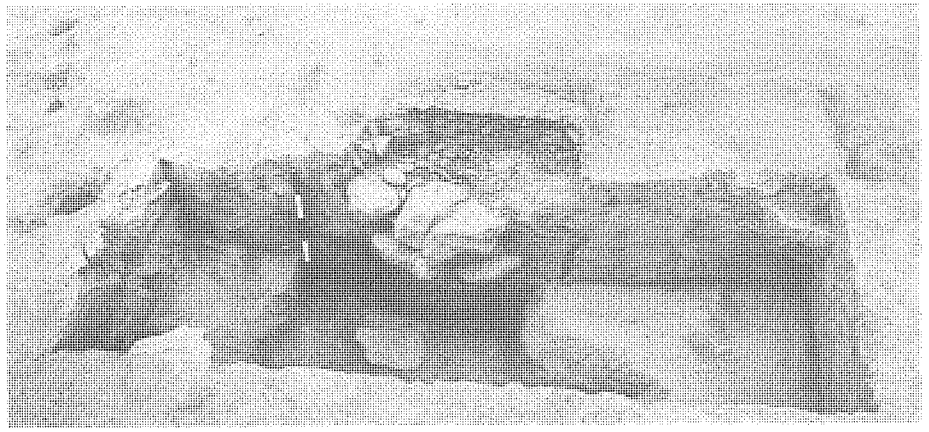

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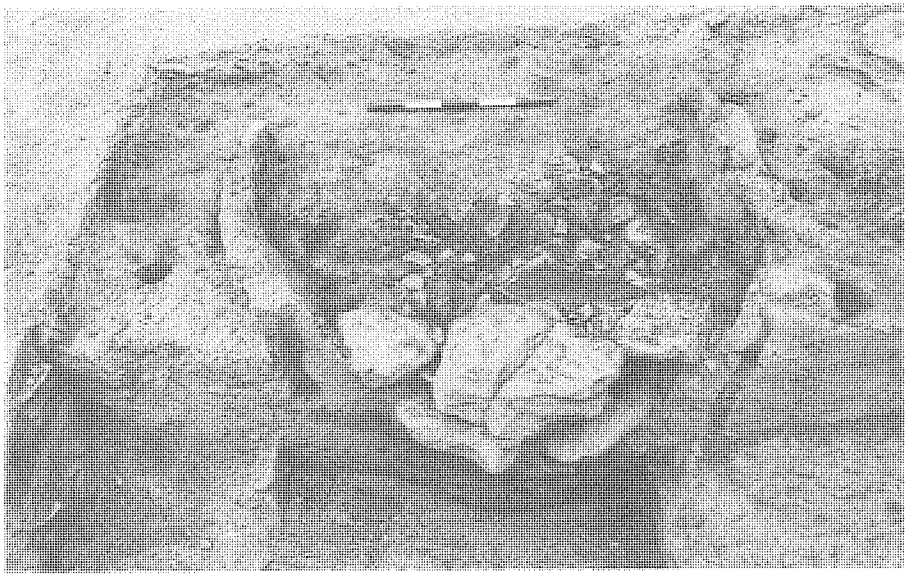

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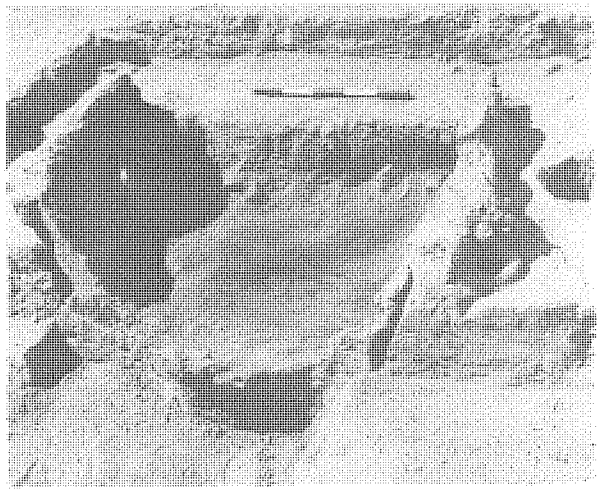

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Plate XXXVIII. Oven base in ML 151 at various stages of excavation.

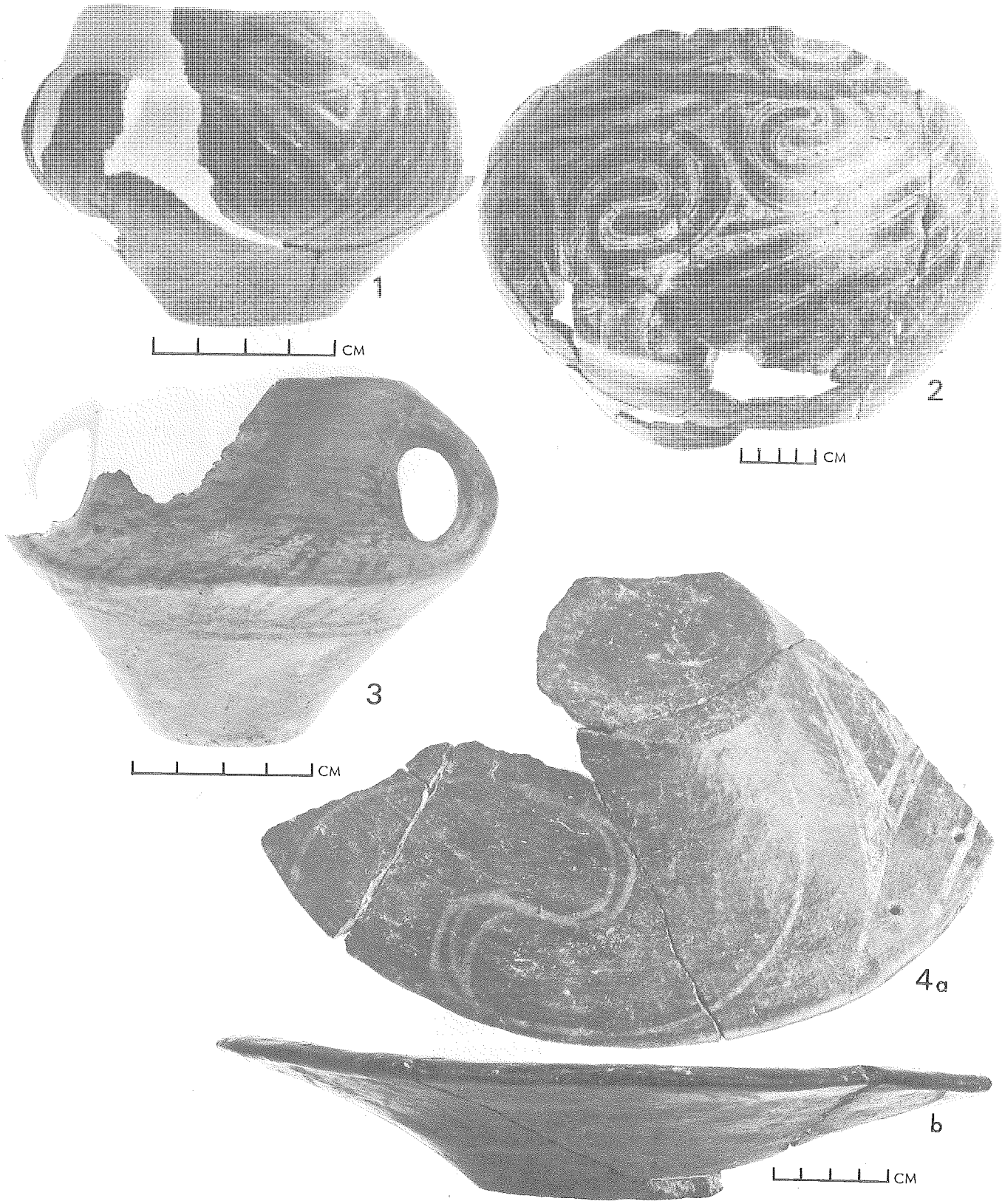


Plate XXXIX. Graphite-painted ware of phase III from squares ML and MM. (1) Hole-mouth jar, pot 236. (2) Globular urn, pot 290. (3) Two-handled, open-neck jar, pot 33. (4a, b) Open flaring bowl, pot 133.

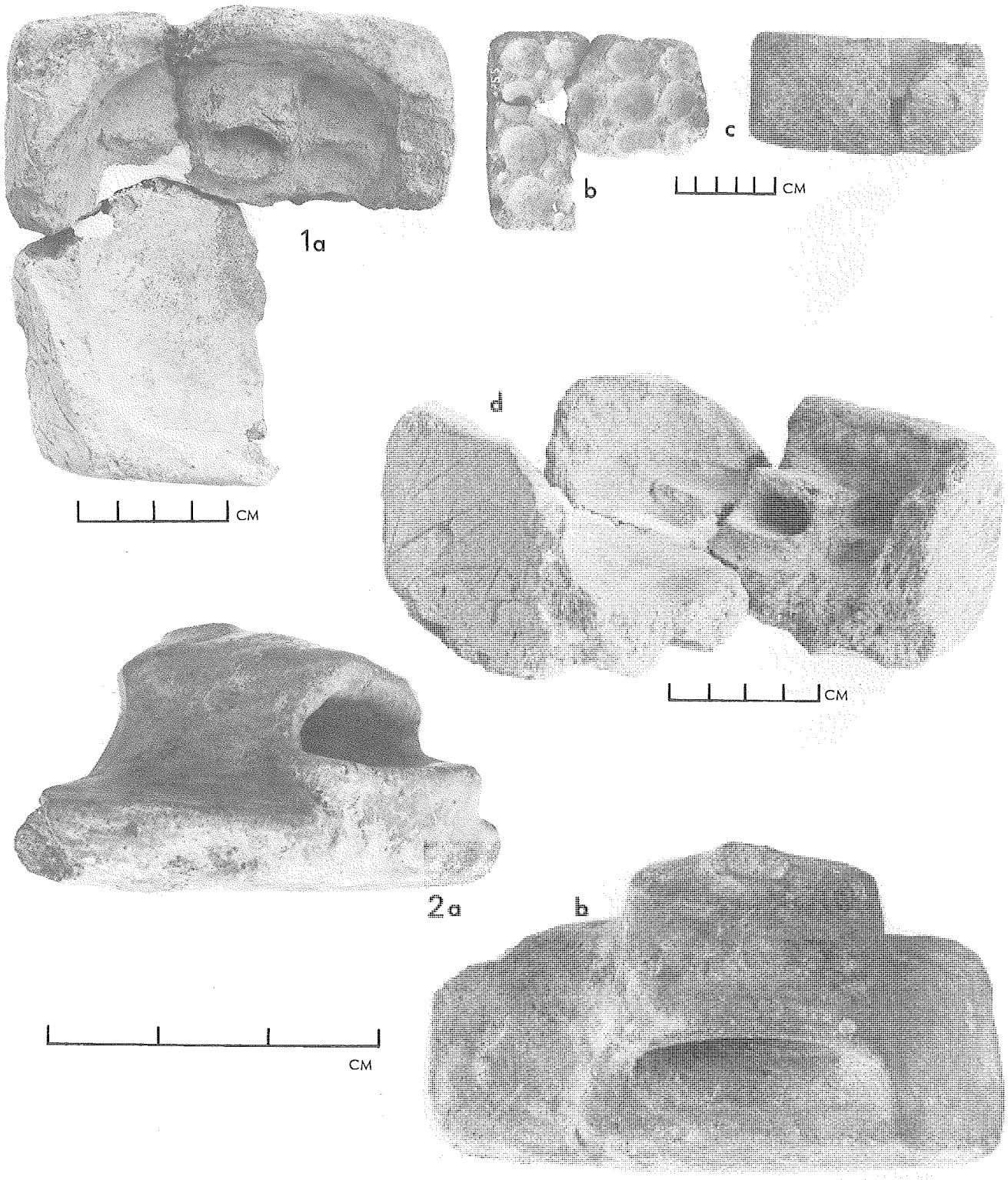


Plate XL. (1a-d) House model, SF 755. (2a, b) Oven model, SF 813.

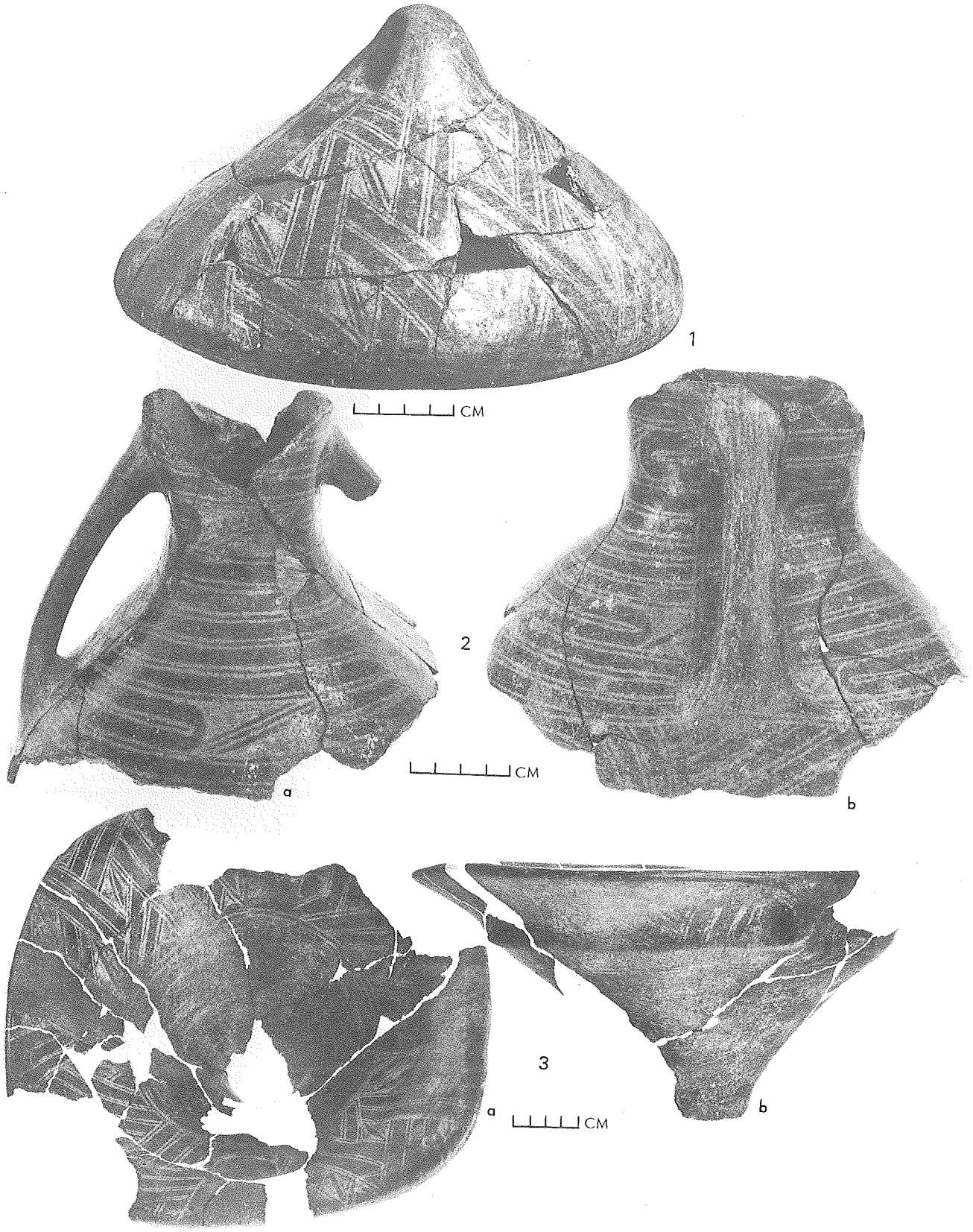


Plate XLI. Graphite-painted ware of phase III from squares ML and MM. (1) Lid with handle, pot 254. (2a, b) Two-handled jar, pot 306. (3a, b) Dikili Tash bowl, pot 67.

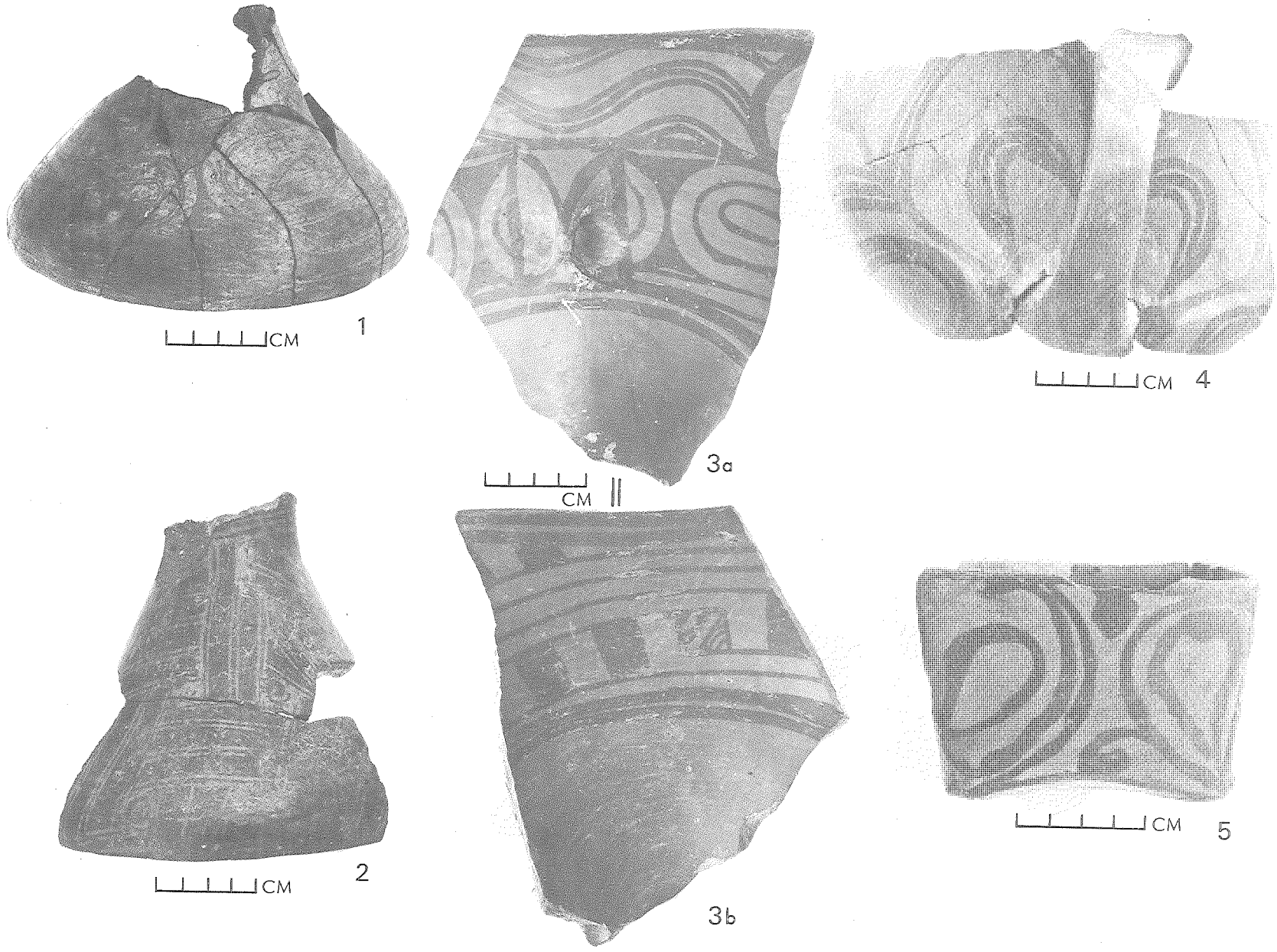


Plate XLII. Graphite-painted (1, 2) and Black-on-Red (3-5) pottery from phase III, squares ML and MM. (1) Stand base, pot 292. (2) Base, pot 308. (3a, *interior*; 3b, *exterior*) Dikili Tash bowl, pot 112. (4) Handled pitcher, pot 312. (5) Square vessel with feet, pot 56/146.

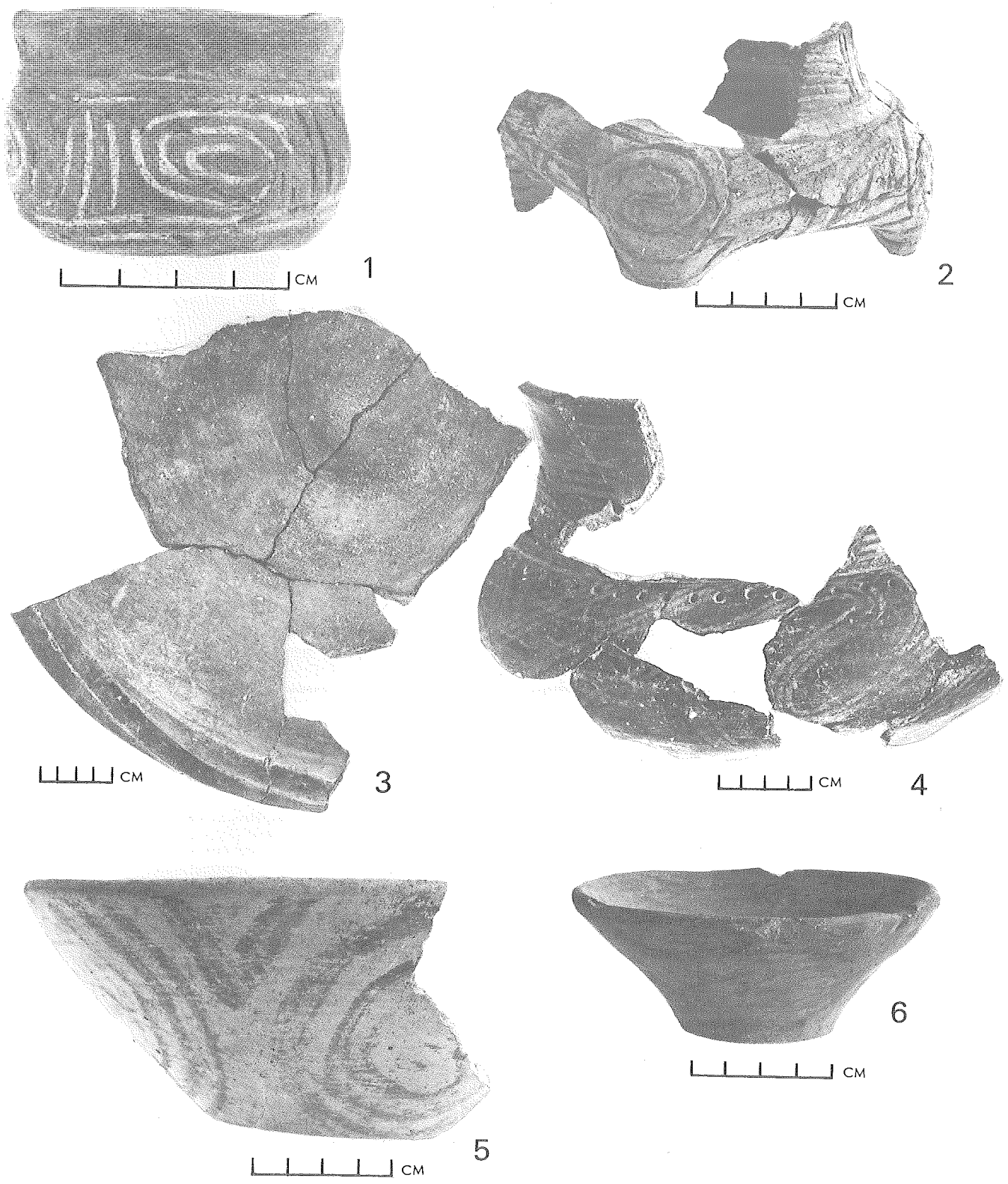
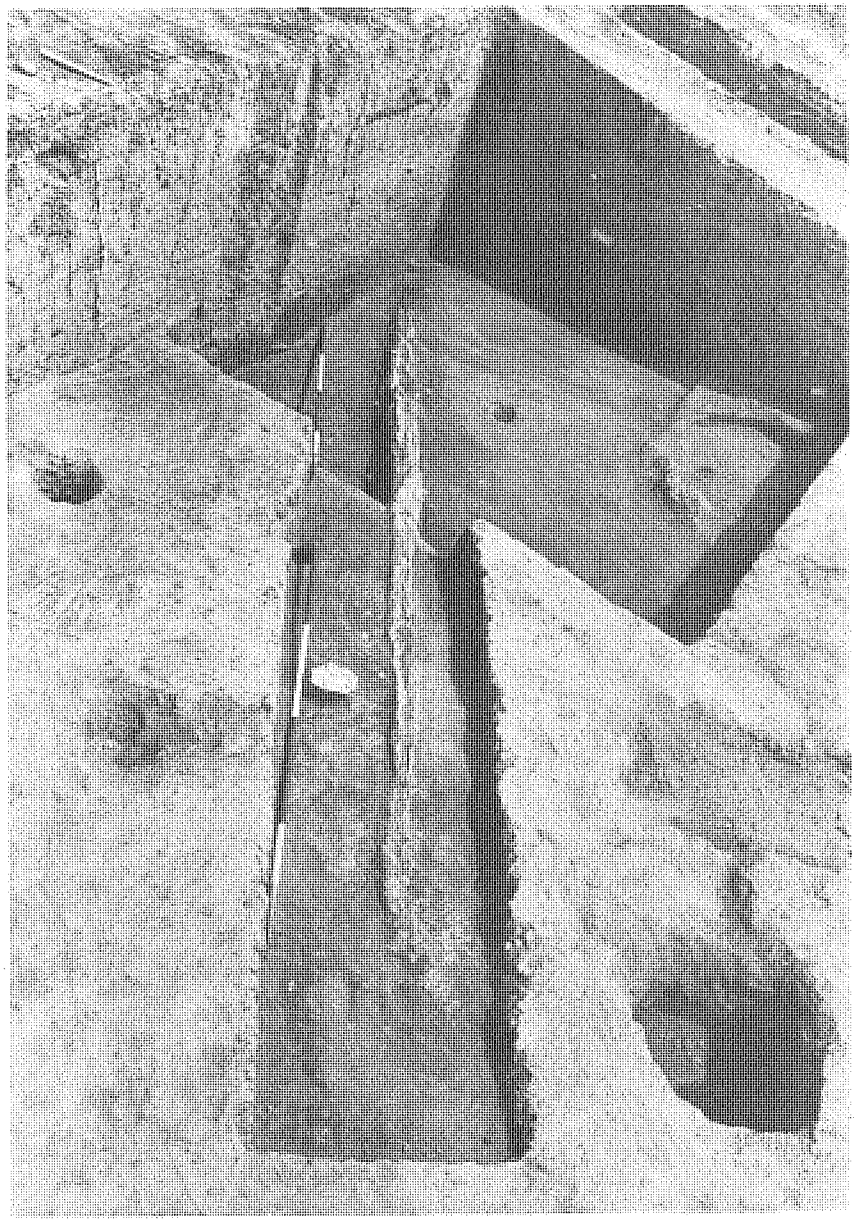


Plate XLIII. Pottery of phase III from squares ML and MM: (1) Deep bowl, pot 66; (2) four-legged vessel, pot 113; (3) open flaring bowl, pot 237; (4) globular jar, pot 313. Pottery of phase II from square KM: (5) Rounded, open bowl, pot 144; (6) open bowl, pot 18.



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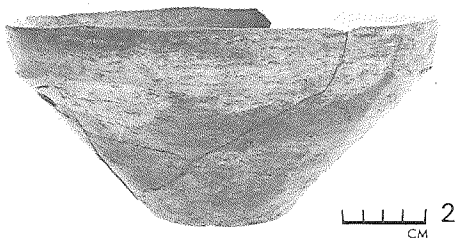

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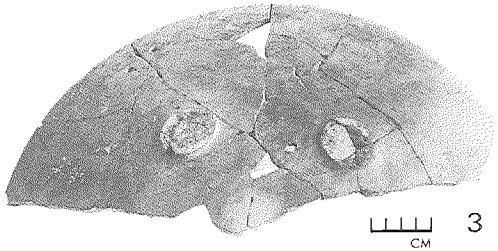

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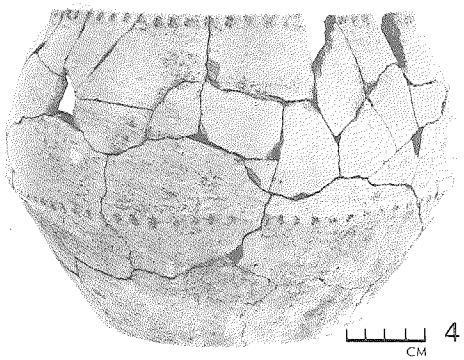

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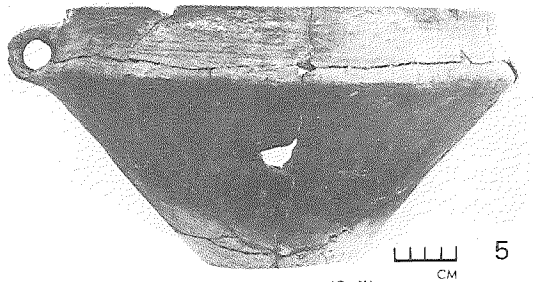
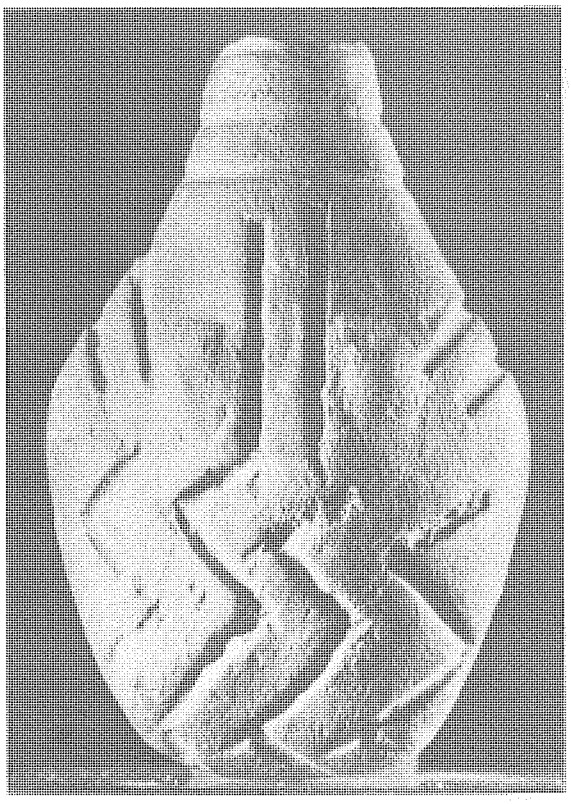


5

Plate XLIV. (1) Wooden sleeper beam in levels of phase I in square KL, seen from the northwest. (2-5) Various vessels: (2) Carinated bowl, pot 160; (3) shallow bowl, pot 156; (4) barrel-shaped jar, pot 137; (5) carinated bowl, pot 32/311.



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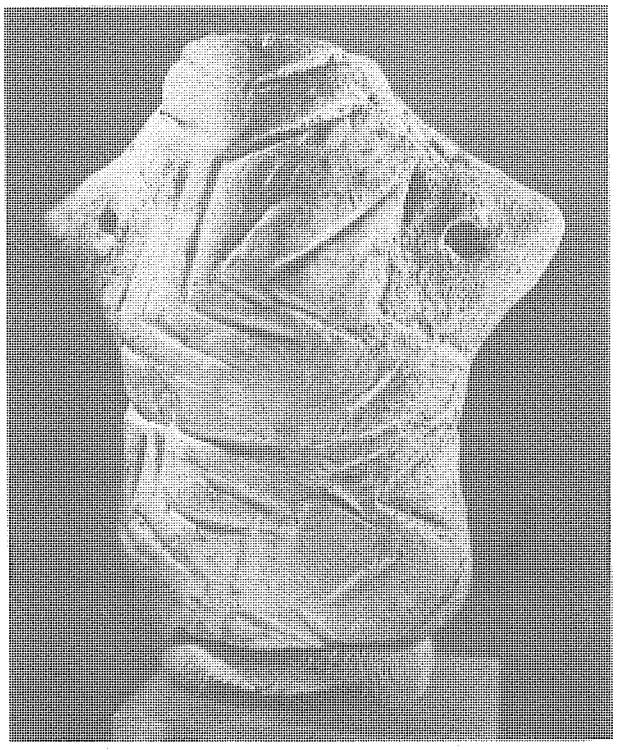

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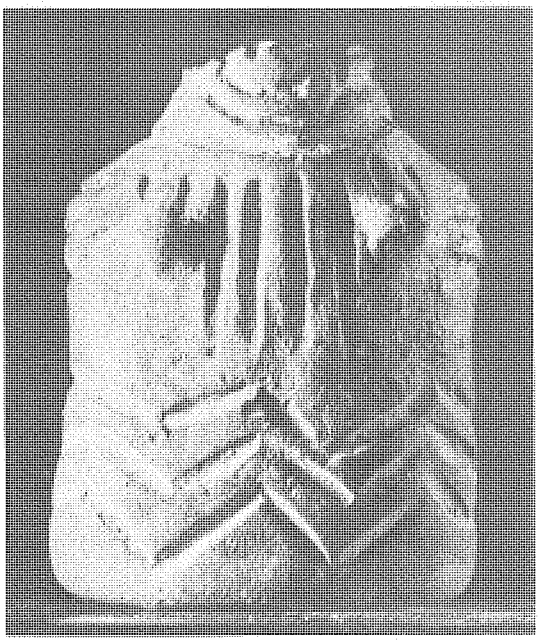
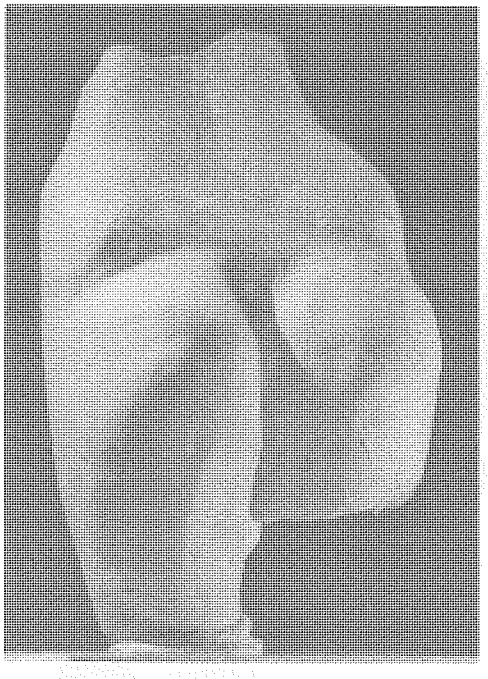


3a

3b

Plate XLV. (1) Incised schematic female figurine encrusted with red ocher; typologically phase II, cat. 19. (2) Incised stylized torso with pierced arm stumps; phase II, cat. 26. (3) Female torso with breasts and dress lines indicated and incisions filled with red ocher; phase III, cat. 98.

1a



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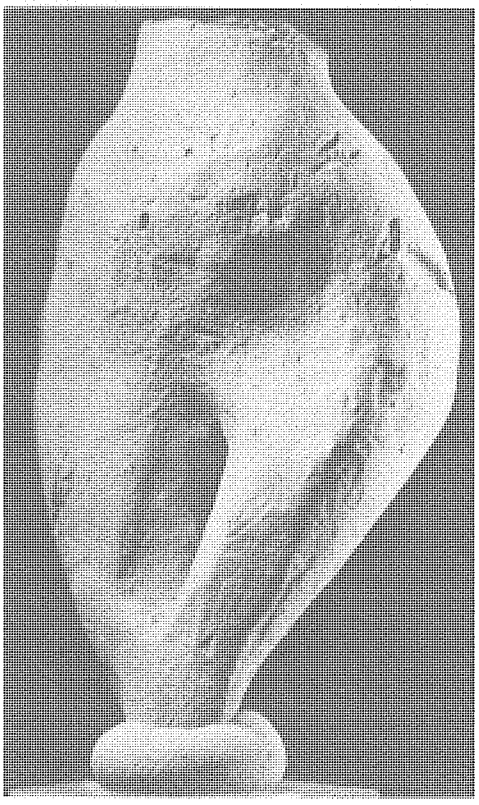

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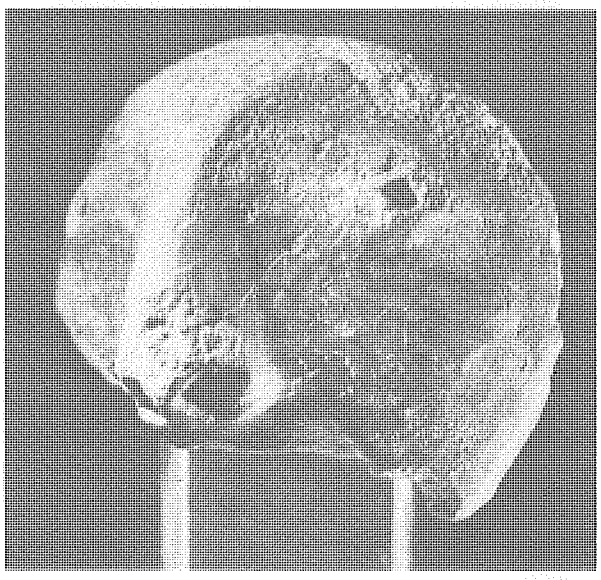
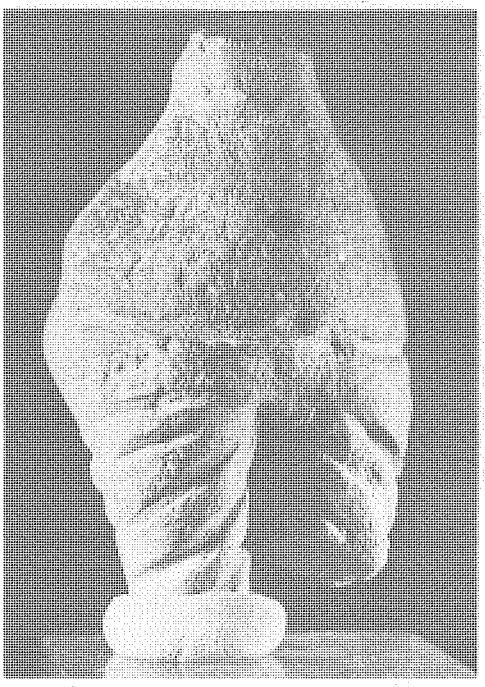


3

Plate XLVI. (1) Red-painted naturalistic female figure; typologically phase III, cat. 147. (2) Female figurine in half-seated position; phase III, cat. 146. (3) Human head with eyeballs and nostrils indicated and lower part of face fractured; phase III, cat. 172.



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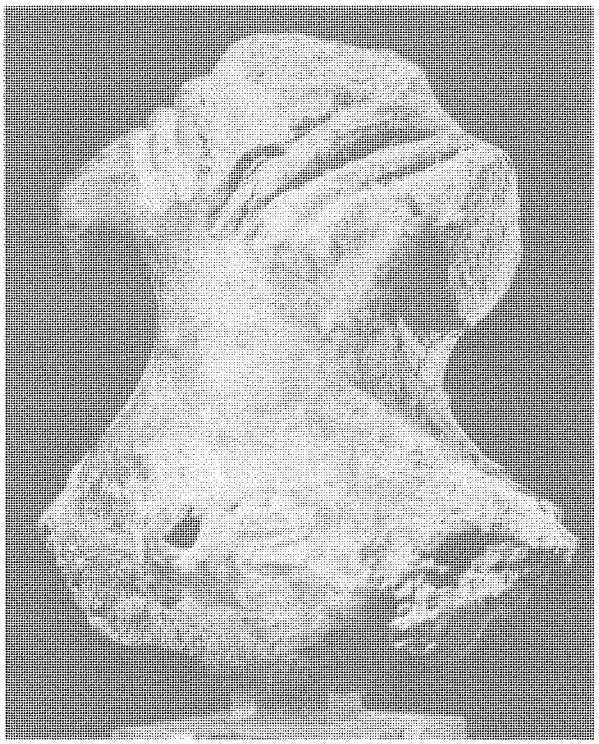

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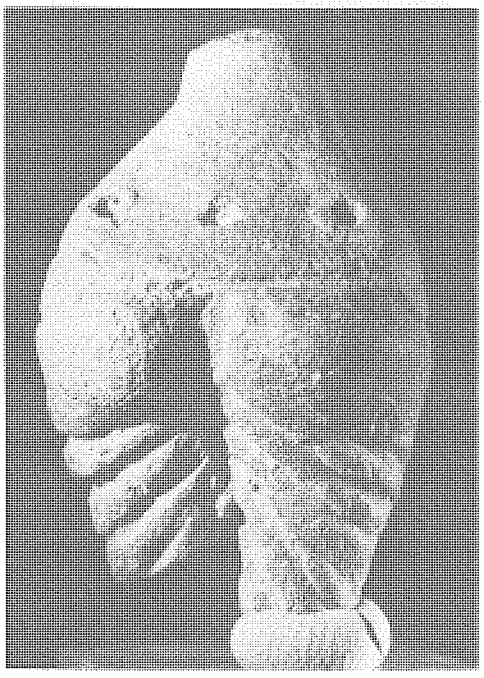

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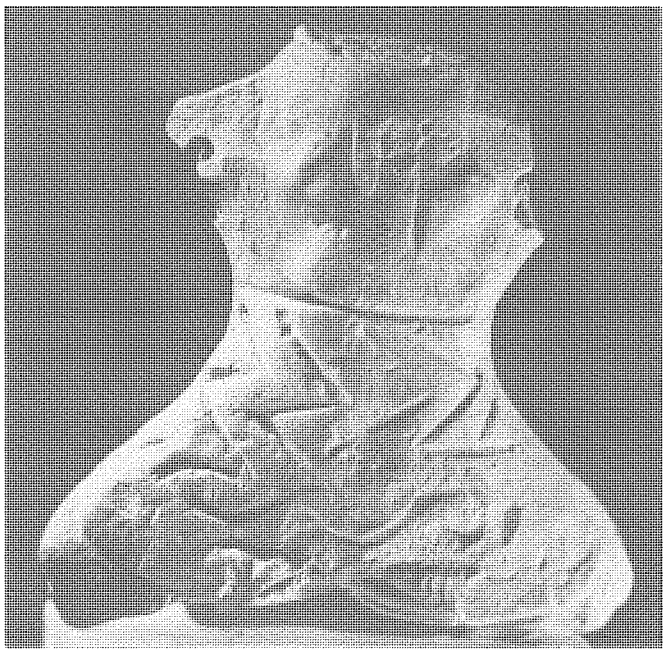
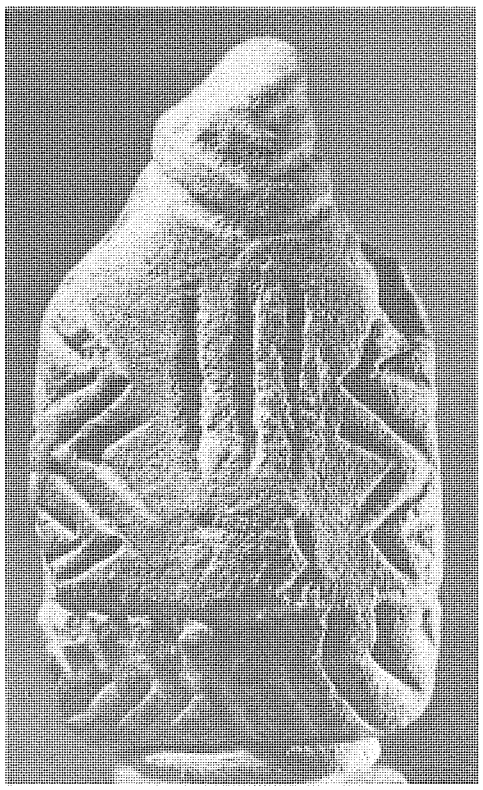


3

Plate XLVII. (1a, b) Semi-nude torso with incised skirt or "pant suit"; phase III, cat. 144. (2) Incised torso of female figurine broken below navel; phase III, cat. 159. (3) Female figurine in squatting position, with head and arms truncated and white-filled incisions; phase II, cat. 39.



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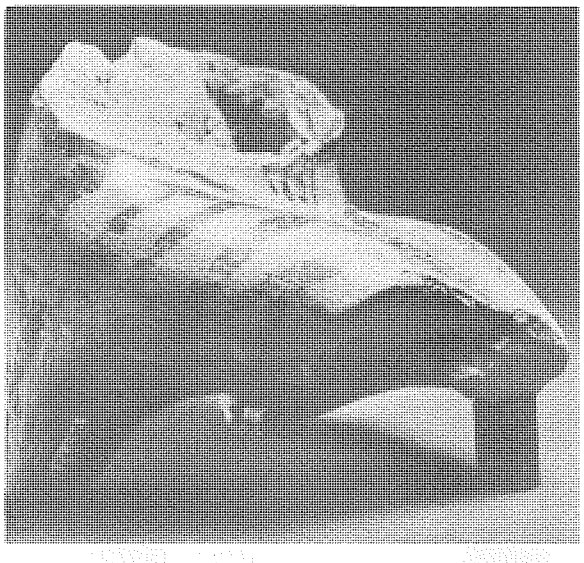

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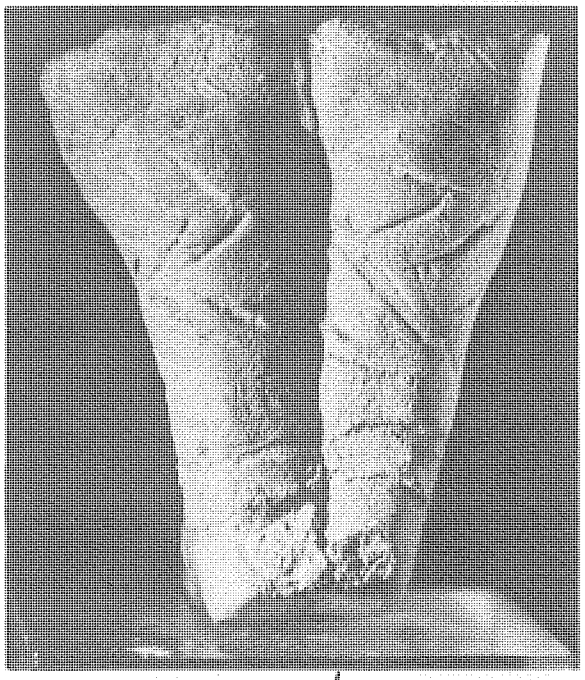
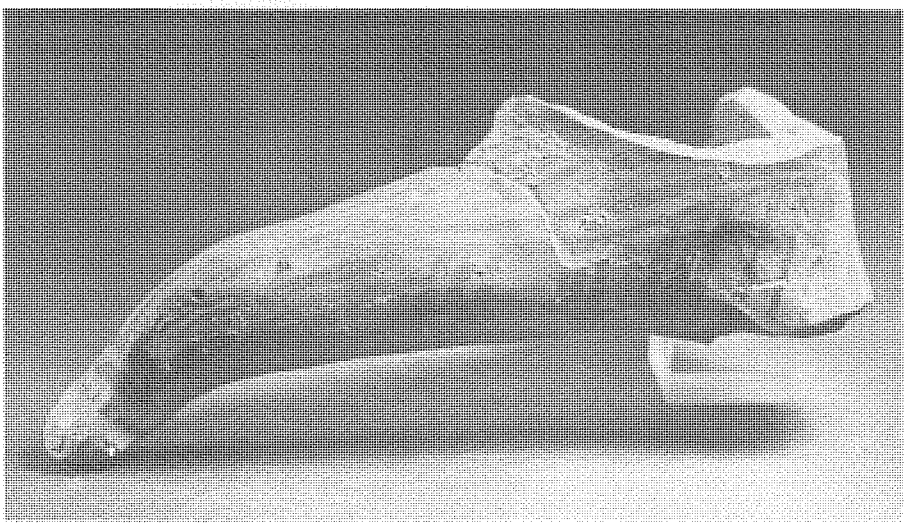


4

Plate XLVIII. (1) Schematic female figurine, with head broken off and dress indicated by incision; typologically phase II, cat. 23. (2) Lower half of seated black-on-red painted figure; phase III, cat. 169. (3) Leg and buttock of standing figurine, with white-encrusted incisions perhaps indicating a richly embroidered skirt; phase III, cat. 106. (4) Figurine legs incised with zigzags and paired circling lines around ankles; phase II, cat. 60.



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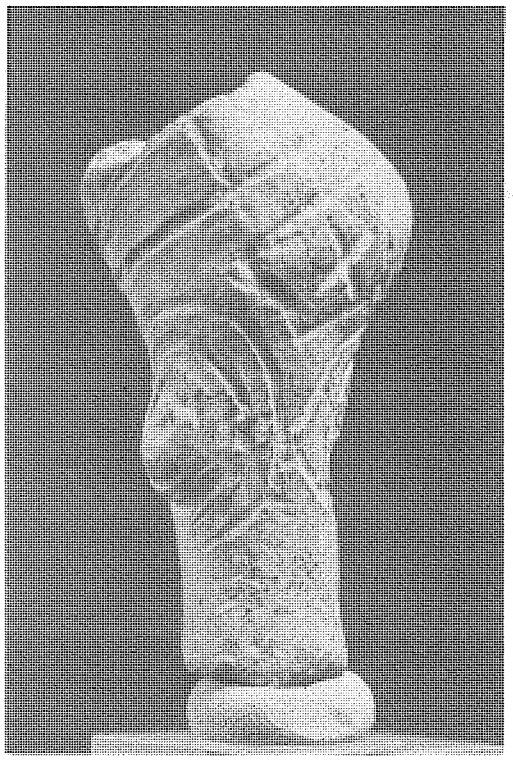

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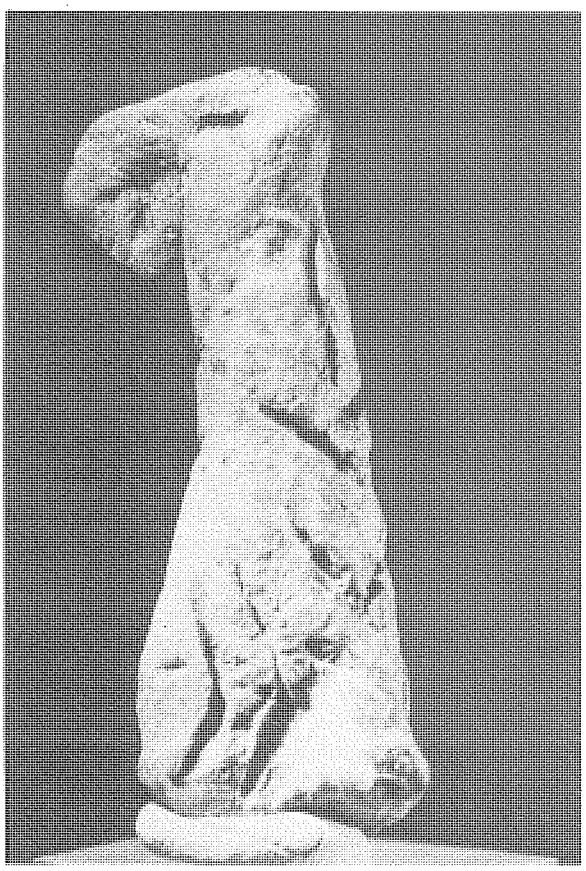
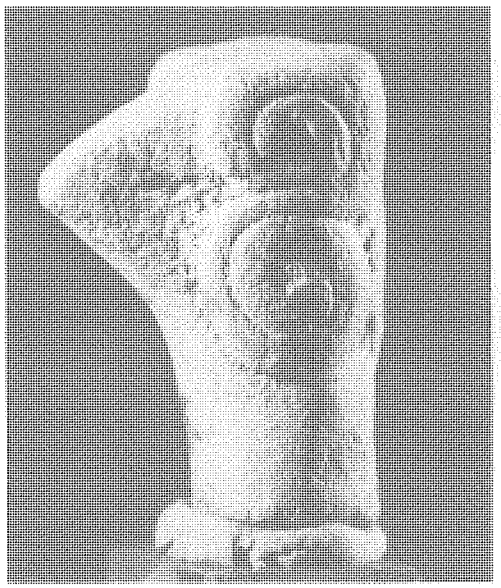


3

Plate XLIX. (1) Leg of seated painted figurine with tasseled apron indicated, in black-on-red; typologically phase III, cat. 166. (2) Figurine leg incised with cross over buttock and concentric circles outlining knee; typologically phase II, cat. 59. (3) Seated "lady with a coif," with incisions encrusted with red color; phase II, cat. 84.



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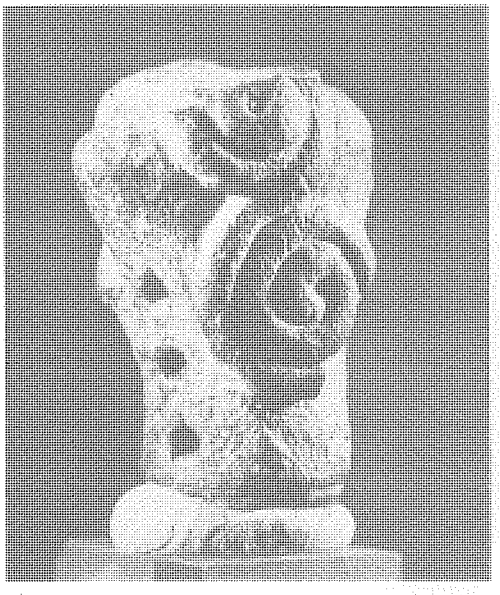

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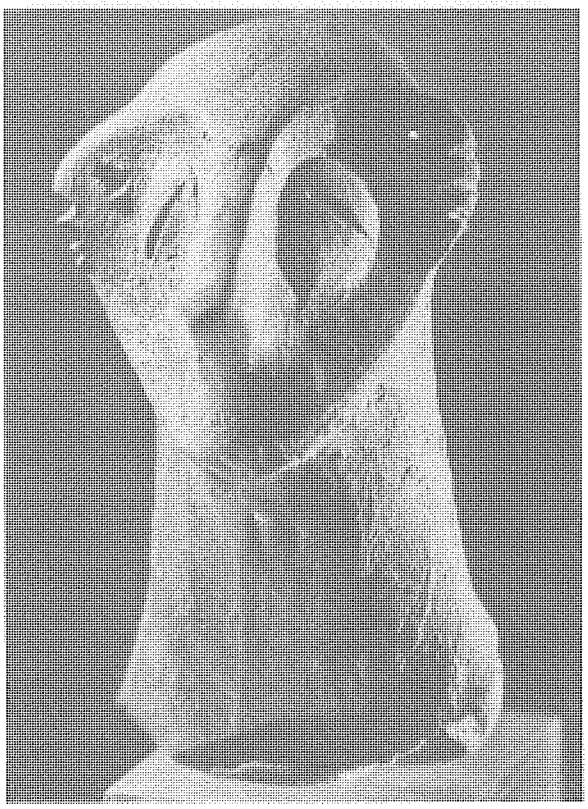

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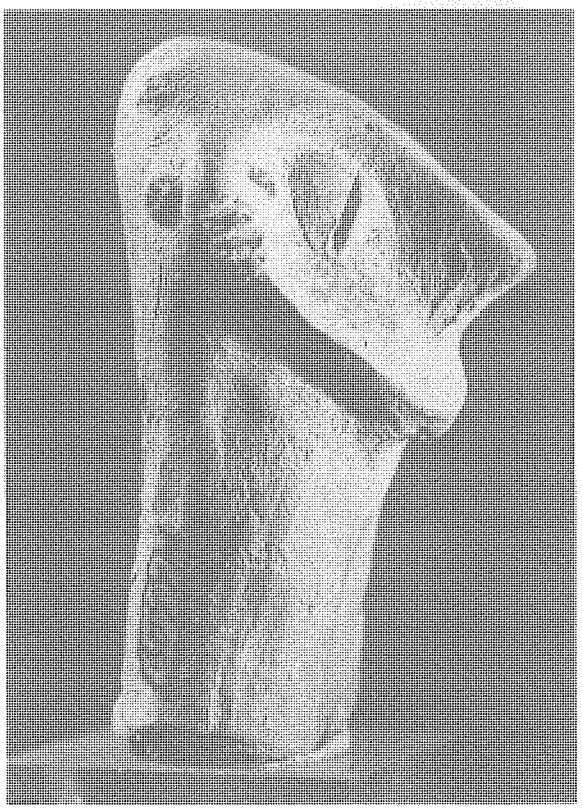
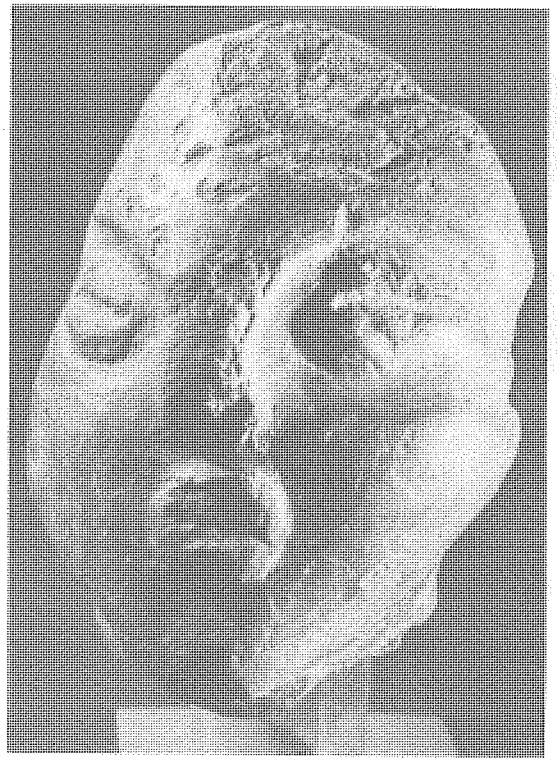


3b

Plate L. (1) Miniature head of Bird Goddess with double spiral hairdo; phase III, cat. 131. (2) Miniature head of Bird Goddess with double spiral coif; phase III, cat. 130. (3a, *front*; 3b, *profile*) Masked human head; phase II, cat. 42.



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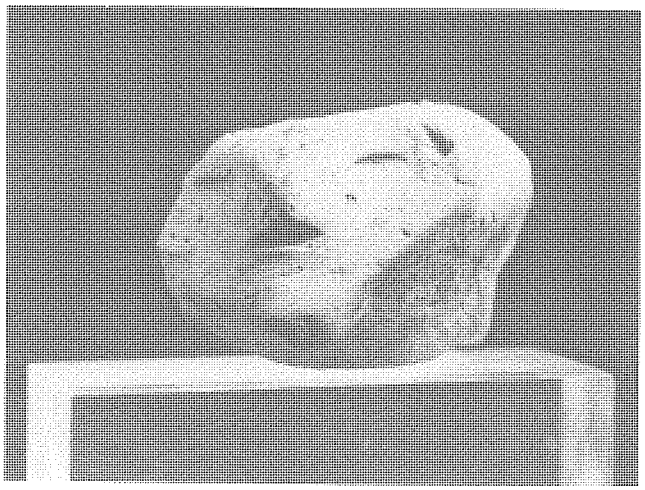

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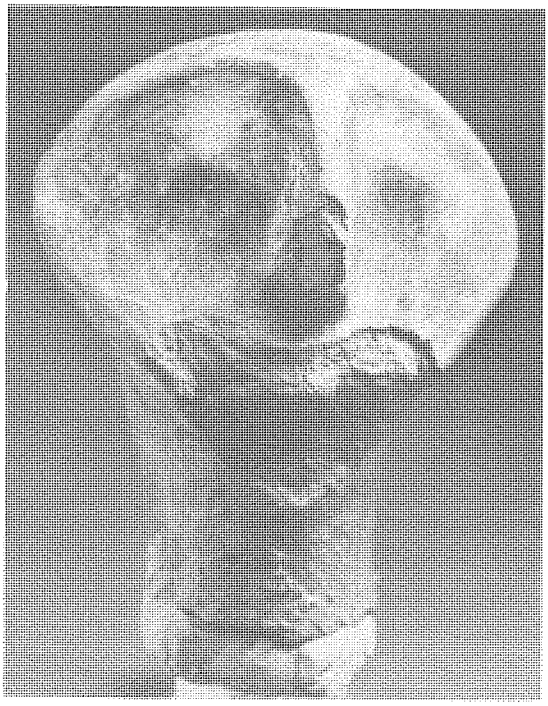

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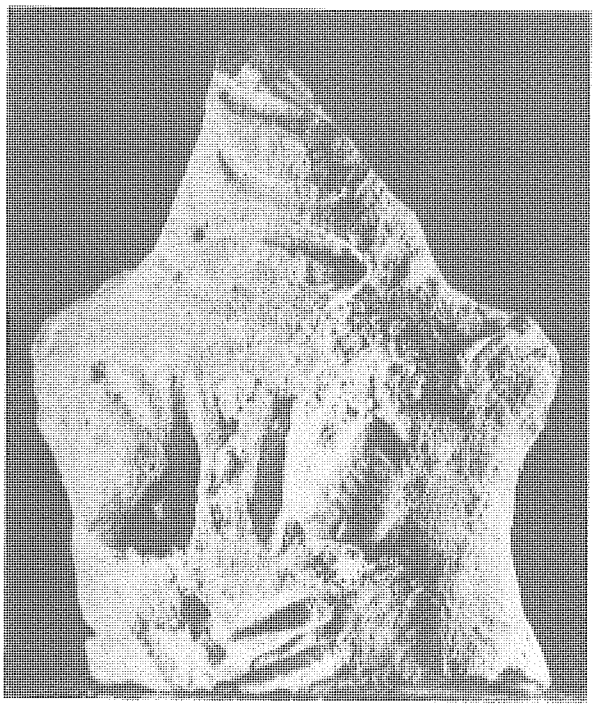
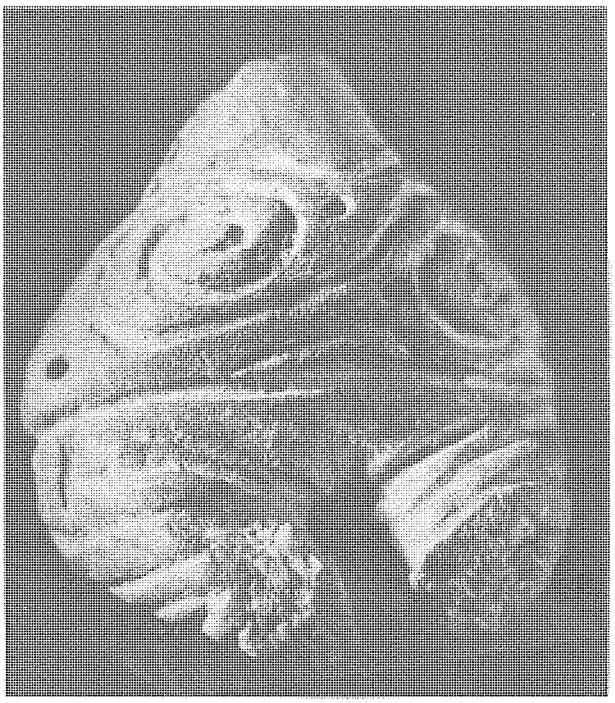


4

Plate LI. (1) Head of black-on-red painted figurine; phase III, cat. 168. (2) Fragment of vessel with representation of human mask; phase III, cat. 171. (3) Masked head modeled as handle of ladle; typologically phase II, cat. 203. (4) Upper half of female figurine with inverted V-sign above breasts, three lines between, and double V-sign across abdomen; phase III, cat. 101.



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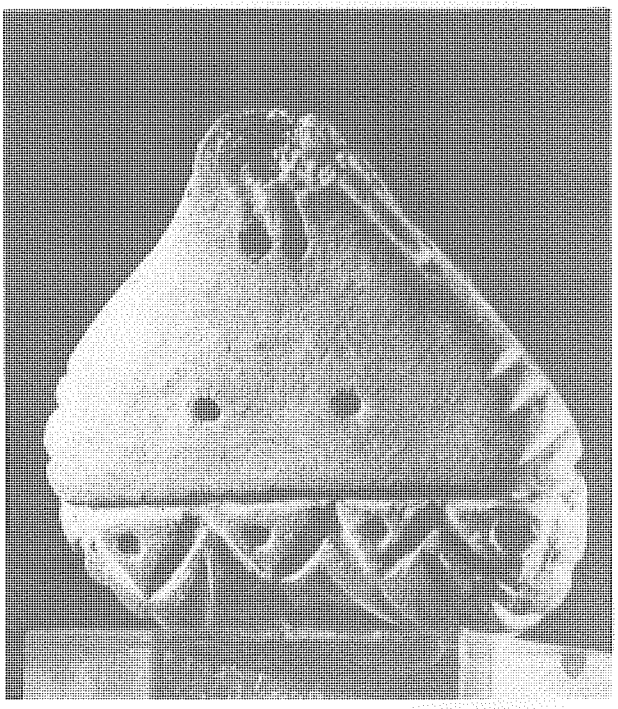

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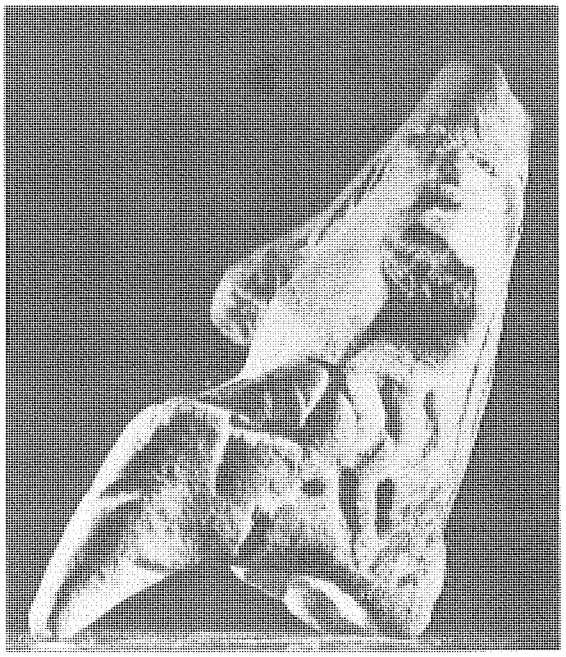

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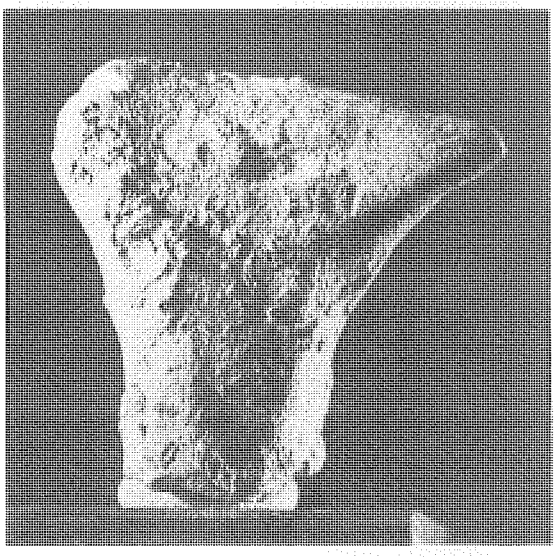

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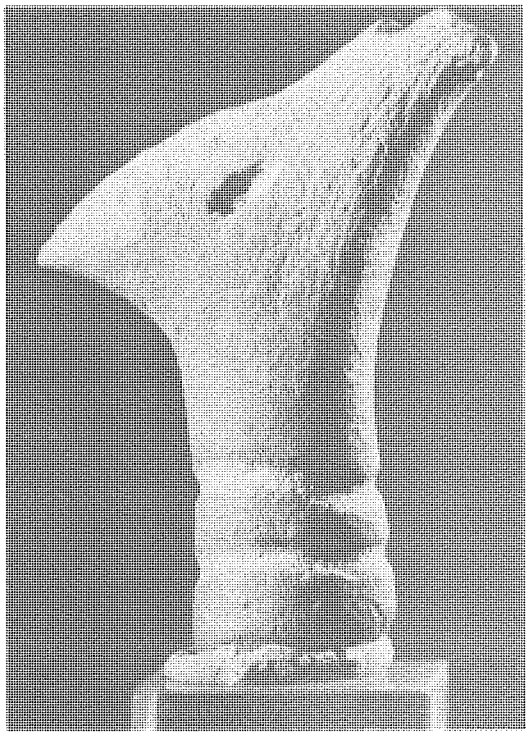
Plate LII. (1) Fat lady in seated position with white-encrusted incisions; phase III, cat. 153: *a*, double spirals on abdomen; *b*, paired holes on back, skirt below waist with symbolic dot within triangle design. (2) Seated female figurine incised with white-encrusted crosses, vertical lines, spirals, and chevrons; phase II, cat. 17. (3) Head of Bird Goddess figurine; typologically phase III, cat. 128.



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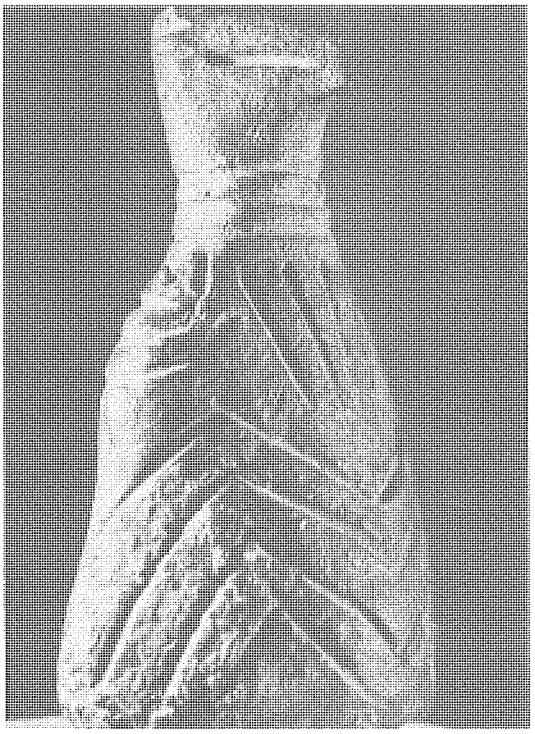

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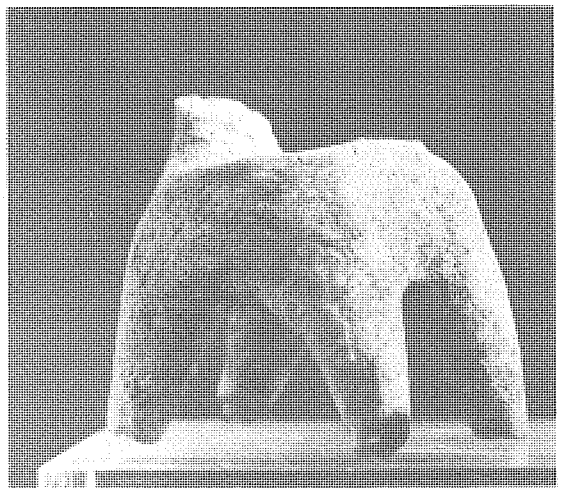

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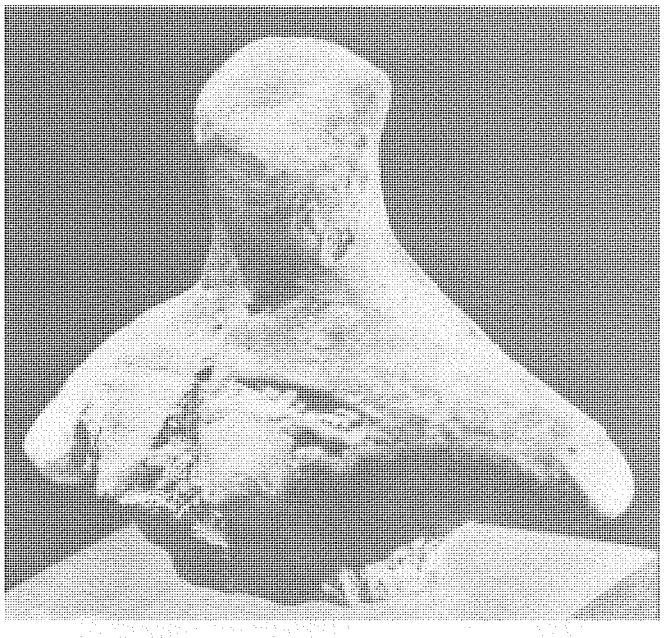
Plate LIII. (1) Miniature head of Bird Goddess; typologically phase II, cat. 85. (2) Figurine of Bird Goddess with white-encrusted incisions; phase III, cat. 127. (3) Small zoomorphic ritual table with central concavity and protome broken at neck, another fracture at rear; phase II, cat. 12. (4) Miniature four-legged chair or throne; phase II, cat. 11.



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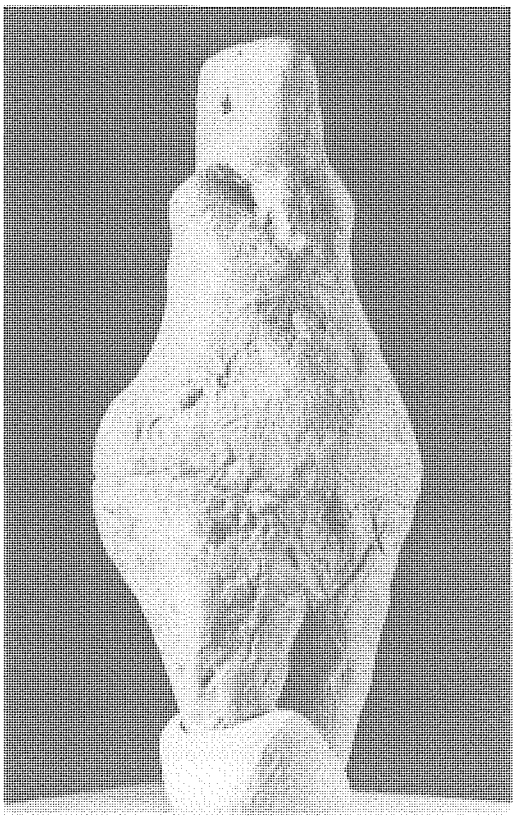

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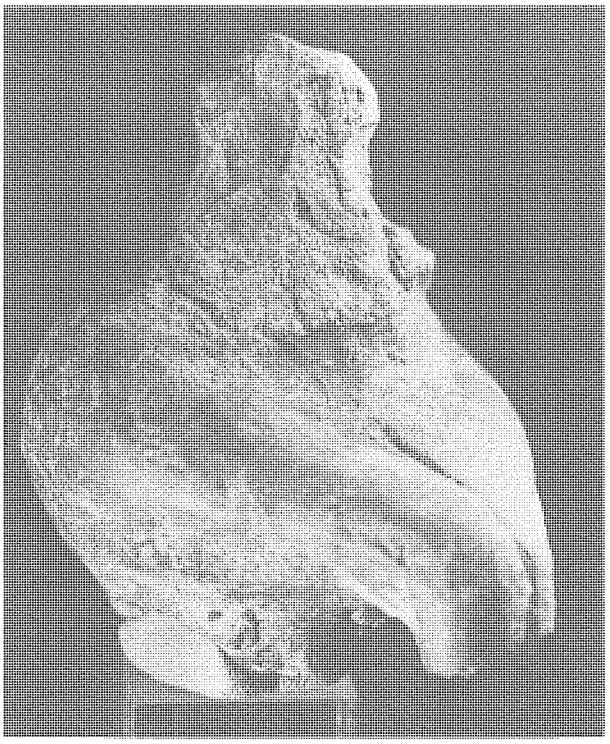

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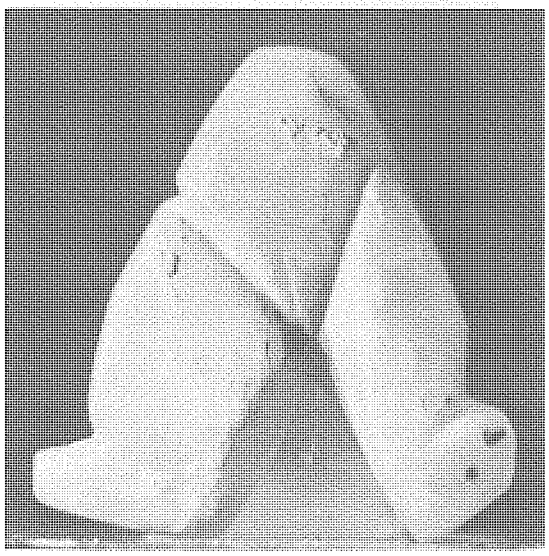

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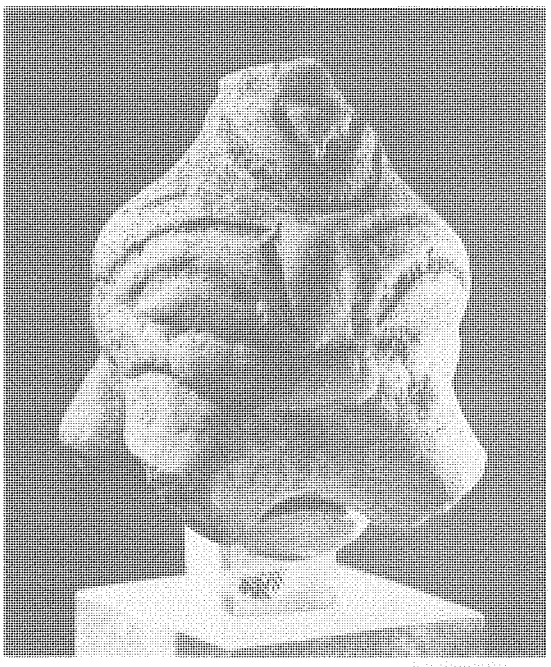
Plate LIV. (1) Bust of Bird Goddess with deep incisions above breasts; phase III, cat. 133. (2) Standing nude figurine with hip belt; typologically phase III, cat. 145. (3) Fat lady, seated on circular stool, broken at waist and below knees; phase III, cat. 161. (4) Schematized Birth-giving Goddess of polished greenstone; typologically phase III, cat. 151.



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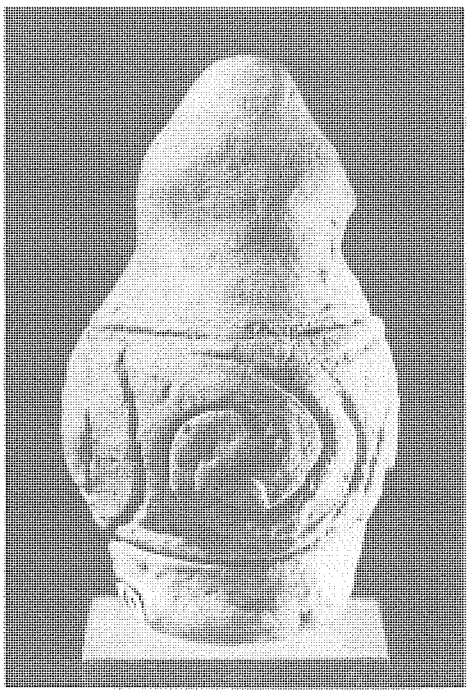

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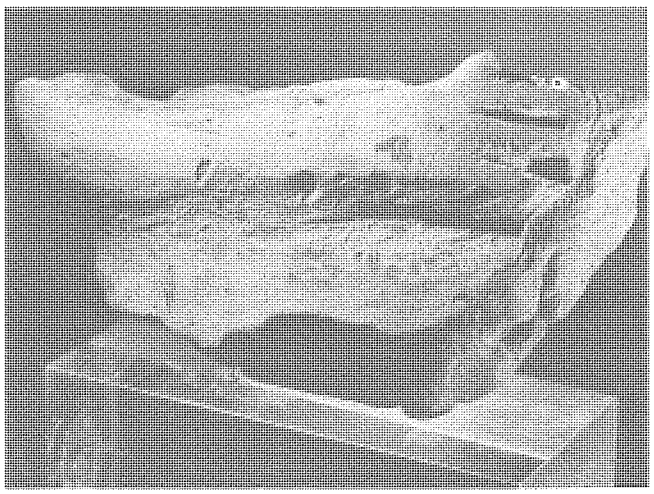

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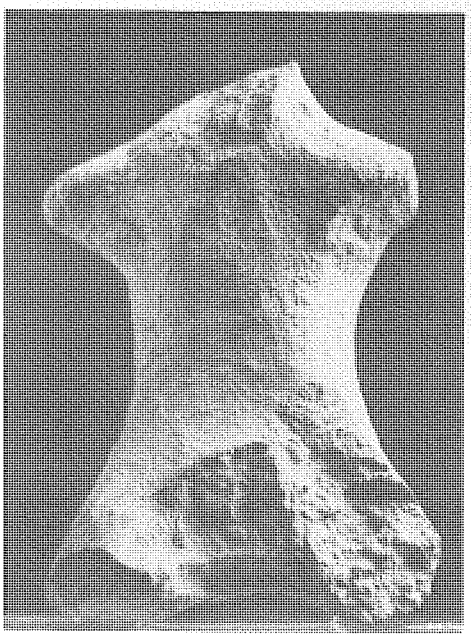
Plate LV. (1) Pregnant Throne Goddess with four sides and legs; phase II, cat. 14. (2) Schematized Pregnant Throne Goddess with incised diamond with dot on all four sides; phase II, cat. 157. (3) Schematized Pregnant Throne Goddess with incised curving snakes around belly; phase III, cat. 156. (4) Fragment of anthropomorphic hand relief on black-on-red painted vessel; phase III, cat. 170.



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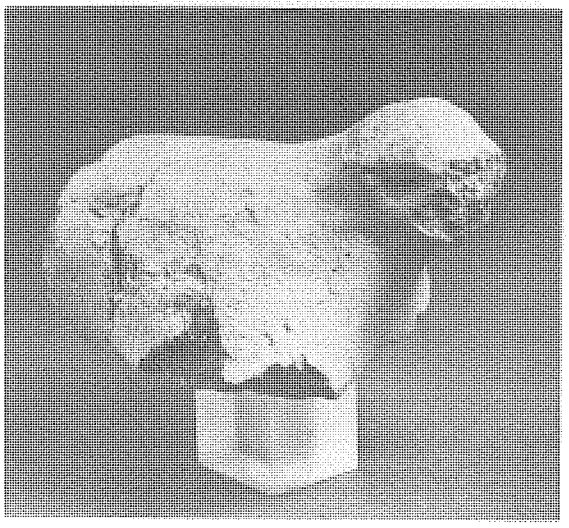

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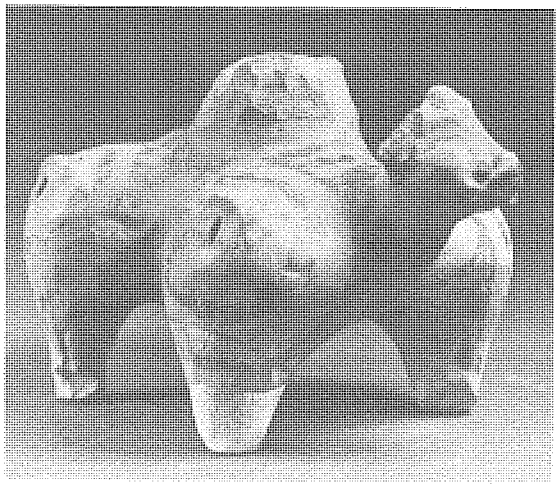

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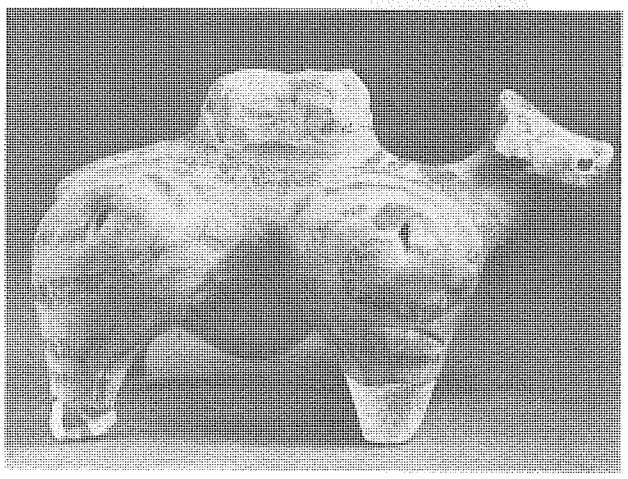
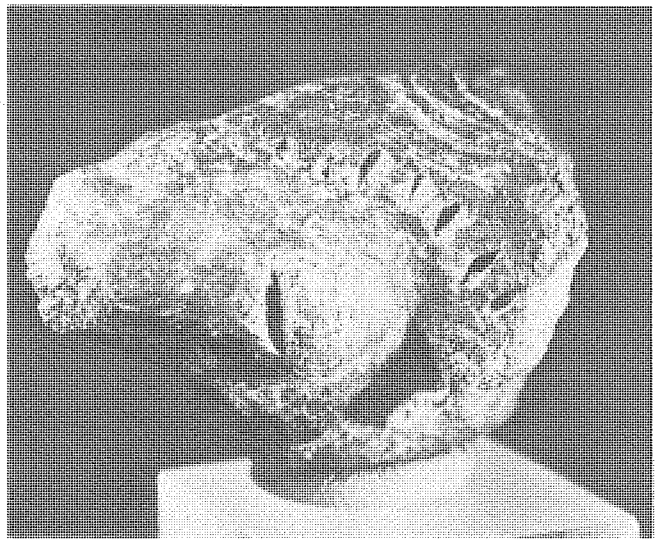


3b

Plate LVI. (1) Torso of seated figure, probably male; typologically phase III, cat. 174. (2) Front section of animal torso with part of head preserved; phase III, cat. 183. (3a, b) Black-on-orange/red painted, stylized bull as a cult vessel and/or lamp with container on back broken; phase III, cat. 190.



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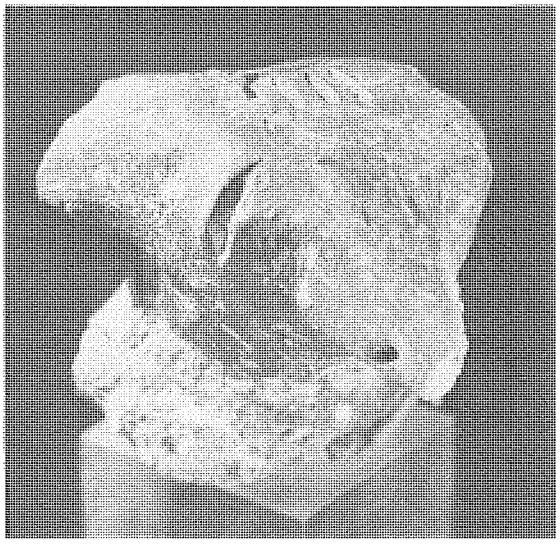

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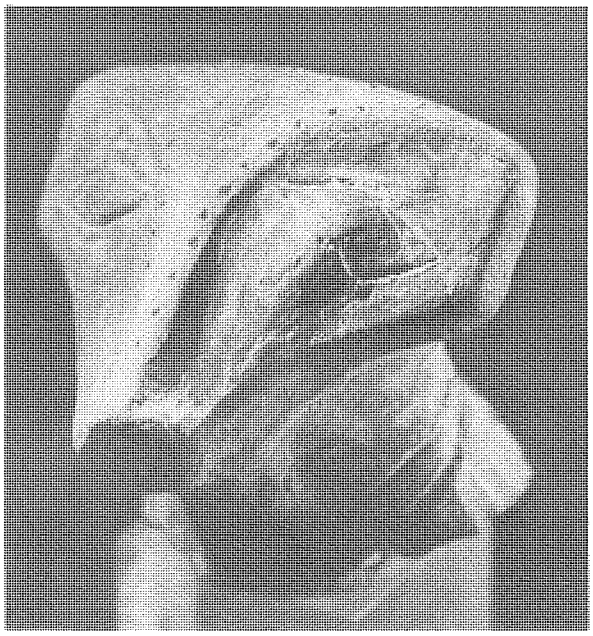

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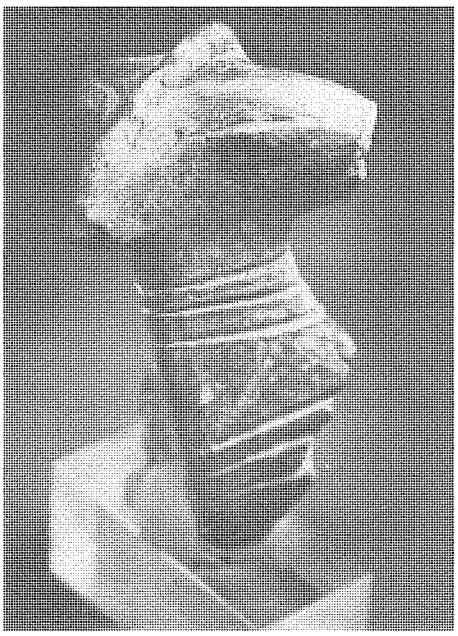
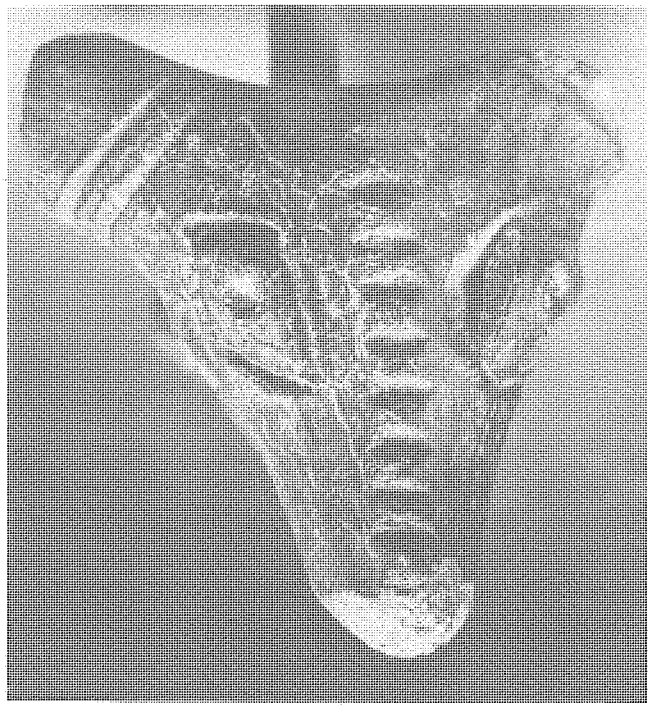


4

Plate LVII. (1) Animal head with "coffee bean" eyes, slipped and highly burnished; phase III, cat. 196. (2) Animal head, probably bull; phase III, cat. 193. (3) Bull head with large incised diamond eyes and line of dots outlining forehead; typologically phase III, cat. 192. (4) Stylized head of a ram or he-goat from large cult vessel; phase III, cat. 200.



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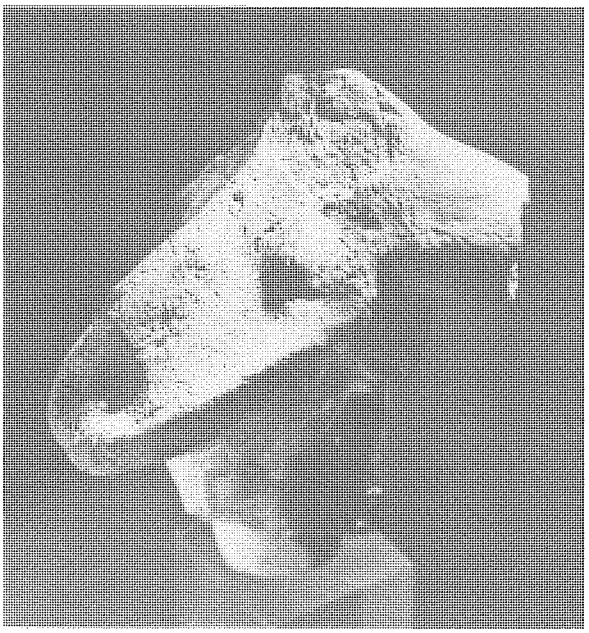

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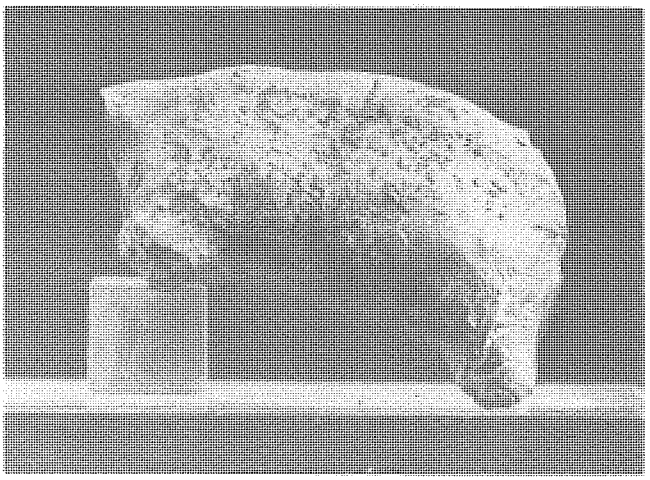

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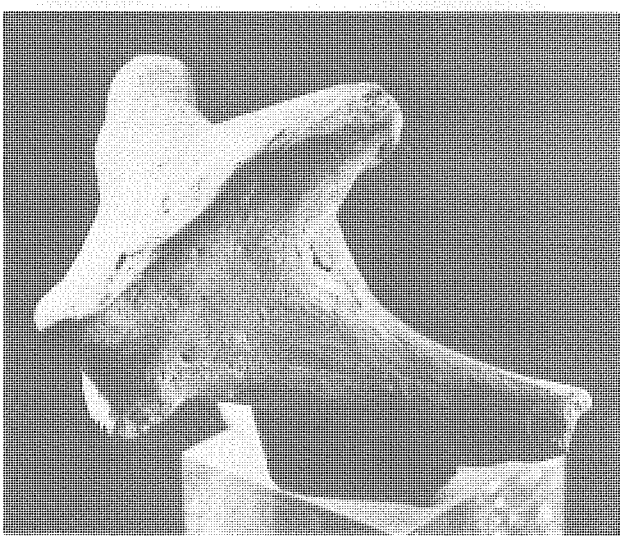
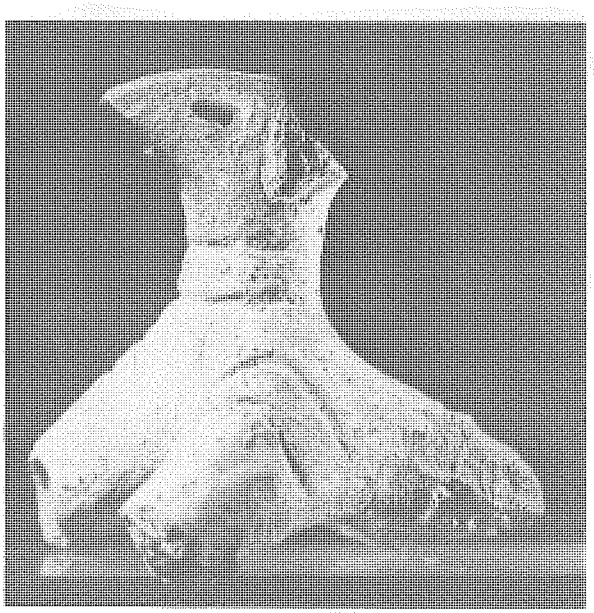


4

Plate LVIII. (1) Stylized animal head (ram or he-goat), probably a protome; phase III, cat. 201. (2) Human-animal mask with horns broken; typologically phase III, cat. 202. (3) Animal torso with head, legs, and tail broken; phase III, cat. 215. (4) Animal protome of cult vessel (barking dog); phase II, cat. 92.



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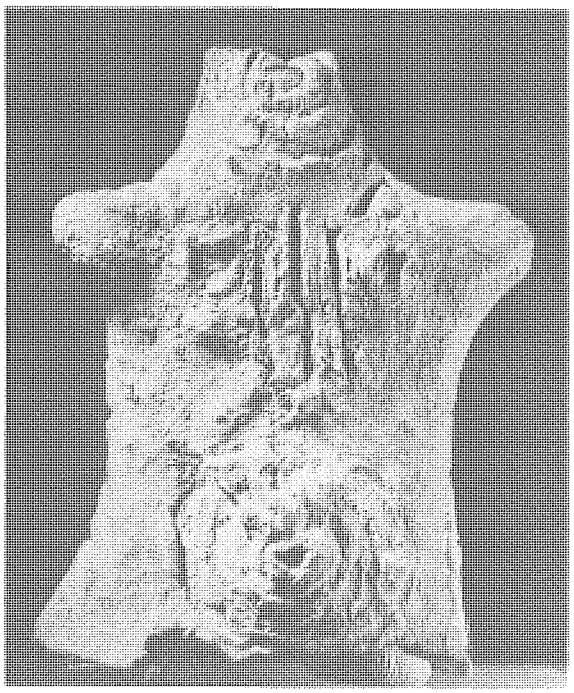

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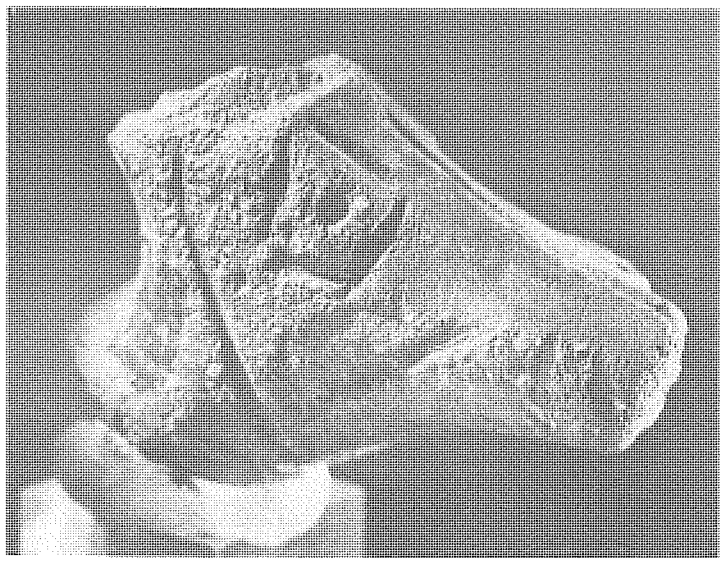

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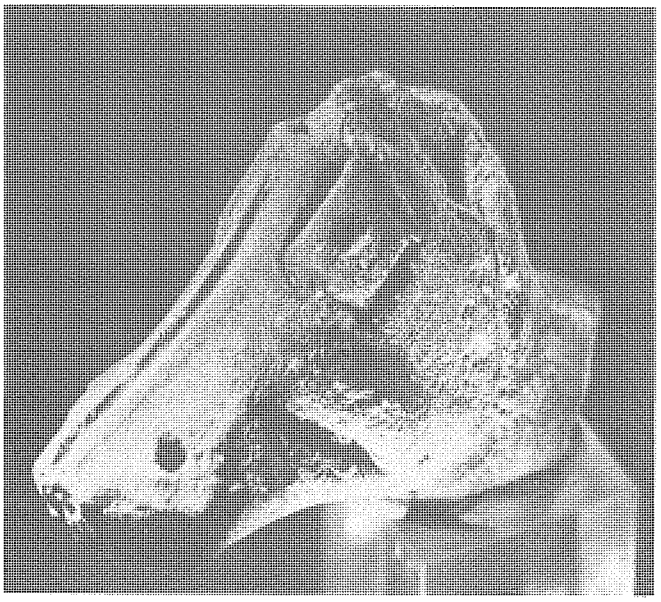
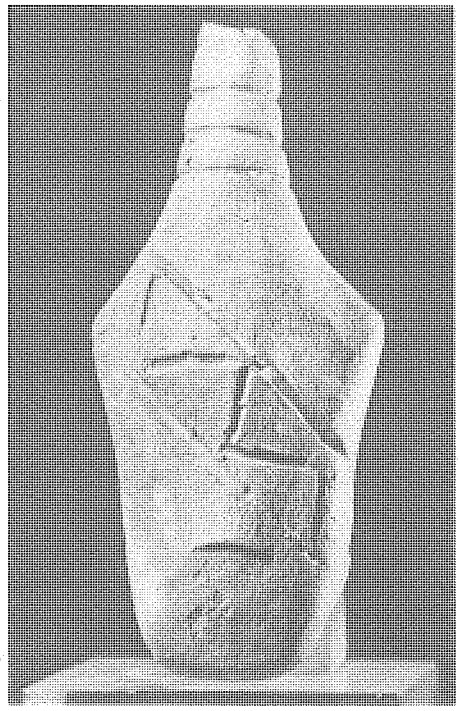


3b

Plate LIX. (1) Front half of mythical animal; phase II, cat. 88. (2) Torso of incised female figurine with frog on belly; phase III, cat. 152. (3a, b) Animal head (cattle or horse); phase III, cat. 219.



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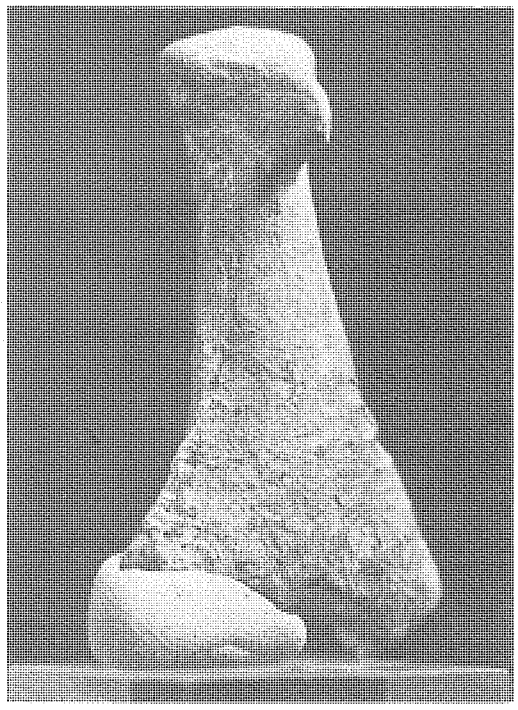

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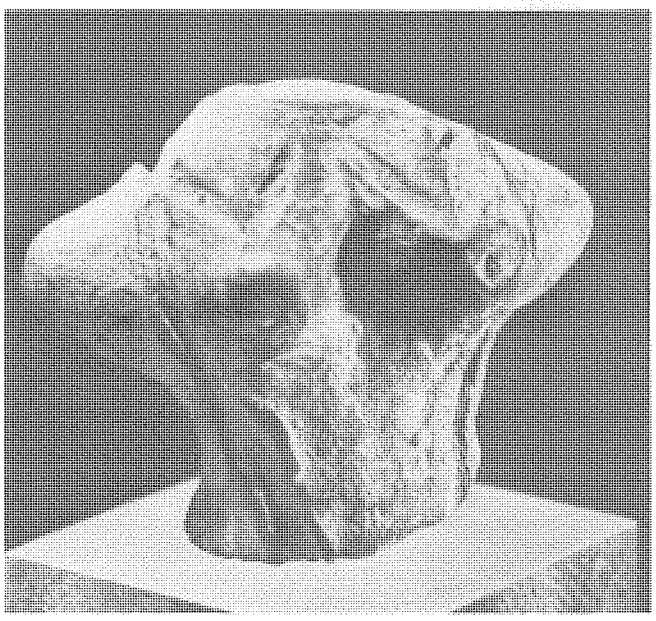

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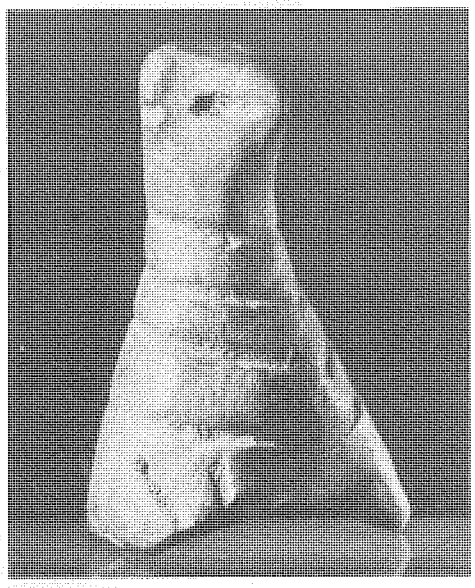
Plate LX. (1) Schematic figurine with incised chest band and three lines around neck; phase II, cat. 18. (2) Stylized, headless, heavily incised figurine with red-filled (ocher?) incisions indicating arms above hips and dress around legs; phase II, cat. 37. (3) Birdlike figurine broken off at base; phase II, cat. 80. (4) Female torso with pronounced breasts and V-signs, deep shoulder and side incisions; typologically phase III, cat. 102.



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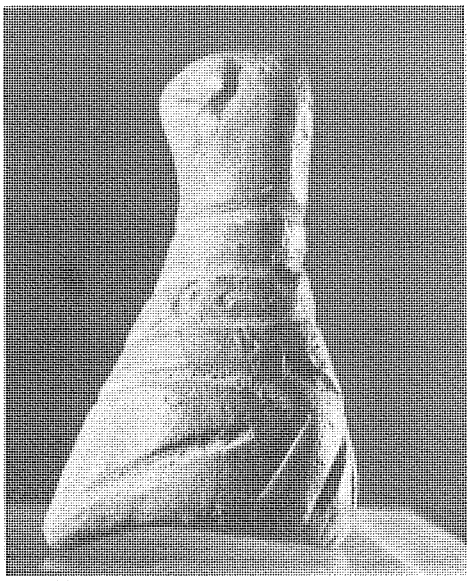

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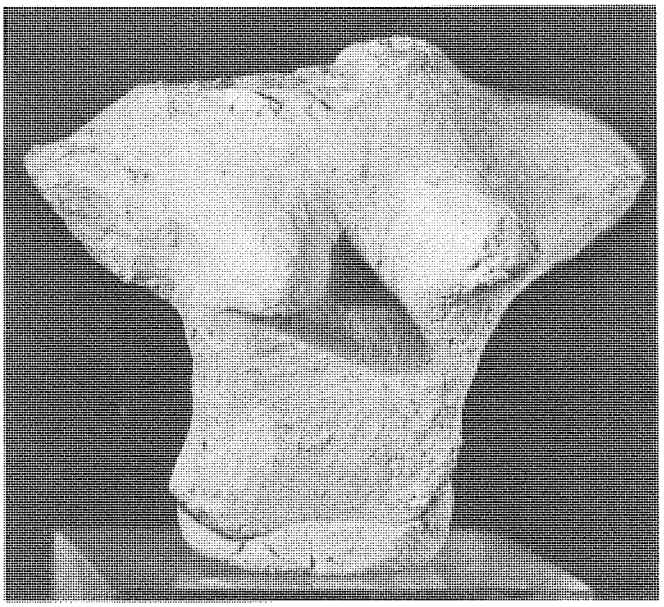

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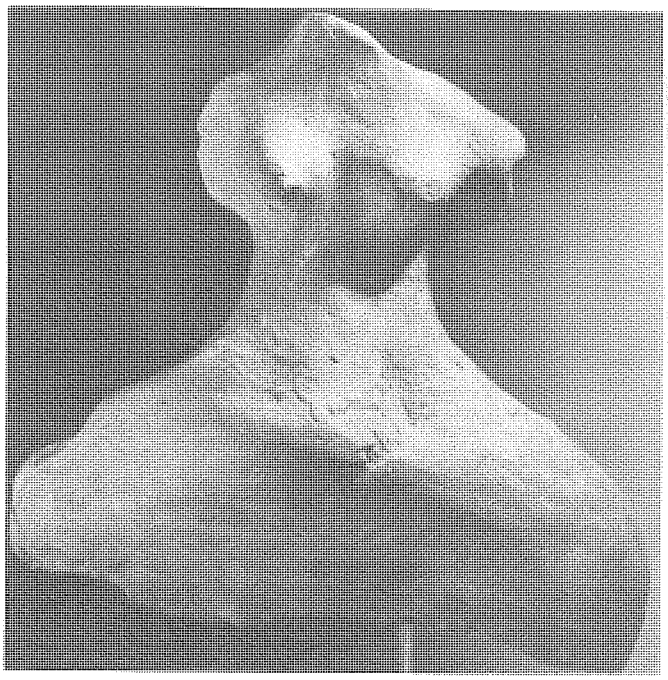
3

Plate LXI. (1a, *front*; 1b, *profile*) Miniature schematized seated Bird Goddess; typologically phase II, cat. 83. (2) Female torso with pronounced breasts; typologically phase III, cat. 142. (3) Triangular incised head with double side perforations; typologically phase III, cat. 137.



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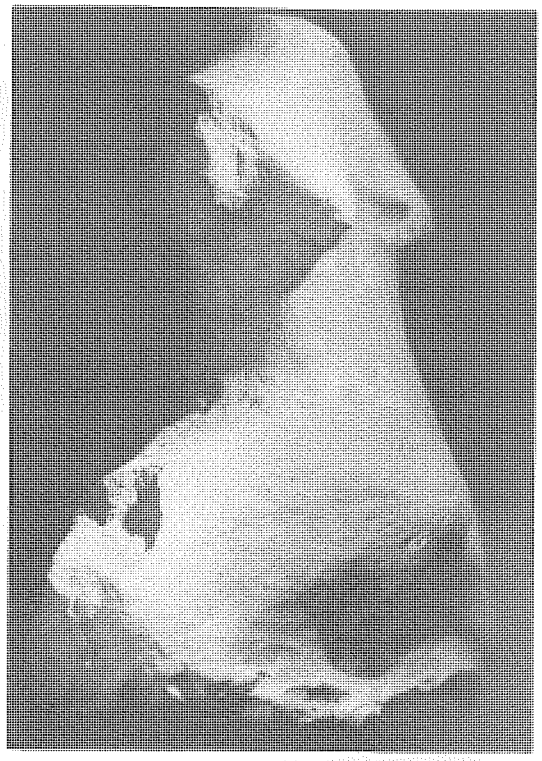

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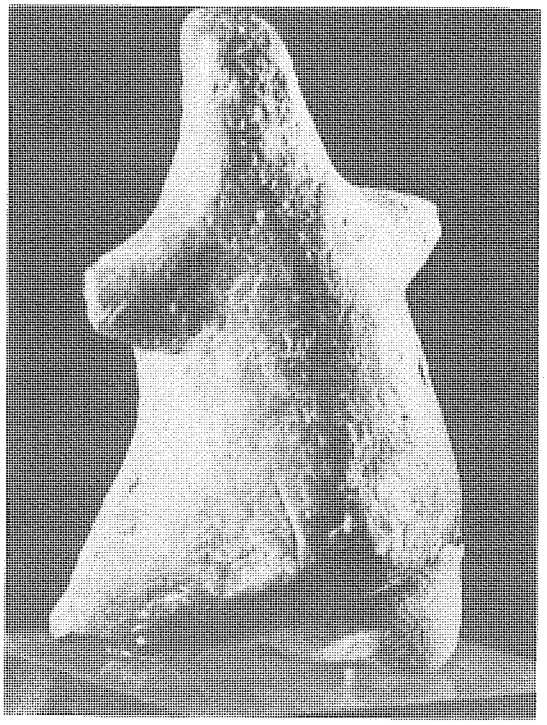

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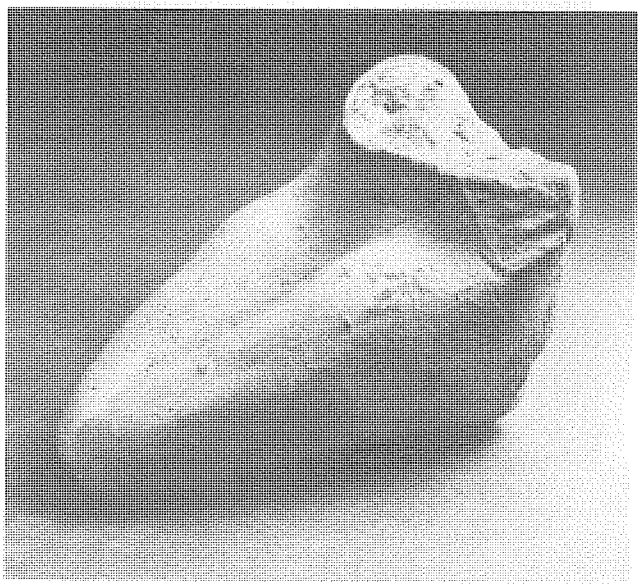

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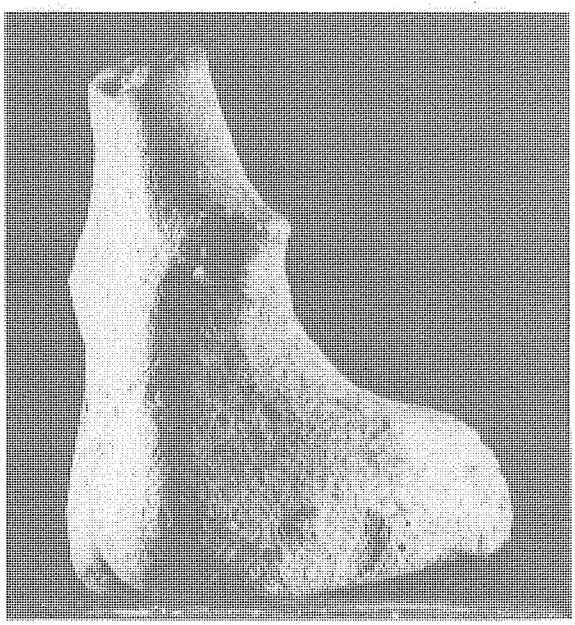
Plate LXII. (1a, b) Nude torso of squatting woman, exaggerated body below waist; phase III, cat. 149. (2) Small bird-headed seated figurine with arm stumps; phase III, cat. 173. (3) Legs of seated female figurine, broken above hips; phase III, cat. 163.



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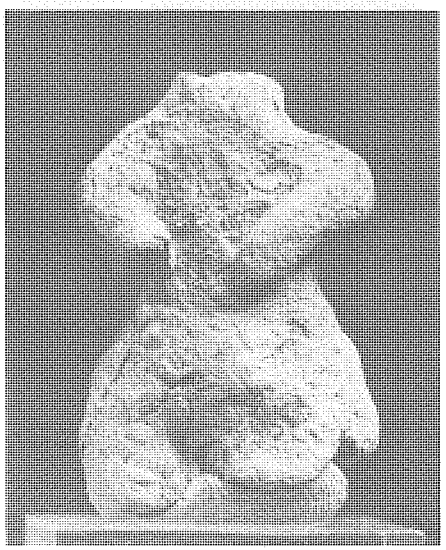

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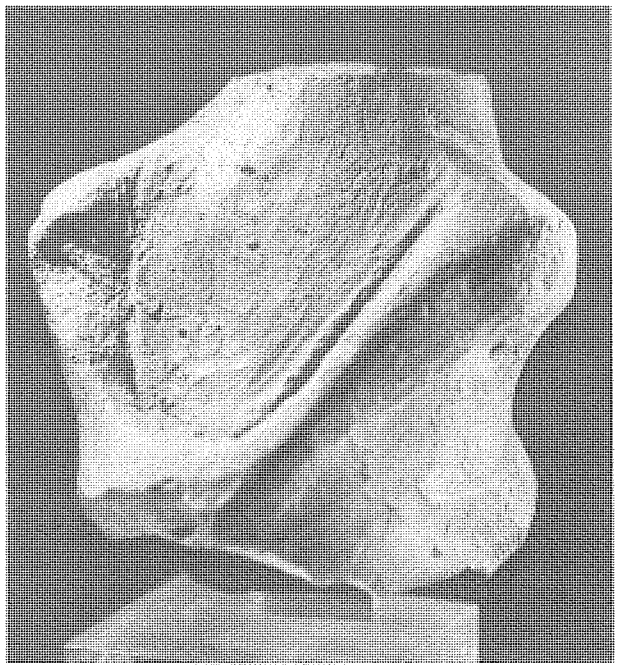

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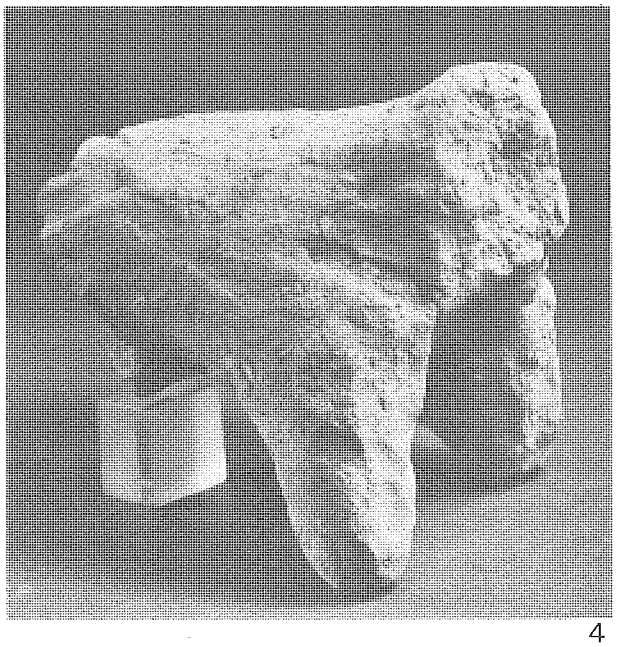
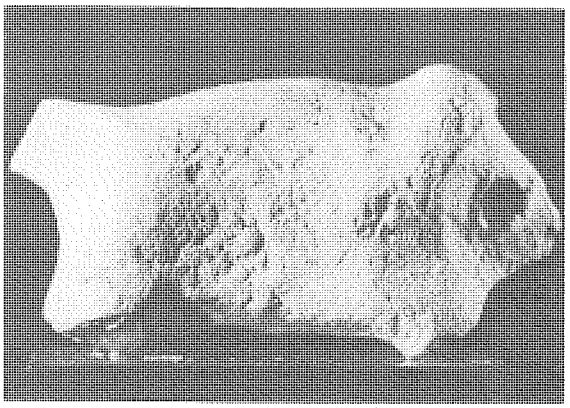


4

Plate LXIII. (1) Torso of seated female with head and legs missing; typologically phase III, cat. 158. (2) Female torso with arms modeled across chest and head and legs missing; phase III, cat. 150. (3) Anthropomorphic handle of large vessel showing upper torso with hands clasped across stomach; typologically phase III, cat. 227. (4) Part of coarse bull figure with rear quarter and head missing; phase III, cat. 179.



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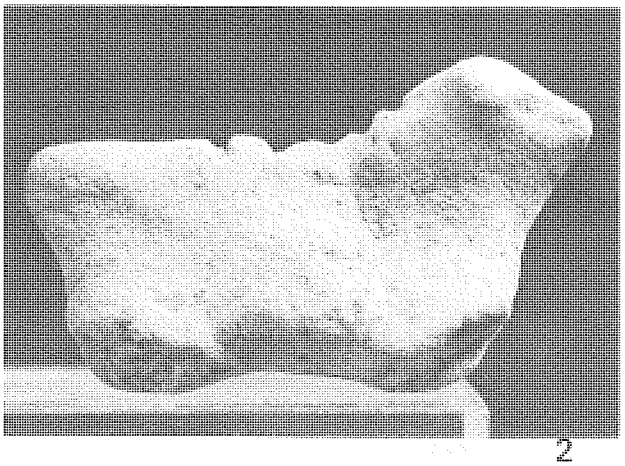

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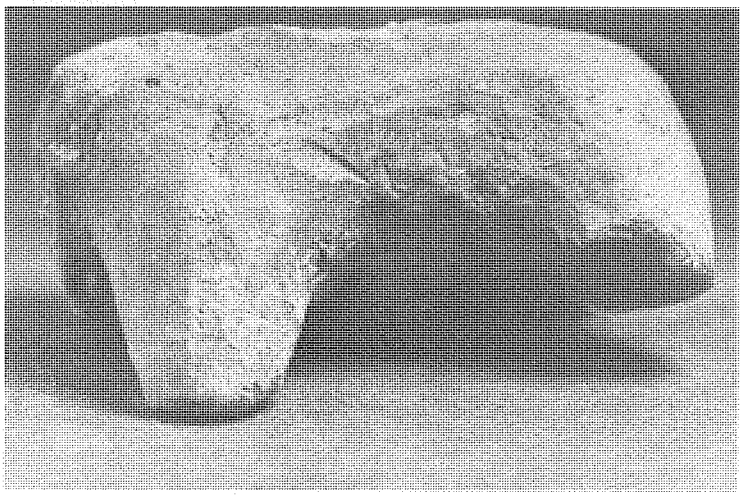

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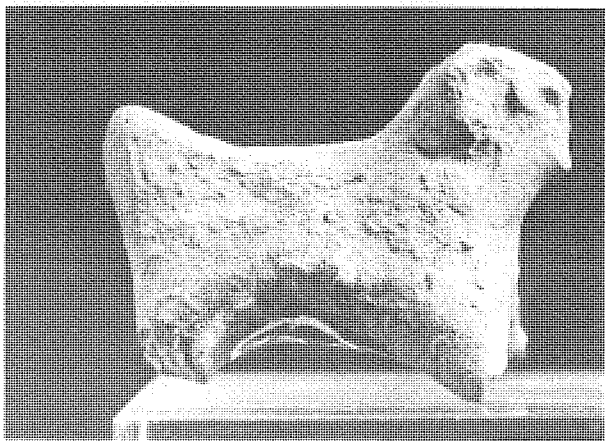
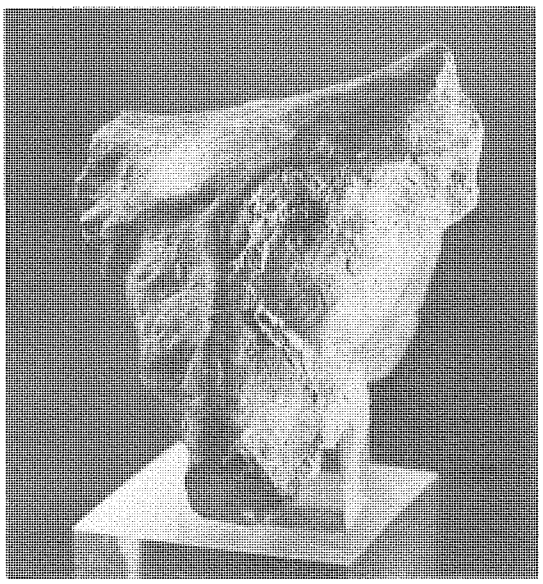


4

Plate LXIV. (1) Animal figurine with legs, tail, and ears missing; phase I, cat. 6. (2) Small animal figurine with legs missing; phase III, cat. 188. (3) Bull-shaped lamp with depression in center top and breaks at legs, neck, and tail; phase III, cat. 189. (4) Small animal figurine with part of legs and nose missing; phase III, cat. 214.

1



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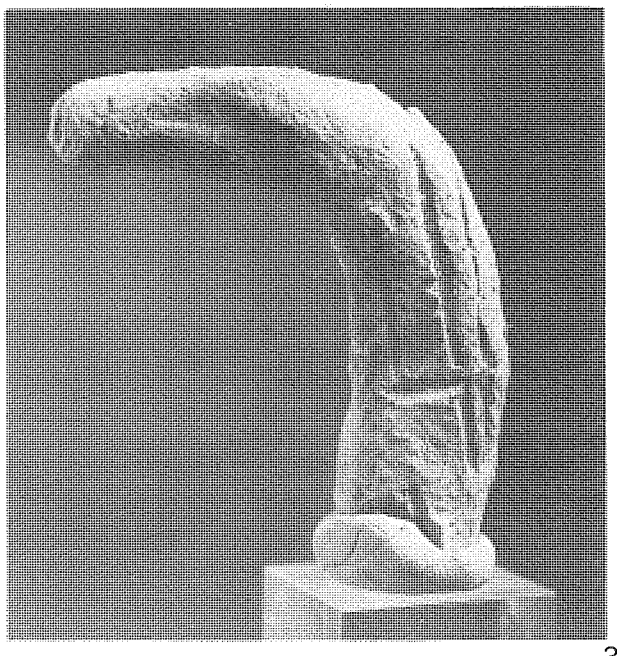

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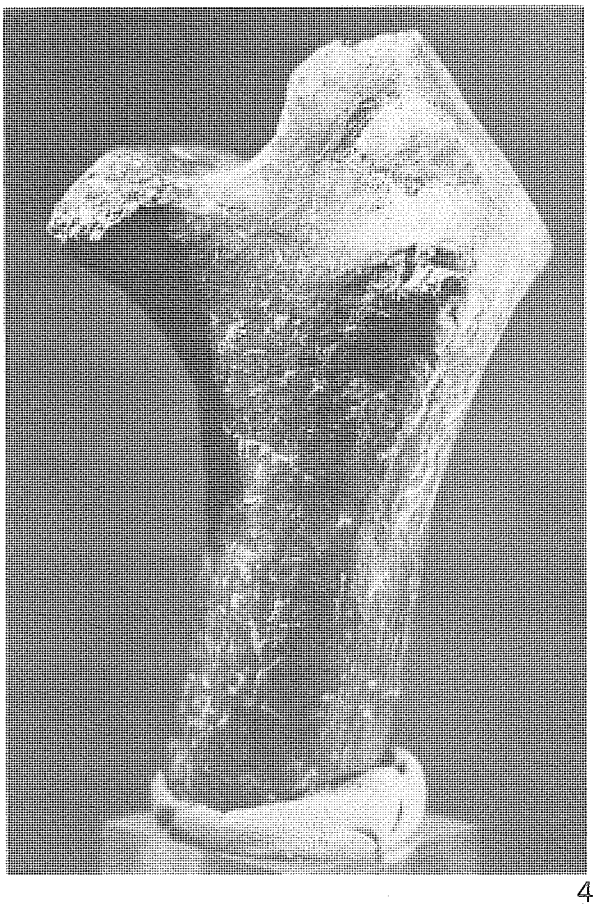


4

Plate LXV. (1) Head of bull with semiglobular eyes and nose ridge; phase III, cat. 197. (2) Head of bull with raised eyes and nose ridge; typologically phase III, cat. 194. (3) Curving cylindrical animal head with incisions; phase III, cat. 218. (4) Animal head with gaping mouth modeled on vessel handle; phase III, cat. 204.

Plate LXVI. Incised tripod profiles with angular leg. (1) Phase IV. (2, 3) Phase I.

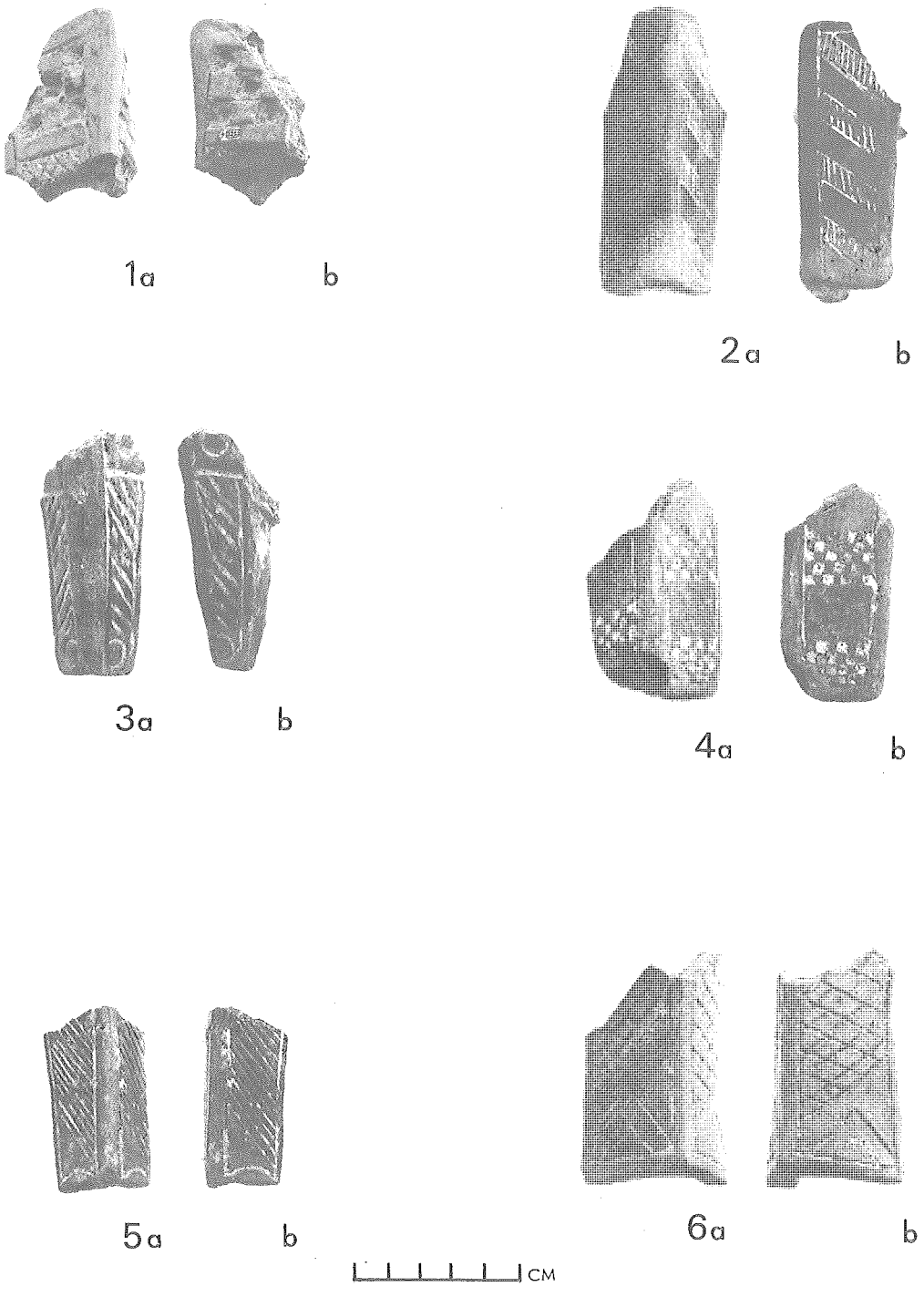


Plate LXVII. Incised tripod fragments, primarily from phases I and II. (1) Corner. (2, 3) Profiles. (4-6) Legs.

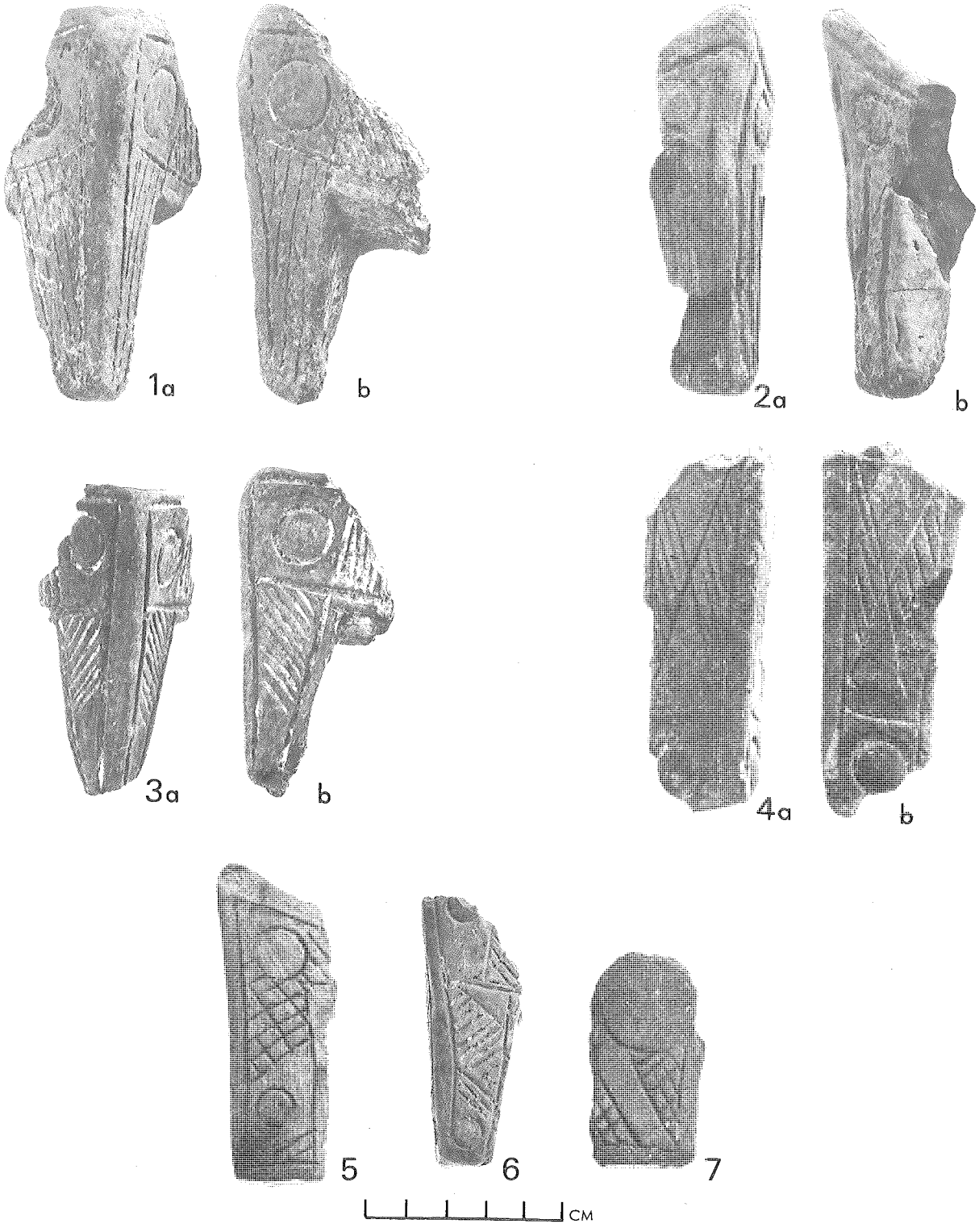
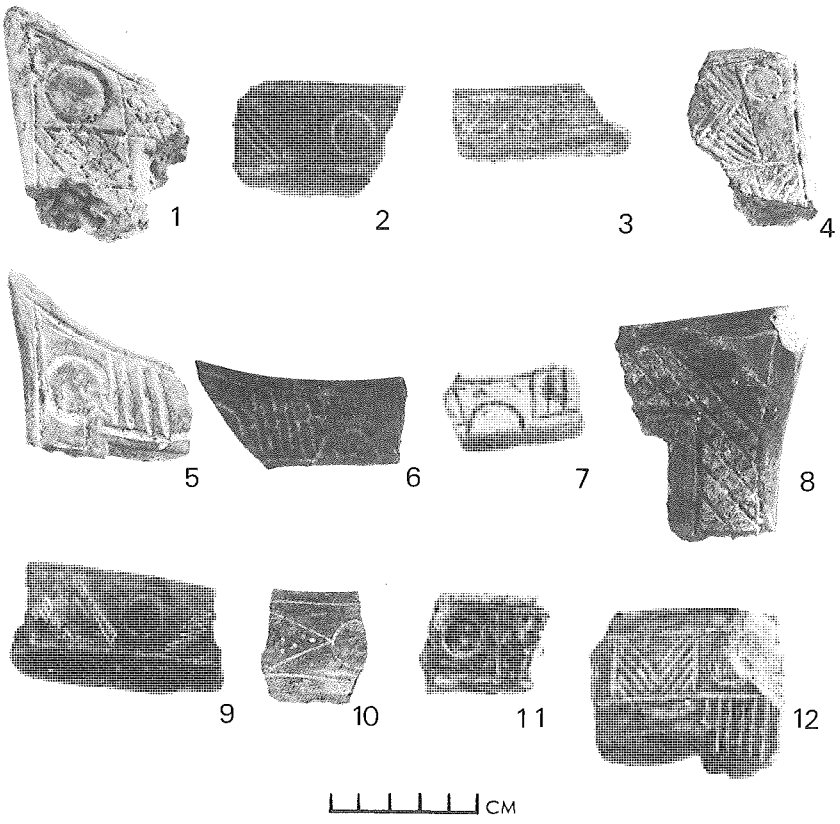


Plate LXVIII. Incised tripod corners, legs, and profiles. (1-3) Sitagroi, phase II. (4) Sitagroi, phase I. (5-7) Chorla.



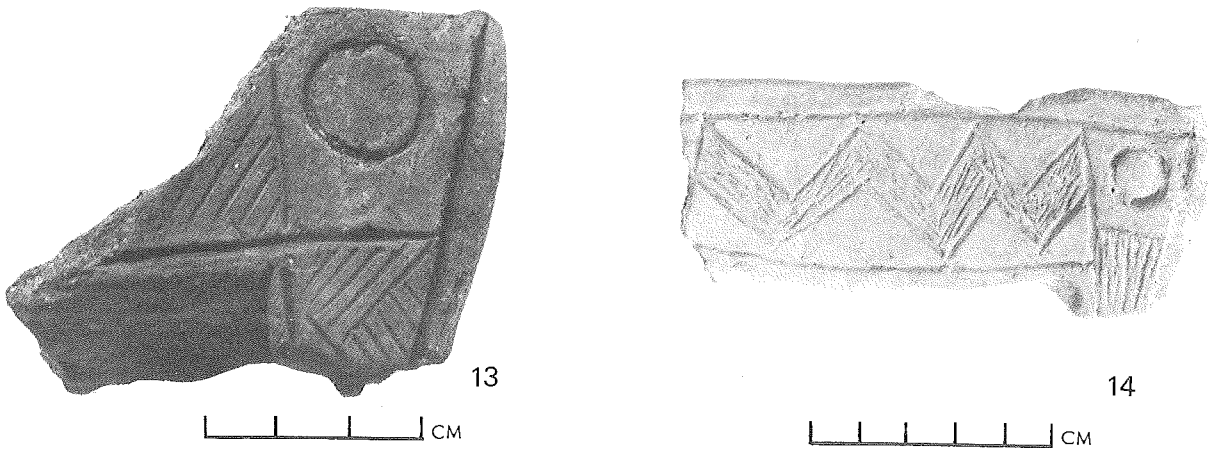
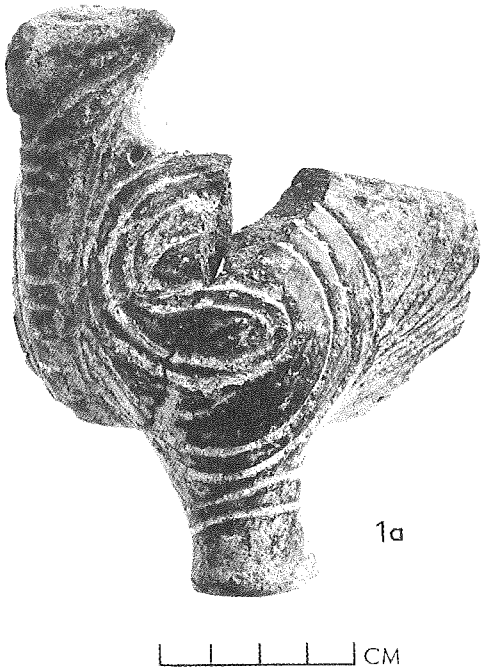
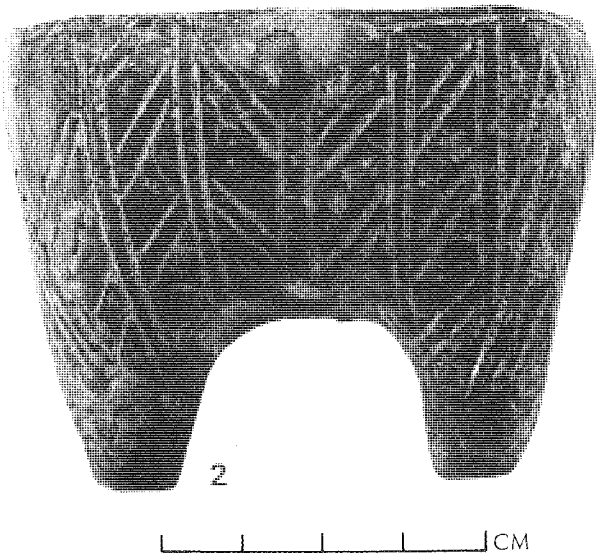


Plate LXIX. Tripod corners and side fragments. (1-4, 7, 10, 12, 13) Sitagroi, phase II. (5, 6, 8, 11) Sitagroi, phase I. (9) Sitagroi, phase IV. (14) Akropotamos.





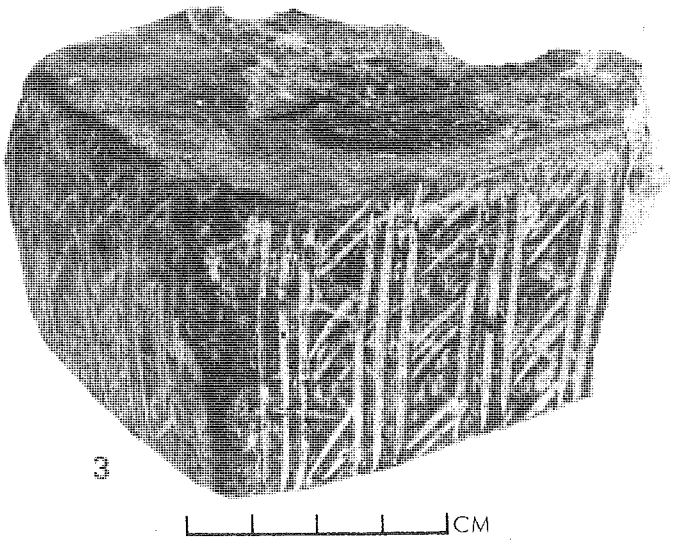


Plate LXX. (1, 2) Incised zoomorphic vessel fragments, phase III. (3) Stand profile, phase III.

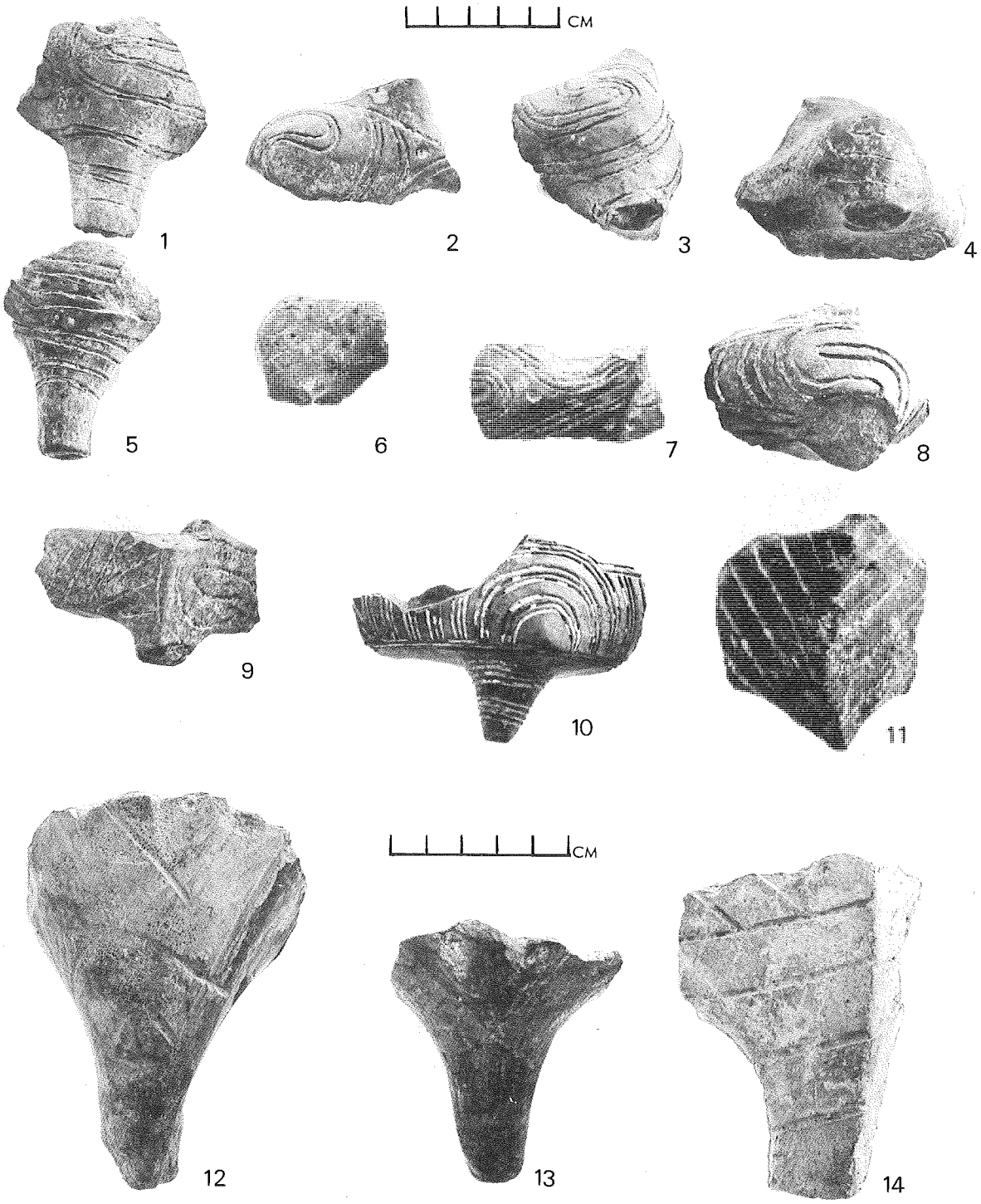


Plate LXXI. Plastic vessel fragments, typologically phase III. (1-9, 11) With incisions and zoomorphic features. (10) Incised profile from open vessel. (12, 14) Large, incised vessel legs. (13) Leg-body with painted triangle.

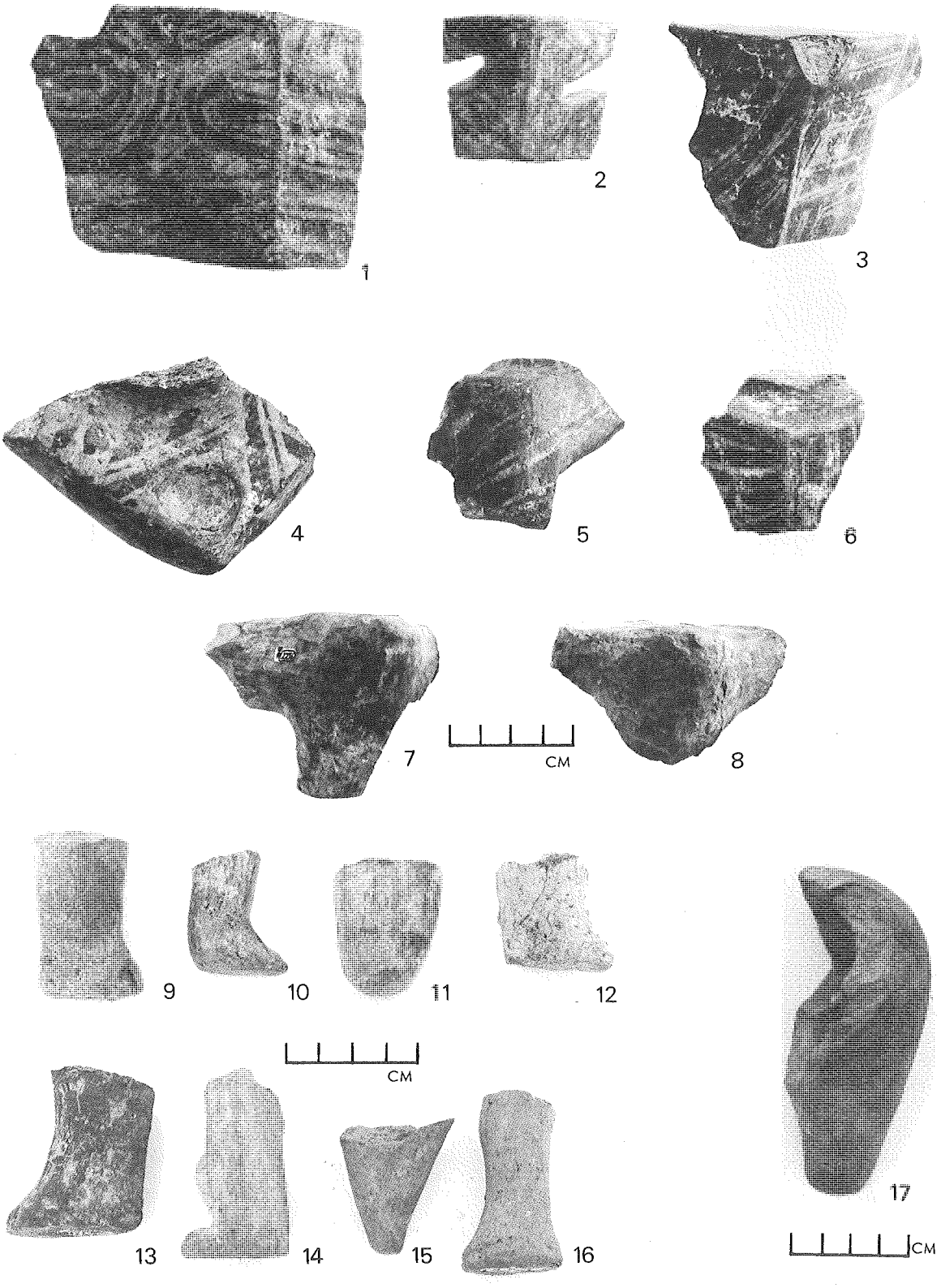


Plate LXXII. Phase III stand fragments: (1, 3) Taborets with graphite decoration; (2) taboret with ocher; (4-6) offering stands with graphite decoration; (7, 8) burnished trivets. Leg and foot fragments: (9) Phase II foot; (10-17) Phase III.

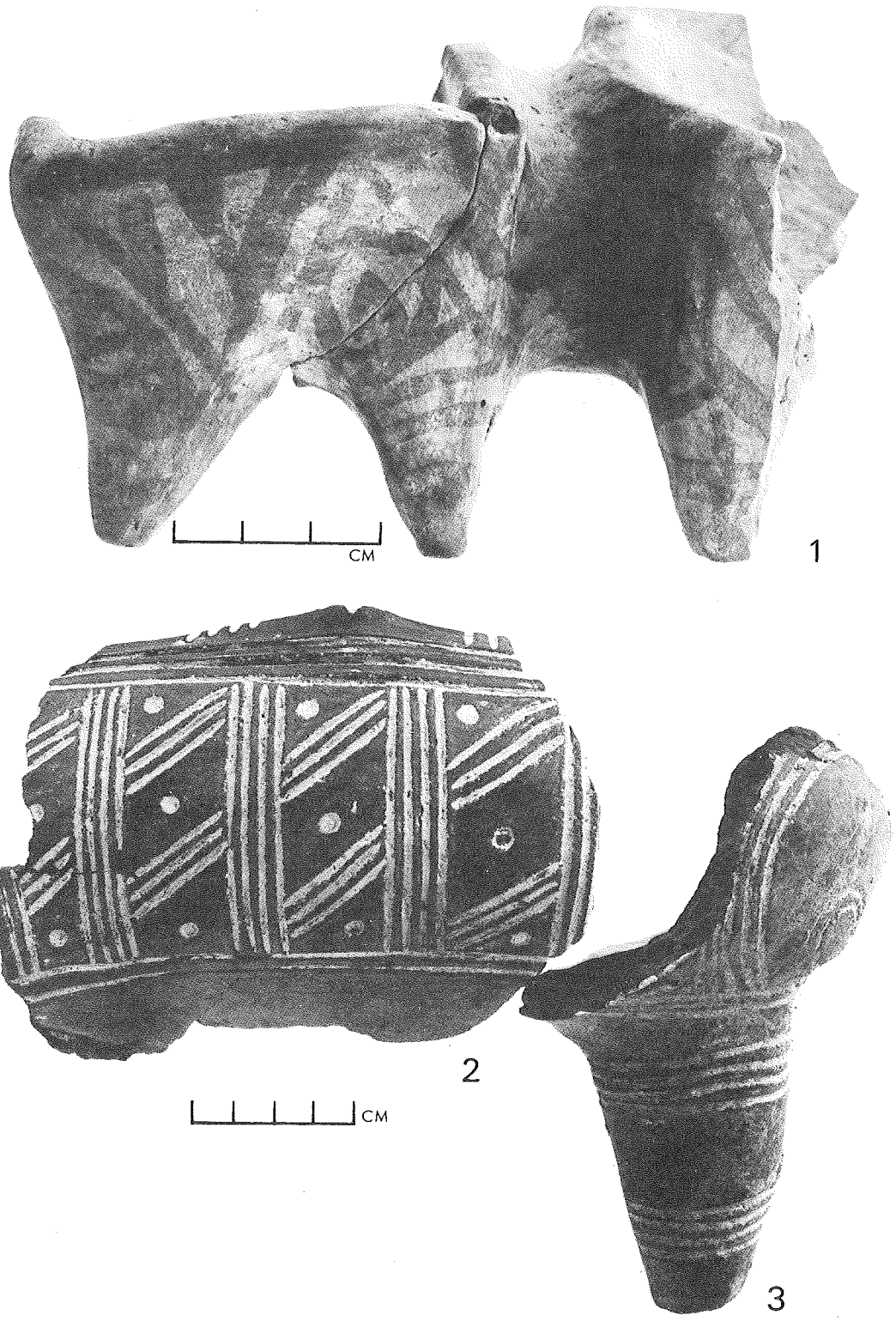


Plate LXXIII. (1) Phase III open double bowl profile, Black-on-Red painted. (2, 3) Red-orange burnished leg and body fragments, deeply incised with white infill, phase III.

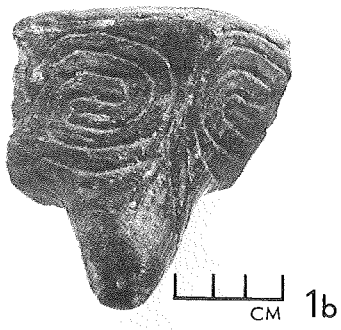
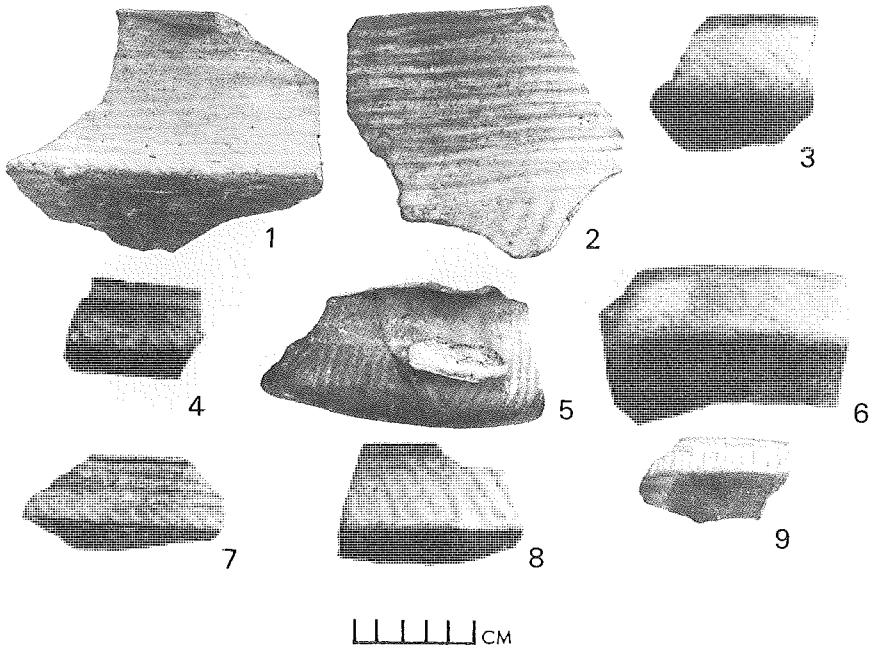


Plate LXXIV. (1a, b) Phase III open vessel profile with deep incisions. (2) Phase II animal handle, tan burnished with red paint at rim. (3) Phase III anthropomorphic foot fragment with angled lines and pinching. (4) Phase III pyramidal offering stand, Graphite-painted.



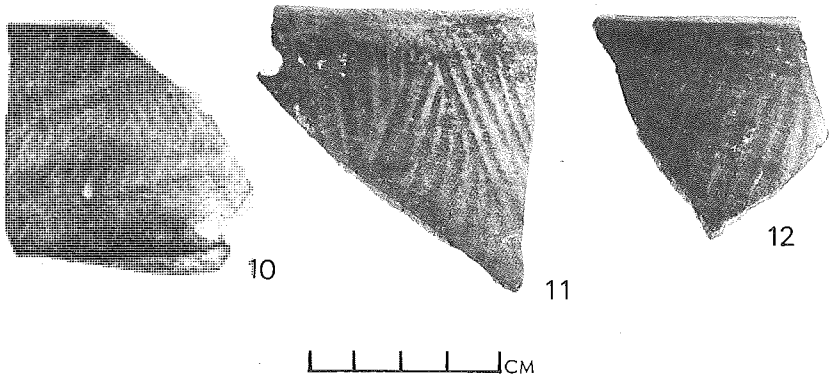
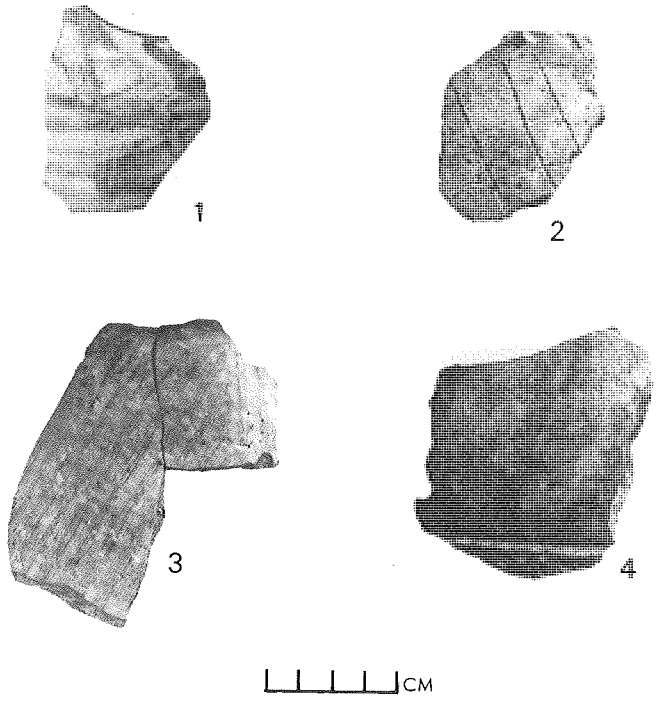


Plate LXXV. Gray Lustre Channeled, phase I (2, 4, 9) and phase II (1, 3). Rippled ware, phase II (10-12).



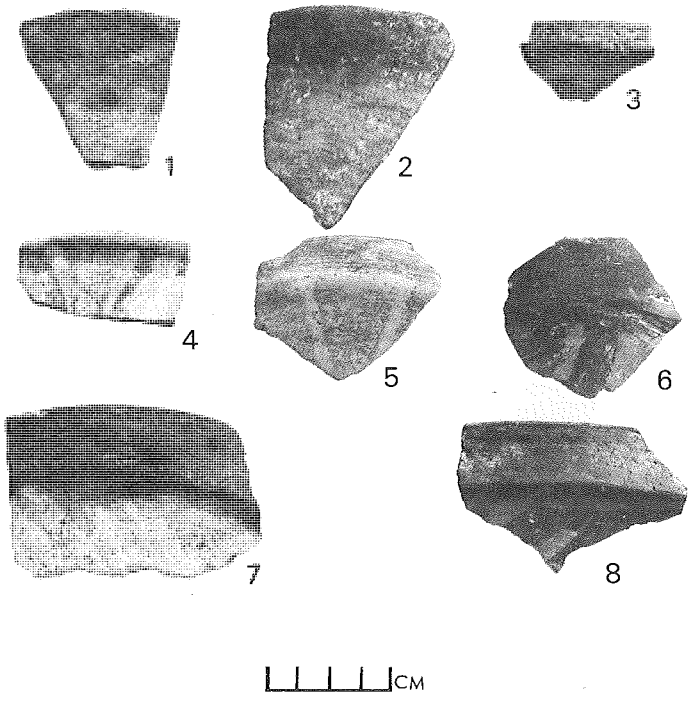
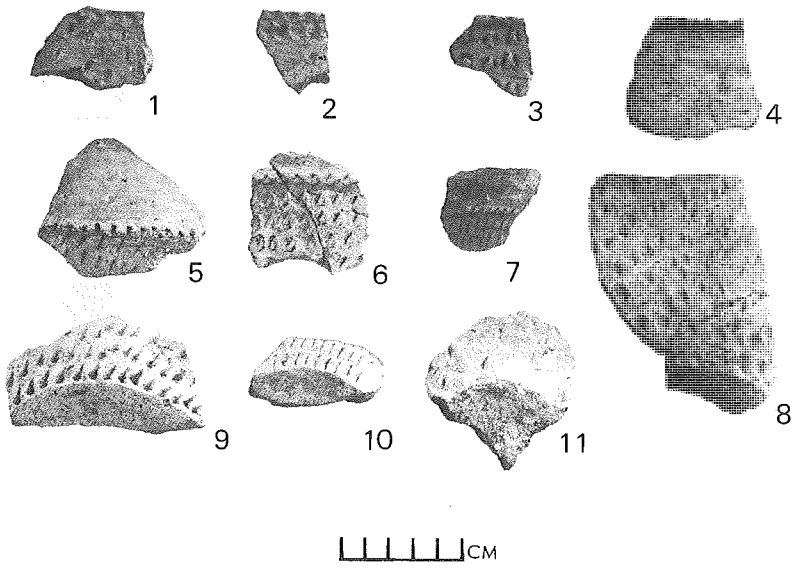


Plate LXXVI. Top: Phase I, Smeared (1), Incised (2), and Pale Burnished/Rippled (3). Phase II, Incised (4). *Bottom*: Black Topped, phase I (3), phase II (2), and mixed (1). Black Topped with painted decoration, phase II (4, 8) and mixed (6). Black Topped with differential burnishing, phase II (5, 7).



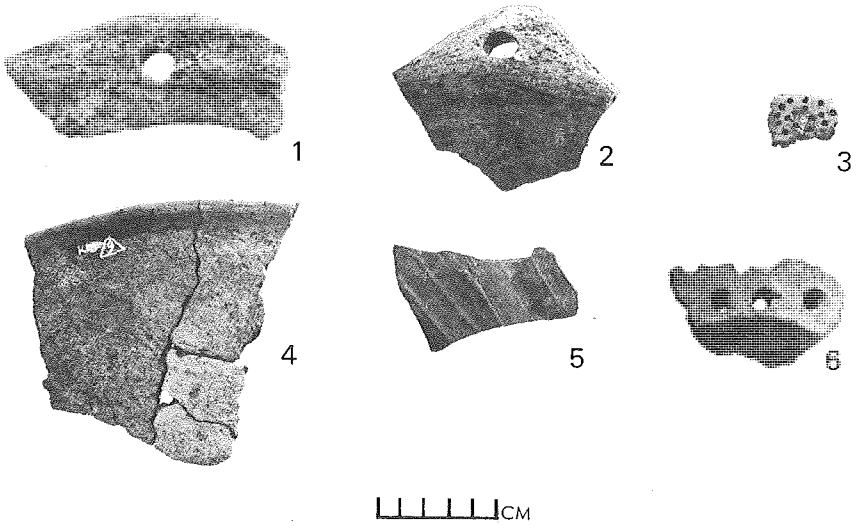
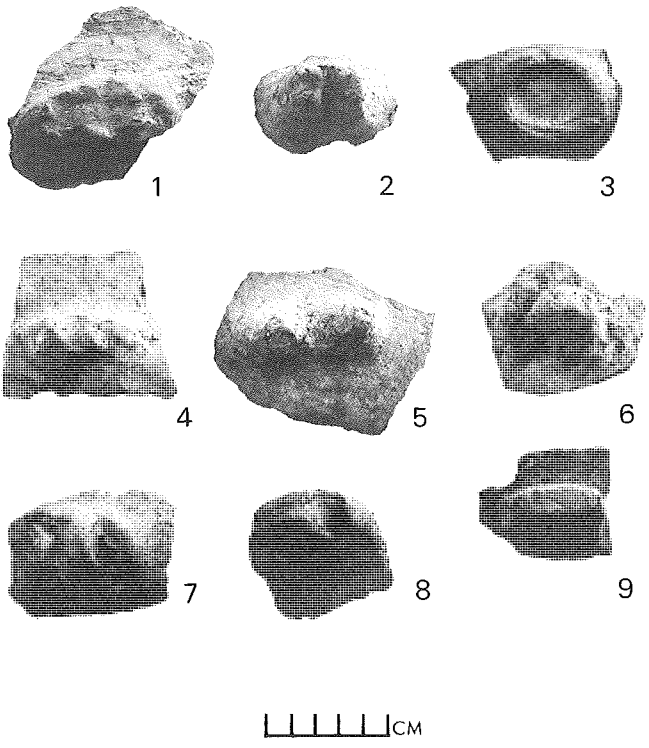


Plate LXXVII. Top: Rusticated ware, phase I (1-9, 11) and phase II (10). *Bottom*: Phase I, Rural (1, 2), Coarse (3, 6) and Rusticated/Barbotine (5). Phase II, Rural (4).



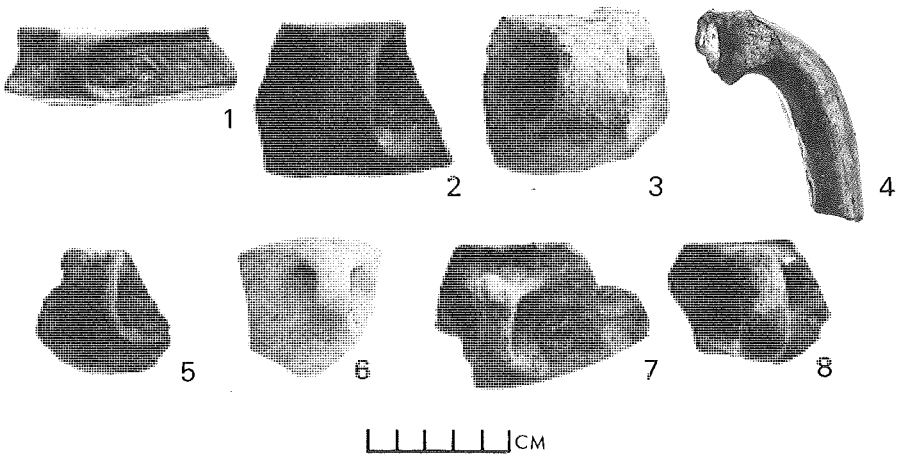


Plate LXXVIII. Top: Phase I lugs and ledges, Smooth (1, 3, 4, 8) and Coarse (2, 5-7, 9). *Bottom*: Handles. Phase I, Dark Burnished (5, 8), Coarse (3), Gray Lustre (4), and Pale Burnished (6). Phase II, Dark Burnished (1, 2). Surface, Dark Burnished (7).

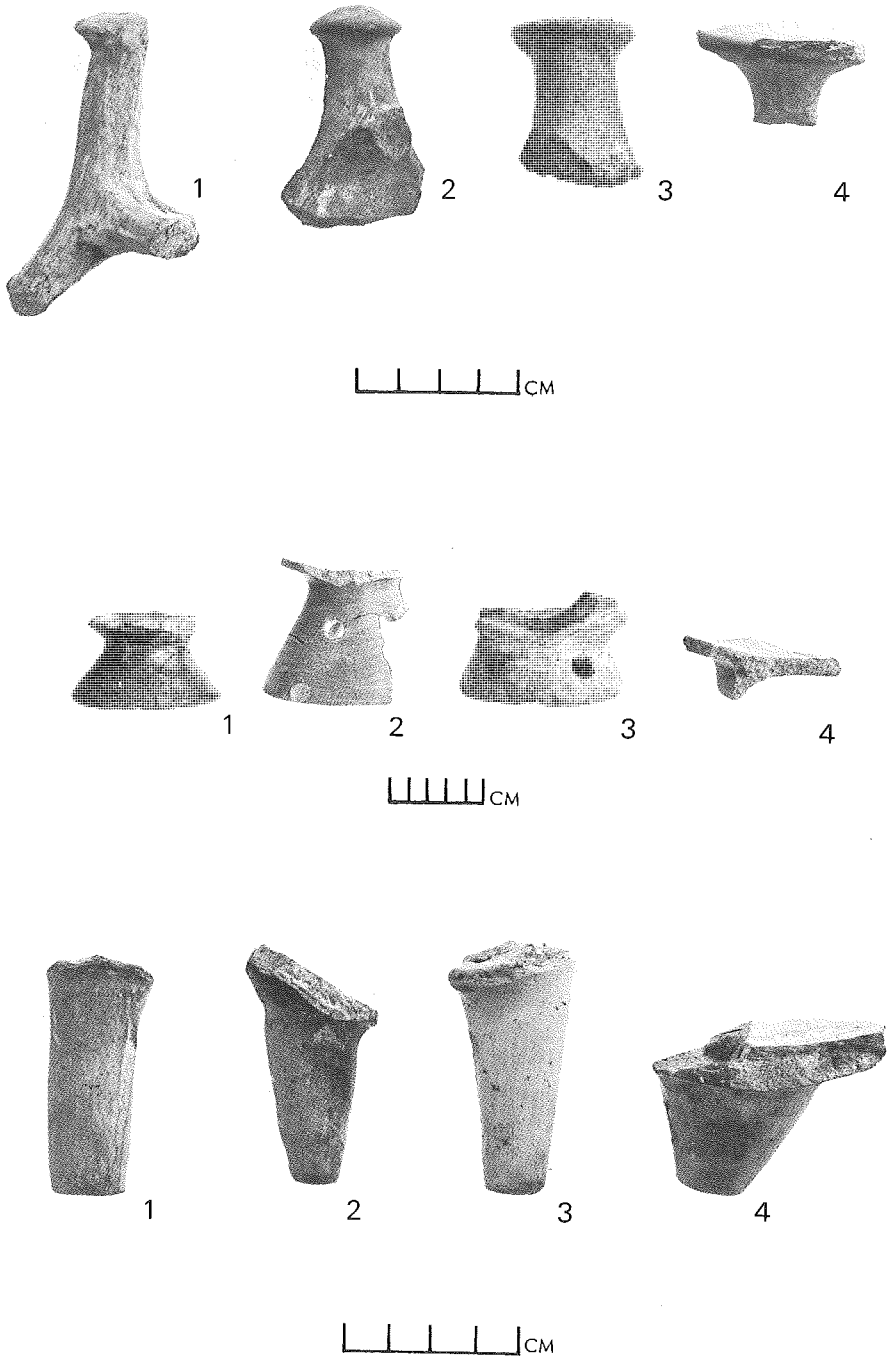


Plate LXXIX. Top: Phase I prong and knob handles, Dark Burnished (1, 3) and Gray Lustre (2, 4). *Middle*: Pedestal bases. Phase I, Gray Lustre (1) and Pale Burnished (4). Phase II, red burnished (2) and Pale Burnished (3). *Bottom*: Phase I legs, Gray Lustre (1, 2, 4) and Pale Burnished (3).

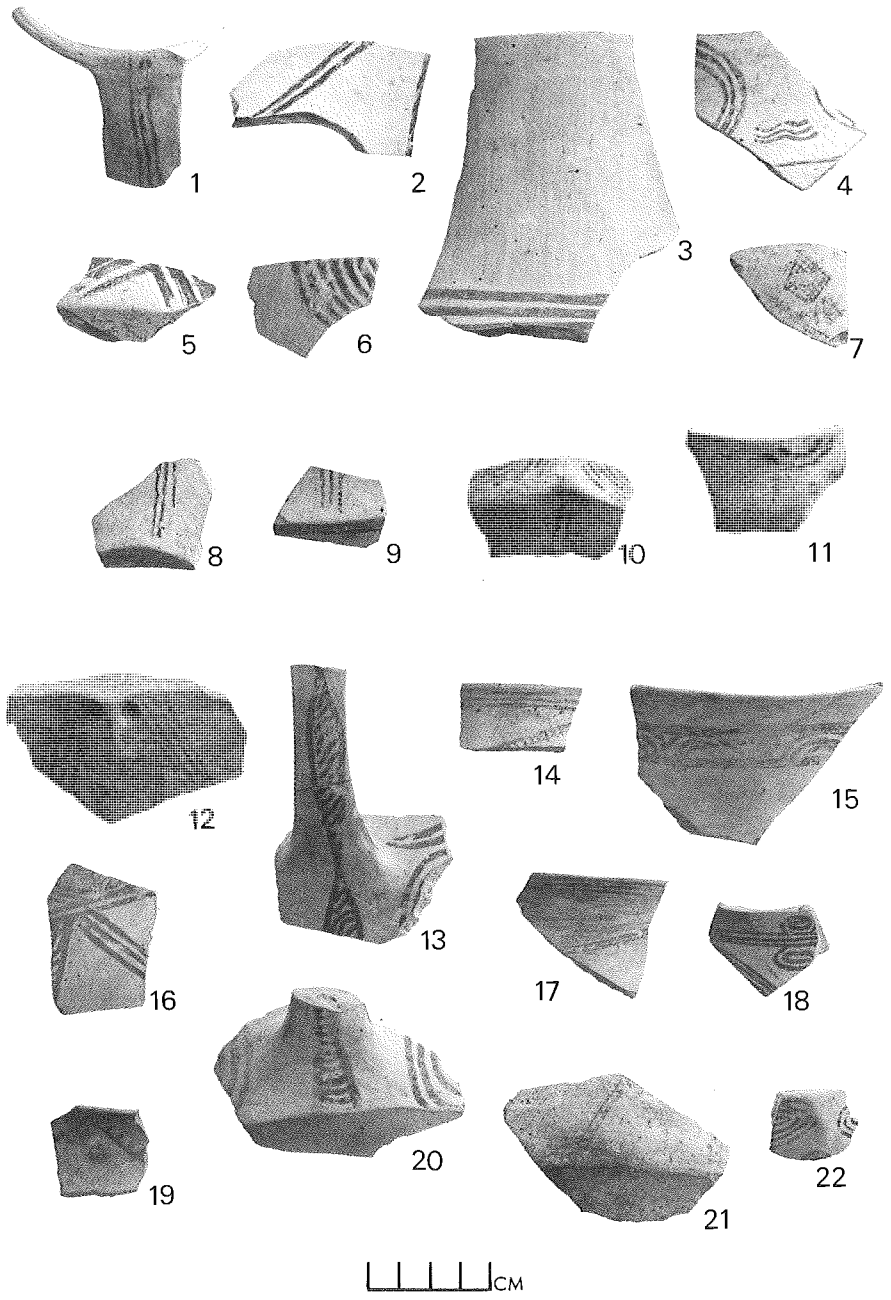
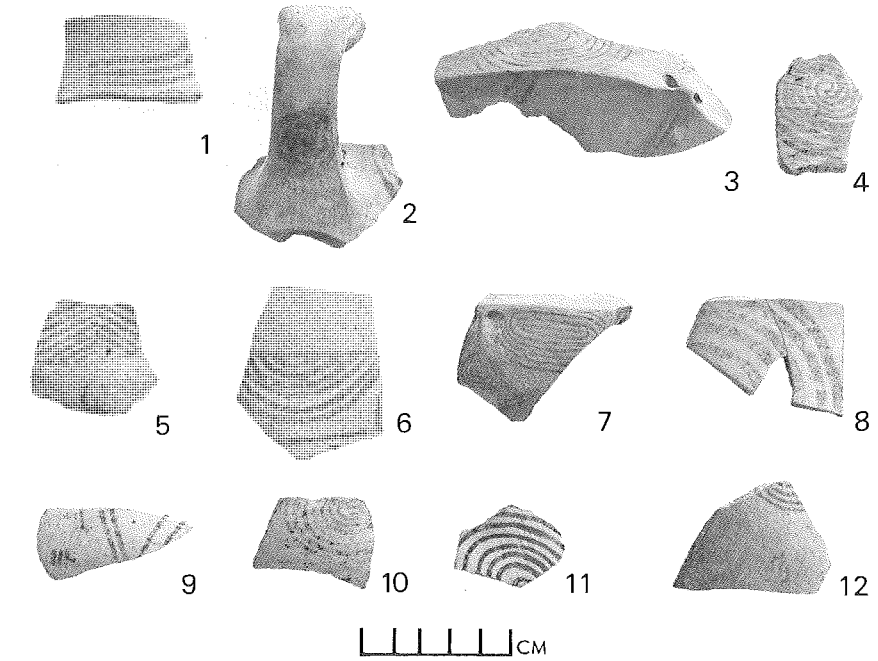


Plate LXXX. Brown-on-Cream, phase II.



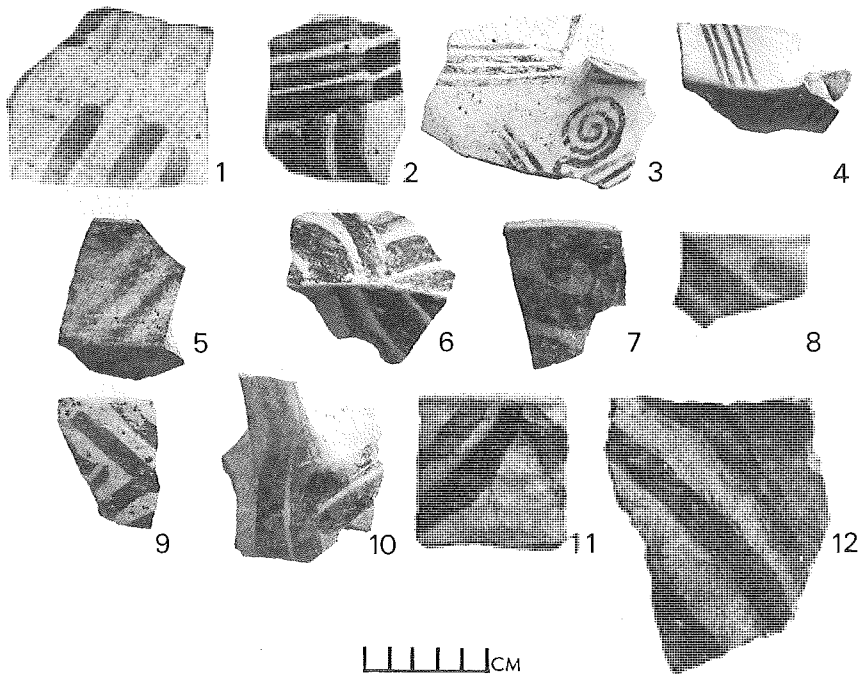
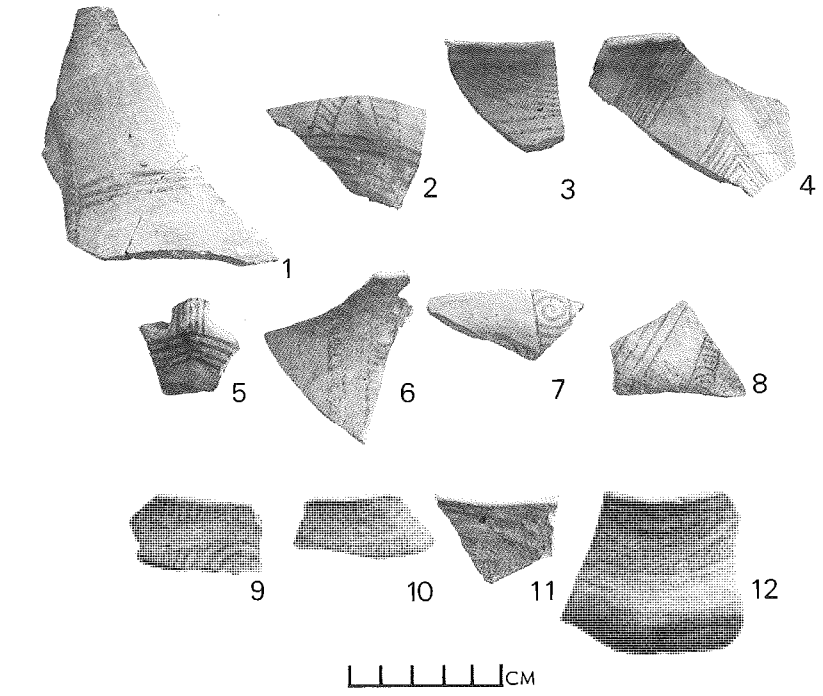


Plate LXXXI. Top: Brown-on-Cream, phase II (1, 5-7, 9, 12), phase III (4), and mixed (2, 3, 8, 10, 11). *Bottom*: Matte Brown-on-White, phase II (1-4). Brown-on-Buff, phase II (8, 11, 12) and mixed (5-7, 9, 10).



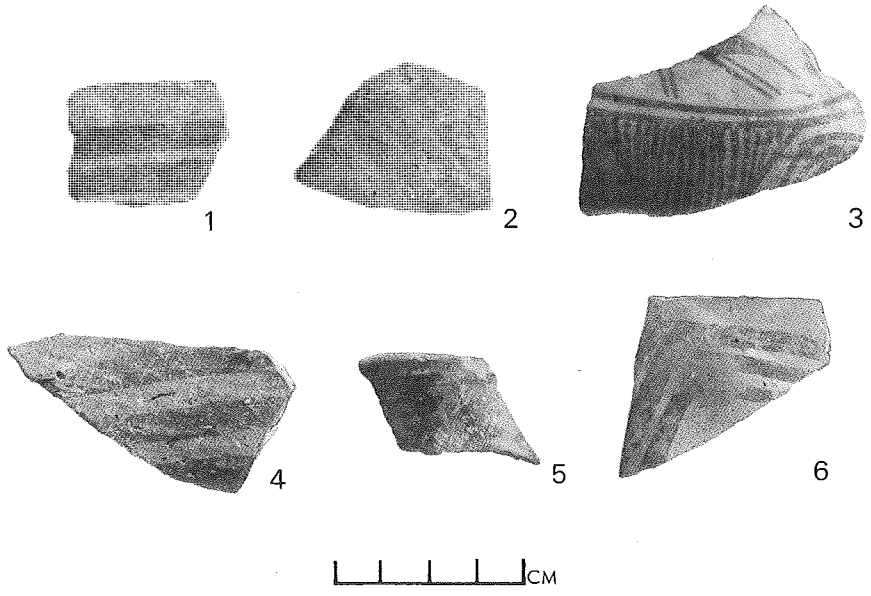
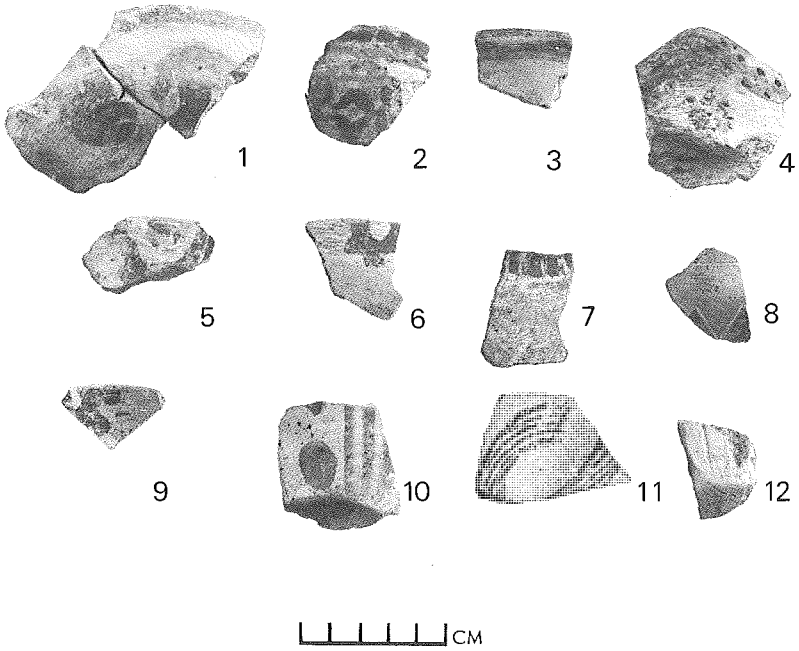


Plate LXXXII. Top: Other Painted (Brown-on-Orange/Red), phase I (1), phase II (2, 4, 6, 7, 10-12), phase III (3), and mixed (5, 8, 9). *Bottom*: Black-on-Red, phase II (1, 2, 4, 6) and mixed (3, 5).



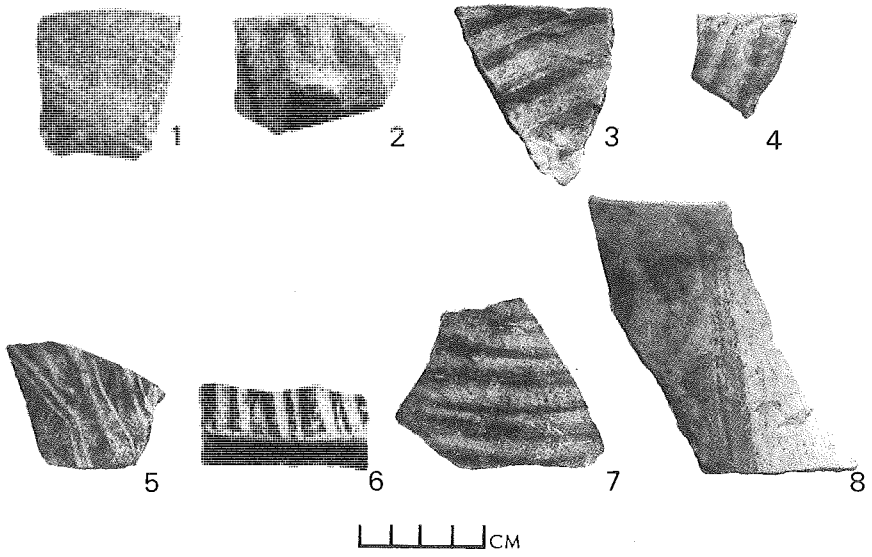
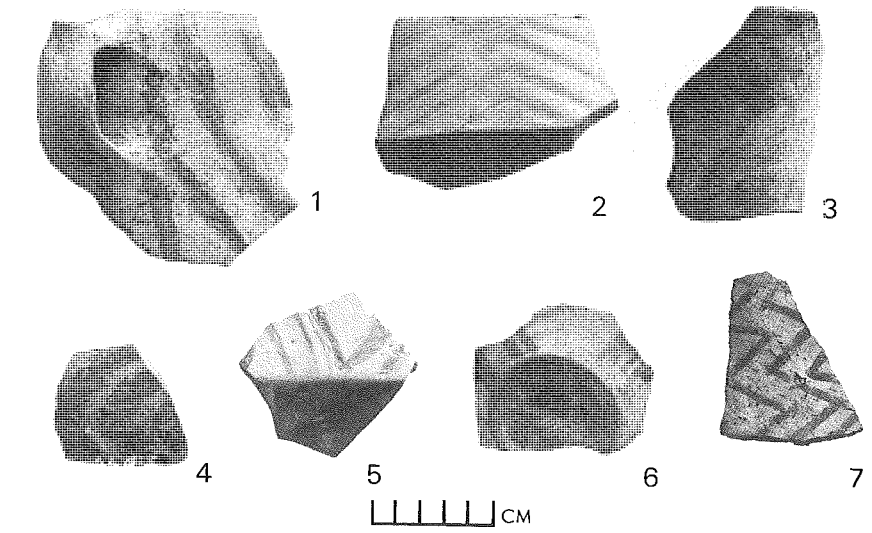


Plate LXXXIII. Top: Red-on-White, phase II (2, 5, 6, 9, 10), phase III (1), and mixed (3, 11). Red-on-White with incisions, phase II (8, 12) and mixed (4). Red-on-White, white slipped, phase II (7). *Bottom*: White-on-Red, phase II (1-4, 6), phase V (5), and mixed (7). Other Painted with red crusting (8).



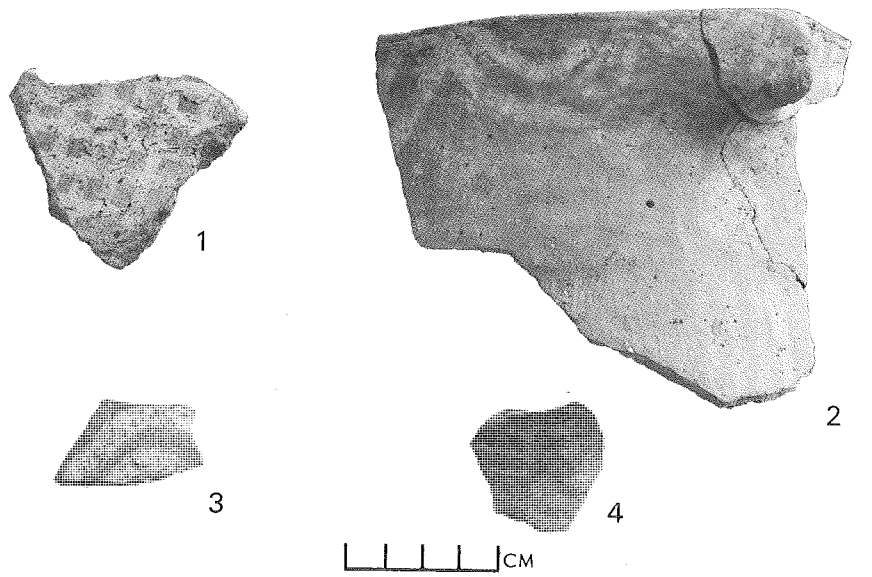


Plate LXXXIV. Top: Orange-on-Orange, phase I (1), phase II (2-4, 7), and mixed (5, 6). *Bottom*: Other Painted (i.e., white), phase II.

Plate LXXXV. Variously shaped vessels. Phase I, Gray Lustre (4) and Smooth (5). Phase II, Red Burnished (1), Coarse (2, 6), and Dark Burnished (3).

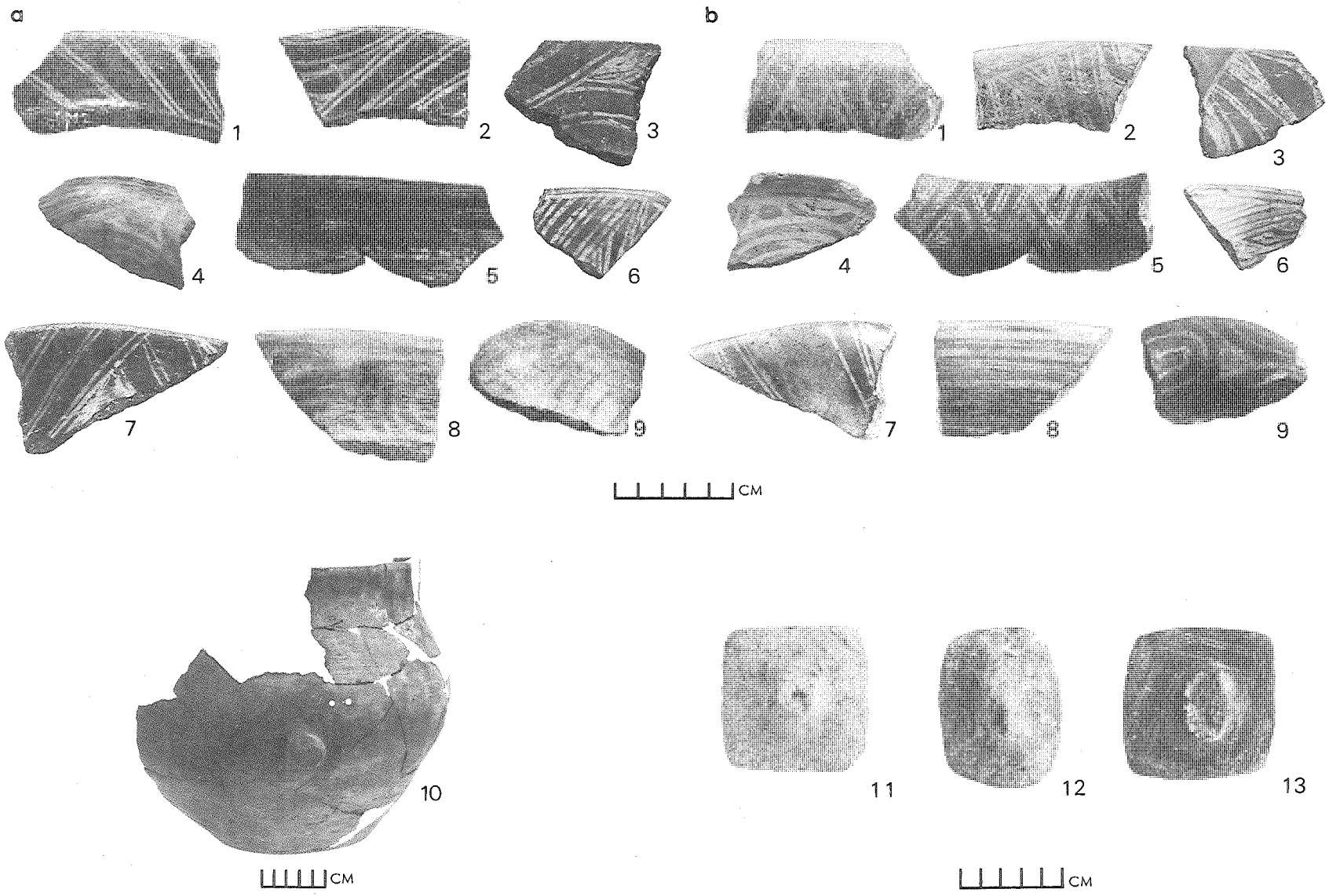


Plate LXXXVI. Phase III pottery. (1a-9a, *exterior*; 1b-9b, *interior*) Graphite-painted fragments. (10) Smooth globular jar with neck. (11, 12) Smooth lids. (13) Graphite-painted lid.

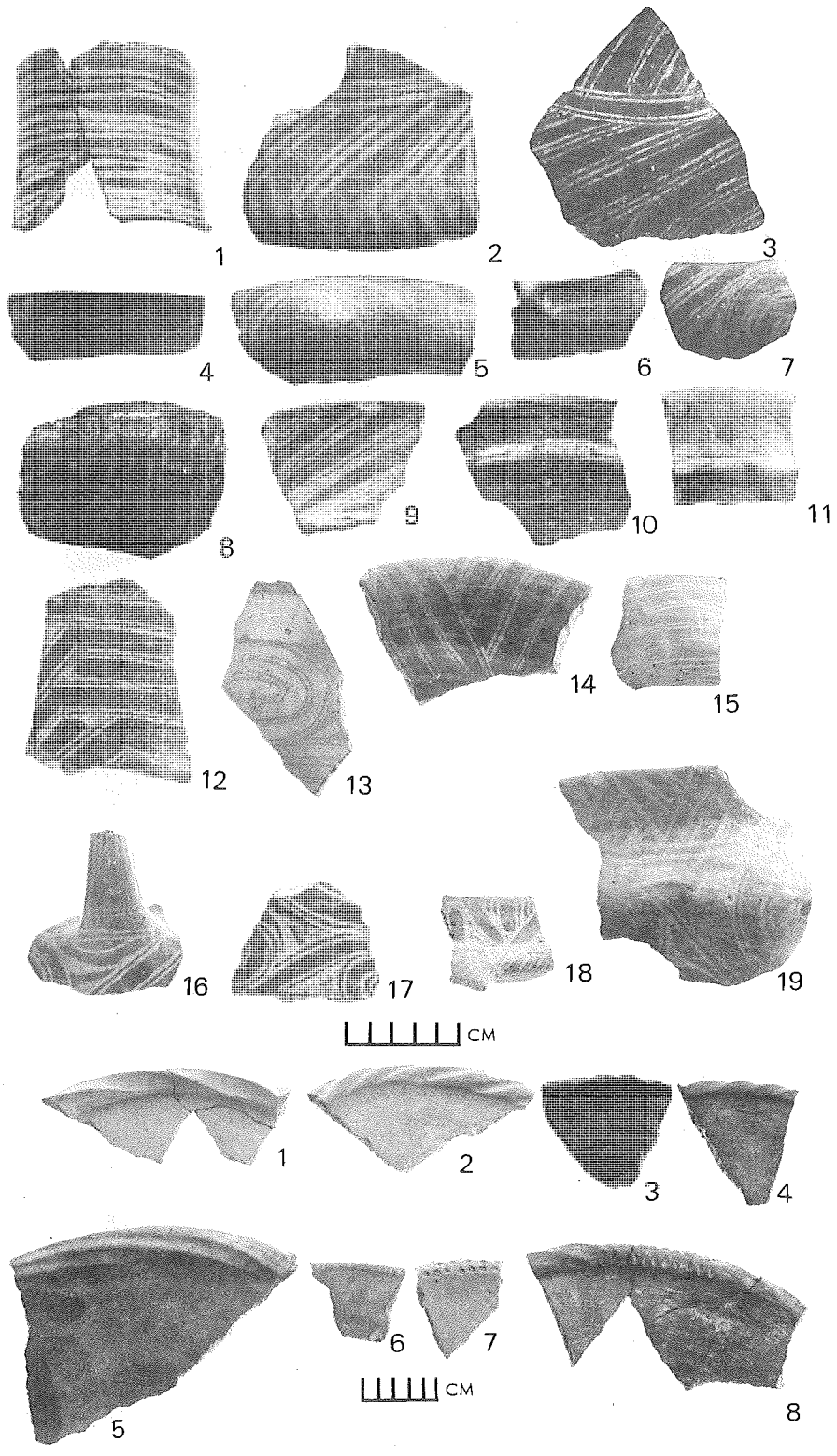


Plate LXXXVII. Phase III pottery. *Top*: (1-19) Graphite-painted fragments. *Bottom*: (1-8) Pale and Dark Burnished plate fragments with thickened and decorated rims.

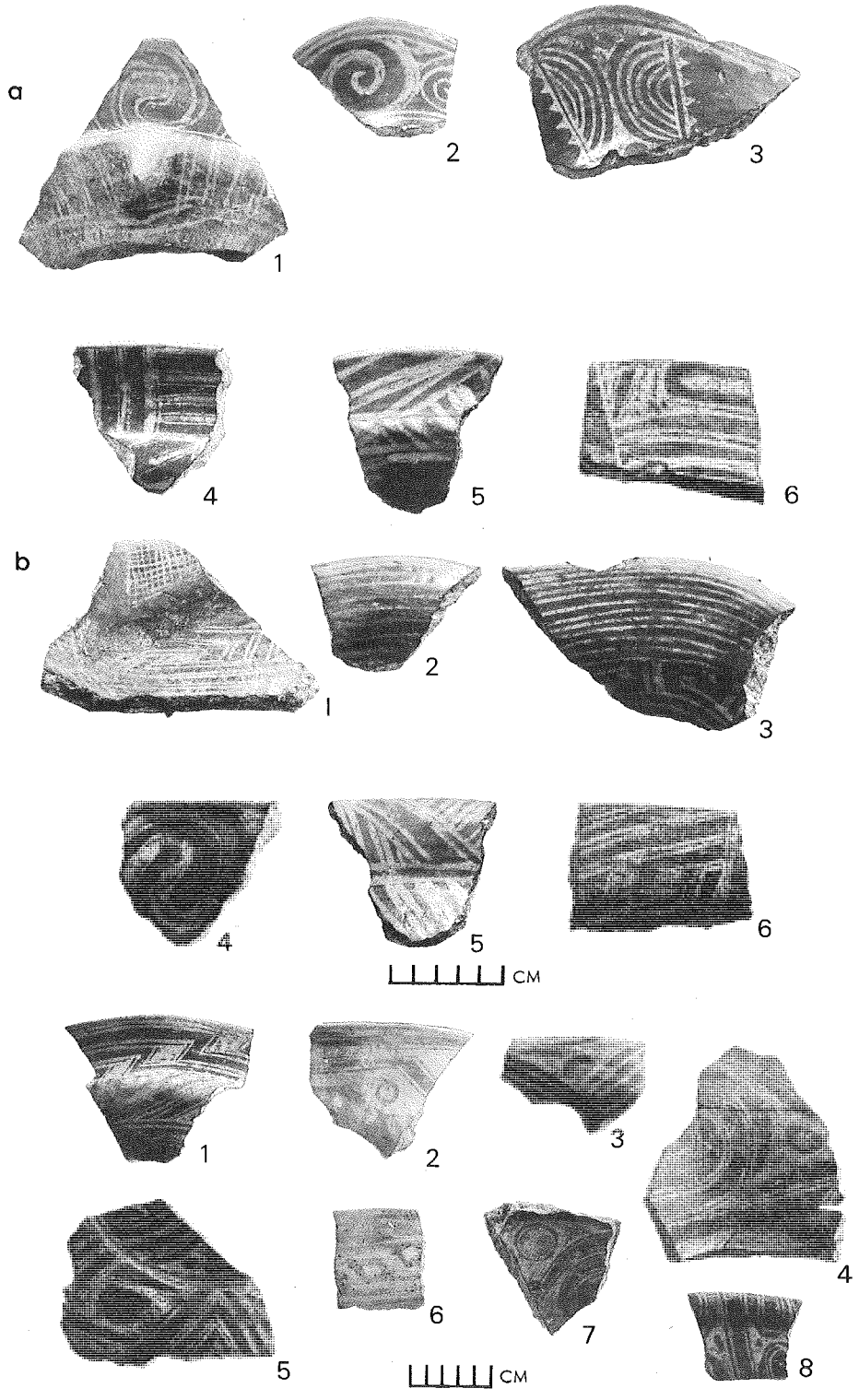


Plate LXXXVIII. Phase III pottery. *Top*: (1a-6a, *exterior*; 1b-6b, *interior*) Graphite-painted flaring rim fragments. *Bottom*: (1-8) Graphite-painted fragments.

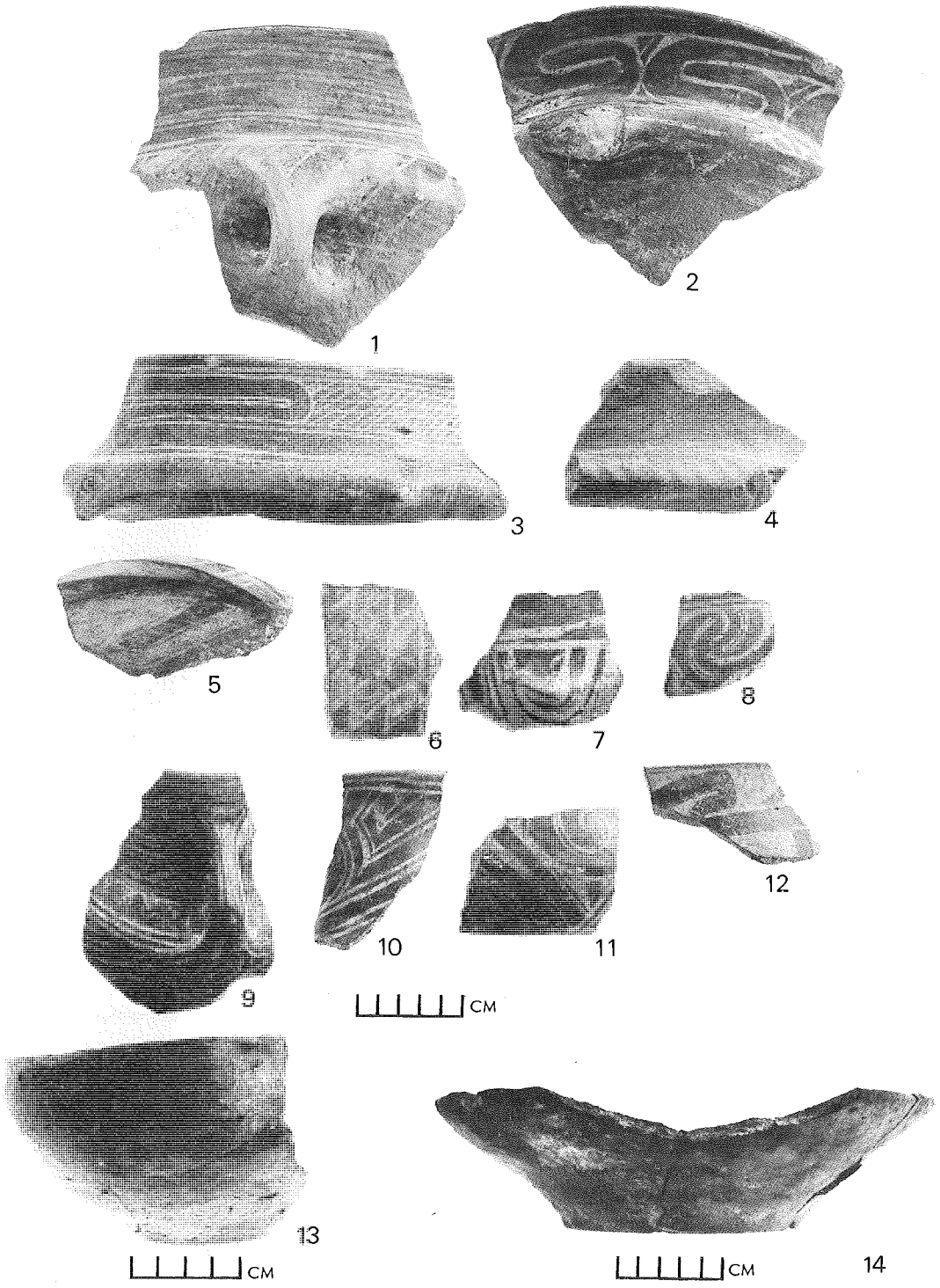


Plate LXXXIX. Phase III pottery. (1-12) Graphite-painted fragments. (13) Dark Burnished incurved rim bowl profile. (14) Bowl on modified platform.

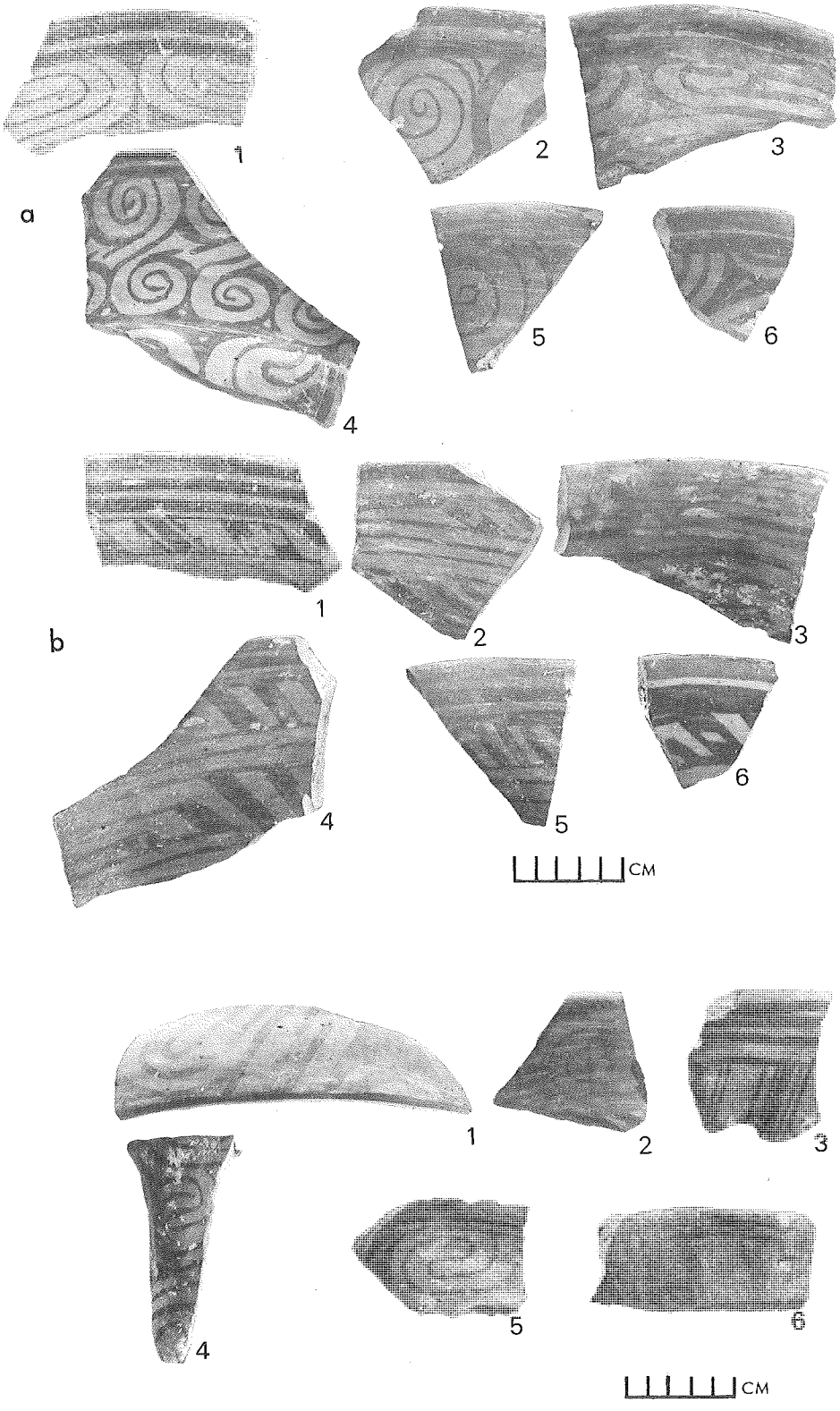


Plate XC. Phase III pottery. *Top*: (1a-6a, *exterior*; 1b-6b, *interior*) Black-on-Red style I flaring rim fragments. *Bottom*: (1-6) Black-on-Red style I fragments.

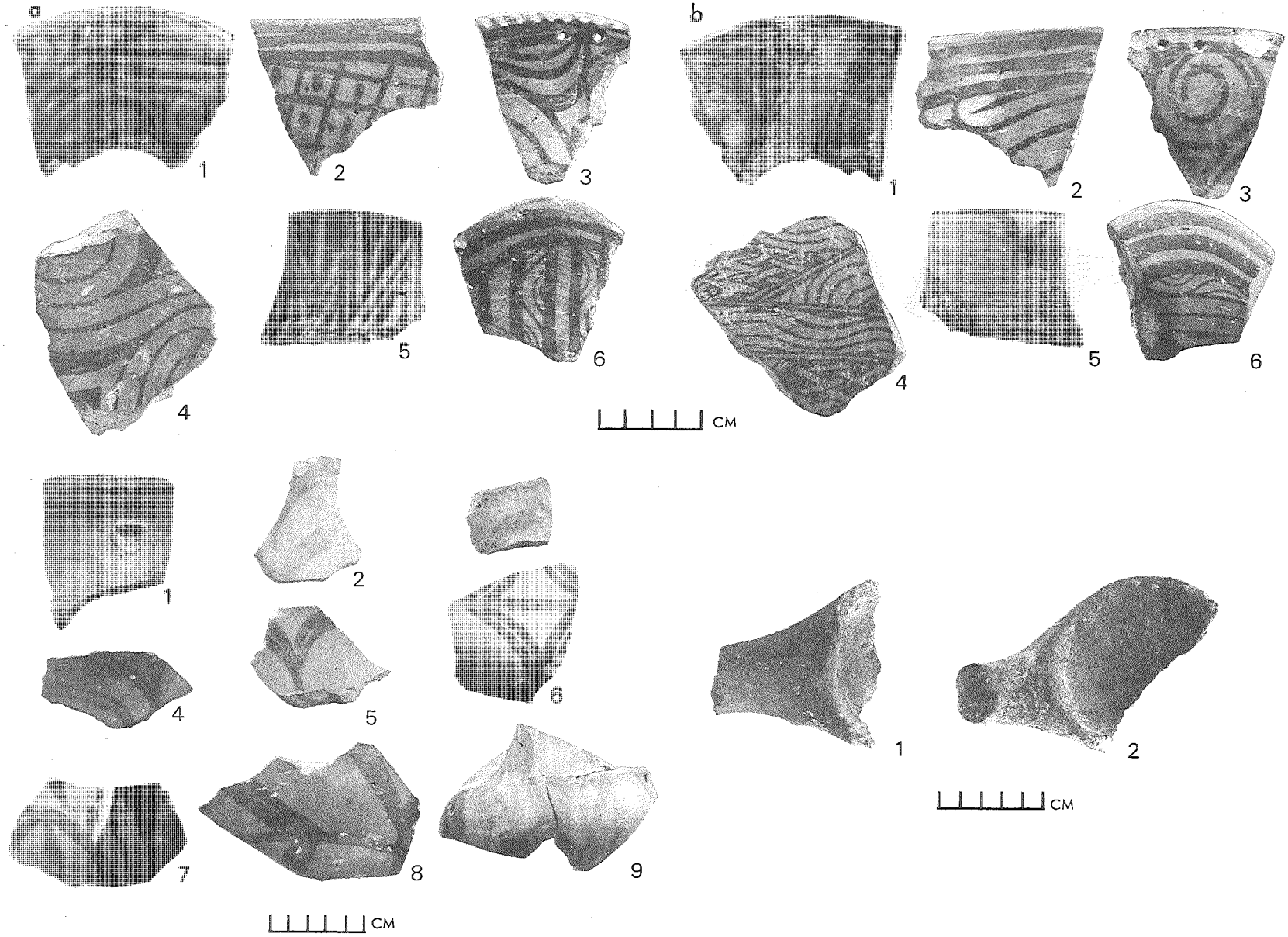


Plate XCI. Phase III pottery. *Top*: (1a-6a, *exterior*; 1b-6b, *interior*) Black-on-Red style I rim fragments. *Bottom left*: (1-9) Black-on-Red style II fragments. *Bottom right*: (1, 2) Ladles.

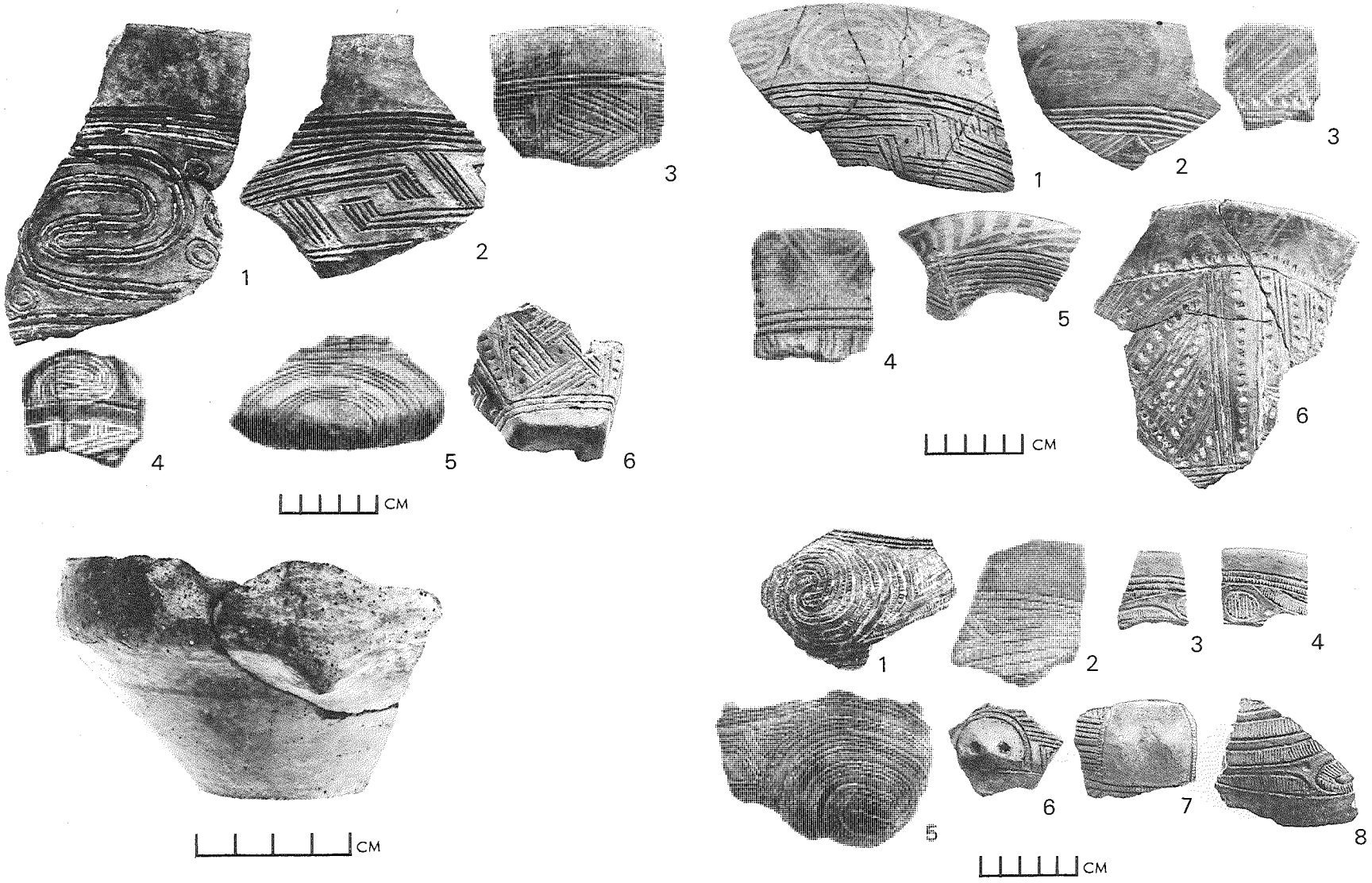


Plate XCII. Phase III pottery. *Top left*: (1, 2, 4-6) Fragments of Excised ware. (3) Fragment of Excised-with-Graphite ware. *Top right*: (1-6) Excised-with-Graphite fragments. *Bottom left*: Graphite-painted Kritsana bowl. *Bottom right*: (1-8) Excised-with-Graphite fragments, Maritsa ware.

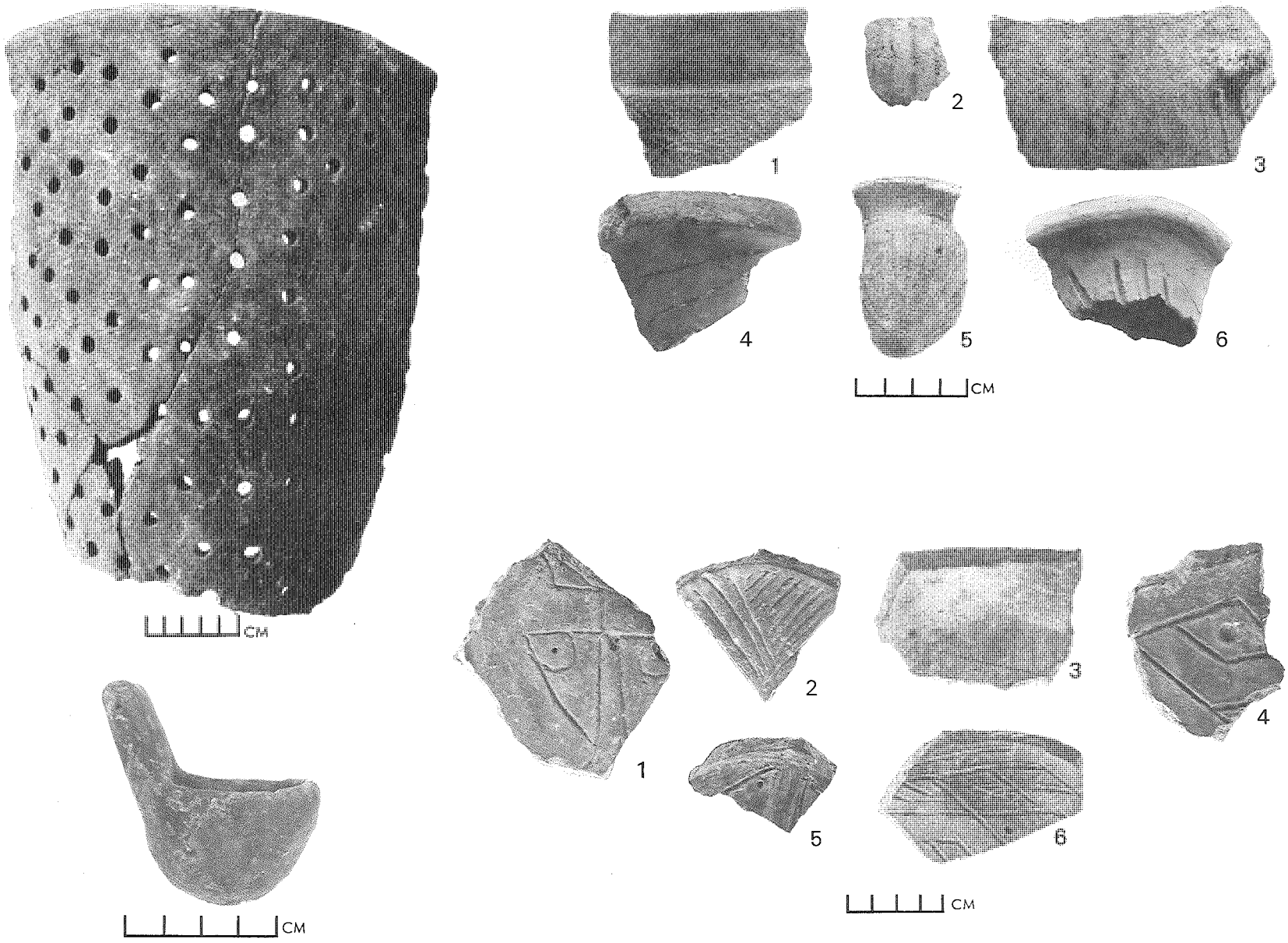


Plate XCIII. Phase III pottery. *Top left*: Sieve. *Top right*: (1-3) Barbotine fragments. (4-6) Crucible fragments. *Bottom left*: Scoop. *Bottom right*: (1-6) Excised fragments.

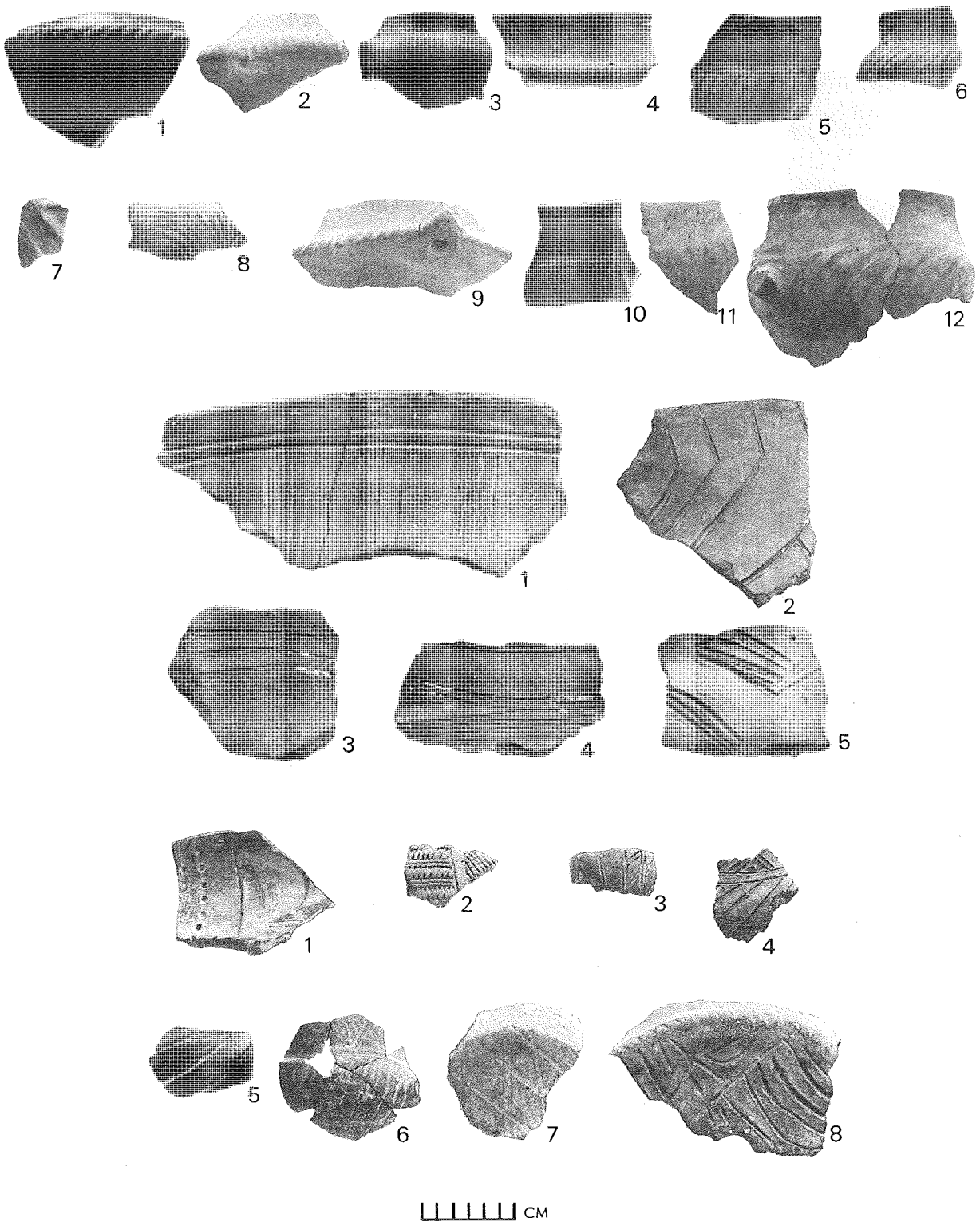


Plate XCIV. Phase III pottery fragments. *Top*: (1-4, 6, 8, 10, 11) Grooved. (5, 7, 12) Clumsy Grooved. (9) Grooved/Pale Burnished. *Middle*: (1-5) Pithoi. *Bottom*: (1) Excised-with-Graphite. (2-5) Incised. (6) Grooved-with-Graphite. (7, 8) Excised.

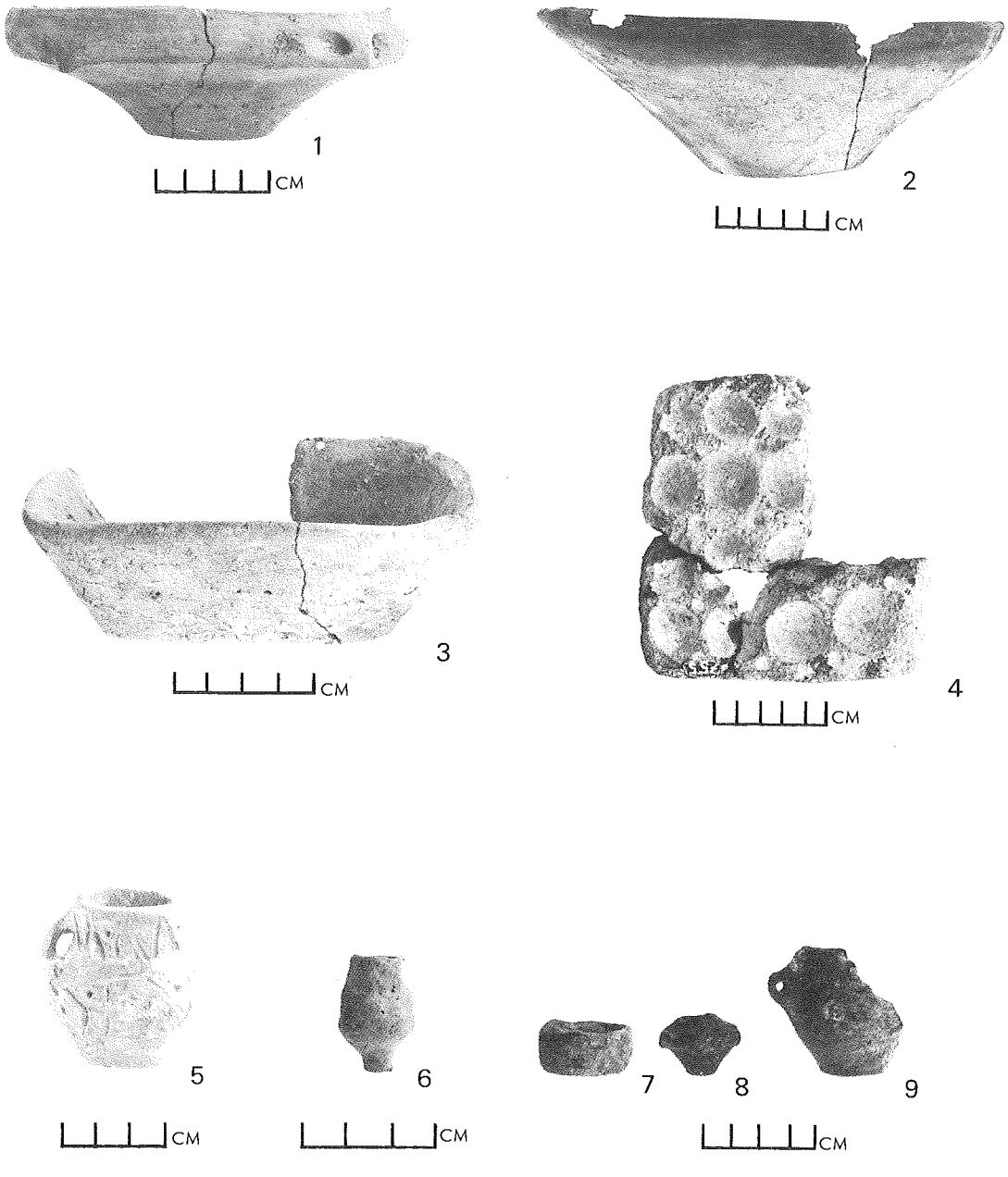


Plate XCV. Pottery from phases II and III. (1) Smooth Kritsana bowl. (2) Black Topped open form. (3) Coarse rectangular bowl. (4) House model base. (5) Incised miniatures. (6) Coarse miniatures. (7-9) Smooth miniatures.

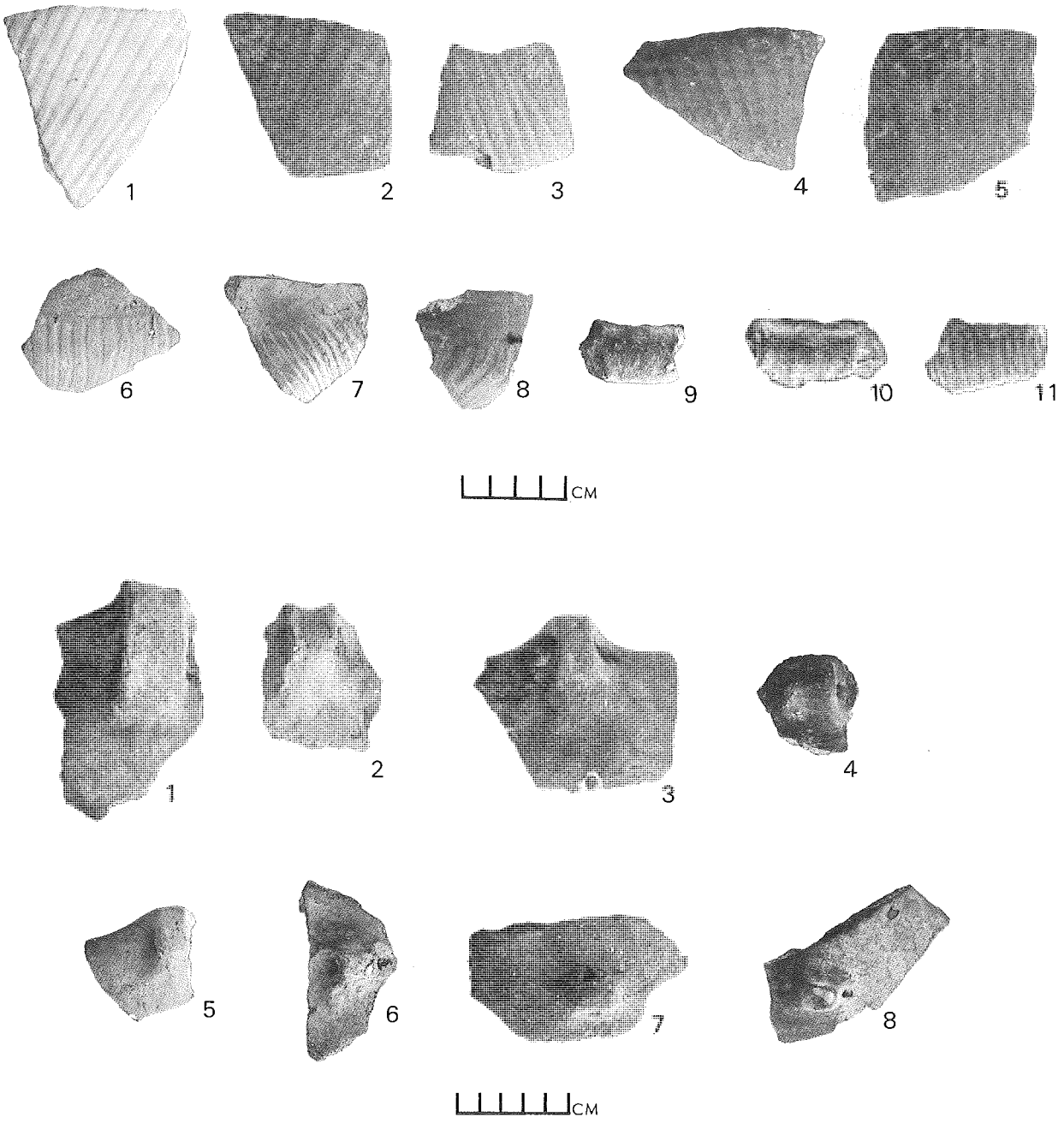


Plate XCVI. Phase IV pottery. *Top*: Channel decoration on body sherds (1-8, 11) and stringhole lugs (9, 10). *Bottom*: Lug and handle types from rim (1-3, 5) and below rim (4, 6-8).

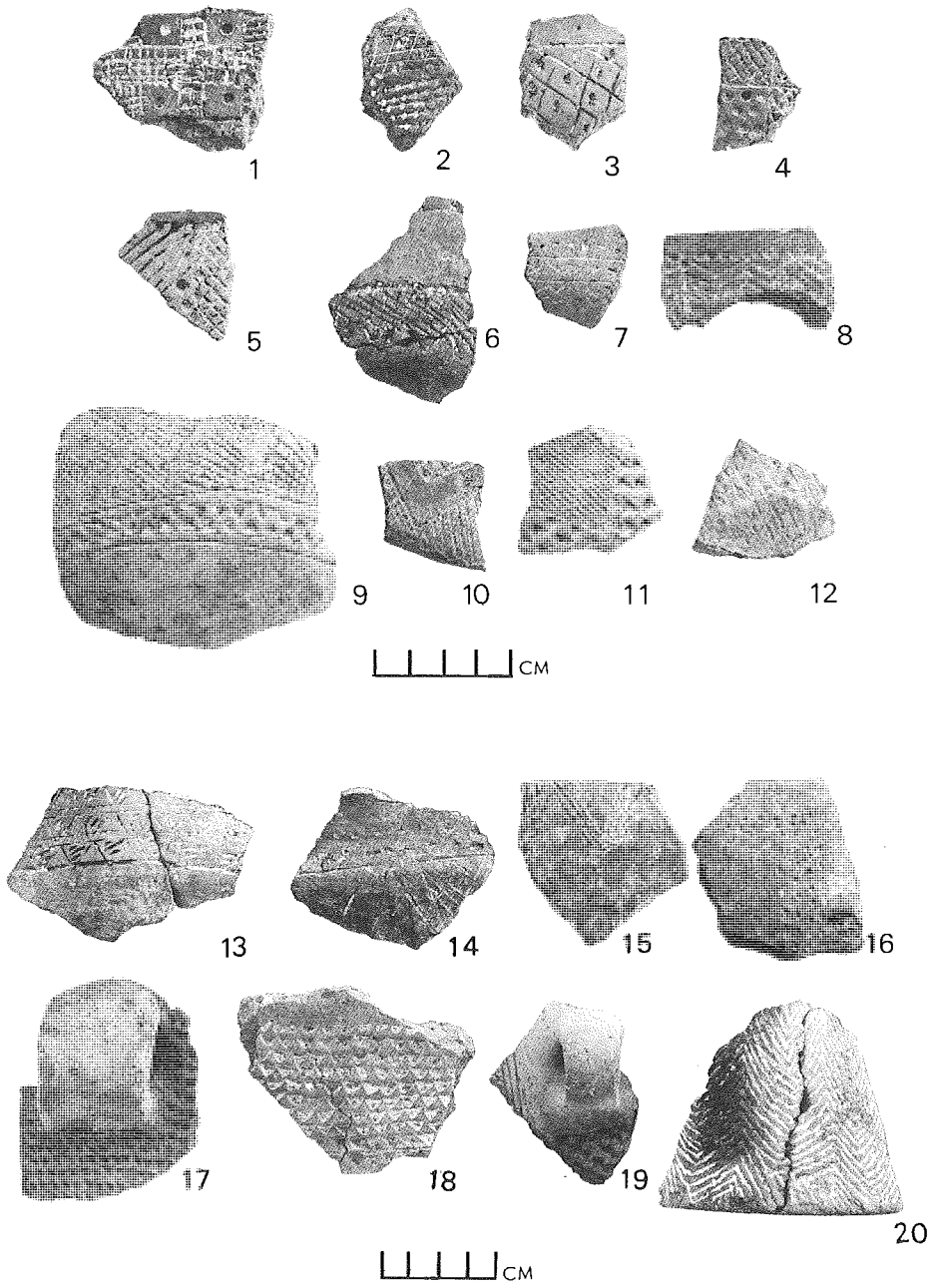


Plate XCVII. Phase Va incised and impressed body sherds with white infill (1-16, 18), with handles (17, 19); pedestal base (20).

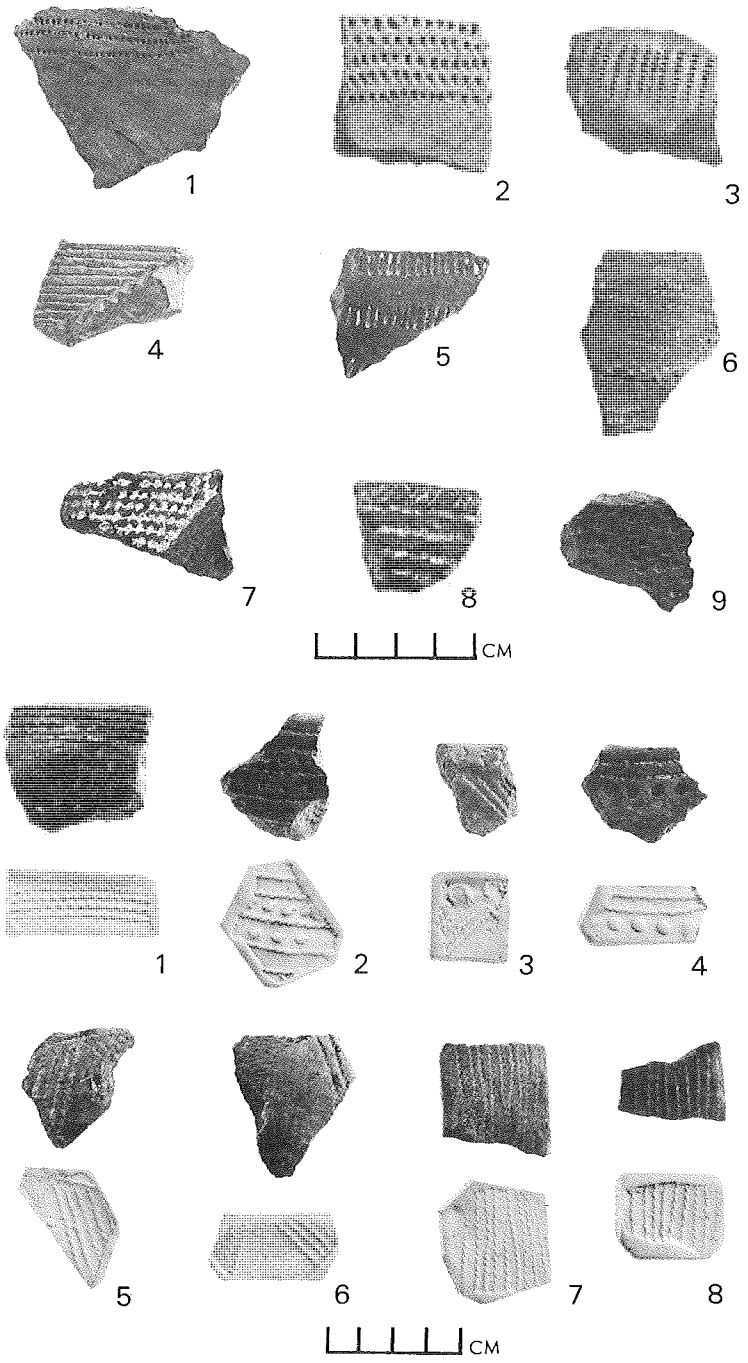
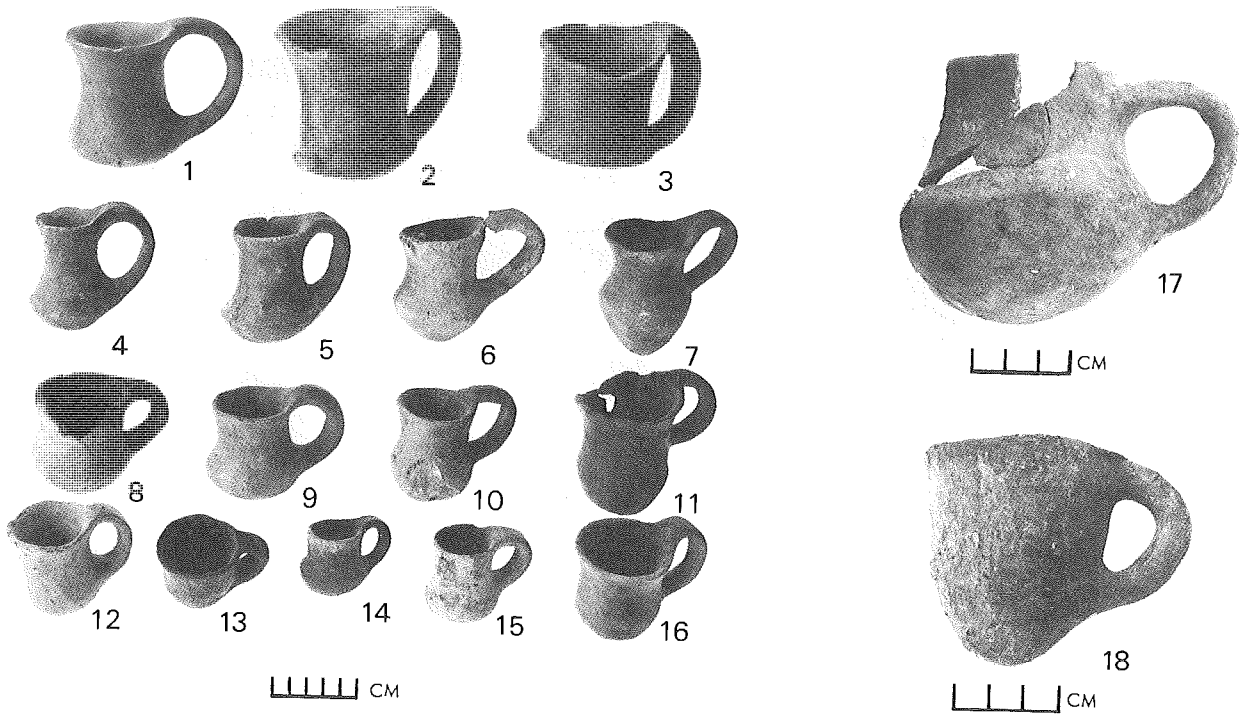


Plate XCVIII. Phase Va pottery. *Top*: (1-9) Types of impressed ornament, including "stab and drag." *Bottom*: (1-8) Cord-impressed decoration, with impressions of the sherds.



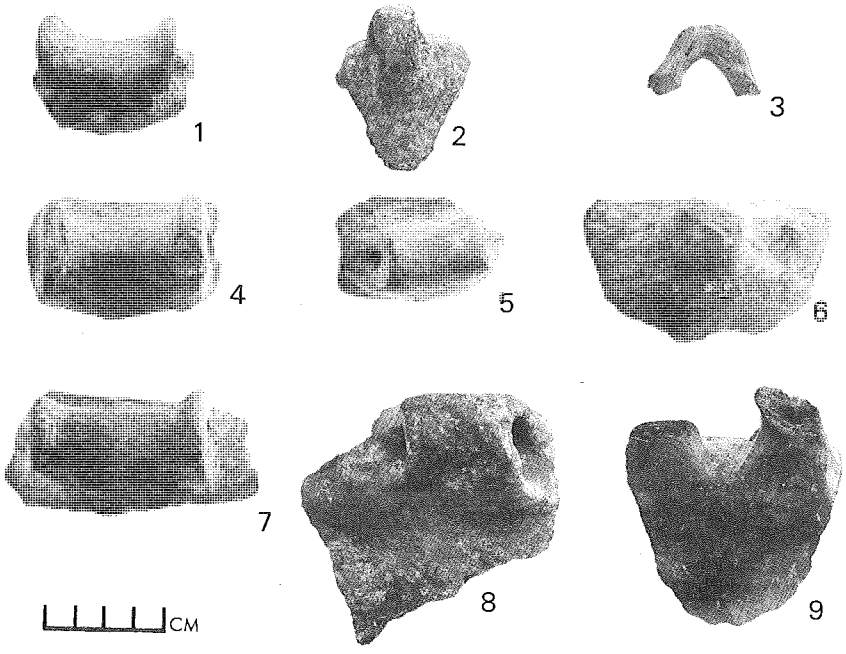


Plate XCIX. Top: Phase Vb cups. (1, 3-18) One-handled. (2) Two-handled. *Bottom*: (1, 4, 5, 7) Phase Vb trumpet lugs. (2, 8) Phase Vb stringhole lugs. (3, 6, 9) Later bronze age loop handles.

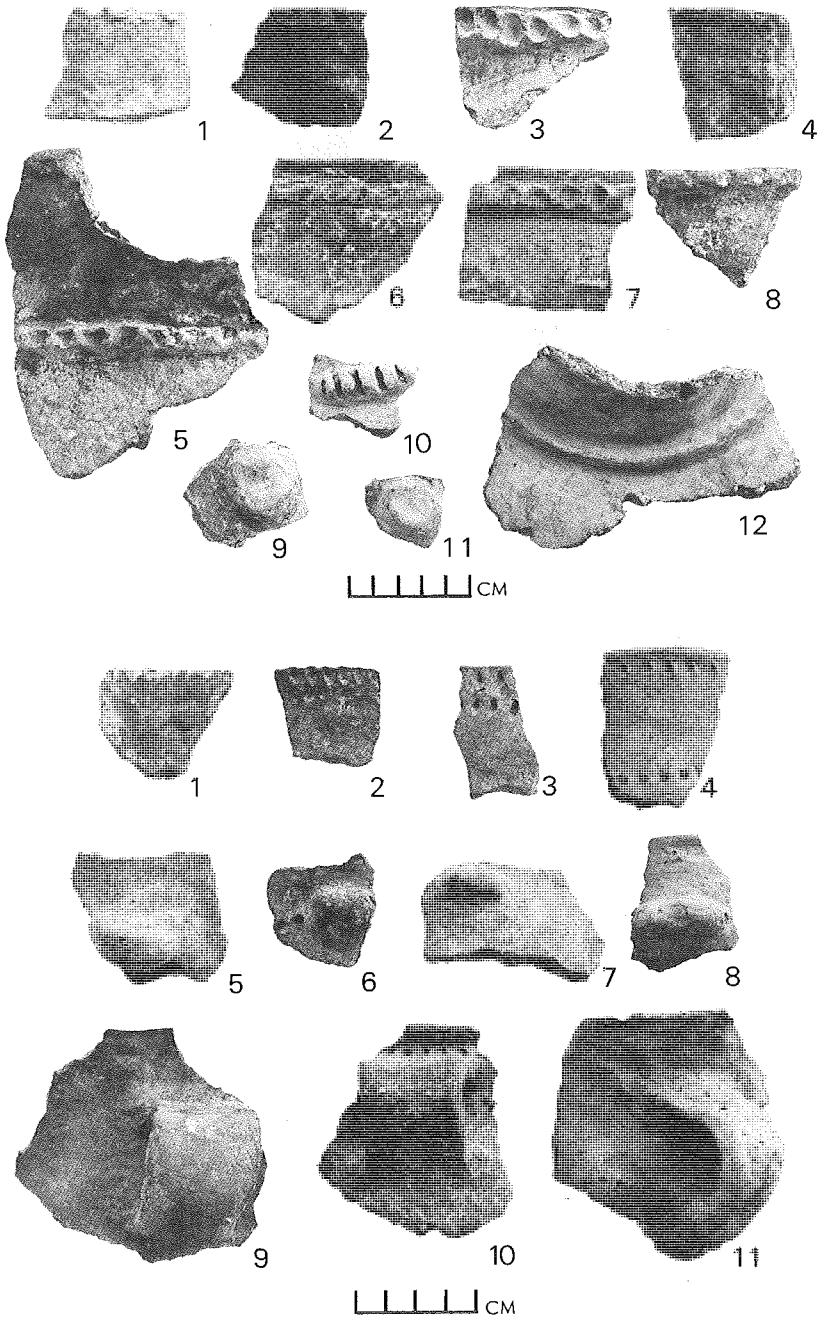


Plate C. Phase Vb pottery. *Top*: (1-12) Coarseware fragments with plastic decoration. *Bottom*: Smaller coarse vessel fragments. (1-4) Impressed rims. (5, 7) Ledge handles. (6, 8) Stringhole handles. (9-11) Rim fragments with lug handles.

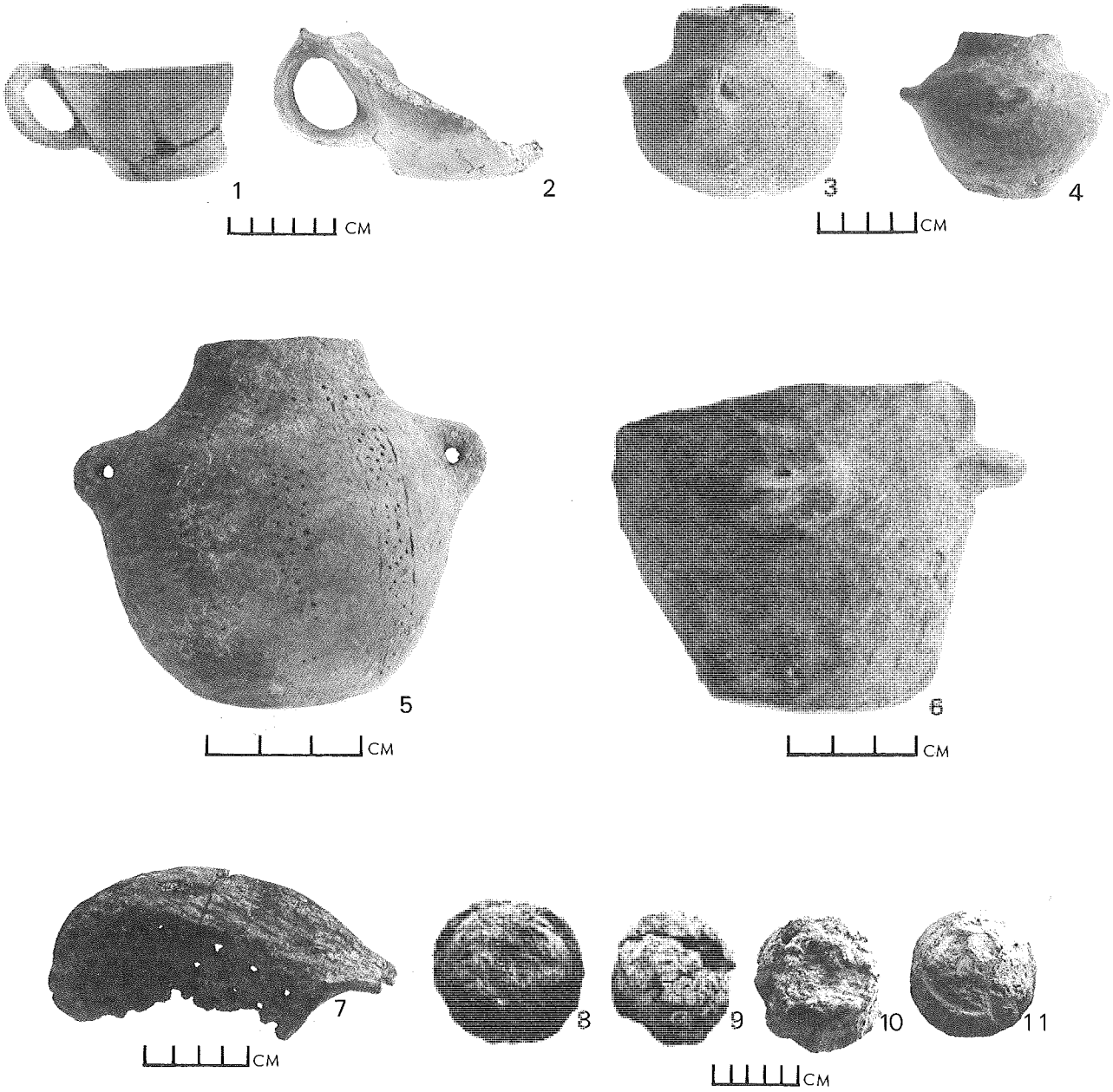


Plate CI. Phase Vb pottery. (1, 2) Handled bowls. (3-5) Suspension jars. (6) Small open vessel with vertical stringholes. (7) Sieve fragment. (8-11) Oven stoppers. Suspension jar (3) held Grain Sample 218.

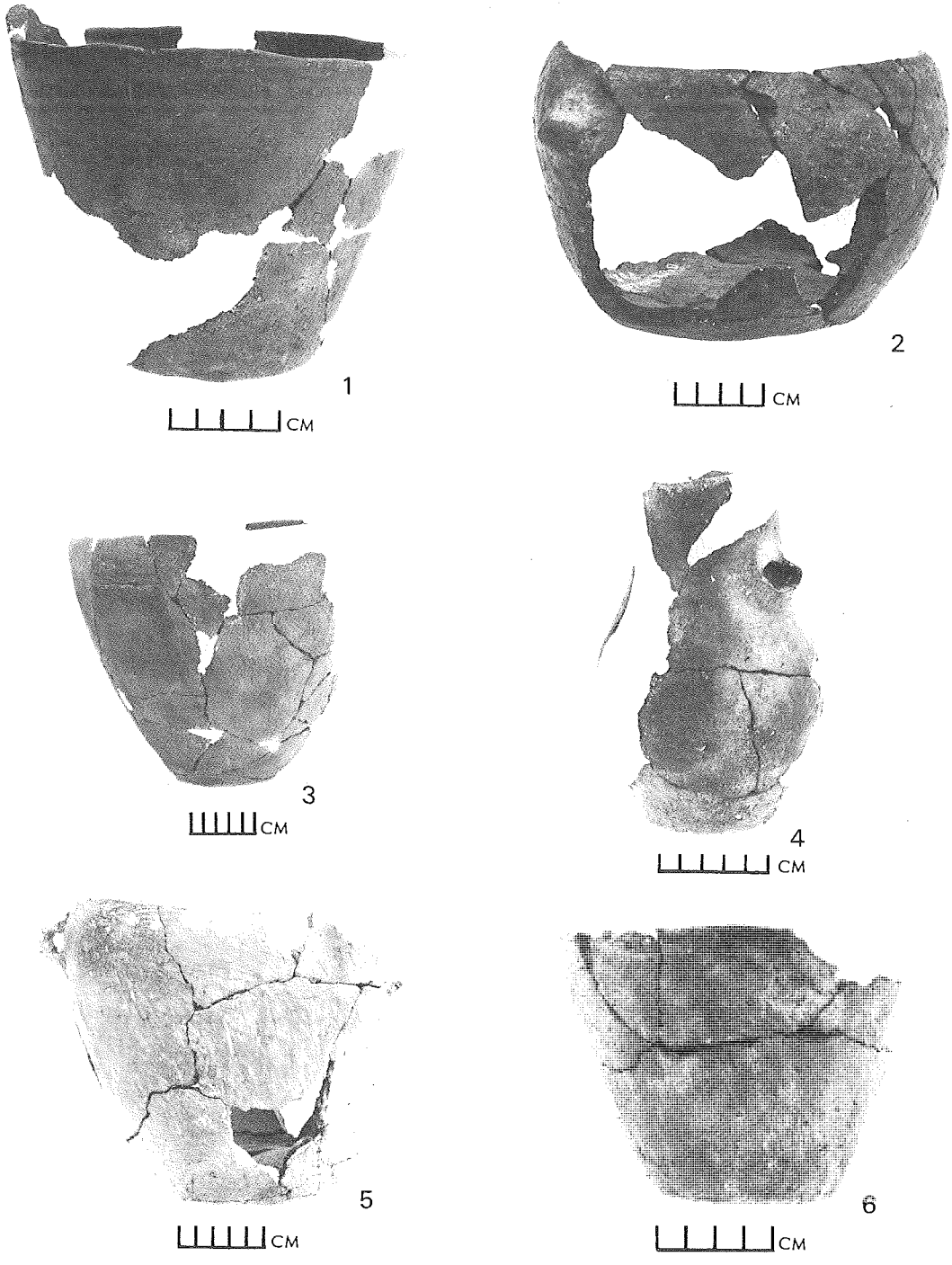


Plate CII. Phase IV pottery. (1) Urn with rim tab. (2) Bowl with horizontal stringhole. (3, 5, 6) Urns. (4) Spouted jug.

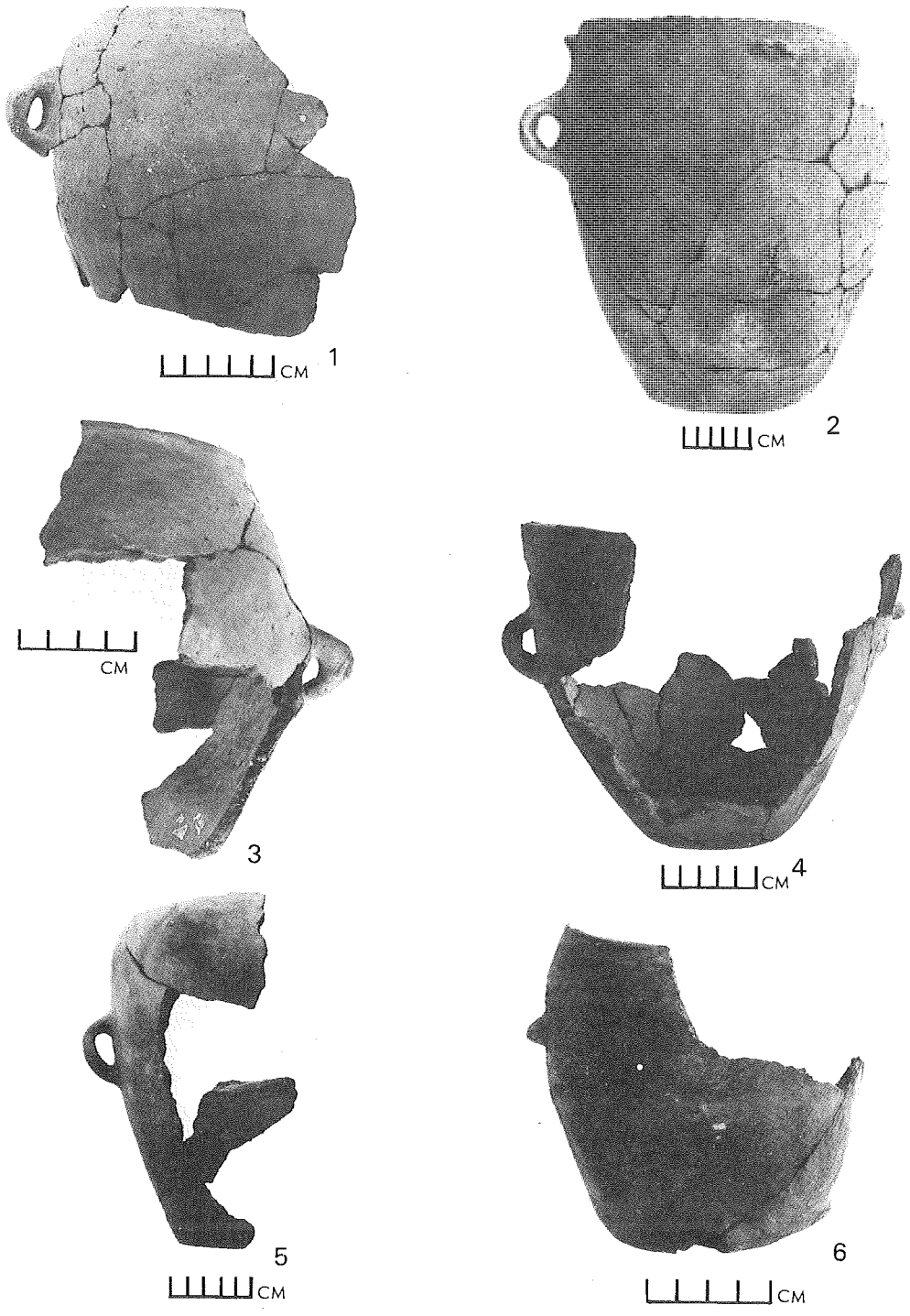
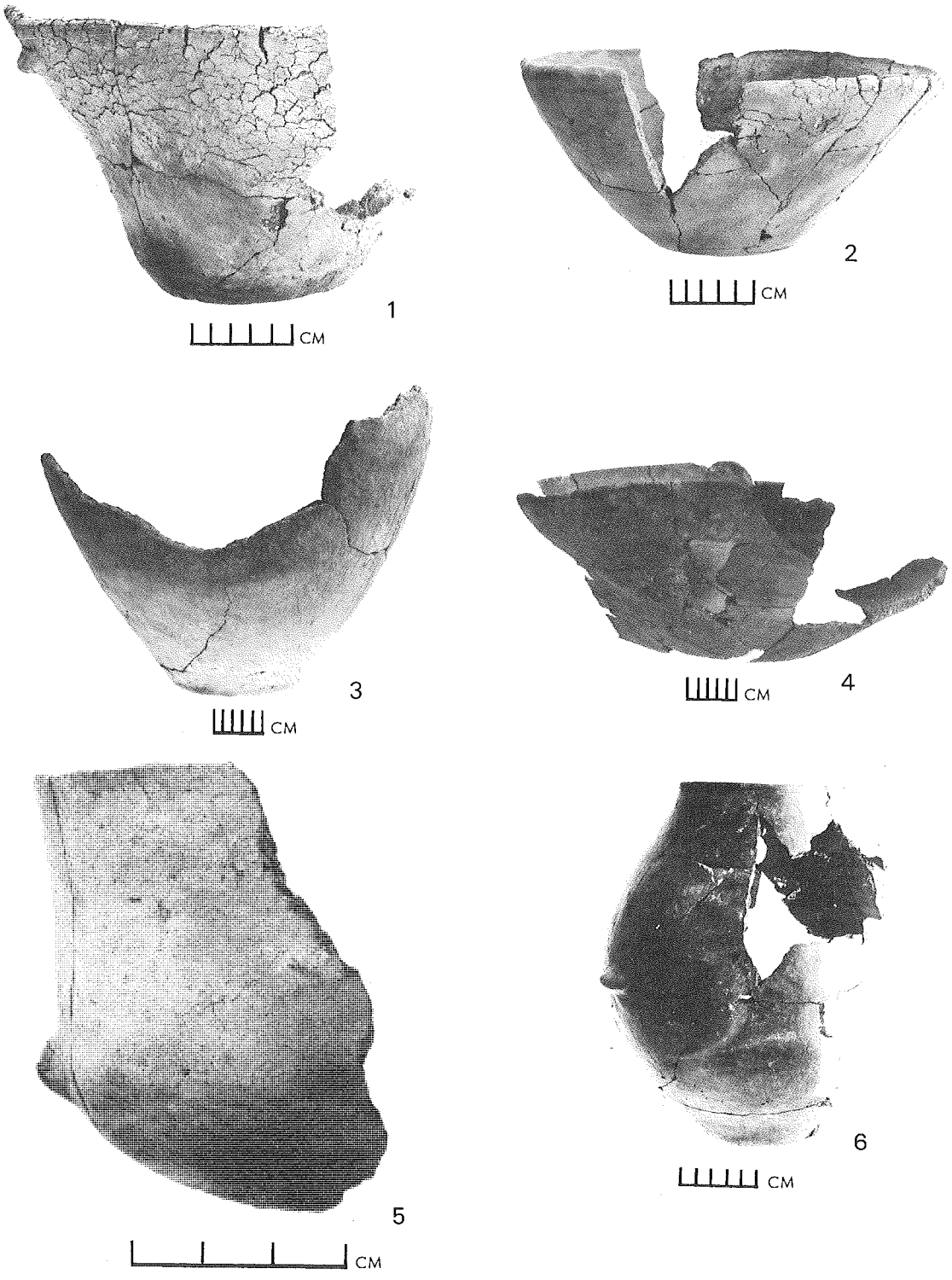


Plate CIII. Phase Va pottery from the Burnt House. (1-5) Urns with lug handles. (6) Urn with ledge.



Place CIV. Phase Va pottery from the Burnt House. (1, 2, 4) Conical bowls. (3, 5) Urns. (6) Jar.

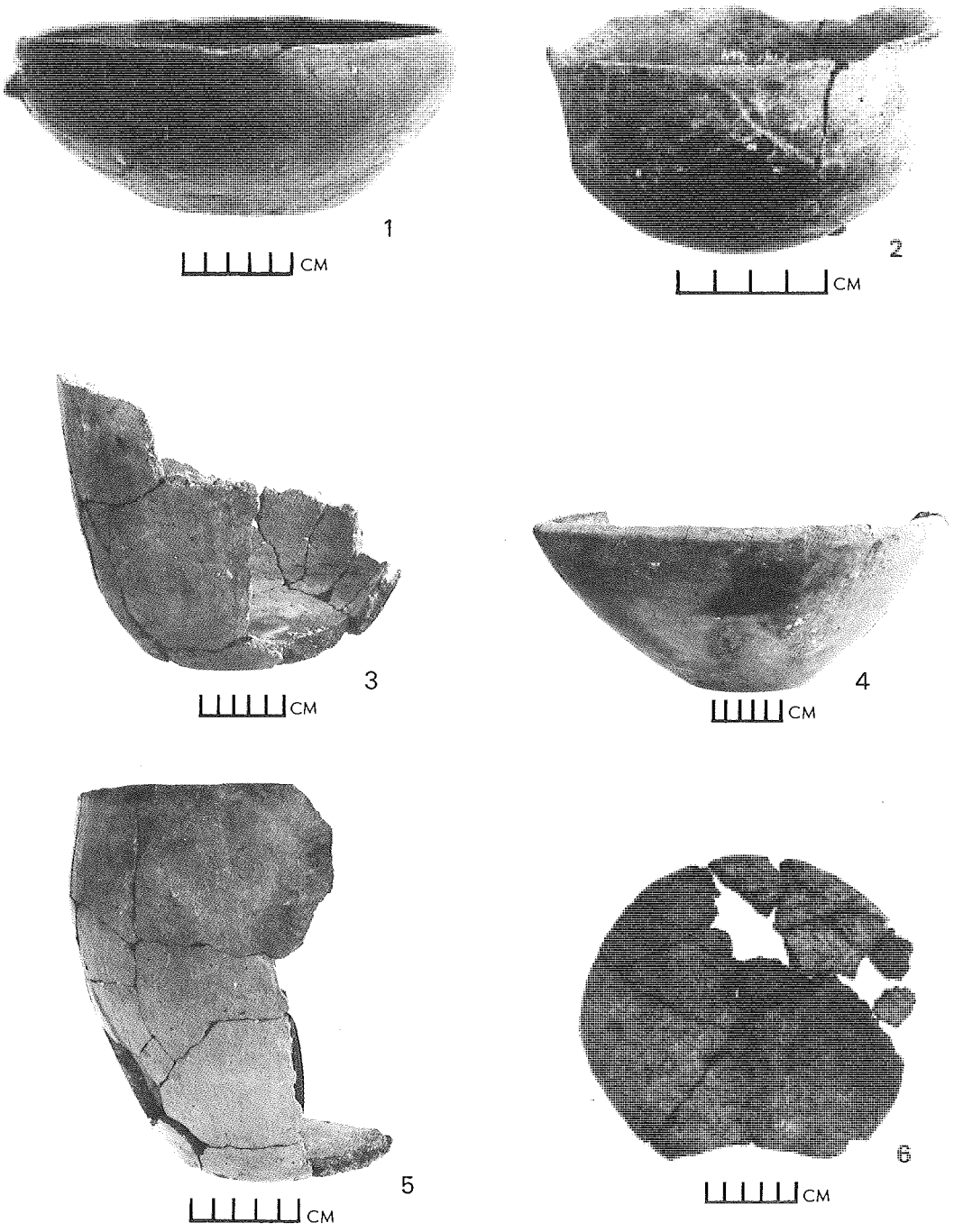


Plate CV. Phase Va pottery from the Burnt House. (1, 2, 4) Bowls. (3, 5) Urns. (6) Clay disc.

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