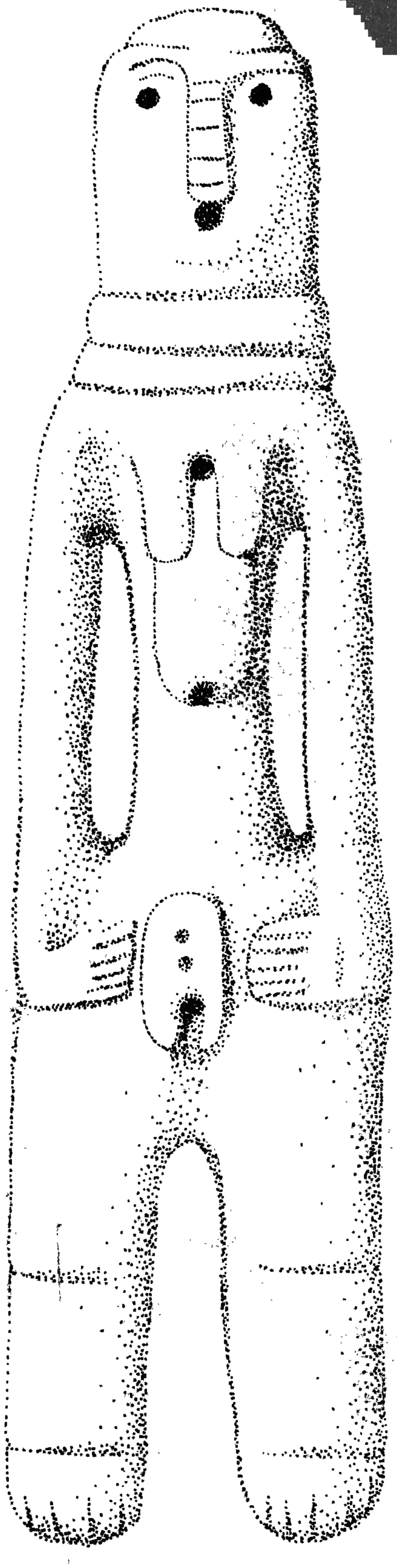


EXCAVATIONS AT TEPE YAHYA, IRAN 1967–1975

The Early Periods

C. C. LAMBERG-KARLOVSKY
General Editor and Project Director

THOMAS WIGHT BEALE

With contributions by
James Adovasio, Dennis Heskel,
Hugh McKerrell, Richard H. Meadow,
Martha Prickett, Ronald F. Tylecote,
and Pamela Vandiver

AMERICAN SCHOOL OF PREHISTORIC RESEARCH
BULLETIN 38

PEABODY MUSEUM OF ARCHAEOLOGY AND ETHNOLOGY
HARVARD UNIVERSITY

American School of Prehistoric Research

Peabody Museum • Harvard University

Bulletin 38

Excavations at Tepe Yahya, Iran 1967–1975

The Early Periods

C. C. LAMBERG-KARLOVSKY
General Editor and Project Director

THOMAS WIGHT BEALE

With contributions by
James Adovasio, Dennis Heskel, Hugh McKerrell, Richard H. Meadow
Martha Prickett, Ronald F. Tylecote, Pamela Vandiver

PEABODY MUSEUM OF ARCHAEOLOGY AND ETHNOLOGY
Harvard University, Cambridge, Massachusetts
1986

Distributed by Harvard University Press

ISBN 0-87365-541-9
Library of Congress Catalog Card Number 84-62628
Printed in the United States of America

To Professor Ezat O. Negahban and our Iranian colleagues, whose spirit of international collaboration advanced the science of archaeology

Contents

FIGURES

TABLES

Acknowledgments

A publication of this sort is never an individual effort. This volume is a reflection of the cooperation and joint effort of many individuals who, as diggers, trench supervisors, photographers, artists, draftsmen, surveyors, registrars, conservators, cooks, and even collaborating scientists from ancillary fields, over seven field seasons helped bring the prehistory of Tepe Yahya to life. More than sixty researchers over the course of seven summers contributed to what we know about the early periods of Tepe Yahya. In fact, as the text indicates, work on the paleobotany, zooarchaeology, and ceramic and lithic technologies is still continuing.

We are greatly indebted to the hundreds of Iranian villagers from the Soghun valley who at different times over the course of seven summers participated in the digging, washing, cataloging, packing, and transporting of the materials recovered from our systematic holes. Many of these workers offered us an occasional understanding, a momentary joy, or a deep frustration. Those who offered us their friendship will remain in our memories. We think often and with nostalgia of the long, hot, dusty days spent in their remote valley and hope today for the safety of old friends, now missed: Hussain, Mohammed, Musa, Farhad, Kalandar, "Mama" Dolati, Gholam-Ali, Sayed Reza, Fayez, Pilal, Hajji, Gholam Reza, Kuchek Ali, Mustapha, Hassan, and many more.

We wish to offer, as the text in chapter 1 so clearly indicates, far more than an obligatory thanks to Dr. Ezat Negahban, Director of the Iranian Archaeological Survey. When we started our research in 1967, his direct support, enthusiasm, and assistance was of inestimable importance. To him we are immensely grateful. Support for our work was also consistently and graciously offered by Mr. Mehrdad Pahlbod, Minister of Culture and Art, throughout our tenure of excavations, as well as by his senior officers Mr. Abdul-Ali Pourmand, Mr. M. Khorramabadi, Mr. Ali Hakemi, and Mr. Firouz Bagherzadeh.

In the U.S. Embassy, Office of the Cultural Attaché, we were richly assisted by Mr. Theodore Wertime and later by his successor Mr. Richard Arndt, who secured for us much-needed commissary privileges—our nearest food market was in Sirjan, an eight-hour drive from Tepe Yahya. In Teheran our "home" for seven summers was the British Institute of Persian Studies. The resident director(s), David and Ruth Stronach, are more fully thanked in chapter 1. In our minds their assistance, support, and friendship hold a place second to none. Our indebtedness to graduate students, colleagues, specialists, and individual benefactors is also fully acknowledged in chapter 1. The principal support for both the excavations and this publication came from a series of grants from the National Science Foundation.

We are particularly grateful to Anne Hastings. Though she never physically graced the site of Tepe Yahya, she has come to know, through almost a decade of study, the field journals and stratigraphic contexts of the early periods and the third millennium as well as their excavators do. The countless hours she has expended in the resolution of problems, minute or major, have made her a treasured resource of our team.

The generous support of the Harvard Society of Fellows has provided one of us (T.W.B.) with three years (1976–1978) of free time and good wining and dining so essential in the initial stages of preparing the manuscript for this volume.

C. C. Lamberg-Karlovsky
Thomas Wight Beale

Chapter 1

The Tepe Yahya Project, 1967–1975

C. C. Lamberg-Karlovsky
Department of Anthropology, Harvard University

The history of an archaeological project is almost as complex as the society that one is attempting to unravel through excavations. The seven seasons spent in the excavations of Tepe Yahya are no exception to this. The results of this project are, in part, set forth in this first volume. Prior to examining this record, a short introductory preamble presenting the history, methods, and motivations of the project provides a useful background for placing the results in a fuller context.

The idea of undertaking an archaeological excavation in southeastern Iran was conceived only ten days before we obtained a permit for survey and sondage from the Archaeological Service of Iran. The birth of the Tepe Yahya Project cannot be said to have been the result of long-term cogitation, yet it would be equally untrue to say that I was leading an expedition into an area that I had thought little about.

The discovery of Tepe Yahya on the afternoon of August 17, 1967, was in a sense an indirect by-product of the Seven-Day Arab-Israeli War. In the summer of 1967 I planned to start an excavation of a Halaf-Ubaid site discovered the previous summer along the Balikh River in Syria. The eruption of the Seven-Day War made continuation of this program unlikely. The flexible approach of Dr. John Cornell, then Program Director for Anthropology at the National Science Foundation, permitted me to expend funds originally assigned for my excavation program in Syria for use in Iran. Following the submission of a new budget and a short proposal to the N.S.F., I was given permission to direct my attention to an archaeological survey of southeastern Iran. The choice of this area was not wholly random. Over the previous two years I collaborated with my research assistant, Denise Schmandt-Besserat (now professor at the University of Texas, Austin), on the study of a collection of ceramics recovered by Sir Aurel Stein from this area of Iran. This collection is in the Peabody Museum and was of fundamental importance in directing my interest to this area. The study of this collection subsequently resulted in two publications (Lamberg-Karlovsky 1969a; Lamberg-Karlovsky and Schmandt-Besserat 1977). It seemed to me that a new survey of this little-known region of Iran might add substantially to our understanding. Thus, on June 14, 1967, I departed with a small team from Harvard to do an archaeological survey in the Kerman Province of Iran. Accompanying me with Denise Schmandt-Besserat were three young scholars who were to spend several seasons in the excavations at Tepe Yahya: Richard Meadow, James Humphries, and our representative from the Iranian Archaeological Service, Gholam Ali Shamlou. Shamlou served as our government representative for two seasons before coming to Harvard's Department of Anthropology, where he completed his Ph.D. in 1978.

Two fortunate circumstances allowed us to undertake this survey in 1967. First, the successful transfer of N.S.F. research funds from an excavation program in Syria to a survey in Iran and, second, permission to undertake this archaeological reconnaissance without prior arrangements or contact with the Iranian Archaeological Survey. It is highly unlikely that in today's climate—with research funds limited and excavation permits increasingly difficult to obtain—we would be able to inaugurate the Tepe Yahya Project. The flexible approach of the National Science Foundation has already been commented upon. Of equal significance in launching this research program was the immediate enthusiasm expressed by the director of the Iranian Archaeological Survey, Dr. Ezat O. Negahban. The four of us arrived in Teheran wholly unannounced and unexpected. David Stronach, Director of the British Institute of Persian Studies, welcomed us and with infinite skill and patience guided us through the intricacies of purchasing a Landrover, insurance, and expedition equipment and informed us how best to move through the delicate maze of acquiring a permit. The British Institute became our base of operations for nine consecutive summers. The hospitality and assistance offered us by David and Ruth Stronach far exceeded the expected duties of an institute director. The Stronachs presided over the institute at an extraordinarily productive time in Iranian archaeology. Their institute was at the very heart of the intellectual ferment of the 1960s and 1970s that characterized the archaeology of the Iranian plateau and was in no small measure responsible for it.

It was with considerable trepidation that I first met Dr. Negahban and requested a permit for survey and excavation. If we were denied a permit, the four of us would be stranded in Teheran without a project but with N.S.F. funds. This would have been difficult to explain on our return to the States. I regretted that I had not met Dr. Negahban in 1961 on a trip to Marlik Tepe with T. Cuyler Young, Jr.: I thought that perhaps an earlier acquaintance with the director would be helpful in facilitating my permit; it proved to be entirely unnecessary. Dr. Negahban was immediately receptive to the idea. He recognized that the Kerman Province was virtually unexplored and that such a survey might add to our understanding. His support was instrumental in obtaining a permit. Dr. Negahban, in addition to his productive excavations at Marlik, Haft Tepe, and on the Qazvin plain, trained a generation of Iranian archaeologists. One's nationality made little difference to Dr. Negahban; what mattered was one's commitment to elucidating the archaeology of Iran. In this approach he encouraged and created an open exchange of international scholarship throughout the 1960s and 1970s. His distinguished contributions are recognized by all who shared the good fortune of working in Iran in those productive decades.

Our survey team of five departed in a single Landrover. It was not a systematic, rigorously conceived survey to shed light on a particular hypothesis. I was in search of a particular type of site. We recorded scores of sites and registered them in our field journals with studied disinterest. I was interested in locating a site that fulfilled but two requirements: (1) it had to be of substantial size; and, more importantly, (2) it was essential that it have a long chronological time span, the longer the better. It must be recognized that this entire region of southeastern Iran was archaeologically unknown in 1967, save for the work undertaken three decades earlier by Sir Aurel Stein. We visited dozens of small, 0.5–1.5-hectare sites littered with ceramics which I simply could not identify within a millennium of their production. I wanted to locate a site that would provide through excavation a foundation for the understanding of this entire region. It was clear to me that such a site would have to be of substantial size and have considerable chronological depth. Prior to the discovery of Tepe Yahya, the site of Tepe Nurabad in the Jiroft was our most promising prospect. In fact, in 1971 when we recognized that Tepe Nurabad would provide a substantial horizontal exposure of our third millennium sequence, something we lacked in the step trench at Yahya, we requested permission to excavate Tepe Nurabad. This permission was denied us by Dr. Firouz Bagherzadeh, who had succeeded Dr. Negahban in the newly established Center for Iranian Archaeological Research.

The discovery of Tepe Yahya provided us with precisely the type of site that I had hoped to locate. It was the only site that we discovered in the three months and 6,000 miles of survey that met our requirements! We undertook a four day sondage at its base, which proved only that it was an archaeological site with coarse ware and an unknown painted black-on-red ware. The sherds that littered its surface suggested "relations with neighboring Baluchistan," which was later proven to be true, as well as "a polychrome ware (that) suggests relations with Giyan," which was utterly wrong (Lamberg-Karlovsky 1968).

In order to obtain useful results from the excavation of a mound the size of Tepe Yahya, it was clear that a minimum of five seasons was required. This in turn demanded sustained funding and staffing. The funding was made possible by a series of grants from the National Science Foundation, the Ford Foundation, and private benefactors; most significant in the latter regard were the contributions of Mr. Landon T. Clay. Funding allowed for the season of survey leading to the discovery of the site and six major seasons of excavations: 1968, 1969, 1970, 1971, 1973, and 1975. Each season consisted of a minimum of nine weeks of excavations; the 1969 and 1971 seasons, the longest, were of 11 weeks duration. Additional funds from the National Science Foundation, the Yahya Project, and Mount Holyoke and Radcliffe colleges allowed for 30 months of archaeological survey by Martha Prickett.

The objective established in the first season of excavations was to remain with us throughout the research program: the establishment of a stratigraphic sequence. On the south side of the mound we laid out five 10-×-10 m squares (A–E), the objective being to excavate a contiguous step trench from the top to the bottom of the mound. Each 10-×-10 m square was supervised by a graduate student; assisting them in the digging were six to ten native villagers per square, depending on the conditions of the excavation. None of our villagers had previous excavation experience. In the first two seasons we undertook to train those men more adept at and interested in the excavation to work with the trowel and to be pick-men. We were fortunate over the years to be able to maintain a considerable continuity in our workers, which greatly benefited the control over the excavations. In addition to the graduate students supervising the excavations on the mound, we maintained a house staff that included in any single season a photographer (Dev Kernan, Richard Meadow, and myself); two registrars (Andrea Bankoff, Marian Laaff, Marny Golding, Vicky Tompkins Smith, Richard Meadow, Laura Nash, Glen Dash, Eda Vidali, Mala Heskel, Yasmin Ladjevardi, Barbara Gard, Grace Corso, and Pauline Shankman); and an artist (Ann Hechle, who participated in every field season but 1968; Barbara Westman, Whitney Powell, and Nancy Lambert-Brown, artists at the Peabody Museum, completed additional pottery drawings, small find illustrations, and architectural plans and sections). In 1973 and 1975, Ingrid Reindell acted as full-time conservator on the site; and in 1971 Dr. Rodman Snead and Phil Durgin undertook a geomorphological survey of the vicinity around Tepe Yahya, while Dr. Dexter Perkins and Pat Daly joined us to assist in the program of zooarchaeological analysis.

Continuity of staff is one feature that I conscientiously tried to maintain throughout the excavations, particularly of the graduate students supervising the fieldwork. This monograph on the early periods is a testimony to the success that such continuity affords. Tom Beale was an undergraduate in 1969 when he first came to work at Tepe Yahya. From 1969 to 1975 he participated in each field season, excavating the periods that he reports upon in this volume. In 1971, he completed with distinction his undergraduate honor's thesis, entitled "The Fifth and Fourth Millennia B.C. at Tepe Yahya: A Study of Prehistoric Trade and

Cultural Contact in Southern Iran," and was admitted to the graduate program in anthropology at Harvard, where he continued his involvement in the work at Tepe Yahya on the early periods. In 1978 he completed his Ph.D. thesis, "Tepe Yahya: The Early Periods," which, substantially revised, forms the foundation of this monograph.

Such sustained continuity of involvement leading to the publication of data from Tepe Yahya was not unique to Tom Beale. Others spent several seasons at Yahya, and their publications are either forthcoming and/or now available. Phil Kohl (now of Wellesley College), has detailed the third millennium chlorite corpus from Tepe Yahya (Kohl 1974, 1975, 1978; Kohl, Harbottle, and Sayre 1980). Daniel Potts's (Free University, Berlin) completed monograph on the third millennium at Tepe Yahya awaits publication as the second volume of our final reports on the Yahya Project. Dan Potts's career at Yahya parallels Tom Beale's, from undergraduate honor's thesis to Ph.D., to collaboration in the preparation of the final report on the third millennium. Richard Meadow precisely parallels the sustained involvement of Tom Beale and Dan Potts. His undergraduate honor's thesis recorded the results of our 1968 survey. Over the past decade his interests have been directed toward zooarchaeology; his analysis of the zoological corpus from the early periods through the third millennium at Tepe Yahya will appear in separate monographic form. Meadow provides an introductory chapter (ch. 3) on the geography and paleoenvironment of Tepe Yahya in this volume.

Another student deeply involved with the Yahya Project since 1969 is Martha Prickett. Beginning in 1970, she turned her attention to settlement pattern studies. Afforded the opportunity of an extended period of research in Iran by the award of an N.S.F. dissertation grant, she surveyed broadly throughout southeastern Iran and focused upon the fourth and fifth millennium settlements of the Rud-i Gushk drainage, located twenty-five km from Tepe Yahya. This intensive settlement survey and related sondages in the Rud-i Gushk, associated with fourth millennium agricultural field systems, provides one of the most extensive documentations of early agriculture on the Iranian Plateau (Prickett 1979). The settlement surveys also provide an extraordinarily rich opportunity for an understanding of demographic changes in the immediate vicinity of Tepe Yahya. The results of this work, summarized in chapter 9 of this volume, are being prepared for her Ph.D. and will form the basis of a separate monograph. The surveys that Martha Prickett conducted throughout southeastern Iran were done with the partial collaboration of Andrew Williamson, whose interest, complementing those of Ms. Prickett, focused on the later pre-Islamic and Islamic periods. Williamson conducted, on behalf of the Yahya Project, three seasons of excavations on the early (twelfth–fourteenth centuries A.D.) Islamic community of Dasht-i Deh, located four km from Tepe Yahya in the Soghun valley. Mr. Williamson's untimely death in Oman has left unpublished the important results from this small but prosperous early Islamic community. It is hoped that in time his careful fieldwork will provide the basis of a summary report. Lastly, Dennis Heskel (now of the University of Utah) spent one season at Tepe Yahya (1973) and undertook an important program of analyzing the copper-bronzes from Tepe Yahya, comparing them to samples obtained from Susa, Sialk, Shahr-i Sokhta, and Hissar on the Iranian Plateau. The overall results of his research were presented in his Ph.D. thesis for the Department of Anthropology at Harvard, entitled "The Development of Pyrotechnology on the Iranian Plateau" (Heskel 1981). The specific results reporting on the metal analysis from Yahya were published in Heskel and Lamberg-Karlovsky (1980). A summary of those results is included in chapter 8 of this volume.

The effort of maintaining long-term continuity in staff and encouraging graduate students to assume a major responsibility in our publication program was a very conscious design. The above individuals were at the very heart of whatever success the Yahya Project may have enjoyed. It is no longer possible for a solitary field director to control, comprehend, and publish the results of a long-term archaeological project. The interdisciplinary perspective of field archaeology, together with more rigorous standards of data retrieval and analysis, prohibits one person from completing the classic site reports so characteristic of the past. The alternative I attempted to develop was the sharing of major responsibility with graduate students, who in sustaining a long-term commitment became colleagues in a collaborative endeavor.

The success of this approach is, nevertheless, dependent upon the commitment of the graduate student to persevere and to bring his or her research to fruition even after the completion of the Ph.D. By and large this approach has succeeded, as is attested by this, and forthcoming, monographs.

Our concern for submitting the material remains recovered from Tepe Yahya to physicochemical analysis in order to determine trade patterns, as in Philip Kohl's study of chlorite bowls (Kohl, Harbottle, and Sayre 1980) or Rita Wright's study of Faiz Mohammed and Emir ceramics (Wright 1984), was complemented by analyses to determine aspects in the techniques of production of both our metallurgical (Heskel 1981) and ceramic inventory. In most cases these were undertaken by graduate students in anthropology at Harvard. Pamela Vandiver, in chapter 5, summarizes her results on the technology of production of the early coarse ware ceramics. These results, including a study of the early ceramics from Hajji Firuz, Seh Gabi, Ganj Dareh, and Sarab, are more fully presented in her Ph.D. thesis, "Near Eastern Pottery Production Technology, 8000–3000 B.C.," submitted to the Department of Materials Science and Engineering at the Massachusetts Institute of Technology.

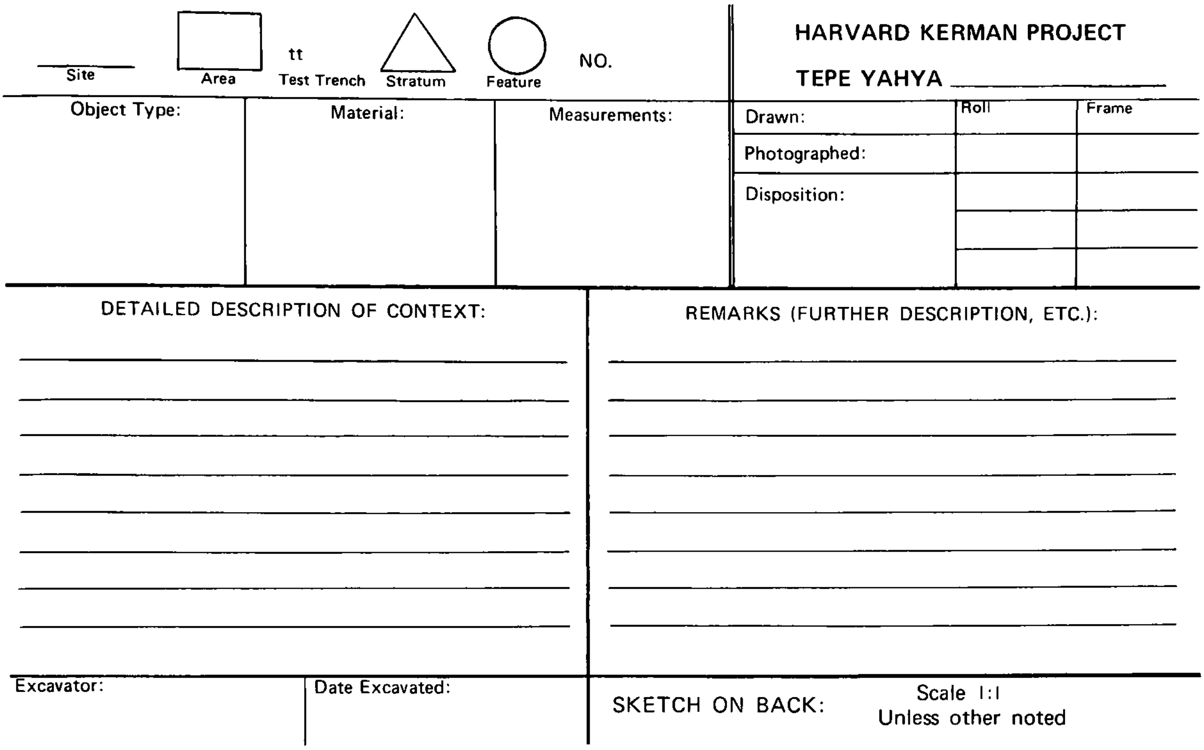
My own interests at Tepe Yahya were directed more to an understanding of the early periods and the Bronze Age, less so to the important Iron Age sequence. Perhaps this is why in our preliminary publications there is a disproportionate emphasis on the earlier periods compared to the Iron Age. James Humphries, who assumed the responsibility of reporting on this work in his proposed Ph.D. thesis, participated in the initial survey that led to the discovery of Tepe Yahya and in every subsequent season except 1975, when no excavacations were undertaken in the Iron Age levels. Humphries's research awaits inception, and the important pre-Achaemenid, Achaemenian, and Parthian/Sasanian settlements remain all but unknown. With the completion of the publication of the excavations of the early periods (this volume), the third millennium (Potts et al.), the settlement pattern (Prickett et al.), the environmental and zooarchaeological setting (Meadow et al.), and the publication of smaller fascicles on the chlorite corpus (Kohl et al.) and Period IVA at Yahya (Hastings et al.), it will be possible to turn our attention to the publication, though in more summary form than is deserving, of the Iron Ages.

I have dwelt at length on personnel, but before turning to the methods of our operations at Yahya I shall list those students and colleagues who participated at the excavations at Tepe Yahya: Peter Dane, David Biernoff, E. C. L. During-Caspers, Nagaraja Rao, Arthur Bankoff, Jane Britton, William Fitz, Donald Whitcombe, Henry Adams, Elizabeth Stone, Abdullah Masry, Connie Piesinger, Thomas Layton, Yasmin Ladjevardi, Christine Lesniak, Mina Sadegh, Raffaelo Biscione, Maurizio Tosi, Marcello Vidale, Michael Toplyn, Greg Gorton, Phil Kohl, Richard Meadow, Dennis Heskel, Dan Potts, Martha Prickett, James Humphries, Denise Schmandt-Besserat, Thomas Beale, Andrew Williamson, and Jeffrey Frye. Our Iranian archaeological colleagues were: Gholam-Ali Shamlou (1967, 1970), Mahmoud Khordovany (1968), Hushang Azimzade (1969), Hussein Baktiar (1973), Ishmael Yaghmai (1971), and Mirabeddine Kabooli (1975). Our cooks were Said Reza, who first cooked for Professor Herzfeld's expedition to Persepolis, and Fayez Mamashi of Nagadeh, who in putting aside his shovel in the excavations of Hasanlu met his challenge and succeeded in keeping us fed for several seasons in an environment in which even eggs and cucumbers were a rarity. Over several seasons the management of our house compound, provisioning of food, and the general management of our expedition supplies were the responsibility of my wife, Martha. Our two sons, who first went to Yahya at the ages of three and seven, provided a sense of another reality and became over the years adept basket-boys.

The methods of excavation, data recording, and analysis remained essentially the same from 1968 to 1975. In 1968 a step trench consisting of five 10-×-10 m squares was laid out on the southern face of the mound from the top to the base (see fig. 2.5). The five 10-×-10 m squares were designated A, B, C, D, and E. A standing balk of 1 m was left between each square and removed when architecture between the squares could be articulated. Expanded areas of excavation were keyed to the central step trench, thus BW was a 10-×-10 m square immediately west of and adjacent to B, while AN2 was two squares north of area A. In 1970 a similar step trench was opened in the north face of the mound. It was our hope that in time we would be able to connect the two step trenches by cutting a series of 10-meter-wide trenches across the top of the mound. This ambitious effort was denied to us by lack of resources and an underestimation of the time it would have taken. As a consequence, the two step trenches remain stratigraphically unconnected. Although our principle effort concentrated upon the excavation of the south step trench, it became increasingly evident that without a stratigraphic alignment of the two step trenches we were virtually excavating two distinct sites on one mound. The northern step trench was aligned with the southern step trench and referred to as X, its individual squares being A, B, C, D, etc., these squares being in direct height alignment with the southern step trench. Thus, XA, XB, etc., were directly opposite A, B, etc., but on opposite sides of the mound, forming a north-south axis. The absence of direct stratigraphic alignment between the step trenches, however, made it impossible to assign with confidence a phase from XC in the southern step trench, which contained entirely Chaff-Tempered Coarse Ware, with a specific phase of Period VI in the northern step trench having generally similar material. From the horizontal exposure in the northern step trench neither the architectural exposure, stratigraphic clarity, nor association of the small find inventory added significantly to our understanding of the early periods. It is within the very end of the third millennium and early second millennium, most particularly Period IVA, that the northern step trench provided significant new data. This monograph provides a comprehensive analysis of the excavations of the early periods in the southern step trench and alludes to the northern step trench only when materials recovered there complemented, contrasted with, or enriched our understanding of the early periods in the southern step trench.

Excavations on the mound began at 6:00 a.m. and continued until 12:30 p.m., with a short mid-morning break of 20 minutes. In the afternoon, excavations resumed at 3:30 p.m. and continued until 6:00 p.m. In the first year of our excavations (1968) we paid our workers 60–80 rials per day. By 1975 this had risen to 100–150 rials per day (throughout that period the dollar remained constant at 75 rials). Every effort was made over the years to maintain specific workers who had shown interest and skill in their assigned work. Our pick and trowel workers were the highest paid, resulting in competition for those positions and a desire to perform with care.

Work proceeded by the careful picking of an area, often with small hand-picks manufactured in Israel for this specific purpose. These I brought to the excavations from Israel in 1970, gifts from Yigael Yadin. All sherds recovered were placed in cloth bags and labeled according to their specific context. Materials from isolated features, pits, hearths, floors, rooms, walls, etc., were specifically identified. Strata were given sequential numbers with the beginning of each season, their number placed within a triangle; feature numbers were placed within a circle. Following the clearing of a 10-×-10 m square, excavation proceeded within a test trench. This test trench (TT) varied in size depending on the area within the 10-×-10 m square being excavated. Thus, in a



Site | Area | tt Test Trench | Stratum | Feature | NO.

HARVARD KERMAN PROJECT

TEPE YAHYA

Object Type:	Material:	Measurements:	Drawn:	Roll	Frame
			Photographed:		
			Disposition:		

DETAILED DESCRIPTION OF CONTEXT:

REMARKS (FURTHER DESCRIPTION, ETC.):

Excavator: | Date Excavated: | SKETCH ON BACK: | Scale 1:1 Unless other noted

Figure 1.1. Small finds card used during Tepe Yahya excavations.

single 10-×-10 m square with standing architecture, two or three such test trenches may have been excavated perpendicular to the standing walls; these would be labeled TT_1, TT_2, etc., with their appropriate triangle and circle designations. These test trenches would be excavated to the depth of the next clearly identifiable stratigraphic division. The test trenches were meant to provide a preview of underlying stratigraphy and a guide toward the excavation of the remainder of the 10-×-10 m square.

Following a picking, all materials recovered were collected by fine-troweling the disturbed earth. Small finds were placed in individual containers: match boxes, plastic bags, etc.; ceramics were placed in cloth bags; bones in plastic bags, following drying by exposure to the sun. Each site supervisor was responsible for filling out a 5-×-8 inch small find card, an example of which is shown in figure 1.1. The reverse side included a sketch of the object. The bones were all sorted by Richard Meadow, whose forthcoming Ph.D. thesis will include a study of the zooarchaeological materials from Periods VII–IVC at Tepe Yahya. The zooarchaeological collections, after sorting, were shipped to the Peabody Museum. Sherd bags from specific contexts were deposited in individual square bins of mud-brick, located directly adjacent to our expedition house. The sherds were then washed by two local women. The sherds each season and from all periods were processed by me every morning and afternoon. Full-profile sherds, rim sherds, and decorated sherds were uniformly preserved and turned over to the registrars, who wrote the context on each sherd in India ink, then covered their designation with clear nail polish. After the sherds were registered, I selected those to be drawn by the artist. Each season over 1,000 sherds were drawn in the field. As I alone processed the sherds each season, I came to have the fullest understanding of the ceramic corpus. In 1971, 1973, and 1975, I took quantitative counts of sherds from specific areas on the mound. These counts are of greater significance for Periods IVC–IVA, where there is a greater typological variation, than for the early periods, and it is in our third millennium report that they play a more significant role. At Yahya for Period VII, 100 percent of the ceramic inventory was Chaff-Tempered Coarse Ware. No full profiles could be reconstructed. For Period VI, in all its phases, coarse chaff-tempered pottery vastly dominated. Few full profiles could be reconstructed, and those that could be are all illustrated here. Finer or painted wares never exceeded 3 percent of the total corpus.

Period VB continued the coarse ware tradition as the dominant ceramic with the addition of plain finer wares and painted Black-on-Buff wares. These types are all illustrated in the text. The most extensive quantitative analysis of Period VB and VA ceramics was undertaken by me in 1971 and by Glen Dash and myself in 1973. These analyses are not included here, nor are those undertaken by Martha Prickett in 1970. Attention was paid to the first occurrences of a new type found in good context, in *relative* proportion to other types. Thus for rare types such as Soghun Bichrome

Ware of Periods VIB.2–VC, a total of 16 sherds was found; while the Black-on-Buff wares in one area of excavation ranged from Period VC, "rare," with only three sherds; to Period VB, where it was "common" (in certain contexts being 40 percent of the total inventory, in other contexts less than 10 percent); through Period VA, when it was once again "rare," only 13 sherds being discovered. Ceramics were not quantified in all areas, so it seems unwise to present only those areas that were quantified, as it would skew the full picture. It seems equally unwise not to be guided to a certain extent by those areas that were quantified. Thus, a compromise approach has been taken that indicates the relative proportion of major types to each other and that specifies their actual numbers where specific types were rare and/or unusual. This approach is, on the one hand, more specific than indicating mere presences and/or absences of types within a given context or period, and on the other hand, less specific than providing absolute numbers of the occurrence of all ceramic types.

The obvious might be pointed out: that ideally one should quantify *all* ceramics recovered. The analysis of the fully quantified corpus should differentiate between all types recovered from their specific contexts, i.e., floors, fill, hearths, pits, etc. This quantified data derived from single periods or strata can then be usefully compared to similarly quantified data from other periods, strata, or contexts. If we had taken this approach, we would have had to restrict both the extent and duration of our excavations. This would have been essential to do in order to control the large body of ceramics retrieved and to adequately record that data according to its specific context and type identification. The complete analysis of each season's ceramic corpus would have had to be done each season in the field, because access in later years to study the collections that were returned to Teheran was at best dubious. In light of the above factors, I decided to take a compromise position: to quantify in a few restricted areas and to deal with relative proportions in other areas in order to maintain a longer season of excavation with greater horizontal exposure. In retrospect I believe the trade-off was entirely justifiable, although there are specific instances in which more thorough quantification might have elucidated and even resolved specific problems.

The selection of all the ceramics and small finds that were drawn and photographed in the field was made by me. At the end of each season a division of archaeological finds was made between the Archaeological Service of Iran and the Peabody Museum, Harvard University. As we were unaware during the field season which institution would obtain which particular artifact, every effort was made to record each selected piece through photography, artist's drawings, or both. Photography logs were maintained, an example of which is presented in figure 1.2. Through the small find cards, photography logs, artist's drawings, and field journals, a complete record of all the excavated artifacts is available in the Peabody Museum. Even this "final" report on the early periods does not provide a complete publication of all available sections, plans, or drawings of artifacts (as the artifact catalog of appendix B makes evident).

At the end of each excavation season, we would truck a few hundred bags of sherds, bones, and the entire inventory of small finds back to Teheran, where a division of the archaeological finds was carried out. The small finds were divided into two reasonably equitable "shares." From the large pile of sherd bags, a member of the Archaeological Service would simply remove an allotment (never more than 25 percent of the total) as the service's share. The division of the small finds took place literally by drawing from a hat, or from another suitable container, one of two folded papers indicating the letter "A" or "B." These letters referred to the two piles of small finds; the letter selected indicated which pile became your institution's share. This process was always undertaken in the best of spirits, and often in the presence of the Minister of Culture and Arts, Mehrdad Pahlbod. It should be mentioned that prior to the division the Archaeological Service claimed ten objects of their choice; at times surprising us by stating that all tablets, or all seals, were to be counted as a single object within their complement of ten. At other times a sense of suspense was added to the division when I weighted one pile more heavily than the other, gambling on the luck of the draw in winning the larger share. I did this in the 1970 and 1971 seasons, winning in 1970 and losing in 1971. I never did it again! Today a substantial collection from Tepe Yahya is housed in the Peabody Museum; over 500 trays (26 × 17 × 3 inches) are sagging beneath the weight of the sherds they contain.

All site supervisors were responsible for maintaining a daily log recording the progress of their excavation. These journals include numerous sections, plans, and a narrative description of the course of work undertaken in their area. In this volume, only a small percentage of the total number of plans, sections, and materials is published. This is inevitable in any distillation such as a "final" archaeological report. What ends up being published in this type of report is that which in the subjective judgement of the research team is of major significance. This differs fundamentally from a site report on an excavation which explicitly tests a hypothesis, wherein the data published is often restricted to the specific materials relevant to that hypothesis. Such a report, entirely valid as an approach, is neither better nor worse than another approach, merely different! Both serve specifically different ends. Ideally, both approaches provide the publication of a data base that allows for the formulation and/or rejection of new ideas.

The drawing of all major sections and plans in the field was done by myself in collaboration with the site supervisor. It should be pointed out that over the course of five seasons at Tepe Yahya, Tom Beale devoted his energies exclusively to the excavation of early period levels. This continuity, aided by the distillation of his own field journals, makes him the ideal person to bring together an analysis of the early periods at Tepe Yahya.

It is now necessary to discuss what this volume does not

HARVARD KERMAN PROJECT **EXCAVATIONS AT TEPE YAHYA**

(1) FIELD SPECIMEN SHEET OR TY/70 PX-6
(2) PHOTOGRAPHIC LOG SHEET

DATE	exp. NO.	(1) DESCRIPTION AND ASSOCIATION (2) SUBJECT AND DESCRIPTION	(1) MEASUREMENT (2) FILM TYPE, F-STOP, SPEED	FILE NO.
13 july	3+6	AW - A Two successive layers of architecture with a platform in		
		between: upper layer is 7 platform is 7 4 lower layer is 8		
13 july	9	XC TT2 2b 4 Black on red pot, geometric, period VA-B		
13 july	12	XA 2A-1 and 4A 5 Large mudbrick wall.		
13 july	15	XA TT2 4A 3 Doorway 4 , bread oven 5 and large		
		mudbrick wall.		
15 july	18	AN1 S Head of reddish clay male figurine (soldier)		
15 july	24	AN1 S Front view of reddish clay male figure (soldier)		
15 july	27	AN1 s Back view of reddish clay male figurine (soldier)		
15 july	29, 31, 35	AN1 TT3 2 3 Bronze pitcher.		

Figure 1.2. Sample of photographic log used for excavations at Tepe Yahya.

contain and the reason for the omissions. There are few final reports of excavations published today. The reward of an excavation is in the excitement of its actual undertaking, its penalty is in the fulfilling of an obligation to publish its results. It is easy enough following the completion of excavations to become distracted by other interests and responsibilities. I have been exceedingly fortunate in having committed and able colleagues, such as Tom Beale, who have at times forced my attentions to return to Tepe Yahya.

The reader may be a bit disappointed by the absence of extended methodological or theoretical discussions. The work undertaken at Yahya from 1967 to 1975 coincided with a real ferment, some would say a revolution, in the epistemological framework of archaeological research. Our excavations at Yahya steered clear of the narrowly defined testing of particularistic hypotheses. We directed all our resources toward the singular goal of building an archaeological sequence through excavation, survey, and the analysis of as many categories of material remains as was humanly and financially possible. Much of this work still continues. It is our hope that the work presented here adds to our understanding of the fifth and fourth millennia society in the Near East. Much remains to be done in order to better understand this important time period. It can be considered a testimony to how very little we do know that the data presented here provide as extensive a picture for this time period as is available from any other excavation in the ancient Near East.

One might argue plausibly that the results from the study of the zooarchaeological, metallurgical, botanical, settlement survey, et al., should be published together in one volume. For us this is not only impractical but impossible, for each of the above is the subject of an independent Ph.D. thesis. First, the results of these various studies cannot be condensed into a single volume. Second, the pace and merit of research results varies according to the scholar(s) involved. Some scholars are still conducting their research, others are finished, and still others await complementary results from the analysis undertaken by colleagues. In light of this, it was deemed appropriate to put forth this completed volume and await the completion of the volume reporting on the later settlement patterns and the bioarchaeological remains.

I have written elsewhere on the development, priorities, and varying conceptions, at times contradictory, that motivated me throughout the undertaking of archaeological research at Yahya (Lamberg-Karlovsky 1973). Only one element needs to be reiterated: the essential geographical isolation in which our work proceeded in relation to other programs on the Iranian plateau. Admittedly, this isolation may be more perceived than real. Prior to 1967, archaeological research on the eastern Iranian plateau was, save for the archaeological reconnaissance of Sir Aurel Stein (1937), simply nonexistent. In that same year three sites were excavated: by Miss de Cardi at Bampur, by Professor Joe Caldwell at Tal-i Iblis, and by Professor Maurizio Tosi at Shahr-i Sokhta. In 1967/68 I joined with Joe Caldwell and Cyril Smith as one of the principal investigators on an N.S.F. project to undertake extensive excavations at Tal-i Iblis. Our N.S.F. grant was funded, but a case of hepatitis contracted in Syria on survey in the summer of 1967 prevented me from participating. Beginning in 1967, excavations at Bampur, Iblis, Shahr-i Sokhta, and Yahya began to create a framework for an understanding of the eastern Iranian plateau and resulted in a productive collaboration between Maurizio Tosi and myself which has endured for fifteen years. The remoteness of Tepe Yahya, with its difficult accessibility, meant that over the years not a single archaeologist not affiliated with our staff visited the excavations. To this day, I believe that the only scholars to have visited Tepe Yahya are Brian Spooner, Richard Frye, and Thierry Berthoud. Berthoud was undertaking a survey of copper ore deposits and has since reported upon the mine of Sheikh Ali some 10 km from Yahya (Berthoud et al. 1978). In 1968 we were visited for several days by Ted Wertime's team in search of tin deposits on the Iranian plateau. We welcomed Ronnie Tylecote, Fred Matson, Benna Rothenburg, Radomir Pleiner, and John Wertime.

Tal-i Iblis and Yahya remain the only sites with a substantial excavation of the early periods in southeastern Iran. Shahr-i Sokhta and Bampur have not revealed evidence for settlement prior to the very beginning of the third millennium. The ceramic and architectural relationships between Iblis I–III and the early periods at Yahya are very strong. Iblis I–III, Yahya VA, and Chah Husaini (Stein 1937:127) share an identity of ceramics that are present over a wide area of southeastern Iran. It is clear that by the mid-fourth millennium this region shared a homogeneous and prosperous village-farming economy that covered a wide area. The distribution of Period VA ceramics extends from Chah Husaini in the east to Hajjiabad (located on the main Kerman-Bandar Abbas road) in the west, a distance of over 475 km by air; while from Shahdad north of Kerman to south of Minab, Period VA sites are distributed over 500 km on a north-south axis. The uniformity of ceramics over this wide area by the middle of the fourth millennium suggests an unexpected homogeneity of material culture, behind which rests an equally unexpected and as yet poorly understood social and political integration.

How far back did the prehistory of this area extend? When we were excavating the early periods at Tepe Yahya, the site represented the earliest excavated agricultural settlement on the eastern Iranian plateau. Only the small aceramic exposure at Kili Ghul Mohammed in Pakistan suggested the presence of earlier neolithic settlements in the east, including both Pakistan and Afghanistan (Fairservis 1956). However, the evidence for Kili Ghul Mohammed as an aceramic Neolithic village site was highly controversial. Our radiocarbon dates for the early periods at Yahya seemed to indicate an early fifth through early fourth millennium sequence—in other words, a comparatively late Neolithic settlement. The radiocarbon dates for Tal-i Iblis Period I clustered in the middle of the fifth millennium (Caldwell 1967:24). Three dates from site R37, contemporary with or perhaps slightly earlier than Period VII at Tepe Yahya, clustered around 4700 B.C. (uncorrected). Thus, it appeared that Tepe Yahya was initially settled in the first half of the sixth millennium. With the recent excavations in Pakistan at Mehrgarh, the question of an early and essentially independent Neolithic process east of the Zagros has been proposed (Jarrige and Lechevallier 1980; Meadow 1981).

Prior to the excavations at Mehrgarh only Kili Ghul Mohammed suggested the presence of an early village farming community east of the Zagros. A single radiocarbon date for the *upper* levels was 3350±200 B.C. (5570 half-life) (Fairservis 1956:356). Over twenty-five years ago Fairservis (1956:357) wrote:

> The dates for Kili Ghul Mohammed I do not seem to be too conservative, if one accepts the general tendency among Near Eastern archaeologists to consider the Indo-Baluchistan Area as on the fringe of a "Nuclear Near East"
>
> It may well be that the beginnings of Kili Ghul Mohammed I reach into the fifth millenium, thus placing the latter assemblage closer in time to such early village complexes as those at Jarmo and Jericho.

The recent excavations at Mehrgarh invigorate this older view and raise again the conflicting view that juxtaposes the independence versus diffusion of agricultural origins east of the Zagros mountains. Meadow (1981) has argued persuasively for the indigenous process of animal domestication at Mehrgarh. Jarrige and Lechevallier (1980:253) are adamant that "it is no longer possible to refer to diffusionism to explain a late development in Baluchistan which is, in fact, characterized by a synchronous evolution with that of western and central Asia." Period I at Mehrgarh is almost certainly dated prior to 6000 B.C. Period II in its generalized features of architecture and ceramics bears a relationship to Yahya VII. A single radiocarbon date of 5378±120 (5730 half-life) for Period II appears to be entirely acceptable for the beginnings of settlement at Tepe Yahya. What Fairservis indicated as plausible, Jarrige's excavations have confirmed. We are no longer surprised that indigenous agricultural processes took place in areas of the natural occurrence of domesticable plants and animals. One must turn away from the Janus-headed perspective which juxtaposes "diffusionism" against "synchronous evolution" and recognize that both elements are involved in the "Neolithic" process. The transition to agriculture took place within a very wide geographical area and chronological expanse. We are only now coming to an appreciation of the geographical extent and the chronological expanse of the process we refer to as the "Neolithic Revolution."

Tepe Yahya's earliest settlement represents a very late stage of agricultural development. The fact that far earlier settlement is evident in this part of Iran was suggested years ago (Huckreide 1961:25–42). The Kuhbanan microlithic industry, north of Kerman, attests to a Neolithic presence predating the settlement of Yahya within this region of Iran.

Finally, we are left to mention that the publications of the excavations at Tepe Yahya do not conform to the normal pattern of final reports. Typically, final reports are synthesized from the various field journals by the director, with additional chapters being contributed that deal with "specialty" studies. The publication of the Yahya excavations is a process that has involved multiple authorship, concluding with the publication of this integrated body of data. We still await publication of the full bioarchaeological data and settlement analysis, both of which are forthcoming. Not so many years ago the director of an excavation, often with a limited staff of archaeological assistants, was solely responsible for the publication of the results. Two factors, at a minimum, were responsible for this past condition: a small supporting staff, often involved for only short periods of time on the same project; and approaches to both the field excavation and the analysis of data which were less demanding than they are today. Astonishingly, as recently as the 1960s a senior archaeologist (Lloyd 1982:187) could state:

> The actual excavations were "conducted" by the director; any form of teaching being restricted to the inclusion of an assistant supervisor, whose function was that of an apprentice, qualifying for fuller independence.
>
> It was accordingly with some misgivings that I now accepted applications from students—to be given experience on a Near Eastern excavation.

The authorships of the Yahya volumes reflect our teamwork approach to the project, which in turn was made possible by the continuity of our staff. Authorship leading to the publication of this volume can be separated into two major components, not readily evident from the title page: (1) authorship of excavation, and (2) authorship of analysis.

By the authorship of an excavation we refer to those who supervised the actual excavation of specific areas pertaining to the early periods. These people were responsible for writing in their field journals the results of each day's work, for drawing sections, and for planning the architecture (the latter two items often accomplished with my own involvement). Additionally, they were responsible for completing the small finds cards on each object recovered from their own area of excavation. In sum, the individual site supervisor was responsible for the authorship and presentation of the raw data recovered from excavation. Every effort was made to standardize the manner in which each site supervisor reported upon this data. A great deal of credit in authorship is to be given to the individuals whose field journals were utilized in synthesizing this monograph. Foremost among them is Tom Beale, for his involvement in excavating the early periods was of paramount significance. His own excavations in Areas C and D from 1969–1975 offered the fullest and most detailed picture for Periods VII–VA. Others who participated in the authorship of excavation for the early periods include: Richard Meadow, Jane Britton, Arthur Bankoff, Greg Gorton, Dennis Heskel, and Abdullah Masry.

All of the above were involved for various periods of time in excavating areas attributable to the early periods. The results of their work as reported upon in their field journals are synthesized in this volume.

The authorship of analysis belongs more entirely to Tom Beale, in the presence of my own continuous collaboration. It was he who brought together the results of the various areas of excavations, provided the pottery analysis, and detailed the stratigraphic sequence. As the director of the Yahya Project it fell to me to decide upon where and how long to dig and survey, what methods to employ, what specific questions to address, and which materials to extensively analyze. The sole motivation in responding to these questions and in deploying our resources was to elucidate as fully as possible the social, technological, and environmental aspects of this Late Neolithic and Bronze Age community.

After sixteen years of familiarity with Tepe Yahya, I am not unhappy to set aside this first monograph of our final publications. We have intentionally constrained ourselves in this, and in forthcoming volumes, from providing extensive interpretations of anthropological significance derived from this data base. The data reported upon here reflect human institutions, their nature and change. It is hoped that this monograph provides an adequate data base that can be used in conjunction with other excavations of a contemporary nature. In this manner a comparative approach can be utilized in developing particular hypotheses that address human adaptations to given environmental, technological, demographic, and social patterns of evolution.

Chapter 2

The Site

Thomas Wight Beale

Peabody Museum, Harvard University

Tepe Yahya was discovered by C. C. Lamberg-Karlovsky, director of the joint mission of the Harvard Peabody Museum and the Archaeological Service of Iran, while on survey in southeastern Iran in the summer of 1967 (fig. 2.1). The only previous archaeological survey in this part of Iran had been that of Aurel Stein in the 1930s (Stein 1937). The primary reason that this area remained relatively unexplored until the late 1960s is that archaeologists had assumed, because of the harshness of the climate, that this part of Iran was a cultural backwater from the fifth through second millennia B.C. Most archaeological work until the 1960s was concentrated in the two major river basins west and east of southern Iran: the Tigris-Euphrates valley and the Indus valley. However, the excavations that began at Yahya in 1967, and in the 1960s at other early sites in southeastern Iran such as Bampur, Shahdad, Shahr-i Sokhta, and Tal-i Iblis (fig. 2.2), have shown that southeastern Iran played not a passive but an active role in the early history of western Asia (Lamberg-Karlovsky and Tosi 1973).

The mound of Yahya rises 19.8 m in height and stands out dramatically and imposingly above the flat floor of the Soghun valley (figs. 2.3 and 2.4). The base of the mound, 187 m in diameter, forms an almost perfect circle (fig. 2.5). It remains the largest known prehistoric mound in southeastern Iran. A heavy scatter of sherds (Vidali and Lamberg-Karlovsky 1976)[1] extends up to a kilometer across the plain in all directions from the site.

Yahya appears to have been occupied continuously for more than five thousand years, with the only major gaps in the occupation coming late in the fourth millennium B.C. between Periods VA and IVC and in the second millennium B.C. between Periods IVA and III. The chronology and periodization for Yahya's later periods are as follows:

Period I	Parthian/ Sasanian	200 B.C. – 225 A.D.
Period II	Achaemenian/ Hellenistic	475–275 B.C.
Period III	Iron Age	700–525 B.C.
Period IVA	Elamite	1700–1400 B.C.
Period IVB.1	Elamite(?)	1800–1700 B.C.
Period IVB.2–6	Elamite(?)	2400–1800 B.C.
Period IVC	Proto-Elamite	2850–2750 B.C.

For the earliest periods (VII, VI, V), we have extended the chronology and modified the periodization previously published (Lamberg-Karlovsky 1970b:5). The new periodization for the earliest periods is as follows:

Period IVC	2850–2750 B.C.		
Gap	3300–2850 B.C.		
Period VA–B	3700–3300 B.C.	VA	3600–3300
		VB	3700–3600
Period VI–VC	3900–3700 B.C.	VIA–VC	3800–3700
		VIB	3900–3800
Period VII	4900–3900 B.C.	VIIA	4000–3900
		VIIB	4200–4000
		VIIC	4500–4200
		VIID	4900–4500

This chronology is based primarily on a series of radiocarbon dates from good contexts within the Period VII–V sequence and from contemporary Period VII sites (R37, R26; see fig. 9.1) in the valley immediately west of the Soghun valley (fig. 9.2; Prickett 1985). Neither the chronology nor the radiocarbon dates themselves have been "calibrated." This was a conscious decision in light of the continuing adjustments being made in date calibrations for these early time periods and the very wide time ranges and standard deviations required in making these calibrations (Klein et al. 1982). All references to calendar "B.C." dates in this volume are based on the uncalibrated 5730 half-life radiocarbon chronology, unless otherwise specifically noted. Table 2.1 lists the uncalibrated 5730 half-life radiocarbon dates used, together with the originally published B.P. dates based on a 5568 half-life.

The only significant difference between the periodization here and the periodization originally published is that an additional period (VII) has been created at the early end of the time scale out of what previously was designated as

1. The correct spelling of the name is Vidale. In the literature, however, both M. L. Vidale and E. Vidale are cited as Vidali.

Table 2.1. Radiocarbon dates for the early periods.

Period	Locus	Lab #	B.P.(5568)	B.C.(5730)
N-VA.1	XCE.71.14B.39	Beta 6560	5060 ± 110	3260 ± 110
VA	R26.73.T1.2.3	Beta 6480	5160 ± 110	3360 ± 110
VA.1	C.68.T7.1	WSU 872	5580 ± 280	3800 ± 290
VB	C.69.T1.1.5	Beta 6476	5210 ± 130	3420 ± 130
VIB.1	D.69.4	GX 1737	5570 ± 160	3790 ± 160
VIB.2–1	D.69.T1.7	GX 1728	5610 ± 140	3830 ± 140
VIIB.2	D.68.t6.1-2	Beta 6559	5550 ± 80	3770 ± 80
VIIB.4	D.68.6.7	GX 1509	6070 ± 180	4300 ± 190
VIIC.1	D.69.T2.14	Beta 6561	5680 ± 200	3900 ± 210
VIID–C or earlier	R37.14	PRL 748	6640 ± 180	4890 ± 190
	R37.19.1	PRL 749	6650 ± 180	4900 ± 190
	R37.T1.4.3	PRL 744	6670 ± 150	4920 ± 150
Unacceptable dates				
N-VA.1	XCE.71.T2.14.30	Beta 6483	4060 ± 80	2230 ± 80
N-VB	XC.71.T2.8N.28	TUNC 38	4254 ± 84	2430 ± 90
VC	C.69.7.13	GX 1736	3290 ± 120	1440 ± 120
VIA	C.69.T3.1.2	Beta 6477	6870 ± 550	5130 ± 570
VIIC.2–1	C.70.T6.3	TF 1139	4195 ± 110	2370 ± 110

Periods VIE, D, and C (Lamberg-Karlovsky 1970b:112–113). The reason for this creation of a new period derives from the analysis of the earliest ceramics. We found that between the old Periods VIE, D, C and VIB there were significant ceramic changes: VIB marks the first appearance of painted fine wares (Bichrome Soghun Ware and Red-Painted Soghun Ware) and also distinct changes in the shapes and the tempering of the ongoing Chaff-Tempered Coarse Ware. Since each new period on the site (designated with a Roman numeral) is marked by the introduction of a major new ceramic type (Period V marks the introduction of Black-on-Buff Ware and Lapui Ware), it was felt that these ceramic changes early in the sequence were distinctive enough to warrant the creation of an additional period. This new periodization also makes more sense when one observes the significant changes in architecture that occur between Periods VII and VI.

CHRONOLOGICAL/CERAMIC PARALLELS WITH OTHER EXCAVATED SITES ON THE IRANIAN PLATEAU

Based on ceramic parallels (discussed in detail in ch. 3) between Yahya and the nearest excavated sites and, secondarily, on the radiocarbon dates for these other sites (Caldwell 1967:24; Sumner 1972:55), approximate period correlations with other sites have been established, as shown in table 2.2.

THE EXCAVATIONS

The plan of the excavation was to lay out a series of 10-×-10 m squares, forming step trenches down the north and south sides of the mound (fig. 2.5). When a full and continuous stratigraphic sequence had been obtained (figs. 2.6, 6.11–6.31) from the top of the mound to sterile soil, additional trenches were laid out beside the step trenches to gain a fuller horizontal exposure. All deposits were excavated stratigraphically, and each artifact was recorded by its stratum and feature association. The findspots of the most important artifacts and artifacts recovered in situ on floors and surfaces were measured three-dimensionally from datum points within the trench. One-meter-wide balks between trenches were taken down only after being drawn. Additional balks were kept between the 10-×-10 m squares where it was considered useful to understanding the stratigraphy. Deposits from a selected number of floors, surfaces, hearths, and intact pots were screened through a ¼-inch mesh screen and/or flotated (cf. Tosi 1976).

Deposits from Periods VII, VI, and V were excavated in 12 different trenches: B, BW, C, CW, D, E, CDE, XB, XBE, XC, XCE, and XD. These represent a total area of approximately 1,175 m^2

METHOD OF ANALYSIS

For the purposes of analysis, the materials from the early periods at Yahya have been broken down here into three major categories: ceramics, architecture, and small finds. The first and most time-consuming task in the analysis was to generate a flow chart showing the sequence and relationships of every excavated stratum and feature from Periods VII–V. This required correlating excavation descriptions from the more than 20 different field journals from the 12 different trenches. Since strata and feature designations usually were started at "1" for each season and each trench, it was necessary to fit together in an orderly stratigraphic sequence and assign to a period and phase over a thousand different strata and features (appendix C).

Since the step trenches on the south and north sides of the mound never were joined stratigraphically, the descriptions of ceramics, architecture, and small finds from the south and north sides are for the most part kept separate. The south side excavations (fig. 2.7) constitute the original basis on which the ceramic sequence and periodization were based; the south side also has a larger exposed area. Materials from the north side (fig. 2.8) are distinguished by an "N-" symbol in front of the period designation. An attempt has been made to equate the north side in its periodization to corresponding periods and phases on the south side. The basic criteria here for establishing equivalencies between the north and south sides were the parallels in the ceramic assemblages of each side. With the exception of the eastern half of Trench XCE, where the strata were more difficult to distinguish and the deposits therefore more mixed, the north side periodization equates very well with that of the south side:

South Side Periods	*North Side Periods*
VII	N-VII
VI	Minimal deposits
VC	Minimal deposits
VB	N-VB
VA.2	N-VA.4–3
VA.1	N-VA.2–1

In the catalog of small finds (appendix B) and the description of architecture, we have listed the original feature and strata designations of the artifacts and architectural features. The code used follows a simple decimal notation. For the provenience C.68.T6.9.4, for instance, "C" indicates the trench, "68" is the year of excavation, "T6" is the test trench number (in situations where test trenches were used), "9" is the stratum number, and "4" is the feature number. Feature numbers were used to designate a variety of individual or composite features: whole rooms, floors within rooms, outside surfaces, hearths, individual walls, pits, platforms, rubble concentrations or layers, ash lenses, midden dumps, and so on. The word "level" is used interchangeably with the word "stratum" throughout the discussion.

The descriptive section on ceramics is based on the descriptive field notes of C. C. Lamberg-Karlovsky, who did all the initial processing of excavated pottery and chose the sherds to be saved, and on the approximately 15,000 sherds shipped back to the Peabody Museum. Sherd counts were kept only in a few selected strata of Period V. These counts are given at the beginning of the descriptive section on ceramics. In the rest of the descriptive section, sherd counts are not included because the analyzed sample at the Peabody Museum does not accurately represent the true percentages of different types, and counts therefore would only be misleading. Unusual sherds (which often turned out to be intrusive) or sherds of rare types were almost always saved, while only a representative sample of the more common types (such as Chaff-Tempered Coarse Ware, Plain Coarse Ware, Black-on-Buff Ware, and Black-on-Red Ware) was kept, with a general emphasis on saving all rims, bases, and painted sherds. The result is that the corpus brought back from the field includes many intrusive sherds, virtually all the sherds of rare types (in which case we have given actual sherd numbers), and an underrepresentation of the most common types.

Within the description of each type, a rough (and admittedly subjective) assessment is given of how numerous the sherds of that type are within a given period. We have used the terms "very rare" (usually five sherds or less), "rare," "common," and "very common." These designations refer not to the numbers of sherds of one type in a

Table 2.2. Chronological correlations with other sites and areas.

Uncalibrated B.C. Range	Yahya	Tal-i Iblis	Tal-i Gap	Bakun B (Egami and Masuda 1962)	Sialk	Susa	Deh Luran (Hole 1977:27)	Mesopotamia
4900	VIID				II		Khazineh Phase	
4200	VIIC			II	II		Mehmeh Phase	
4200	VIIB			II	II	Susiana *c–d*	Bayat Phase	Late Ubaid
3900	VIIA			II	II			
3900	VI	0	I	II	II			
3700	VC	I	I	I	II			
3700	VB	I	II	I	III	Susa A		
3300	VA	III/II	II		III			

given period relative to the overall numbers of sherds in the corpus of that period but to the number of sherds of that type relative to the number of sherds of the *same* type in succeeding and preceding periods. Thus, if a type is listed as rare in one period but common in the next, it means that in the lifespan of that ceramic type, the common period is its period of greatest use, and a period in which the sherd numbers appear to be higher than in the preceding rare period. In several instances where types are listed as rare or very rare, the numbers are so small that the type probably can be considered intrusive in that period or phase.

The primary basis on which the different ceramic types were defined and distinguished from one another is a combination of ware, temper, surface decoration, and surface color. Using one or more of these criteria, the ceramic corpus is easily divisible into several mutually exclusive types that overlap only in terms of their shapes, and then only occasionally.

For the descriptive section on architecture, it should be pointed out that all length and width measurements for rooms

Figure 2.1. Aerial view of Soghun valley, southeastern Iran. Circular outline of Tepe Yahya is indicated by arrow in southwest corner of valley.

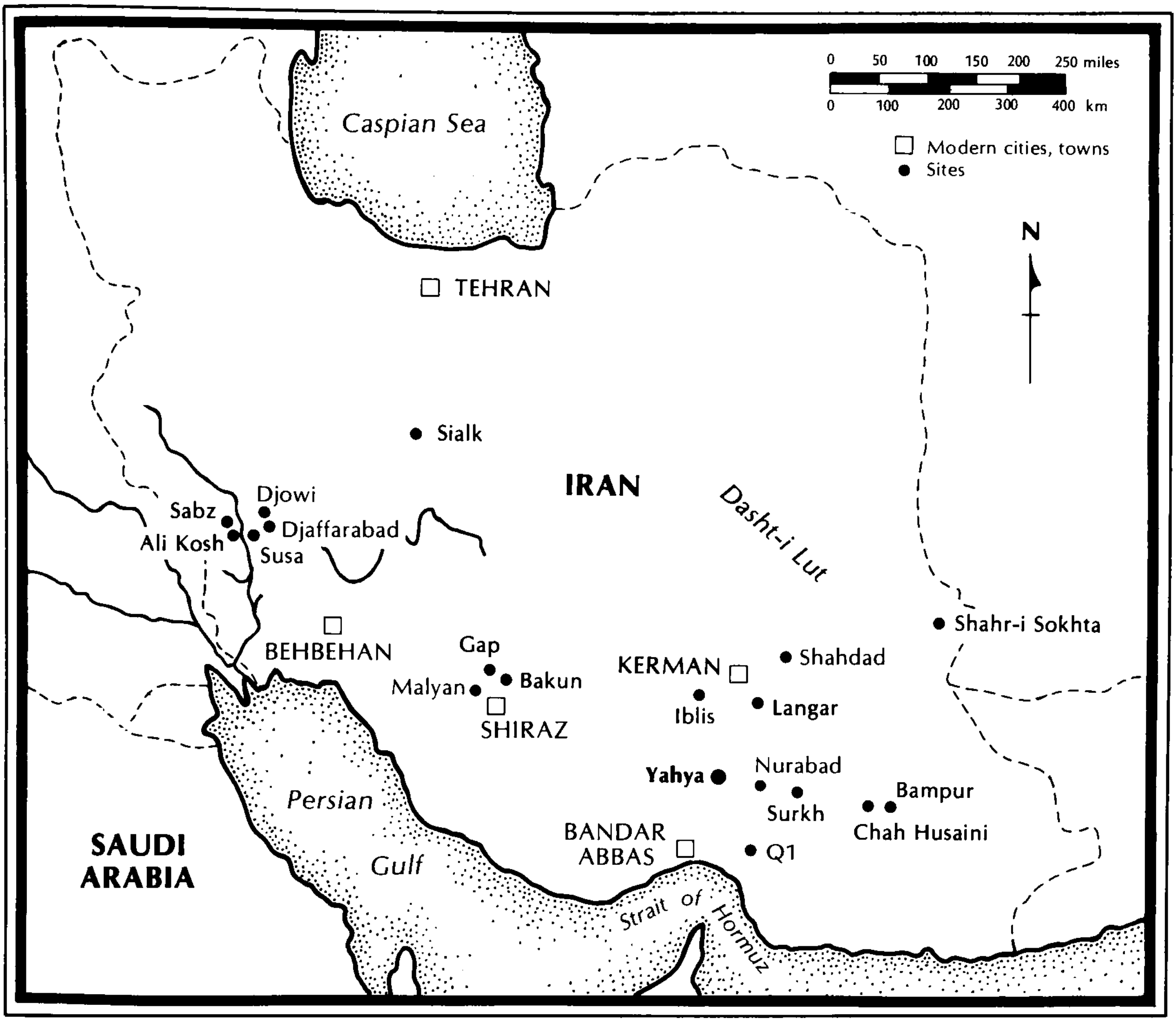


Figure 2.2. Map of selected early sites in Iran, 5000–2000 B.C.

were taken across the centers of the rooms, from inside face to inside face. For the most part, wherever artifacts were recovered in situ on floors or surfaces, they are recorded on the architectural plan. A detailed contextual and associational analysis of the artifacts within the architecture will not be attempted, for the simple reason that less than 5 percent of the 992 artifacts come from floors or surfaces. The great majority come from general fill *above* floors and surfaces. Most artifacts were removed when architectural complexes were abandoned, and during occupation, "living areas" were kept relatively clean. In only a couple of instances have "dumps" for broken pottery, artifacts, and organic debris been found within the area of excavation.

As much detail as possible is included in the architectural descriptions. Indeed, it is the longest chapter in the volume, deserving of such status, we felt, because we have at Yahya perhaps the best and longest sequence of well-exposed prehistoric architecture in all of Iran. Where there are obvious lacunae, such as not describing the fill of the room or whether or how it was plastered, the reason is that this information was not always recorded during excavation or could not be determined. Isolating individual bricks of widely differing sizes and getting accurate measurements was something approaching an art. To counteract possible individual inaccuracies, we have measured and have listed in appendix A as many bricks as possible in the hope that a larger sample will give a less distorted overall view of brick size variations.

The subperiods after the period designation (A, B, C, etc.) are based on major new constructions that are different in orientation, layout, or location from the constructions that precede and succeed them. Phases (indicated by a number *after* that letter of the subperiod) represent different building phases in what was a continuously occupied architectural complex (such as VIIB.6–1). Phases are used to indicate the construction and use of new rooms, walls, or features in an area where old rooms continued to be used. Phases are also used to distinguish nonoccupational strata that contain leveling constructions, such as VIIB.3, VIIB.1,

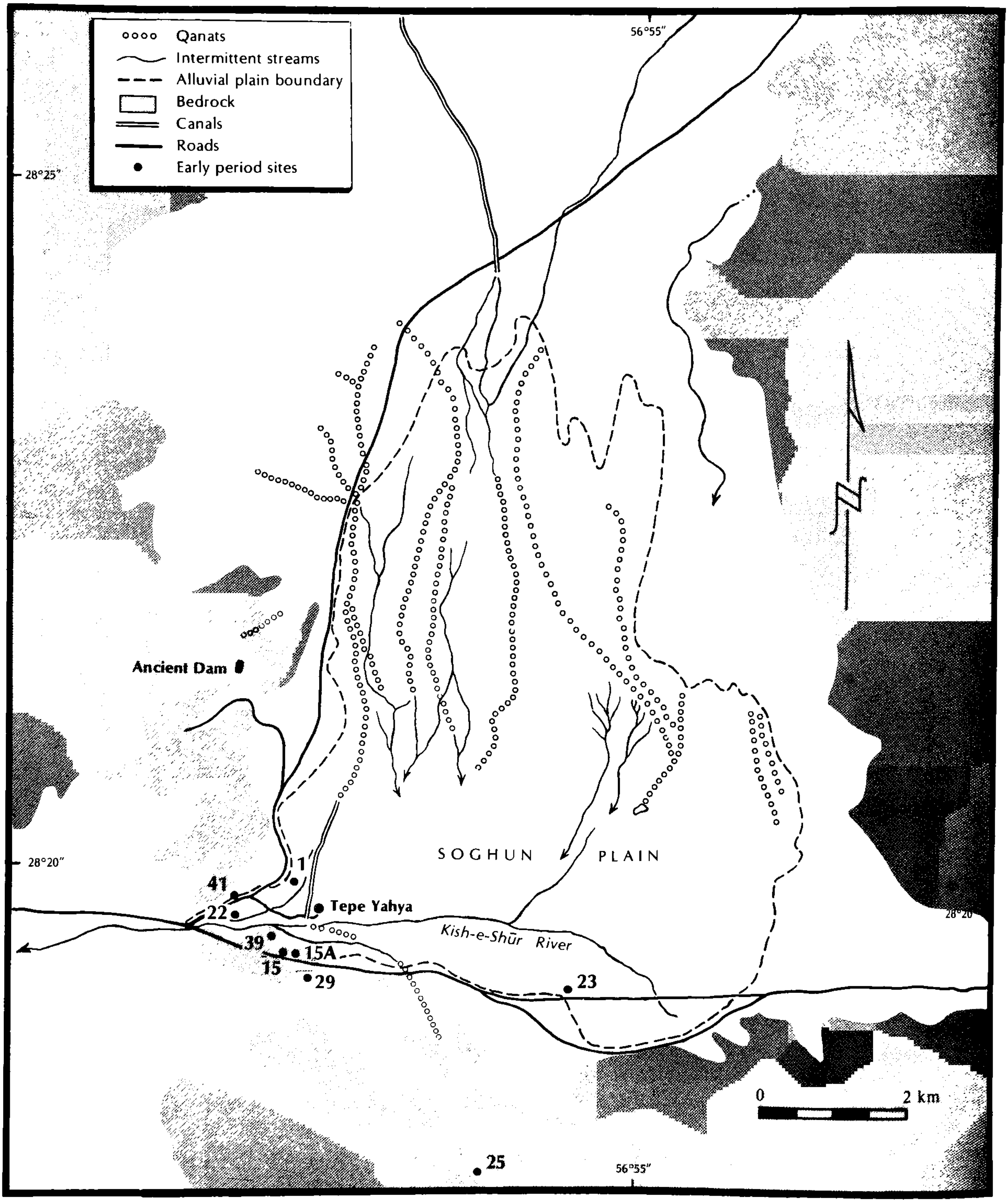


Figure 2.3. Map of the Soghun valley.

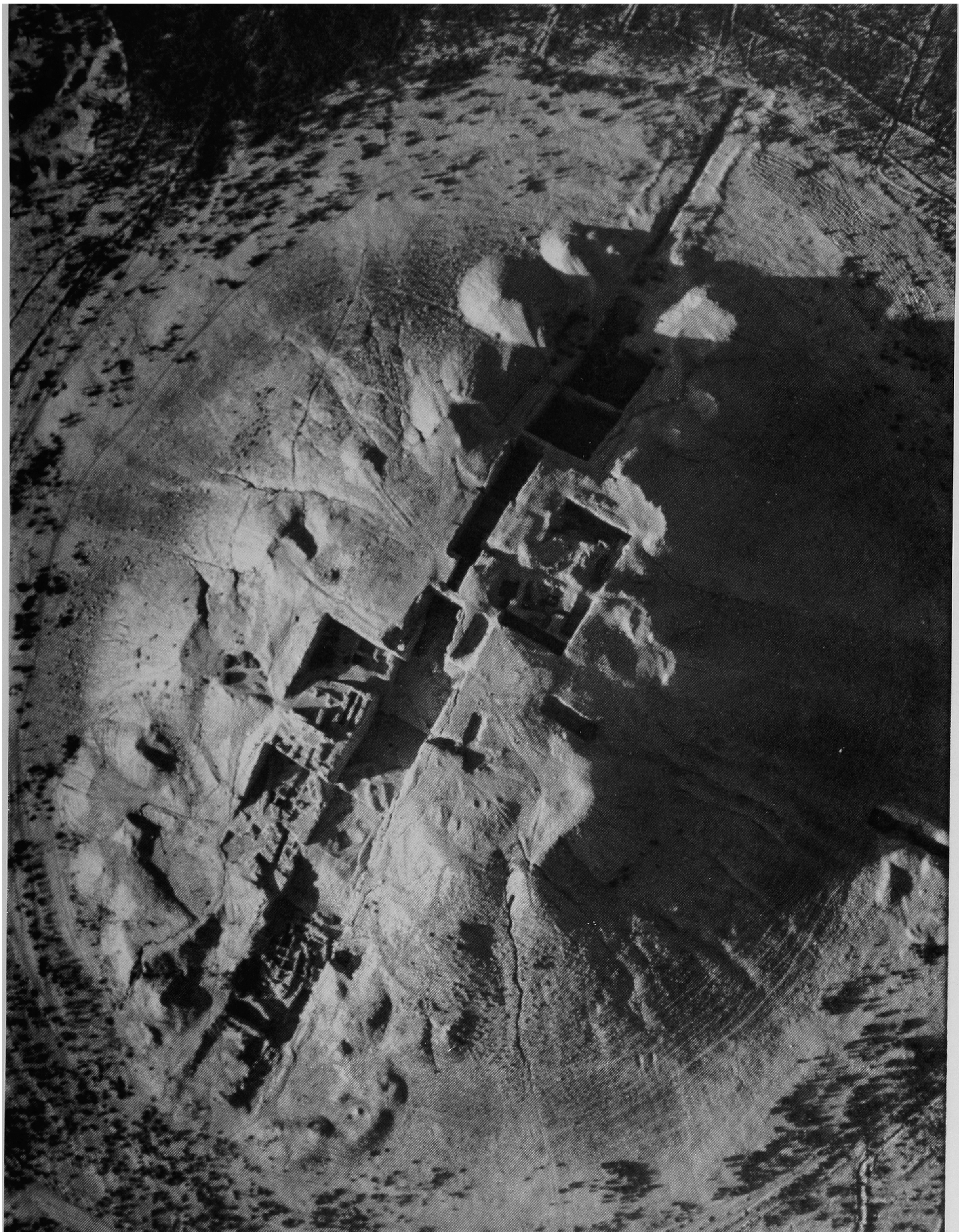


Figure 2.4. Aerial view of Tepe Yahya at completion of excavation project.

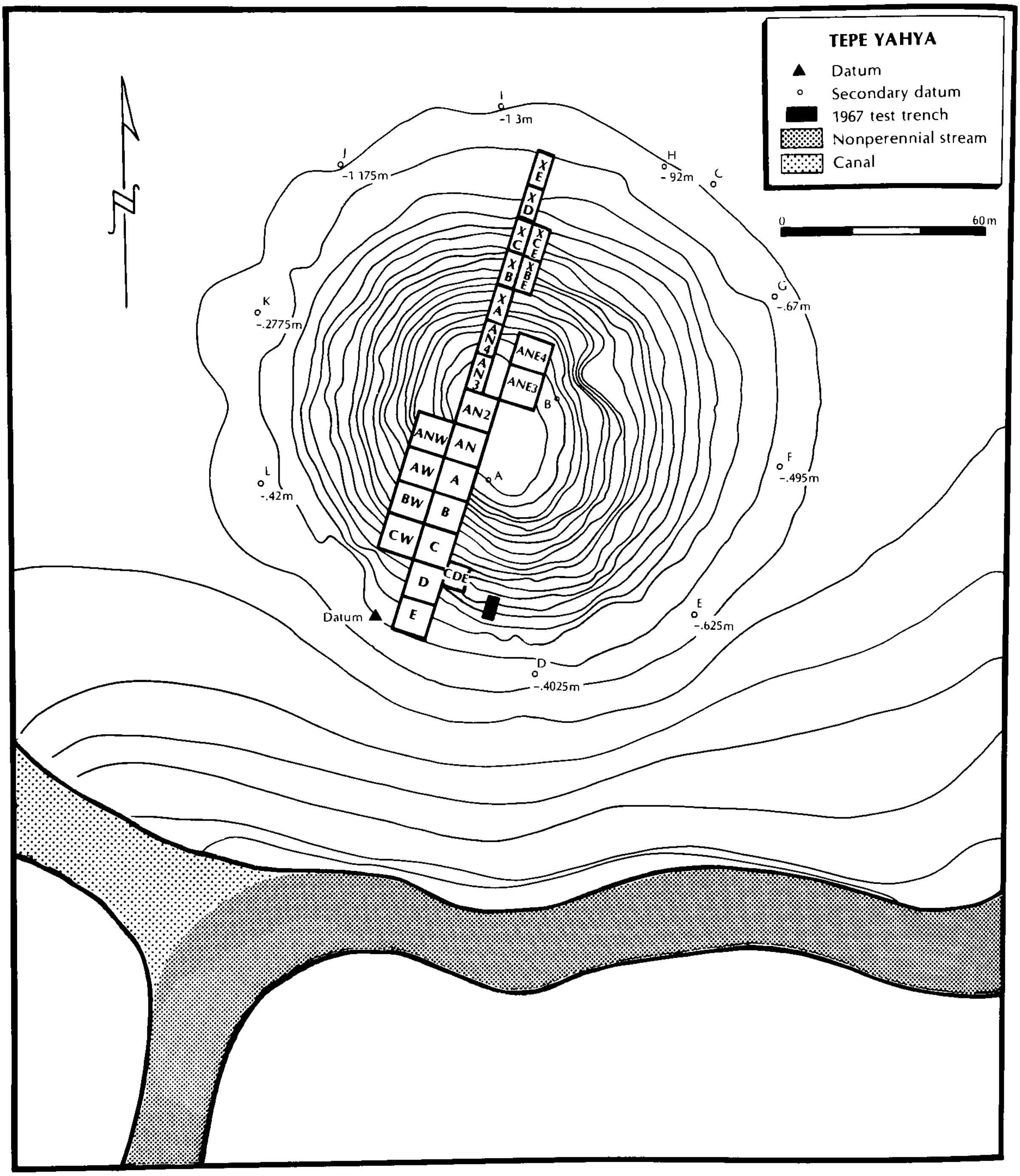


Figure 2.5. Map of Tepe Yahya.

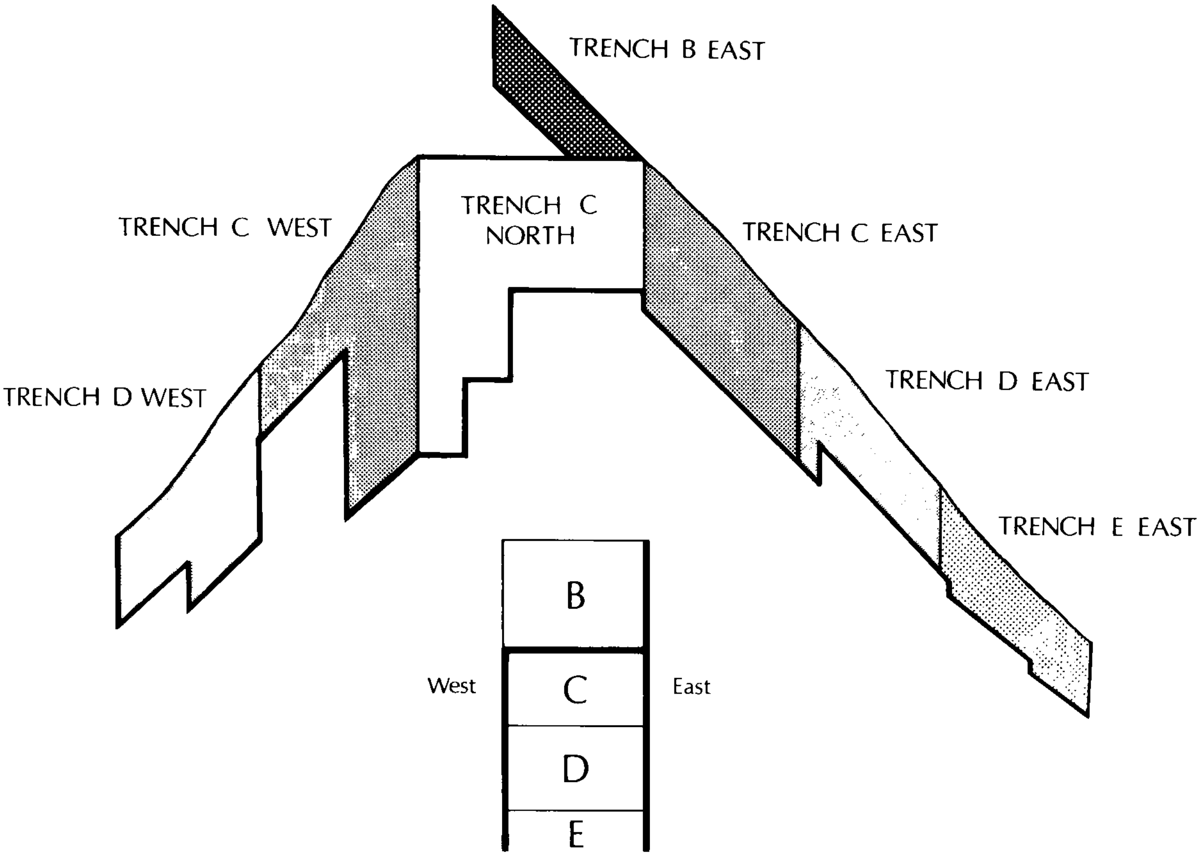


Figure 2.6. Schematic plan of sections in Trenches B, C, and D.

and VIA. Phases, subperiods, and periods are all numbered in *reverse* order to the true chronological sequence. Thus, VIIB.6 comes before VIIB.5 and also before VIB. The descriptive discussion, however, is organized according to the true time sequence, from early to late.

The descriptive section on small finds is a synthesis of the data presented in the artifact catalog (appendix B). Each artifact entry in the catalog includes the artifact type, the register number, the coded stratum and feature designation, the assigned period, the type of raw material, the condition of the artifact, the general interior/exterior context, the specific feature association, the fill description, the quality of the context in which the artifact was found, and specific attributes and measurements of each artifact.

The only major artifact group not included in the catalog is the flint tool assemblage. The flint tool assemblage for the entire site is being analyzed by Marcello Piperno. His preliminary results have already been published (Piperno 1973) and will be introduced into the discussion where relevant.

The most complete previously published summary of the materials of Periods VII–V can be found in C. C. Lamberg-Karlovsky's monograph on Yahya (1970b). Two unpublished undergraduate theses (Meadow 1968; Beale 1971) also deal in detail with Period VII–V materials. Other publications with discussions and illustrated materials relating to Periods VII–V are Lamberg-Karlovsky 1972, Lamberg-Karlovsky 1973, and Lamberg-Karlovsky and Tosi 1973. Since significant modification of the periodization, further excavations, and further analysis of the material remains from Yahya have taken place since the 1970 preliminary report (Lamberg-Karlovsky 1970b), it should be assumed that the periodization ascribed to artifacts in this volume and statements as to context herein take precedence over all previous preliminary publications.

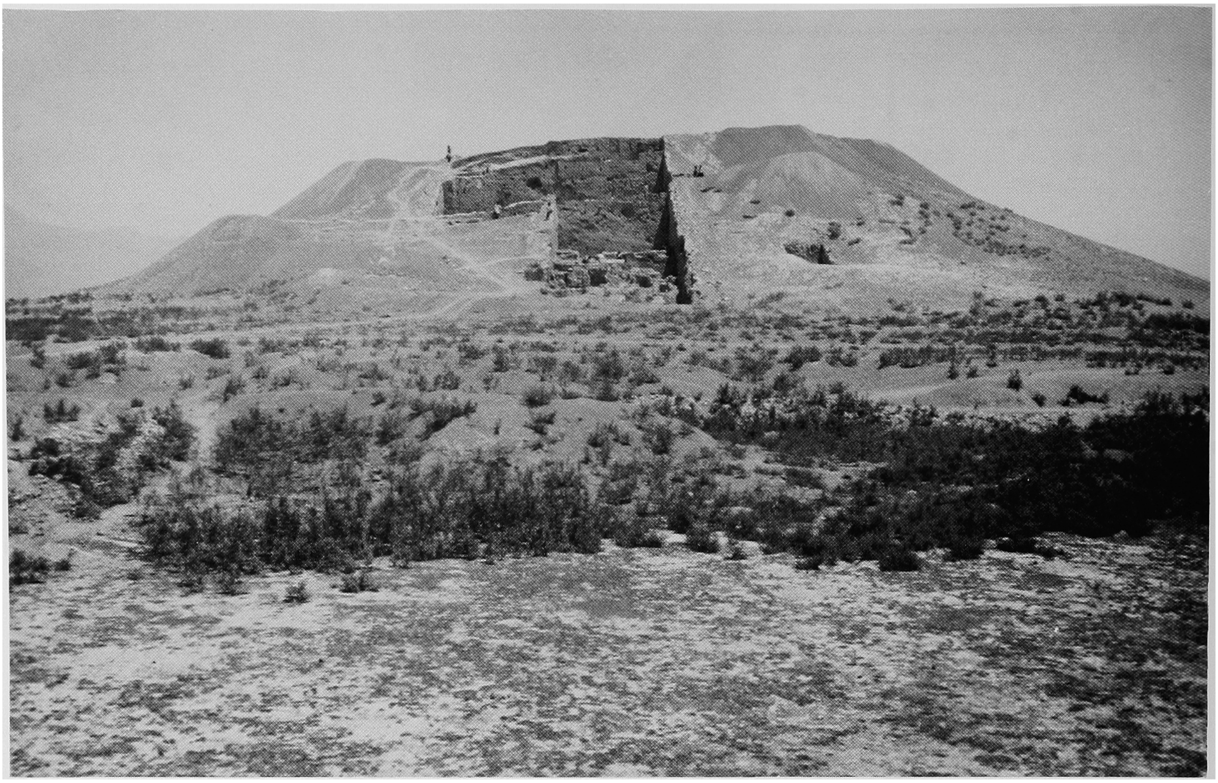


Figure 2.7. Tepe Yahya south step trench viewed from the south during 1971 season.

Figure 2.8. Tepe Yahya north step trench viewed from the north during 1970 season.

Chapter 3

The Geographical and Paleoenvironmental Setting of Tepe Yahya

Richard H. Meadow
Peabody Museum, Harvard University

SETTING AND CLIMATE

Tepe Yahya is located in southeastern Iran at approximately 56° 52′ East longitude and 28° 20′ North latitude, a point about 220 km directly south of the city of Kerman and 130 km north of the Strait of Hormuz (fig. 2.2). The site is situated in the southwest corner of a highland valley often referred to by the name of its principal village, Soghun (fig. 2.3). This valley, which is a tectonic basin and not an erosional valley, is almost completely surrounded by gravel fans and bare, sharply dissected ridges that, particularly to the north and east, turn into imposing mountains reaching heights of more than 3,000 m. The southern part of the Soghun valley is a gently sloping plain of lakebed clays and playa sediments that cover an area of some 68 square km between about 1,500 and 1,560 m above sea level (fig. 3.1). In the lower half of this alluvial portion is located almost all of the land in the valley for which there is evidence of extensive cultivation, either by dry farming or by traditional methods of irrigation (floodwater or *qanat*).

The prevailing slope of the Soghun valley is north-south, with the only drainage exit in the southwest corner near Tepe Yahya. Here, through a large gap in the encircling highlands, an impressive array of gravel terraces and fans descends about 500 m to meet the playa sediments of the Shah Maran-Daulatabad basin 25 km to the west. In 1973, groundwater could be reached some six to eight m below the level of the plain in the area of the site, and along the southern border of the valley, small pools of water and marshy areas could be found with drainage being impeded by areas of bedrock (Snead and Durgin 1975). Thus Tepe Yahya is located at a place in the Soghun valley where the water table lies closest to the surface and through which all surface runoff flows. Presently the lower part of the alluvial plain is being incised by its drainage channel, which is tributary to the Rud-i Gushk, itself a seasonal channel draining the Shah Maran-Daulatabad basin (hereafter referred to as the "Daulatabad valley"). In the past, at an earlier stage of the downcutting of the bedrock at the exit to the Soghun valley and before the introduction of diesel-powered pumps, the water table would have stood higher and marshy areas could have existed periodically even at the base of the site itself. Under such conditions of restricted drainage, the Soghun valley would have fit the model of an endoreic basin (see Bowen-Jones 1968:579; Krinsley 1970), with the low-lying alluvium probably considerably more saline that it is today.

North and east of the alluvial plain are more steeply sloping alluvial fan deposits that attain an elevation of about 1,900 m near the village of Ashin in the northwest corner of the Soghun valley. This region of some 50 square km is watered by springs that emerge at the base of the rugged highlands. Relatively small areas have been painstakingly cleared of their natural groundcover of rocks and gravel and are cultivated using the water from these springs. Near such perennial water sources at both the north and south ends of the Soghun valley are located shrines of local saints marked by enormous buttonwood (plane) trees. Past the adjoining small villages wind footpaths and roads that connect the valley to the outside world. Major routes in use today are those to the mountain valley of Isfandaqeh in the north, to Baluk and the agriculturally rich Jiroft in the east, and past Tepe Yahya to the west along the drainage channel to the Daulatabad valley below. From archaeological finds in the Soghun valley and surrounding areas it is clear that routes similar to these have been used since at least the sixth millennium B.C.[1]

The climate of the Soghun valley can be classified as semiarid, with the mean annual rainfall estimated to be about

---

This chapter is based in part on analyses of pollen by Allen M. Solomon (Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee) and of macrobotanical remains by Lorenzo Costantini (Istituto Italiano per il Medio ed Estremo Oriente, Rome, Italy). I thank these individuals for their contributions but wish to note that they are not responsible for the uses to which I have put their data. I also wish to thank Gerald Kelso for a critical reading of my interpretation of the pollen data and Martha Prickett for many corrections and clarifications of the text.

1. All dates and references to millennia cited in this chapter are in calendar years B.C./A.D. (historical or calibrated radiocarbon) unless qualified as b.p., b.c., or a.d. (as in figure 3.2), in which case they refer to radiocarbon years (5568, "Libby," half-life).

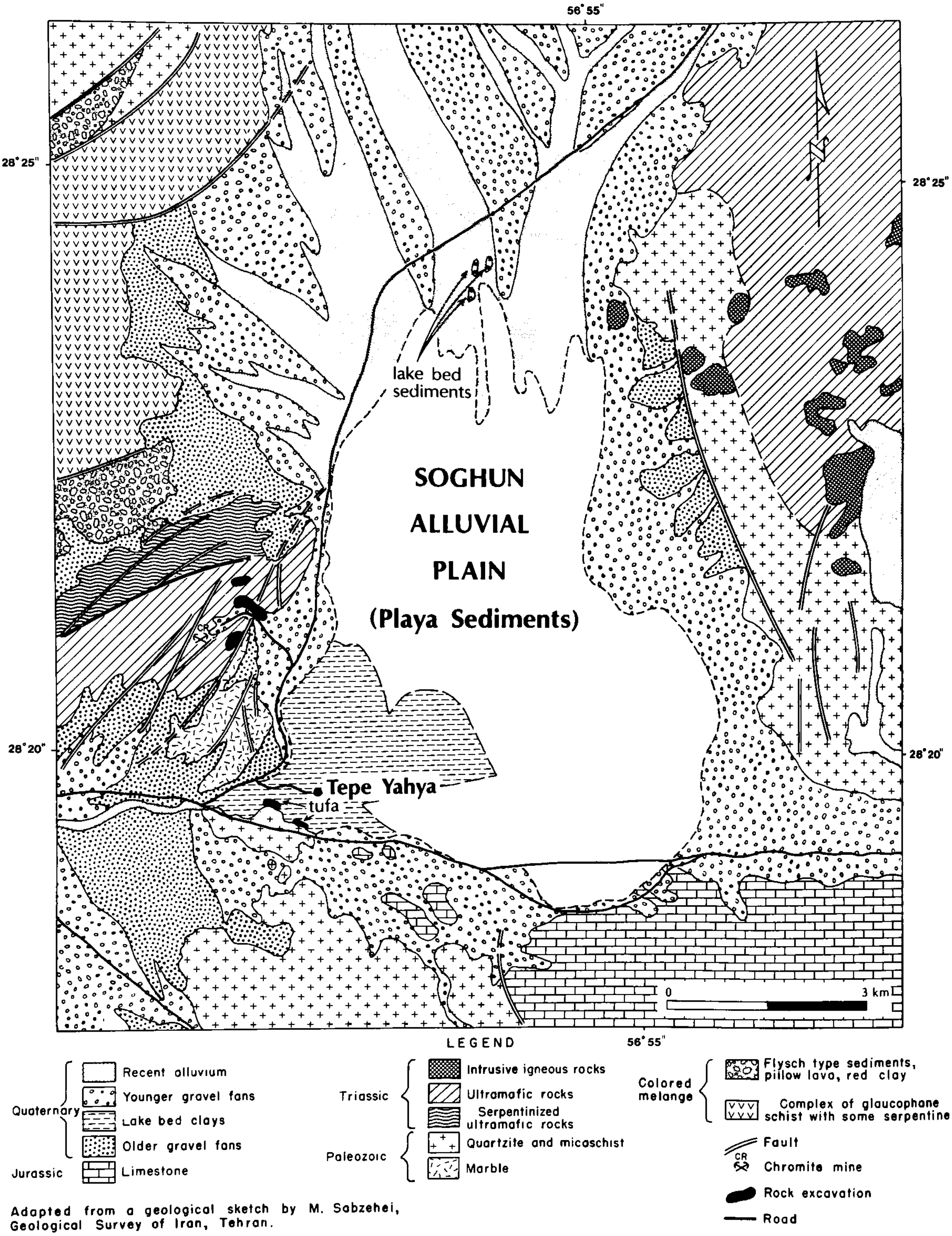


Figure 3.1. Map of geological and structural features of the Soghun valley.

250 mm (Ganji 1968:fig. 79; Raikes, personal communication). Temperatures during the summer months may occasionally reach 40° C in the shade during the day but will have fallen at least 15° by the following dawn. The average maximum and minimum temperatures for the valley are probably much like those of Kerman or Shiraz, with a range of 35° to 18° C in July and 13° to −1° in January (Ganji 1968:222–225). Higher elevations are cooler, while the Daulatabad valley, being lower (1,020–1,080 m), is some 5° C warmer. The Soghun valley is considered to be on the very edge of the *sardsir* (cold area), defined as that region where it is not possible to grow date palms (*Phoenix dactylifera*). Some palms do, in fact, grow in the very southwest corner of the valley, but these have been identified as the dwarf palm *Nannorrhops ritchieana*, native to Baluchistan (Snead and Durgin 1975). Large groves of date palms are cultivated around the village of Daulatabad which, therefore, is considered to be in the *garmsir* (hot region) even though many low lying areas in the Daulatabad valley do get frost in the winter.

Precipitation in the Soghun and Daulatabad valleys falls mostly in the late fall, winter, and early spring, although this small area of the Iranian plateau is also affected by the Indian Ocean monsoons, which may bring torrential downpours to the valleys and surrounding slopes, particularly in late July and August. Precipitation during the winter sometimes occurs in the form of snow even in parts of the Daulatabad valley, but all moisture, whether summer or winter, is extremely variable in terms of how much falls at any given point at any given time. Usually, however, the mountain peaks immediately to the north of the Soghun valley will receive snow during the winter, often in sufficient quantities to remain covered until spring, thus providing moisture both in terms of spring runoff and subsurface recharge. During the Pleistocene, when permanent snowlines in the southeastern Zagros were apparently depressed to altitudes of less than 3,000 m even on south-facing slopes (Busche et al. 1977; Kuhle 1976), melting snow would have provided a major source of moisture, perhaps enough to form perennial streams or lakes in the Soghun and Daulatabad valleys. Indeed, Snead and Durgin (1975) suggest that an intermittent lake was present in the Soghun valley at least as recently as the mid-sixth millennium b.c. (?seventh millennium B.C.). The presence of such a lake would, of course, imply that the drainage outlet was blocked at that time.

MODERN VEGETATION PATTERNS

One of the most striking features of the Soghun and Daulatabad valleys and the hills around is the scarcity of significant vegetation except in isolated areas of the higher slopes where widely scattered specimens of oak (*Quercus*), juniper (*Juniperus*), and pistachio (*Pistacia*) can still be found. The almost complete absence of arboreal species from more accessible locations around the valley attests to the activities of local woodcutters, the occasional tree growing only where carefully protected. The valley floor and lower slopes appear to be heavily grazed and strongly degraded, with pockets of grasses evident during the summer only where sheltered by low spiney shrubs. Species such as camel thorn (*Alhagi camelorum*) and wild rue (*Peganum harmala*) grow around villages and in other areas where sheep and goats concentrate. Not only are these forms generally avoided by feeding animals (Nyerges 1977), but growth of a species like wild rue is further linked to animals by the fact that its seeds adhere to their coats and are thus distributed.

According to the *Vegetation Map of the Mediterranean Zone* (UNESCO/FAO 1969), the Soghun valley falls into what, potentially, would be an area of "shrub or tree pseudosteppes and open forests in less dry climates" (category 23), grading into "steppe or tree-steppe with pistachio, almond, and juniper" (category 33) at higher elevations. These units together are what Zohary (1973:category 12) terms the "supposed climax area of *Pistacia-Amygdalus* steppe forest." The word "supposed" is used realistically in recognition of the fact that, with a negative mean annual water balance (i.e., evaporation is greater than precipitation), climax vegetation can hardly be expected to occur except high in the mountains. The lower areas suffer hot and often rainless summers and are liable to degradation due to such human-associated activities as cultivation, woodcutting, and grazing (Bowen-Jones 1968:573).

The warmer and lower Daulatabad valley to the west is classed in the UNESCO/FAO map as "shrub or tree pseudosteppe and open forests in very dry climates" (category 22), with indicator vegetation including species of pistachio and almond with tamarisk (*Tamarix*) and willow (*Salix*) in areas with access to moisture from the water table. Tamarisk, at least, does grow in the Daulatabad valley, where it acts to create phreatophyte mounds on the surface of the playa (Prickett 1979:47). Zohary (1973) places the Daulatabad region partly in his category 29: "Acacietea flavae iranica and Nubo-Sindian classes (e.g., Euphorbietea laricae, etc.)," reflecting the fact that in the date-palm-growing areas to the east, south, and west of the Soghun valley, vegetation of the type so characteristic of the Gulf and Indian Ocean coasts is to be found.

THE POLLEN RECORD

Another source of information about the vegetation of the Yahya area is a series of fifteen soil samples, the pollen from which has been extracted and analyzed by Allen M. Solomon (1975).[2] One of these samples comes from the

2. The technique of pollen extraction is described by Solomon in his paper (1975), where it is characterized as "adapted to arid-land samples." My discussion of the pollen record that follows, although based upon the data compiled by Solomon, includes emphases and interpretations that differ from those of the original investigator. A "reworking" seems worthwhile because, when writing his report, Solomon had no personal acquaintance with either the sites or the area involved.

surface on top of Tepe Yahya, but its spectrum is swamped by pollen of Russian thistle type (*Salsola*, about 91 percent). Twenty-five grains of other taxa were identified, however, including juniper (*Juniperus*, 2 grains), goosefoot (Chenopodiaceae + *Amaranthus*-type, 9 grains), grasses (Gramineae, 8 grains), wormwood (*Artemisia*, 2 grains), sedges (Cyperaceae, 2 grains), bur-reed (*Sparganium*, 1 grain), and another composite (Compositae, 1 grain). It is particularly unfortunate that the quality of this single surface sample is so poor, since without such samples and without a survey of the local vegetation it is difficult to be particularly confident about interpreting the ancient profiles in terms of how the vegetation patterns reflected in the various spectra compare with the situation in the area today.

The absence of modern standards is compounded by other problems of interpretation that relate on the one hand to the intrinsic nature of the pollen record and on the other to the nature of archaeological samples. The quantity of pollen of a species likely to end up trapped at a given locus is dependent not only upon the frequency of that species in the area, but also upon its absolute pollen production and its pollen dispersal mechanisms. Thus, insect-pollinated (entomophilous) plants are, as a rule, underrepresented in pollen spectra, but a form like the willow (*Salix*) produces such a large amount of pollen that some of it will generally find its way into a deposit. The case of the pistachio (*Pistacia*) is rather different. Analysis of modern samples has shown that this tree, while wind pollinated (anemophilous), can be severely underrepresented in the pollen rain of a region (Wright, McAndrews, and van Zeist 1967:435; van Zeist 1967:305).

In other words, something of a production-dispersal continuum can be defined. Toward one end is an entomophilous shrub like the almond (*Prunus amygdalus*), which produces very little pollen and therefore may not be represented in a deposit even when it is an important member of the local plant community. Toward the other end of the continuum is an anemophilous tree like the pine (*Pinus*), which produces enormous quantities of pollen, some of which may find its way into a deposit even from many tens of kilometers away. A pollen spectrum, therefore, will contain local, regional, and long-distance components, with the relative size of each fraction at least partly dependent upon the pollen production and dispersal properties of the various species involved.

The immediate significance of this discussion lies in the fact that in none of the archaeological samples from the Yahya area were pollen of pistachio or almond identified, while in some of the same samples grains of willow or pine or both were found. This does not necessarily mean that pistachio and almond were absent from a region where both are found today (albeit sparsely), but only that they are not represented in the pollen record, a situation not impossible given their low production-dispersal characteristics. At the other extreme, the pine pollen could have blown in from a long distance away, although it seems more likely that scattered trees grew high on the slopes surrounding the Soghun and Daulatabad valleys.

Before advancing further in discussion of the pollen records, problems of using spectra derived from archaeological samples should be noted. The principal difficulty is one of sample contamination, four sources of which are noted by Bottema (1975:22). These are: (1) older pollen being brought up in building materials (e.g., mud bricks and plaster); (2) passive transport by animals (including humans); (3) selective deposition by burrowing insects; and (4) infiltration from younger deposits. A further difficulty lies in differential destruction or "corrosion" of pollen grains under the usually less than optimal conditions for preservation in archaeological deposits. One result of these factors is that some types of pollen, particularly from certain entomophilous composites, either may be overrepresented in the pollen spectra or may fluctuate markedly in abundance. Under circumstances where a fair number of analyzed samples are available, however, it seems possible to check consistency of pollen representation both within and between time periods and thus to eliminate wildly aberrant spectra or to determine which taxa to exclude from the pollen sums. In a similar fashion, samples taken from different kinds of contexts are checked one against the other to determine if the sheltering effects of walls or the special use of particular areas have affected the pollen spectra.

Of the archaeological samples from the Yahya area, twelve were taken from freshly cut sections at Yahya itself, and two are from deposits in the Daulatabad valley. Of the latter, one has been eliminated from this discussion because it comes from natural silts of questionable date (sample 11 from site R12). The remaining thirteen samples are graphically presented in figure 3.2 where they are arranged in chronological order in a diagram that was developed from the pollen counts made by Solomon (1975:table 4). The single Daulatabad sample (no. 5 from Tepe Gaz Tavila-R37, the site name hereafter shortened to "R37") is placed at the base of the diagram. Of the Yahya spectra, numbers 3, 4, and 13 come from immediately above the floors of rooms, but since there seem to be no significant differences between these and any other samples, they have not been considered separately. The remaining spectra are from exterior habitation surfaces or from lenses occurring in loose fill. All the samples come from the south-facing side of the mound, south being the direction from which the prevailing winds blow during the day. Since no samples were taken from deposits on the north face of Tepe Yahya, it is not possible to test whether the spectra from that side, exposed to the prevailing night winds, are any different in character.

In preparing the pollen diagram (fig. 3.2), percentages of certain taxa were calculated outside of the pollen sums. This practice was followed primarily to make the diagrams as comparable as possible to those published principally by van Zeist (e.g., van Zeist 1967; van Zeist, Timmers, and Bottema 1968; van Zeist, Woldring, and Stapert 1975; van Zeist and Bottema 1982). Excluded from the pollen sums but plotted on the right side of figure 3.2 are the aquatics including sedges (Cyperaceae), bur-reed (*Sparganium*), and the nitrophilous knotweed (*Polygonum avunculare*), as well as cocklebur (*Xanthium*, an anemophilous composite), entomophilous composites (Compositae), and Russian thistle (*Salsola*, a chenopod).

The reason for excluding *Xanthium* and *Salsola* from the pollen sums is that both genera are wind-pollinated weeds which grow in disturbed habitats immediately around and even within settlements. As a result, the rather marked abundance of pollen from these taxa in some spectra may reflect only immediately local situations, a possibility supported by the fact that the highest values come from post- or non-occupational deposits. In pollen spectra derived from lake sediments in western Iran and Anatolia, both genera, when present, are very rare (ibid.). In contrast, the profile for Compositae at Yahya shows very little fluctuation, pollen from this group being present at under 5 percent throughout the first part of the sequence and then again in the late samples. Apparently burrowing insects and pollen corrosion are not cause for serious distortion of these spectra, the entomophilous composites, like all the other insect-pollinated taxa, being poorly represented or not present at all.

As for the aquatics, previous description of the single surface sample noted the presence of pollen grains of both Cyperaceae and *Sparganium* type. This pollen almost certainly comes from the shallow water reeds and sedges that grow in marshy areas along the southern border of the Soghun valley. A situation similar to this seems to be indicated by the archaeological spectra, pollen from true aquatics or the nitrogen-loving knotweed (*Polygonum aviculare*) being present in each of the eight early samples from Tepe Yahya.

The absence of Cyperaceae pollen from later samples is puzzling, however, particularly in light of an increasing representation of arboreal species, the presence of willow (*Salix*), and a marked increase in *Sparganium* pollen. The latest samples, numbers 1 and 15, come from the Achaemenid and Sasanian periods, the latter especially a time of agricultural expansion and resettlement in the Yahya area made possible by the development of irrigation technology

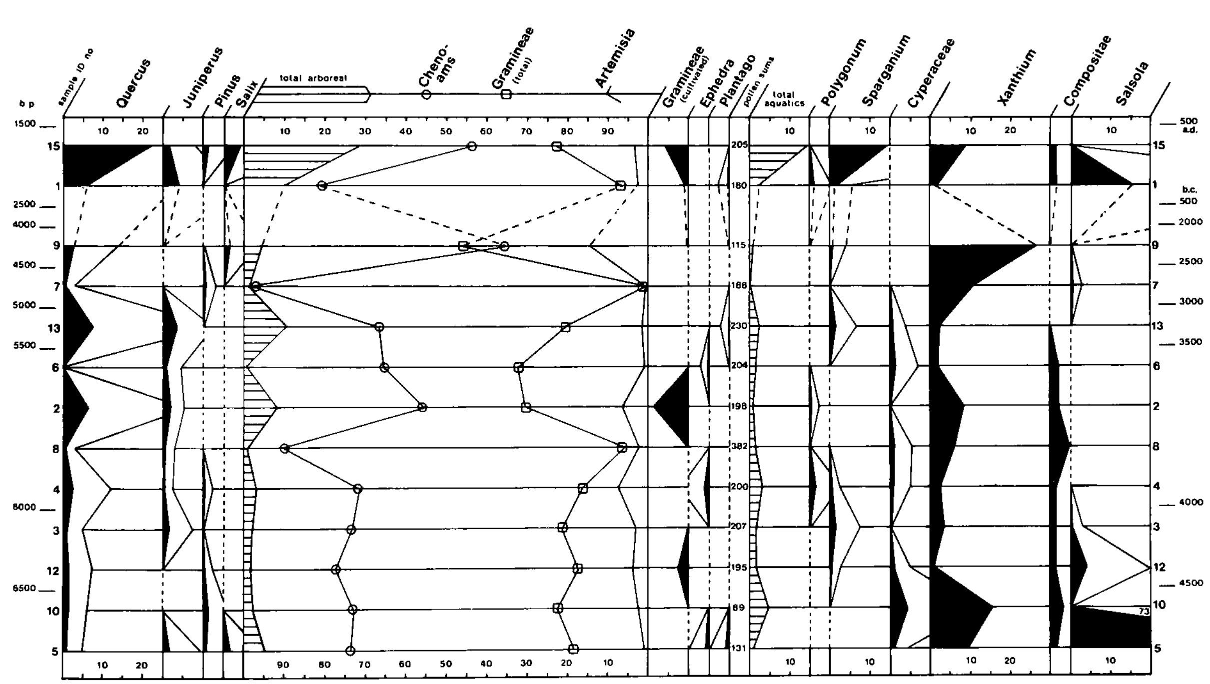


Figure 3.2. Pollen diagram of samples from Tepe Yahya and Daulatabad R37 (no. 5) arranged chronologically. Open profiles represent five times (5×) the solid profiles. Not included in the diagram are the following taxa, which are presented by sample, chronologically, and as a percentage of the "pollen sum" for that sample: Spectrum 5: Umbelliferae 1.9%, Nyctaginaceae 1.0%, Cruciferae 2.7%, Leguminosae 2.7%; Spectrum 8: Plumbaginaceae 0.6%; Spectrum 13: Umbelliferae 1.3%; Spectrum 7: Caryophyllaceae 0.6%; Spectrum 15: *Fagopyrum* 1.5%. All proportions are calculated using counts compiled by Solomon (1975). The samples come from the following proveniences at Tepe Yahya: *no. 15*: A/AN1.West balk.8, Period IA, loose fill; *no. 1*: A.71.7.4, Period IIA, outside surface; *no. 9*: lens west of Period IVA wall in B/BW; *no. 7*: BW.69.T5.5, Period IVB.1, possible outside workshop area; *no. 13*: B.70.20, Period IVC.2, floor of room; *no. 6*: C.69.1, Period VA/B, outside surface; *no. 2*: C.69.3, outside surface above upper Period VC mud brick platform; *no. 8*: C.69.T1.3, outside surface slightly below provenience of no. 2; *no. 4*: C.69.7, Period VC, floor of room; *no. 3*: C.71.T6.1.5, Period VIIB.2, floor of room; *no. 12*: C, Period VIID, compact clayey fill 10 cm above "sterile soil"; *no. 10*: 20 cm below provenience of no. 12, in "sterile soil." The following sample comes from Tepe Gaz Tavila-R37: *no. 5*: R37.73.6.2, Phase IV.2, fine layered silts in an ancient ditch. The method of presentation used in this figure was chosen because it is more graphic than using the histogram technique that Solomon employs in his report. One must be careful to note, however, that spacings on the vertical axis bear no relationship to depth of deposit.

based on the *qanat* (Prickett 1976:176, 1979:54; Beale 1976:175). In modern times, too, until the advent of diesel-powered pumps, agriculture in the Soghun valley was based on an extensive system of these underground water channels (fig. 2.3). A high *Sparganium* fraction along with *Salix* pollen in the latest Yahya sample could reflect the presence of a network of continually flowing irrigation channels close to the mound itself, channels impossible without *qanat* technology. Up until at least Achaemenid times, however, agriculture in the lower alluvium of the Soghun valley was probably practiced using dry farming techniques that took advantage of the high water table combined, possibly, with some use of flood water. The relatively high values for Cyperaceae pollen in the preoccupational sample from Yahya (no. 10), as well as the presence of pollen from the same taxon in the Daulatabad sample, suggest the presence of swampy locations, areas of permanent and reasonably fresh water which may have served to attract settled populations to the valleys in the first place.

Turning now to those taxa which are included within the pollen sums of figure 3.2, these are separated into arboreal and nonarboreal fractions. Except for the latest spectrum (no. 15), arboreal pollens are represented at levels below 11 percent. Included are varying proportions of oak (*Quercus*), juniper (*Juniperus*), pine (*Pinus*), and willow (*Salix*). In those spectra with the highest arboreal component (nos. 4, 2, 13, 9, 1, 15), oak pollen dominates, the only exception being the Daulatabad spectrum (no. 5) where oak and pine pollen are less common than juniper and willow. The ability of pine pollen to travel great distances has already been noted. Good production-dispersal characteristics are also a feature of oak, *Quercus* pollen in western Iran being found up to 75 km from its apparent source (Wright, McAndrews, and van Zeist 1967:439). Juniper pollen, however, seems to disperse less readily, the genus being seriously under-represented compared to oak in the pollen rain of southeastern Turkey (van Zeist, Timmers, and Bottema 1968:29).

Overall, then, both the pine and oak components of the pollen spectra discussed here could reflect a much larger catchment area than the juniper or, for that matter, the willow (*Salix*) components. Given the very low oak and pine counts for most of the samples, one can suppose the near absence of both forms from the immediate region, a light pollen rain being derived from trees growing on the high and damper slopes surrounding the valleys. The presence of juniper, willow, and occasionally larger amounts of oak pollens, however, suggests closer proximity of these taxa to the sampling sites at certain periods. If an overall trend can be defined, it would seem to be one of generally increasing arboreal representation starting in the mid-fifth millennium B.C., this possibly being related to a slight improvement in the mean annual water balance due to a cooler and/or wetter climate (following, for example, van Zeist 1967:310; van Zeist and Bottema 1982:esp. fig. 14.14).

The nonarboreal fraction of the pollen sums of figure 3.2 includes pollen primarily from goosefoot-related species ("Cheno-ams" or Chenopodiaceae + *Amaranthus*), grasses (Gramineae), and wormwood (*Artemisia*), as well as infrequent occurrences of joint-fir (*Ephedra*) and plaintain (*Plantago*). These anemophilous forms comprise part of both the local and regional vegetation, growing as they do along hillsides as well as on the valley floors. In all samples except one (no. 9), chenopod pollen is the most common form. This taxon includes many halophytic species, and its dominance of the pollen spectra can probably be attributed to two factors: first, the presence of large areas of poorly drained and somewhat saline playa sediments present in both the Soghun and Daulatabad valleys; and second, soil disturbance caused by agriculture and herding (following Wright, McAndrews, and van Zeist 1967:437; van Zeist, Woldring, and Stapert 1975:136; Solomon 1975; Woosley and Hole 1978:64; Gerald Kelso, personal communication). Decreases in the chenopod fraction coupled with increases in the representation of grasses could reflect reduction in disturbed or alkaline areas.

In addition to the total Gramineae profile, that portion of the grass pollen identified by Solomon (1975) as coming from cultivated forms is plotted separately. Since such cereals as wheat and barley are self-pollinating and release only a very few pollen grains, their presence in the pollen record should indicate agriculture in close proximity to the place where the samples were taken (van Zeist, Timmers, and Bottema 1968:34). Of interest, perhaps, is the markedly similar rise in proportions from sample 1 to sample 15 of both Cerealia-type and *Sparganium* pollen. This coincidence would seem to support the proposal made earlier concerning the presence of irrigated agriculture in the immediate vicinity of Tepe Yahya during Sasanian times. For earlier periods, the use of permanent irrigation works is not likely, with the result that the presence of cultivated grass pollen in samples 12 and 2 merely confirms the fact that cereals were grown close to the site at those times. That such pollen is absent from the other spectra, however, cannot be used to suggest an absence of agriculture from the area.

The third most important nonarboreal taxon included within the pollen sums is *Artemisia*, a characteristic member of the steppe vegetation of the Iranian plateau (Zohary 1973). With only one exception, however, this genus is represented in the Yahya samples at levels of under 8 percent, low when compared with proportions in the otherwise strikingly similar, although modern, spectra from south and east of Lake Urmia in northwestern Iran (table 3.1). The relatively higher *Artemisia* and correspondingly lower Gramineae values in these samples from the Tabriz transect are difficult to evaluate, however, given the absence of comparable samples from southeastern Iran. That *Artemisia* is, even today, relatively uncommon in the lower Soghun valley is suggested by the single surface sample from Yahya (8 grass grains, 2 wormwood, see above). The genus might be better represented on the well-drained and stonier soils at the north end of the valley or at higher elevations, but in the absence of a vegetation survey, this is mere speculation. As for the two final taxa, in both the Yahya area and Tabriz samples, the *Plantago* fraction is low, a feature attributable to altitude

Table 3.1. Comparison of modern Tabriz[a] and ancient Yahya-area[b] pollen spectra.

Taxon	Tabriz (%)	Yahya (%)
Quercus	1–5 (2)[c]	0–8 (2.5)
Juniperus	0	0–4 (1)
Pinus	0–1 (0.5)	0–1 (0.25)
Salix	0	0–2 (0.25)
Chenopods	51–81 (68)	35–97 (72)
Gramineae	1–19 (8)	1–46 (20)
Artemisia	11–29 (19)	1–15 (4)
Plantago	0–5 (2)	0–1 (0.25)
Ephedra	0–1 (0.25)	0–2 (0.25)

a. Recalculated from Wright, McAndrews, and van Zeist (1967:fig. 3, samples 30a, 30b, 31, 66, 67, 69, 70) on the basis of pollen sums including only the same taxa as those attested in the Yahya spectra. *Acer, Betula,* and *Ulmus* are present in one Tabriz sample each at less than 1 percent.

b. Includes ranges for all spectra in figure 3.2 except sample no. 15.

c. (XX%) = mean percentages for each taxon.

as well as to soil salinity (Wright, McAndrews, and van Zeist 1967:439; Solomon 1975). *Ephedra* counts are also low, but such scarcity is apparently due more to the poor production-dispersal characteristics of joint-fir than to poor representation in the regional vegetation (Wright, McAndrews, and van Zeist 1967:437).

A convenient way to sum up the Yahya area pollen record is to note the overall resemblance between it and the upper half of the A-2 zone of the Zeribar 63-J diagram (van Zeist 1967:fig. 3). In those Zeribar spectra, tree pollen, largely *Quercus*, is very low but on the rise. Chenopods dominate, and *Artemisia* values are much diminished (although not so low as in the Yahya samples). *Plantago* is nearly absent, and the grasses are better represented than earlier (although not so well represented as later or as in the Yahya area). Composites other than *Artemisia* are present at low levels, and pollen identified as coming from the Umbelliferae is remarkably frequent, this last, however, being quite unlike the Yahya situation. Van Zeist (1967:309) believes that this portion of the Zeribar profile could represent desert steppe beginning to make the transition to open savanna. In the context of the terminal Pleistocene of western Iran, such an interpretation suggests increases in both annual precipitation and temperature, but also the presence of dry summers. In southeastern Iran at a later period, it seems more likely that falling temperatures perhaps combined with increased precipitation would be required to improve the mean annual water balance sufficiently to promote increased tree growth even on the higher slopes.

For most of the five thousand years covered by the pollen record, the Yahya spectra seem to indicate that the vegetation of the Soghun valley was that of a warm, semiarid steppe with the presence of both saline soils and some swampy areas. The single Daulatabad sample suggests much the same conditions, even though it comes from an area which today gets significantly less rainfall each year. A possible reason for such similarity lies in the fact that the chenopods and even the grasses that dominate the spectra may represent local disturbed area and playa margin components of the vegetation, with statistically significant counts of the regional vegetation therefore being precluded. Even given the possibility of the samples being swamped by local pollen, however, an increase in arboreal representation toward the end of the sequence does seem evident, this suggesting something of a shift toward more savanna-like conditions.

THE PALEOETHNOBOTANICAL RECORD

The charred grains, seeds, fruits, and woods from Tepe Yahya and two Daulatabad sites (R37 and R12; see fig. 9.1) have been studied by Lorenzo Costantini (1984b). The majority of these paleoethnobotanical remains were gathered under the supervision of Maurizio Tosi during the 1973 and 1975 excavations (Tosi 1976), although some material was collected in earlier seasons as well. Costantini's findings are summarized in table 3.2, where taxa identified from pollen (Solomon 1975) are also listed. The amount of overlap between the two sources of information is not great, only four families definitely being represented by both pollen and charred remains (Caryophyllaceae, Leguminosae, Gramineae, and Polygonaceae). Three other families—Chenopodiaceae, Cyperaceae, and Pinaceae—have also been identified from charred remains by Tosi (1976) or Wright (1977) but do not make their way into Costantini's final list. One would indeed expect to find traces of chenopods, sedges, and juniper among the paleoethnobotanical remains from Yahya, and their absence in the definitive analysis is noteworthy. Also of interest is the absence of Compositae and Cruciferae from the charred remains, since members of both families are usually common weeds in agricultural fields. From the opposite viewpoint, the presence of the fruits of *Pistacia vera* and *Prunus* cf. *spinosa*, taxa both missing from the pollen record, confirms the supposition made previously that these trees did indeed grow in the region, probably on the higher slopes surrounding the Soghun valley in secluded areas similar to those where they can be found today.

Cultivated crops identified from the Yahya and Daulatabad samples include principally the cereals and grapes. Grapes are difficult to grow successfully in dry alluvial areas without the application of supplemental water and shelter from hot winds (J. M. Renfrew 1973:130–131). The presence of their seeds at Yahya could reflect importation of dried fruit (raisins) from the surrounding uplands or local production in small plots near such perennial water sources as springs, nonsaline swamps, and wells. It is perhaps significant that no grape remains are listed from the Daulatabad sites, located as they are in a hotter, drier environment.

More suitable for growth in the Daulatabad valley, although also requiring significant amounts of water, are date palms, the presence of which is attested as early as the sixth

Table 3.2. Flora identified at Tepe Yahya and Daulatabad sites from pollen and macrobotanical remains.

Taxon	S	C	Yahya Period R37	R12	VII	VI	VC	VB	VA	IVC	IVB	IVA	III	II
Anacardiaceae (sumac)														
Pistacia (pistachio)		X	+	–	–	–	–	–	+	–	–	–	–	–
Boraginaceae (borage)														
Lithospermum (gromwell)		X	–	–	–	–	–	–	+	–	+	–	–	–
Capparaceae														
Capparis (caper)		X	+	+	–	–	–	–	–	–	+	–	–	+
Caryophyllaceae (pink)	X													
Agrostemma (corn cockle)		X	–	–	–	+	–	–	–	–	–	–	–	–
Chenopodiaceae (chenopods)	X													
Chenopodium (goosefoot)		?												
Salsola (russian thistle)	X													
Compositae (sunflower)	X													
Artemisia (wormwood)	X													
Xanthium (cocklebur)	X													
Cruciferae (mustard)	X													
Cucurbitaceae (cucurbits)														
Cucumis/Citrullus (gourd)		X	–	+	–	–	–	–	–	–	–	–	–	
Cupressaceae (cypress)														
Juniperus (juniper)	X	?												
Cyperaceae (sedge)	X													
Scirpus (club-rush)		?												
Ephedraceae														
Ephedra (joint-fir)	X													
Fagaceae (beech)														
Quercus (oak)	X													
Gramineae (grass)	X	X	–	–	–	–	–	–	–	+	–	–	–	–
Aegilops (goat-face grass)		X	–	+	–	+	–	+	–	+	+	–	–	–
Avena (oats)		X	–	+	+	+	–	–	–	–	+	–	–	–
Hordeum (barley)		X	+	+	–	+	+	+	–	+	+	+	+	+
Panicum (millet)		X	+	+	–	–	–	–	–	–	+	+	–	+
Phalaris (canary grass)		X	–	+	–	–	–	–	–	–	–	–	–	–
Secale (rye)		X	–	–	–	–	–	–	–	–	+	–	–	–
Triticum (wheat)		X	+	+	+	+	+	+	–	+	+	+	–	+
Leguminosae (pea)	X													
Astragalus (milk vetch)		X	+	+	+	+	–	+	–	+	+	–	–	–
Genista (woadwaxen)		X	–	–	–	–	–	–	–	–	–	–	–	+
Lathyrus (grass pea)		X	–	+	–	–	–	–	–	–	+	–	–	–
Lens (lentil)		X	–	–	–	–	–	–	–	–	+	+	–	+
Linaceae														
Linum (flax)		X	–	–	–	–	–	–	–	–	–	–	–	+
Malvaceae														
Malva (mallow)		?												
Nyctaginaceae (nightshade)	X													
Palmae (palm)														
Phoenix (date palm)		X	+	–	–	–	–	–	–	–	+	–	–	–
Papaveraceae														
Papaver (poppy)		X	–	+	–	–	–	–	–	–	–	–	–	–
Pinaceae														
Pinus (pine)	X													

Table 3.2. Continued.

			Yahya Period											
Taxon	S	C	R37	R12	VII	VI	VC	VB	VA	IVC	IVB	IVA	III	II
Plantaginaceae														
Plantago (plantain)	X													
Plumbaginaceae (plumbago)	X													
Polygonaceae														
Polygonum (knotweed)	X	X	–	–	–	–	–	–	–	+	–	–	–	–
Fagopyrum (buckwheat)	X													
Rosaceae (rose)														
Prunus (almond)		X	–	–	–	–	–	–	–	+	–	–	–	–
Rubiaceae (madder)														
Galium (bedstraw)		X	–	–	–	–	–	–	–	–	+	–	–	–
Salicaceae														
Salix (willow)	X													
Sparganiaceae														
Sparganium (bur reed)	X													
Ulmaceae (elm)														
Celtis (hackberry)		X	–	–	–	+	–	+	–	+	+	–	+	–
Umbelliferae (carrot)	X													
Vitaceae														
Vitis (grape)		X	–	–	–	+	–	+	–	+	–	–	–	–
Unidentified fruit		X	–	–	–	+	–	–	–	+	+	–	–	–

Key: S = pollen identified by A. M. Solomon (1975), not tabulated by periods; C = carbonized material identified by L. Costantini (1984b), tabulated by periods; X and + = presence attested to with no reference to quantity; – = absent from sample; ? = presence attested to in other studies of carbonized material (Costantini 1981; Tosi 1976; Wright 1977).

millennium at Daulatabad R37. The only other occurrence of this taxon in Yahya-area samples is from Yahya Period IVB (subphase 1, late third millennium B.C.). Date stones are relatively heavy and dense and are easily carried by rodents; they can thus find their way into a deposit through cracks in the sediment and burrowing activities. Early remains of dates also have been identified from the site of Mehrgarh in Pakistani Baluchistan in samples from levels approximately contemporary with Daulatabad R37 (sixth millennium B.C.). Costantini (1984a:32) notes that these finds from Mehrgarh "are difficult to interpret since they do not conform with the picture developed of the ancient ecosystem." Whether he means by this statement that the date stones are intrusive or that dates were not grown locally is unclear; in the case of R37, however, the former seems unlikely given the context in which the date stones were found (personal communication from the excavator Martha Prickett).

As for the cereals, cultivated types include wheat, barley, millet, oats, and rye. The presence of the rye (*Secale cereale*) is potentially significant because, as a cool weather grass, it suggests a winter growing season (fall sown, spring harvested). This grass, however, has been identified only in Yahya Period IVB, whereas the remains of the more adaptable wheats and barleys are found throughout almost the entire sequence and in both valleys. Also more commonly found are the charred grains of oats and millet, the distribution of the latter (broomcorn millet, *Panicum miliaceum*) being particularly interesting. It is attested at both Daulatabad sites but not at Yahya until Period IVB (subphase 6, beginning of the third millennium B.C.). Jane Renfrew (1973:100) notes that this cereal is "adapted to regions where spring-sown crops are fairly successful. It requires only 60–65 days from sowing to maturity, but these must be moderately warm and entirely free from frost. It requires relatively little water, in fact it has the lowest water requirement of any of the cereals, but its shallow root system makes it more susceptible than other cereals to conditions of complete drought." The slightly warmer Daulatabad area might thus have been more suitable for growing millet either as a spring crop using late winter/early spring precipitation or even as a quick fall crop planted after late summer rains had flooded the area. Perhaps not until after the Daulatabad area had been abandoned by settled agriculturalists in the late fourth millennium B.C. were attempts made to grow broomcorn millet in the Soghun valley.

As far as wheat and barley are concerned, Costantini (1984b) has identified a large number of different forms of both cereals from Yahya and the Daulatabad sites. Wheats (all domesticated) include: einkorn (*Triticum monococcum*—diploid hulled) from R37, R12, and Yahya Periods VII–IVB.6; emmer (*T. dicoccum*—tetraploid hulled) from both areas and throughout the sequence; bread wheats (*T. aestivum*—hexaploid naked) of two kinds, a long-grained form from R12 and Yahya Period VI onward and a short-grained form from Yahya IVC and IVB; club wheat (*T. compactum*—hexaploid naked) from Yahya IVC and IVB; and Indian dwarf or shot wheat (*T. sphaerococcum*—hexaploid naked) from Yahya IVC, IVB, and IVA. Also to be noted with the wheats is *Aegilops* sp. (goat-face grass) at R12 and from Yahya VI through IVB. The Daulatabad and Soghun valleys lie within the modern range of distribution of this weed of the wheat field, and its presence during the fifth, fourth, and third millennia suggests that it was available to cross with emmer and produce local forms of hexaploid wheat (see Zohary 1969:60–63; J. Renfrew 1973: 40–47). It is interesting to note, however, that both goat-face grass and hexaploid wheats are absent from R37 and the broadly contemporary levels of Yahya VII. To judge from the available evidence, the earliest agriculturalists of the Yahya area cultivated only einkorn and emmer, long-grained bread wheat coming in later, having been developed locally or imported together with goat-face grass mixed with the seed. Not until Yahya IVC does one get a proliferation of wheats, all forms listed above being identified in samples from those late fourth millennium B.C. levels. Period IVC at Yahya is separated from the earlier Period V by a gap of some hundreds of years, and thus we are left without any information on possible local development of various wheat forms. Furthermore, this Proto-Elamite period is one of wide-ranging cultural contacts and thus of opportunities for importation of various seed stocks and food stuffs. The diversity of wheats continues through Period IVB, only einkorn disappearing from the samples. By second millennium Period IVA, however, the number of different wheats present falls to three, while in first millennium Period II, only the original emmer and long-grained bread wheat are present in the samples.

Four forms of barley (all domesticated) have been identified from the Daulatabad and Yahya samples. These include two-rowed barleys (*Hordeum distichum*), hulled and naked six-row barleys (*H. vulgare* and *H. vulgare* var. *nudum*), and a short, round-grained naked six-row barley (*H. sphaerococcum*). This last form is an eastern variety known from Pakistani Baluchistan at least as early as the fifth millennium (Costantini 1984a:31); it is present at Daulatabad R12 and in samples from Yahya Periods V through IVA, although curiously absent from Yahya IVC. The other three forms are represented at both Daulatabad sites and throughout the sequence at Yahya, although there are no barley remains at all from Yahya Period VII samples, a situation that could be an accident of collection or could, in fact, indicate that barley was not grown in the higher Soghun valley at that time, being confined to the warmer and perhaps more saline Daulatabad valley.

No reliable statement can be made concerning the relative importance of the different cereal grains at Tepe Yahya or the Daulatabad sites without detailed consideration of the contexts from which each sample was derived. Such a task is beyond the scope of this chapter and will not be attempted. What can be said, however, is that both wheat and barley were staple crops; rye was almost certainly a weed of the winter season staples; and millet may have been a staple in the Daulatabad valley not grown in the Soghun valley until the third millennium. The only other plant forms whose remains are found commonly are milk vetch (*Astragalus* sp.—R37, R12, and Yahya VII through IVB) and hackberry (*Celtis australis*—Yahya VI through III). Hackberry fruits are sweet and commonly eaten in the Middle East, while the seeds of some milk vetches can be processed for consumption (Hedrick 1919:74–75, 155). The remains of lentils (*Lens culinaris*) are not found before the third millennium, while capers (*Capparis* sp.), like millet, are present at both Daulatabad sites but not at Yahya until Period IVB. Other plants are represented in only one or two periods; grapes and dates were discussed above.

AGRICULTURE

As of the last season of excavation at Tepe Yahya in 1975, wheat and barley still formed the basis for field crop agriculture in the Soghun valley, although modern truck farming of cotton and vegetables had become widespread in the last decade. The use of "improved" seed, requiring irrigation and fertilizers, was a general phenomenon and most of the water no longer came from *qanats* but from tube wells, fifty of which had managed to lower the water table of the valley some two meters in a decade of pumping. Water from springs was still spread over fields in a few areas at the base of the surrounding hills, but no crops were grown on alluvial fans using seasonal runoff or in areas where it was possible to take advantage of a high water table. Even given the prevalence of petroleum-based agriculture, however, the traditional seasonal cycle of crop-growing was maintained, and a number of poorer peasants still employed traditional ard and animal technology (Ladjevardi 1976).

Most wheat and barley in the Soghun valley is fall sown and spring harvested. From late September to late November the fields are flooded, and after the surface has dried out seed is broadcast without additional soil preparation. The same procedure is used for spring-sown cereals that are started in February. The fields are then plowed employing a simple iron-tipped wooden scratch plow (ard) pulled by two oxen. Next, an oxen-drawn wooden board on which the animal handler stands is dragged over the fields to flatten them and to create a dust mulch that serves to seal the moisture into the ground. Larger areas are then subdivided into small plots which can be flooded with irrigation water whenever necessary, but particularly as the crop reaches maturity. Winter rains also serve as a source of moisture and, in good years, make additional watering unnecessary. Harvest extends through the months of May and June, and threshing with the use of oxen and sledge lasts from June through August. After winnowing in the wind, the grain is cleaned using sieves and much of it stored in straw-lined circular pits (*kormeh*) dug into the alluvium and covered with more straw and earth. Throughout the following year, unused grain is periodically checked and transfered, if necessary, to a freshly lined *kormeh*.

Cereal cultivation in the Soghun valley today is extensive in character, a condition made possible by the availability of irrigation water. Before the coming of the *qanat*, however, perennial water would have been restricted to springs and areas of trapped surface flow. Given the likelihood that the bedrock barrier at the exit to the valley was higher in the past than it is today, these areas of standing moisture may have been considerably larger than they are presently. Around their margins it might have been possible to carry out small-scale but intensive cereal crop cultivation. Sherratt (1980) believes that such horticultural growth of grains favored the use of spring-sown wheats and barleys to take advantage of the period of positive water balance between the winter rains and summer drought. Confining cultivation to restricted but well-watered areas would have had the effect of promoting the spread of agriculture "through a variety of environmental zones with minimal adaptation" (Sherratt 1980:318).

For the Soghun valley, however, another crop-growing strategy seems more likely for wheat and barley if one assumes weather patterns similar to those of today. When discussing the climate of the region, it was noted that the Yahya area receives perhaps 10 percent of its annual rainfall in the summer. This precipitation often occurs as torrential downpours that not only drench the ground locally but bring water from the surrounding slopes onto the basin floor through sheet flooding. In the absence of conditions conducive to channel incision, these floods would cover much of the southwest corner of the valley with silt-laden waters. Later in the fall, as areas of standing water evaporated and the ground surface firmed up, seeds could be broadcast and trampled into the soil, the moisture available in the silts producing germination and some growth before the onset of cold weather. The much more gentle winter precipitation would serve to raise the moisture level but not wash out the crop. Even in the absence of significant amounts of winter rain or snow, however, the cereals would still grow in those areas where their roots could tap subsurface moisture. Should the summer rains fail, more restricted areas closer to the valley exit could be planted. Each year there would be a crop characterized by lesser yields in some areas because of water logging and in other areas because of moisture deprivation. The relative size of these areas would depend upon weather conditions for that year. Zoning the crop by planting more tolerant barley on the inner and outer margins with wheat between could serve to buffer the uncertainty to some degree, as would planting a supplementary February-sown crop, although the latter might involve the keeping of a separate seed stock. Whatever strategy was employed to practice agriculture in the Soghun valley, it seems to have had the effect of concentrating settlement at the better-watered south and southwest corners of the valley until the first millennium B.C. (see Prickett, this volume, ch. 9).

If fall sowing of wheat and barley seems likely for the Soghun valley, it is even more so for the Daulatabad valley, which is warmer and today receives significantly less rainfall each year. There, on the upper Rud-i Gushk drainage, Martha Prickett has discovered a large number of sixth, fifth, and early fourth millennium B.C. sites as well as some 400 hectares of late fifth and early fourth millennium fields covering about 7.5 square km of alluvial fan (Prickett 1976, 1979, this volume, ch. 9). These Daulatabad sites, which in any given period suggest a population many times that of the Soghun valley, show a shifting settlement pattern over time. The 13 earliest mounds, contemporary with or earlier than Yahya Period VII, are almost all located on the edge of the silts at the base of the alluvial fan, an area that today is subject to sheet flooding during the torrential summer rains. By building low field walls of stone, it would have been possible to contain some of the water and permit it to sink into the soil. (A similar strategy would have been possible in the Soghun valley as well.) Water thus stored in the silts could serve to get a fall-sown crop growing with supplementary moisture coming from gentler winter showers. Since the Daulatabad region is lower than the Soghun valley, the period of cold weather is shorter, and fall-sown crops will ripen earlier, thus avoiding desiccation during the hot, dry weather of the late spring.

Following the earliest defined Moradabad phase, Prickett has identified 39 sites contemporary with Yahya Period VI through VB. Of these, about half (19) are located on the alluvial fan itself and mark the beginnings of the extensive terraced field system. The following Period VA is the time of maximum settlement of the area, with some 53 sites assigned to this time frame. Of these, 26 are situated on the alluvial fan associated with the terraced fields with the remainder located on the edge of the silts, not only at the base of the large Rud-i Gushk fan but also scattered "around the valley at localities with only the slightest run-off potential" (Prickett 1979:54). By the next phase, contemporary with an apparent gap in the Yahya sequence between Periods VA and IVC, the number of sites has decreased to 26, all located once again on the silts at the base of the Rud-i Gushk fan. This phase apparently marks the end of settlement in the Daulatabad valley until the introduction of the *qanat* some 3,000 years later, at which time sites were founded in a different part of the valley.

From Prickett's work it is clear that the field systems identified on the upper Rud-i Gushk alluvial fan represent an attempt to extend flood water farming from the fan toe onto the fan itself through the use of terracing techniques that are still employed in Pakistani Baluchistan. The description by Raikes (1968:126) of field preparations in the Jhalawan District, an area climatically similar to the Daulatabad region, is of particular interest. The process involves diversion and channeling of silt-laden flood waters across alluvial fans, where they are trapped by series of L-shaped terrace walls (sometimes called *gabarbands*). The silt so trapped, in fact, forms an area of cultivable ground where none may have existed previously. After a flood, the field is allowed to stand until the ground is firm. The area is then plowed, the surface permitted to dry out, and the field finally flattened by an oxen-drawn drag that serves to reduce evaporation through creation of a dust mulch. In Jhalawan the torrential rains occur during July and August just as they do in the Yahya area, but planting of wheat or barley is not carried out until October or November, at which time the seed is broadcast, and the field is again plowed with an ard and dragged to seal the surface. The grain proceeds to germinate and grow on the stored moisture, which may or may not be supplemented by winter precipitation.

The key feature of the Jhalawan system is the dust mulch formed by the cultivator as soon after a flood as possible. Yet sowing may not take place until two or three months after field preparation, which means an additional round of plowing and dragging. This delay is necessary for two reasons. A second or even third storm may follow the first, and if the crop were sown immediately, it would stand a chance of being washed out. Furthermore, should a wheat or barley crop be permitted to grow during the hot late summer and early fall months without additional rainfall, transpiration would quickly deplete the soil of moisture with poor yields being the result. Millet can be grown under late summer and early fall conditions because it develops and matures in a 60-to-70-day period. Sorghum has the same properties, and the two are grown in many areas of Baluchistan since they can be planted to take advantage of whatever water there is whenever it comes. Most wheats and barleys, however, require at least three months from seed to harvest and ripen best in warmer weather.

Wild wheats and barleys are winter cereals dependent upon winter rainfall for their growth within their range of natural distribution. Sherratt (1980:317–319) has argued that movement of these cereals out of their natural habitats and into conditions of horticultural growth led to the development of spring-sown varieties that dominated until agriculture expanded away from sources of abundant water. "Rainfall-dependent growth would have necessitated a winter growing season, at least for the wheats, and it is likely that there was a return to the pattern of seasonality characteristic of the wild cereals. Such a move would favour the use of barley, as well as bread-wheat (*Triticum aestivum*)—the 'soft, light grain' which replaced the older and harder forms" (Sherratt 1980:319). As noted, bread-wheat first appears in the Yahya-area samples in Period VI. Its arrival could be an indication of a shift from spring to winter sowing of wheats, although such an inference is certainly stretching the evidence too far.

Once cereals became a field as opposed to a horticultural crop, soil preparation depended upon the use of draft animals, particularly cattle (*Bos*). Remains of domestic cattle are present in the faunal assemblages from the earliest periods of both Yahya and Daulatabad R37, but whether they were used as draft animals is not possible to determine directly. The plow itself is attested to at Yahya in the form of a sign inscribed on a number of Proto-Elamite tablets from the Period IVC complex (Lamberg-Karlovsky 1971b: fig. 1). Given a mean annual rainfall of less than 300 mm in the Yahya and Daulatabad valleys, field crop agriculture also required techniques to ensure maximum use and conservation of available water. The terracing systems of the Daulatabad valley show that such techniques had been developed by the end of the fifth millennium B.C.

MODERN AND ANCIENT FAUNA

On a general level, the modern wild fauna of the Soghun and Daulatabad valleys can be described as primarily Palearctic in character but with significant Indian and Ethiopian elements present due to the proximity of the Gulf coast and Baluchistan. While zoological studies of the immediate region have never been carried out, areas to the north (Kerman), east (Baluchistan), west (Fars), and south (the coast) have been surveyed to varying degrees by mammologists (e.g., Lay 1967), ornithologists (e.g., Hüe and Étchécopar 1970), and herpetologists (e.g., Anderson 1968, 1974). Using such studies as guides, lists of taxa likely to be present in the region can be drawn up. One such list for mammals is presented as table 3.3. When examining this table, it is important to understand that given our present poor state of knowledge, some taxa listed may actually be represented only rarely or not at all in the region, while others not listed may be present, if only in small numbers or infrequently.

All of the listed taxa have their individual physiological requirements and habitat preferences, most of which can probably be satisfied somewhere in the environmentally varied Yahya and Daulatabad areas. The juxtaposition of *sardsir* (cold) and *garmsir* (hot) regions together with the mountain-plain-wetland continuum provide a wide variety of environmental conditions. Although it is possible to denote habitats where many of the mammalian species are most likely to be found, what is important for interpreting the ancient faunal record (just as for the pollen record) is knowledge of the factors which today control the *local* distribution of the various taxa. Such information is not available for the Yahya area, and thus any use of faunal remains for reconstructing the nature of past environments or for reflecting the use of specific environments by humans must be considered subject to considerable qualification.

Also listed in table 3.3 are the domestic mammals present in the Yahya area today, namely dog, cat, horse, donkey, dromedary, zebu, goat, and sheep. Of these taxa, there is evidence only for dog, zebu, goat, and sheep in the faunal record from Tepe Yahya prior to the second millennium B.C. (see table 3.4). Domestic pigs are not kept in the region today but are represented in great quantities in the assemblages of the first millennium, together with camel (species not determined), horse, and donkey. Domestic chickens, ducks, and geese are also kept by peoples of the area today. A single specimen from a Yahya Period VC context clearly comes from domestic chicken, although its rather bleached aspect leads me to suspect that it is intrusive, coming from some first millennium level where chicken bones are quite common.

Of the nearly 19,000 bone and tooth fragments so far analyzed by me from Daulatabad R37 and Yahya Periods

Table 3.3. Mammalian taxa (except Chiroptera) likely to be found today in the Daulatabad and Soghun valleys and surrounding highland areas, based on modern distributions described by Misonne (1959), Lay (1967), and Corbet (1978).

Taxon	Common Name	Author[a]	Habitat
Wild			
Insectivora			
Hemiechinus auritus (Gmelin, 1770)	long-eared hedgehog	M, ?C	Arid/semiarid hills and plains
Paraechinus hypomelas (Brandt, 1836)	Brandt's hedgehog	M, L, C	Gravel slopes
Crocidura zarudnyi Ognev, 1928	shrew	?C	Areas of denser vegetation
Lagomorpha			
Ochotona rufescens (Gray, 1842)	rufescent pika	M, L, C	Mountain steppe forest
Lepus capensis Linnaeus, 1758	cape hare	M, L, C	General
Rodentia			
Calomyscus bailwardi Thomas, 1905	long-tailed hamster	L	Mountain steppe
Cricetulus migratorius (Pallas, 1773)	gray hamster	M, L	Mountain steppe
Gerbillus nanus Blanford, 1875	Baluchistan gerbil	M, L, C	Rocky areas or clay flats with scrub
Gerbillus cheesmani Thomas, 1919	Cheesman's gerbil	L, C	Semi-desert dunes or mud flats
Tatera indica (Hardwicke, 1807)	Indian gerbil	M, L, C	Alluvium, cultivated areas
Meriones persicus (Blanford, 1875)	Persian jird	M, L, C	Mountainous regions
Meriones hurrianae (Jerdon, 1867)	Indian desert jird	M, L, ?C	Alluvium
Meriones libycus Lichtenstein, 1823	Libyan jird	M, L, C	Broad valleys at lower altitudes
Meriones crassus Sundevall, 1842	Sundevall's jird	M, L, C	Barren, stony plains
Rhombomys opimus (Lichtenstein, 1823)	great jird	M, L, C	Broad valleys at lower altitudes
Rattus rattus (Linnaeus, 1758)	black rat	?M, ?L, C	Commensal
Mus musculus Linnaeus, 1758	house mouse	M, L, C	Field and commensal
Acomys cahirinus (Desmarest, 1819)	spiny mouse	M, L, C	Barren, rocky regions
Nesokia indica (Gray, 1830)	bandicoot rat	M, L, C	Damp soil
Dryomys nitedula (Pallas, 1779)	forest dormouse	?M, L, C	Steppic mountain regions
Jaculus blanfordi (Murray, 1884)	greater three-toed jerboa	M, L, C	Barren, arid plains

a.M = Misonne (1959); L = Lay (1967); C = Corbet (1978).

Table 3.3. Continued.

Taxon	Common Name	Author[a]	Habitat
Allactaga elater (Lichtenstein, 1825)	small five-toed jerboa	M, L, C	Upland desert slopes or flats
Hystrix indica Kerr, 1792	crested porcupine	M, L, C	General
Carnivora			
Canis lupus Linnaeus, 1758	wolf	M, L, C	General
Canis aureus Linnaeus, 1758	jackal	M, L, C	General
Vulpes vulpes (Linnaeus, 1758)	red fox	M, L, C	General
Vulpes rueppelli (Schinz, 1825)	sand fox	L	Deserts
Vulpes cana Blanford, 1877	Blanford's fox	L	Mountain steppe
Selenarctos thibetanus (G. Cuvier, 1823)	Asiatic desert bear	?L	Arid subtropical thorn forest
Ursus arctos Linnaeus, 1758	brown bear	M, ?L, ?C	High mountains
Vormela peregusna (Guldenstaedt, 1770)	marbled polecat	M	Semi-rocky areas, especially uplands
Martes foina (Erxleben, 1777)	rock marten	?L	Mountain steppe
Herpestes auropunctatus (Hodgson, 1836)	small Indian mongoose	M	Commensal; wooded lowlands
Herpestes edwardsi (Geoffroy, 1818)	gray Indian mongoose	L	Arid plains
Hyaena hyaena (Linnaeus, 1758)	striped hyena	M, L	General hills and valleys
Felis silvestris Schreber, 1777	wild cat	M, L, C	General
Felis chaus Guldenstaedt, 1776	jungle cat	L, C	River and swamp areas
Felis caracal Schreber, 1776	caracal	L	Remote scrubby low-lying areas
Panthera pardus (Linnaeus, 1758)	leopard	L	Broken, hilly country
Acinonyx jubatus (Schreber, 1776)	cheetah	L	Semiarid plains
Perissodactyla			
Equus hemionus Pallas, 1775	Persian wild ass	M, L	Semiarid plains
Artiodactyla			
Sus scrofa Linnaeus, 1758	wild boar	M, L, C	River, swamp, and nearby plains
Gazella subgutturosa (Guldenstaedt, 1780)	goitered gazelle	M, L, C	Shrubby plains/broad valleys
Gazella dorcas (Linnaeus, 1758)	jeber/chinkara	L	Subdesert plains/semiarid valleys

Table 3.3. Continued.

Taxon	Common Name	Author[a]	Habitat
Capra aegagrus Erxleben, 1777	Persian wild goat	M, L, C	Remote, steep hillsides
Ovis orientalis Gmelin, 1774	wild sheep	M, L, C	Lower hills and valley slopes
Domestic			
Carnivora			
Canis familiaris Linnaeus, 1758	dog		
Felis catus Linnaeus, 1758	cat		
Perissodactyla			
Equus caballus Linnaeus, 1758	horse		
Equus asinus Linnaeus, 1758	donkey		
Artiodactyla			
Camelus dromedarius Linnaeus, 1758	dromedary		
Bos indicus Linnaeus, 1758	zebu		
Capra hircus Linnaeus, 1758	goat		
Ovis aries Linnaeus, 1758	sheep		

VII through IVC, less than 1.5 percent come from animals other than goat, sheep, and cattle. These rare taxa include birds, reptiles, and mammals (table 3.4). Birds from all three of the major environmental zones of the region are represented by a total of 34 specimens, 19 of which come from Yahya Period IVC. Birds that prefer to nest in cliffs and crags include the eagle owl, bearded vulture, golden eagle, Bonelli's eagle, rock dove, and raven. Representative of the flats are francolin or chukar (identification uncertain), houbara, and turtle dove. From water habitats are mallard, grey heron, and pochard. Only the Phasianidae are represented by more than four specimens.

As for reptiles, only one form, the land tortoise, has been identified. The remains of this animal have been found in all periods at Tepe Yahya, with 68 fragments making it the second most frequently represented nondomesticate (after gazelle and excepting small rodents, which have not yet been studied). Tortoise (*Testudo graeca zarudnyi*) can still be found on the lower slopes around the Soghun valley today; they are edible, and their carapaces can be used as containers.

Mammal remains make up the bulk of the faunal assemblages. The most commonly represented nondomesticate is gazelle (107 specimens identified); bones of the jeber (*Gazella dorcas*) are definitely present, and those of the goitered gazelle (*Gazella subgutturosa*) may be as well. Wild boar and half-ass are equally represented (32 specimens each) and, like gazelle, are found throughout the sequence. The other seven taxa are more spottily represented; there are eight bones of porcupine coming from the floors of Period VC rooms, six of these probably from the same animal, with single specimens from Periods VI and VB. Two bones of fox and single bones of hare, mongoose, jungle cat, bear, and lion have been identified from Yahya, with three bones of hare and one of fox coming from Daulatabad R37. Bears are reported today from high in the mountains to the north of Yahya; based on considerations of habitat, these are probably the brown bear *Ursus arctos*. The black bear, *Selenarctos thibetanus*, the Baluchistan subspecies of which apparently thrives in arid areas, has been reported from "the southeastern part of Kerman Province" (Lay 1967:234) and thus could be represented at Yahya. The lion is thought to be now extinct in Iran. Except for the brown bear, all of the wild taxa either have very general habitat requirements or are animals of the valley floor and lower slopes. Gazelle, boar, and half-ass are crop robbers, and thus the hunting of these species may have been as much for protection of the fields as for obtaining meat. Among the domesticates, the dog is represented by a total of only nine specimens. Bones from throughout both Yahya and Daulatabad R37 show

Table 3.4. Fauna identified at Tepe Yahya (Periods VII–IVC) and Daulatabad R37.

		Yahya Period					
Taxon	R37	VII	VI	VC	VB	VA	IVC
Mammal (wild)							
Lagomorpha							
Lepus capensis (hare)	+	–	–	+	–	–	–
Rodentia							
Hystrix indica (porcupine)	–	–	+	+	+	–	
Carnivora							
Ursus arctos (brown bear) or *Selenarctos thibetanus* (black bear)	–	–	–	–	–	–	+
Vulpes vulpes (fox)	+	–	–	+	–	–	+
Herpestes auropunctatus (mongoose)	–	–	–	–	–	–	+
Felis chaus (jungle cat)	–	–	+	–	–	–	–
Panthera leo (lion)	–	–	–	–	–	–	+
Perissodactyla							
Equus hemionus (half-ass)	–	+	+	–	+	+	+
Artiodactyla							
Sus scrofa (boar)	+	+	+	+	+	+	+
Gazella sp. (gazelle)	+	+	+	+	+	+	+
Mammal (domestic)							
Carnivora							
Canis familiaris (dog)	+	+	+	–	+	+	+
Artiodactyla							
Bos sp. (cattle)	+	+	+	+	+	+	+
Ovis aries (sheep)	+	+	+	+	+	+	+
Capra hircus (goat)	+	+	+	+	+	+	+
Reptile (wild)							
Testudo graeca (tortoise)	–	+	+	+	+	+	+
Bird (wild)							
Ardeidae							
Ardea cinerea (grey heron)	–	– a	–	–	–	–	
Anatidae							
Anas platyrhynchos (mallard)	–	–	–	–	–	–	+
Aythya ferina (pochard)	–	–	–	–	–	–	+
Accipitridae							
Gypaetus barbatus (bearded vulture)	–	?	–	–	–	–	–
Aquila chrysaetos (golden eagle)	–	–	–	–	–	–	+
Hieraaetus fasciatus (Bonelli's eagle)	–	–	–	–	–	–	+

Note: Bird identifications by Joachim Boessneck; small mammal identifications with the assistance of Angela von den Driesch and Mostefa Kokabi, all of the Institut für Palaeoanatomie, Domestikationsforschung, und Geschichte der Tiermedezin, University of Munich.

Key: a = chronological attribution uncertain; could date to Period VII or VI; + = species present; ? = possible identification; – = not attested.

Table 3.4. Continued.

Taxon	R37	Yahya Period VII	VI	VC	VB	VA	IVC
Phasianidae							
Alectoris chukar (chukar) or *Francolinus* sp. (francolin)	–	+	a –	+	+	+	+
Otididae							
Chlamydotis undulata (houbara)	–	–	–	–	–	–	+
Columbidae							
Columba livia (rock dove)	–	–	–	–	–	–	+
Streptopelia sp. (turtle dove)	–	–	–	–	–	–	+
Strigidae							
Bubo bubo (eagle owl)	–	+	–	–	–	–	+
Corvidae							
Corvus corax (raven)	–	–	+	–	–	–	–
Bird (domestic)							
Phasianidae							
Gallus gallus domesticus	–	–	+		–	–	–
Unidentified bird	+	+	–	–	–	–	+

signs of carnivore gnawing, however, indicating that dogs probably played some role in shaping the final configuration of the faunal assemblage.

As noted, more than 98 percent of the faunal remains from Yahya Periods VII–IVC and Daulatabad R37 come from domestic bovids. Figure 3.3 displays five bar graphs, each showing the relative abundance of the remains of wild mammals, sheep, goats, and cattle. For the two Yahya periods with small-scale architecture (VII and V), the percentages of the various taxa are quite similar, cattle bones and teeth making up about 18–23 percent of the assemblages, with sheep and goat remains contributing most of the rest. For Period VI, however, the contribution of cattle is considerably higher, being over 37 percent. Faunal remains from this period come mostly from stone and sherd rubble used as fill under and between leveling walls. This fill is probably tertiary in origin, that is, transported from an area on or off of the site that had been used as a dump. Materials from such tertiary deposits are likely to have gone through sorting processes that were different from those characteristic of habitation deposits, and thus they are not comparable to remains found in and around domestic structures like those of Periods VII and V. From the monumental Proto-Elamite complex of Period IVC, about 6 percent of the bones come from cattle. This low percentage in part reflects the fact that much of the IVC deposit was screened, although even in the unscreened fraction, the proportion of cattle remains is only about 8 percent. A similar low percentage of cattle bones from Daulatabad R37 also should be noted. While no detailed attempt to explain these phenomena will be made here, it may be significant that the Daulatabad valley is drier and warmer than the Soghun valley and that Yahya VA is separated from IVC by a substantial temporal gap and cultural discontinuity.

Morphologically, the domestic bovids change very little through the sixth, fifth, and fourth millennia B.C. A very few large bones of sheep and goat are present in all periods, coming from big males or possibly even from wild animals. Cattle, on the whole, are somewhat larger than those from contemporary sites in Pakistan, being similar in size to the animals of Shahr-i Sokhta (Meadow, in press). There is, however, a change between Periods V and IVC, the cattle of the later period being somewhat smaller than those of the earlier periods. Again the temporal gap and cultural discontinuity may help to account for this phenomenon. To judge by the presence of bifid (notched) dorsal spines of thoracic vertebrae and of broad and flat suborbital rims, zebu cattle (*Bos indicus*) are represented at both Daulatabad R37 and Tepe Yahya. The extent of distribution to the west of this form of cattle and the history of its use vis-à-vis that of European cattle (*Bos taurus*) remains an important problem for future research.

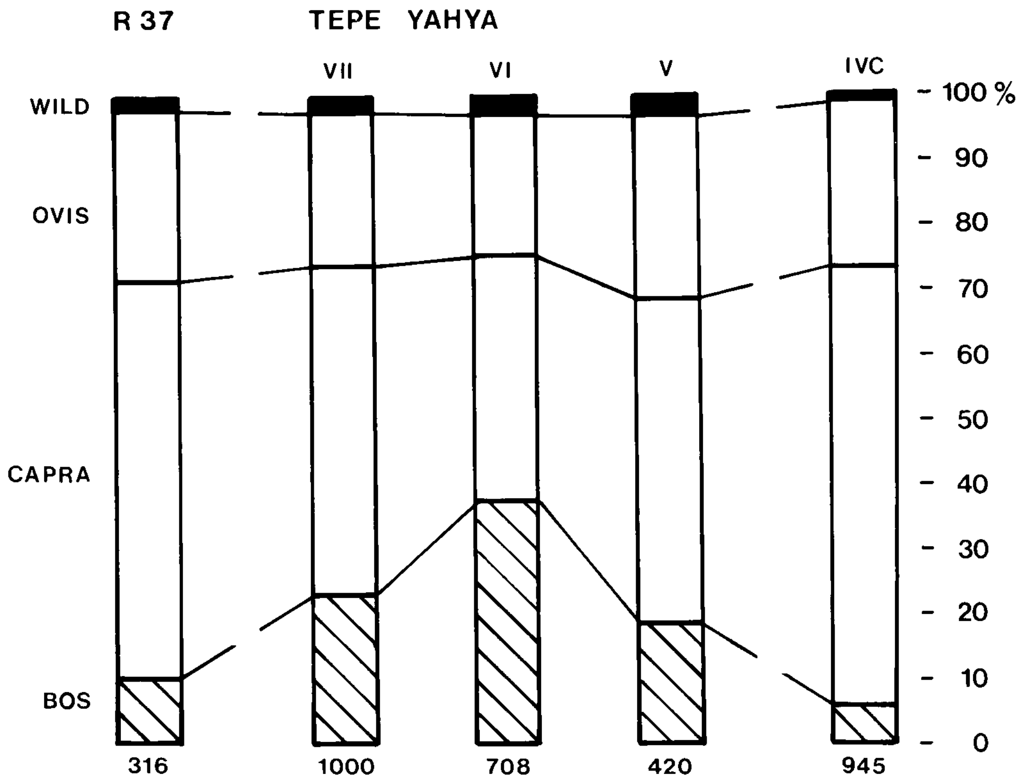


Figure 3.3. Composition of faunal assemblages from Daulatabad R37 and Tepe Yahya Periods VII, VI, V, and IVC. Proportions are based on the standardized bone counts noted at the base of each column. The following elements were counted: articular ends of long bones, glenoid of scapula, acetabulum of pelvis, atlas, axis, phalanges, maxillary and mandible pieces with teeth, single deciduous third molars, and permanent third molars. The counts are corrected for articulating specimens. The proportions of sheep and goat reflect the ratio of sheep to goat among those elements that could be identified to the genus level.

Chapter 4

The Ceramics

Thomas Wight Beale

Peabody Museum, Harvard University

SUMMARY OF CERAMIC TYPES

The primary focus of this chapter is the ceramic typology and sequence, with a description of the range of shapes and painted designs within each defined type. Type definitions are based on distinctive combinations of attributes of paste, temper, surface decoration, and surface color by which mutually exclusive types could be established. Vessel forms were not used as a criterion for defining types, and certain common forms tend to reappear through time and crosscut different types. Paste color ranges for each type are based on standard Munsell soil color charts (Munsell 1961). Other descriptive terminology generally follows that established by Hole, Flannery, and Neely (1969:110–111) for the Deh Luran ceramic sequence in southwestern Iran. A more detailed discussion of the technology of ceramic production follows in chapter 5.

To introduce this discussion, we provide a summary chart (fig. 4.1) of the different ceramic types and their distribution through time. The bar thicknesses of the various types on the chart relative to other types are only an approximation of the relative percentages of different types in each period. The only detailed sherd counts come from Period VB levels in Trench B. For example, from Period VB stratum B.73.5 a total of 1,770 sherds was recovered, of which 61 (3.4 percent) were Lapui Ware, 727 (41 percent) were Black-on-Buff Ware, 866 (49 percent) were Chaff-Tempered Coarse Ware, and 116 were undiagnostic, unidentifiable, or intrusive. Several general statements regarding relative numbers of different types can be made, based on these sherd counts and field notes. From Period VII through VB, Chaff-Tempered Coarse Ware is by far the most common ceramic type, and is in most strata more numerous than all other types combined. In VA.2 Plain Coarse Ware becomes the most numerous type. The most common painted wares—Black-on-Buff Ware in VB and Black-on-Red Ware in VA.1—comprise, on average, about 40 percent of the assemblage in their respective periods. Lapui Ware never constitutes more than 5 percent of the assemblage. The rarest fine wares—Soghun Ware, Black-on-Fine Orange Ware, and Black-on-Smooth Buff Ware—never constitute more than 2–3 percent of the assemblage in their respective periods.

CHAFF-TEMPERED COARSE WARE

This is a handmade ware, heavily tempered with chaff (figs. 4.2–4.8). One of the forms—the carinated jar (fig. 4.4)—is constructed in two pieces and then joined at the carination. The shapes are uniformly simple: open bowls and jars. The vessels are often crudely made, with unevenly formed rims and bases that make accurate measurements of rim and base diameters difficult. Chaff-Tempered Coarse Ware is very common at Yahya from the earliest levels of Period VII through VB. In these periods sherds of Chaff-Tempered Coarse Ware are far more numerous than those of any other single type.

Two distinctive phases in the use of this ware can be distinguished. The first phase extends from VIID through VIIA. In this earlier phase the chaff or straw used as tempering is cut up and crushed into smaller, finer pieces (perhaps coming from the winnowing process), and the resulting vessel fabric is much heavier and denser and breaks less easily than that of vessels from the later phase. Vessels from this first phase are often burnished. In the second phase, beginning in VIB.2, the straw and chaff used for tempering are left in much larger pieces and the resulting vessel fabric is lighter and less dense. A major new shape—the carinated jar (figs. 4.4:i; 4.5)—is first introduced in this later phase, while other shapes from the first phase—such as (rare) rectangular trays (fig. 4.8:c) and ovoid bowls with large loop handles (figs. 4.2:n,p,q–x; 4.6)—go out of use.

Vessels are usually well fired, with the paste being of a uniform reddish color, although less well oxidized sherds with grey cores are also fairly frequent. At the extremes, paste color ranges from a pinkish red to a brownish red (5 YR 6/6 to 10 R 5/8 on Munsell soil color charts). Tempering material consists of pieces of cut up and/or crushed straw. As noted above, the chaff tempering of the Period VII vessels is much finer and more concentrated that that of VIB.2 through VA.2 vessels. The easiest way to determine whether a particular sherd belongs to the earlier or later phase is by the size of the straw impressions on the exterior surface. On chaff-tempered vessels of Period VII, the maximum length of a surface chaff impression averages 0.5 to 0.75 cm and is never longer than 1 cm. For VIB.2 through VA.2

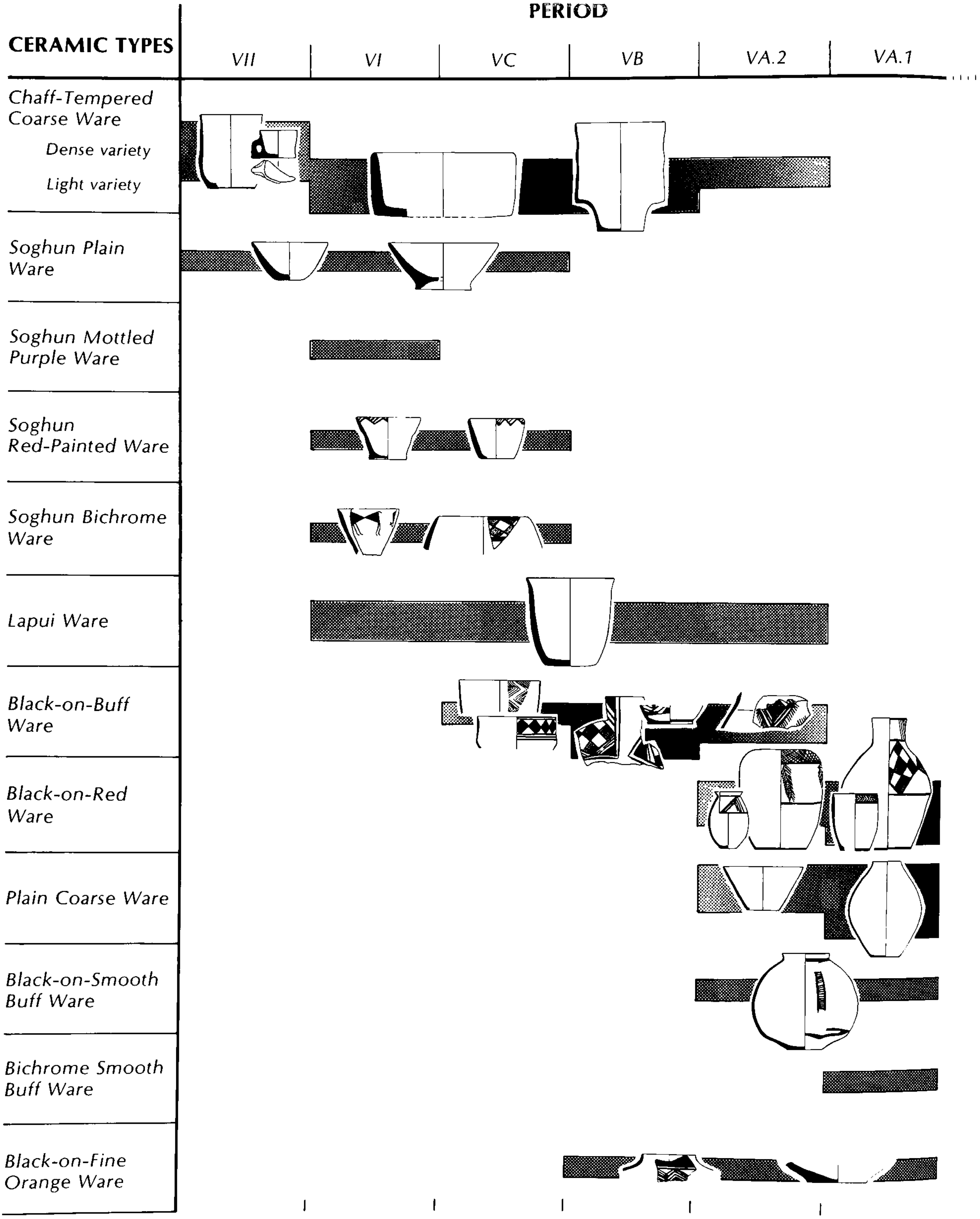
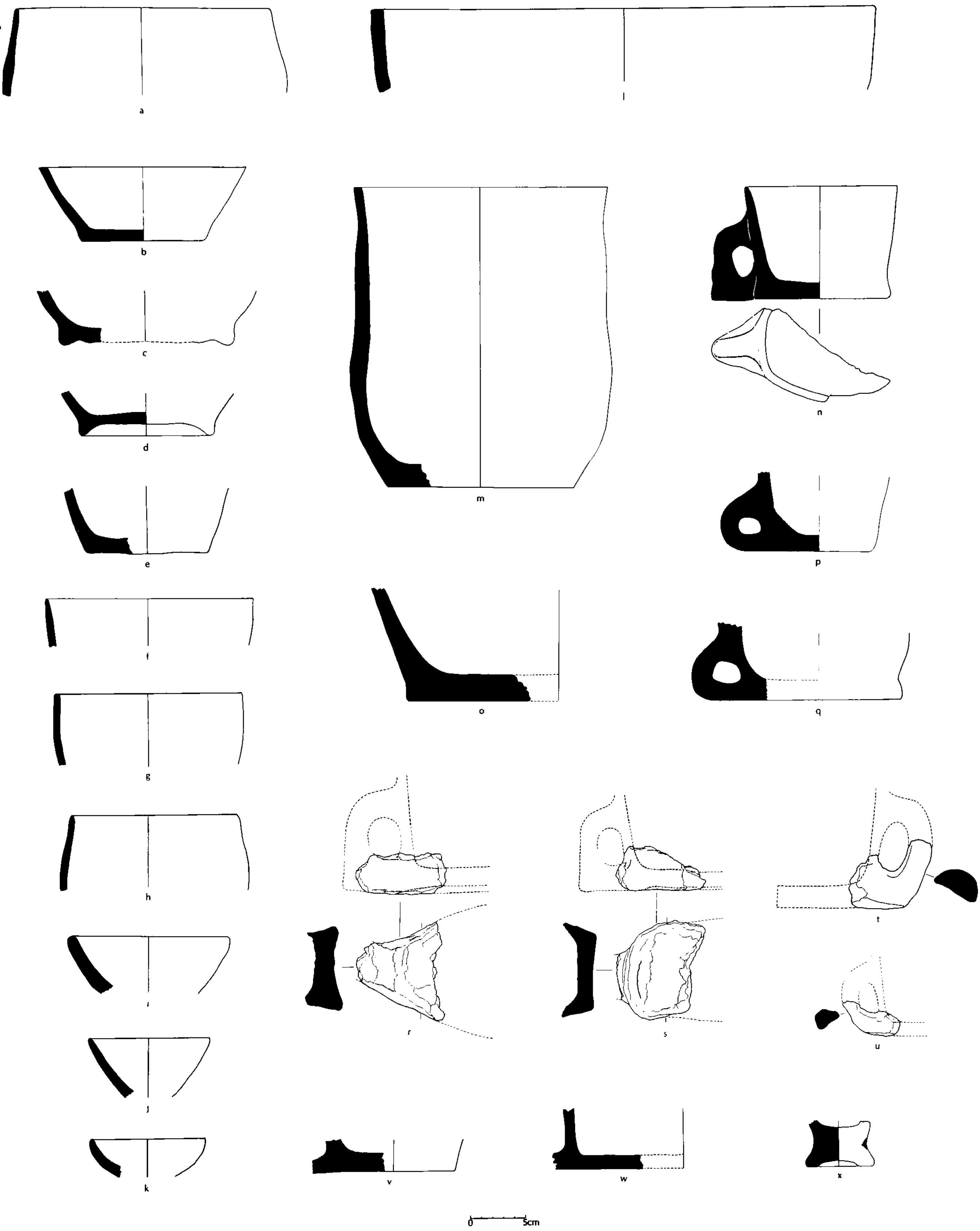


Figure 4.1. Chronological distribution of ceramic types.

Figure 4.2. Chaff-Tempered Coarse Ware, Period VII. Proveniences: a, C.73.6-9; b, XD.70.T2.3; c, D.68.6; d, D.68.6; e, D.68.6; f, D.68.T1.11; g, C.70.T6.6; h, C.73.T1.6-9; i, D.68.6; j, D.68.6; k, D.68.6; l, XCE.73.T1.10; m, C.70.T5.7; n, A.75.T8.13; o, XC.73.1; p, D.69.8; q, D.69.8; r, D.69.8; s, B.73.T1.3.5; t, C.73.T1.6-9; u, D.69.T1.11; v, D.68.T2.13-14; w, XCE.73.T1.11; x, D.69.5.


a
l
b
c
d
e
f
g
h
i
j
k
m
n
o
p
q
r
s
t
u
v
w
x
0
5cm

vessels, on the other hand, a sherd will almost always have on the exterior surface at least one and probably several chaff or straw impressions that are 2 to 3 cm in length. Clearly, the material used in the earlier phase was more thoroughly processed and cut up into shorter pieces before being added to the clay as tempering.

A mineralogical analysis of one sherd of Chaff-Tempered Coarse Ware was carried out by Diana Kamilli (Kamilli and Lamberg-Karlovsky 1979: sample 3). This sherd is of the lighter, less dense variety that begins in VIB.2. The chaff temper in the sherd was found to make up 15 percent of the coarse fraction, and mineral grains only 2 percent. Minerals in the sherd included quartz, untwinned feldspar, pyroxene, biotite, abundant muscovite, and primary calcite, along with traces of chlorite, twinned calcic plagioclase, chert, and sherd fragments. This mineral assemblage is very similar to that found in the Black-on-Buff and Black-on-Red Ware sherds analyzed, differing only in its abundance of primary calcite and chaff. Kamilli concluded from the mineral composition that this sherd was made from local clays. On the basis of the sherd's softness and the unfused paste matrix, Kamilli estimated a firing temperature of 600° C or less.

Vessel surfaces are wet-smoothed, but chaff impressions still show up clearly on the surfaces. Vessels of Period VII are usually burnished, while from VIB onward burnishing is found on only a few sherds, most or all of which may be intrusive from earlier levels because all have the shorter straw temper and denser fabric common to the earlier phase. Surface color usually is red, but like the fabric itself shows considerable variation, from a pinkish red to a brownish red (5 YR 7/6 to 2.5 YR 5/6). From VIB.2 through VC there are occasional rim or body sherds painted on the exterior surface with broad red or purplish red meandering bands (fig. 4.3). Only one of the painted sherds recovered was large enough to show any sort of pattern in these meandering bands; it consists of an "E" design (fig. 4.3:a).

Shapes

Because so few full profiles were recovered (mostly carinated jars, low-sided trays, and ovoid bowls), it is difficult to discuss in detail the different shapes to be found in Chaff-Tempered Coarse Ware. Thus, where shapes are not clearly known, our description will be limited to a discussion of the different types of rims and bases. It would appear from the angles of most of the rims and bases that the most common forms are open bowls and simple jars.

Chaff-Tempered Coarse Ware bases can be divided into two basic types: concave bases and flat bases. In more extreme examples, concave bases (fig. 4.2:d) resemble ring bases. The shallow base angles on concave bases suggest that this base type was associated exclusively with open bowl forms. Concave bases have a limited period of use, from Period VIID through VIIA. The few examples found in later levels (fig. 4.4:u) probably can be considered intrusive, for they have the same heavy, dense fabric, burnished surfaces, and smaller, finer chaff tempering that distinguish the Chaff-Tempered Coarse Ware of VII. Concave bases show little variability in their diameters. The modal concave base diameter is 11 cm, and 18 of the 21 measurable bases (86 percent) are between 11 and 14 cm.

Flat bases appear to be associated frequently with open bowl forms, although the steepness of many of the base angles suggests that flat bases were also associated with more straight-sided, simple jar forms. Flat bases are common throughout the span of Chaff-Tempered Coarse Ware's use. In contrast to concave bases, the flat bases of both the earlier phase (Period VII) and the later phase (Periods VIB–VA.2) show a very wide range of base diameters, with

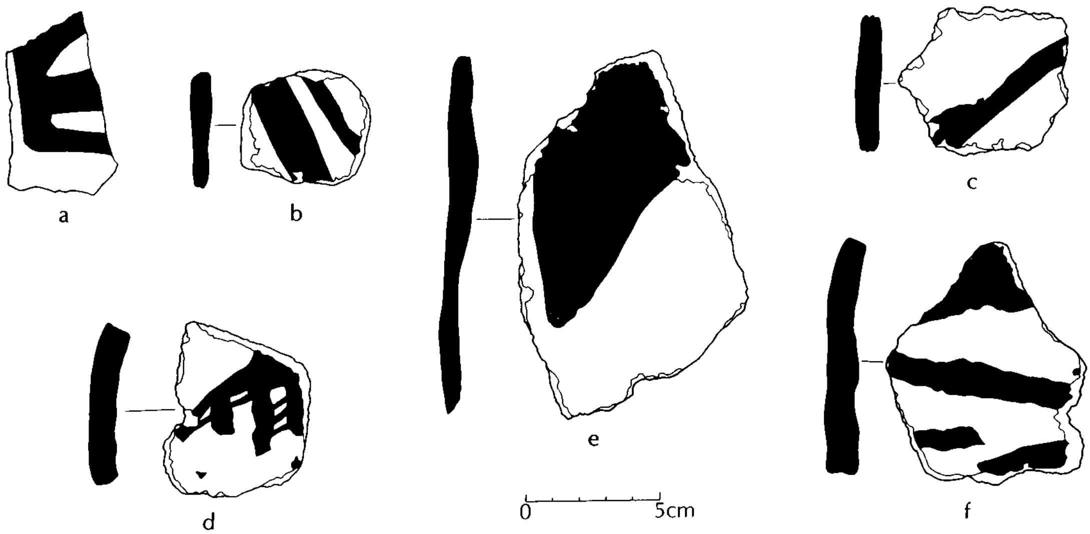


Figure 4.3. Painted Chaff-Tempered Coarse Ware, Periods VII–VC. Proveniences: a, C.69.7.11; b, XC.71.T2.6A; c, XC.71.T1.6A; d, XC.71.T1.6A; e, D.69.T1.8.1; f, XC.71.T2.6A.

very little difference between the two phases except for a much higher percentage of bases in the 6–12 cm range in the later phase. Many of these smaller bases of the later phase were probably the bases for carinated jars, which were first introduced in VIB.

Pedestal bases are very thick, but their diameters never exceed 7 cm. The bases are usually concave on the bottom. Pedestal bases are very rare; only four examples were found, all from VIB.2 through VIA levels (fig. 4.2:x).

Rims are of two basic types: simple rounded rims and simple flattened rims. Flattened rims, often very unevenly formed, are most common in VII (fig. 4.2:b,g,l,m) but rare thereafter. The later examples probably can be considered intrusive, for like the later concave bases, they have the distinctive vessel fabric and tempering of the earlier phase. Simple rounded rims appear throughout the life span of Chaff-Tempered Coarse Ware. The distinction between the rounded rims of the earlier and later phases is that a high percentage of the later rims are slightly out-turned in profile, while no such out-turned rims are to be found in Period VII.

Handles are very rare and have been recovered only from Period VII.

The carinated jar form (figs. 4.4:i; 4.5) first appears in VIB.2 and is by far the most common form in the later phase of Chaff-Tempered Coarse Ware. Three complete carinated jars were found in their original positions along the walls of one of the main rooms of the VC architectural complex (fig. 6.23: Room 1). It would appear, therefore, that they functioned as storage jars.

Fifteen examples of ovoid bowls with large loop handles were recovered, all from VII (figs. 4.2:n,p,q–x; 4.6). The loop handle is placed at one of the narrow ends of the ovoid bowl. The loop begins at the rim and ends at the base, occupying the whole vertical height of the bowl.

Carinated bowls, open bowls, and simple jars are common forms throughout Periods VII, VI, and V, although full profiles are rare (figs. 4.2:b,m; 4.4:p; 4.7).

Three Chaff-Tempered Coarse Ware vessels were recovered that are each unique within the general corpus (fig. 4.8). They include a miniature bowl (from the lowest level of Period VIID) with a ring base, almost no chaff tempering, and fired very lightly if at all (fig. 4.8:a); a rectangular tray from VIIA (fig. 4.8:c); and a globular, necked vessel decorated on the exterior with black painted horizontal lines over a red wash, coming from Period VIB.2 (fig. 4.8:b).

Chronology

Period VII	Very common
Period VI	Very common
Period VC	Very common
Period VB	Common
Period VA.2	Common
Period VA.1	Rare

The distinctions between the earlier and later phases of Chaff-Tempered Coarse Ware production can be summarized as follows:

Period VII (fig. 4.2)	*Period VIB.2–VA.2 (figs. 4.3, 4.4)*
Heavier vessel fabric	Lighter vessel fabric
Shorter (less than 0.75 cm on average), finer pieces of chaff for tempering	Longer (more than 1.5 cm on average), larger pieces of chaff for tempering
More than 50 percent of vessels burnished	Burnishing very rare, sherds probably intrusive (heavier fabric, shorter straw tempering)
Concave bases common	Concave bases very rare, probably intrusive
Flattened, uneven rims common	Flattened, uneven rims very rare, probably intrusive
Handles	No handles
Ovoid bowls with loop handles	No ovoid bowls with loop handles
No painted designs	Meandering exterior painted bands
No pedestal bases	Pedestal bases
No carinated jars	Carinated jars common

Chaff-Tempered Coarse Ware, North Side

Chronology

Period N-VII	Very common
Period N-VB	Common
Period N-VA.4–1	Very rare

Since only one major level of architecture was exposed for Period N-VII, the sample of the denser Period VII variety of Chaff-Tempered Coarse Ware is very small. No examples of loop handles or ovoid bowls were found, but as so few were recovered from the south side excavations, their absence on the north side probably is not significant. No new shapes appear on the north side assemblage of denser Chaff-Tempered Coarse Ware. Measurable rims and bases fall within the same size range found on the south side. One additional full profile of an open bowl with flattened rim and flat base (similar to fig. 4.2:b) was recovered. It was 7 cm high, with a 17 cm rim diameter and an 11 cm base diameter.

There are no Period VI or VC deposits on the mound's north side, with the result that the sample of the lighter Period VI, VC, and VB variety of the Chaff-Tempered Coarse Ware also is very small and limited to N-VB levels. No new shapes were found. Carinated jars appear to be as common in this area of exposure as on the south side. Five sherds with simple bands or lines painted in red on the

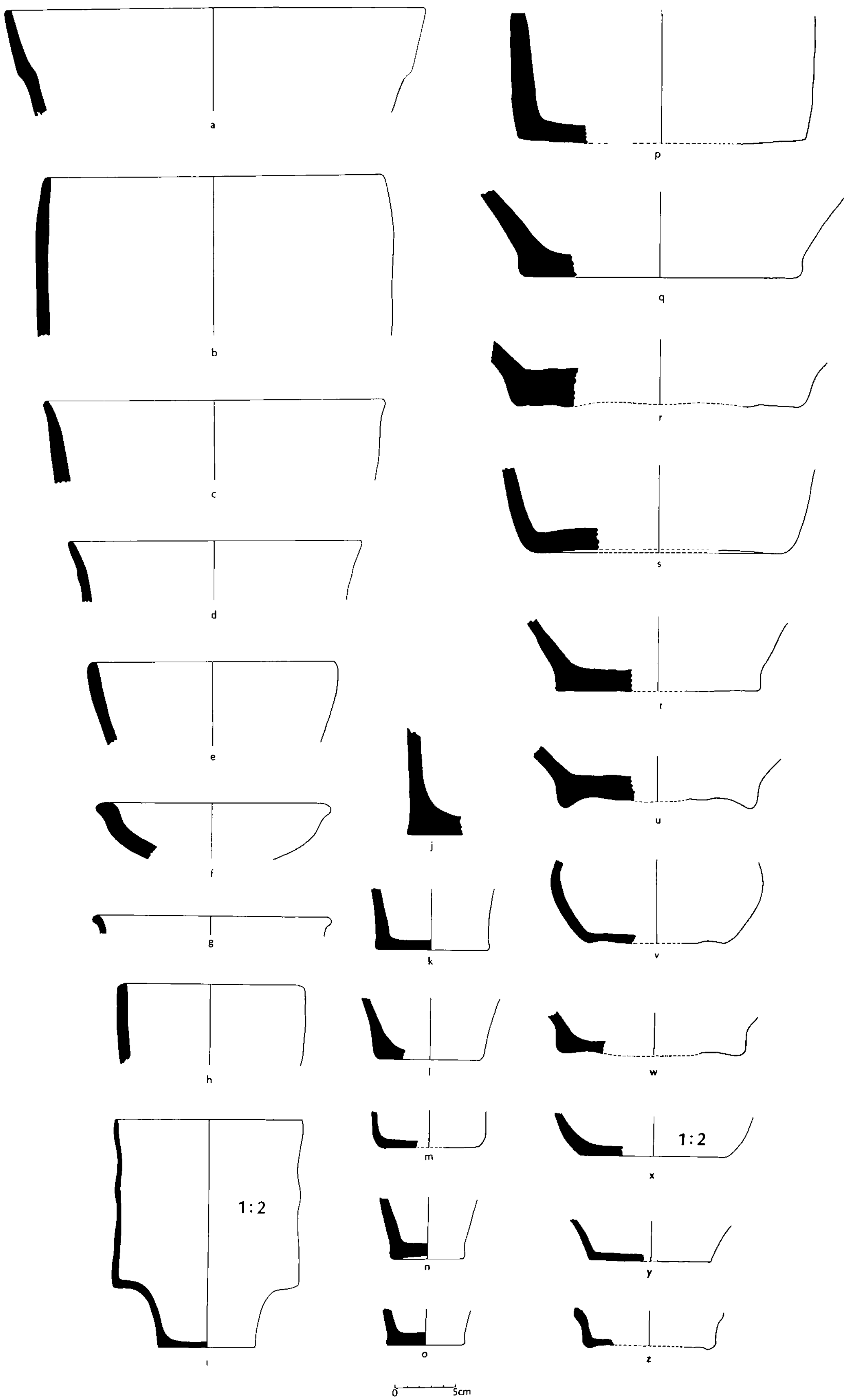


Figure 4.4. Chaff-Tempered Coarse Ware, Periods VI–VA.2. Proveniences: a, XC.71.T1.7B; b, D.68.T1.8; c, D.68.T2.8; d, C.70.1; e, C.69.1.9; f, D.68.2; g, D.68.T1.3; h, D.69.5 [illegible] C.69.T1.2.4; m, D.68.2; n, C.70.1.2; o, D.69.4; p, C.69.1.9; q, D.68 [illegible]

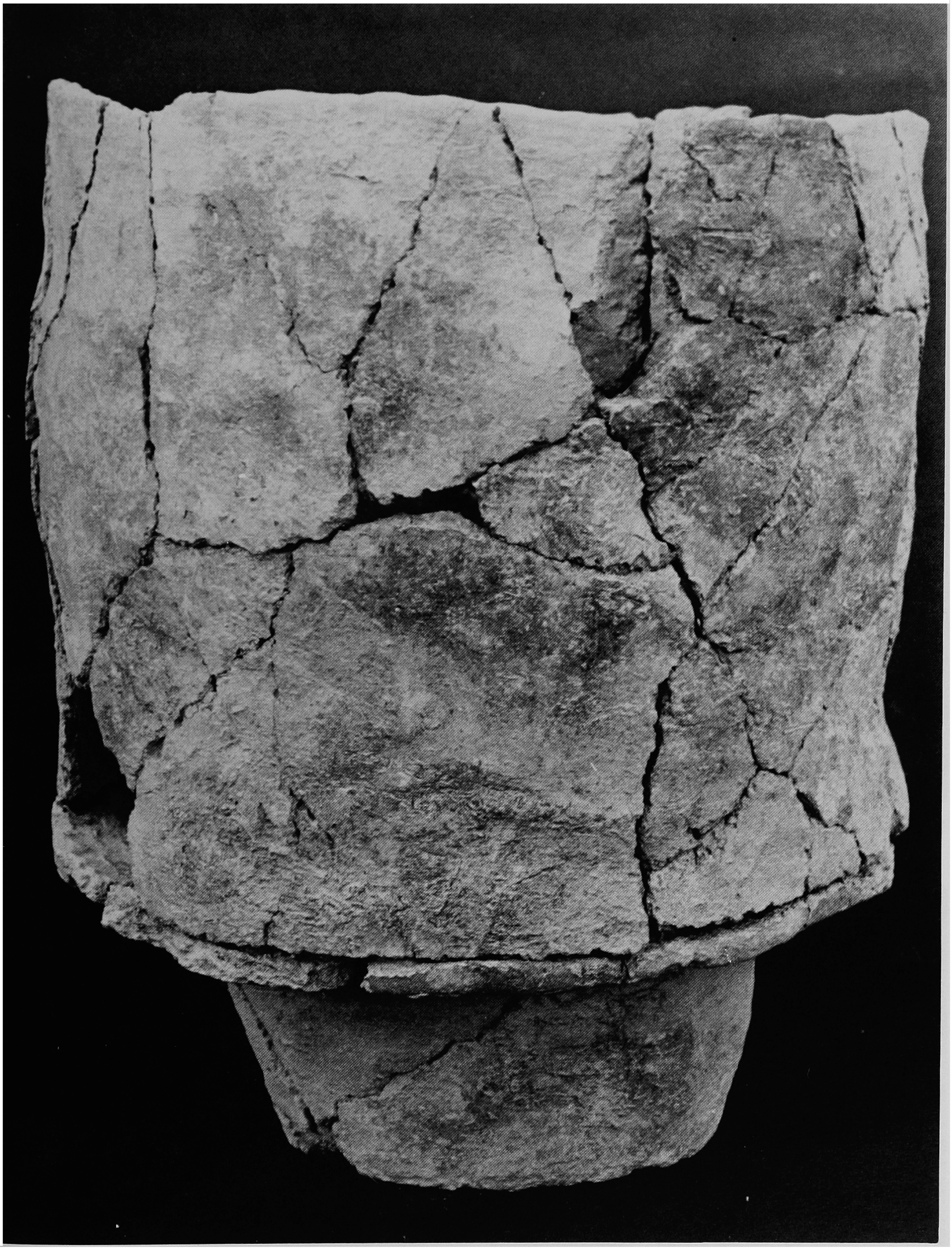


Figure 4.5. Carinated jar (48 cm high) of Chaff-Tempered Coarse Ware (C.69.7.9-10), Period VC, found in situ on floor of Room C.69.7.9-10 (see fig. 6.23).

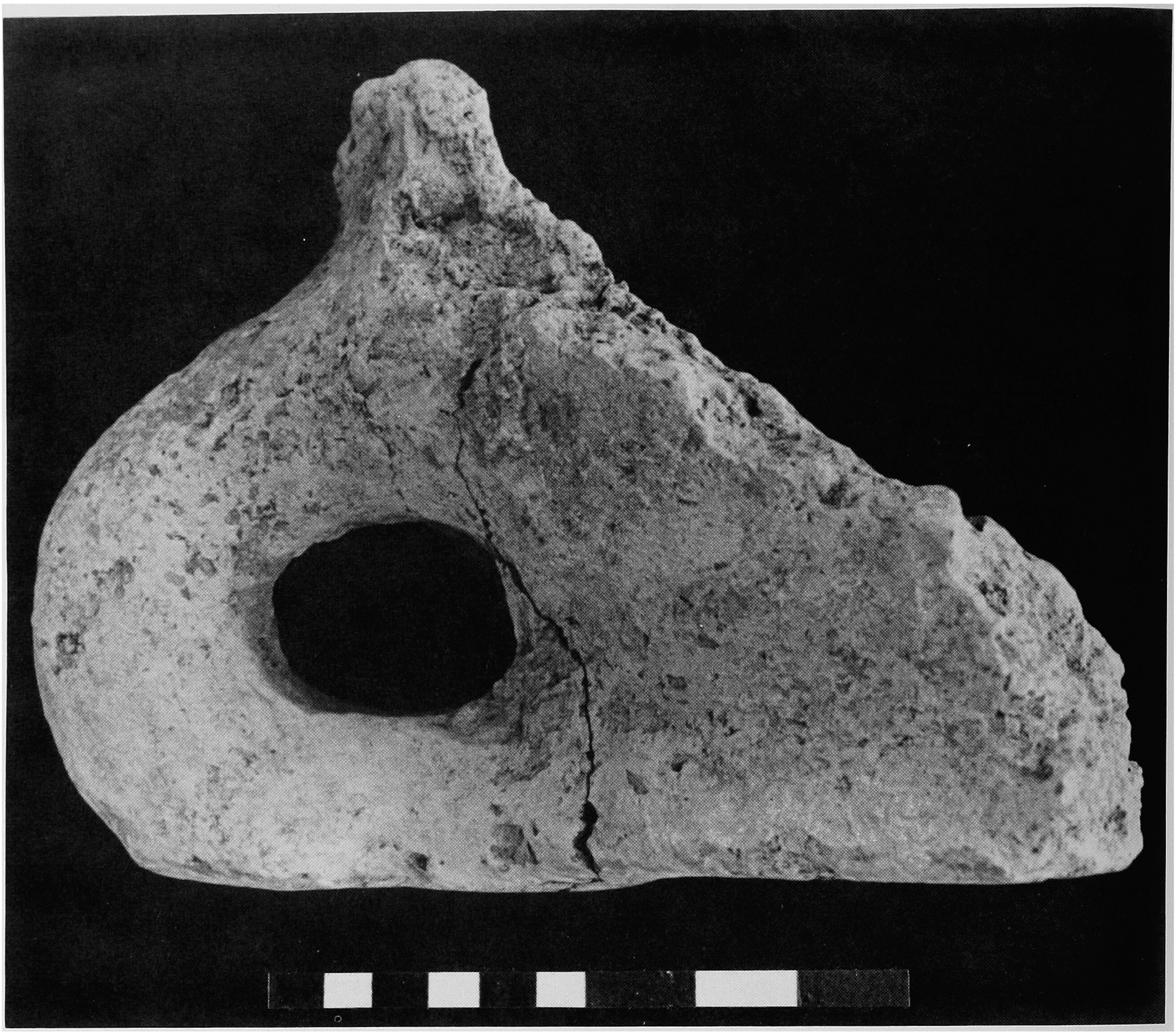


Figure 4.6. Loop handle and base from ovoid bowl of Chaff-Tempered Coarse Ware, Period VIIB.5–4 (D.69.8).

Figure 4.7. Carinated bowl of Chaff-Tempered Coarse Ware, Period V (CDE.73.S.1).

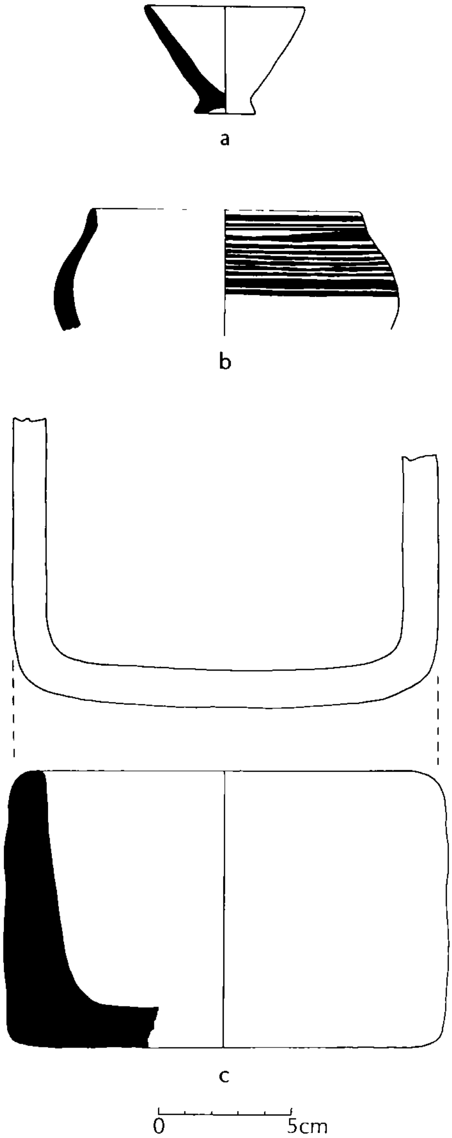


Figure 4.8. Chaff-Tempered Coarse Ware, unusual examples. Proveniences: a, C.70.T5.7 (Period VIID); b, D.68.T3.1 (Period VIA); c, C.70.T6.5 (Period VIB.2).

exterior surface were found (fig. 4.3: a–d,f), four from N-VB contexts and one from N-VA.4. These rare examples of painted Chaff-Tempered Coarse Ware may indicate that this painted variety was still made in Period VB times, but it is interesting to note that on the south side it is found only in Period VI and VC levels.

Light Chaff-Tempered Coarse Ware is far less common in N-VA.4 and N-VA.3 levels than it is in N-VB. Like VA.2 on the south side, these two phases probably should be considered transitional phases in which N-VA Plain Coarse Ware is replacing the Chaff-Tempered Coarse Ware so common in earlier periods.

SOGHUN WARE

We have coined a special name for this type of ware because in its painted forms it has no ready parallels at any other excavated sites of this time period. We have divided Soghun Ware (figs. 4.9–4.15) into four types which have in common the fact that they are made from the same paste and have the same range of shapes but which are decorated in different ways. These four types are Soghun Plain Ware, Soghun Mottled Purple Ware, Soghun Red-Painted Ware, and Soghun Bichrome Ware.

Mineralogical analysis of one of the Period VIA Soghun Bichrome sherds was carried out by Diana Kamilli (Kamilli and Lamberg-Karlovsky 1979:sample 2). Its coarse fraction included quartz, untwinned feldspar, traces of calcic plagioclase, brown amphibole, muscovite, biotite, chert, and pyroxene. The paste was hard and the matrix well fired. Kamilli notes that the mineral assemblage is not at variance with that of Yahya Black-on-Buff and Black-on-Red wares, which indicates that Soghun Ware might have been locally produced. But she suggests further analysis before making any firm statements about local versus nonlocal production of this rare ware.

Soghun Plain Ware

This handmade ware (figs. 4.9, 4.10) is the earliest non-coarse ware at Yahya. It appears in small quantities (less than 1 percent of the assemblage) beside the dominant Chaff-Tempered Coarse Ware from the earliest Period VIID levels through VIIA and is more common from VIB.2 through VIA. In VC it begins to be replaced by other fine handmade wares such as Lapui Ware and Black-on-Buff Ware. The Soghun Mottled Purple, Soghun Red-Painted, and Soghun Bichrome are really just Soghun Plain Ware with a wash or painted design added. In many instances bases or body sherds of Soghun Plain Ware may in fact belong to vessels of Soghun Red-Painted or Soghun Bichrome Ware, which are decorated only on their upper bodies near the rim.

Vessels are made from finely levigated clay that has very small amounts of probably natural mica inclusions. The paste is tempered with small quantities of crushed vegetal matter that has burned out in firing and left cavities averaging less than 0.5 mm, which are visible in cross section. Some sherds, especially those from Periods VIID through VIIA, have other types of tempering material as well: small pieces of crushed limestone and/or small amounts of orange sherd temper. Paste color ranges from tan to brownish tan, although in some cases the paste is more of a buff to buff-tan (7.5 YR 7/4 to 10 YR 6/3). Occasionally there is a darker core in section that is a reddish brown. A group of less than 20 sherds from VIB and later was found to have a paste color closer to a buff or even greenish buff combined with orange sherd temper. These are included under Soghun Plain Ware because the vessel forms and sizes are the same as the normal Soghun Plain Ware, and the time range is identical.

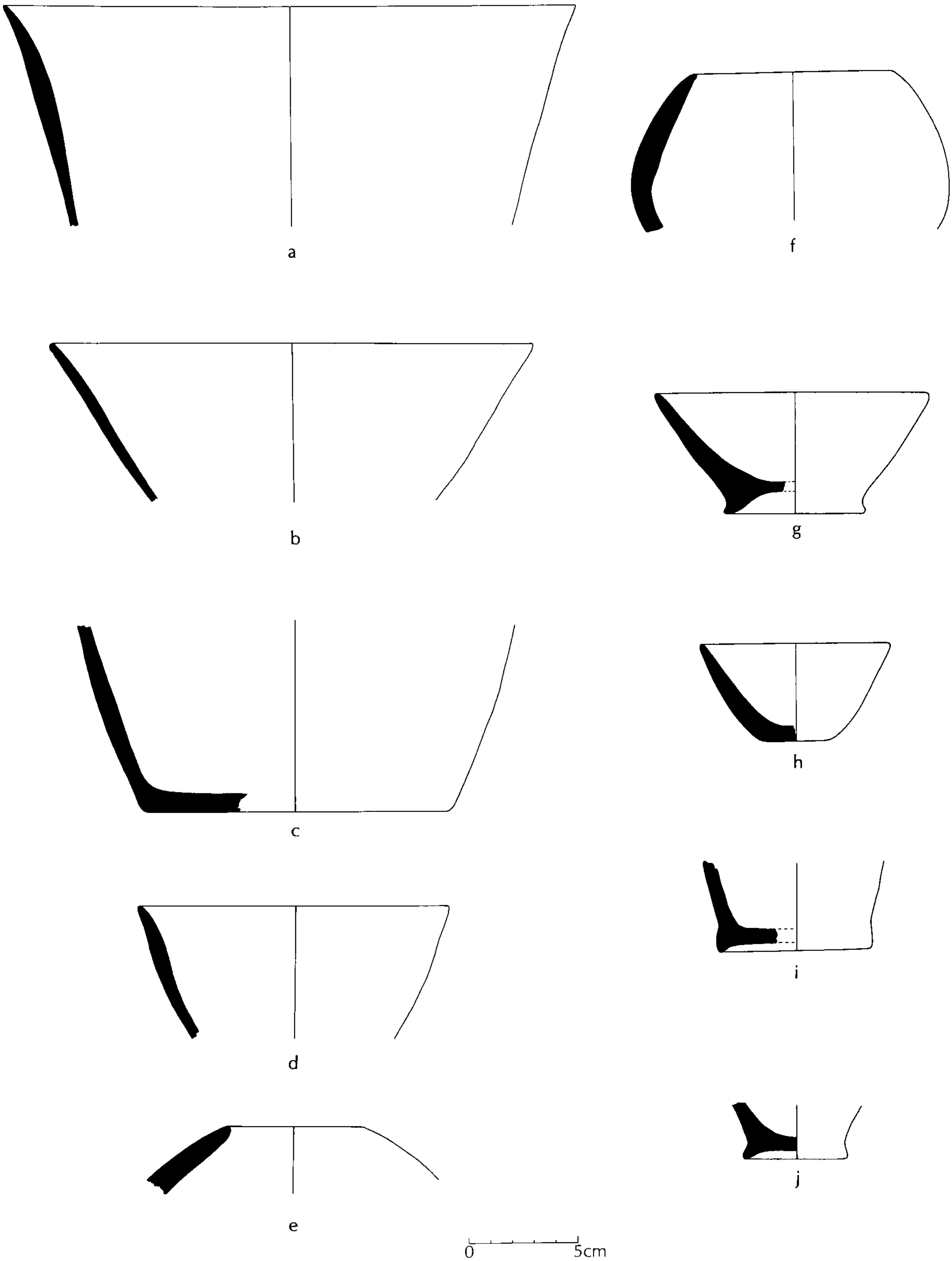


Figure 4.9. Soghun Plain Ware, Periods VII–VC. Proveniences: a, D.69.4; b, C.70.1.2; c, C.70.T2.1.1; d, D.69.5; e, CDE.73.2.10; f, C.70.T6.5; g, BW/CW.71.12.1; h, D.68.T3.1; i, D.69.5; j, D.69.5.

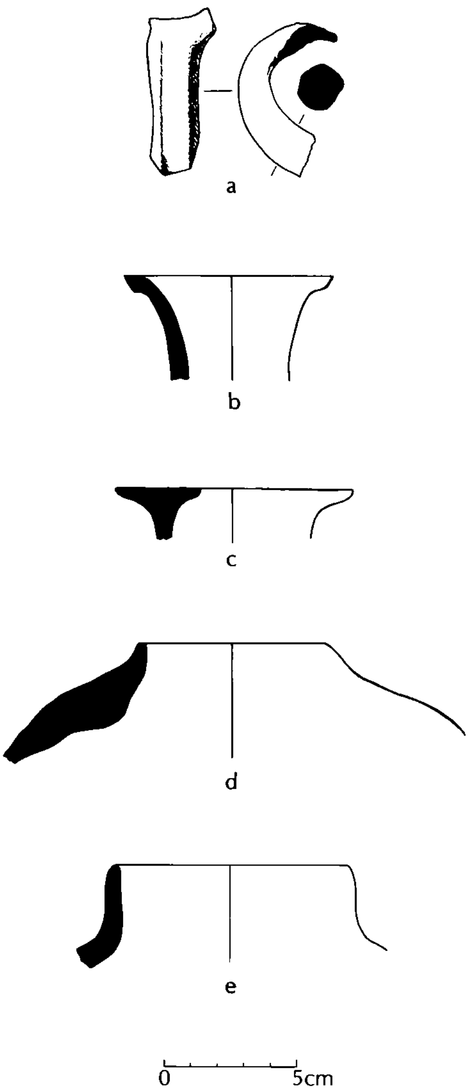


Figure 4.10. Soghun Plain Ware, unusual examples. Proveniences: a, CDE.73.2.11–12 (Period VC); b, D.69.8–9 (Period VIIB.6–4); c, CDE.73.1.5 (Period VIA); d, CDE.73.2.11–12 (Period VC); e, D.69.5 (Period VIA).

Vessels are wet smoothed, but the surface usually retains a rather uneven appearance. On less than 10 percent of the sherds recovered a thick buff slip was found to have been applied to the exterior (probably hole-mouth jars) or both the interior and exterior (probably open bowls). This thick buff slip is unusual in that it has a sharp, jagged fracture line that contrasts markedly with the smoother fracture line of the vessel fabric to which it is applied. Unslipped surface color ranges from buff to tan (2.5 YR 8/2 to 10 YR 8/3).

Shapes

The two dominant shapes in Soghun Plain Ware are open bowls and hole-mouth jars.

Full profiles (fig. 4.9: h,i) indicate that open bowls were produced both with flat bases and with ring bases. The rims are highly variable, ranging from straight, simple rims to slightly everted rims (rare), to rolled rims. Bowls with straight, simple rims tend to have a smaller rim diameter than bowls with rolled rims. The wide range in rim and base diameters indicates that bowls were produced in a wide variety of sizes.

No identifiable hole-mouth jars (fig. 4.9:e,f) appear before Period VIB.2. Rim diameters are highly variable. Since no full profiles were recovered, it is not clear whether these jars had flat bases or ring bases. However, the flat bases on later hole-mouth jars and the globular profiles of some of the Soghun Plain flat-base sherds would suggest that the hole-mouth jars *were* made with flat bases.

Necked jars are an extremely rare vessel form. Only six rim sherds—from both cylindrically necked and everted necked jars—were recovered from Periods VII–VC (fig. 4.10:b,d,e). Other unique examples include a loop handle on a rim sherd from VIA (fig. 4.10:a) and a very wide flattened rim from Period VIA (fig. 4.10:c), which closely resembles the Lapui Ware rim sherd illustrated in figure 4.18.

Chronology

Period VII	Rare
Period VIB.2	Common
Period VIB.1	Common
Period VIA	Common
Period VC	Rare

Although our sample from Periods VIID through VIIA is small (fewer than 30 sherds), no hole-mouth jar rim sherds were recovered from these earliest levels, so that it would appear that hole-mouth jars begin only in VIB.2.

Soghun Mottled Purple Ware

This is the rarest of the four types of Soghun Ware; fewer than 20 sherds were recovered (fig. 4.11). The mottled purple effect derives from the applied purple wash being rather fugitive. The time range for Soghun Mottled Purple Ware—from Period VIB.2 through VIA—is also shorter than that of the other three Soghun wares. (Paste and temper are the same as for Soghun Plain Ware.)

Vessels are wet smoothed. Unlike Soghun Plain Ware, a majority of the Soghun Mottled Purple sherds (13 out of 19) have a thick buff slip applied to the exterior or to the exterior and interior. This unusual buff slip has a sharp, jagged fracture line that contrasts markedly with the smoother fracture line of the vessel fabric to which it is applied. In places where the buff slip has chipped off, one can see underneath how the underlying vessel surface was prepared and roughened with many small gouge marks, probably so that the added buff slip would adhere better. Over the buff slip (or directly on the vessel surface in the absence of a slip), a purple or reddish purple wash (10 R 4/8) has been applied very thinly, so that the buff slip shows through quite clearly in most places. The wash tends to be fugitive and on some of the sherds only faint traces of it remain.

Shapes

The dominant shape is the hole-mouth jar (fig. 4.11:b), although a few of the body sherds with both interior and exterior buff slip and purple wash may belong to open bowls or simple jars. Hole-mouth rim sherds have a buff slip (if it is used) and a purple wash applied only to the vessel exterior. Body sherds from the hole-mouth jar show globular profiles and tend to be unusually thick (more than 1 cm). Only flat bases were recovered, so that almost certainly the hole-mouth jars were made with flat bases. This provides supporting evidence for the probability that hole-mouth jars of Soghun Plain Ware also were being made with flat bases.

Chronology

Period VIB.2–1	Very rare (5 sherds)
Period VIA	Rare

There are no obvious chronological distinctions except that the Soghun Mottled Purple Ware as a type is probably a good chronological indicator, since its span of use is so short.

Soghun Red-Painted Ware

Soghun Red-Painted Ware (figs. 4.12, 4.13, 4.14:h–m,o–p,r–bb) is more common than the Soghun Mottled Purple but less common than its unpainted contemporary, the Soghun Plain; it never constitutes more than 1 percent of the ceramic assemblage of any level in which it is found. There is a strong possibility that this rare painted ware evolved locally out of the Soghun Plain Ware of Period VII. The recovery of an over-fired sherd of Soghun Red-Painted from VIA suggests that this type was locally made. Distinctive for having no clear parallels for its painted designs in any other excavated sites in southern Iran, Soghun Red-Painted Ware is found in small quantities from Period VIB.2 through VC. (Paste and temper are the same as for Soghun Plain Ware).

None of the Soghun Red-Painted sherds has the added buff slip found so commonly on Soghun Mottled Purple and (more rarely) on Soghun Plain sherds. The red or brownish red painted designs are applied directly to the wet-smoothed vessel surfaces. Surface color has the same range as that for Soghun Plain Ware.

Shapes

As with Soghun Plain Ware, the two dominant shapes in Soghun Red-Painted Ware are open bowls and hole-mouth jars (for detailed description, see "Shapes" under Soghun Plain Ware). Full open bowl profiles, both with flat bases (fig. 4.12:o) and with ring bases (fig. 4.12:h), were recovered.

Designs

On both hole-mouth jars and open bowls the painted designs are almost always limited to panels of repeated motifs running beneath the rim on the vessel exterior. Exceptions to this manner of decoration will be discussed later. Unlike the Black-on-Buff or Black-on-Red wares of the following periods, Soghun Red-Painted vessels do not usually have painted rim lines as an upper border to the painted designs. Rather, the designs simply begin at or just below the rim. The most common designs are rows of lozenges, triangles, hanging triangles, and zigzags. Usually each triangle or lozenge will be filled in not with cross-hatching, as in the following periods with Black-on-Buff Ware, but with three or four parallel diagonal lines.

Two ring-base bowls were recovered that are exceptional in the location of their designs, one having a painted exterior base line and interior rim design, and the other having an exterior painted base line with a design starting directly above it on the lower body of the bowl (fig. 4.13:f). Also unusual is a group of three sherds from VIA with reserve-painted lozenge designs (fig. 4.13:a,c,e). One of these is a bowl rim sherd with the reserve design on the interior (fig. 4.13:e). Another sherd that stands out as unique in the assemblage is an exterior-painted bowl rim sherd from Period VC with two running panels of what appear to be abstract gazelle motifs (fig. 4.13:b). This unique design, as well as the painted rim line which extends onto the interior lip of the bowl, argues for this vessel being an import. Similar-looking designs have been found to the west at Tal-i Gap (Egami and Sono 1962:pl. XXXVIA:2). Finally, the only Soghun Red-Painted sherd from VIIA is noteworthy for having an interior-painted design that is theriomorphic (fig. 4.12:d). This is the only clear example of an attempt to portray an animal in all of the corpus of painted pottery from Periods VI and V at Yahya.

Chronology

Period VIIA	Very rare (1 sherd)
Period VIB	Common
Period VIA	Common
Period VC	Very rare (3 sherds)
Period VB	Very rare (1 sherd)

No distinctions were apparent between the different levels.

Soghun Bichrome Ware

Only 16 sherds of Soghun Bichrome Ware were recovered (12 are illustrated in fig. 4.15; see also fig. 4.14:a–g,n,q), making it only slightly less rare than the Soghun Mottled Purple Ware. Bichrome-painted pottery of this type and belonging to this time period has not been found anywhere else in southern Iran, which makes its presence at Yahya all the more remarkable. And yet it probably should be seen as a natural outgrowth of or variation on the Soghun Red-Painted Ware, for the types of vessel forms and the range of designs are identical. Soghun Bichrome Ware is found in small quantities at Yahya from Period VIB.2 through

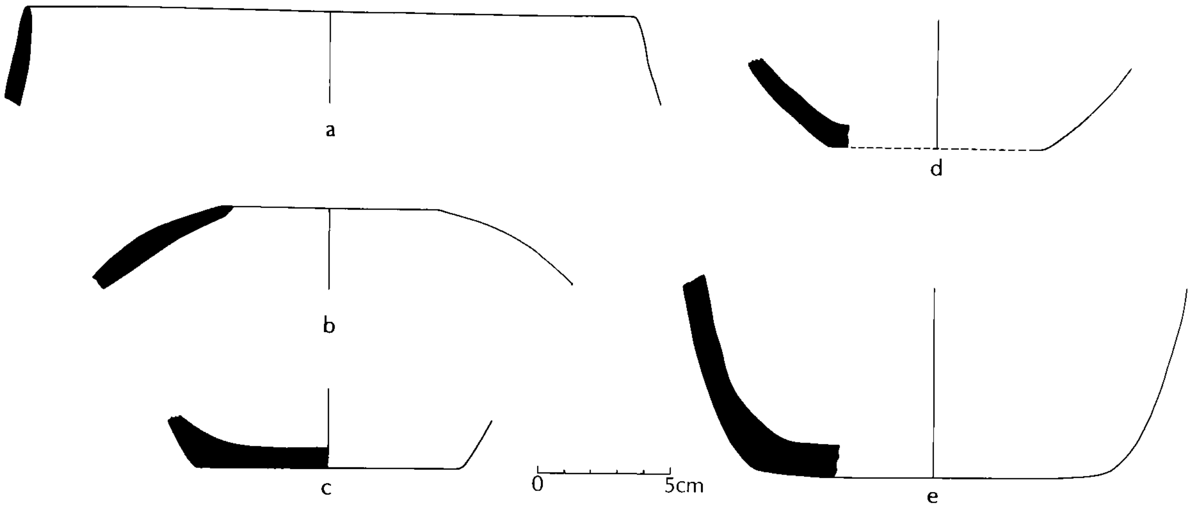


Figure 4.11. Soghun Mottled Purple Ware, Period VI. Proveniences: a, D.69.5; b, CDE.73.2.10; c, BW.73.T1.2; d, BW.73.T1.2; e, D.69.4.

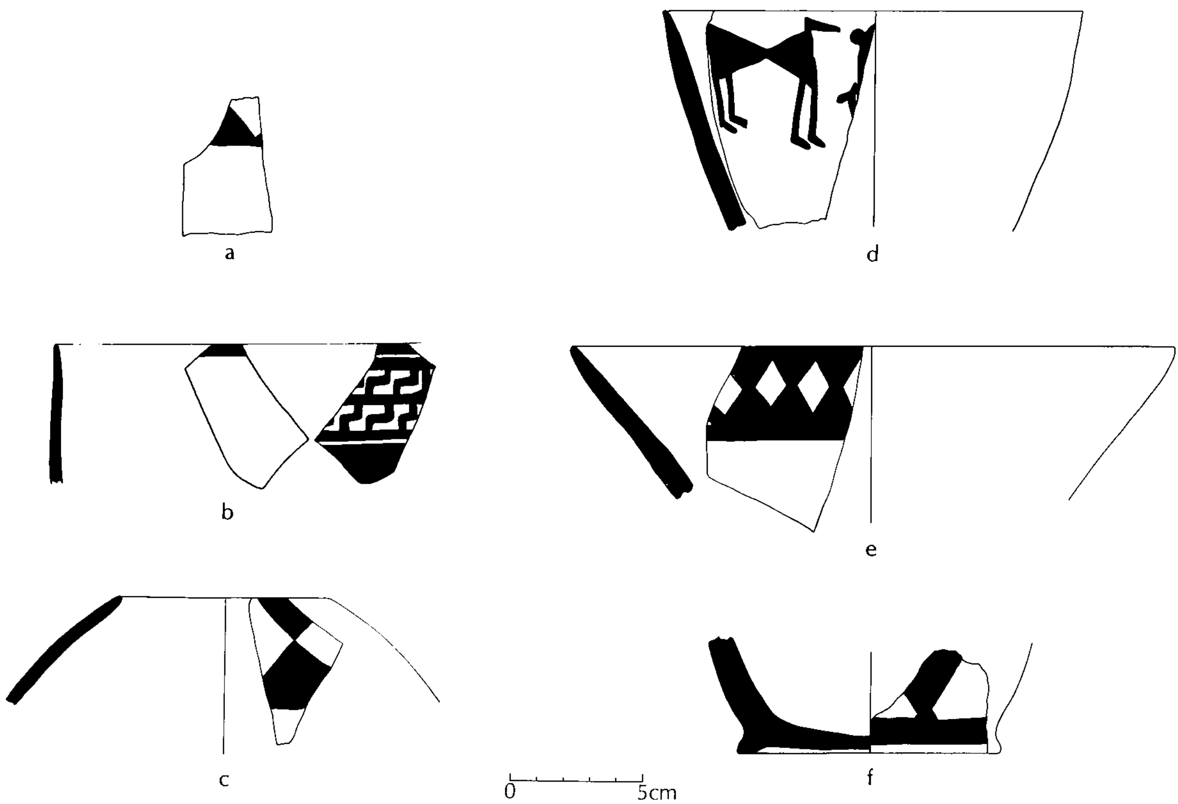


Figure 4.12. Soghun Red-Painted Ware, unusual examples. Proveniences: a, BW.73.T1.2 (Period VIA); b, BW.73.T1.3 (Period VIB.1); c, BW.73.T1.2 (Period VIA); d, D.68.T5 (Period VIIA); e, BW.73.T1.2 (Period VIA); f, CW.73.T3.2 (Period VIB.1).

VC. (Paste and temper are the same as for Soghun Plain Ware.)

None of the Soghun Bichrome sherds has the distinctive buff slip so common to Soghun Mottled Purple Ware. Designs are painted in both red and brown or dark brown and applied directly to the wet-smoothed, unslipped vessel surfaces. Surface color has the same tan to brownish tan range as for Soghun Plain.

Shapes

As with Soghun Plain Ware and Soghun Red-Painted Ware, the two dominant shapes are hole-mouth jars (fig. 4.15: a–e,g–l) and open bowls (fig. 4.15:f).

Designs

Designs are always painted on the upper exterior bodies of the hole-mouth jars and bowls, starting just below the rim.

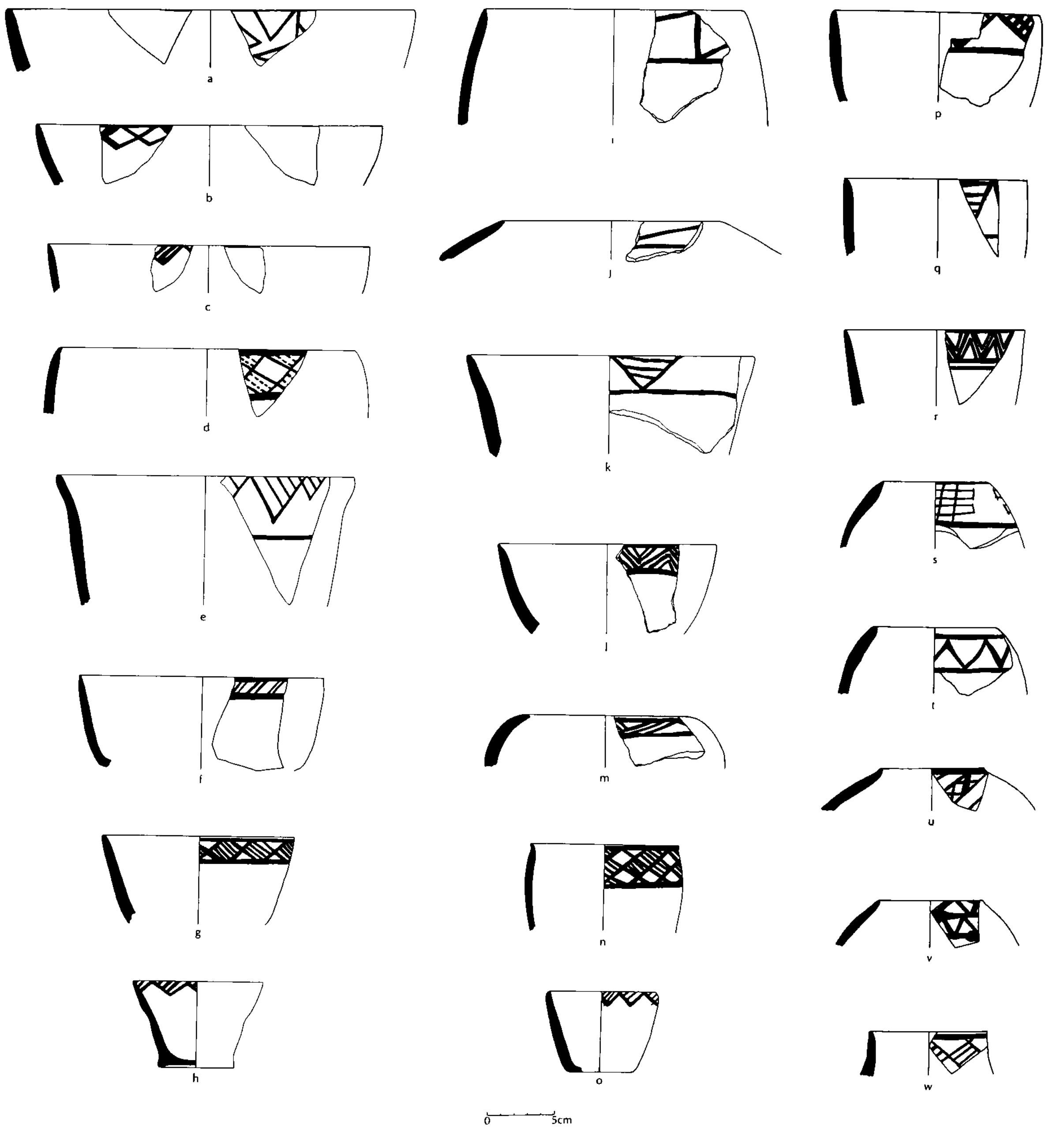


Figure 4.13. Soghun Red-Painted Ware, Periods VI–VC. Proveniences: a, D.69.5.1; b, D.69.5.1; c, C.70.1; d, D.69.3.3; e, D.69.T1.7; f, D.69.3.7; g, D.69.3; h, C.70.1.4; i, BW.73.T1.2; j, BW.73.T1.2; k, D.69.5.1; l, D.69.5; m, BW.73.T1.2; n, C.70.T6.5; o, D.69.T2.8; p, CDE.73.2.10; q, D.69.5.1; r, D.69.4; s, C.70.1.1; t, D.69.3.5; u, D.69.5.1; v, C.69.3; w, D.69.5.

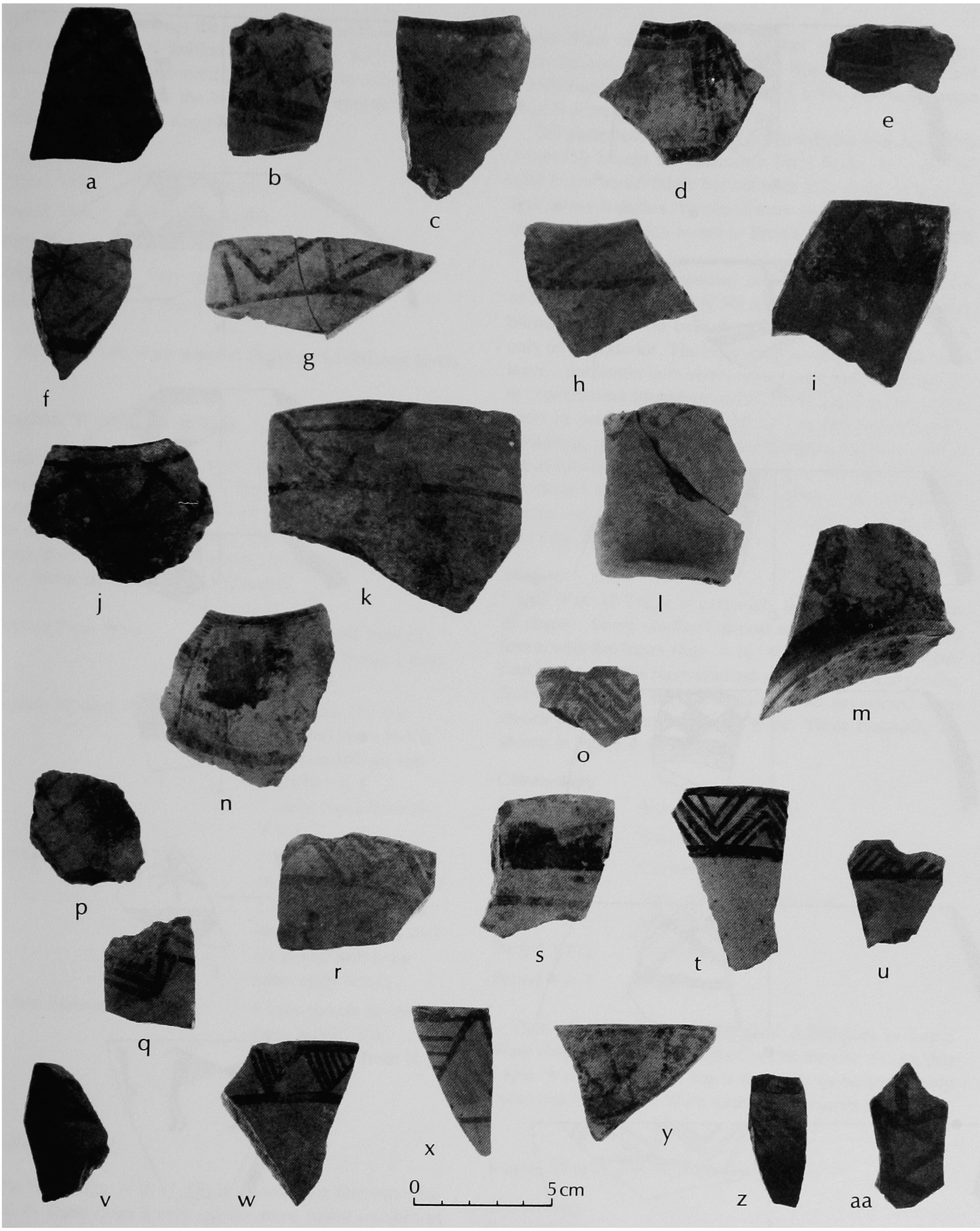


Figure 4.14. Sherds of Soghun Bichrome and Red-Painted Ware, Period VI. a, Bichrome, BW.73.2; b, c, d, Bichrome, D.69.5; e, f, Bichrome, CDE.73.2.10; g, Bichrome, C.69.1.9; h, i, Red-Painted, BW.73.T1.2; j, Red-Painted, D.68.T2.5; k, Red-Painted, D.68.5.1; l, Red-Painted, D.69.T2.8; m, Red-Painted, CW.73.T3.2; n, Bichrome, D.68.5.3; o, Red-Painted, CDE.73.3.18; p, Red-Painted, C.70.1.1; q, Red-Painted, CDE.73.2.18; r, Red-Painted, CDE.73.3.18; s, Red-Painted, BW.73.T1.2; t, Red-Painted, D.69.5; u, Red-Painted, C.70.1.2; v, Red-Painted, C.70.1.1; w, Red-Painted, BW.73.T1.2; x, Red-Painted, D.69.5.1; y, Red-Painted, D.69.5.1; z, Red-Painted, C.70.1.1; aa, Red-Painted, BW.73.T1.2.

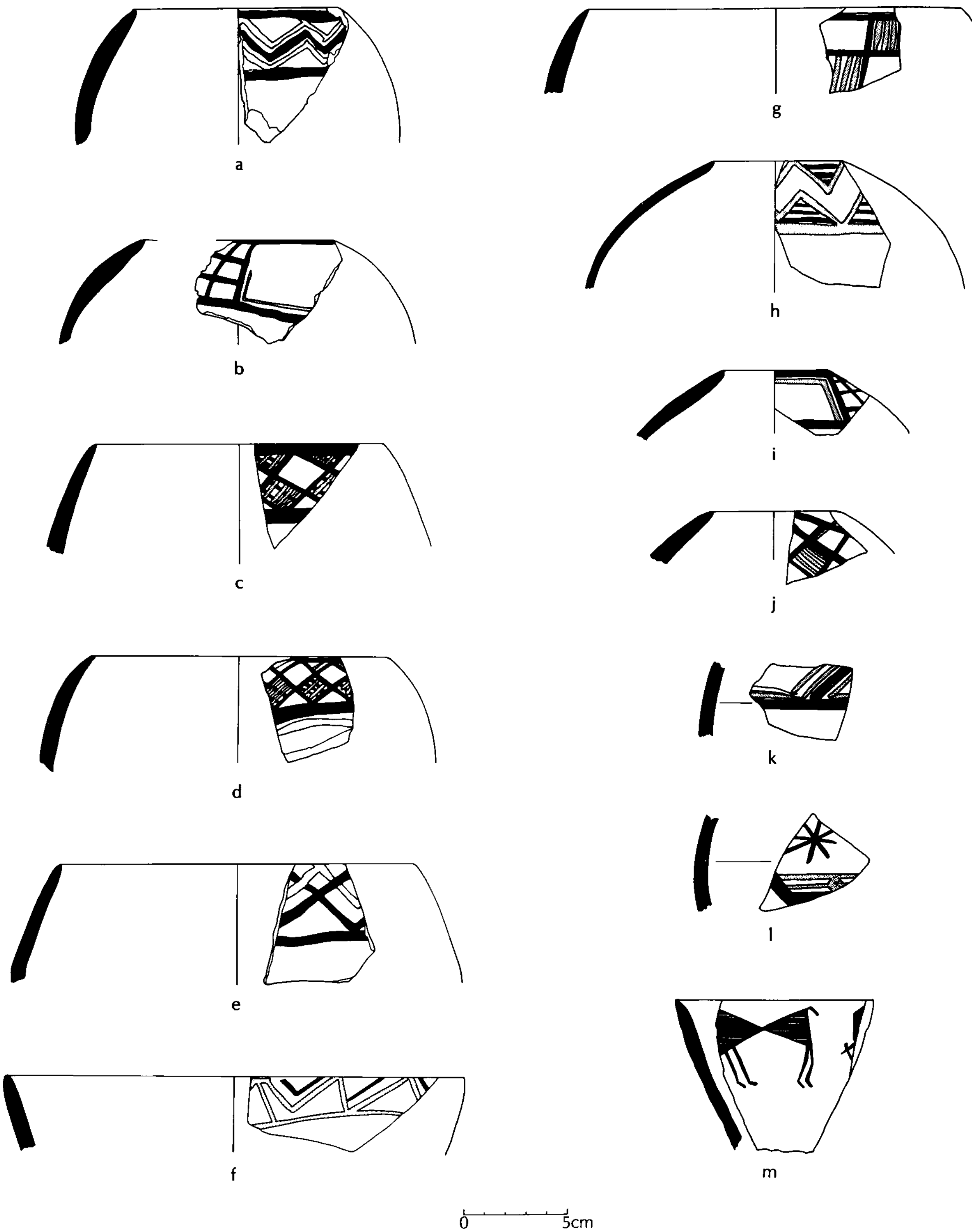


Figure 4.15. Soghun Bichrome Ware, Periods VI–VC. Proveniences: a, D.69.5; b, D.68.5.3; c, CDE.73.2.10; d, D.69.5; e, BW.73.T1.2; f, C.69.1.9; g, D.69.3.6; h, C.69.1.4; i, D.69.5; j, CDE.73.2.10; k, CDE.73.2.10; l, CDE.73.2.10; m, D.69.3.5. Shaded areas = dark brown paint; black = red paint.

The design repertoire is the same as for Red-Painted Ware, typified by rows of infilled lozenges (fig. 4.15:c,d,j) and rim zigzags (fig. 4.15:a,e,f,h). Red paint is used for most of each design, while the brown paint is used primarily as infilling within these designs.

Chronology

Period VIB	Rare (6 sherds)
Period VIA	Rare (7 sherds)
Period VC	Very rare (1 sherd)
Period VA.2	Very rare (1 sherd)
Mixed levels	1 sherd

No distinctions were apparent between the different levels.

Soghun Ware, North Side

Since Soghun Ware is the most diagnostic type for, and is limited almost exclusively to, Periods VI and VC, it is not surprising that only 11 sherds of this ware were found in the entire north side exposure. The distribution of the Soghun Ware subtypes is as follows, being scattered as intrusive sherds in various post-VC levels:

Soghun Plain Ware	3 open bowl rims (2 from N-VB and 1 from N-VA.4)
Soghun Mottled Purple Ware	1 flat base (10 cm diameter) from N-VB 1 hole-mouth jar rim from N-VA.4 1 body sherd from N-VA.4–3
Soghun Red-Painted Ware	1 interior-painted body sherd from N-VB, VA 2 interior-painted rim sherds from N-VA.4–3 (possibly both from same open bowl)
Soghun Bichrome Ware	1 hole-mouth jar rim from N-VB, VA 1 body sherd from N-VA.2

LAPUI WARE

Lapui Ware (figs. 4.16–4.18) is a handmade fine ware that takes its name from a very similar ware found on sites in the Marv Dasht plain to the west of Yahya in Fars Province (Sumner 1972). The distinctive features of Lapui Ware are a red or dark red wash on interior and exterior surfaces and burnishing of both the interior and exterior. Open jar forms, often with slightly everted rims, are the dominant shape (figs. 4.16:q; 4.17). Other forms are extremely rare. This ware is common at Yahya from Period VC through VA.2. Lapui Ware occurs in much smaller quantities than other contemporary pottery types such as Black-on-Buff Ware and Chaff-Tempered Coarse Ware and never represents more than 5 percent of the assemblage.

The paste consists of finely levigated clay with no visible tempering except for occasional mica flecks. In some examples the vessel fabric has not been fully oxidized in firing and shows a darker, brownish core in section. Paste color ranges from pinkish to red to brown (7.5 YR 6/4 to 5 YR 6/6).

Vessels are wet smoothed and then covered with a red or dark red wash (2.5 YR 5/8 to 10 R 5/4). All vessels are burnished, most on both the interior and exterior, a few only on the exterior. The burnishing process does not always leave a uniformly burnished surface; one often finds parallel or crisscrossing burnishing marks which leave small surface areas in between unburnished. Occasionally this pattern-burnishing process rubs off the underlying red wash, giving the surface a slightly mottled appearance. Mica flecks, evenly distributed and in relatively large numbers, are a distinctive feature on vessel surfaces. Painted designs are never found on Lapui Ware.

Shapes

Lapui Ware at Yahya is extremely limited in its repertoire of shapes, being confined almost exclusively to open jar forms with flat bases (figs. 4.16, 4.17). More than 50 percent of the jar rims recovered are slightly everted in profile. Extremely rare is the occurrence of an occasional hole-mouth jar rim sherd of Lapui Ware. Three examples are shown in figure 4.16:k,l,m.

Chronology

Period VIB.1	Very rare (2 sherds)
Period VIA	Rare (7 sherds)
Period VC	Common
Period VB	Very common (period of maximum use)
Period VA.2	Common
Period VA.1	Rare

There are no clear chronological differences in Lapui Ware shapes during its period of use on the site, except that Lapui Ware from VA.2 has a tendency to be less highly burnished than Lapui Ware sherds from earlier levels.

Lapui Ware, North Side

Chronology

Period N-VB	Common
Period N-VA.4–3	Rare
Period N-VA.2–1	Very rare

The same Lapui Ware open jar form so common on the south side of the mound also predominates in the north side assemblage. Two more hole-mouth rim sherds were re-

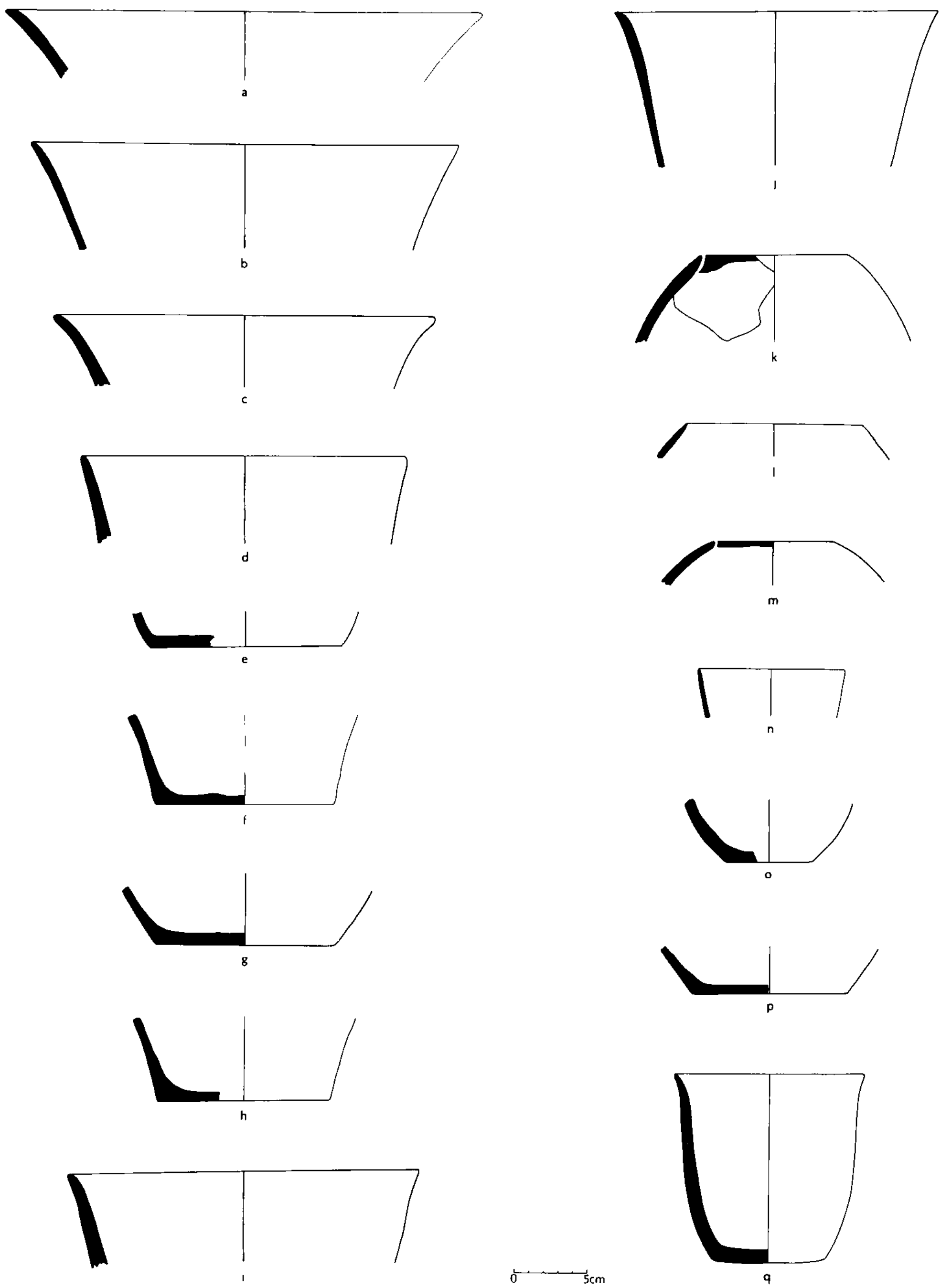


Figure 4.16. Lapui Ware, Periods VC–VA.2. Proveniences: a, B.71.22; b, C.69.T1.1; c, CDE.73.1.5; d, XCE.73.T1.5; e, XC.71.T1.7A; f, XC.71.T2.6; g, XC.71.T1.6; h, B.73.4; i, CDE.73.2.10; j, XC.71.T1.5B&7; k, B.73.4; l, CDE.73.2.10; m, XCE.73.T1.4A; n, B.73.4.2; o, XCE.71.15; p, B.73.4; q, BW.69.T5.7A.

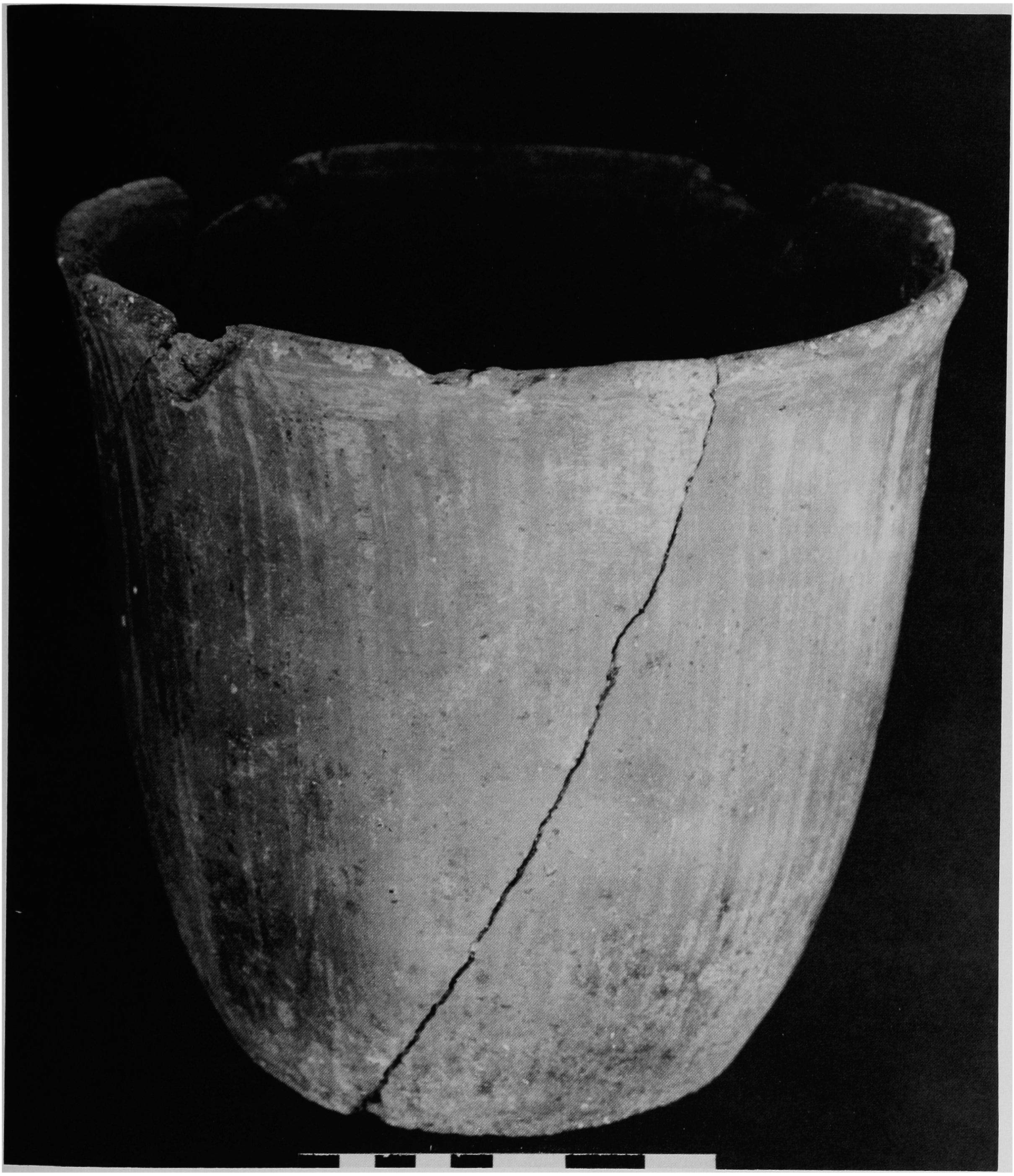


Figure 4.17. Jar of Lapui Ware, Period VB (BW.69.T5.7A).

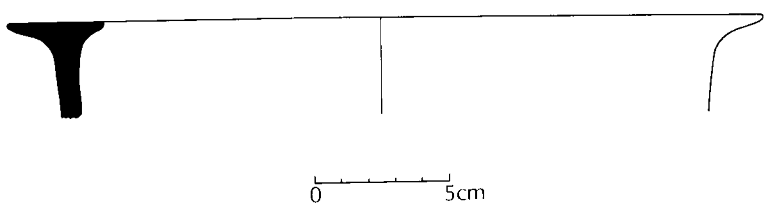


Figure 4.18. Lapui Ware, unusual example from Period N-VA.2. Provenience: XCE.73.T1.2.

covered from N-VA.4–3 levels (fig. 4.16:m), along with a curious Lapui Ware fragment from N-VA.2, T-shaped in profile and about 30 cm in diameter (fig. 4.18). This object is the right size to have been fitted over the rims of some of the Lapui Ware open jars, but for what purpose is unclear. It is similar in form to the Soghun Ware rim illustrated in figure 4.10:c.

BLACK-ON-BUFF WARE

Yahya Black-on-Buff Ware (figs. 4.19–4.26) is a handmade, buff fine ware decorated with continuous multiple chevrons or rectilinear geometric designs. The designs are painted in black on either the inner or outer surface, depending on the vessel shape (fig. 4.19). This ware is common at Yahya from Period VC through VA.2.

The paste consists of finely levigated clay that has been evenly fired and leaves no dark core in section. The paste color ranges from buff to pinkish buff (10 YR 7/4 to 7/5 YR 7/6). The tempering material consists of finely crushed vegetal matter. In the open bowl and beaker shapes the vegetal tempering is scarcely visible to the naked eye. In the larger necked jar forms the vegetal tempering is less finely crushed and shows up in section as small holes in the paste where the vegetal material was burned out in the firing.

Three Black-on-Buff Ware sherds underwent mineralogical analysis (Kamilli and Lamberg-Karlovsky 1979: samples 4,5,6), two from Period VC and one from VB. The two from VB, an interior-painted ring-base bowl sherd and a chevron-painted rim sherd, are virtually indistinguishable in their mineral assemblage from the analyzed Black-on-Red Ware sherds. Their paste mineral assemblage included abundant biotite and chlorite, quartz, chert, calcic plagioclase, untwinned feldspar, and traces of pyroxene and volcanic rock, all of which indicate a local source for the clay. The one example from VC, on the other hand, differed from the other Black-on-Buff samples and the Black-on-Red samples in that it had calcite but no mica or twinned calcic plagioclase. In addition, the black paint on this Period VC rim sherd (from a ring-base bowl) lacked MnO but contained relict quartz. Kamilli concluded that this sherd was sufficiently different to suggest that it probably was manufactured at another site and represents an import. This difference in paste between Period VC and VB Black-on-Buff Ware correlates well with the observed differences in the designs and base diameters between the ring-base bowls of VC and VB.

Vessel surfaces are wet smoothed. Drag marks from smoothing show up as faint, tightly spaced parallel striations on the vessel surfaces. Near the rim, drag marks usually run horizontally, but on other parts of a vessel they tend to crisscross in a more haphazard fashion. The drag marks are clearest on the interiors, especially the interiors of necked jars.

The surface color ranges from buff to pinkish buff (10 YR 8/2 to 5 YR 7/6). The variability in surface color on different vessels probably is attributable to variations in firing temperature and degree of oxidation. There is no evidence for burnishing, and only in rare instances does it appear that a slip was added. Usually it was found that what looked on one sherd like an added buff slip proved on other, larger sherds to be only a variation in surface color, probably due to differential exposure and differential oxidation of different portions of the same vessel during firing. The more exposed the surface, the "buffer" the surface color after firing. Less exposed surfaces tended to be more of a pinkish buff. Contributing to this differential exposure of vessel surfaces during firing was the fact that bowls and beakers apparently were stacked during firing. This is clear from the occasional presence of faint mirror images of designs on the exteriors of interior-painted bowls and on the interiors of exterior-painted bowls and beakers. Such designs probably rubbed off from one vessel onto another because they were stacked together in a firing position before the paint in the designs was entirely dry.

Designs are painted on with a thin brush. Paint color ranges from dark brown to a thick, vitreous black, apparently depending on the degree to which the paint mixture was diluted before application.

Yahya Black-on-Buff Ware can be subdivided into four basic shapes: necked globular jars, carinated bowls with flat bases, open bowls with ring bases, and beakers.

Necked, Globular Jars

In relative numbers of sherds, necked, globular jars (fig. 4.20:y) are the least common of the four vessel types. Body sherds of necked jars are almost always 0.5 cm or more in thickness, making them easily distinguishable from body sherds of exterior-painted carinated bowls, whose body sherds are usually less than 0.5 cm thick. Although no full profiles of this necked jar type were recovered, it probably was similar in shape to the Black-on-Red necked jars that replaced it in Period VA.2. Bases probably were flat and steep-sided in profile, if one can interpolate from the Period VA Black-on-Red jars. It is difficult, however, to be sure whether any given steep-sided base belongs to a necked jar or to a chevron-decorated beaker, since on both these vessel types there are no designs on the bottom third of the vessels. Probably jar bases were at the higher end of the ange of flat base diameters.

Designs

Necked jars are always decorated on the exterior. Since numerous neck sherds but no actual rim fragments were recovered, it is not clear whether the rim had a painted line or whether this line extended onto the jar interiors. By far the most common design was the crosshatched lozenge, often with smaller lozenges in solid black extending out from each corner of the central lozenge and connected by parallel lines (fig. 4.20:y). On most neck sherds one finds a series of horizontal lines beginning at the bottom of the neck carination.

Chronology

Period VC	Very rare (3 sherds)
Period VB	Common (period of maximum use)
Period VA.2	Common
Period VA.1	Very rare (3 sherds)

Although our sample is small, two designs from VC—a fringed, crosshatched triangle and a large, meandering chevron—do not appear again on Period VB jars.

Small, Necked Jars

This jar type is smaller in overall size than the necked jars described above, and the body sherds are always less than 0.5 cm thick. Only five sherds of this type were found, all from Period VB levels: three rim sherds and two neck sherds. On all three rims there is a painted rim line that extends at least 0.2 cm onto the interior of the rim. Only one of the

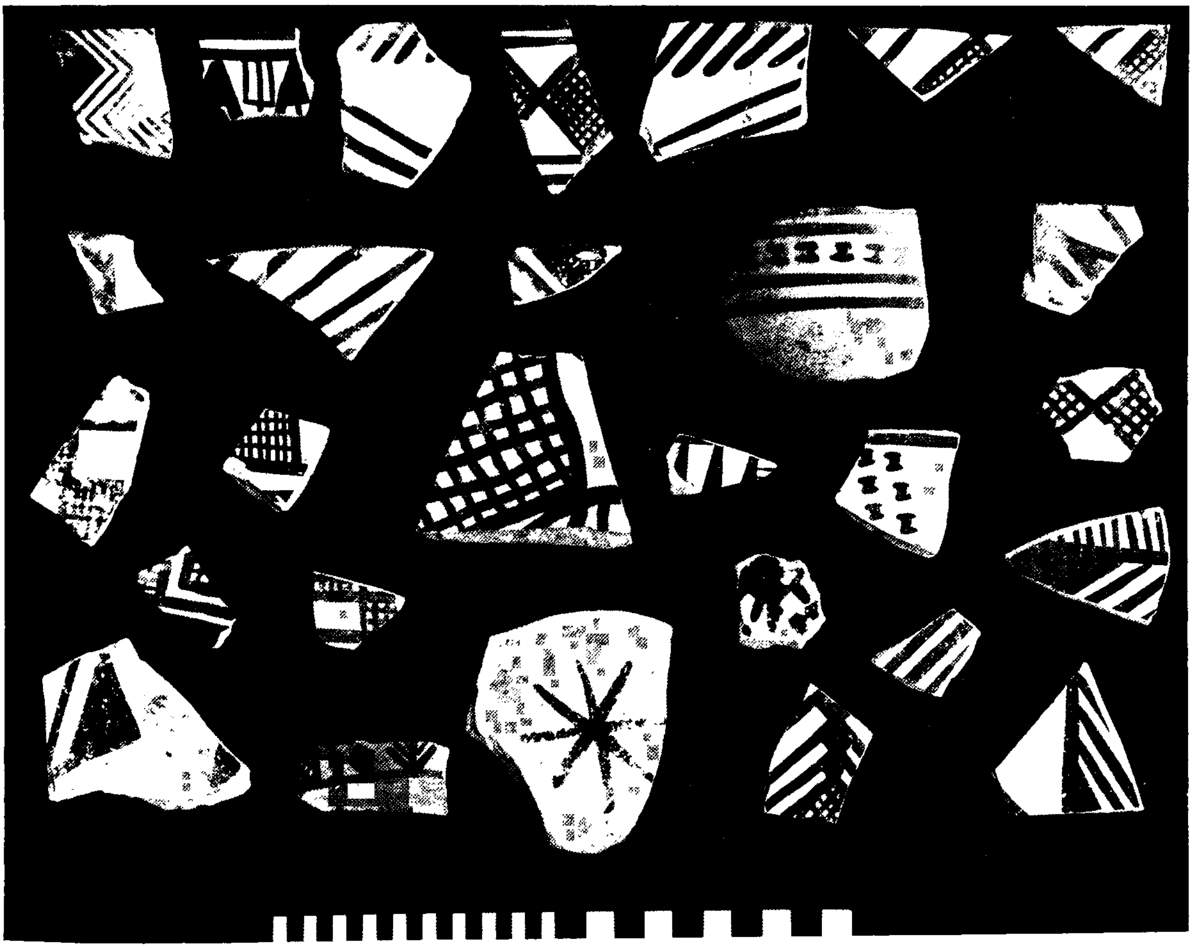
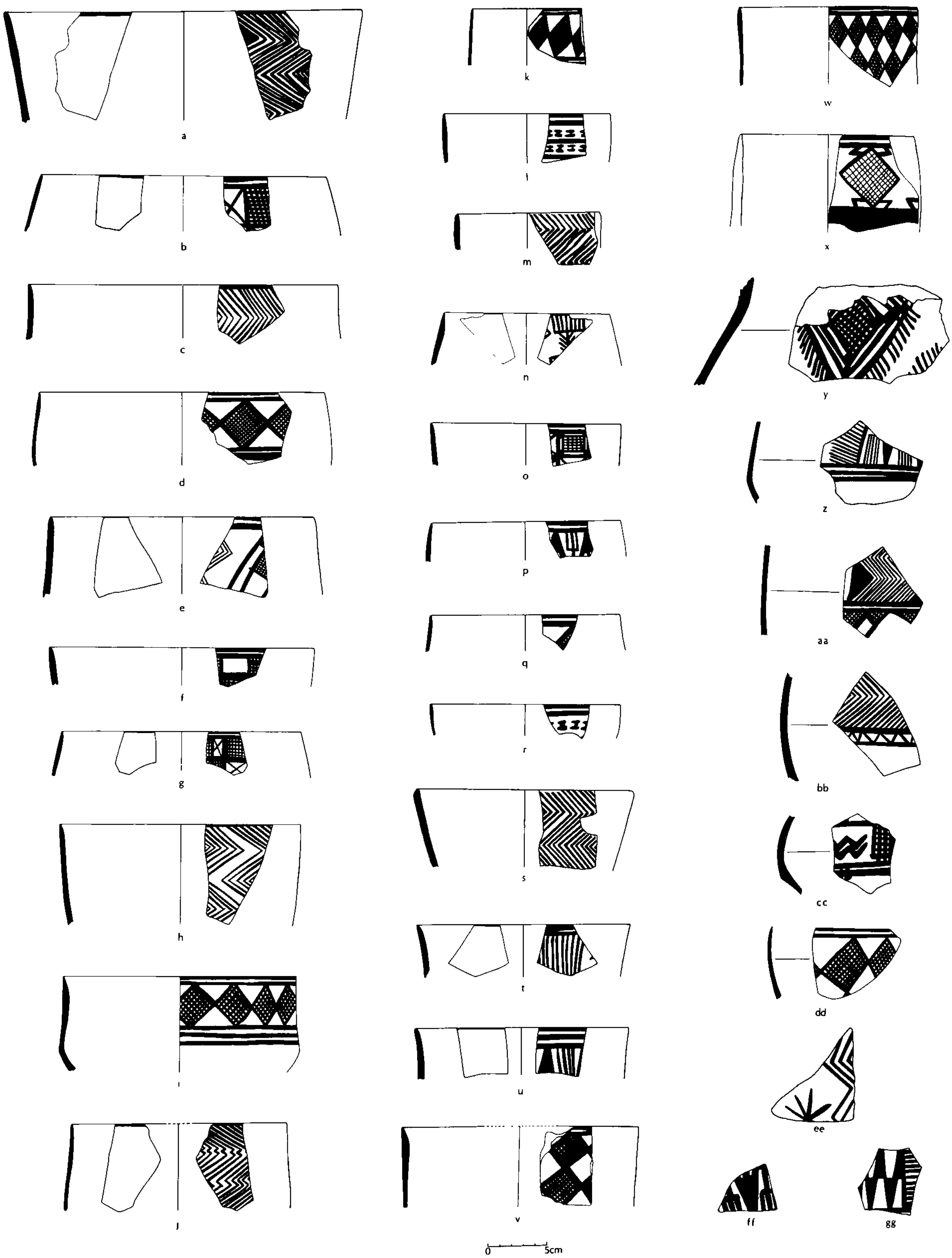


Figure 4.19. Sherds of Black-on-Buff Ware, Periods VC and VB (B.71.27, BW.71.10).


a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
p
q
r
s
t
u
v
w
x
y
z
aa
bb
cc
dd
ee
ff
gg
0
5cm

rims has an exterior design starting down from the rim. The measured rim diameters were 11.5, 12, and 12.5 cm.

Carinated Bowls with Flat Bases

The sides of this type of bowl (figs. 4.20:j,z,cc; 4.21:e; 4.22) flare sharply outward from a flat base to a carination somewhere on the lower half of the vessel. Above the carination the sides of the bowl are vertical and the shape cylindrical. An interesting feature of this type is that it is decorated either with multiple chevrons or with geometric designs, but never with both together on the same bowl. These two distinct decorative styles do not appear to correspond to any particular difference in bowl shapes or sizes, except that the modal rim diameter for carinated bowls decorated with chevrons is slightly less (12–13 cm) than the modal rim diameter for carinated bowls decorated with other geometric designs (15 cm).

Designs

Carinated bowls always are decorated on the exterior. The design always begins at or just above the carination in a horizontal panel that runs around the entire circumference of the vessel. Below the carination the bowls are not decorated at all except for a single painted horizontal base line that is found on all carinated bowl bases. As noted earlier, the design corpus can be separated into two distinct categories: multiple chevrons and other geometric designs.

The continuous multiple chevron designs (fig. 4.20: a,c,e,h,j,m,s,aa,bb,ee) always start down from a single painted rim line. In only one instance did we record a rim whose painted rim line extended onto the interior lip of the bowl. It is clear that the chevrons were painted starting down from the rim, for on every rim examined the chevron line starts down to the right, whereas at the bottom the multiple chevrons would terminate with a line angled to the right or left without any apparent consistency. A close examination of the brush work of the chevrons indicates that usually the brush was lifted before each turn in the chevron design. In other words, each chevron was formed with two separate brush strokes. Occasionally the multiple chevrons are discontinuous—i.e., they do not continue all the way around the bowl. Where the multiple chevron ends on these examples, there is usually a triangular area of solid black infilling (fig. 4.20:a,aa). Almost always there is a single horizontal line painted at the bottom of the multiple chevrons where they reach the bowl carination. Only rarely is a second line added to the bottom of the design.

Non-chevron geometric designs run in a panel usually bounded above at the rim by two parallel horizontal lines and below at the carination by two more parallel horizontal lines. Occasionally a single line or as many as three lines appear above and below the panel of geometric designs. The design repertoire appears fairly limited, especially compared with sites to the west such as Tal-i Gap and Tal-i Bakun. By far the most common design is a crosshatched lozenge laid out in rows within the panel (fig. 4.20: d,i,k,q,v,dd). Also quite frequent are alternating rows of solid black triangles between comb-like projections of horizontal lines (fig. 4.20:u,z). As a variant, the alternating triangles often have a trident motif placed between them (fig. 4.20:p,ff). Other fairly common designs are vertical lines hanging off the rim line (fig. 4.20:t), crosshatched squares (fig. 4.20:b,f,g), and rows of "I" motifs (fig. 4.21:a,l,r). Notable, but rare, are eight-sided stars (fig. 4.20:ee). Two designs that are worthy of note as unique in our corpus are a Maltese cross (fig. 4.21:b) and a theriomorphic lozenge-with-legs from Period VC (fig. 4.21:c).

On one sherd with unusually thick paint we were able to determine under a microscope the order in which the lines of the designs had been painted. This order, as much as could be determined, is shown in figure 4.23. It would appear that the rim line and the lines bordering the top and bottom of the panel were painted first. Then the crosshatched lozenge designs were filled in from left to right. This direction of painting implies that the artists were right-handed. Lozenges were formed by painting first two diagonal lines from the upper edge of the panel down to the right as far as the lower edge, then two diagonal lines from the upper edge down to the left to the lower edge. This resulted in two rows of lozenges that were then filled in with crosshatching, first parallel lines running down diagonally from left to right, and then parallel lines running down diagonally from right to left.

Chronology

Period VIA	Very rare (2 sherds)
Period VC	Rare
Period VB	Common (period of maximum use)
Period VA.2	Rare
Period VA.1	Rare

The carinated bowls of Period VC appear to be consistently different from the carinated bowls of VB and VA.2 in certain important details. First, the modal base diameter of VC (5 cm) is significantly smaller than the modal base diameter (8 cm) in VB; and the largest VC base diameter is only 6 cm, while 69 percent of the VB carinated bowl bases are 7 cm or more. Second, the paste color of many

Figure 4.20. Black-on-Buff Ware, Periods VB–VA.2. Exterior-painted beakers, carinated bowls, and necked jars. Proveniences: a, B.73.4; b, B.73.6; c, XC.71.5A.18; d, XC.71.T1.6A; e, B.73.5; f, XCE.73.T1.8; g, B.73.6.2; h, XC.71.T2.6; i, C.69.1; j, B.73.5; k, C.69.T1.1; l, XCE.73.T1.8; m, XCE.73.T1.2.1; n, B.73.6.3; o, B.73.6.2; p, B.71.27.2; q, XC.71.T1.6A; r, XCE.73.T1.5; s, XCE.73.T1;4A; t, XC.71.T1.6; u, B.73.6; v, C.70.Surface; w, C.69.1; x, C.68.T3.4; y, B.73.6; z, B.73.6.2; aa, XCE.73.T2.11; bb, B.73.5; cc, XC.71.T2.6; dd, B.73.6.2; ee, B.73.6; ff, C.69.T1.1; gg, C.69.1.

of the VC sherds is a paler buff (2.5 Y 8/2) than in VB. Third, on nine out of ten VC rim sherds recovered the painted rim line extends between 0.3 and 0.7 cm below the interior lip of the bowls. On none of the VB or VA.2 rims does the painted rim line extend onto the interior lip of the bowl. Finally, the crosshatched triangle, two examples of which we recovered from VC levels, does not appear at all in the design repertoire of Periods VB and VA.2.

Open Bowls with Ring Bases

The sides of this bowl type (figs. 4.24, 4.25) flare straight outward from a ring base to a rim that usually is about twice the diameter of the base. The ring base appears to have been as much a practical as a decorative feature. Such shallow bowls would have had a strong tendency to tip if they were made with flat bases. With the ring base the stability of the bowl is greatly increased. Most body sherds are less than 0.5 cm thick, but on three open bowl rim sherds (two recovered from VB, one from VC) the body thickness increases dramatically just below the rim to greater than 0.5 cm.

Designs

Open bowls with ring bases are always decorated on their

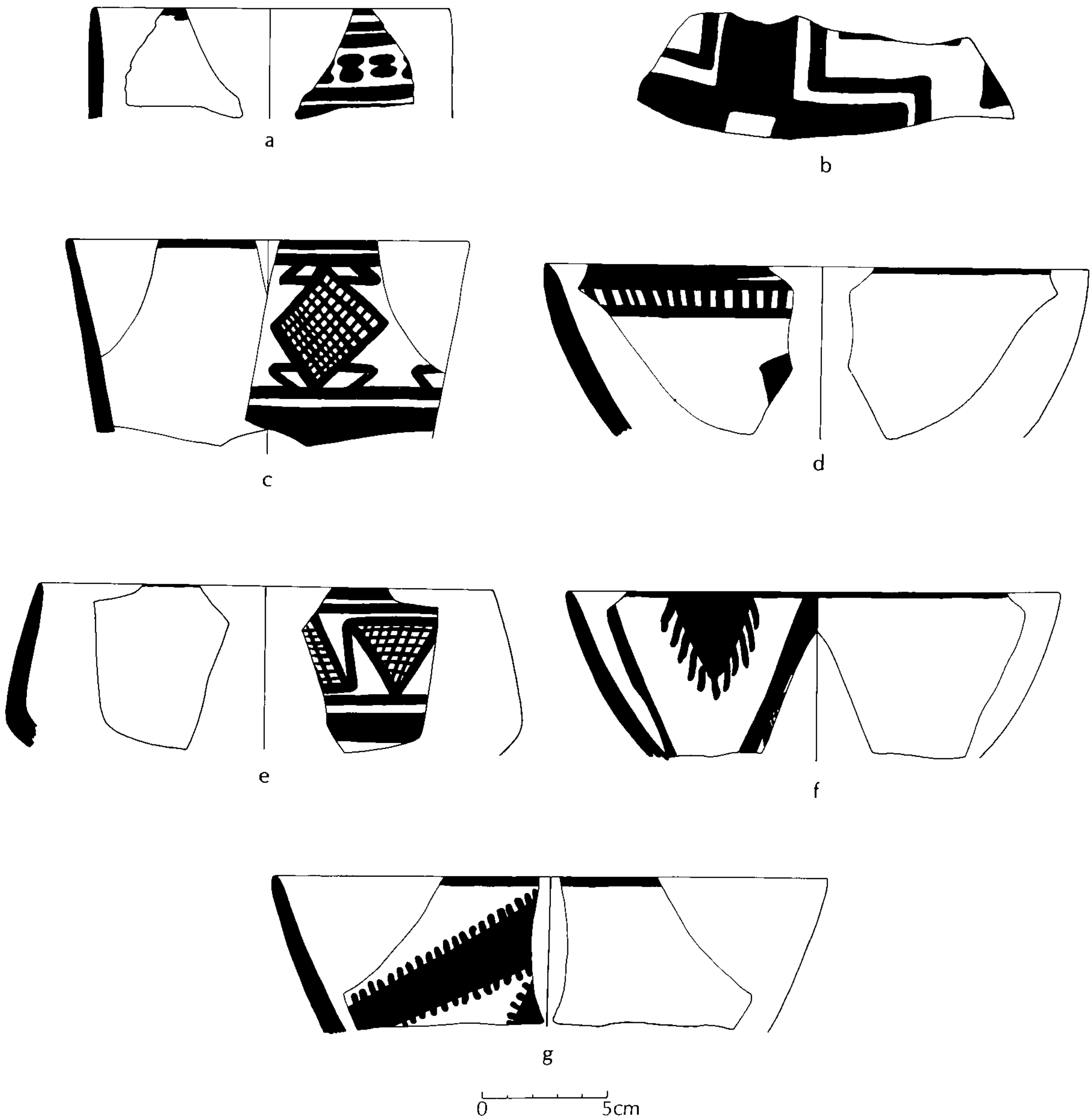


Figure 4.21. Early (imported?) Black-on-Buff Ware, Period VC. Proveniences: a, C.69.7; b, C.69.7; c, C.68.T1-3.4; d, C.69.7; e, B.73.T1.2; f, XCE.73.T1.9; g, C.69.3.

Figure 4.22. Carinated bowl of Black-on-Buff Ware, Period VB (C.69.1).

interiors, obviously because in such an open form this is where decoration would be most visible. The only exterior design is a single painted base line on or just above the ring base, which is found on all ring bases of less than 16 cm in diameter but on none of the ring bases greater than 16 cm in diameter. Designs almost always begin above the base on the interior. A notable exception to this is the single example from Period VB where a star pattern was painted in the center of the base. At the top of the designs there is in most cases a single rim line painted along the interior rim of the bowl. The most common design is a large cross-hatched lozenge with smaller lozenges in solid black extending out from each corner of the central lozenge and connected with parallel lines (fig. 4.24:a, b, k). These designs invariably are squared off at the corners with solid black triangles, so that the design as a whole becomes square. Almost as common are vertical lines hanging off the rim and comb medallions: comb motifs projecting out in four directions that form a central design in solid black. As extra filling in empty spaces around central designs, one occasionally finds "I" designs (seven examples from VB) or stars. A rare design, but worthy of note because of its apparently brief period of use, is the "fringed saw" motif, of which we have only three examples, two from Period VC (including fig. 4.21:g) and one from a mixed level, but probably also dated to VC.

Chronology

Period VIA	Very rare (1 sherd)
Period VC	Rare
Period VB	Very common (period of maximum use)
Period VA.2	Common
Period VA.1	Rare

As with the carinated bowls, there are certain important differences in the details of VC ring-base bowls that distin-

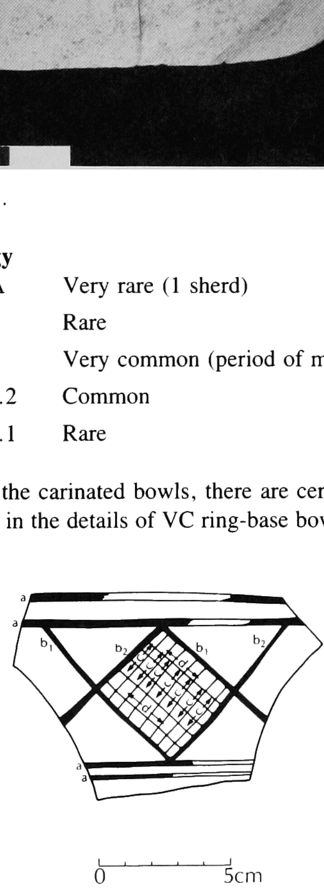
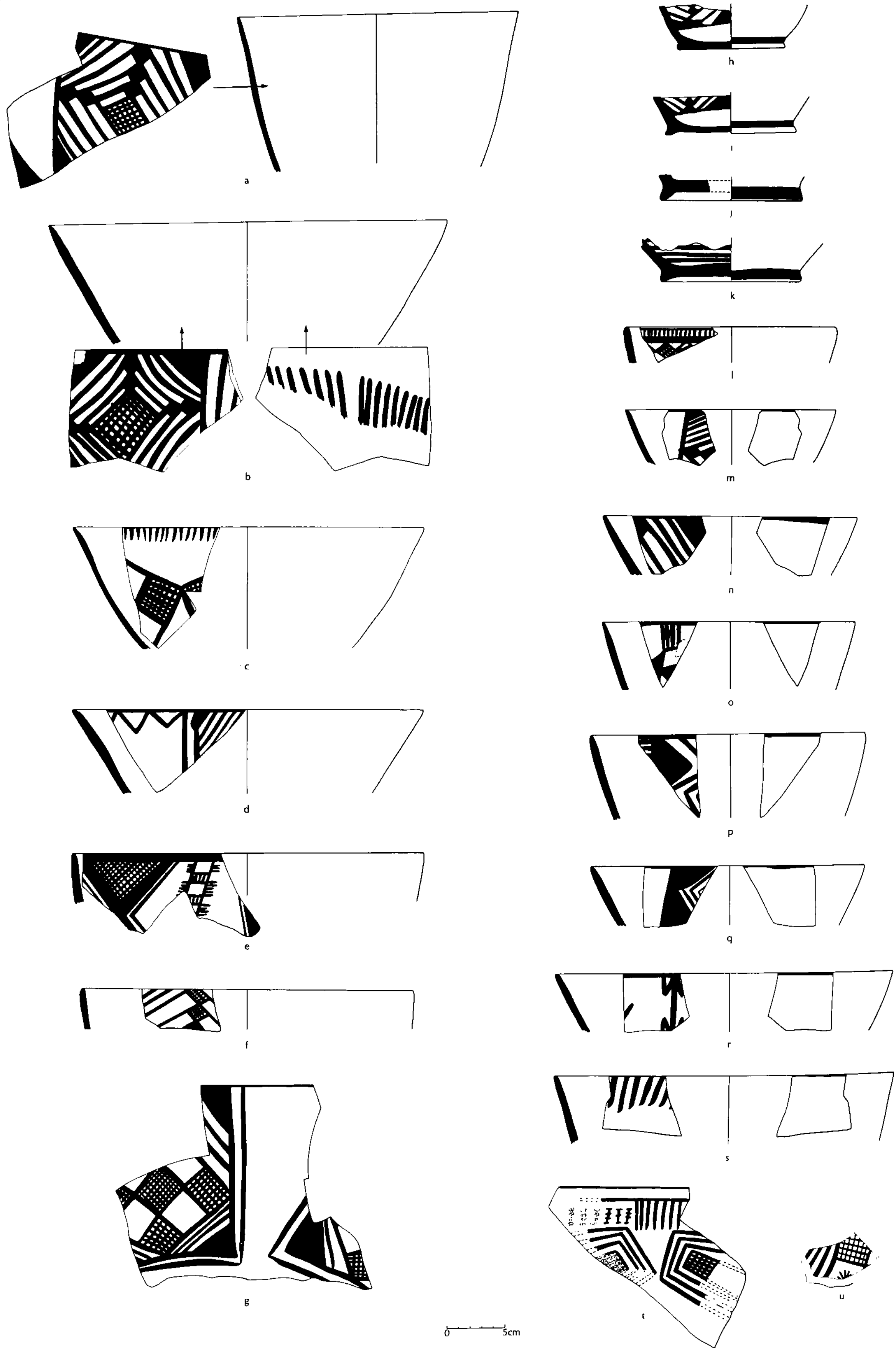


Figure 4.23. Reconstruction of the order in which lines of Black-on-Buff Ware were painted. Provenience: XC.71.T1.6A (Period N-VB).


a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
p
q
r
s
t
u
0 5cm

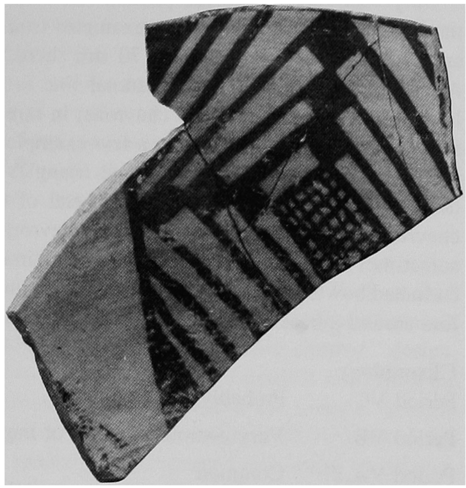


Figure 4.25. Rim sherds from interior-painted ring-base bowls of Black-on-Buff Ware, Period VB (left, B.73.4; right, B.73.T1.1.1).

guish them from the ring-base bowls of Periods VB and VA.2. First, the VC bases on average appear to be significantly smaller than later bases. The modal base diameter for VB bases is 12 cm, but for VC there are no base diameters greater than 11 cm. Second, on seven of the nine rims from VC the painted rim line extends 0.3 cm or more onto the exterior lip of the bowl; the two exceptions come from the uppermost level of VC (C.69.3). In VB, on the other hand, painted rim lines never extend onto the exterior lip of the bowl. Finally, the fringed saw motif appears only in Period VC. It is worth noting that the two primary features that distinguish VC ring-base bowls—smaller average base diameters and painted rim lines extending onto both interior and exterior surfaces—are exactly the same features that distinguish the VC carinated bowls from later carinated bowls.

Beakers

Beakers (fig 4.20) have flat bases and sides that rise almost vertically to the rim in a gentle convex curve. No full profiles were recovered; for a sample beaker base profile, see figure 4.33m,n. Beaker bases easily can be distinguished from carinated bowl bases by their consistently steep base angle (always greater than 60°). On the other hand, it is impossible to distinguish chevron-painted rims belonging to beakers from chevron-painted rims belonging to carinated bowls unless the sherd includes the bottom of the chevron design, where one can determine the bowl type from the presence or absence of a carination. Since no steep-sided bases were recovered from VC levels and all the VC body sherds showing the bottom of the chevron design are carinated, one can tentatively conclude (keeping in mind the relatively small sample involved) that the beaker shape does not begin at Yahya until Period VB.

Designs

The design repertoire on beakers is limited to multiple chevrons painted on the upper one-third to one-half of the vessel exterior. No other geometric designs are used on the beaker form (except in rare exceptions mentioned later). The multiple chevrons are painted in the same manner as the chevrons on carinated bowls: they always start down to the right from a single painted rim line and at the bottom angle either to the right or left (fig. 4.20:a,c,e,h,j,m,s). There is considerable variability in the quality of the brush work. Some multiple chevrons are perfectly straight and parallel and are drawn with an even stroke so that the width of the line does not vary. Occasionally, however, there are beakers whose chevrons are more carelessly applied: the lines waver and the line thicknesses vary. This may imply that several potters were active on the site at the same time and that not all of them had the same level of ability and experience in the delicate task of painting such symmetrical designs.

Figure 4.24. Black-on-Buff Ware, Periods VB–VA.2. Interior-painted ring-base bowls. Proveniences: a, B.73.T1.1; b, C.69.Surface; c, B.71.26; d, B.73.4; e, XCE.73.T1.4A; f, XCE.73.T1.4A; g, B.73.4; h, XCE.73.T1.4A; i, CDE.73.1.5; j, B.71.22; k, B.73.6; l, XCE.73.T1.4A; m, B.73.5; n, XC.71.T1.6; o, B.73.6; p, XC.71.T1.6A; q, B.73.6; r, XCE.73.T1.9; s, XC.71.T2.6A; t, B.73.T1.1; u, C.69.7.

Only very rarely does the painted rim line extend onto the interior lip of the beaker (no examples from Period VC and only four of the more than 70 rim sherds from VB). Almost invariably a single horizontal line is used as the lower border for the multiple chevrons; in rare instances a second bottom line is added. In a few examples other geometric designs such as crosshatched triangles and zigzag designs are also added at the bottom end of the multiple chevrons (fig. 4.20:bb). The multiple chevron designs are sometimes discontinuous, as they also sometimes are on the carinated bowls. There always is a single painted horizontal line around a beaker's exterior just above the base.

Chronology

Period VC	Probably none
Period VB	Very common (period of maximum use)
Period VA.2	Common
Period VA.1	Very rare (2 sherds)

Some of the chevron-painted rims from VC may belong to beakers, but as noted above the total absence of steep-sided beaker bases in VC implies that beakers first appear only in Period VB. Interestingly enough, one cannot use rim lines on beakers as a chronological indicator. Unlike the rims on the geometric-painted carinated bowls and ring-base bowls of Period VC, the chevron-painted VC rims do *not* have rim lines that extend onto both the interior and exterior surfaces.

Unusual Examples of Black-on-Buff Ware

These unusual examples (fig. 4.26) are sherds that can be categorized as Black-on-Buff but whose shape or placement of painted decoration is totally different from the rest of the Black-on-Buff corpus. It may be that some of these unusual examples are imports.

The curious, doughnut-shaped fragment—a possible vessel lid—from Period VB has a flange on the outside edge and an inside diameter of 8 cm. It is decorated on the top with continuous chevrons (fig. 4.26:a).

The first example of a beaker with unusual design placement (fig. 4.26:d) is a beaker base (10 cm in diameter) that lacks the usual exterior painted horizontal base line and that has a painted *interior* design. This example is from VB. The next three examples, two from VB and one from VC, are beaker bases where the chevron design begins immediately above the exterior base line rather than on the upper half of the vessel (only one is illustrated: fig. 4.26:c). These three bases are all 12 cm in diameter, which means they are larger in diameter than any other VB beaker bases. The final example (fig. 4.26:b) is a beaker base from VB on which the painted geometric designs also begin just above the base and include an unusual plant(?) motif. The paint in the design, moreover, is unusually thick and vitreous in appearance.

Yahya Black-on-Buff Ware, North Side

Chronology

Period N-VB	Very common
Period N-VA.4–3	Common
Period N-VA.1–2	Rare

The north side Black-on-Buff Ware assemblage is indistinguishable from that of the south side. All four of the major vessel forms documented for the south side—necked globular jars, open bowls with ring bases, carinated bowls with flat bases, and beakers—are also present on the north side. The design repertoire, too, seems exactly the same, and no new types of designs were recorded. Measurable rims and bases fall into the same size range as those from the south side. None of the designs and interior-and-exterior-painted rims peculiar to VC levels on the south side were recovered from the north. This is understandable given the fact that the north side of the mound does not appear to have been occupied at all during Period VC.

The only noteworthy sherd is a rim fragment from a carinated bowl. The black paint of the exterior design (a row of crosshatched lozenges) was applied so thickly that a close examination reveals the order in which most of the lines were painted. Interestingly enough, the designs are

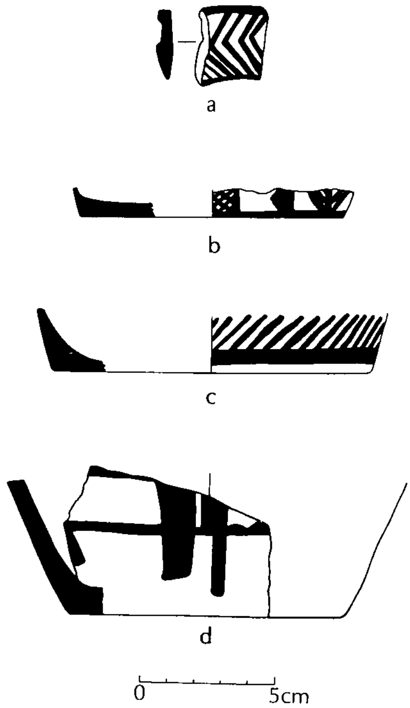


Figure 4.26. Black-on-Buff Ware, unusual examples. Proveniences: a, B.73.5 (Period VB); b, B.71.27.2 (Period VB); c, C.69.7 (Period VC); d, B.73.5 (Period VB).

painted in precisely the same order as noted for the sherd with a similar design illustrated from the south side (fig. 4.23), with the (presumably right-handed) painter working around the vessel from left to right.

BLACK-ON-RED WARE

Like the Yahya Black-on-Buff Ware, Black-on-Red Ware (figs. 4.27–4.38) is handmade and decorated with continuous multiple chevrons or rectilinear geometric designs. Designs are painted in black on either the inner or outer surface, depending on the vessel shape. Many of the vessel shapes and design motifs of Black-on-Red Ware are identical to those of the preceding Black-on-Buff Ware, which the Black-on-Red Ware replaces beginning in Period VA.2. The major difference between the two wares is paste color and surface color, which may be the result of a shift to a different type of clay, a different technique of processing clays, the introduction of a new type of kiln with different firing temperatures, or a combination of these factors. Black-on-Red Ware is common at Yahya in Periods VA.2 and VA.1.

The paste consists of finely levigated clay, evenly fired (although firing clouds are occasionally found on the lower half of vessels). The paste color is red, ranging from an orange-red to a brownish red (5 Yr 6/6 to 2.5 YR 6/6). The paste color of Black-on-Red Ware falls outside the normal range of the Black-on-Buff Ware, so that the two wares can be distinguished fairly easily by paste and surface color alone. The tempering material consists of finely crushed vegetal matter that is scarcely visible to the naked eye. The mineral composition of three of the Black-on-Red sherds from VA.1 was analyzed by Diana Kamilli (Kamilli and Lamberg-Karlovsky 1979:samples 9,10,11). The paste was found to be mineralogically identical to that of the Black-on-Buff Ware and included abundant biotite, chlorite, quartz, untwinned feldspar, traces of twinned calcic plagioclase, pyroxene, and chert. The only difference between the Black-on-Red Ware paste and the Black-on-Buff Ware paste is that hematite stain is much more abundant in the Black-on-Red Ware. Kamilli concludes from the mineral assemblage that the Black-on-Red Ware was made from locally obtained materials derived mostly from metamorphic biotite- and chlorite-rich schists.

Like Black-on-Buff Ware, Black-on-Red Ware vessels are wet smoothed with a material or object that leaves parallel surface striations, or "drag marks," as it is dragged across the vessel's surface. In general the drag marks are rougher and deeper than those of Black-on-Buff Ware, as if a coarser material were used in wet smoothing or the vessels' surfaces were not as dry when the wet smoothing was done. On exterior surfaces these drag marks often show up as deep diagonal scratches. Finger marks are often found on the interior of a base. Another tool, probably a flat paddle of some sort, also is used in the shaping and smoothing of many Black-on-Red Ware vessels. This tool leaves visible scrape marks that run diagonally on vessel exteriors. The surface color is usually a purplish red, although it may range from an orange-red to a brownish red. Surface color and paste color seem to co-vary: the darker the paste color, the darker the surface color will be (2.5 YR 6/6 to 5 YR 5/4). There is no evidence for burnishing or slips (although see discussion below of north side necked jars from N-VA.1). Vessel surfaces have a powdery, chalky feel when rubbed with the hand.

Designs in black or dark brown paint are applied with a brush. Compared to the painted designs of Black-on-Buff Ware, there usually is less clarity in the edges of painted lines, and designs, particularly the "short chevron" design, often have a smudged appearance. Kamilli's analysis of the black paint from three Black-on-Red VA.1 sherds (Kamilli and Lamberg-Karlovsky 1979:samples 9,10,11) showed that it contained medium-fired, sintered iron oxide (hematite), MgO, and MnO, as well as silicate binders. Kamilli points out that the presence of MnO is distinctive and may account for the black coloration despite highly oxidizing firing conditions. The occasional faint mirror impressions of chevron designs on the interiors of beakers indicate that these vessel forms at least, like the Black-on-Buff beakers, continue to be fired in a stacked position.

Yahya Black-on-Red Ware can be subdivided into four basic shapes: necked jars, hole-mouth jars, open bowls with flat bases, and beakers.

Necked Jars

This type of vessel (figs. 4.27; 4.28; 4.29; 4.30:a–d, h,i,l,m,s,v) appears to be the lineal descendant of the necked, globular jars in Black-on-Buff Ware. The problem again, however, is a lack of full profiles. The only complete examples of this type come from levels on the north side of the mound (figs. 4.27, 4.29, 4.30:v). Bases apparently are always flat. Many of the Plain Coarse Ware bases may well be the bases for Black-on-Red Ware jars that are unpainted on the lowest third of the vessel. There are two basic types of jar necks: long, cylindrical necks (especially for larger jars; fig. 4.27) and short necks with sharply everted rims (fig. 4.30:a–d,h,i,l,m,s,v). Many of the rims recovered were flattened, producing a distinctive squared rim profile. One of the large, complete jars (figs. 4.27, 4.28) from a Period N-VA.4 courtyard (see fig. 6.33) and two of the examples from the south side (fig. 4.30:c,d) show a gentle carination about halfway down the vessel profile. Repair(?) holes occasionally are found in body sherds, and one example (fig. 4.30:b) had a pierced lug handle attached to the rim.

Necked jars are always decorated on the exterior (eg. fig. 4.29), although one rim was recovered that also had a simple design of vertical lines hanging off the rim on the interior. There is always a thick, painted rim line that extends at least 0.2 cm onto both the exterior and interior surfaces of the jar. The most common designs are fringed lines (fig. 4.30:f,u), zigzags (illustrated on hole-mouth jar, fig. 4.30:h), crosshatched lozenges and squares (figs. 4.27, 4.29, 4.30:b,x), filled-in lozenges and squares (illustrated on beaker, fig. 4.30:p), and parallel vertical lines starting down from the rim (fig. 4.30:h,s). Continuous multiple chevron designs are not found on necked jars. There usually is a painted horizontal band on the carination where the bottom of the jar neck meets the main body of the vessel.

Chronology

Period VB	Very rare (3 sherds)
Period VA.2	Common
Period VA.1	Common

No clear distinctions in shape or design repertoire could be discerned between Period VA.2 and VA.1 necked jars.

Hole-Mouth Jars

The hole-mouth jar shape is rarer than the necked variety, but one splendid example was recovered in situ from an N-VA.4 courtyard (figs. 4.31; 4.32; see fig. 6.33), and several other rim sherds were found in VA contexts on both the north and south sides of the mound (fig. 4.30:n,r). The design repertoire appears to be the same as that for necked jars, with the designs always on the upper half of the vessel and set off from the undecorated lower half by a characteristic thick horizontal painted line.

Chronology

Period VA.2	Rare
Period VA.1	Rare

With so small a sample, there were no discernible chronological distinctions between the VA.2 and VA.1 hole-mouth jars.

Open Bowls with Flat Bases

This bowl type (fig. 4.33:b,c,e,j) appears to replace the Black-on-Buff Ware ring-base bowls and carinated bowls of Period VB. No full profiles were recovered, but given the absence of any ring bases in VA, these bowl forms must have had flat, shallow-sided bases. Five such shallow-sided bases were recovered from VA.1, two with a measurable diameter of 4 cm, and all with a painted horizontal line just above the base. Also, some of the unpainted plain Coarse Ware bases may belong to Black-on-Red Ware open bowls. One body sherd from a VA.1 level had had a repair(?) hole drilled through it.

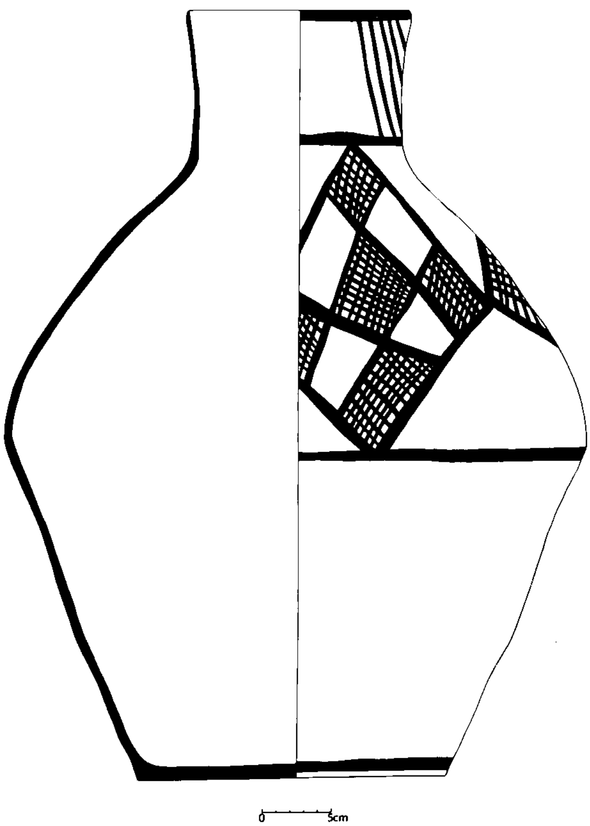


Figure 4.27. Black-on-Red Ware, Period N-VA.3. Necked jar. Provenience: XC.71.T1.5C.17.

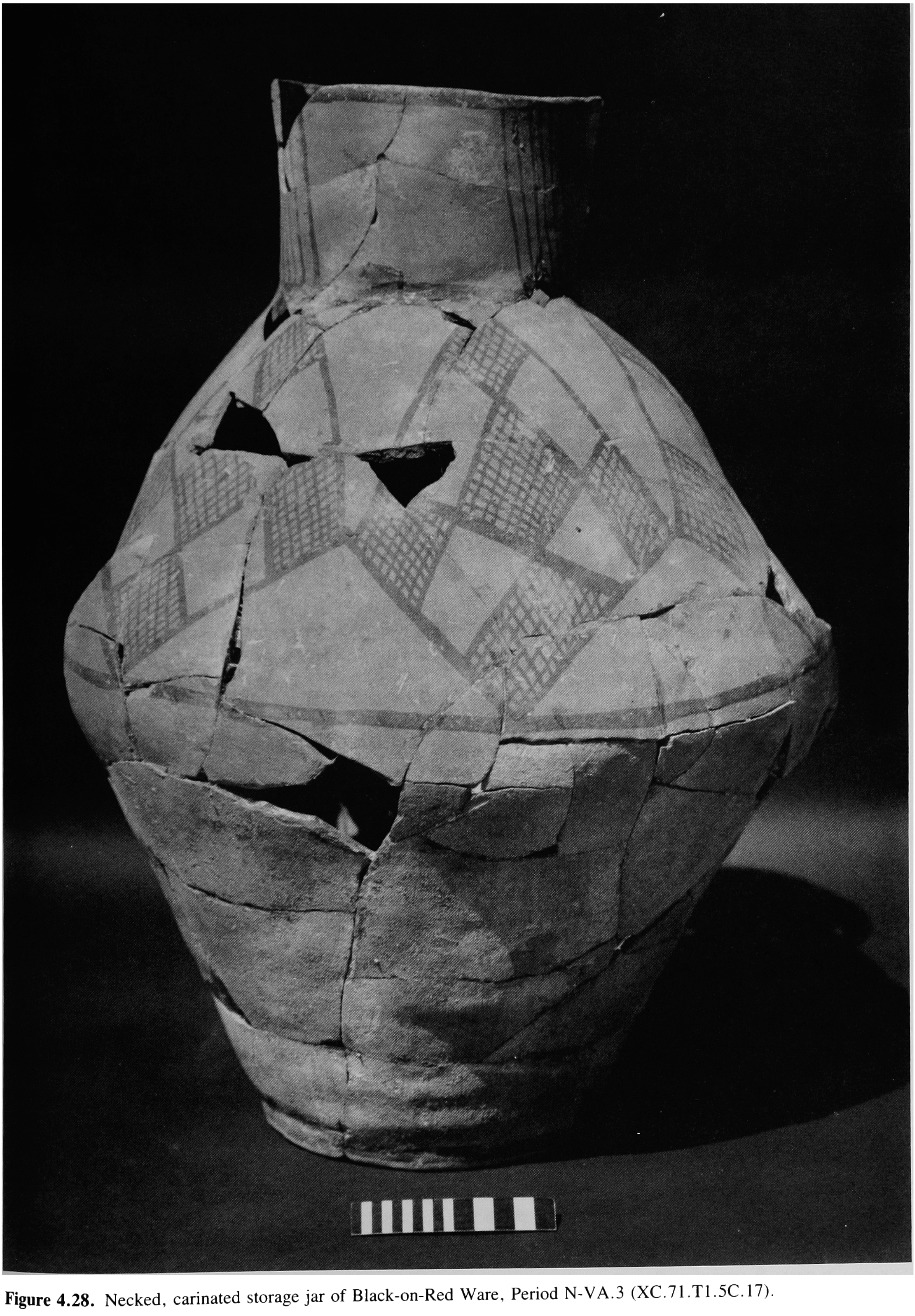


Figure 4.28. Necked, carinated storage jar of Black-on-Red Ware, Period N-VA.3 (XC.71.T1.5C.17).

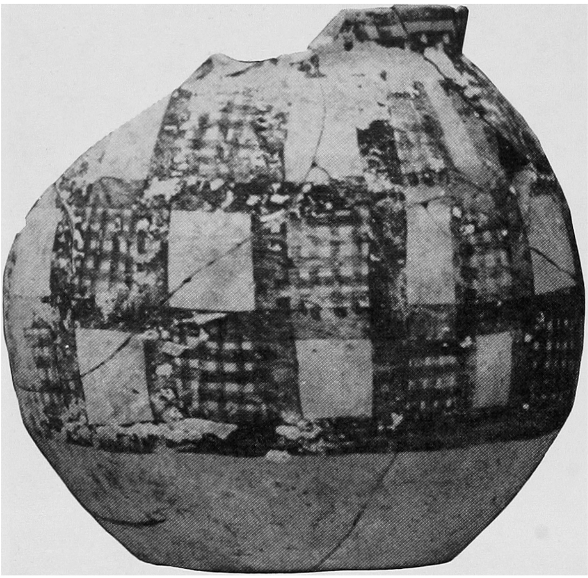


Figure 4.29. Necked jar (13.6 cm high) of Black-on-Red Ware, Period N-VA.1 (XCE.73.T2.2).

Designs

These bowls are always decorated on the interior. Almost all rims have a thick painted rim line that extends at least 0.2 cm onto both the exterior and interior surface of the bowl. The most common design is a row of hanging, solid black triangles beneath the rim interior (fig. 4.33:c,e). Fringed lines and panels with concentric lines around crosshatched lozenges also are common.

Chronology

Period VB	Very rare (1 sherd)
Period VA.2	Common
Period VA.1	Common

There are no apparent distinctions between the Black-on-Red bowls of VA.2 and those of VA.1

Beakers

The Black-on-Red Ware beaker form (figs. 4.34, 4.35) is a continuation of the Black-on-Buff beaker. Indeed, Black-on-Red Ware beakers have a size range for rim and base diameters very similar to that of Black-on-Buff Ware beakers. The only obvious difference is an increase in beakers at the smaller end of the size range in Black-on Red Ware. However, there are several changes other than color that serve to distinguish Black-on-Red beakers from Black-on-Buff beakers. Black-on-Red beakers are decorated with geometric designs other than multiple chevrons and have a new type of chevron design, the short chevron, that does not usually extend more than 2 to 3 cm below the beaker rim (fig. 4.33:i,m,n). In contrast to the practice with Black-on-Buff beakers, at least 90 percent of the rims painted with geometric patterns or short chevrons have rim lines which extend at least 0.2 m onto the interior lip of the beaker. Unlike their predecessors, many of the Black-on-Red beaker rims are flattened to provide a square rim profile, or scraped at an angle along the outside edge of the rim to produce a slightly beveled profile. Finally, potter's marks become common for the first time on Black-on-Red beakers (see figs. 4.36, 4.37). Several full profiles of Black-on-Red beakers were recovered; their shapes suggest that beaker bases are consistently about one half the size of the rim diameter.

Designs

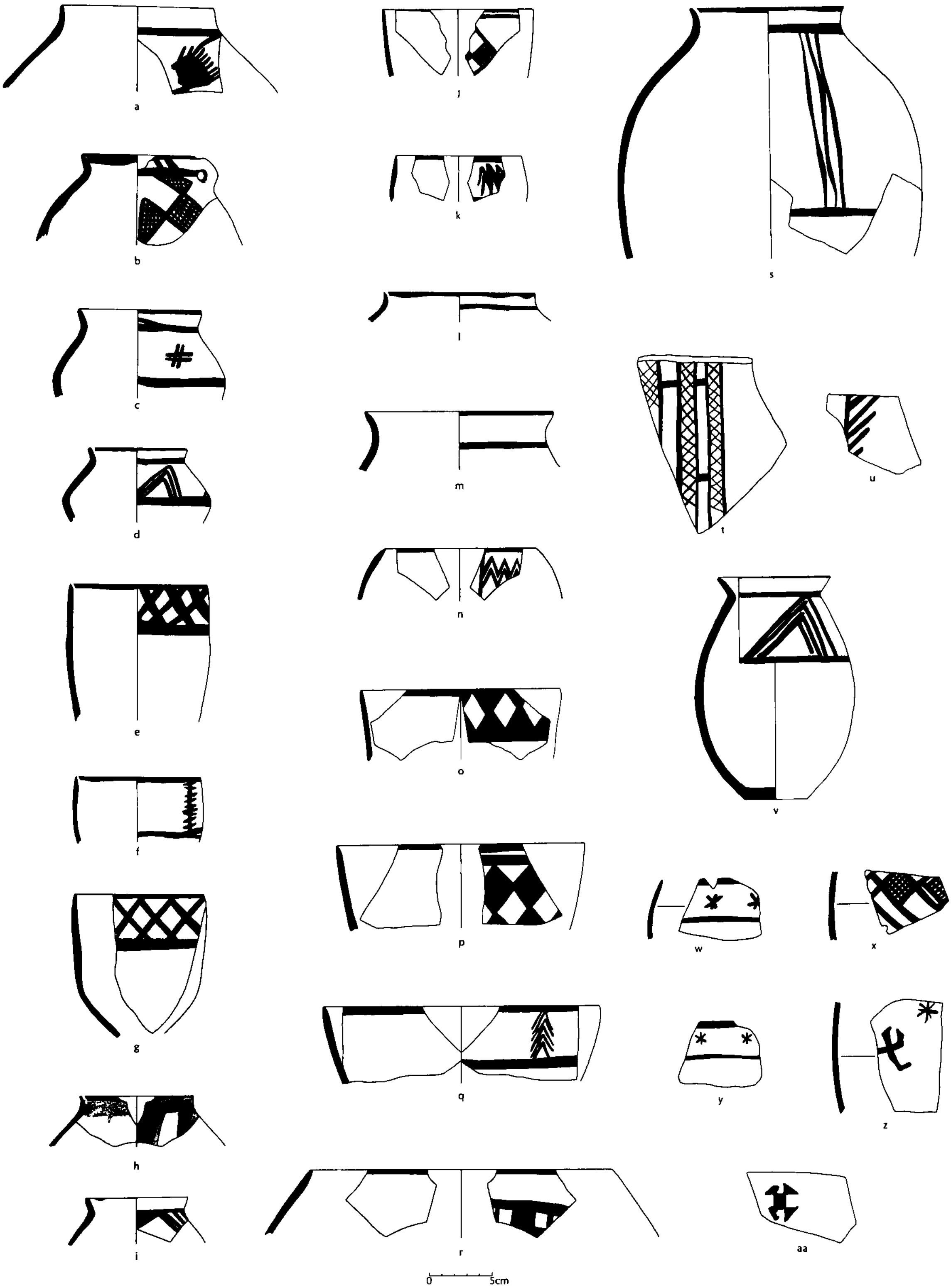
Beakers are decorated on the exterior, although on many of the rims the painted rim line extends at least 0.2 cm onto the interior lip of the beaker. Designs are restricted to the upper half of the beaker. Beaker bases have a single painted horizontal band just above the base, but some beaker bases may also have been unpainted: some of the unpainted Plain Coarse Ware bases may belong to beakers that were painted on their upper bodies. The design repertoire can be divided into two distinct and mutually exclusive categories: chevron designs and other geometric designs.

Continuous multiple chevron designs are applied to Black-on-Red beakers in much the same way they were to Black-on-Buff beakers. Without exception the chevrons start down to the right from a painted rim line; at their bottom the multiple chevrons terminate with a line angled to the right or to the left, without any apparent consistency. Occasionally the multiple chevrons are discontinuous. In most cases the painted rim line does *not* extend onto the interior lip of the beaker.

In addition, however, a new variation of the chevron design is introduced in Period VA.2 and becomes dominant in VA.1. This new design will be called the "short chevron" because it consists not of multiple chevrons, but of single chevrons, one-and-a-half chevrons, or double chevrons in a narrow panel that rarely extends more than 2 or 3 cm below the rim. In contrast to the multiple chevron beakers, the painted rim lines on short chevron beakers always extend at least 0.2 cm or more onto the interior lip of the vessel.

Chevrons are never used in conjunction with other geometric designs on a beaker, so that those beakers with non-chevron designs can be treated as a distinct category of beakers (fig. 4.30:e,f,g,j,k,o,p,q). The most common geo-

Figure 4.30. Black-on-Red Ware, Period VA.2–VA.1. Necked jars, hole-mouth jars, and geometric-painted beakers. Proveniences: a, XCE.73.T2.4C; b, B.73.3.4; c, C.68.T6.9.5; d, C.68.T2.1; e, C.68.T3.2; f, C.68.T6.9.5; g, C.68.T3.2; h, XCE.73.T1.4B (shaded area = red wash); i, C.69.1.7; j, B.73.4; k, XCE.73. Surface; l, XCE.73.T2.4C; m, XCE.73.T2.4A; n, C.69.1; o, XCE.71.14C.39; p, XCE.73.T1.10; q, XC.71.T2.5; r, B.73.2A; s, C.69.Surf.6; t, C.68.4; u, B.73.3; v, XCE.71.T2.14.30; w, C.68.T3.5; x, B.73.3; y, C.68.T3.3; z, XCE.73.T2.4C; aa, XC.71.T1-2.5.


a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
p
q
r
s
t
u
v
w
x
y
z
aa
0 5cm

metric designs are fringed lines (fig. 4.30:f,u), zigzags, crosshatched lozenges and squares, filled-in lozenges and squares (usually in a checkerboard pattern), and parallel vertical or horizontal lines. Included in this category are a large number of rim sherds with a painted rim line but no geometric designs beneath. These rims—and, in fact, geometric-painted beakers in general—tend to fall at the larger end of the beaker size range.

Chronology

Period VC	Very rare (2 sherds)
Period VB	Very rare (4 sherds)
Period VA.2	Common
Period VA.1	Common

Short chevron beakers provide a fairly clear chronological indicator by which VA.2 can be distinguished from VA.1. Short chevron beakers are extremely rare in VA.2 and may be intrusive (only two sherds were found). In VA.1, on the other hand, short chevron rims become the dominant beaker rim type, outnumbering multiple chevron rims by a ratio of 3 to 1.

Potter's Marks on Black-on-Red Ware Beakers

While a potter's mark was found on the base of a Black-on-Red Ware beaker from a VB context (fig. 4.36:j), potter's marks only become relatively common on the Black-on-Red Ware beakers of VA (fig. 4.36). They are most common in VA.1, where they were found on at least 14 different beaker bases. (Additional potter's marks were found on Black-on-Red beakers from the north side of the mound. These will be discussed under the description of the north side pottery.) There are no examples of potter's marks on any vessel forms other than beakers. The totals of bases with marks on them are as follows:

South Side	*Bases with Potter's Marks*
Period VB	1 Black-on-Red beaker base (fig. 4.36:j)
Period VA.2–1 mixed	10 Black-on-Red beaker bases
Period VA.1	14 Black-on-Red beaker bases

All potter's marks were applied with a brush before the beakers were fired. The black paint used is the same as that used to paint the chevron patterns on the upper body, so that it appears highly probable that the individual who decorated a beaker also was the one who added the potter's mark. The marks used are all quite simple: a dot, a circle, a pair of parallel lines, a "V" mark, and so on. Only on one base (fig. 4.36:s) does more than one mark occur. Out of 25 examples (23 of which are illustrated here), there are 18 different marks. The most commonly repeated mark (five examples) is a pair of parallel lines, found either at the center of the base or along the edge. The second most common mark is the "V," repeated on three different bases, either at the edge or at the center of the base.

It is tempting to see the potter's marks of VA.2 and VA.1 as the direct precursors of the Proto-Elamite writing system of Period IVC, a kind of Proto-Proto-Elamite. At present, however, this possibility does not appear likely. First, there is a major shift in ceramic styles between VA and IVC, perhaps even a chronological gap, and potter's marks are not found on any of the IVC ceramics. Second, few convincing correlations can be made between the Proto-Elamite signs of IVC and the potter's marks of VA. The Proto-Elamite tablets show an already highly developed writing system using a fully worked out system of numbers and combinations of two or three signs, whereas the Period VA marks appear singly and incorporate no recognizable number system. To argue for continuity between the marks of VA and the writing of IVC would necessitate the discovery of some intermediate developmental stage, and so far evidence for such an intermediate stage at Yahya is lacking. Indeed, throughout their use in VA.2 and VA.1 there is no indication of any internal development in the system of potter's marks beyond single signs on the bases of beakers.

To prove what purpose potter's marks served at Yahya in VA is of course difficult, but certain possibilities can be eliminated. First, the marks probably are not indicators of beaker capacity. There are simply too many different signs for them to be a number system enumerating different units

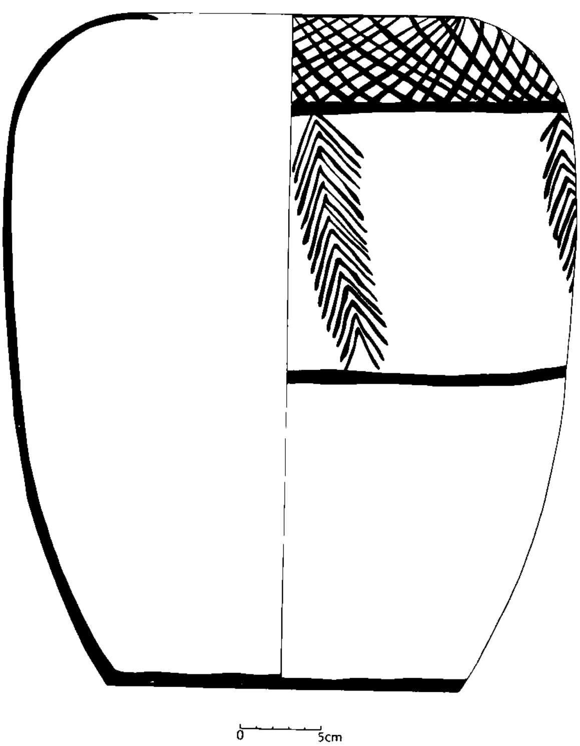


Figure 4.31. Black-on-Red Ware, Period N-VA.3. Hole-mouth jar. Provenience: XC.71.T1.5C.16.

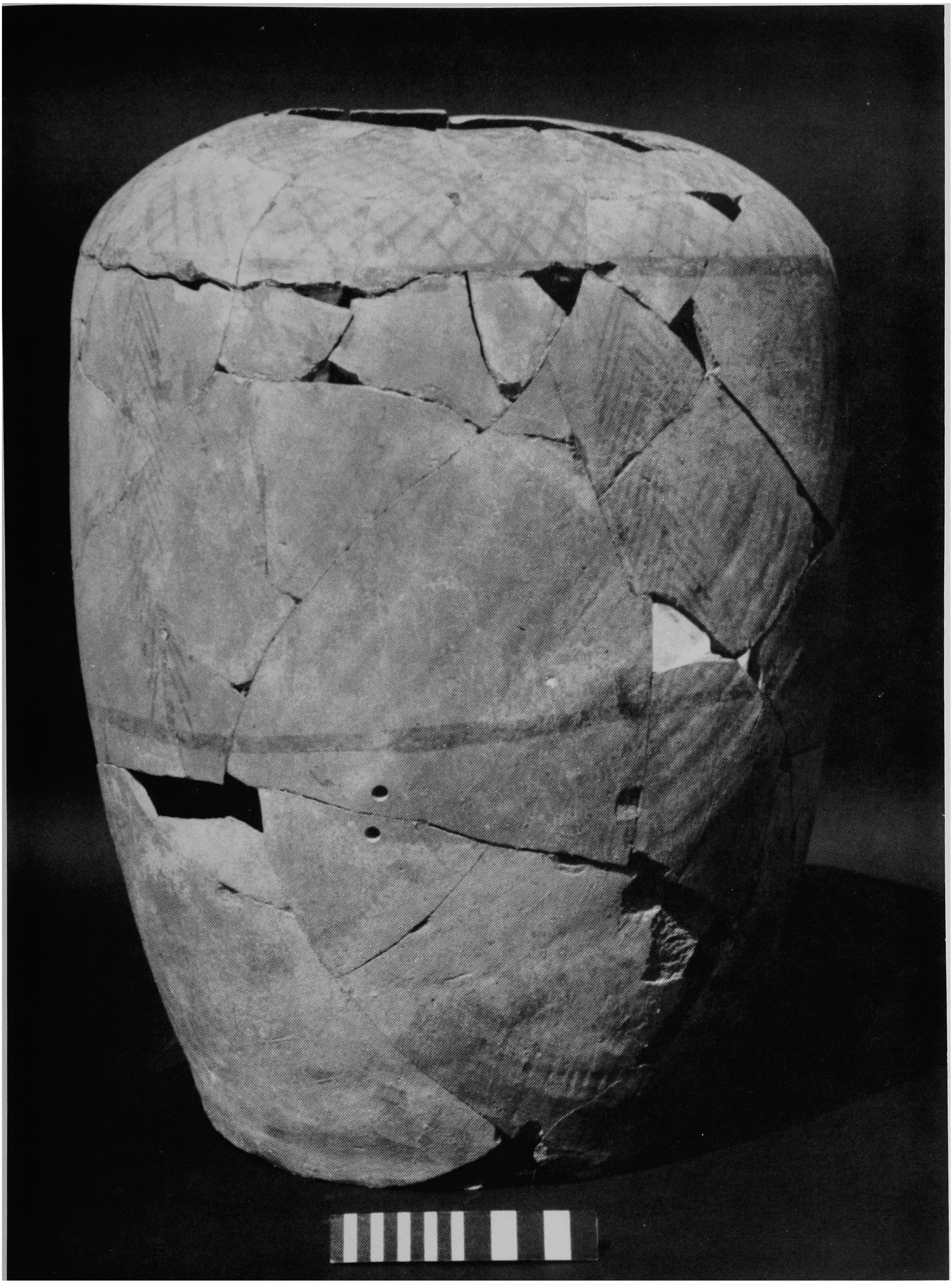


Figure 4.32. Hole-mouth storage jar of Black-on-Red Ware, Period N-VA.3 (XC.71.T1.5C.16).

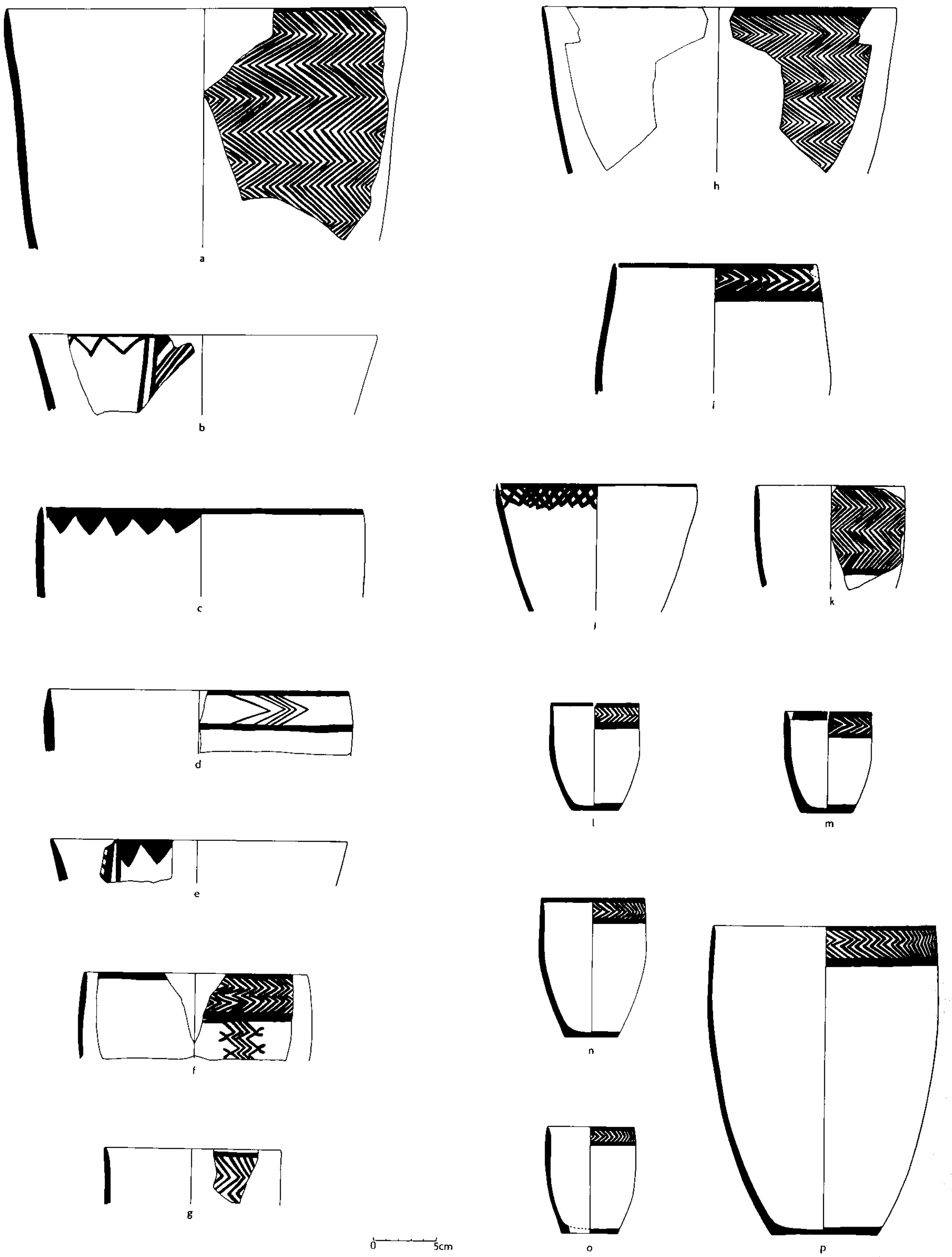


Figure 4.33. Black-on-Red Ware, Period VA.2–VA.1. Chevron-painted beakers and interior-painted bowls. Proveniences: a, B.73.2A; b, B.73.4; c, C.68.Surface; d, C.68.T3.2; e, XC.71.T1.5A; f, C.68.T7.1; g, C.69.1.2-3; h, XC.71.T2.6; i, XCE.73.T2.4C; j, XC.71.T2.6; k, B.73.2; l, B.73.4; m, XCE.73.T1.6; n, C.69.T3.1.4; o, C.68.T2; p, C.69.1.5.

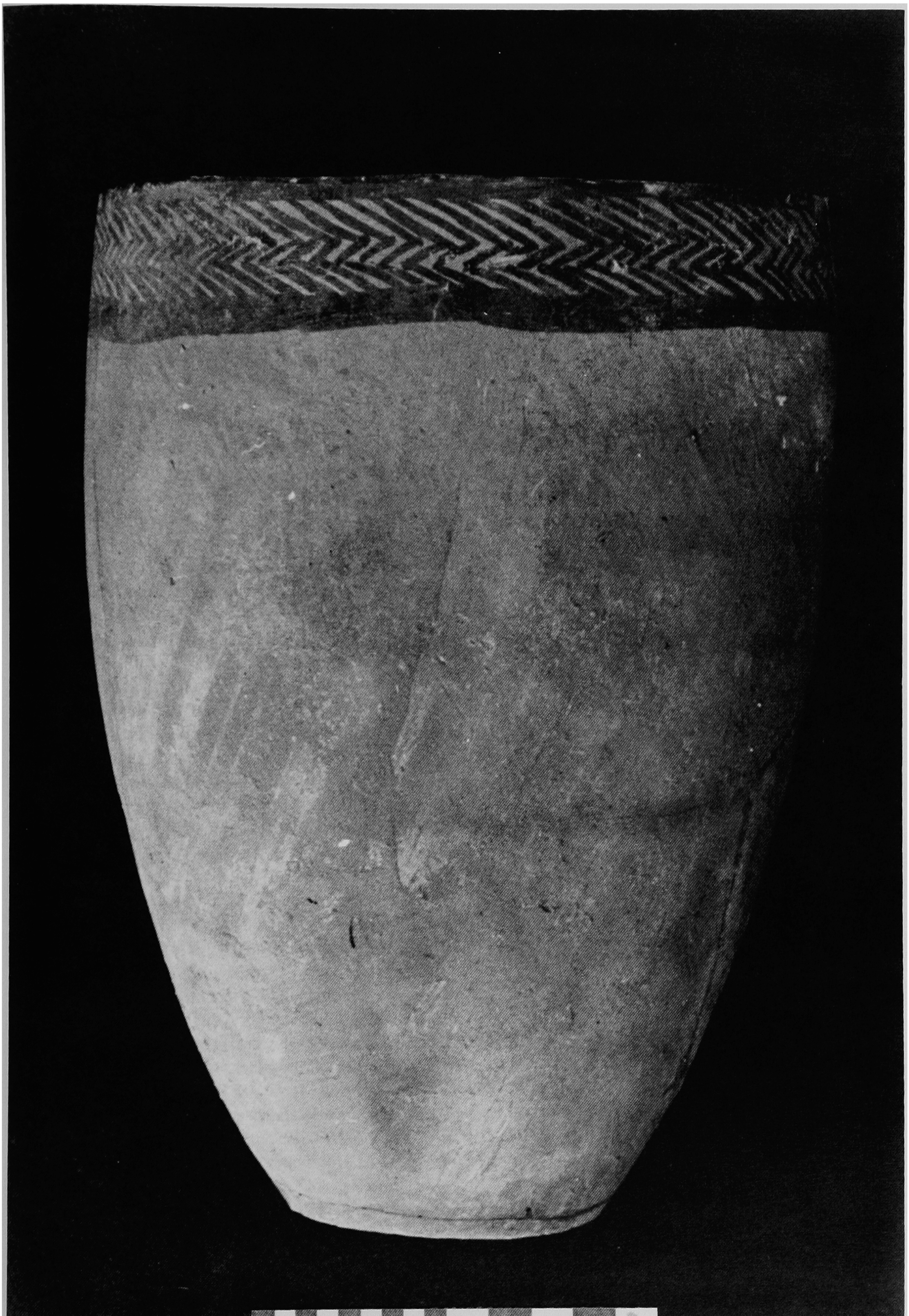


Figure 4.34. Large chevron-painted beaker of Black-on-Red Ware, Period VA.1 (C.69.Surface).

of volume. In addition, beaker profiles show a rough correlation between base size and overall beaker size, so that base diameters should provide a rough indication of beaker capacity. And yet beakers with the same base diameter have different marks; conversely, the same mark appears on bases with different diameters.

It is also unlikely that the marks served to identify the contents of the beakers on which they were painted. There would have to have been at least 18 different commodities stored in this particular type of vessel, which does not seem very probable. Moreover, the placement of a mark identifying the contents on the *bottom* of a vessel would seem totally impractical. One would have had to risk spilling the contents in the process of lifting up the beaker to look at the identifying mark on the bottom. It would have been much more practical to place such marks on the sides of beakers.

A third possibility is that the beaker marks served to identify the individual who owned the beaker. Given the large number of different marks within a relatively small exposure, it is plausible that individuals were the unit of ownership being identified by these marks (data from the mound's north side argues against the "family" being the unit of ownership), with certain individuals in the community having his/her own unique mark. If the marks, painted on before firing, do identify individuals, then beakers possibly were still being domestically produced, at least up to the firing stage. Alternatively, the beakers could have been commissioned from a professional potter by an individual, and the potter would then have placed the individual's mark on the beaker before firing it.

Figure 4.35. Chevron-painted Black-on-Red Ware beaker, Period VA.2 (B.73.4).

If these marks are to be interpreted as ownership marks, then the obvious question remaining is why these marks were applied only to beakers and not to other contemporary ceramic types such as painted jars or bowls. What distinguishes beakers, and in particular chevron-painted beakers, from other ceramic types of the same period is that they are so much alike. The geometric designs on other types of pottery vary from vessel to vessel, but the chevron designs on different beakers are painted in so identical a manner that in many cases it must have been difficult to distinguish one beaker out of a group of such beakers. The adoption of identifying marks for this particular type of vessel, and this type alone, may simply have been a means of avoiding confusion of ownership once these look-alike beakers were in use.

Unfortunately, the question of why almost none of the Black-on-Buff beakers and less than a third of the recovered Black-on-Red beakers had identifying marks on them is still unanswered. Possibly only a certain individual (or individuals) within a family had an identifying mark or was allowed to use an identifying mark. Another possible solution may be that the marks were used to avoid confusion of ownership not *after* the beakers were in use, but during the firing process. We know from the mirrored impressions of chevrons on the interiors of other chevron-painted beakers that in VA.2 and VA.1 chevron-painted beakers were fired in a stacked position. Quite possibly in this period vessels made domestically were fired in communal kilns. If this were the practice, then an individual's identifying mark on the base of the topmost beaker of a stack of beakers in a communal kiln would have served to distinguish that stack from an identical-looking stack of beakers being fired in the same kiln by or for another individual. Of course, one still needs to explain the absence of marks on Black-on-Buff beakers, which also look very similar to one another and also were fired in a stacked position. Possibly there was a shift in the organization or techniques of pottery production at the same time that the shift from Black-on-Buff Ware to Black-on-Red Ware occurred, so that in Periods VA.2 and VA.1 the new Black-on-Red Ware was being fired in a new, larger type of kiln used by the entire community, where identification in the kiln of which vessels belonged to whom would have become a problem.

Because of the series of assumptions necessitated by our theory, it must remain highly tentative, but it raises interesting implications about increasing specialization and centralization in the production of pottery, implications that are worth keeping in mind while examining other aspects of the VA.2 and VA.1 settlements at Yahya.

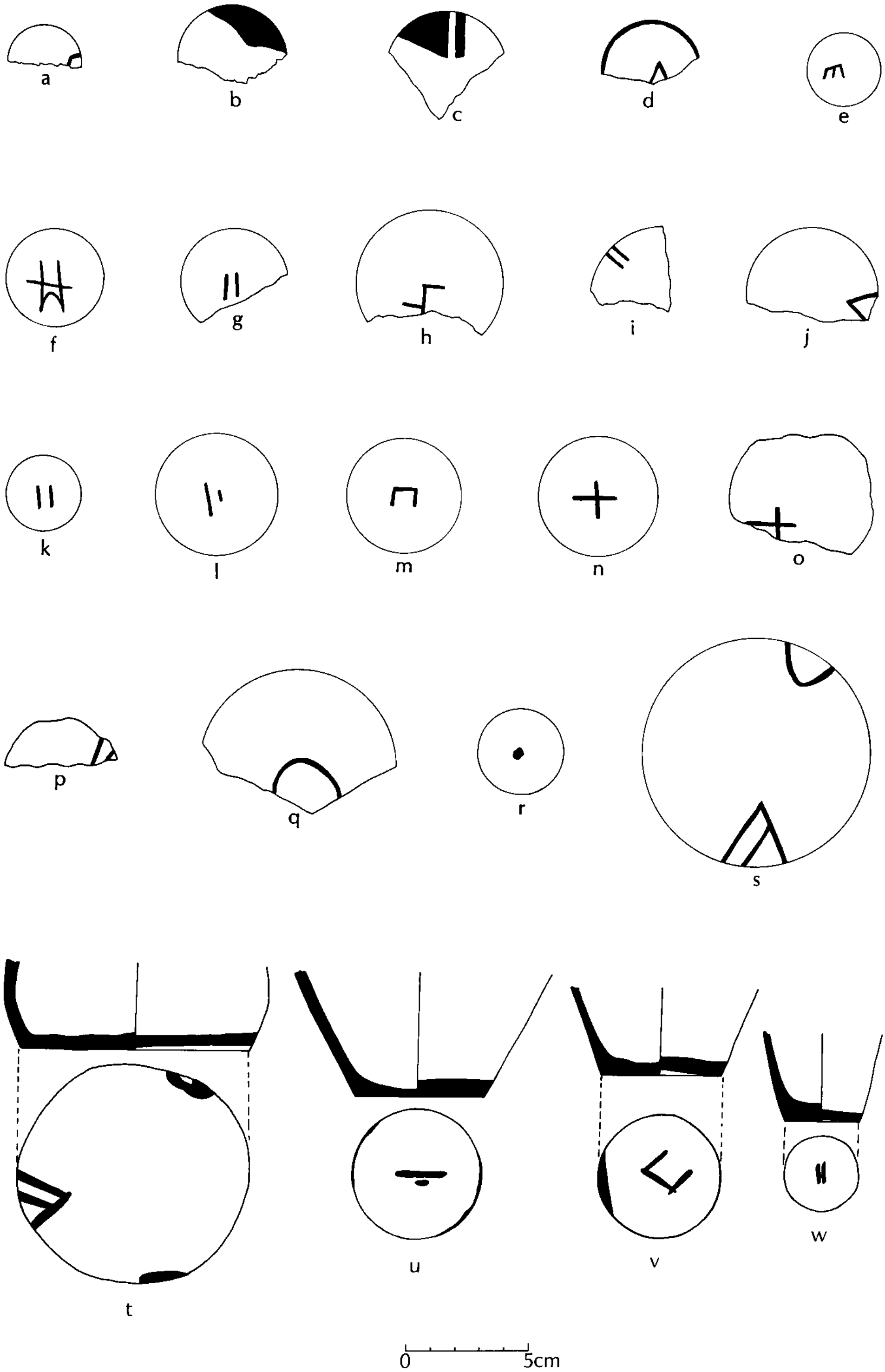


Figure 4.36. Potter's Marks, Black-on-Red Ware, south side. Proveniences: a, B.73.2; b, B.73.2; c, B.73.2; d, B.73.3; e, C.68.T3.2; f, CDE.73.Surf.1; g, BI.67; h, unknown; i, unknown; j, C.69.1.2-3; k, C.68.T7.1; l, C.68.T6.9; m, C.68.T6.9; n, C.68.T1-3.1; o, C.69.T2.Surf.8; p, B.71.20; q, B.73.3.4; r, C.69.1; s, C.68.T1-3.1; t, C.68.T1-3.1; u, C.68.T6.9; v, C.68.T6.9; w, C.68.T4.1.

Yahya Black-on-Red Ware, North Side

Chronology

Period N-VA.4–3	Common
Period N-VA.2–1	Very common

The north side of the mound, with four major architectural levels containing Black-on-Red Ware, provides a much more complete corpus of designs and full vessel profiles for this ware than does the south side. Of particular interest are the complete hole-mouth jar (figs. 4.31, 4.32) and complete necked, carinated jar (figs. 4.27, 4.28) found set into the ground in an outside context in N-VA.4, and the small, complete necked jar (fig. 4.30:v) found in Room 1 of the N-VA.1 complex (fig. 6.36).

Only one hole-mouth rim sherd was recovered in south side excavations, and the sample is equally small from the north side: one complete hole-mouth jar from N-VA.4 (noted above) and three hole-mouth rim sherds from N-VA.1. The only new shape on the north side is a ring-base open bowl, represented by only a single base sherd (diameter of 7 cm) from N-VA.1.

Designs from the north side on necked jars, open bowls, and large beakers are generally the same as those found on south side Black-on-Red Ware. The only noteworthy new designs are eight-sided stars and two unusually shaped geometric crosses (fig. 4.30:z,aa). The analysis of the north side chevron-painted beakers brought to light two interesting facts about the use of chevron designs. First, multiple chevron patterns, common in VA.2 on the south side, are rare in the north side assemblage. Fewer than 20 such sherds were found, all from N-VA.4 or N-VA.3. In N-VA.2 and N-VA.1 multiple chevrons are not found at all and only short chevrons are used. This is approximately the same situation as is found in VA.1 on the south side, and it confirms the usefulness of short versus multiple chevrons as a chronological indicator. The second interesting fact is the correlation between discontinuous short chevron designs (rims where there are gaps several centimeters wide in the row of chevrons encircling the beaker) and the size of the beaker. Discontinuous short chevron patterns are found only on the larger beakers (fig. 4.33:d), those with rim diameters of 11 cm or more.

North side beaker bases usually are decorated with only a single, painted base line; only three examples of beakers with painted geometric designs starting just above the base were recovered from the north side.

A most curious phenomenon occurs with the necked jars of Black-on-Red Ware in N-VA.1, a phenomenon that is limited exclusively to this last phase of N-VA and that does not appear at all on the south side. Typical Black-on-Red necked jars continue in N-VA.1, but alongside them appear a large number of Black-on-Red necked jars that are slightly but consistently different. This new variety has a buff or buff-tan fabric and surface color, over which a dark red or brownish red wash is applied on the jar exterior and the interior lip of the jar neck, so that the jars look like regular Black-on-Red necked jars. Indeed, the general design repertoire for the two varieties is the same. But this new dark red wash over buff paste variety can easily be distinguished by the telltale line around the interior of the jar neck where the applied wash stops. There are other features, too, that distinguish this new variety. Typical Black-on-Red Ware necked jars almost always have rounded rims, with the painted rim line extending onto the interior lip of the neck (fig. 42:b), whereas the red-washed variety almost always has flattened rims, with the painted rim line not extending onto the interior lip of the neck at all. Although no exact sherd counts were kept for these two varieties of necked jars, they seem to be present in approximately equal numbers.

Interestingly enough, the necked jar (fig. 4.30:v) found in Room 1 of the N-VA.1 complex is of the red-washed variety. The existence of these two varieties in the same level could be explained in several different ways. Possibly the red-washed variety is an import competing with locally made Black-on-Red Ware. A second possibility is that there were two local production sites for necked jars, one making them in the traditional manner and the second imitating the traditional forms but using slightly different techniques for forming and painting the vessels and a different paste and/or firing temperature, and then compensating by applying a red wash. The third (and most likely) possibility is that the two varieties represent a shift in production techniques during N-VA.1, so that the differences could be seen as chronological. Thus, the red-washed jar on the floor of Room 1 would represent the very end or abandonment of N-VA.1, after the changeover to the new red-washed variety. The presence in N-VA.1 of red-washed Plain Coarse Ware sherds indicates that these new production techniques are not limited to Black-on-Red Ware. Finally, the fact that this new, late N-VA.1 variety does not appear on the south side implies that the N-VA.1 occupation on the north side continues slightly longer than that of VA.1 on the south side. This small but significant shift at the end of N-VA.1 presages a general shift back to and preference for Black-on-Buff ceramics in Period IVC.

Potter's Marks on Black-on-Red Ware Beakers, North Side

The north side provides a much richer corpus of potter's marks than does the south side (fig. 4.37). Forty-three different bases were found to have potter's marks on them, for a total of 68 potter's marks from both sides of the mound. Unfortunately, many of the marks are partially worn away, so it is unclear exactly how many different signs are represented. If there is anything that stands out about the collection of north side potter's marks, it is their diversity, both overall and within single strata. As on the south side, the most commonly repeated mark (at least six examples) is a pair of parallel lines, found either at the center of the base or along the edge. The second most common marks are the "V" (at least four examples) and the "X" (three examples). Perhaps most significant is the almost total lack of repetition of individual signs around or within the well-

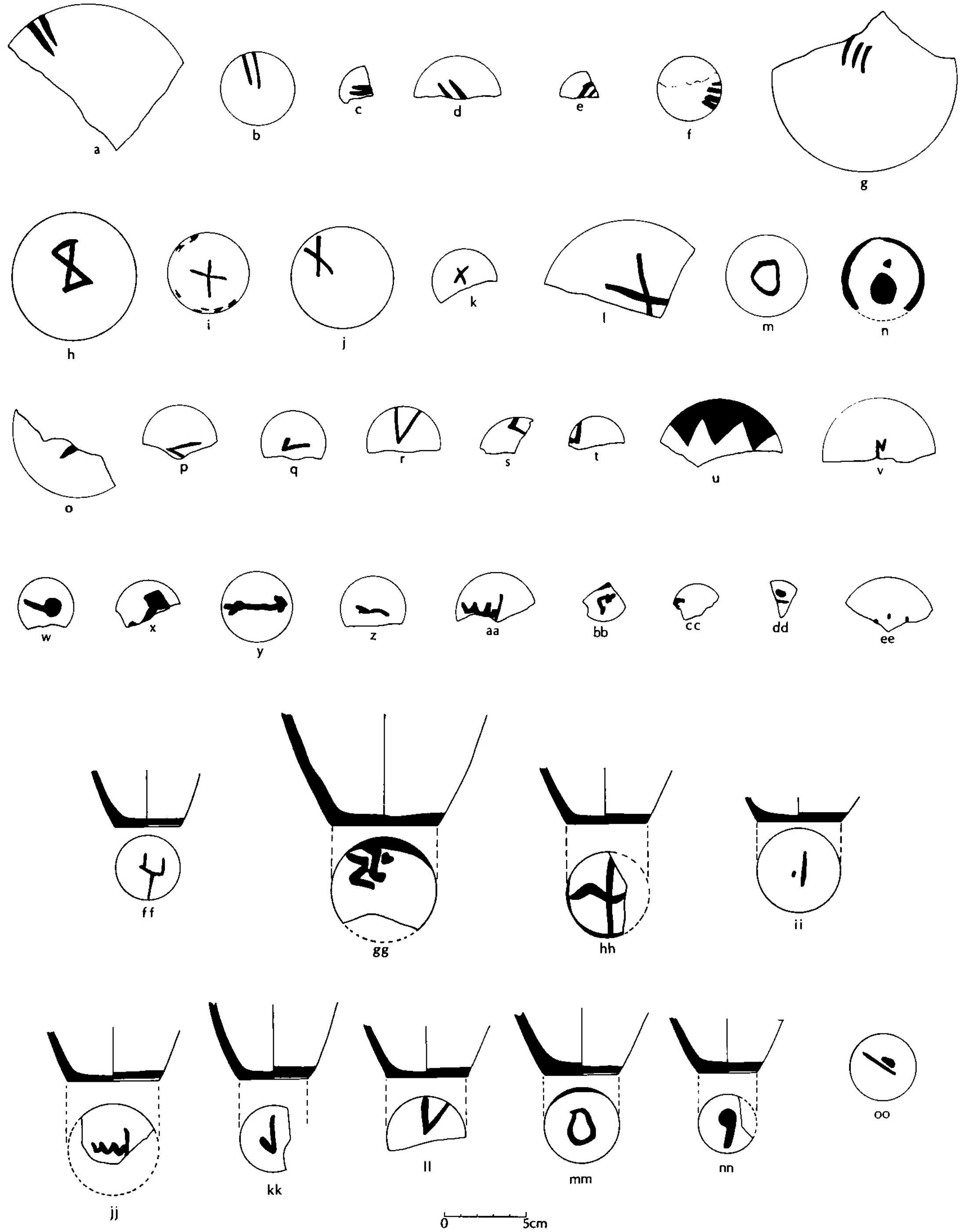


Figure 4.37. Potter's Marks, Black-on-Red Ware, north side. Proveniences: a, XCE.71.14C.42; b, XC.71.T1.6; c, XCE.73.T1.2; d, XCE.73.South Balk; e, XCE.71.14A.30; f, XC.71.T1.5; g, XC.71.T1.5; h, XCE.73.T2.3; i, XCE.73.T1.5.27; j, XCE.73.T1.2; k, XCE.73.1.6; l, XBE, 73.T5.3; m, XCE.73.T2.4A; n, XC.71.T1.5; o, XCE.71.15.42; p, XB.71.T1.9C; q, XCE.73.5; r, XCE.73.5; s, XCE.71.T2.14B; t, XCE.73.T1.2; u, XC.70.T2.2D/2D-1; v, XC.71.North Balk.6; w, XCE.73.T2.11; x, XCE.73.T1.2; y, XCE.71.14&14A; z, XC.70.T2.6-1; aa, XCE.73.T2.6; bb, XCE.73.T1.2; cc, XCE.73.T1.2; dd, XC.71.T2.6; ee, XCE.73.T2.6; ff, XCE.73.T1.2; gg, XCE.73.T1.4A; hh, XCE.73.T1.4A; ii, XCE.73.T1.4A; jj, XCE.73.T2.6; kk, XCE.73.5; ll, XCE.73.5; mm, XCE.73.T2.4A; nn, XCE.73.T2.11; oo, XCE.73.T1.2.

isolated domestic complexes of N-VA.2 and N-VA.1. If the marks are identifying marks for families, then one would expect a great deal of repetition of signs on beakers in and around individual domestic complexes. But this is not the case here. In N-VA.2, nine of the ten marked beakers bases from good contexts have different marks. Only the pair of parallel lines is repeated. In N-VA.1 there appear to be as many different signs as there are marked bases, and inside Room 1 of N-VA.1 three different marks were found on three different bases. Thus, while the marks still could be seen as ownership marks for individuals, it seems highly unlikely that a given mark could have been the identifying mark for the whole family unit.

When one compares the north side corpus with the south side, only the simplest marks recur on both parts of the site: pairs of parallel lines, "V" marks, and a simple circle. In the end, the most plausible explanation for the Period VA beaker marks is that they were identifying marks of individual ownership. But in what context they were needed and used as identifying marks is still unclear. Both contexts suggested in the discussion of the south side potter's marks seem possible: they could have been kiln marks to identify the owner of a particular stack of beakers placed in a communal kiln for firing, or they could have been intended as identifying marks for beakers during their use-life so that certain individuals in the community could distinguish their own beakers from large numbers of other identical-looking beakers within the community or even within their own family compounds.

PLAIN COARSE WARE

Plain Coarse Ware (fig. 4.38) is a handmade, unpainted red coarse ware that is distinguished by the scrape and/or drag marks almost always found on the exterior surface of the vessels. The scrape marks probably were made by a tool used in forming these vessels, and the drag marks probably are the result of wet smoothing the vessels with a coarse material. Plain Coarse Ware is a coarser, unpainted version of the Black-on-Red Ware just described. The only attributes that distinguish Plain Coarse Ware from Black-on-Red Ware are an absence of painted designs and more pronounced drag marks. Some of the Plain Coarse Ware Bases may, in fact, be the bases for Black-on-Red Ware vessels that were painted only on their upper bodies and lacked a painted base line. The only other significant difference between the two wares is that the Plain Coarse Ware vessels tend to be larger on average than those of Black-on-Red Ware. Plain Coarse Ware is common at Yahya in Periods VA.2 and VA.1.

Paste and temper in Plain Coarse Ware are essentially the same as that described for the Yahya Black-on-Red Ware. In most cases the small amounts of vegetal tempering are scarcely visible to the naked eye. Paste color, too, has the same range as the Black-on-Red Ware.

As with Black-on-Red Ware, Plain Coarse Ware is wet smoothed with a material or tool that leaves parallel striations on the vessel surfaces. These drag marks are deepest and most pronounced on the lower exterior surface of a vessel, where they almost always run diagonally down from left to right. In addition to drag marks one occasionally finds "chatter" marks on the exterior surfaces of vessels. These are short, parallel, fairly equally spaced incised lines that probably are the result of smoothing the vessel surface when it was already leather hard, so that the smoothing tool slipped in a staccato-like fashion as it was pushed across the vessel surface. Scrape marks, too, are fairly common, showing up as vertical strips where the curved exterior vessel surface has been flattened slightly with a hard object, perhaps a paddle used in forming the vessel. Also very common is the scraping of the outside edge of rims, which gives the rim profiles a slightly beveled appearance. Drilled holes occasionally are found on body sherds, but their function is not clear (see the description of the north side Plain Coarse Ware that follows). Surface color varies widely from vessel to vessel, ranging from orange-red to a dark brownish red (5 YR 6/4 to 2.5 YR 6/6). In some cases the dark brownish red exterior surface color was achieved by adding a wash.

Shapes

Because so few profiles were recovered, it is difficult to give a detailed description of the range of shapes to be found in Plain Coarse Ware. All bases are flat, and usually fairly steep-sided. Rims show four basic shapes: hole-mouth jars (fig. 4.38:g), necked jars (fig. 4.38:c,f), straight-sided large beakers, and open bowls. Thus, all major vessel foms of Black-on-Red Ware are also represented in Plain Coarse Ware. The rims of hole-mouth jars are in every case flattened by scraping. Likewise, the straight-sided large beaker forms (fig. 4.38:b) have rims that are usually scraped at an angle along the outside rim edge to give the rim profile a slightly beveled appearance. These large beakers appear to be larger versions of the chevron-painted or geometric-painted beakers of the Black-on-Red Ware. No measurable rim diameter was less than 30 cm. The open bowl rims show considerable variety. The most common open bowl form has a very thin, nonscraped rim and a thin upper body (fig. 4.38:e). A few of the thin bowl rims had outwardly rolled rims (four examples), and two other thin rim examples had scrape marks along the outside rim edge. Very thick bowl rims (usually more than 0.5 cm thick just below the rim), either rounded or slightly flattened at the rim by scraping, were found in small numbers (five examples; fig. 4.38:j). Finally, three simple loop handles, possibly attached to necked jars (as in fig. 4.30:b), also were recovered (fig. 4.38:d).

Chronology

Period VB	Very rare (1 sherd)
Period VA.2	Common
Period VA.1	Very common

No clearcut distinctions could be made between the VA.2 shapes and the VA.1 shapes, except that all four examples of the thin, outwardly rolled bowl rims come from VA.1 levels, and none come from VA.2.

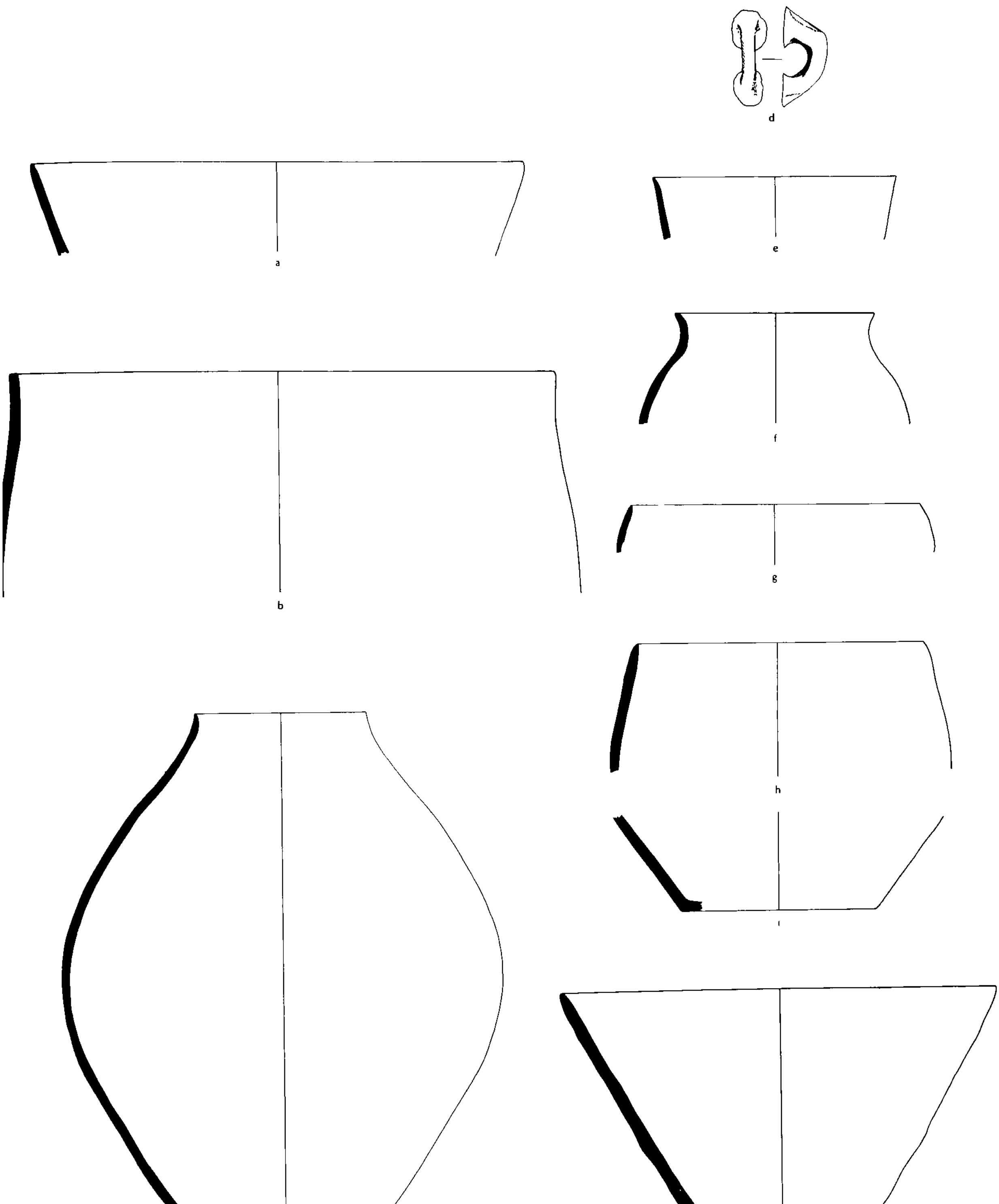


Figure 4.38. Plain Coarse Ware, Period VA.2–VA.1. Proveniences: a, B.73.2A; b, XCE.73.T1.4B; c, XCE.73.T2.3A; d, C.68.T5.2; e, XCE.73.T1.4B; f, C.69.T2.3; g, B.73.2; h, B.73.2A; i, XCE.73.T1.4B; j, XCE.71.14.34.

Plain Coarse Ware, North Side

Chronology

Period N-VA.4–3	Common
Period N-VA.2–1	Very common

All vessel shapes found on the south side—hole-mouth jars, necked jars, straight-sided large beakers, and open bowls—also are present in the north side assemblage. Thus, all four of the major vessel forms common to Black-on-Red Ware are clearly represented in Plain Coarse Ware as well.

Many of the north side Plain Coarse Ware sherds have one or more holes drilled through them. Since in several examples the hole is not near any line of breakage or there are two holes with no crack between them, it is evident that these holes in most cases were not serving as repair holes. But what other function or functions they may have had remains an enigma. The holes appear on every part of vessels, from near the rim to on or near the base. On one base sherd from an open bowl five different holes had been drilled, all clustered on or near the base as if to turn the bowl into a sieve.

The necked globular jar rim from N-VA.2–1 provides an insight into surface treatment of Plain Coarse Ware (fig. 4.38:c). It is often difficult to determine whether the darker surface color of Plain Coarse Ware is due to the firing process or to the application of an actual wash. This jar rim clearly shows the application of a wash, for there is a distinct, if irregular, line visible on the interior lip of the rim that shows where the wash ends. Thus, it is clear that by N-VA.1, at least, washes occasionally were being applied to Plain Coarse Ware vessels.

BLACK-ON-SMOOTH BUFF WARE

Black-on-Smooth Buff Ware (figs. 4.39, 4.40) is a handmade, fine buff ware decorated with both rectilinear and curvilinear geometric designs. Designs are painted in black on either the inner or outer surface, depending on the vessel shape. In one example both interior and exterior surfaces are painted. Although several of the rectilinear designs of Black-on-Buff also are found in Black-on-Smooth Buff, there are several attributes that serve to distinguish these two wares. First, the surfaces of Black-on-Smooth Buff Ware, particularly exterior surfaces, have been rubbed and smoothed in a way that leaves a surface texture that is much smoother and creamier to the touch. While this surface treatment might be interpreted as a form of burnishing, it does not produce any obvious surface luster. A second distinctive attribute of Black-on-Smooth Buff Ware is the treatment of its rims: in contrast to Black-on-Buff Ware, almost all the rims are wide and squared in profile, with painted rim lines that extend onto both the interior and exterior lips of the vessels. Finally, curvilinear designs are common on Black-on-Smooth Buff, whereas they were nonexistent in Black-on-Buff Ware. Black-on-Smooth Buff Ware is found in very small quantities at Yahya in Periods VA.2 and VA.1. This ware is one of the few that continues in use on the site into Period IVC, where it still represents a relatively rare type but definitely is more common than in VA.1.

The paste consists of finely levigated clay varying in color from buff to pinkish buff (7.5 YR 7/6 to 2.5 YR 6/8). Occasionally one finds sherds with a darker, less oxidized core, particularly sherds that are more then 0.5 cm thick. In many of the sherds there is either no visible tempering material or very small amounts of fine vegetal matter that have burned out in firing, leaving holes usually less than 0.5 mm in diameter. One of the Black-on-Smooth Buff sherds was analyzed by Diana Kamilli (Kamilli and Lamberg-Karlovsky 1979:sample 7). The paste of this sherd contained quartz, untwinned feldspar, abundant biotite, traces of calcic plagioclase, and chert. Pyroxene and sherd fragments were absent. The mineralogy closely resembles that of the Period VB Black-on-Buff Ware, so that this sherd, Kamilli concludes, could have been made locally.

Vessel surfaces are wet smoothed. Drag marks are most visible on vessel interiors. As noted above, surfaces appear to have been carefully rubbed to produce a very smooth, creamy surface texture, although there is no real surface luster. Surface color is variable, ranging from buff to pinkish buff (7.5 YR 8/4 to 5 YR 7/4). Designs are painted with dark brown or black paint that appears somewhat fugitive and tends to smudge, resulting in designs with slightly blurred edges.

Shapes

Only one full profile was recovered. Included in this very small sherd sample are large, interior-painted open bowls (fig. 4.39:e); exterior-painted carinated bowls; and large, straight-sided, exterior-painted necked jars with globular bodies (fig. 4.39:a–d,f–k). Vessels made in Black-on-Smooth Buff Ware appear to have been relatively large on average, and body and rim sherds are often more than 0.5 cm thick. Nine out of the 11 rims recovered have thick, squared rim profiles.

Designs

Old design elements common to Black-on-Buff Ware also appear in Black-on-Smooth Buff—for instance, cross-hatched lozenges and squares (fig. 4.39:j). But now curvilinear design elements become common as well (fig. 4.39:c,e,g,i,k). This is a significant development, since curvilinear design elements are very rare or nonexistent in the other painted wares of Yahya Periods V and VI. Black-on-Smooth Buff curvilinear motifs include wavy lines (fig. 4.39:c,g,k), meandering ladders (fig. 4.39:e), and triangles and trapezoids (usually just beneath the rim) with drooping, concave sides (fig. 4.39:e). On open bowl forms designs are found on the vessel interior; on jar or beaker forms they are found on the exteriors of the vessels. One bowl rim has painted designs on both the interior and exterior. Wide, painted rim lines are used on all vessel forms and almost always extend at least 0.5 cm onto both the interior and exterior lips of the vessels.

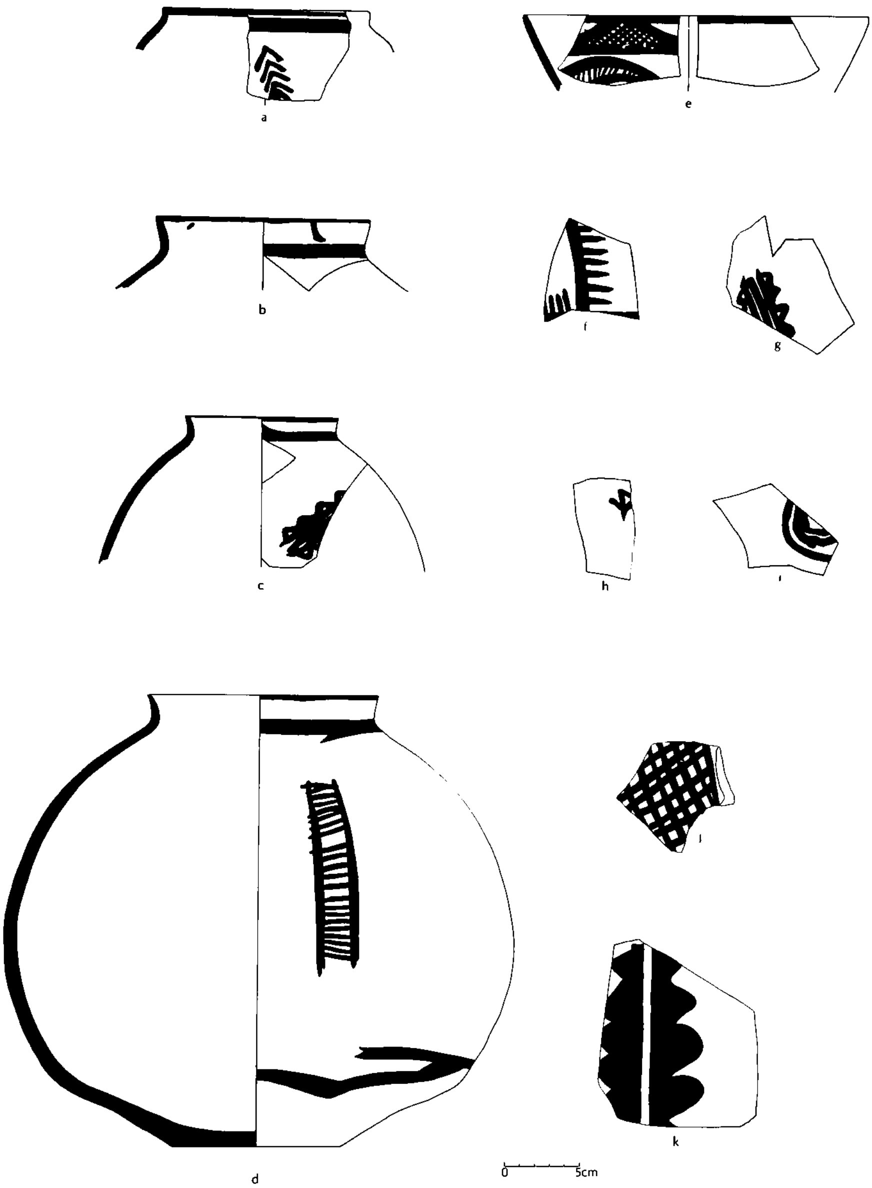


Figure 4.39. Black-on-Smooth Buff Ware, Period N-VA.2–VA.1. Proveniences: a, XCE.73.T2.3; b, XCE.73.T1.5; c, XCE.73.4A.23; d, XCE.73.T1.4A; e, B.73.4; f, XCE.73.T1.2; g, XCE.73.4A; h, XCE.73.T1.4B; i, XCE.71.T2.14B; j, XCE.71.14&14A; k, XCE.73.T2.5.

Chronology

Period VIA	Very rare (1 sherd)
Period VA.2	Rare
Period VA.1	Rare
Period IVC	Rare

In so small a sample (a total of less than 30 sherds), it was impossible to discern any differences in shape or design between Periods VA.2 and VA.1.

Black-on-Smooth Buff Ware, North Side

Chronology

Period N-VA.3	Rare
Period N-VA.2	Rare
Period N-VA.1	Rare

Black-on-Smooth Buff Ware is almost as rare in N-VA levels on the mound's north side as it was on the south side.

Fewer than 50 sherds of this ware, and no full vessel profiles, were recovered from N-VA.3–1 levels. Several bases, however, were recovered and serve to amplify our knowledge of Black-on-Smooth Buff vessel forms. These include an unpainted ring base (7 cm diameter) belonging to an open bowl form and several flat bases belonging to necked jars and perhaps carinated bowl forms. No new shapes other than those noted for the south side were found. New designs found on north side sherds include a series of three concentric circles (fig. 4.39:i), a ladder design (fig. 4.39:d), and a curious curvilinear free-form design on a body sherd (fig. 4.39:h). Several of the necked jar sherds have an exterior buff slip added.

BICHROME SMOOTH BUFF WARE

Chronology

Period N-VA.2	2 sherds
Period N-VA.1	8 sherds

This extremely rare bichrome variety of Smooth Buff Ware (fig. 4.40) is found only on the north side of the mound. Since eight of the ten sherds come from N-VA.1, it could be argued that this bichrome ware appears only at the very end of the N-VA occupation. The paste and surface treatment are the same as for Black-on-Smooth Buff Ware, and the geometric designs are quite similar. The difference is that over the black painted designs a fugitive red wash has been added. In some cases the red wash has been applied over the whole design; in other cases it has been applied more carefully as infilling within certain parts of the design. The six rim sherds recovered are all flattened along the rim; one is from a necked jar, and the others are from carinated open bowls or large beakers.

BLACK-ON-FINE ORANGE WARE

Black-on-Fine Orange Ware (fig. 4.41) is notable for being the earliest wheel-made pottery at Yahya. This ware appears at Yahya from Period VB through VA.1. However, it is found in such small quantities that it probably can be considered an import. All sherds recovered appear to come from small globular pot forms with sharply out-turned rims and flat, footed bases.

Vessels are made from finely levigated clay tempered with small amounts of finely crushed vegetal matter scarcely visible to the naked eye. Paste color ranges from tan to orange-tan (5 YR 6/6 to 2.5 YR 5/8).

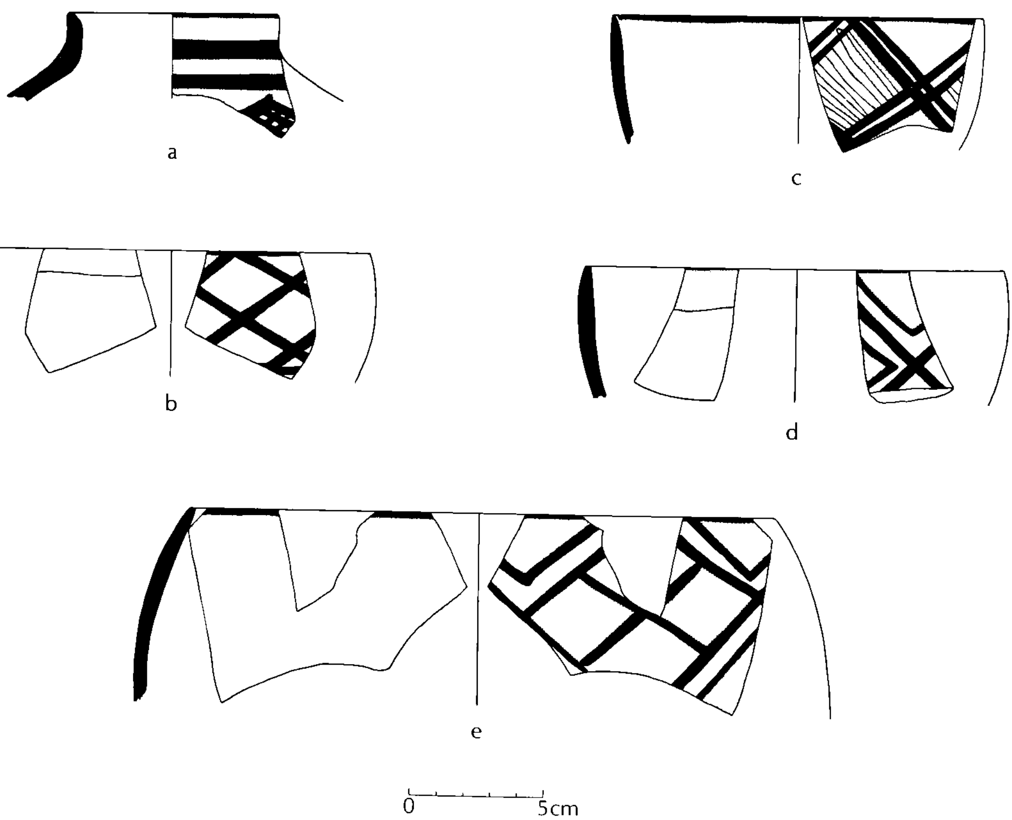


Figure 4.40. Bichrome Smooth Buff Ware, Period N-VA.1. Proveniences: a, XCE.71.14A.38; b, XC.70.T2.7&7-1; c, XCE.71.14C.41; d, XC.70.T2.7&7-1; e, XCE.71.T2.14B. Shaded areas = red paint; black = black paint.

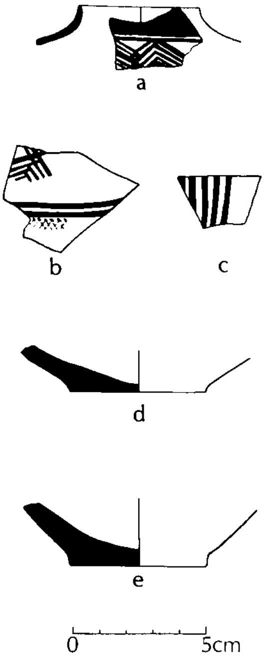


Figure 4.41. Black-on-Fine Orange Ware, Periods VB–VA.1. Proveniences: a, XC.71.T2.2B; b, XCE.71.14C&15.47; c, XCE.73.T1.4A; d, B.71.21; e, B.73.3.

Vessels are wet smoothed while on a wheel. This process leaves fine, horizontal, parallel drag marks from base to rim. A red wash (5 YR 6/6 to 10 R 5/6), often fugitive, always is applied to vessel interiors and exteriors, over which geometric designs in black or purple-black paint are added. The painted designs, too, tend to be fugitive and on many sherds are partially worn away.

Shapes

Although full profiles are lacking, all rim, body, and base sherds appear to come from a single type of shape: small globular pots with sharply out-turned rims and flat, footed bases.

Designs

The design repertoire is as limited and uniform as are the vessel shapes. Vessels are painted only on their upper bodies. In almost every case where the painted design has survived, it consists of the same patterns: one or more horizontal panels of running zigzags on the pot exterior starting beneath the carination of the out-turned rim, with a painted rim line that extends at least 0.2 cm onto the interior lip of the pot. The one exception is a body sherd from VA.2 painted with a series of parallel vertical lines.

Chronology

Period VB	Rare
Period VA.2	Rare
Period VA.1	Rare

The only discernible chronological distinction is that none of the rims recovered from VB has any painted designs on it. Painted designs only begin to be used in VA, and even here some of the rims are still unpainted. Of course, with a total sample of less than 30 sherds, this distinction must be considered highly tentative.

Black-on-Fine Orange Ware, North Side

Only three sherds of this type were found within the north side exposure, all from N-VA.1. One is a body sherd (fig. 4.41:c) with a series of parallel vertical lines painted on the exterior (one sherd with an identical design also was recovered from the south side); the other two are rim sherds (fig. 4.41:a) from small, globular pots (one has a rim diameter of 8 cm). The fact that the sherds all come from the last phase of N-VA implies that this ware may have appeared (probably as an import) very late in the N-VA occupation.

CERAMIC PARALLELS WITH OTHER SITES

The tendency in drawing ceramic parallels with sites other than one's own is to pick out the similar shapes and designs and emphasize the similarities. While this approach may be useful in establishing chronological equivalencies, it gives a distorted sense of the degree of interaction between sites by ignoring the ceramic differences, which are often just as informative and striking as the similarities. In the following discussion, we shall try to compare Yahya's assemblage with the total assemblage at other sites, because it demonstrates just how much regional variation there was in suburban Iran in the fifth and early fourth millennia B.C. in spite of certain intersite similarities.

Tal-i Iblis

Iblis, excavated by Joseph Caldwell in 1964 and 1966 (Caldwell 1967), is the excavated prehistoric site nearest to Tepe Yahya. Located in the Bard Sir valley, the mound of Iblis lies about 180 km north of Yahya (see fig. 2.2). Although the region between the two sites is quite mountainous, there is a major route north from Yahya through the mountains to Kerman that might well have been used in prehistoric times. The overland trip on foot today from Yahya to the Bard Sir valley is said to take about a week.

The overall ceramic assemblage of Iblis Periods 0, I, and II is strikingly similar to that of Yahya Periods VI and V (Caldwell 1967; Sarraf 1981). The following periods have almost identical ceramic assemblages at Iblis and at Yahya:

Yahya	*Iblis*
Period VA.1	Period II/III
Period VA.2	Period I–II
Period VB, VC	Period I
Period VI	Period 0

The following types of wares also have a one-to-one correlation between the two sites:

Yahya	*Iblis*
Lalehzar Coarse Ware	Chaff-Tempered Coarse Ware
Bard Sir Painted Ware	Yahya Black-on-Buff Ware
Bard Sir Red Slipped Ware	Lapui Ware
Iblis Painted Ware	Yahya Black-on-Red Ware

So similar are the Iblis wares to the Yahya wares that virtually every vessel shape and painted motif of Yahya Black-on-Buff Ware, Black-on-Red Ware, Chaff-Tempered Coarse Ware, Plain Coarse Ware, and Lapui Ware also appears at Iblis (cf. Caldwell 1967:117–134,149–154,173, 175,176,209–210). Indeed, it is the few ceramic differences between the two sites that are most noteworthy. Raised designs modeled onto the exterior surfaces of Lalehzar Coarse Ware sherds are not uncommon at Iblis (Caldwell 1967: 120–151), but do not appear at all on the Yahya Chaff-Tempered Coarse Ware. There are interior-painted flat-base (as opposed to ring-base) open bowls at Iblis in the Bard Sir Painted Ware (Caldwell 1967:209), but not in the Yahya Black-on-Buff Ware. In the Iblis Painted Ware, the short chevron motif, so common on Yahya Black-on-Red beakers of VA.1, appears to be totally absent. As with Yahya Black-on-Red beakers, potter's marks are found on the bottoms of Iblis Painted beakers (Caldwell 1967:132,154), but at Iblis the only potter's mark recorded is a simple "X" mark. At Yahya, by contrast, there is an extraordinary variety of marks other than this same "X" mark.

The Soghun Red-Painted Ware and Soghun Bichrome Ware of Yahya Periods VI and VC apparently are not present at all in the Iblis assemblage. However, there is an indication in the Iblis site report that could indicate that Soghun Red-Painted Ware *is* present but was lumped together under the category of Bard Sir Painted Ware. In describing Bard Sir Painted Ware, Caldwell (1967:152) observes that occasionally sherds of this ware are decorated with "a faded or 'fugitive' red." These could in fact be Soghun Red-Painted sherds. What makes this possibility even more likely is the illustration of a sherd under the Bard Sir Painted category whose distinctive design is identical to that found on several Soghun Red-Painted sherds at Yahya. The design (Caldwell 1967:121) is a series of triangles hanging off a rim that lacks a painted rim line. The triangles have the parallel line infilling so diagnostic of the Soghun Red-Painted designs at Yahya.

The Aliabad Painted and Aliabad Bichrome Wares of Iblis IV are not as well defined or isolated in excavation as the earlier wares of Iblis I–II, but they resemble fairly closely Yahya Black-on-Smooth Buff and Bichrome Smooth Buff wares, which begin in VA and continue in larger numbers into IVC, a period equivalent to Iblis IV chronologically. Aliabad Painted (Caldwell 1967:76–77,138–145) is similar to the Yahya Black-on-Smooth Buff in its black paint, buff or pinkish buff paste, open bowl and necked jar forms, and many of its designs (such as wavy lines and concentric circles). Aliabad Bichrome (painted in red and black) is similar to the very rare Yahya Bichrome Smooth Buff Ware found only in the very last levels of VA (N-VA.2–1).

Tal-i Bakun B and Tal-i Gap

Bakun B and Gap are located in the Marv Dasht plain approximately 500 km west of Yahya (see fig. 2.2). Together they represent the nearest excavated prehistoric sites west of Yahya. Overland travel between Yahya and the Marv Dasht plain, if it occurred in prehistoric times, would have been relatively easy and direct, following the northwest-southeast running valleys of the southern Zagros massif.

Period II at Bakun B, the earlier of the two periods as defined by Egami and Masuda, contains only chaff-tempered coarse ware, which is classified as Group B-2 (Egami and Masuda 1962:4–5). As a whole, the Bakun chaff-tempered coarse ware assemblage resembles fairly closely the earliest Chaff-Tempered Coarse Ware of Yahya Period VII. Predominant on both sites in this era before the introduction of painted fine wares are simple bowl forms, both flat and concave bases, and both flattened and rounded rims (Egami and Masuda 1962:fig. 18). Curiously enough, the chaff-tempered coarse ware of Bakun B does not appear to evolve much after the introduction of black-painted fine buff ware (Group B-1) in Bakun B Period I. This is in contrast to Yahya, where beginning in Periods VI and VC flattened rims become very rare and a major new shape—the carinated jar—appears in large numbers. No carinated jars are recorded for Bakun B Period I. In fact, the only close parallel between Bakun B Period I chaff-tempered coarse ware and Period VI and VC Chaff-Tempered Coarse Ware at Yahya is the presence at both sites of rare pedestal bases (Egami and Masuda 1962:fig. 19, no. 36).

Black-painted fine buff ware (Group B-1) first appears at Bakun B in Period I (Egami and Masuda 1962:4–5). Although the shapes are similar to those of Yahya Black-on-Buff Ware—interior-painted ring-base bowls, carinated bowls, and necked jars—most of the designs are different (Egami and Masuda 1962:figs. 13–17). Only crosshatched squares and lozenges appear commonly on both sites. Bakun B has none of the Yahya multiple chevron beakers, and Yahya lacks the variety in geometric and theriomorphic motifs that Bakun B has.

Gap Period I has ceramics similar to, and appears roughly contemporaneous with, Bakun B Period I. Certain shapes of Period I black-painted fine buff ware at Gap—interior-painted ring-base bowls and necked jars—are identical to those at Yahya. But again there are significant differences. Gap Period I has interior-painted flat-base bowls, which are not found at all in Yahya Black-on-Buff Ware; and neither Gap Period I nor II has the chevron-painted beaker form that becomes so common in Yahya Period VB. As for designs, the exterior-painted panels of crosshatched squares and lozenges on the upper third of vessel bodies in Gap Period I (Egami and Sono 1962:figs. 20,21) are virtually identical to those found at Yahya. Other motifs Yahya and Gap Period I have in common include "I" designs, vertical lines hanging off rims, and theriomorphic lozenges-with-legs (Egami and Sono:figs. 20,26,30). But many of the other Gap Period I painted motifs, such as wavy lines, bird friezes, and negative-painted designs, do not appear at all at Yahya. Another distinctive feature of Gap Period I is that vessels always have a very wide, painted rim line that extends onto *both* the interior and exterior lip of the vessels. Rim lines of this type are found only in Yahya Period VC, when Black-on-Buff Ware first appears (as an import from the west?).

To summarize, there is a generic resemblance between the chaff-tempered coarse wares of Yahya and Bakun B Period II, which may indicate nothing more than a common ancestry. The introduction of black-on-buff fine ware in Bakun B Period I, Gap Period I, and Yahya VC may have come within the same two to three hundred year period, with the Yahya VC Black-on-Buff seeming to come at the end of this first fluorescence of Black-on-Buff ware and being totally derivative from what was developing to the west in the Marv Dasht plain. In other words, the Yahya VC Black-on-Buff Ware appears to consist exclusively of imports from the west. This hypothesis is based on the paucity of Black-on-Buff Ware in VC, the mineralogical analysis of a VC Black-on-Buff Ware sherd that indicated nonlocal production (Kamilli and Lamberg-Karlovsky 1979), and the presence on all VC rim sherds of the interior-and-exterior painted rim line so characteristic of Bakun and Gap black-on-buff ware, but not found at all in the following Yahya Period VB. In Period VB at Yahya the Black-on-Buff Ware becomes locally produced, imitating some of the imported designs and vessel shapes from the west, but the overall repertoire of shapes and designs in Yahya VB is much less varied and rich than that of the Bakun and Gap corpus. There also is a divergence in Yahya VB Black-on-Buff Ware from what is found to the west. Chevron-painted beakers, perhaps derived from the east, first appear in Yahya VB, but are not found at all in the Bakun B and Gap I–II assemblages. Indeed, there seems to be very little further contact between Yahya and the west after Period VC, for in the Gap Period II assemblage a new corpus of black-painted designs evolves that is applied over the entire vessel body. Since Gap Period II develops directly out of Period I, it should probably be considered roughly contemporaneous with Yahya VB and VA, and yet none of the Gap Period II developments appear at Yahya, which in VB and VA continues with its rather limited repertoire of geometric motifs while shifting to red wares.

In light of the preceding discussion, one can establish the following rough ceramic synchronisms between Bakun B, Gap, and Yahya:

Yahya	*Gap*	*Bakun B*
Period VII		
Period VI		Period II
Period VC	Period I	Period I
Period VB		
Period VA	Period II	

Other Excavations and Survey Work in the Marv Dasht Plain

The excavated sites of Jari and Mushki (Fukai, Horiuchi, and Matsutani 1973) appear to be earlier for the most part than anything at Yahya, and the very early painted wares at these sites bear no close resemblance to early Yahya painted wares. An excellent synthesis, adjustment, and refinement of the prehistoric Marv Dasht ceramic sequence has been carried out by William Sumner (1972), combining excavated material with his extensive survey material from the area. One of his most useful efforts was to try to fit Lapui Ware (a term we have borrowed to describe the same ware at Yahya) into the Marv Dasht and Fars sequence. Since Lapui Ware is totally absent at Gap and very rare at Bakun A, Sumner concludes that Lapui must enter the sequence somewhat later, after the end of Gap and Bakun A but before his Banesh period (Sumner 1972:59), or in the early to mid-fourth millennium B.C. The evidence from Yahya, where Lapui Ware first becomes relatively common in Period VC (when there are strong parallels to Gap Period I), would suggest either that Lapui Ware does overlap with the painted Bakun and Gap wares or that Lapui Ware appears somewhat later in the Marv Dasht plain than at Yahya. The second interesting fact about Lapui Ware is that at Yahya it goes out of use entirely by VA.1, whereas in the Marv Dasht plain it continues on into the Banesh period in a wider variety of vessel forms than ever appears at Yahya.

Sabz, Djowi, Bendebal, Djaffarabad, and the Behbehan-Zureh Survey

We mention these sites primarily to emphasize the degree to which there are marked regional differences within the painted "Buff Ware" tradition of prehistoric Iran. Sabz lies in the Deh Luran plain of Khuzistan, about 1,200 km west of Yahya (fig. 4). The overall ceramic assemblage from the Sabz through Bayat phases, which are roughly contemporary with Yahya Periods VII–V, is quite different from that of Yahya, both in the range of vessel forms and in the types and placement of painted design motifs (Hole, Flannery, and Neely 1969:113–169). This is what one would expect, since the site is more than twice as far west of Yahya as the Marv Dasht plain.

The same can be said of other more recently excavated sites and surveys in southwestern Iran that overlap chronologically with Yahya Periods VII–V, such as Djowi (Dollfus 1978, 1983a), Bendebal (Dollfus 1978, 1983b), Djaffarabad (Dollfus 1971, 1975, 1978), and the Behbehan-Zureh survey (Dittman 1984). While individual designs can be paralleled, the overall painted design repertoire and range of shapes argues for a quite different ceramic tradition in these more distant areas.

Tepe Sialk

Tepe Sialk is located on the central Iranian plateau about 1,100 km northwest of Yahya (fig. 2.2). Sialk Periods II and III are roughly contemporary with Yahya Periods VII–V. In the Sialk Period II assemblage there are a few parallels in simple design motifs such as the multiple chevron and crosshatched lozenge (Ghirshman 1938:pl. XLIX C, nos. 4, 5) and the triangles with parallel line infilling (Ghirshman 1938:pl. XLVII A,B,C) that are identical to Soghun Red-Painted Ware designs at Yahya. But overall, the ceramics of Sialk II, and also those of Sialk III with their elaborate anthropomorphic and animal designs, are quite different in their range of vessel shapes and designs from what appears at Yahya.

Chah Husaini, Tump-i Surkh, Tepe Nurabad, Tepe Langar, Site Q1

When one looks for ceramic parallels east of Yahya, the obvious problem is that there are no prehistoric sites in this direction that have been excavated. Comparative material comes exclusively from surface collections and small sondages. Chah Husaini, Tump-i Surkh, and Tepe Nurabad are three of the sites discovered by Aurel Stein in the course of his archaeological reconnaissances in southeastern Iran during the 1930s (Stein 1937) (fig. 2.2). Chah Husaini is the most distant of the sites, being about 400 km due east of Yahya. At all three sites were found chevron-painted black-on-red ware sherds identical to those that occur in Yahya Black-on-Red Ware (Stein 1937:pls. XXV, XXIX, XXXIV). Both multiple chevrons and short chevrons appear, and from Chah Husaini Stein recovered a complete chevron-painted beaker indistinguishable from those found in Yahya Period VA (Stein 1937:pl. XXXIV). Notably absent in Stein's assemblages are examples of the geometric-painted Yahya Black-on-Buff Ware of Period VB. It would appear that this black-on-buff ware from the west does not extend at all to the east of Yahya.

Tepe Langar is a site about 180 km north-northeast of Yahya (fig. 2.2). It was discovered by C. C. Lamberg-Karlovsky while on survey in 1967 (Meadow 1968:100). Sherds clearly identifiable as Yahya Chaff-Tempered Coarse Ware, Yahya Black-on-Buff Ware, and Yahya Black-on-Red Ware were recovered from a small sondage on the site. Thus, Langar has very much the same Black-on-Buff Ware/Black-on-Red Ware sequence as Yahya and nearby Iblis.

Site Q1 is a site southeast of Yahya near the Persian Gulf (fig. 2.2). It was discovered by Martha Prickett while on survey in the area in 1970. Although the ceramic assemblage recovered from the site has yet to be examined in detail, it was reported to have painted pottery characteristic of Yahya Period V (personal communication from Prickett to Lamberg-Karlovsky).

Miscellaneous Parallels

Ruth Amiran (1976:61) sees a parallel between the Chaff-Tempered Coarse Ware handles of Yahya Period VII and "churn" handles in Chalcolithic Palestine. However, all the more complete examples of Yahya Chaff-Tempered Coarse Ware handles are attached to what are clearly open bowl forms, so that Amiran's proposed parallel does not appear to be a true one.

Three body sherds of Ubaid-style pottery were found in Period VIA rubble leveling (fig. 4.42). The hard, greenish buff paste and thick, vitreous black paint are unlike anything else at Yahya from this period and are very reminiscent of Ubaid wares from Mesopotamia. A mineralogical analysis of one of the sherds (Kamilli and Lamberg-Karlovsky 1979:sample 1) supports the conclusion that the three sherds were Ubaid imports from the west. The coarse fraction of the sherd analyzed by Kamilli was found to contain quartz, chert, twinned calcic plagioclase, untwinned feldspar, pyroxene, traces of magnetite, volcanic rock fragments, and secondary calcite. The total fusion of the groundmass and the destruction of any fine mica or clay minerals suggest, according to Kamilli, a firing temperature of more than 900°

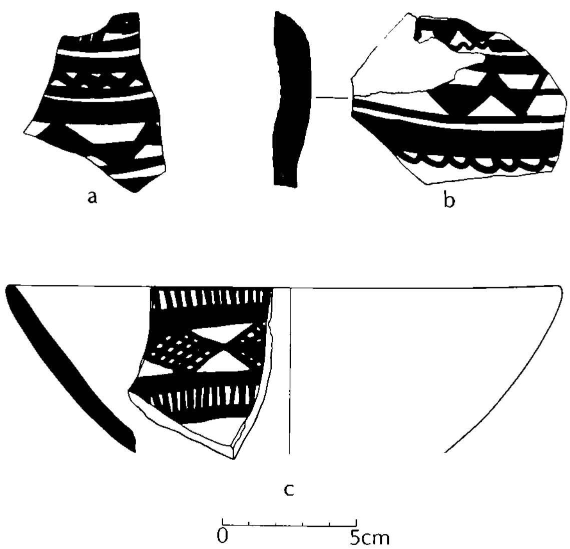


Figure 4.42. Probable (imported) Ubaid sherds, Period VI. Proveniences: a, D.69.4.1; b, D.69.5; c, XCE.73.T2.12.

C. The sherd differed from local Yahya Black-on-Buff and Black-on-Red wares in its high firing temperature, its lack of micas, and in the presence of a coarser and more plentiful coarse fraction. Kamilli concludes that this sherd must have been an import from the west and notes that the sherd's black paint is identical to that on many Ubaid sherds from Al Ubaid and Ur, as well as sites along the Arabian Gulf coast (cf. Oates et al. 1977).

The wheel-made Black-on-Orange Fine Ware found in small quantities in Period VA, if not intrusive from later periods, probably is imported. The VA examples resemble closely the complete globular pots with the same shape and zigzag line frieze found in Yahya Periods IVC and IVB (cf. Lamberg-Karlovsky and Tosi 1973:figs. 107,126). These IVC and IVB examples find close parallels with third millennium painted wares at Bampur, a site about 400 km east of Yahya (de Cardi 1970). Thus, the Black-on-Orange Fine Ware of Period VA probably should be considered an import from the east.

Summary of Ceramic Parallels with Other Sites

Ceramic parallels between Yahya and other sites in Periods VII–V serve as a useful indicator of the shifting direction of influences (as well as contacts and trade?) coming into Yahya over this 1,500-year span of time. In Period VII (the Baghin Period), Yahya has fairly close parallels to the chaff-tempered "soft ware" horizon to the west at sites such as Bakun B. This may indicate that the initial settlement at Yahya was colonized from the west, or it may simply indicate a common ceramic ancestry with sites to the west. In Period VI (the Soghun Period), the three Ubaid sherds demonstrate continued though weak contact with the west. The Soghun Ware of Period VI is an enigma, for it finds no ready parallels except possibly at Sialk. The possibility remains that the painted Soghun Ware of Period VI is a local development out of the unpainted Soghun Ware of Period VII.

At the beginning of Period V (the Yahya Period), new ceramic influences appear from the west in the form of imported Black-on-Buff Ware, and possibly also Lapui Ware. However, the influences appear to be short-lived, for by Period VB Yahya is producing its own imitation of the western Black-on-Buff Ware in more limited repertoire. Already in VB, with the introduction of chevron-painted beakers, the ceramic orientation of Yahya is shifting toward the east, for this type of beaker is not found at all to the west of Yahya. By Period VA, Yahya appears to have become part of a Black-on-Red Ware ceramic sphere extending as far east as Chah Husaini; and ceramic connections with the west, where the Black-on-Buff Ware continues to evolve into the Bakun A assemblage (Langsdorff and McCowan 1942), seem to disappear altogether.

In the end, one is left with a sense of major regional distinctions in the early painted wares of Iran. Northern Iran, southwestern Iran, and southeastern Iran each appear to have their own special repertoire of designs and shapes. It will take many further excavations and surveys to determine whether regional variations are really as clearcut as they seem or whether, when sites in between those discussed here are excavated, there turns out to be a ceramic gradient or continuum that changes gradually as one moves across this part of western Asia. For the moment, given the almost identical ceramic assemblages at sites as far apart as Yahya, Iblis, and Tepe Langar, it can be said that there is a striking amount of ceramic uniformity within this southeastern region of Iran, at least by Yahya Periods VB and VA. And this ceramic homogeneity may in turn represent continuing interaction through trade or other mechanisms between different sites in this region.

Chapter 5

The Production Technology of Earthenware Ceramics, 4900–2800 B.C.

Pamela Vandiver

Ceramics and Glass Laboratory,
Massachusetts Institute of Technology

As part of a more extended study that developed into doctoral dissertation research (Vandiver 1985), a preliminary study of the production technology of Tepe Yahya ceramics was carried out in 1983. The significance of pottery has long been recognized as a symbol of a society's level of cultural attainment, but no studies have attempted to determine the details of the forming technology in the Neolithic of the Near East. Because fired pottery is well preserved (due to its rock-like hardness), pottery technology is, in general, more accessible to analysis than is clay-based architecture, which tends to be heavily weathered, or metal artifacts, which corrode so easily that few remain in the archaeological record. Over 4,000 sherds were examined from Hajji Firuz, Dalma, and Pisdeli in the northern Zagros region; Ganj Dareh, Sarab, and Seh Gabi in the central Zagros; Chogha Sefid, Tepe Sabz, and Tepe Farukhabad in the southern Zagros; and Tepe Yahya on the Iranian plateau. All were found to have a similar shared production technology. In addition, examples of the sequential slab method of construction have been found at Mostegedda and Merimde in Egypt, Jericho in the Levant, and at Mehrgarh in Pakistan. About 800 sherds from Tepe Yahya were examined and analyzed in this preliminary study.

The early pottery from Tepe Yahya consists of thick-walled, porous, vegetal- or chaff-tempered pottery used for such utilitarian purposes as storing foodstuffs, cooking, and food preparation. This pottery has been described as the "Soft Ware Horizon" by Dyson (1966:217). In appearance the soft ware is similar to the well-known Hassuna vegetal-tempered, earthenware pottery. The early coarse wares are found later with assemblages of first vegetal-tempered and later grit-tempered fine wares, both of which were made using the same methods of production as the earlier coarse wares. These pottery vessels were not coiled or thrown; instead, they were made by a conservative hand-building technology we have called "sequential slab construction," which is well suited to the raw materials available at each of the above-named sites and for which contemporary ethnographic evidence exists.

Sequential slab construction is the building of vessels by stacking slabs of clay on top of one another. Larger slabs are used at the bases of pots, smaller slabs for the bodies, and even smaller elements at the rims of vessels. The slabs are often combined in double- and even triple-wall thicknesses, particularly at and near the vessel base. Slabs were made as preformed elements of nonuniform oval or rectangular shape and joined in butt and bevel joins, and in complex joins of three or more elements. We have described, counted, and measured these joins in fractured and polished sections from rims and bases as well as horizontal and vertical body sections for major fine and coarse ware types at each of the sites studied, as shown for Tepe Yahya coarse wares in figures 5.1 and 5.2. The spatial extent of these preformed elements was established with xeroradiography (described in Vandiver 1985).

By applying the methods of materials science to the study of pottery production and by establishing standards for each of the methods proposed, a narrative description of the development of pottery technology was deduced. Slab construction technology persisted throughout the long period of coarse wares manufacture. Out of this tradition, and coexisting with it, developed the so-called fine wares, with thin walls and shapes better suited to the serving of food than to food preparation or storage. Fine wares have a higher frequency of painted decoration and display a pattern of development in which grit tempers replace the vegetal or chaff temper.

Slab construction methods continued to be used after the development of fine wares. During Period VI (3900–3700 B.C.) the technology evolved to include the use of molding

---

Grateful appreciation is extended to my thesis committee for their help with this work, particularly to W. D. Kingery, C. C. Lamberg-Karlovsky, and M. Roe Smith. I would also like to thank Martha Prickett, Tom Beale, Don Potts, Richard Meadow, and Beryl Noble for their help. I am grateful to Martha Lamberg-Karlovsky for helpful discussions and much encouragement.

Pamela Vandiver is now a research physical scientist at the Conservation Analytical Laboratory, Smithsonian Institution, Washington, D.C.

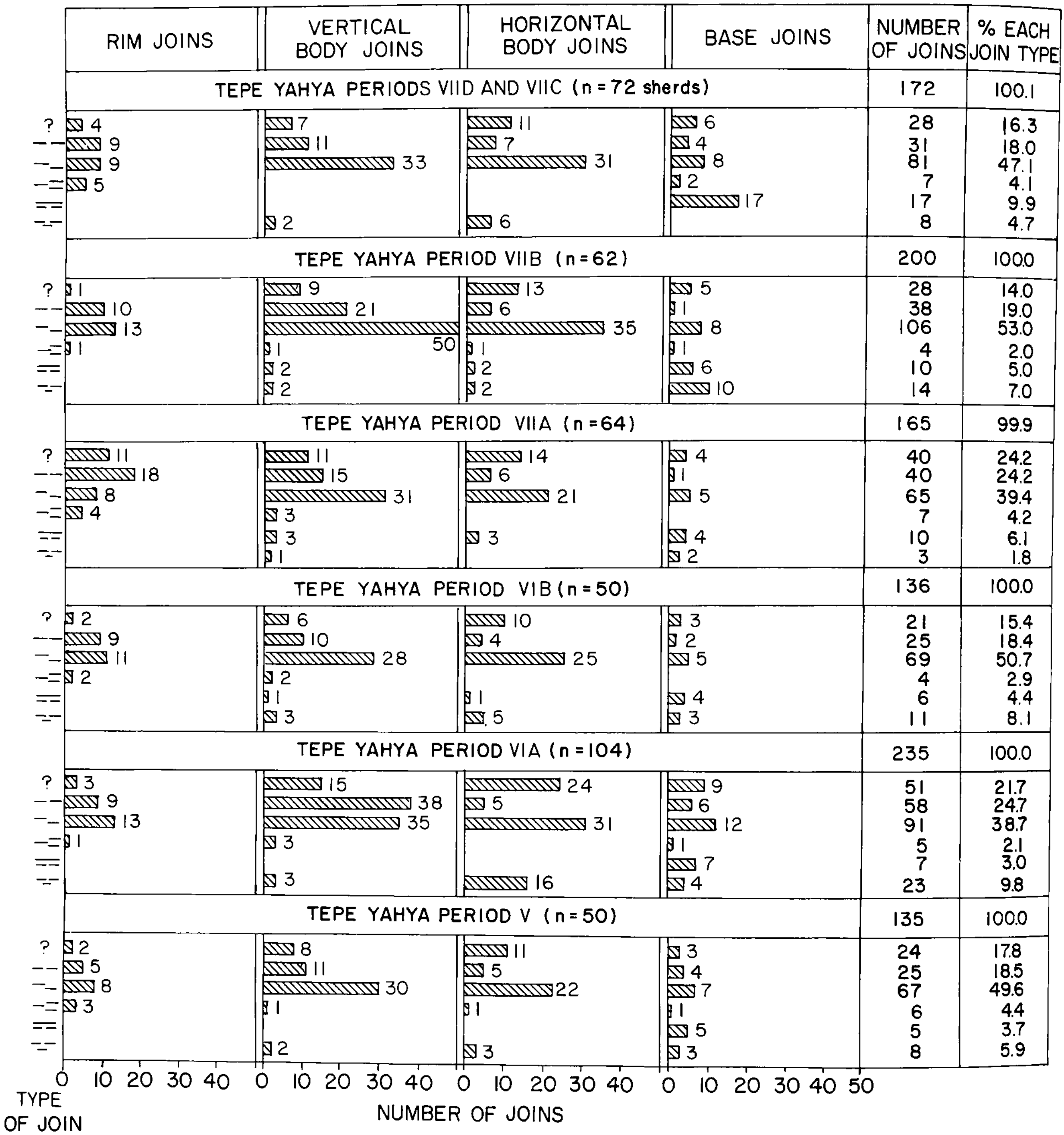


Figure 5.1. The type of join and the frequency of each join type are plotted for Tepe Yahya Chaff-Tempered Coarse Ware sherds by position in the pottery, including joins found in the rim, body in both vertical and horizontal sections, and in the base. The coarse ware was studied from Periods VII to V in six time periods. The types of joins that are schematized on the left and reading from top to bottom include sherds with no visible evidence of joins; butt joins; bevel or lap joins; and three types of complex joins: a single slab joining to a double layer wall; a double wall with a join in one of the thicknesses; and a join with another element covering the join. Butt and bevel joins are about equally present in rim joins. Beveled or worked joins predominate in the body by a factor of 2 to 3 (with one exception) in the vertical body joins, indicating that the pottery was built in sections, and 3 to 6 in the horizontal body joins, where the clay was joined at the same wetness in overlapping joins. Complex joins are more frequent in the three early time periods, while simple and complex joins are about equally present in the three later time periods, indicating that multiple slab wall thicknesses were more common earlier, which is one of the lines of circumstantial evidence for the introduction of a turntable to mold or form bases. The fine wares show the same pattern of joins, thus demonstrating a continuity of forming technology.

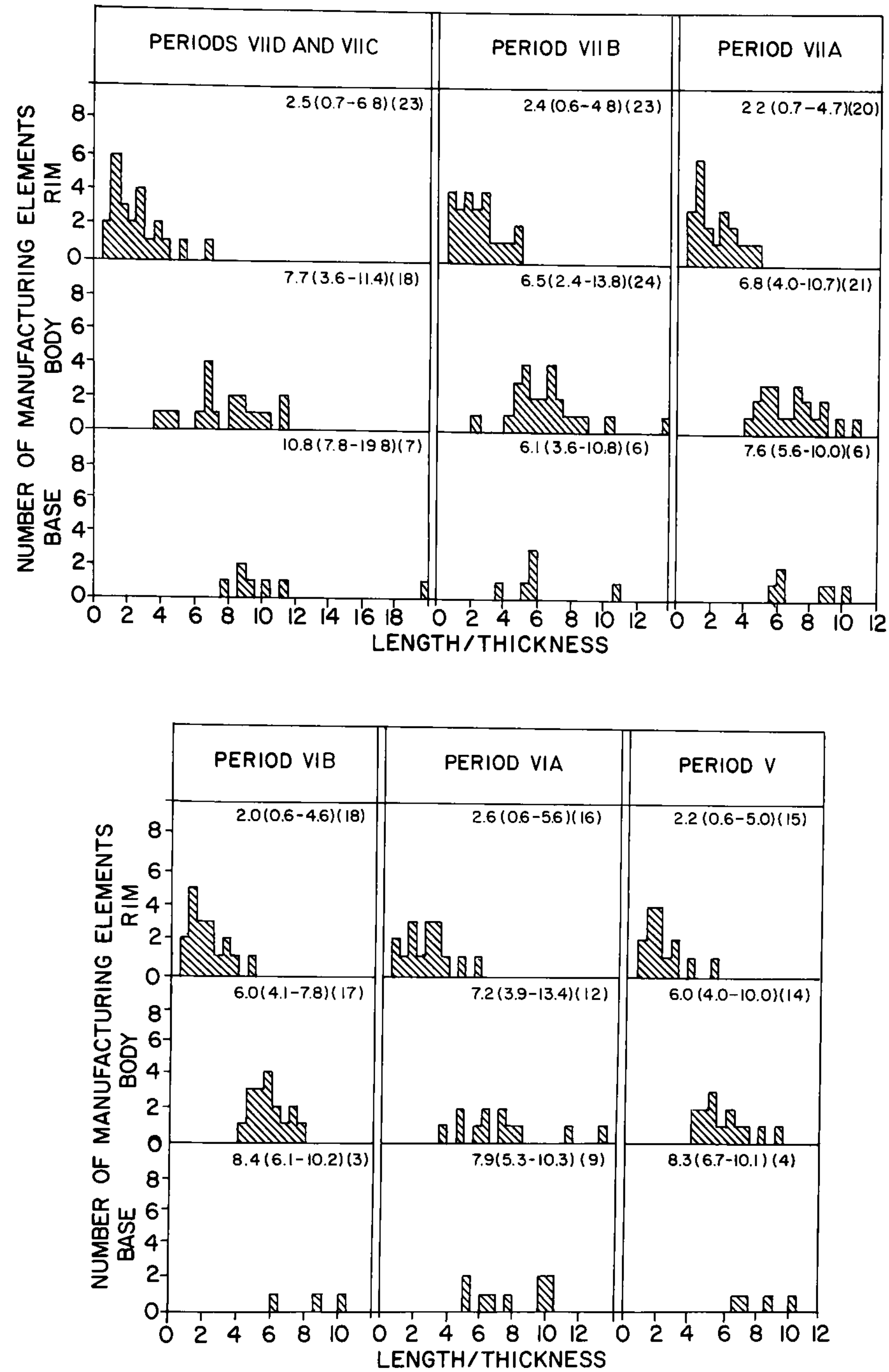


Figure 5.2. The relative size of the manufacturing elements from Chaff-Tempered Coarse Ware at Tepe Yahya is reported by level for rim, body, and base fragments. The ultrasonically cleaned cross sections of sherds were microscopically examined, and the length and width of slabs or preformed elements were measured. The ratio of length to width is reported. The mean, range, and number of samples are reported in the upper right-hand corners for each set of data. Fewer basal sherds were preserved than body and rim sherds; thus, there are fewer than desired measurements for the bases. However, these data show a definite pattern in which the relative size of rim elements is smaller than that of body elements and probably than the base fragments. When the lowest tier of slabs in the wall are grouped with those from the base, this pattern is more pronounced. This same pattern of pottery construction is also found in the fine wares, showing a continuity of forming technology, in which larger slabs are used for the base than in the wall and the smallest preformed elements are used to finish the rim.

to produce thinner walled wares, the use of a turntable for banding of horizontal decoration and for the wet smoothing and forming of rims with a symmetrical shape and fine parallel horizontal striations. During Periods VC and VB (3800–3600 B.C.) further improvements in forming are found: a turntable is used for the shaping of walls still being constructed by the sequential slab method. Near the end of the period of study, about 2800 B.C., new forming methods are added to this repertoire, including wheel throwing and spiral coiling of some of the small beaker and cup forms. However, larger vessels continue to be made in the same way, using sequential slab construction.

This description differs from the view of technological change presented in the archaeological literature, in which the development of pottery is viewed as a technological revolution that occurs in association with urbanism. Instead, pottery production technology is seen as a conservative tradition with a gradual development, in which technological innovation takes place not by trial and error but by analogical reasoning, by modifying what is already being done to serve a new purpose.

This pottery technology is not only more complex than was heretofore believed; it also involves a combination of research methods that previously have not been exploited fully: study of the microstructure and properties of local clays, analysis of replication efforts, and determination of the microstructure and macrostructure of a large sample of pottery vessel fragments from different parts of many different shapes of pottery. Rather than fitting pottery making into a rigid, modern classification scheme, we have endeavored to determine the effects of different sorts of manipulation with the clay bodies, to establish sequences of manufacture for each class of form, and to understand the actions of potters and the constraints of raw materials. This has been not a sorting task, but a tedious reconstruction of the pottery technology. The conclusion that sequential slab construction was used as a production method has not been made before, most likely because archaeologists tend to conceive of pottery in terms of average profile shapes and superimposed decoration. This conception overlooks surface texture and edge fractures, both of which reveal how an earthenware pot was constructed.

METHODS OF INVESTIGATION

The methods of analysis included examination of surface textures and edge fractures for evidence of manufacturing methods, using a hand lens (Bausch and Lomb 10× magnifying loupe) and zoom binocular microscope with the advantage of continuous focusing with increasing magnification (Bausch and Lomb Stereozoom 7–140×). Where accumulated dirt on the surfaces and edge fractures hindered examination, ultrasonic cleaning (½ gallon Brasonic Ultrasonic Cleaner) with water and scrubbing with hard and soft brushes was carried out. Most sherds have a dirt patina embedded in the clay body pores at the surface, which prevents recognition of important structural details. All of the sherds from Tepe Yahya now in the collections of the Peabody Museum, Harvard University, were examined. Individual notes were taken and measurements made on 802 of these sherds. The purpose of this examination was to isolate those surface textures and joins which, when found in several examples, led to the reconstruction of a pattern of manufacture of the vessels.

Optical microscopy was used to detect shape and alignment of temper, pores, and voids left from burned-out organic material, all of which serve as evidence for the extension and joining of the clay body; breaks that have occurred at original joins and are evidence for manufacturing sequence; fineness of the clay matrix, slips, and paints, which provides evidence for the preparation of clays; and texture and faceting of the exterior surfaces, which are evidence of wiping, burnishing, trimming, scraping, and other processes carried out in various stages of drying the unfired clay body. Color and hardness of the body have been observed as indications of the extent of firing and of the relative changes in atmosphere across a single sherd or group of sherds. The extent of firing is indicated also by the ring or thudding sound made by tapping the pot. Porosity is indicated by the length of time it takes a small amount of water placed on the surface to be carried by capillary action into the interior of the sherd cross section.

After the different sorts of joins present in the wall cross sections of sherds were counted for different ware types and the sizes of slabs were measured in the cross sections, other tests were carried out. In order to determine the spatial distribution of the preformed slab elements, a sample of 75 sherds was x-rayed using xeroradiography (Xerox Medical Systems 125) at the Cambridge City Hospital. Xeroradiography enhances the edges of objects and joins, and, as has been shown by Glanzman (1983, 1985) and Johnston (1982), it also shows density gradients and pore and temper alignments within the material.

DISCUSSION

The conclusions reached from this preliminary study are that sequential slab construction was the pottery-forming technology used at Tepe Yahya for a 1,600-year period. Within the framework of this conservative tradition, it has been possible to document the introduction of new methods of manufacture, such as the use of a turntable or tournette (that is, a slowly rotating device used with hand-building methods of wall construction), and of new manufacturing sequences, such as the use of a potter's wheel (or fast wheel, where the motive force to raise the clay wall is provided by centrifugal force) or the introduction of construction by spiral coiling (in which a lump of clay held in the hand is pinched out and joined in a spiral to form a continuous coil). However, the basic reliance on sequential slab construction for most pottery persists throughout the period of study. Thus, sequential slab construction is a conservative, long-lived technology that changes in gradual, incremental steps,

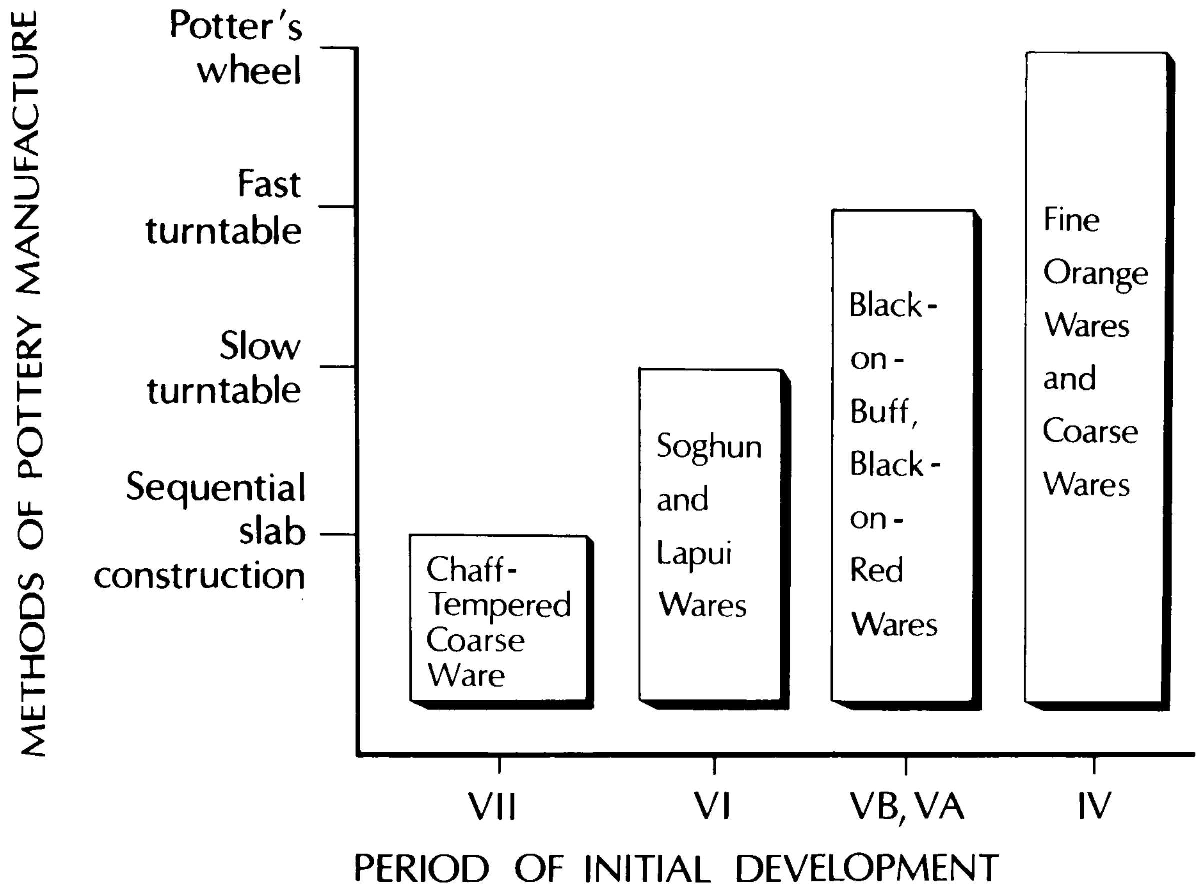


Figure 5.3. Technological change in pottery manufacture at Tepe Yahya. The conservative nature of ceramic technology is shown by the fact that each new method of manufacture is added to the existing repertoire of pottery skills and persists until it is no longer useful for a particular ware type. For instance, sequential slab construction was used for all ware types from Period VII to Period VA. It became one among several methods in Period IV, when throwing was used for some small cups and beakers, and slab construction on a turntable is used for larger wares.

retaining most elements of the technology from the past while incorporating some new elements, but lacking any major or revolutionary changes. The general picture of the ceramic-forming technology that emerges from this study, schematized in figure 5.3, is that early methods of hand-forming Chaff-Tempered Coarse Ware by sequential slab construction are quite complex and that they gradually incorporate some slow-wheel hand-forming methods and then change (for only a small fraction of the ware) to fast-wheel turning. The basic sequential slab construction methods continue with minor changes superimposed on the old ways.

These developments are not well described in the literature. Dyson (1971:217) first described an early "Soft Ware Horizon" in Iran dated to the sixth to fifth millennia B.C. Hole, Flannery, and Neely (1969:9–10, 111–114), in their study of early village sites in central western Iran having a pottery horizon dating to 6000–5600 B.C., chose not to deal in depth with production technology. Their observations, however, foreshadow the conclusions of this study, both with regard to the use of edge fractures to determine forming methods and with regard to the nature of the development of pottery-forming methods (ibid.:111–112):

> Most of the vessels in our sequence were hand-made—or so we infer from the unevenness of their sides, their asymmetry, their lack of complicated profiles, and the presence of rough marks of scraping. None of the pottery shows any evidence of having been coiled. .
>
> The bases appear to have been made as flat slabs, to which nearly-vertical walls were added; often the junctures of wall and base are thick in outline, like a human heel. . Another solution is to make the joint into an oblique angle or carination which is somewhat thicker than the vessel walls, because of the overlapping of the two sections.
>
> The question of the use of the wheel in early periods is still a matter of some debate. . . It seems certain that intermediate stages, such as the use of a slow wheel or tournette . will be very difficult to identify from the signs of the pots themselves. From the Mehmeh phase

onward, however, our sequence includes vessels made with a degree of fineness, uniformity, and precision that is difficult to imagine unless some sort of wheel was in use.

We are not prepared to announce the instant at which the effective wheel was put into use, and in any case we regard our evidence as suggestive rather than definite. One problem is that the break between hand-made and wheel-made pottery is not a temporal one: at one and the same time, the ancient Deh Luran villagers deemed it appropriate to make Khazineh Red and Mehmeh Red-on-red pottery by hand, while they made some Susiana Plain Buff and Susiana Black-on-buff vessels by wheel. [Author's note: This pottery presumably comes from the Mehmeh period of 4500–4000 B.C.; the first two wares are chaff-tempered, and the last two grit-tempered. The wheel described meets criteria for a slow wheel, and we have found evidence that it is earlier than suggested in the above statement.]

Many observations of Chaff-Tempered-Coarse wares describe the rare occurrence of a clearly defined join in the fractured edge of sherds, and there are descriptions of piece-building from slabs (Voigt 1976:414) and a tongue and groove effect (MacDonald 1979:361). The excavation reports from Tal-i Gap and Tal-i Bakun (Egami and Masuda 1962) even show some of the joins drawn into the cross sections of pottery.

The Chaff-Tempered Coarse Ware at Tepe Yahya was formed by sequential slab construction. There is wide variation in the sequence and number of slabs added to form a vessel, as shown in the cross-sectional drawings in figure 5.4. Slabs were made as preformed elements—some as rounded lumps, others elongated—and pressed together in butt joins or overlapped in beveled joins. The early Chaff-Tempered Coarse wares of Periods VII, VI, and V were made from such preformed elements. Occasionally strips, short coils, or wads of clay were used to even the rim, and there are examples of short coils used for handles and ring bases. Overlapping joins were more commonly used during continuous building of a wall, while butt joins generally were used if it was necessary to stop work and allow a vessel to dry partially prior to the adding of more clay for the upper wall. Proof of this lies in the fact that fractures are found more commonly and occur for longer distances at butt than at bevel joins.

An oval tray about 38 cm (15 inches) in length (fig. 5.4:b) was built with three overlying slabs in the base, joined to a wall made of smaller slabs to which was added a coil as a handle. In another example, a jar measuring about 60 cm (2 feet) in height was made in two sections, one built on top of the other: an everted bowl shape for the base and a cylinder shape for the top, as shown in the schematic sketch in figure 5.4:a. Fragments revealing the joins are shown in figure 5.4:c–f. The base was formed of slabs added sequentially: one for the base, one for the wall, and another on the interior (fig. 5.4:c). The upper part (fig. 5.4:a,f) was also formed in slab layers added sequentially as the potter worked around the pot. Near the rim, one slab was added outside the lower one, forming a beveled join. The lower wall of the cylinder was made of a double thickness of slabs. The upper wall is thinner and formed by overlapping one slab on the other in a beveled join. The lip has been smoothed in short strokes, thus offering no evidence for the use of a tournette. A facing coat of slip or very wet clay about 1–5 mm thick has been added to the interior and exterior surfaces of the pot. About 3 centimeters above the join between the cylinder and bowl there are fairly large indentations made in handling the pot. The lower bowl section was formed and allowed partially to dry, then the upper section was built. The join was not scored; scoring would have facilitated addition of wet clay. This type of jar most often breaks at the carination join, indicating that differential shrinkage (caused by building in sections separated by a period of partial drying) contributed to weakening this join. The surface has been burnished in a multidirectional "pattern burnish," although there has been wear and/or weathering in some places. Bowls and jar bases were made in a similar manner, but the profile curve of bowls is convex outward. In rare instances the nearly completed bowl was turned over, and one or more strips were added to the bottom to form a ring base.

The large jar is not round in cross section (fig. 5.4:a,c–f), its rim shape varies from place to place, and it is not symmetrical in profile, yet its overall shape is complex and even daring from a structural point of view. It is difficult to form such a large cylinder on a cantilevered wall. How can we explain this dichotomy between the unsymmetrical shape and refined structural design? It has been suggested that a lack of expertise may be responsible for the unsymmetrical shape, but evidence of the recurring pattern of pottery manufacture we have called sequential slab construction combined with the large size (60 cm tall) and purposeful, but structurally difficult shape, negate any suggestion of a lack of expertise on the part of the potter. The potter apparently believed that this type of pot was successful and well suited to a particular purpose, because there are many instances of this shape, with no indication of any evolution of the form. It is possible that during use the bottom was buried up to the cantilever in order to provide stability. Skill was required to build such a large, weighty cylinder on the multiple-layered, cantilevered bowl. The bowl was probably buttressed or supported during construction of the large cylinder, but there is no evidence of a mold. Another possible explanation for the apparent dichotomy is that we are imposing modern criteria of symmetry in pottery appearance that were not embedded in the tradition of pottery produced at Tepe Yahya and other Zagros region sites. Potters may not have had a mental template that required the ideal pot to be symmetrical in plan and section. The lack of standard sizes for slabs and the organic method of building both reinforce this possibility. Still another possibility is that the appearance of the vessels and the methods used by potters were constrained by raw materials, as will be explored below.

Sequential slab construction is a technology very different

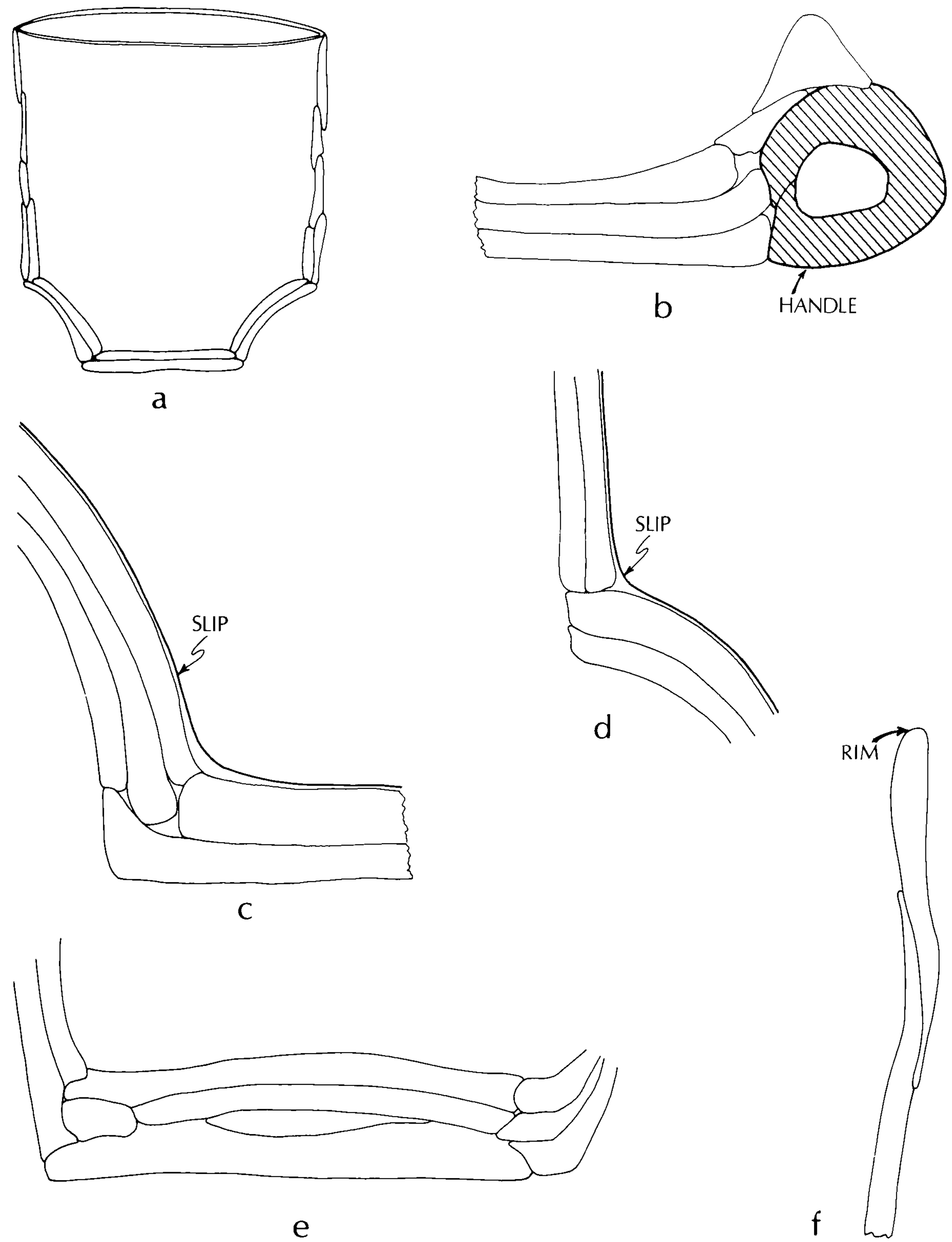


Figure 5.4. Sequential slab construction of Chaff-Tempered Coarse Ware oval tray (b) and carinated storage vessel (a, c–f), showing construction in slabs and the various butt, bevel, and complex joins which indicate the sequence of manufacture. Figure 5.2:a is a schematic reconstruction; figure 5.2:b–f is drawn to scale. Proveniences: a, C.69.7.9 (Period VC); b, D.69.8 (Period VIIB); c, D.69.2 (Period VC); d, D.69.T2.8.1 (Period VIB.2); e, C.71.T4.3 (Period VIB.2); f, C.68.T1.3.3. (Period VA).

from coil construction. Although short coils sometimes are found at rims and (rarely) as reinforcements at joins and for ring bases, they are a minor element of the sequential slab technology. Owen Rye (1971:58–95) described slab building as the overlapping of preformed slabs (regular units formed by pressing or rolling the clay on a flat surface or by flattening the clay between the hands) and joining of them by pressing or smearing—a technique he found well suited to rectangular shapes and to the rapid production of large vessels. Because chaff and straw temper was added to the clay, the Yahya chaff-tempered clay body has only limited plasticity; that is, once the chaff and straw are aligned parallel to the surfaces of the walls, they act to stiffen or prevent further extension of the body during wet forming, just as fibers act to reinforce a modern fiber-reinforced composite.

The limits of the working properties of a heavily chaff- or organic-tempered clay body must be understood. The chaff acts to stiffen the clay, and in extending a lump of clay the chaff aligns with the direction of elongation. In the Tal-i Iblis coarse ware, Matson (Caldwell 1967:150) found poor alignment of the organic burnout (just as we have found) and that "the clay was not further worked or wedged to any great extent, nor were the vessel walls patted and shaped and scraped much." The Tepe Yahya material has well-aligned organic burnout parallel to the wall faces that consists either of pores or voids in the shape of organic material or, in the lowest fired examples, of residual siliceous ash. Viewed in cross section perpendicular to the wall surfaces, the organic burnout is poorly aligned; that is, it is randomly oriented within an individual slab. At the edges of slabs that have been joined together, the chaff tends to fold back on itself. A small amount of extension of the clay body aligns the chaff, but extension of the clay body into a thin coil results in decreased strength because the clay delaminates from the chaff, necks down, and breaks. Thus, sequential slab construction is a method optimized for building with this particular composite clay body. Once we recognize the constraints of raw materials, we recognize that this is not a crude technology, just as vessel shape is not crude. These conclusions add credence to the conjecture that symmetry is a value of the quality of pottery projected from twentieth-century standards.

A preliminary study of the development of clay fabrics, slip, and paint preparation also was made by observing macrostructure and microstructure. Preliminary observations were backed up with the rapid technique of energy-dispersive X-ray analysis on a scanning electron microscope to identify relative differences in elemental compositions. Further study is underway using microprobe analysis. Early production of the chaff-tempered ware at Tepe Yahya involved application of thick slips as facing coats to conceal and strengthen joins. This was a step in manufacture different from the rare application of red ochre as a fugitive pigment painted onto only a part of the pot's surface for possible decoration, demarcation, or other unknown function. At earthenware temperatures and without a suitable flux, the application of red iron oxide (hematite) will not produce a stable red pigment on the earthenware pottery. Only when an earthy hematite (that is, a natural mixture of red iron oxide and clay) or a man-made mixture of red iron oxide and clay was used is there sufficient sintering during firing to promote cohesion and durability. There are rare occurrences of durable colors made with red pigment-slip mixtures in Tepe Yahya Chaff-Tempered Coarse Ware of Period VI. Thus, the pigment-plus-slip technology developed in Period VI.

On Soghun Ware the red slips consist of mixtures of one of several different clays with red iron oxide. These slip-paints frequently crack and peel because of poor fit with the clay body, and the colors are not very durable, indicating poor control of composition, application, and/or firing. The colors and thicknesses are also quite variable. Some Soghun pottery is coated with a whitish-colored slip, either selected from nature for its fine particle size or prepared by the potters (this distinction cannot be made by microscopic examination of the slip). This highly calcareous slip is very thick (about 1 mm) and often peels or breaks away from the body.

Slip coatings on Lapui Ware are more homogeneous in color and thickness and show a greater degree of control. Without any apparent changes in the appearance and gross composition of the chaff-tempered body, the Lapui Ware can be differentiated technologically from the Soghun Ware by the modification and greater degree of control of the slip technology. However, no evidence of potash flux was found that would indicate an innovation in chemical technology. Thus, the change seems to be based on improvements in selection of raw materials and control of processing variables. The Lapui Ware and some of the Soghun buff wares have a distinctive, very fine-particled, cream-colored slip coating that may have been selected as a particularly fine clay or perhaps prepared by levigation. The color of the Lapui slips varies from red to white to a mixture of the two that gives a mottled appearance.

The development of Lapui slips and some of the Soghun slips probably required a considerable amount of experimentation. Further study may demonstrate that slip preparation was a precursor of clay preparation techniques. At the very least, slip preparation attuned potters to the fine distinctions between different sources of raw materials and to the constraints of various raw materials when fired. In the Black-on-Red Ware beakers, in which a grit temper has replaced the chaff temper in the clay body, a potassium oxide flux was found in the black slip-paints, which are a mixture of iron and manganese oxides with clay. No potassium oxide was detected (detection limit of about 1 percent) in the red colors, which are mixtures of red iron oxide and clay.

Sequential slab construction forms the technological basis for the manufacture of later fine wares, as shown in the table below, which represents an attempt to identify changes in ceramic technology. The gradual introduction of a slowly rotated device, a tournette, or turntable, is superimposed on the conservative process of building pottery walls by sequential slab construction. This tournette may have been as simple as a leaf, mat, basket, or stiff piece of hide, or as complicated as an earthenware female mold for the base of the pottery. The development of fine wares involves the elimination of the chaff temper found in Soghun and to a minor extent in Lapui wares and the addition of grit temper, as in the Lapui Black-on-Red Ware. In addition, there is a thinning of the walls and a greater homogeneity in size of slabs and construction of vessels. A concern for symmetry in both plan and elevation, as well as consistency of rim form is found. The decorated wares at Tepe Yahya seem to be fairly small in size and more suited to serving than storage purposes. This change in pottery style may signal a change in diet, eating habits, decorative preferences, social stratification, or any of a number of other variables. The suggestion is offered that a change does occur in the requirement of the market for more vessels suited to the function of serving food. The following are the criteria for indicating the introduction of the tournette: (a) slow turning to smooth and form the lip and to band decoration in horizontal stripes, (b) trimming of the base and lower wall to thin the wall and to control the profile, and (c) at a later time, turning to shape and extend the slab-constructed walls. Each has associated traits in the pottery for which standards have been prepared.

Period	*Summary of the Development of Ceramic Technology*
VII	Sequential slab construction (S.S.C.) of Chaff-Tempered Coarse Ware.
VI–VC	Continuation of Chaff-Tempered Coarse Ware.
	Development of fine grit-tempered ware without chaff temper; use of S.S.C. method to form clay body into thinner walls and avoid cracking from extensive drying shrinkage.
	Development of turntable to form and wipe rims and to band decoration on decorated Soghun and red slipped Lapui wares.
	Development of reddish and whitish clay-based slips to coat surfaces of pottery.
	Limited use of fugitive hematite red pigment fired onto vessels.
	Experimentation to develop a durable, red, iron-containing, clay-based slip for decoration. Finger impressions very common.
VB	Continuation of S.S.C. to build walls.
	Development of a potash-fluxed, stable black pigment-clay slip for decoration.
	Use of turntable to shape S.S.C.-built walls on Black-on-Buff and Black-on-Fine Orange wares.
	Replacement of chaff with grit temper, which means clay was aged.
	Use of hand-held ribs to form bases and walls.
	Few finger impressions found.
	Walls more regular, forming arcs of circles of varying radius when viewed in profile.
	Rib possibly used as a trimming tool.
	Bases and lower walls of bowls and beakers trimmed to achieve a geometric profile and walls as thin as 1.5 mm.
	Possible development of craft specialists or recognized artisans.
	From the skill required to manufacture thin-walled fine wares, from the complexity of the manufacturing process, from the limited variability in numbers of shapes and sizes within a shape type, and from the uniformity of high-temperature firing and atmosphere, reasonable to suggest that the Black-on-Buff wares were made by a limited number of experts, although pottery was probably not their only responsibility.
VA	Continuation of S.S.C. method.
	Possible increase in kiln temperature and change to a more oxidizing firing, as some of the pottery is less porous and rings more when struck, while the fine orange is more porous and lower fired.
IVC	Continuation of S.S.C.
	Use of centrifugal force to form walls of some small cups with string-cut bases, probably thrown off the hump (fast or potter's wheel).
	Use of a hand-held lump of clay pinched out into a spiral coil to form walls of some small cups (spiral coiling).

In examining the Period VA beakers to try to follow the hands of the potters through the sequence of manufacture, one discerns virtually no variation. For instance, bases are ribbed on the inside with five to eight draws of the tool, all set at about the same angle. The walls were initially constructed by S.S.C., usually as a base and two wall sections. Next, the walls were extended with a rib held at a diagonal and the tournette was moved somewhat rapidly. Exterior basal surfaces were trimmed first by vertical scrapings, the facets of which are often visible at the base; then the beakers were scraped at a near horizontal angle. Finally, the surface was wiped with a fine slip. We hypothesize the development of a pottery workshop for the rapid production of large quantities of beakers of various sizes, although we do not consider full-time specialization a feature of such production. Other supportive evidence for the development of specialization comes from the use of painted potter's marks on some of the beakers. In Period VA the first kiln was found at Tepe Yahya, with examples of under- and overfired pottery and fine unfired clay. Both Black-on-Red and Chaff-Tempered Coarse wares were found, possibly indicating that this was a communal kiln which fired various types of ceramic ware.

The change from chaff to grit temper is particularly important because it reveals the conservative nature of the technology. A clay body of low plasticity made from ground clay, cut lengths of grass or chaff, and water, which were mixed at the time of use (similar to formulating a clay body for chineh or brick architecture) was replaced by a fully plastic body made of ground clay, grit, and water, which was allowed to age after mixing so that the fine clay particles would wet through. This change allowed for the manufacture of thin-walled fine wares. Any of the pottery forming techniques is equally likely to be used with the new working properties, yet for another 1,000 years the old sequential slab construction method of manufacture continued to be used at Tepe Yahya. The change in processing and properties of the clay body is incremental, with no attendant change in the forming or firing technology.

In order to fully appreciate the nature of this change, it is necessary to understand the microstructural changes that occurred in the making of this pottery. Raw clays from each site were characterized for their working, drying, and firing properties. These raw clays were identified by differential thermal analysis and found to be montmorillonites, a clay type known to have one of the finest particle sizes of any clay. As the clay dries, films of water between each particle evaporate, causing shrinkage of the pot; the greater the number of water films, the greater the shrinkage. Temper is particularly necessary to decrease this shrinkage in montmorillonites. In addition, a period of aging is essential for the clay to wet through completely. In the hot, dry climate of the Near East, clay is placed deliberately in a shaded or below-ground area for two to three weeks to age.

The remarkable feature of the early Yahya pottery from Periods VII through V is the continuity of mental set and structural sequence required to produce ware made by sequential slab construction while evolving to the more sophisticated use of the tournette. An essentially conservative technology with many similarities to brick, plaster, and fuel cake technologies provides the basis of pottery manufacture and survives for 2,000 years with only gradual, incremental change to slow-turning and trimming technologies. The slip and paint technologies, once established in Period VB, continue as a tradition for almost 1,000 years before fast-wheel manufacture of small cups is found. The forming technology and the decorative pigment technology thus develop separately and, as far as we can determine, in unrelated steps.

CONCLUSIONS

During the earliest Soft Ware Horizon of initial pottery production on the Iranian plateau, the Chaff-Tempered Coarse Ware at Tepe Yahya was formed by a process of sequential slab construction. This same basic method remained a continuing, conservative tradition, used in conjunction with subsequent developments of fine-ware clay preparation and the introduction of new techniques such as the tournette, or slow wheel. It was not abandoned even with the introduction of the fast wheel and spiral coiling around 2800 B.C.

NOTE: SEQUENTIAL SLAB CONSTRUCTION

C. C. Lamberg-Karlovsky,
Department of Anthropology,
Harvard University

Dr. Vandiver has shown that the method of production known as sequential slab construction was a major technique utilized on numerous fifth- and sixth-millennium sites. Analysis of pottery from Hajji Firuz (5600–4900 B.C.), Dalma (4500–4100 B.C.), and Pisdeli (5000 B.C.) in the Zagros of western Azerbaijan, Iran; from Seh Gabi (4500 B.C.), Sarab (6000 B.C.), and Ganj Dareh (6500+ B.C.) in the central Zagros; and from Chogha Sefid, Tepe Sabz, and Tepe Farukhabad in the southern Zagros, has shown that there are similar examples of pottery made by sequential slab construction at each of the above sites (Vandiver 1985). Although publications to date have not recognized the significance of this production technology, there are in the published records numerous hints at its existence. Thus at Tal-i Bakun (Egami and Masuda 1962) the illustrations show joins in the walls that correspond to slab construction, while at Chogha Sefid, Hole (1977:95–96) writes, "some of the Susiana vessels [are] built in sections as their breaking at joints illustrates." More tellingly, Hole, Flannery, and Neely (1969:112) write of the chaff-tempered soft wares of the Deh Luran plain that "the bases appear to have been made on flat slabs, to which nearly-vertical walls were added. . . . Another solution is to make the joint into an oblique angle or carination which is somewhat thicker than the vessel walls, because of the overlapping of the two sections . . . some of them [the joints] show that the potter pinched the clay at the joint to effect a tight bond."

On a recent visit to Mehrgarh, Baluchistan, I had the opportunity to observe at first-hand the chaff-tempered coarse ware of Period II. It seemed clear from this preliminary analysis, particularly in the area of bases and carinations where the tell-tale marks of sequential slab construction are most evident, that this technique of ceramic production is present at Mehrgarh. There are some basket-impressed interior layers in the chaff-tempered coarse ware from Mehrgarh, as reported by J.-F. Jarrige (in press). The relationship between the early molding and slab techniques will be investigated by Vandiver during the 1986 season at Mehrgarh. In addition, Robert Henrickson has documented sequential slab construction in storage vessels of the third millennium B.C. from Seh Gabi.

Years ago, Dyson (1966:217) defined a "Soft Ware Horizon" representing the initial spread of pottery making on the Iranian plateau; apparently its technique of manufacture shared a common technological mode of production. A determination of the degree to which this technological base was shared and of the cultural implications of its very wide distribution await Vandiver's further research.

Chapter 6

The Architecture

Thomas Wight Beale

Peabody Museum, Harvard University

In the following discussion of the architecture of the early periods at Tepe Yahya, a simplified system has been used for numbering features. The intent here is to facilitate the reader's understanding of each plan. The original feature designations used during excavation are too long and complicated for easy reference and can be confusing. Moreover, given the technique of excavation and the method by which features were numbered during excavation, the same feature may have several original feature designations simply because different portions of it were excavated in different trenches or in the same trench in different seasons. In order that the renumbered features can always be related back to the original field notes and small finds loci, a list of the new feature numbers together with their original corresponding excavation feature numbers will be provided at the beginning of the detailed discussion section for each architectural plan.

PERIOD VIID SETTLEMENT

These levels represent the earliest occupation on the site of Tepe Yahya. The horizontal *area of exposure* of Period VIID levels was minimal (approximately 17 m^2), being limited to two small test-trenching operations in the northwest corner of Trench C (figs. 6.1: Features 12–14, Burial 5; 6.2; 6.3). No significant architectural remains were recovered in this small area. Most of the deposition consisted of thick lenses of hard compacted fill with a very low density of sherds, bones, and small finds. These lenses slope fairly steeply down from north to south (fig. 6.2). Apparently in this first phase of occupation on the site the major activity areas and habitational structures lay elsewhere. From the sloping nature of the Period VIID levels, one might hypothesize that the settlement itself lay slightly higher up and farther to the north, under what is now the center of the mound.

How these sloping lenses were laid down and over how long a period remains enigmatic. The hard compacted, uniformly fine-grained soil of these lenses and the low artifact density are not what one would have expected from a gradual buildup of midden and occupational debris on the edge of a living site. An alternate possibility is that these sloping layers represent erosional wash off a higher-lying Period VIID settle[illegible] n have been encountered in trenching operations around the present base of the Yahya mound. Gradual erosion through time from wind and rain have carried soil (much of it probably derived from decayed mud bricks, since these are what make up most of the volume of the mound) with a minimal number of sherds or other artifacts in it down to the base of the mound, while leaving a thick surface cover of heavier sherds and artifacts on the upper slopes of the mound. It is possible that the VIID levels were built up through the same process: not as the accumulation of midden at the edge of a living site, but as more peripheral erosional deposits at the base of a Period VIID mound.

There is, moreover, a strong likelihood that periodic flooding contributed to and indeed accelerated this erosional process. The level of the original land surface on which the Period VIID deposits rest is no higher than that of the surrounding plain today. Since Yahya is situated on the lowest part of the valley floor near the valley's only drainage outlet (fig. 2.3), it is probable that this low-lying location was subject to periodic flash flooding and inundation from rain runoff. Flash flooding is still a problem in many parts of the valley because of the severity of the occasional summer rain storms in the surrounding mountains and the swiftness of the runoff. Before the valley's water table began to be lowered with the introduction of irrigation pumps, the problem of periodic flooding of low-lying areas must have been even worse. Even today, the water table in the immediate vicinity of Yahya is still only 6 m below the surface, and villagers tell of a time before the pumps were introduced when this end of the valley was very marshy.

This process of erosional deposition apparent in the Period VIID levels was interrupted only once, by a phase of indeterminate length during which this small area was occupied and more normal quantities of cultural debris accumulated. This occupational phase occurs near the top of levels C.71.T1.1 and C.70.T5.7 (figs. 6.2, 6.3) and includes a greatly increased density of sherds as well as a human burial, a hearth, and traces of a wall (fig. 6.1). Since these features are not associated with any discernible living surface, they probably represent a rather brief period of use of this area. Unfortunately, since the exposure is so limited and in so peripheral an area, it provides frustratingly little information about what may well have been a sizeable permanent settlement farther to the north during this earliest period.

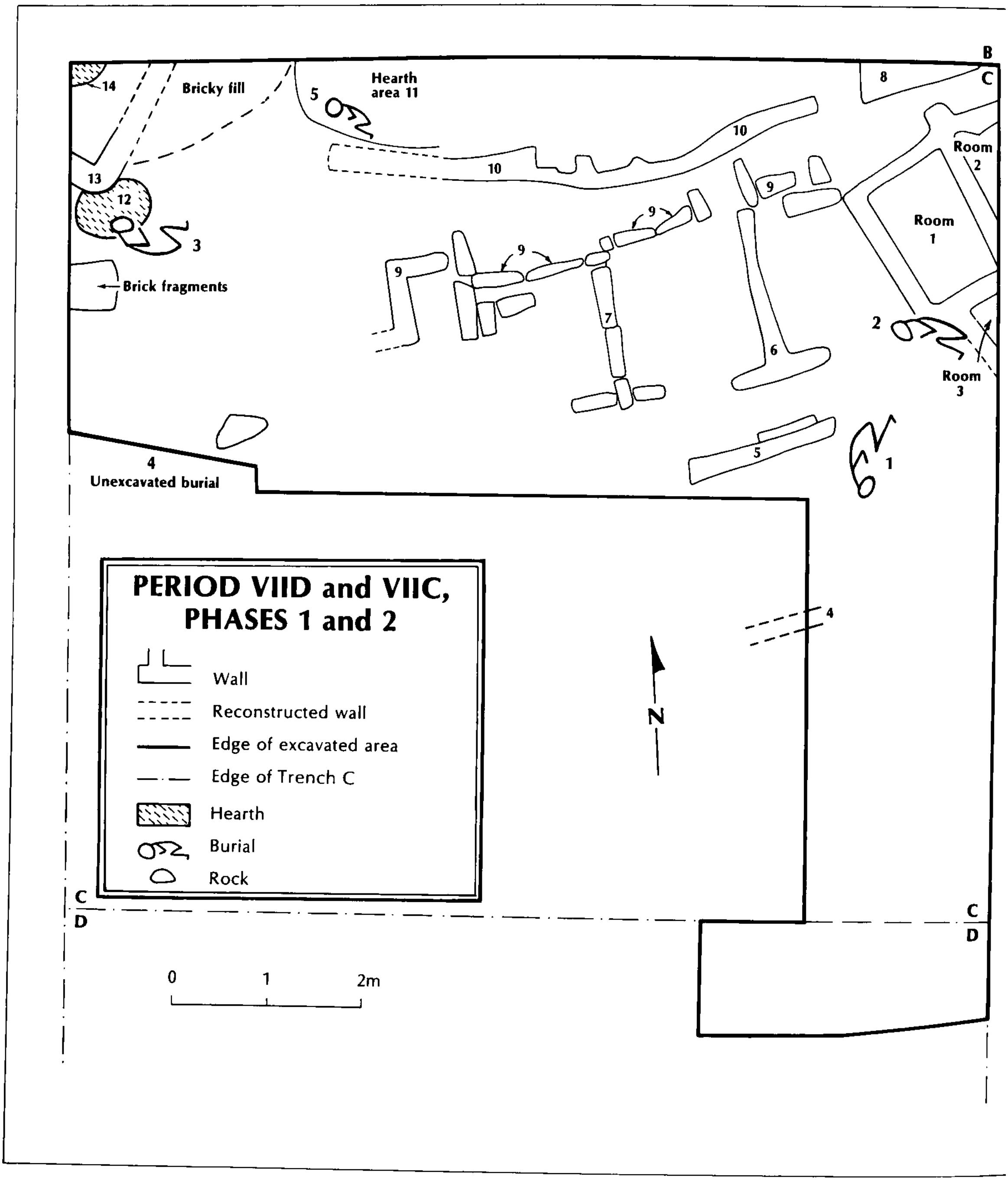


Figure 6.1. Plan of Period VIID and Period VIIC.2–1.

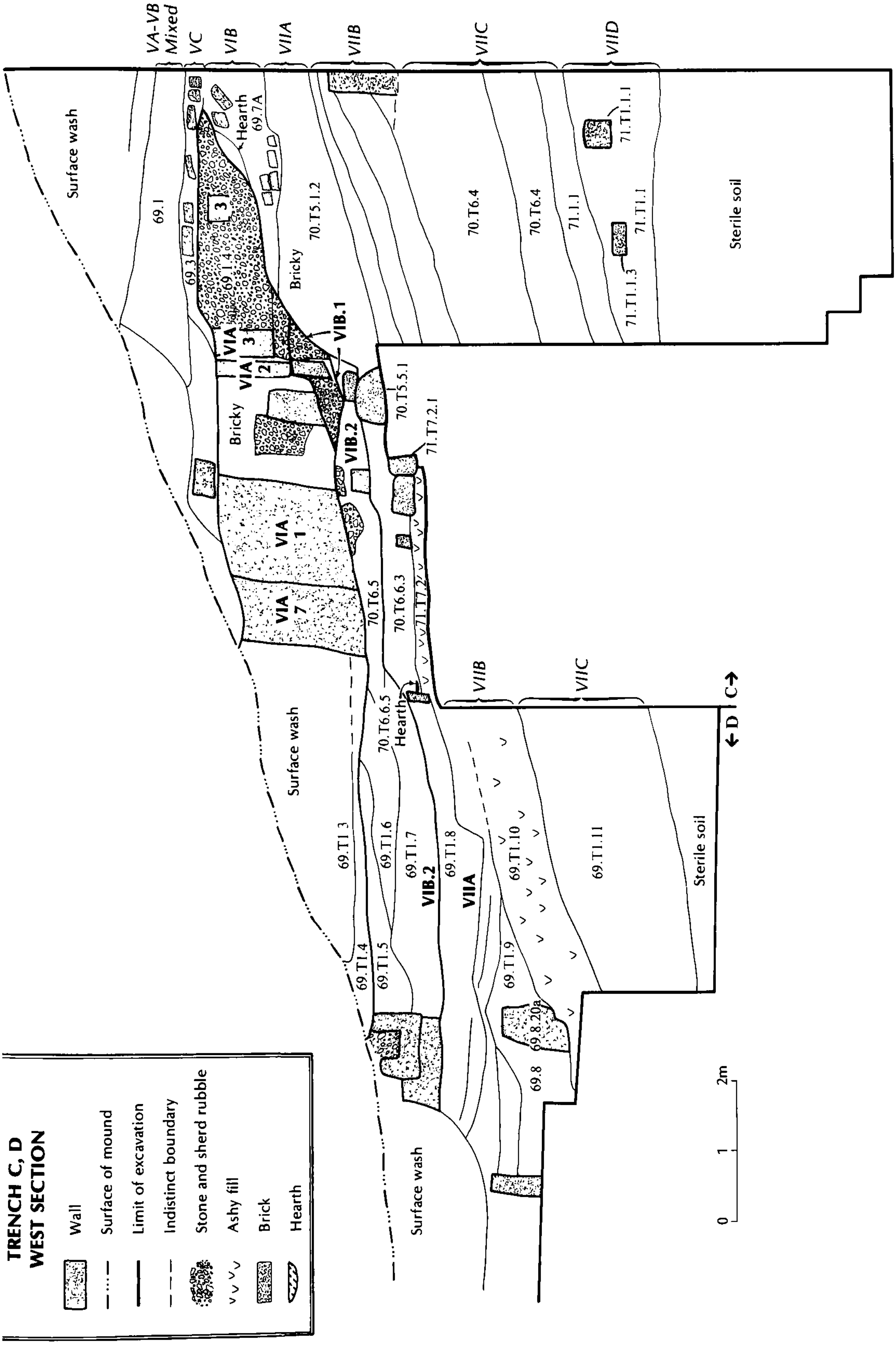


Figure 6.2. Trenches C and D, west section.

Period VIID Strata and Features

Feature Numbers (fig. 6.1)

Hearth 12	C.71.T1.1.2
Wall 13	C.71.T1.1.1
Hearth 14	C.71.T1.1.4
Human Burial 5	C.70.T5.7.2

Sterile soil C.71.T1.2 (fig. 6.3) is a sterile stratum beneath the earliest occupation levels, consisting of heavy lakebed clays from an earlier Pleistocene lake in the valley. Excavations were continued to a depth of 3.35 m below the top of the sterile clays to be absolutely sure that there were no additional occupational levels farther down. The curious fact about this sterile stratum is that it was not in fact sterile: small quantities of sherds, bone, and flint flakes were found to a depth of about 3 m below the top of the sterile clays, the probable cause being rodent holes that extended this far down. All the artifacts were found in these holes: more than 20 Chaff-Tempered Coarse Ware sherds, all less than 4 cm in diameter and of the variety common to Period VIID; 26 flint flakes; one flint blade; and one white calcite bead. This was a sobering discovery, for such rodent holes are to be found honeycombing levels from all periods on all parts of the site. A certain amount of upward migration of artifacts is to be expected on a continuously occupied site because of leveling operations, the digging of pits, foundation trenches, and so on. However, the materials found in these rodent holes demonstrate that downward migration, too, is a phenomenon that must have been occurring during all periods on the site.

Fortunately, the quantities involved are minimal and include only smaller artifact categories such as beads or flint flakes or very small fragments from larger artifact categories such as pottery. But because downward migration was taking place, it becomes more difficult to ascertain when a particular type of artifact first appears on the site. The presence, for example, of a specific ceramic type in very rare quantitiesin levels just prior to those where it becomes common could be explained as the result of downward migration. The question then comes down to how many or what relative quantities of a given artifact type must be found in a given stratum or within a certain number of cubic meters of deposit before one can be sure its presence there is real and not just the result of downward migration through rodent activity.

This excavated stratum of sterile soil can serve as a cautionary example. It can even provide a rough sense of what quantities of intrusive artifacts to expect in nonsterile strata as the result of this phenomenon of downward migration. In sterile soil C.71.T1.2, for example, the number of flint flakes was 1.44 per cubic meter. The number of sherds per cubic meter was somewhat higher, but no precise density figure can be calculated because an exact sherd count was not kept. Theoretically, one should be able to assume that approximately the same number of flint flakes or sherds per cubic meter in normal occupational strata can be attributed to downward migration from overlying strata.

Wall 13 is very poorly preserved, surviving to a height of only one course. It consists of a single row of stretchers which run roughly north-south, but which turn at a right angle within the area excavated and head west into the west balk of Trench C. No complete bricks were recovered, but the bricks appear to be approximately 18 cm wide. A concentration of chaff-tempered mud about 25 cm thick lay beneath this wall and on either side of it. This concentration may be a congealed mass of disintegrated bricks, but no identifiable brick fragments were recovered from it. Another concentration of what clearly were brick fragments (C.71.T1.1.3) was found about a meter south of the wall. The wall was not plastered on either side and may have been nothing more than a low retaining wall of the type used in other phases of Periods VII and VI.

Whatever the wall's true function, it probably was *not* the wall of a room, so that Hearth 14, found just to the northwest of it, was almost certainly an outside hearth. This hearth was 10 cm deep, consisting of 7 cm of greyish white ash overlying 3 cm of burned earth. The bottom of the hearth sloped slightly up against the chaff-tempered mud concentration east and south of it, and so postdates slightly both the mud concentration and Wall 13.

Just south of Wall 13 lay Hearth 12. It consisted of a concentration of burned earth including a few burned brick fragments, along with several large Chaff-Tempered Coarse Ware sherds and several rocks (5–10 cm in diameter) of the type one finds in great profusion on the alluvial fans at the edges of the valley less than a kilometer from the site.

Farther to the south of this group of features and at the same level lay a large rock of smooth, polished (probably water-worn) green serpentine measuring a maximum of 35 cm in length, 25 cm in width, and 10 cm in thickness. Three other large rocks of comparable size but not of serpentine were found near the serpentine rock, but were not drawn in on the plan. None of the rocks showed any signs of having been worked. It must have taken considerable effort to carry these heavy rocks to this spot, but there is nothing about their context that provides a clue as to their function.

East of the complex of features was a lens of burned earth (C.70.T5.7.1). This lens is probably contemporary with Hearth 14. Just beneath the lens was Human Burial 5. The body was lying on its right side in a tightly flexed position, with the legs drawn up and the arms raised so that the hands lay beneath the head. The body was oriented east-west, with the head at the west end and turned toward the south. Preliminary examination of the skeleton during excavation showed it to be that of a child between 6 and 12 years old. Two stones, each about 7 cm in diameter, had fallen on the skull, partially crushing it. Two large fragments of an incomplete Chaff-Tempered Coarse Ware bowl were recovered about 20 cm northeast of the body, and another bowl sherd rested on the ribs. No other artifacts were found with the burial. Curiously enough, the body did not lie in any sort of burial pit but apparently was laid directly on the

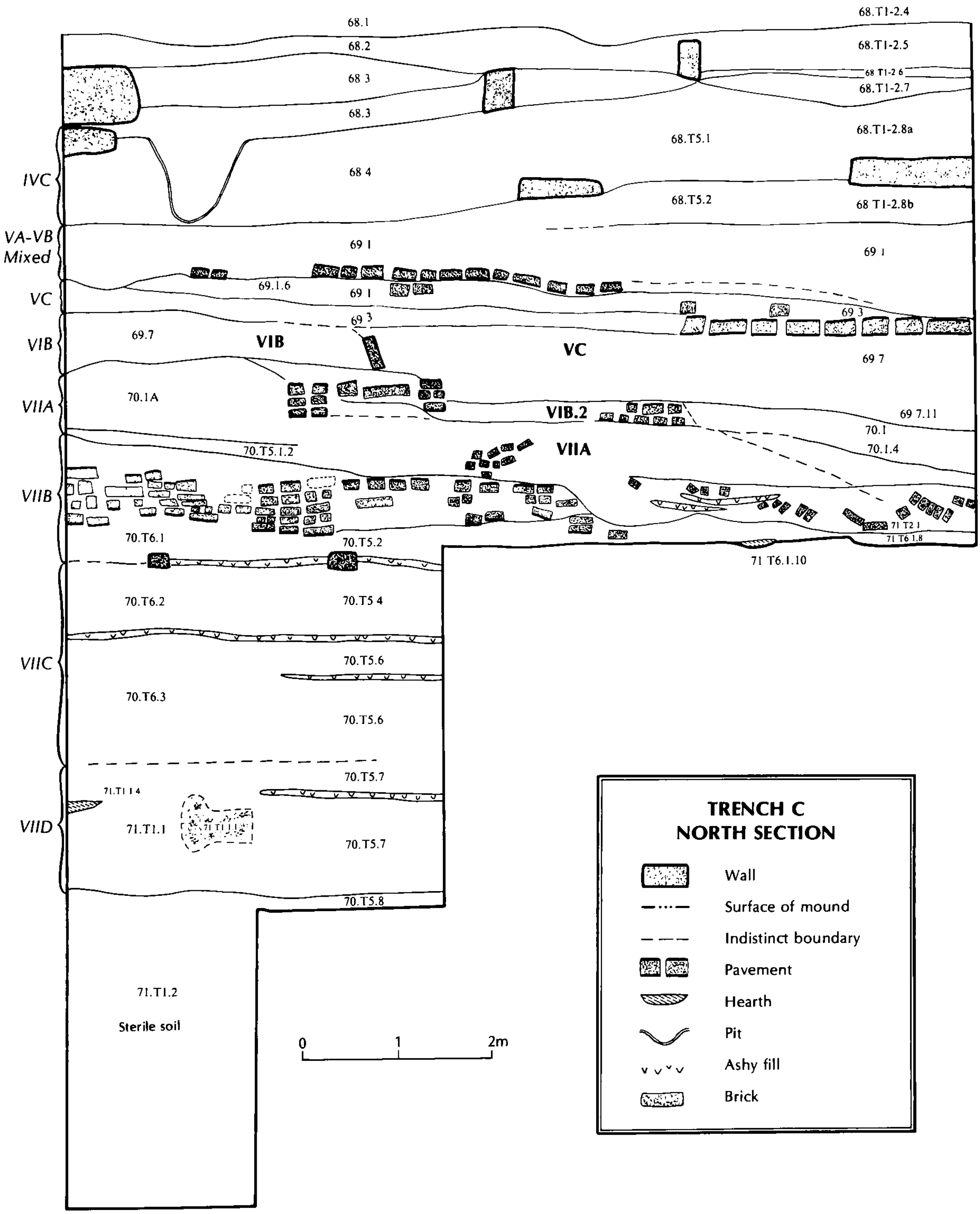


Figure 6.3. Trench C, north section.

ground surface. No good stratigraphic link could be established between the burial and the complex of features to the west, but it lies at the same level and is therefore probably roughly contemporaneous with them.

PERIOD VIIC SETTLEMENT

During Period VIIC (fig. 6.1: Features 1–11, Burials 1–4) the Yahya settlement expanded, or perhaps shifted, farther to the south. In the *exposed area* (approximately 59 m^2 in Trenches C and D) on Yahya's south side for this period, habitational structures appear for the first time, and the edge of the settlement deposits now extends at least 10 m farther south over virgin soil (figs. 6.2, 6.4).

Period VIIC has two major phases. The earlier Phase 2 consists of a portion of a habitational structure (Rooms 1, 2, 3) and an associated series of enigmatic walls that clearly do not form rooms. Some of these additional walls (9, 10, possibly 8) probably were retaining walls built to hold back an accumulating ash dump that threatened to overrun the area, but the function of the other walls (4, 5, 6, 7) remains unclear. All Phase 2 rooms and walls (except for the later retaining Walls 8, 9, and 10) were constructed directly on top of approximately 40 cm of the same compact, uniform, sloping erosional fill (C.73.10, C.70.T6.3, and C.70.T5.6) that made up so much of the Period VIID deposits (cf. C.71.T1.1 and C.70.T5.7) (fig. 6.3). The implication is that after Period VIID this area of the site continued to be peripheral and unoccupied until the building of the VIIC.2 rooms and walls. Even during Phase 2, the settlement density on this part of the site was very low: only 2.5 percent, or 1.48 m^2, of the 59 m^2 horizontal area exposed consisted of interior space.

Immediately overlying Phase 2 is Phase 1 of Period VIIC, another phase of compact, sloping erosional fill accumulation that is devoid of any features except burials. Once again, this part of the site appears to have become a peripheral, unoccupied area used only for occasional burials. Four burials were found in strata C.70.T6.2 and C.73.7 of Phase 1, making a total of five burials for Periods VIID and VIIC together (two children, two adults, and one unexcavated), all of them laid down without burial pits on erosional fill, apparently during phases when this part of the site was not used for any other purpose. On the other hand, no burials were made in this area during phases when houses and other structures existed here. The similarity of context for all five burials implies that during Periods VIID and VIIC the dead customarily were buried not in close proximity to or beneath houses, but on the edges of the living area in locations not otherwise being used.

Whether the dead were left entirely exposed or whether dirt was heaped up over them is not clear from excavations. In all four excavated burials the bodies lay in a flexed position, three of the four on their right side; and in all three of the excavated Period VIIC burials traces of red ochre were found on or in the immediate vicinity of the body.

Period VIIC, Phase 2 Features

Feature Numbers (fig. 6.1)

Room 1	C.73.10.3
Room 2	No feature number given during excavation
Room 3	No feature number given during excavation
Wall 4	C.73.9.1 (unexcavated)
Wall 5	C.73.9.1
Wall 6	C.73.10.1
Wall 7	C.73.10.2
Wall 8	C.73.9.5.
Wall 9	C.73.9.4, C.70.T5.6.2.
Wall 10	C.73.9.3
Hearth Area 11	C.70.T5.6.1

Rooms 1, 2, 3 and Walls 4, 5, 6, 7 are the earliest features of Phase 2. All were built directly on the sloping, compact fill of stratum C.73.10. Since the walls of Rooms 1, 2, 3 were not taken down, it was not determined whether the walls of these rooms were bonded at their corners, but probably all three were built at the same time as part of a multiroom complex of which we have only the northwest corner (fig. 6.5).

The function of these rooms is not clear. No doorways were found into or between any of the rooms. The rooms contained soft, loose, trashy fill in contrast to the solid, bricky fill (C.73.9) west of the rooms, but no artifacts were found in situ on the floors of any of the rooms. Indeed, only in the northwest corner of Room 1 did evidence of a floor survive. The walls of the room had rough mud plaster on both their interiors and exteriors. In addition, the exterior face of Room 1's west wall had been coated with a thick green clay plaster.

Room 1 was the only complete room excavated. It measured 1.37 × 0.88 m at the midpoints of its sides, or 1.21 m^2. Along the north side of the complex was a single exterior buttress. No brick sizes were obtained from the rooms' walls, but a few brick fragments were found in the fill of the rooms, including a single well-preserved brick that had mud plaster still adhering to it. The brick was thumb-impressed and measured 38 × 14 × 7 cm.

West of the Phase 2 room complex were several enigmatic walls (4, 5, 6, 7) that are roughly contemporaneous with the complex but which clearly do not form rooms in the normal sense of the word (a space enclosed on four sides). Wall 5 survived to a height of seven courses, with mud plaster on both faces. The bricks in Walls 4 and 5 were observed to be of two types: dark brown chaff-tempered bricks with the consistency of very compact clay and yellowish, untempered bricks with the consistency of fine clay but not as hard-packed as the dark brown bricks. No brick sizes were obtained from these walls.

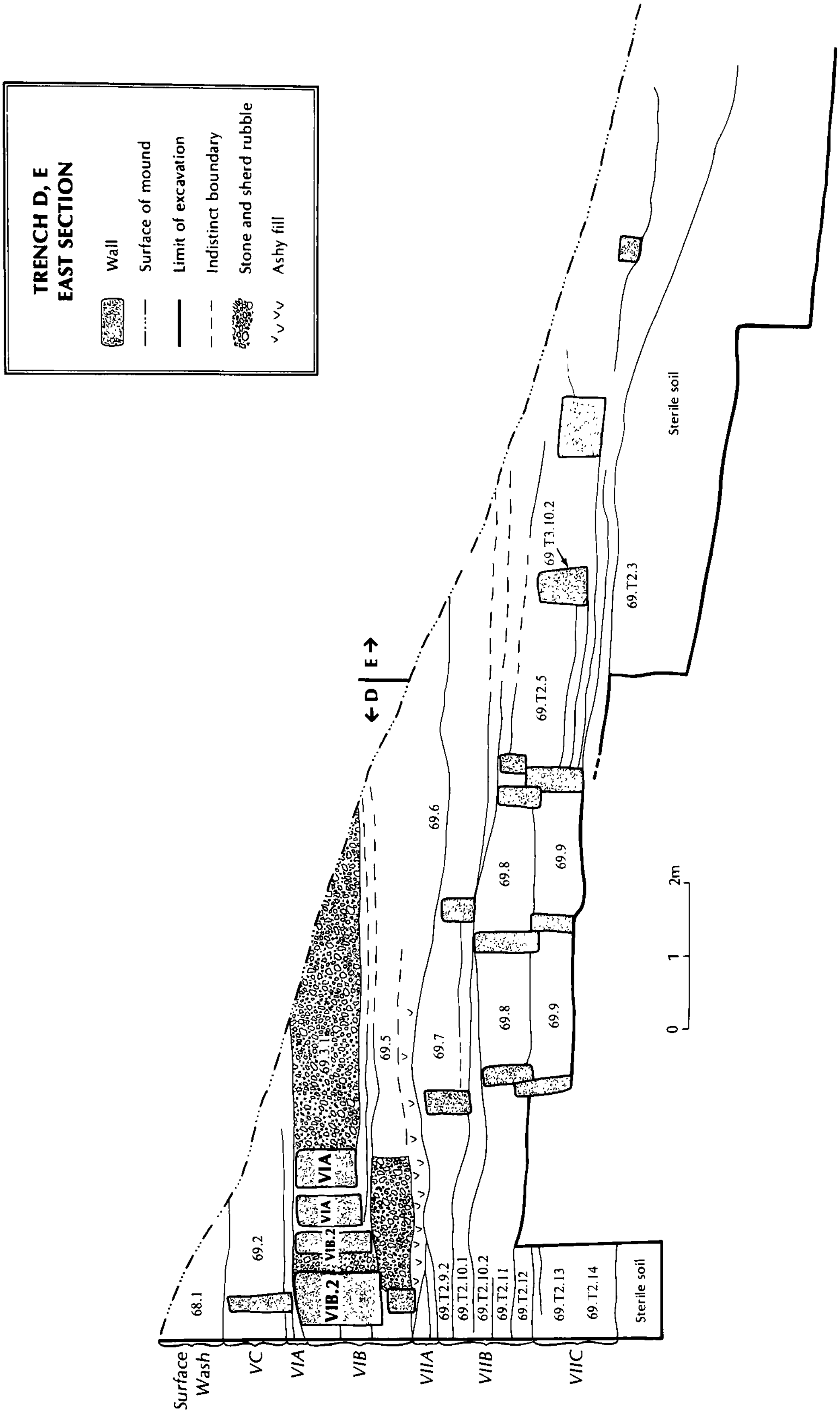


Figure 6.4. Trenches D and E, east section.

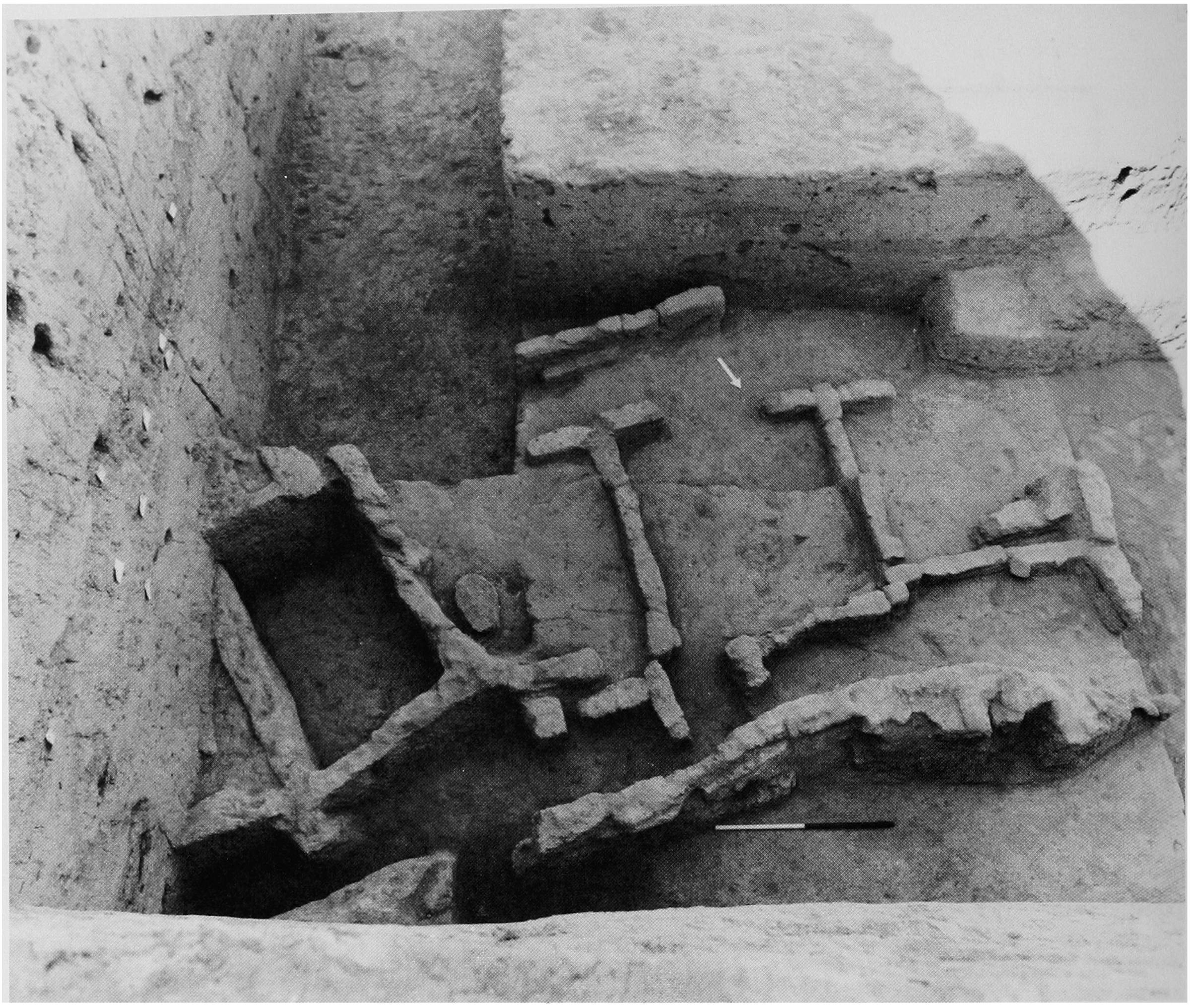


Figure 6.5. Architecture of Period VIIC.2, viewed from the north.

North of Walls 4 and 5 lay two T-shaped walls (6, 7) that were not plastered. It is important to note that these T-shaped walls do not bond with and are stratigraphically earlier than Wall 9 directly to the north of them and so cannot be said to form rooms with Wall 9 as the north wall. No good surfaces or floors were associated with Walls 4, 5, 6, 7. They were all built directly on top of the fill of stratum C.73.10, which sloped fairly steeply down from north to south. The fill between and around these walls consisted of dark brown, solid, bricky material in which occasional brick fragments could be discerned. It is possible that this amorphous bricky fill accumulated gradually; on the other hand, it may represent a deliberate filling and leveling operation on the slope of the mound in which Walls 4, 5, 6, 7 were constructed as retaining walls for the fill.

Wall 8 was built at some point after Room 1, probably at approximately the same time as Wall 9 or 10. Wall 8 rests on the bricky fill of C.73.9 and has light-colored mud plaster on its south face. It was at first thought to be an eastward extension of Wall 10 and is in fact at the same level, but the two walls are not connected, and Wall 8 appears to be wider. The bricks of Wall 8 are of the same dark brown, chaff-tempered type found in Walls 4 and 5.

Walls 9 and 10 were the last additions in Phase 2. Wall 9 was built first. It is only one brick high and has ashy fill (C.73.9A) backed up behind it. Since no ash was found to the south of this wall (only the bricky fill of C.73.9), its probable function was to hold back an accumulating ash dump that was spilling down the mound from the north. At its west end it turns sharply to the south and runs down the mound slope. In order that the top of the wall's north-south segment remain level with its east-west segment, the wall at its southernmost point had to be built up to a height of 60 cm to make up for the downward slope of the fill on which it was constructed. Apparently Wall 9 did not suffice to hold back the ash, for at a later point a second east-west retaining wall (10) was built just to the north of Wall 9. This second retaining wall was coated with thick mud plaster on its south face, but had a very irregular, unplastered north face, behind which more ashy fill accumulated.

The source for at least some of the ash accumulation may be Hearth Area 11, located north of the west end of Wall 10. The edges of this open hearth were difficult to define. At its center the hearth was 8–10 cm thick and consisted of burned earth, ash, and small bits of charcoal.

Period VIIC, Phase 1 Features

Feature Numbers (fig. 6.1)

Human Burial 1	C.73.7.1
Human Burial 2	C.73.7.2
Human Burial 3	C.70.T6.2.1
Human Burial 4	Unexcavated; no feature number given during excavation

It was impossible to determine in what order the four burials were laid down, but all lay in the same stratum of sloping erosional fill (C.70.T6.2 and C.73.7). No burial pits were associated with any of the burials; the body in each case appears to have been laid directly on the erosional fill. Burial 1 was that of an adult. The body was lying on its right side with the legs drawn up in a tightly flexed position and the arms, slightly bent, extending down the body toward the feet, with the right hand resting beneath the legs. The body was oriented roughly north-south, with the head at the south end. Traces of red ochre were found in the earth surrounding the body. Also accompanying the burial were a fragment of turquoise and a necklace of small fish vertebrae. Just north of the burial an articulated femur and pelvis of *Bos* were recovered.

Burial 2 lay 1.6 m north of Burial 1. The skeleton was that of a young child under the age of ten. Several of the child's deciduous teeth were still in place. The body lay on its right side, with the arms and legs tightly flexed. The body was oriented roughly east-west, with the head at the west end and facing south. Once again, traces of red ochre were found in the soil around the body. There were, however, no artifacts found with the burial.

Burial 3 is that of an adult and was found in the northwest corner of Trench C. The body lay on its left side, with the legs drawn up in a flexed position and the arms bent at chest level. The skull was found in a crushed state, with a deposit of water-laid mud inside the skull. The presence of this water-laid mud may indicate that the skull lay exposed for an extended period of time. The body was oriented east-west, with the head at the west end and facing north. In association with the burial were found several Chaff-Tempered Coarse Ware sherds and a few bones of *Bos*. Of particular interest was the presence of red ochre on the ulna of one of the arms.

Bones from another burial, Burial 4, appeared in the south section of the area exposed in the northwest corner of Trench C, but were not excavated.

PERIOD VIIB SETTLEMENT

With Period VIIB comes the first extensive horizontal exposure of architecture on the south side of the mound (figs. 6.7, 6.9, 6.10). The *area of exposure* varies from phase to phase and is discussed under individual phase descriptions. The intensive use of this area in Phases 6 through 2 of VIIB was manifested by the uncovering of a complex sequence of room constructions alternating between the east and west sides of Trench D. During these phases more than 44 different rooms were built within the excavated area. Unfortunately, the function of most of these rooms remains unclear. The fill and floors of these rooms contained very few sherds, flints, or other artifacts; doorways appear to have been relatively rare; and none of the rooms has an interior hearth. Moreover, the rooms are uniformly small, most of them being less than 1.5 m square. The small size of the rooms and the dearth of artifacts on the floors imply that most of the rooms were not used as human activity areas and probably not as sleeping areas either. One possible explanation is that they served as a storage complex for hay, grain, or other organic materials that were cleaned out when the rooms were abandoned and built over or that have decayed without leaving recognizable traces. Another possible explanation is that some of the rooms functioned as sheep or goat pens during the winter months.

The most significant find of Period VIIB was a female figurine 26.6 cm high and carved from a single piece of chlorite (see figs. 7.26–7.29). It was found in situ on the floor of Room D.68.6.7 (Room 20 on fig. 6.6; see also fig. 6.7) and belongs to Phase 4. Beside it were found flint tools, polished bone tools, and three stone "shaft straighteners" (figs. 7.16, 7.17).

Period VIIB, Phase 6 Features

Area of Exposure

53.3 m^2 in Trench C
68.1 m^2 in Trench D
29.8 m^2 in Trench E

151.2 m^2 total area

Feature Numbers (fig. 6.6)

Wall 1	C.70.T5.2.2, C.70.T6.1.1, C.71.T2.1.3
Wall 2	C.73.T1.6.2
Courtyard 3	D.69.9.19
Room 4	D.69.9.18
Room 5	D.69.9.2
Room 6	D.69.9.1
Room 7	D.69.9.3, E.69.T2.4.5
Alley 8	No feature number given during excavation

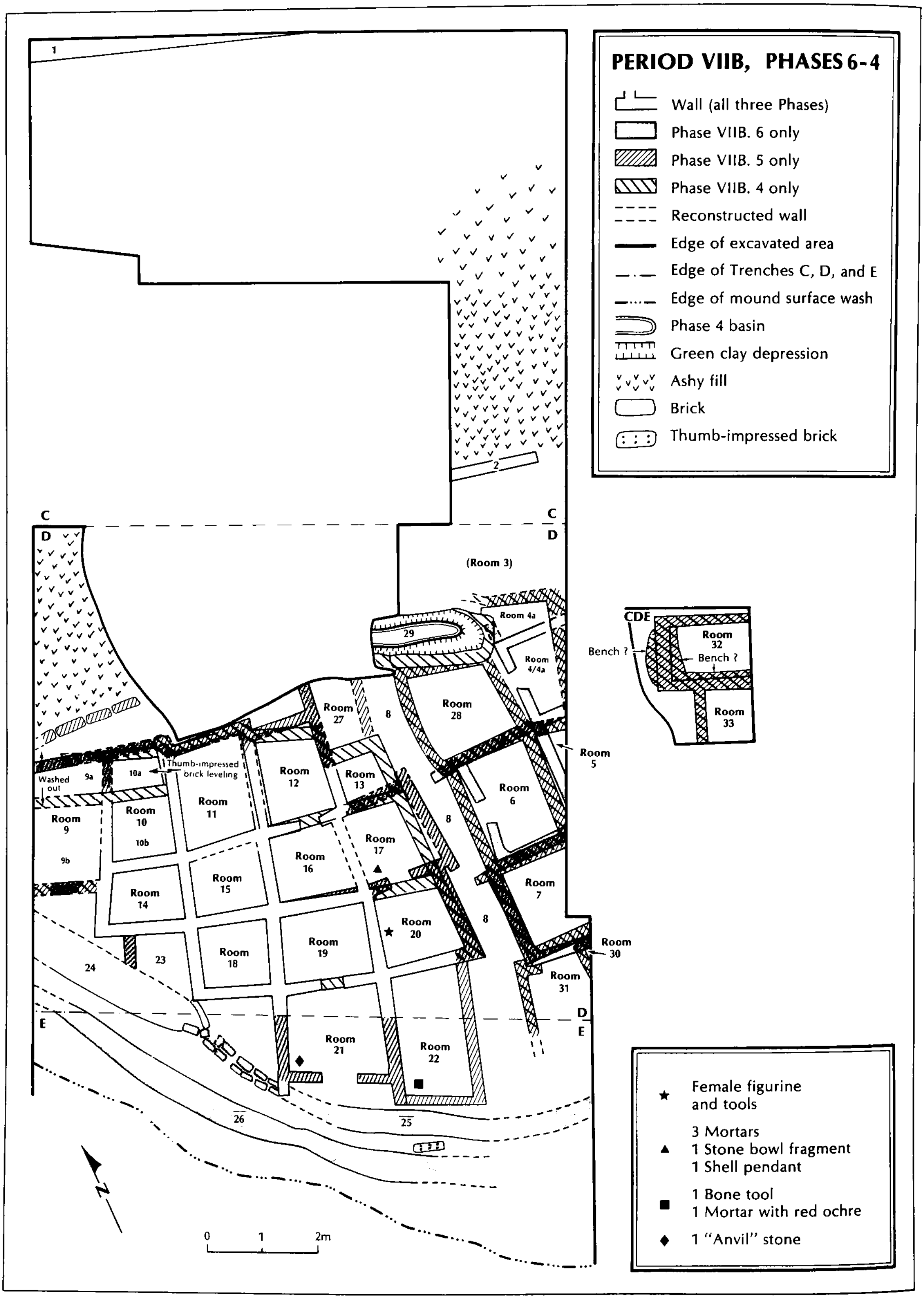


Figure 6.6. Plan of Period VIIB.6–4.

Possible Room 9	D.69.9.13
Room 10	D.69.9.14
Room 11	D.69.9.15
Room 12	D.69.9.16
Room 14	D.69.9.9
Room 15	D.69.9.10
Room 16	D.69.9.11
Room 17	D.69.9.12
Room 18	D.69.9.5
Room 19	D.69.9.6
Room 20	D.69.9.7
Room 21	E.69.T7.4.1, E.69.T7.4.2
Room 22	E.69.T3.2.1, E.69.T3.2.2
Possible Room 23	D.69.9.4
Wall 24	E.68.T1.3.1
Wall 25	E.68.T1.6.1, E.69.T3.10.2
Wall 26	E.68.T1.6.1, E.69.T7.3.1

Wall 1, which runs east-west across the northern edge of Trench C, is the earliest construction of Phase 6 (the earliest phase of Period VIIB). This was determined from the fact that the ashy fill (D.69.T1.10) that runs *underneath* the Phase 6 rooms to the south also runs up *against* Wall 1 (fig. 6.2). The function of Wall 1 is unclear. Only its south face is within the area of excavation. This face had not been plastered. The wall, consisting of green clay bricks of varying lengths, survived to a height of five courses. No single bricks were recovered entirely intact, so that no brick sizes could be obtained. However, two bricks were retrieved sufficiently intact to allow the observation that there were no thumb impressions on either their top or bottom surfaces.

When exactly Wall 2 was built is not clear, but it is roughly contemporary with the earliest Phase 6 rooms to the south of it. This wall appears to have been built as a retaining wall to protect the room complexes south of it from the buildup of ashy fill (ash dumps?) spilling down from the north. North of Wall 2 is sloping ashy fill; south of Wall 2 is bricky fill. The wall survived to a height of 1.05 m, or seven courses. The courses of the wall appear to have been added one at a time over a considerable time period beginning in Phase 6, with the last course being added during Phase 3. The clue to this piecemeal construction of the wall over so long a time is the fact that there is ashy fill similar to that north of the wall between each course, the implication being that each time ashy fill built up behind the wall to the north and began to spill over it, a new course was added.

The rooms east of Alley 8 were the first rooms built in Phase 6. One complete room (Room 6) and portions of three other rooms (Rooms 4, 5, 7) were uncovered in this area. Room 6 measured 1.82 × 1.35 m, or 2.46 m^2, and had a 0.44-m-wide doorway on its west side providing an entrance rom Alley 8. There is also what probably is a doorway in the west wall of Room 4. The floors and walls of all four rooms were plastered, with the plaster on the walls being continuous with that on the floors. The walls of Room 7 were partially removed and proved to be built of greenish thumb-impressed bricks. No brick sizes were recorded. The walls of the other three rooms were left standing. The walls of the four rooms survived to a height of between 0.5 and 0.8 m. Almost no artifacts were found on the floors of any of the rooms. The fill of the rooms consisted of hard-packed brick collapse, as well as fragments of what was probably roofing plaster, with reed impressions on the underside. From this evidence one can hypothesize that the rooms were flat roofed, with wooden beams overlaid with brush and reeds which in turn were plastered over with chaff-tempered mud.

Courtyard 3 was originally thought to be a room, but very probably is not. What was at first considered to be a west wall turned out not to be a wall at all, and no north or east walls were found in excavation, nor do they appear in the east section of Trench D.

Following the construction of the rooms east of Alley 8, but before the construction of the rooms west of Alley 8, three curving walls were built which followed the contour of the Period VIIC mound along what was to become the southern edge of the west side room complex of Phase 6. These walls (24, 25, 26) lay very close to the present mound surface and thus were poorly sealed and badly eroded. Possibly Wall 26 or all three walls together served as a perimeter wall or even a defensive wall for the Phase 6 room complex to the north. It is also possible that they were nothing more than low retaining walls and platforming built on the lower slope of the Period VIIC mound preparatory to the construction of the west side Phase 6 rooms. Unfortunately, none of the walls survived to a height of more than three courses, and there is no way of determining how much taller they might originally have stood. Wall 24 was built after Walls 25 and 26, but all three appear to have been built at approximately the same time; many bricks and brick fragments were found between Walls 24, 25, and 26, as if all were part of the same construction. The only well-preserved course of Wall 26 consisted of a loosely laid double row of stretchers. All three walls were made of hand-molded thumb-impressed bricks, with the thumb impressions on the top. Bricks were of various lengths. The following brick sizes were obtained: 36 × 15 × 9–10 cm and 36 × 16 × 9–10 cm, both bricks having three pairs of thumb impressions on their top sides.

The final construction of Phase 6 was a complex of rooms west of Alley 8 and north of the walls just discussed. The rooms east of Alley 8 continued in use. The fact that the west side rooms were a later construction was determined by examination of a section across Alley 8 that showed the rooms to the west to have been built from a slightly higher surface than the rooms to the east. Twelve complete rooms were uncovered in the west side complex, with Walls 9 and 23 being two possible additional rooms whose walls could not be clearly defined in excavation. The rooms were built without foundation trenches on hard-packed sandy/ashy fill (D.69.T1.10) that sloped steeply up to the north toward Trench C (fig. 6.2). Since the walls of the Phase 4–3 rooms directly above were never taken down, the precise positions of the west side Phase 6 rooms could not be determined in all cases. Wall faces that were not clearly defined are shown as dashed lines on figure 6.6. Room walls survived to a height of anywhere from 0.3 to 0.7 meters. Doorways were found between Rooms 12 and 16, Rooms 17 and 20, and Rooms 19 and 21. Room 21 also had a possible outside doorway at its south end. Other doorways may have existed, but the overlying Phase 4–3 walls prevented further exploration. Approximate dimensions of the twelve exposed rooms are as follows:

	Dimensions		
Room	*N-S*	*E-W*	
10	1.98 ×	1.08 =	2.14 m^2
11	1.80 ×	1.32 =	2.38 m^2
12	1.68 ×	1.24 =	2.08 m^2
14	1.00 ×	1.36 =	1.36 m^2
15	1.32 ×	1.34 =	1.77 m^2
16	1.25 ×	1.38 =	1.73 m^2
17	1.38 ×	1.35 =	1.86 m^2
18	1.15 ×	1.30 =	1.60 m^2
19	1.25 ×	1.62 =	2.00 m^2
20	1.45 ×	1.32 =	1.91 m^2
21	1.58 ×	1.78 =	2.81 m^2
22	2.35 ×	1.30 =	3.01 m^2

Wherever walls of the rooms could be examined, they proved to be made of grey-brown, hand-molded, thumb-impressed bricks (as opposed to the greenish thumb-impressed bricks of the rooms east of Alley 8). Generally the fill of the rooms consisted of loosely consolidated sandy/ashy fill. Most of the rooms' floors were of laminated packed earth and were rather difficult to find, often discernible only as a denser concentration of sherds, charcoal, bones, and flint flakes at a level corresponding with the base of the room walls. In Rooms 21 and 22 heavily chaff-tempered yellow mud plaster was found on the walls, and on the floors of these two rooms were traces of white decayed vegetal fiber that may indicate the use of matting. Also found on these floors were pieces of roofing plaster with reed impressions on the bottom.

Only Rooms 17, 21, and 22 had other types of artifacts on or near their floors. On the floor of Room 17 were found three broken, trough-shaped stone mortars and a green stone bowl fragment, and in the fill above, a shell pendant. Room 21's floor had on it a very hard green-black "anvil" stone. Room 22 had a crushed Chaff-Tempered Coarse Ware vessel upside down on the floor, and a bone knife and a broken stone mortar with traces of red ochre on it in the fill above the floor.

Overall, Phase 6 manifests a high settlement density in terms of the amount of interior space in use on this part of the site. Fully 30.27 m^2, or 20 percent, of the 151.2 m^2 exposed horizontal area consisted of interior space. This is a marked increase from Period VIIC, where only 2.5 percent of the exposed area was interior space.

Period VIIB, Phase 5 Features

Area of Exposure

53.3 m^2	in Trench C
72.2 m^2	in Trench D
4.6 m^2	in Trench CDE
11.1 m^2	in Trench E
141.2 m^2	total area

Feature Numbers (fig. 6.6)

Wall 1*	C.70.T5.2.2, C.70.T6.1.1, C.71.T2.1.3
Wall 2*	C.73.T1.6.2
Room 4a	D.69.8.18
Room 5	D.69.8.2
Room 6	D.69.8.1
Room 7	D.69.8.3, E.69.T2.4.5A
Alley 8*	No feature number given during excavation
Possible Room 9*	D.69.8.13
Room 10*	D.69.8.14
Room 11*	D.69.8.15
Room 12*	D.69.8.16
Room 14*	D.69.8.9
Room 15*	D.69.8.10
Room 16*	D.69.8.11
Room 17*	D.69.8.12
Room 18*	D.69.8.5
Room 19*	D.69.8.6
Room 20*	D.69.8.7
Room 21*	E.69.T7.4.1, E.69.T7.4.2
Room 22*	E.69.T3.2.1, E.69.T3.2.2
Possible Room 23*	D.69.8.4
Room 27	D.69.8.17
Room 28	D.69.8.20
Room 30	No feature number given during excavation
Room 31	E.69.T2.4.1, E.69.T2.4.6
Room 32	No feature number given during excavation
Possible Room 33	No feature number given during excavation

*Features that were first built in Phase 6 but which continue in use

Wall 1 remains exposed during Phase 5 as more sloping deposits accumulate against its south face, and at least one more course is added to Wall 2 as ashy fill continues to build up to the north of it. For a detailed description of Walls 1 and 2, see under Phase 6. During Phase 5 a third wall (D.69.8.20A) is built to the north of the Trench D room complex (north of Rooms 9, 10 in fig. 6.6). Like Wall 2, this new wall appears to have been built as a retaining wall to hold back the buildup of ashy fill sloping down from the north (fig. 6.2). The bricks in the wall are thumb-impressed.

All the rooms west of Alley 8 (9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23) were constructed in Phase 6 and continued to be used during Phase 5. A detailed description of these rooms can be found under Phase 6.

The major new construction of Phase 5 takes place east of Alley 8, where the Phase 6 rooms are apparently knocked down intentionally and filled in with wall and roof debris, upon which a new complex of rooms (4a, 5, 6, 7, 28, 30, 31, 32, 33) is built. The walls of this new complex are of the same type of grey-brown, hand-molded, thumb-impressed bricks that were used in building the west side complex of Phase 6. No brick sizes were recorded. Walls survive to a maximum height of 0.7 m. None of the rooms appears to have had any doorways. Possibly access to these rooms was through the roof. Complete dimensions were obtained for four of the nine rooms exposed:

	Dimensions		
Room	*N-S*	*E-W*	
4a	2.25	× 1.05	= 2.36 m^2
6	1.88	× 1.32	= 2.48 m^2
7	1.45	× 1.3	= 1.89 m^2
28	1.5	× 1.6	= 2.4 m^2

The east-west dimension for Room 4a must remain tentative, since the exact location of the east wall where it runs into the balk was never clearly ascertained. The positioning of these Phase 5 rooms is almost the same as for the Phase 6 rooms beneath, except for a slight shift to the west: the bases of several of the Phase 5 north-south room walls are set against the west sides of the north-south Phase 6 wall stubs beneath. In fact, the interior "bench" in Room 32 may be the top of a wall stub from an underlying Phase 6 room. However, since excavations in Trench CDE were terminated at the level of Room 32, the true origin of the "bench" was never clarified. The fill of the rooms is poorly consolidated and contains numerous brick fragments, as well as some bone and sherds. A piece of roofing material (thick mud plaster with reed and branch impressions on the underside) was found in Room 7. Floors were difficult to isolate, but in most cases appear to have been of beaten earth. Aside from an occasional sherd, no artifacts were found in situ on any of the floors.

Rooms 30 and 31 to the south were built slightly later than the other Phase 5 rooms. Room 30's north wall abuts the south wall of Room 7, while the south wall of Room 7 serves as th

Settlement density continues high in Phase 5, with at least 37.02 m^2 of the total 141.2 m^2 exposed, or 26.2 percent, consisting of interior space.

Period VIIB, Phase 4 Features

Area of Exposure

53.3 m^2	in Trench C
72.6 m^2	in Trench D
4.6 m^2	in Trench CDE
130.5 m^2	total area

Feature Numbers (fig. 6.6)

Wall 1*	C.70.T5.2.2, C.70.T6.1.1, C.71.T2.1.3
Wall 2*	C.73.T1.6.2
Room 4a*	D.69.8.18
Room 5*	D.69.8.2
Room 6*	D.69.8.1
Room 7*	D.69.8.3, E.69.T2.4.5A
Alley 8*	No feature number given during excavation
Possible Room 9b	D.69.8.13A
Room 10b	D.69.8.14A
Room 11	D.69.8.15A
Room 12	D.69.8.16A
Room 13	D.69.8.17A
Room 14	D.69.8.9A
Room 15	D.69.8.10A
Room 16	D.69.8.11A
Room 17	D.69.8.12A
Room 18	D.69.8.5A
Room 19	D.69.8.6A
Room 20	D.69.8.7A, D.68.6.7
Room 28	D.69.8.20
Basin 29	D.69.8.21
Room 30*	No feature number given during excavation
Room 31*	E.69.T2.4.1, E.69.T2.4.6
Room 32*	No feature number given during excavation
Possible Room 33*	No feature number given during excavation

*Features that were initially constructed in Phases 5 or 6 but which continue in use in Phase 4.

As in Phase 5, Wall 1 remains exposed during Phase 4 as additional sloping deposits accumulate against its south face, and at least one more course is added to Wall 2 as ashy fill continues to build up to the north of it. For a detailed description of Walls 1 and 2, see Phase 6. During Phase 4 another wall is constructed in the northwest corner of Trench D to the north of the Phase 4 room complex (north of Rooms 9b–10b). Like Phase 5's retaining wall on almost the same spot and like Wall 2, this new wall appears to have been a retaining wall to protect the rooms to the south from the buildup of ashy deposits sloping down from the north.

All the rooms east of Alley 8 (4a, 5, 6, 7, 28, 30, 31, 32, 33) were constructed in Phase 5 and continued to be used during Phase 4. A description of these rooms can be found under Phase 5. At the same time, as part of the continuing phenomenon of alternating room construction, where first the rooms east of Alley 8 and then the rooms west of Alley 8 are rebuilt, the Phase 6 rooms west of Alley 8 are knocked down to a height of less than 0.7 m and a new complex of Phase 4 rooms is built directly over them.

These new west side rooms (9b, 10b, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20) are built of the same grey-brown, hand-molded, thumb-impressed bricks that were used in Phase 5 and in the west side complex of Phase 6. Since the walls were left standing, no brick sizes were recorded. Walls survive to a maximum height of approximately 0.7 m. Wall alignments are very much the same as those of the underlying Phase 6 walls, except toward the north end of the complex, where east-west walls are positioned farther south than the Phase 6 walls beneath. As with the Phase 5 rooms, no doorways were found in the new Phase 4 rooms. Eleven complete rooms were exposed in the west side Phase 4 complex. Feature 9b may be a twelfth room, but it is incomplete and in a badly washed out area. The interior dimensions of the eleven complete rooms are as follows:

	Dimensions				
Room	*N-S*		*E-W*		
10b	1.06	×	1.14	=	1.21 m^2
11	1.78	×	1.38	=	2.46 m^2
12	1.46	×	1.10	=	1.61 m^2
13	0.80	×	0.88	=	0.70 m^2
14	0.98	×	1.35	=	1.32 m^2
15	1.08	×	1.35	=	1.46 m^2
16	1.30	×	1.38	=	1.79 m^2
17	1.45	×	1.05	=	1.52 m^2
18	1.15	×	1.28	=	1.47 m^2
19	1.26	×	1.60	=	2.02 m^2
20	1.25	×	1.30	=	1.63 m^2

The fill of the west side Phase 4 rooms consists of brown or yellow clayey deposits with some sand, brick fragments, and decayed chaff mixed in. The fill also contains some bone and charcoal as well as small quantities of Chaff-Tempered Coarse Ware sherds. Once again, floors were difficult to isolate within the rooms. Only one room (20) yielded any artifacts in situ on its floor. Here, on the floor next to the room's west wall, was found a 26.6-cm-high female figurine carved from chlorite, along with 63 worked stone tools or flakes, three chlorite "shaft straighteners," two bone "razors," and a bone spatula (figs. 6.7, 7.16, 7.17). A more detailed description of these artifacts will be found under the discussion of small finds (ch. 7).

Figure 6.7. Architecture of Period VIIB.5–4, Trenches D and E, viewed from the southeast. Note findspot of chlorite female figurine, indicated by an arrow.

The only other new feature in Phase 4 is Basin 29. This enigmatic trough-shaped feature consists of a hollowed out area within the bricky fill north of Room 28. At its rim, Basin 29 measures 1.75 m by 0.35 m. The sides, but not the bottom, of this hollowed out area are coated with green clay. One possible explanation for this curious feature is that it was a pit dug during Phase 4 for the purpose of mixing green clay with water to make plaster. After the green clay was mixed, it would have been removed from the bottom and central area of the pit, leaving only the green clay residue found on the sides of the pit. More concentrations of green clay were found just to the north of the pit. It may well be that the green clay plaster mixed in this pit was used for floor or wall plaster. Several of the Phase 2 rooms overlying this area have green floor plaster, although no green floor plaster was found in any of the Phase 4 rooms near Basin 29.

Settlement density continues to be high in Phase 4. At least 29.97 m^2 of the total 130.5 m^2 exposed, or 23 percent, consists of interior space.

Period VIIB, Phase 3 Features

Phase 3 is a nonoccupational phase found only in Trench C (*area of exposure* = 58.0 m^2). There are no features associated with this phase in Trenches D or CDE. Phase 3 is represented in Trench C by a series of five parallel, one-course-high walls that were placed on top of an accumulation of loose, ashy Phase 4 fill (C.73.6) preparatory to the building of a Phase 2 room complex in the same area (fig. 6.8). The exact function of these walls can only be guessed at. There is no evidence that any of them was ever more than a single course high, although one of them consists of a new course added to Wall 2 of Phases 6, 5, and 4, which extends down another six courses. The most likely explanation for these walls is that they were put in to stabilize the otherwise loose fill on which a new room complex was to be built. This hypothesis would account for the close alignment of these walls to the Phase 2 room walls directly above. Also, the areas between the walls had considerable quantities of badly eroded bricks and brick fragments with thumb impressions on their top sides, as if these walls were part of a general brick platforming of the area in order to provide a firmer base on which to construct the Phase 2 rooms.

All five walls run east-west across ashy fill that slopes down from north to south. Each of the five walls is made up of a single row of stretchers, but individual brick sizes were not recorded during excavation.

Period VIIB, Phase 2 Features

Area of Exposure

90.0 m^2	in Trench C
87.7 m^2	in Trench D
25.0 m^2	in Trench CDE
202.7 m^2	total area

Feature Numbers (fig. 6.8)

Wall 1*	C.70.T5.2.2, C.70.T6.1.1, C.71.T2.1.3
Room 2	C.71.T6.1.4
Room 3	C.71.T6.1.3
Room 4	C.71.T6.1.9
Room 5	C.71.T6.1.7
Room 6	C.71.T6.1.1
Alley 7	C.71.T6.1.2
Room 8	C.71.T6.1.5
Possible Room 9	No feature number given during excavation
Room 10b*	D.69.7.14
Room 11*	D.69.7.15
Room 12*	D.69.7.16
Room 13*	D.69.7.17
Room 14*	D.69.7.9
Room 15*	D.69.7.10
Room 16*	D.69.7.11
Room 17*	D.69.7.12
Room 18*	D.69.7.5
Room 19*	D.69.7.6
Room 20*	D.69.7.7
Possible Room 21	No feature number given during excavation
Wall 22	C.71.T7.2.1, C.71.T7.2.2
Courtyard 23	C.71.T6.1.6, C.71.T7.1.1
Platforming 24	D.69.7.41
Room 25	D.69.7.27
Room 26	D.69.7.26
Room 27	D.69.7.25
Room 28	D.69.7.24
Room 29	D.69.7.22
Possible Room 30	D.69.7.23
Possible Room 31	D.69.7.20
Possible Room 32	D.69.7.2
Possible Room 33	D.69.7.1
Possible Room 34	D.69.7.3
Outside Hearth 35	C.71.T6.1.10

*First built in Phase 4, but continued in use through Phase 2. The same feature numbers are used in both Phase 4 and Phase 2. Wall 1 is an earlier feature (built in Phase 6) that continues to be exposed through Phase 2 as additional deposits accumulate against its south face.

Phase 2 is represented by the construction of four new room complexes: two on the north side of Courtyard 23 (Rooms 2–6 and 8, 9, 21) and two on the south side of Courtyard 23 (Rooms 25–28 and 29–34).

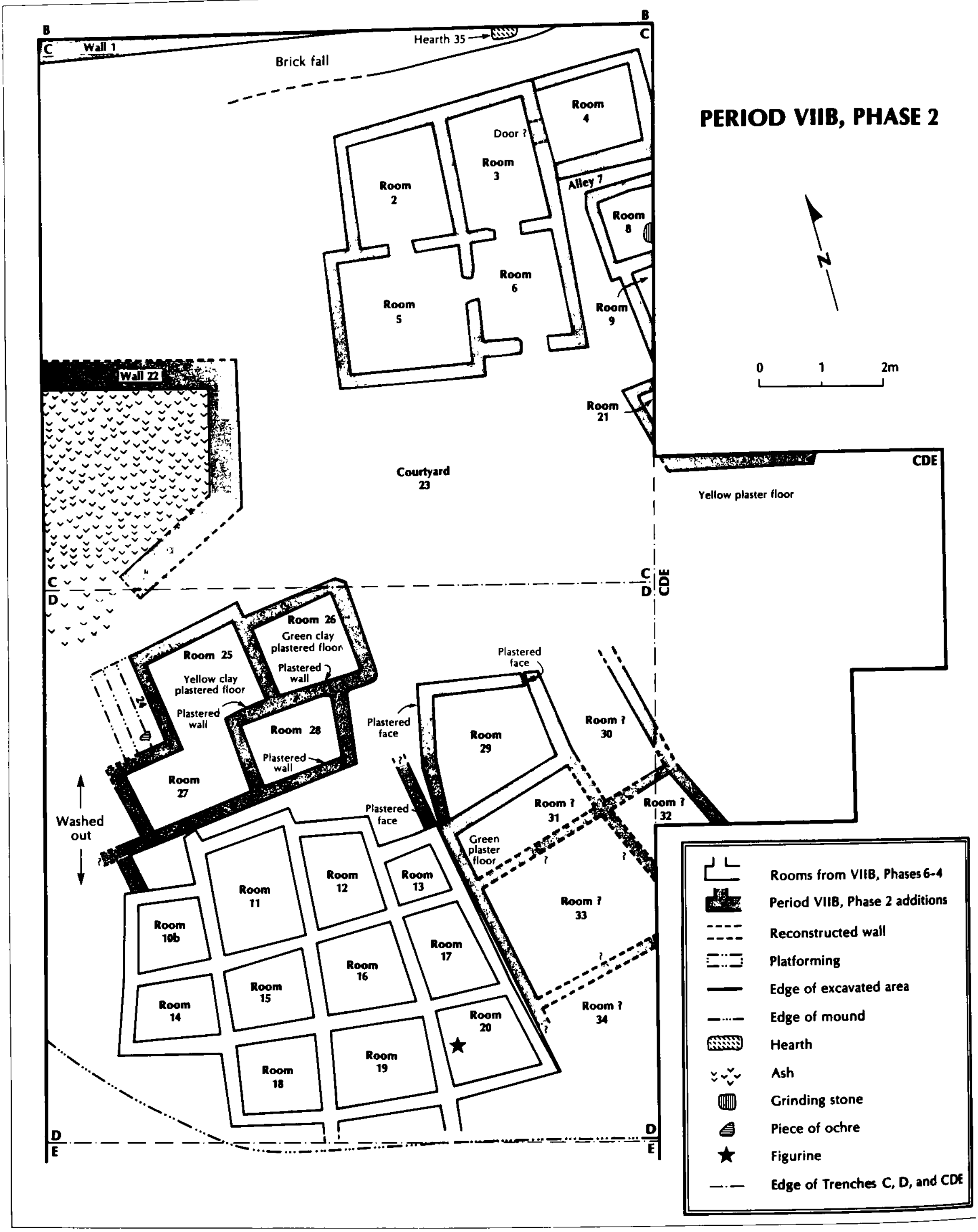


Figure 6.8. Plan of Period VIIB.2.

The Northern Room Complexes

These rooms yielded more data about construction techniques, plastering techniques, wall bonding, doorways, and brick sizes than any other room complex from Period VIIB (fig. 6.9). This is partly because these rooms were deeper into the mound and thus better preserved than those to the south and partly because—unlike most other VIIB rooms, which were left standing—these rooms were taken down brick by brick after they were exposed. These Phase 2 rooms are the first VIIB rooms to be built in the area of Trench C. They are constructed directly over the stabilizing foundation walls of Phase 3, which in turn were laid on top of the loose, ashy fill which had been accumulating in the area of Trench C since Phase 6. No complete rooms were exposed from the complex that extends into the east balk of Trench C (Rooms 8, 9, 21). All five rooms of the other complex, however, are complete. Their interior dimensions are as follows:

	Dimensions		
Room	*N-S*	*E-W*	
2	1.75 ×	1.48	= 2.59 m^2
3	1.90 ×	1.30	= 2.47 m^2
4	1.22 ×	1.55	= 1.89 m^2
5	1.80 ×	2.00	= 3.60 m^2
6	1.60 ×	1.40	= 2.24 m^2

Room 6 is the best-preserved room of the complex and the room through which the complex is entered from Courtyard 23. The fill of this room was made up almost entirely of fallen bricks and brick fragments, among which there were virtually no sherds, bones, or flint flakes. There was, however, a considerable quantity of charcoal and ash mixed in with the room fill, which suggests that this particular room was destroyed by fire. Further indications of a fire were the presence in the fill of several fallen bricks that had been hardened and reddened by heat, as well as a piece of chaff-tempered mud roof plaster with a completely carbonized fragment of a tree branch still adhering to its bottom side. The room's north and south walls, preserved to a height of almost 0.6 m, both tilted sharply to the south. This unusually severe tilt may have been a result of the roof falling in and the upper walls buckling during the fire.

A large, well-preserved piece of fallen wall plaster within the room made possible a complete reconstruction of the history of the room's wall replasterings (table 6.1). From

Figure 6.9. Architecture of Period VIIB.2, Trench C, viewed from the north.

Table 6.1. Diagrammatic reconstruction of layers of wall plaster from outermost face (layer 6) to brick of north side Room 6, Period VIIB.2.

Layer	Composition
6	Green plaster wash, peels off like paint, was applied in two layers
	0.2 cm of chaff-tempered mud
5	Fine, thin red plaster
	0.2 cm of chaff-tempered mud
4	Fine, thin red plaster
	0.2 cm of chaff-tempered mud
3	0.1 cm of mica-tempered red plaster
	1.0 cm of chaff-tempered mud
2	Fine, thin white plaster
	0.1 cm of chaff-tempered mud
1	Fine, thin red plaster
	0.2 cm of chaff-tempered mud
	0.2–0.3 cm of chaff-tempered mud
	Brick wall

this evidence it would appear that the room's walls underwent six major plasterings during its period of use, with each plastering consisting of a thin layer of chaff-tempered mud over which a plaster of finely levigated clay—white, red, or green—was applied.

The room's floor, too, underwent multiple replasterings, with each layer being 0.1–0.2 cm thick and matching the color of the wall plaster. Thus, the topmost floor plaster was green, like the outermost wall plaster. Wall plaster was continuous with the floor plaster, with the floor plaster curving up at the room's sides and corners to meet the wall plaster. No artifacts were found on the floor of the room that would give a clear indication of the room's function. The fill just above the floor consisted of soft ash mixed with decayed white organic material which, from the shape of the impressions, was probably chaff. A yellowish organic deposit was also found on the floor. Finally, a large number of bones were found up against the sides of the room, especially the northeast corner. A high percentage of these bones were ribs of *Bos*.

A doorway in the west wall of Room 6 leads into Room 5, the largest room in the complex. The upper fill of the room was bricky, but within 0.2 m of the floor the fill was loose and unconsolidated. There was both an upper and a lower floor in this room. On both floors lay a white, powdery deposit that could not be identified, but which may be the residue from something that was stored in this room. A fine, chaff-tempered mud plaster had been applied to both the floors and the walls. No artifacts were found on either the upper or lower floors.

Room 2 is accessible from the outside only through Rooms 6 and 5. The room fill was primarily unconsolidated grey, ashy fill with a few brick fragments mixed in. Like Room 5, Room 2 had both an upper and a lower floor, on both of which was found a white, powdery residue. Both the floors and the walls had been plastered, and traces of a green plaster wash were recovered from the upper floor and walls in the room's northwest corner. As in Room 6, many bones were found up against the sides of the room, particularly in the southeast corner.

Room 3 is accessible only through Room 6. This room was poorly preserved and the walls difficult to isolate. An upper and a lower floor were found, both of beaten earth and unplastered, with approximately 5 cm of loosely consolidated fill between them. On both floors lay the same powdery white residue that was on the floors of Rooms 2 and 5. In addition, some brown organic material with yellow specks in it was recovered from the lower floor. Once again, a large quantity of bones lay up against the walls of the room and in the corners, including considerable numbers of sheep/goat ribs and mandibles. Details of wall plastering could not be determined because of poor wall preservation. There may have been a door in the east wall of Room 3 providing access into Room 4, but again, the poor preservation of the east wall made it impossible to be sure of this doorway's existence.

Room 4, the last room of this complex, was poorly preserved. The only floor found in this room lay about 20 cm higher than the floors of any of the other rooms. A white, powdery residue was found on this floor, identical to that found on the floors of Rooms 2, 3, 5. Traces of fine, chaff-tempered mud plaster were found on both the floor and the walls. Since the north and south walls of Room 4 abut against but do not bond with the east wall of Room 3, Room 4 may be a slightly later addition.

Taken as a whole, these five rooms form a self-contained unit with interconnecting doorways and walls that are bonded at the corners (except for Room 4). The doorways are all between 36 and 40 cm wide, except for the doorway between Rooms 6 and 3, which, being only 28 cm wide, seems hardly wide enough for a human being to have maneuvered through. Internal doorways have thresholds ranging from 13 to 25 cm above the room floors. These relatively high thresholds may account for some of the difficulty in locating doorways in walls preserved to only two or three courses in other rooms of Period VIIB. The outside doorway between Room 6 and Courtyard 23 has a threshold only 8 cm high.

Approximately 80 complete bricks were measured in the process of taking down the walls of this five-room complex. All bricks examined were thumb-impressed, most of them laid so that the thumb impressions were on the top sides of the bricks (fig. 6.10). Brick sizes are given in appendix A. Individual brick lengths varied greatly, from 11 to 96 cm. Lower wall courses tended to have a higher percentage of the longer bricks. Generally the room walls extended one course, or about 10–15 cm below the lowest floor of the

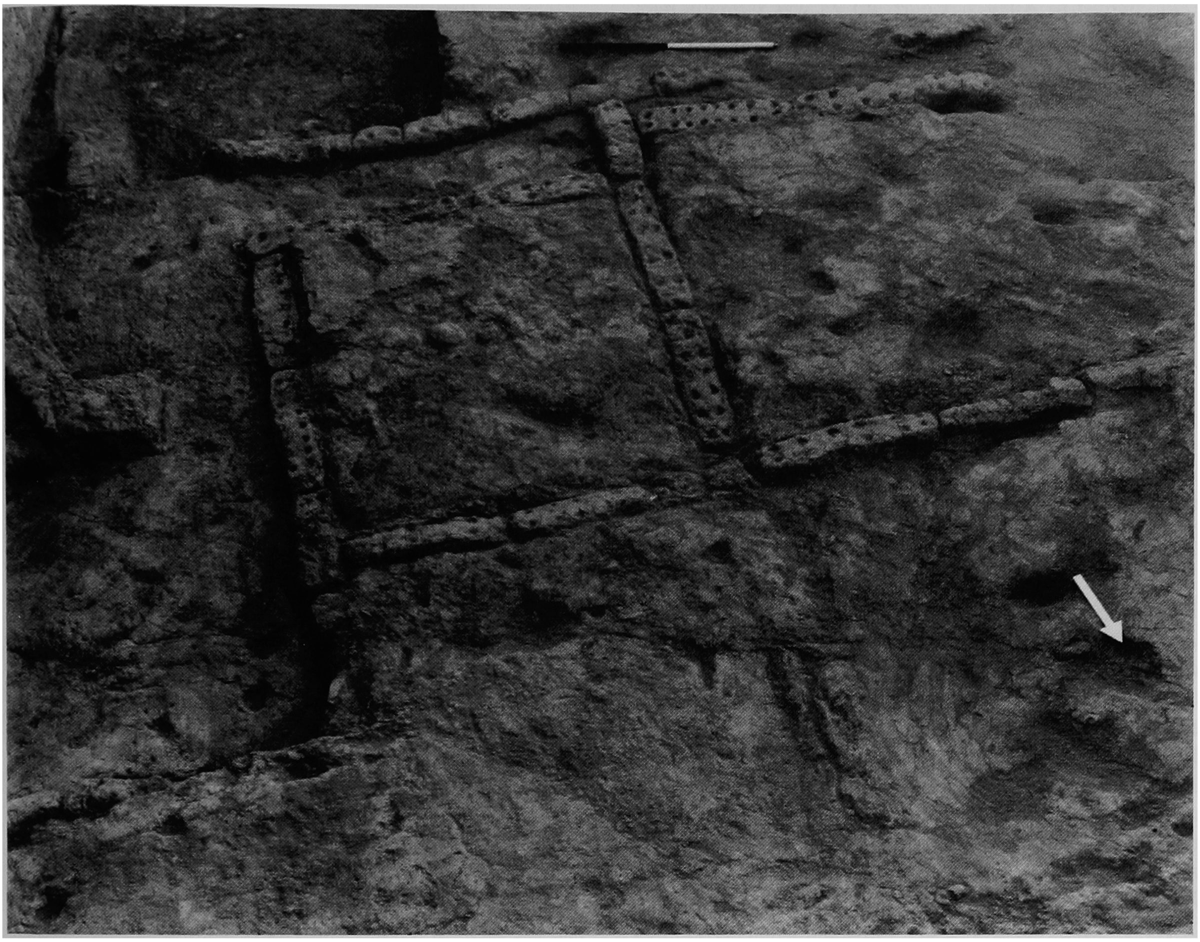


Figure 6.10. Architecture of Period VIIB.2, Trench C, with lowest course of thumb-impressed bricks exposed; viewed from the north.

room, with the bottom course resting directly on hard-packed earth of the bricky fill of Phase 3.

The other northern complex (Rooms 8, 9, 21) is roughly contemporary with Rooms 2–6, for the outside surface in Alley 7 runs up against the base of both the east wall of Room 6 and the west wall of Room 8. However, Rooms 8, 9, 21 clearly constitute a separate, detached complex with an alignment different from that of Rooms 2–6. Room 8 is the most completely exposed and the best preserved of the rooms of this second northern complex. Traces of fine wall plaster and floor plaster were found in this room. The fill of the room was entirely soft and ashy. On the floor was the same powdery white substance found in Rooms 2–5, as well as the same brown organic material with yellow specks in it that appeared on the floor of Room 3. In addition, several bones of *Bos*, a mortar, and an unfired green clay bowl with a concave base were found in situ on the floor of Room 8.

Features 9 and 21 are probably rooms, too, but such a small portion of them was exposed that this could not be shown with certainty. What appears to be the south wall of Room 21 extends along the north edge of Trench CDE, but the CDE wall does not align well with the west walls of Rooms 9 and 21, and it is not certain that these walls join to form a room. Part of the difficulty here is that walls running close to and parallel with major balks are difficult to isolate, and if they run into a balk, it is often impossible to locate the face nearest the balk and determine the exact alignment of the wall. This was the difficulty with Rooms 9 and 21, so that in the end the alignment of their walls as shown in figure 6.8 must be considered somewhat tentative.

Alley 7, the narrow space between the two northern complexes, became a favorite dumping area during Phase 2. The loose, ashy fill in this area was filled with sherds of Chaff-Tempered Coarse Ware pottery, bones of sheep/goats and cattle, and a considerable quantity of brown organic material that may be the remains of dung. In addition, various other types of artifacts had been discarded in this alley, including a stone mortar, four phallus-shaped stone pestles, a spherically shaped pounding stone with red ochre on it, a complete chlorite bowl (fig. 7.20:a), a fragment from another chlorite bowl, and a shell pendant.

In contrast to Alley 7, Courtyard 23 was virtually bare of artifacts. Only a few sherds, one flint blade, and a bone awl were found lying directly on its surface. The courtyard surface was of beaten earth which, over the period of its use in Phase 2, built up many layers of thin, laminated surfaces that tend to merge and then separate again in different areas of the courtyard. Individual layers were almost impossible to isolate, especially since there was no accumulation of fill between any two layers. The surface of Courtyard 23 slopes up to the north along the west side of Rooms 2–6, following the slope of the mound at that time, and is fully 1.2 m higher at the north end of Trench C (C.71.T6.1.8) than it is at the south end (fig. 6.11).

Feature 35 is a small hearth 40 cm in diameter and about 8 cm deep that lies just to the north of Rooms 2–6 and runs into the north balk of Trench C. This hearth is associated with the occupation of the northern room complexes, and it may have contributed to the continuing buildup of the ash dump (C.71.T7.2) in the southwest corner of Trench C during Phase 2.

The Southern Room Complexes

On the south side of Courtyard 23 and east of Rooms 10b–20, which continue in use from Phase 4, a new group of rooms is built in Phase 2. The west walls of new Rooms 31, 33, and 34 abut directly against the east walls of Rooms 13, 17, and 20, so that the alley that had separated the east side and west side room complexes of Trench D in Phases 4–6 now disappears. Unfortunately, the walls of most of these new Phase 2 rooms in this area were missed in excavation and only discovered later in the east balk of Trench D. Portions of the east wall of Rooms 30 and 32 were recovered in Trench CDE, but most of the wall alignments, represented by dashed lines on figure 6.8, are purely hypothetical except where they meet the east balk of Trench D. The only other trace found of Rooms 30–34 was a small section of green floor plaster in the northwest corner of Room 31.

The only east side room recovered in its entirety during excavation was Room 29. Since the north and west walls of this room abut against rather than bond with the room's east and south walls, it is possible that this room is a slightly later addition to room complex 30–34. The interior dimensions of Room 29 are 1.6 m north-south by 1.8 m east-west, or 2.88 m^2 The chaff-tempered mud plaster on the inside face of Room 29's south wall is fully 6–8 cm thick. This unusual thickness is probably due to this face originally being an outside face. By way of contrast, the plaster on the other side of this wall, which is the inside face of the north wall of Room 31, is only about 2 cm thick at the maximum.

The other new complex south of Courtyard 23 consists of Rooms 25–28. The walls of these four rooms, although better preserved and easier to isolate than the Phase 2 walls on the east side of Trench D, only survive to a height of two to four courses (20 to 40 cm). No doorways were found, although there is a wide opening between Rooms 25 and 27. The interior dimensions of the four rooms are as follows:

	Dimensions		
Room	*N-S*	*E-W*	
25	1.35 ×	1.60	= 2.16 m^2
26	1.25 ×	1.42	= 1.78 m^2
27	1.08 ×	1.80	= 1.94 m^2
28	1.08 ×	1.48	= 1.60 m^2

These four rooms were built directly over the poorly consolidated, ashy fill that had been accumulating in this area since Phase 6. Like the walls of the northern complexes, the walls of these rooms extended about one course below the inside floor levels, with the bottom course being laid in a shallow foundation trench dug into the underlying ashy fill or on a layer of packed mud mortar. All walls of Rooms 25–28 (as well as Room 29) are built of brown, hand-molded, loaf-shaped, thumb-impressed bricks, with the thumb impressions on the top sides of the bricks. The corners of all four rooms are bonded, so that the rooms must have been built as a single unit.

The floors of the rooms are about 60 cm higher than the floors of Rooms 10b–13 directly to the south, which gives an indication of how much ashy fill had accumulated in this area and how steep the slope of the mound had become here. Room 25 has a yellow plaster floor, while Room 26 has a green plaster floor. The walls are covered with thick coats of brownish mud plaster identical in color to the bricks they cover. The chaff-tempered mud plaster on the outside faces of the walls is even thicker: on the outside face of the east wall of Room 26 it is 12 cm thick at the base of the wall, probably because this is where the wall would have had the greatest tendency to erode.

At some point during Phase 2, but after the building of the new northern and southern room complexes, Platforming 24 and Wall 22 were built, apparently to stabilize and hold back the loose ash deposits still accumulating on the west side of Trenches C and D (cf. D.68.T1.9 and C.71.T7.2 in figure 6.2). Platforming 24, laid up against the west wall of Room 25, lies directly over unconsolidated ashy fill and consists of packed mud mortar overlain by two courses of bricks laid in rows. Within the packed mud was found a stone mortar covered with red ochre. Wall 22, in the southwest corner of Trench C, is a low, U-shaped wall apparently constructed to hold back the thick ash deposit that continued to build up against its west face during Phase 2. The wall is built directly over ashy fill. It is two courses high and 45–50 cm wide, wider than any of the room walls of Period VIIB. The wall is constructed with the same type of thumb-impressed bricks as the rooms of Phase 2, with the thumb impressions on the top side of the bricks.

Overall, settlement density in Phase 2, based on interior space, continues at approximately the same levels as in Phases 6–4. If one does not include Rooms 30–34, whose exact dimensions are not known, fully 41.28 m^2 of the total 202.7 m^2 exposed, or 20.4 percent, consists of interior space. If a rough estimate of the interior areas of Rooms 30–34 is

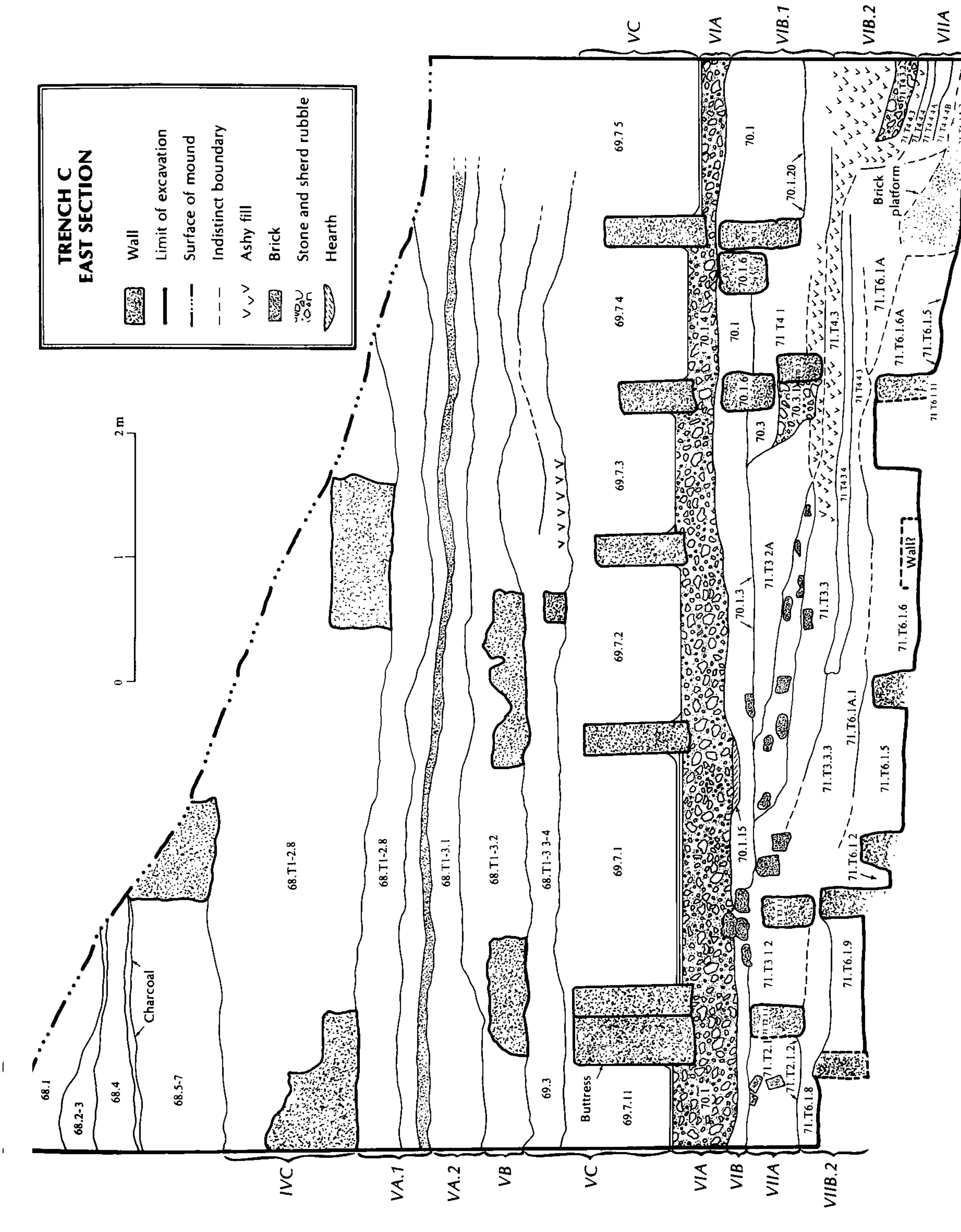


Figure 6.11. Trench C, east section.

added—and this is probably a more reasonable way of estimating the actual overall density—then approximately 53 m^2 of the total 202.7 m^2 exposed, or 26.1 percent, consists of interior space.

Period VIIB, Phase 1 Features

Area of Exposure (fig. 6.8)

90.0 m^2 in Trench C
40.0 m^2 in Trench D
25.0 m^2 in Trench CDE

155.0 m^2 total area

Phase 1, like Phase 3, is a nonoccupational phase. It consists of the leveling and brick infilling of the Phase 2 rooms of northern Trench D and a large brick platform which fills in the area of Phase 2's Courtyard 23 (see fig. 6.8). This Phase 1 leveling and platforming evidently was undertaken out of a need for a stable, level base on which to build the rooms of Period VIIA (fig. 6.12). In the northern half of Trench C this was achieved by knocking down and filling in the VIIB.2 rooms. Here the walls of the VIIA rooms directly overlie the VIIB.2 wall stubs. However, raising the surface of Courtyard 23 to the same height as the leveled VIIB.2 rooms required the building of a brick platform (C.71.T6.1A.2). In this way, the level area on which VIIA rooms could be built was extended further to the south (fig. 6.11).

The Phase 1 brick platform rests directly on the uppermost surface of Courtyard 23. At its western edge, which is clearly defined, it is built up against the low retaining Wall 22 of Phase 2. At its north edge, it survives to a height of four courses. In areas where bricks of the platform were better preserved, two types of bricks were observed: light brown bricks with minimal amounts of chaff temper and dark brown bricks with large amounts of chaff temper. This mixture implies that the platform may have been built with bricks robbed from two different older structures that had been constructed with different types of bricks.

All complete bricks in the platform are hand-molded and thumb-impressed, with the bricks always laid with thumb impressions on the top side. Four complete brick sizes were obtained in dismantling the platform:

Brick Size	*Thumb Impressions*
40 × 19 × 19 cm	4 pairs
43 × 18 × 10 cm	4 pairs
43 × 18 × 19 cm	4 pairs
45 × 21 × 11 cm	4 pairs

PERIOD VIIA SETTLEMENT

Area of Exposure

12.0 m^2 in Trench B
4.7 m^2 in Trench BW
90.0 m^2 in Trench C
2.7 m^2 in Trench CW
30.5 m^2 in Trench D
17.2 m^2 in Trench CDE

157.1 m^2 total area

Feature Numbers (fig. 6.12)

Courtyard 1	C.70.T5.1.2, C.71.T2.1.2, C.71.T5.1.2
Room 2	C.71.T3.1.2
Room 3	C.71.T3.1.3
Room 4	C.71.T3.1.4
Room 5	C.71.T3.1.5
Room 6	C.71.T3.1.6
Room 7	C.71.T3.3.2
Room 8	C.71.T3.3.1
Room 9	C.71.T4.4.1
Room 10	C.71.T4.3.1, C.71.T4.4.2
Room 11	C.70.T7.4.1
Room 12	C.70.T6.6.1
Room 13	C.70.T6.6.3
Hearth 14	C.70.T6.6.5
Sloping Mud Plaster 15	C.70.T7.5.1A
Green Clay Floor 16	C.70.T5.5.1, C.70.T6.6.4, C.70.T7.5.1, C.71.T4.4.4, C.71.T4.4.4A, C.71.T4.4B
Wall 17	C.71.T5.1.1
Rampway 18	No feature number given during excavation

Period VIIA, the last architectural subperiod of Period VII, continues the Period VII tradition of "beehive"-type clusters of small, contiguous rooms whose size, shape, means of access, and artifactual contents (or lack thereof) provide disappointingly few clues as to function or functional differentiation. There are, however, certain new features introduced in Period VIIA that are worthy of note. First, the layout now includes what appears to be a large central courtyard (Courtyard 1) extending from the northern end of Trench C northward toward the unexcavated center of the mound. While a major central courtyard such as this may have existed in earlier phases or subperiods (perhaps to the north of Wall 1 in Phases VIIB.6–2), there is no direct evidence of it within the excavated areas. Courtyard 1 has a well-defined southern boundary formed by the continuous facade of the northern rooms of the Period VIIA complex stretching across Trench C, a facade broken at only one point by Rampway 18, which appears to have been the route of access to Courtyard 1 from the south.

Another feature that appears for the first time in VIIA is an interior hearth, Hearth 14 in Room 13. All other hearths from earlier phases of Period VII are outside hearths.

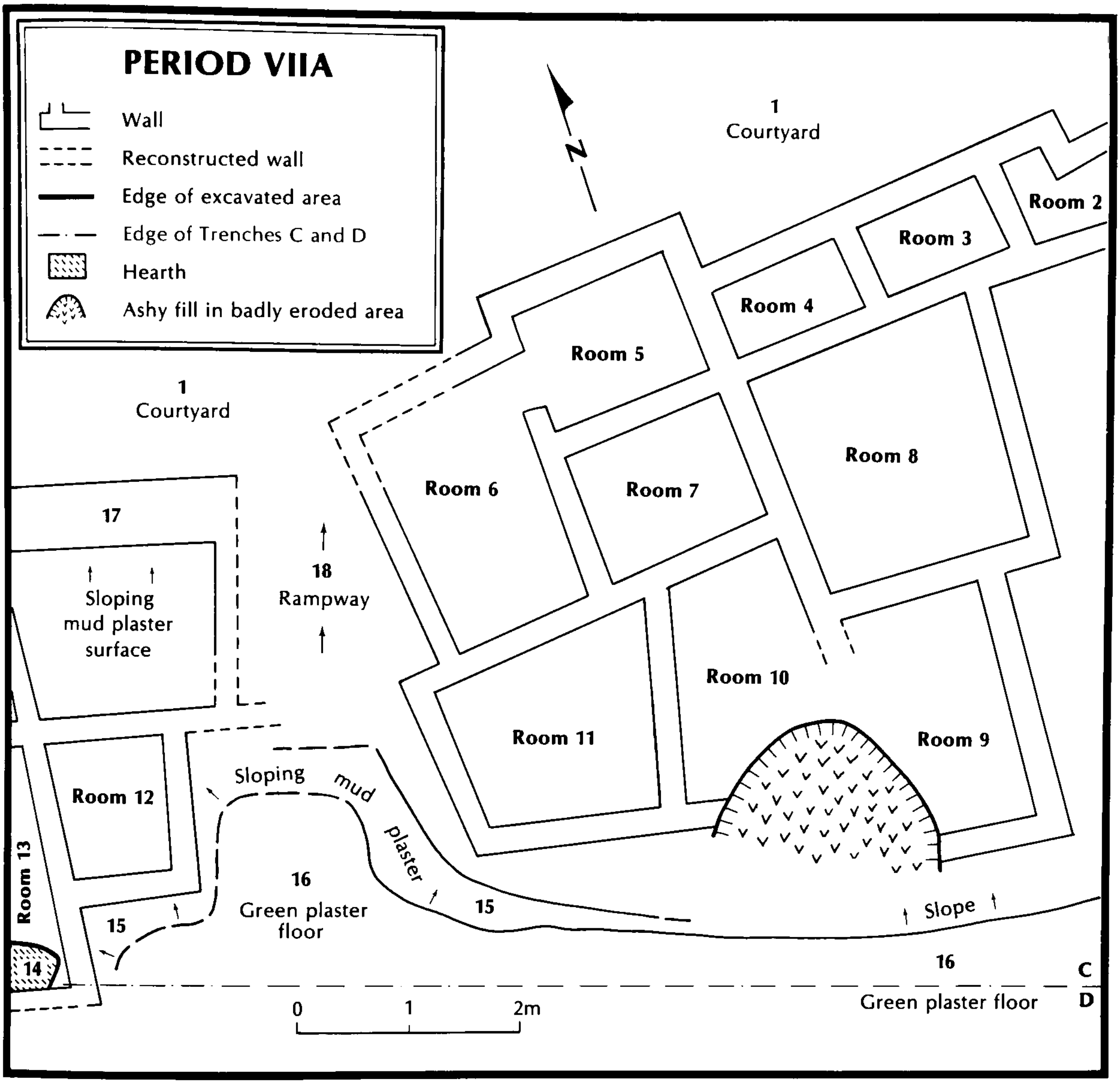


Figure 6.12. Plan of Period VIIA.

Finally, the room complex of Period VIIA shows a construction technique that may also have been utilized in earlier architectural phases of VII, but whose use is not so immediately obvious or clearly arguable in those phases. A term that could be used to describe this constructional phenomenon is "offset corner bonding." At first glance the VIIA room complex looks haphazard, almost careless in its layout. Corners are not square; room walls are not parallel, which creates peculiar, asymmetrical room shapes; and the side walls of most rooms do not align with the side walls of adjoining rooms at the corners, as they would in a normal grid pattern.

To attribute this unusual layout to haste or sloppiness on the part of the builders is probably to underestimate their common sense and practical abilities. There appears to be an excellent structural rationale behind so asymmetrical a layout. The basic problem involved is that the walls of this period are so thin: 20–25 cm wide, or the width of a single brick plus thick mud plaster on the interior and exterior faces. Such thin walls must have been very susceptible to cracking and buckling over time, especially if built to a height of 2 m or more and subjected to the weight of roof beams and roof plaster. In Periods VI and VC the problem of providing additional wall strength to 25-cm-wide, sun-dried mud brick walls was solved by adding buttresses at corners and at strategic points along the side walls of longer rooms. An alternative solution to this problem of wall strength would simply have been to make the walls themselves thicker, as was done in later periods on the site. Sun-dried mud brick house walls in the local villages today, with wall heights of 3–4 m, are usually three courses or about 75 cm thick. However, the builders of VIIA, and to a certain extent those of VIIB, chose a third alternative: offset corner bonding. By intentionally departing from a simple grid pattern—creating a stepped-out wall line along exterior facades and offsetting the alignments of interior walls—the builders were able to provide added wall support for individual rooms by creating wall bondings in the middle of walls, where they provided greater structural support than they would have at the corners of the rooms. Figure 6.13 demonstrates how—with the exception of Rooms 4 and 12, which are the two smallest rooms of the complex—each room, when considered as an independent unit, has at least one structurally supportive wall bonding along the middle of a side wall in addition to its corner wall bondings. The effect is to create a bonded buttress along longer side walls that are in need of additional support. As one would predict, Room 8, the largest room in the complex and the room with the longest side walls, has three supportive wall bondings along its side walls, more than any other single room.

Another way of showing how the Period VIIA builders used offset corner bonding to maximize the support for the walls of each room is to count the number of bonded corners created by the asymmetrical layout versus the number of bonded corners that would have been created by laying out the same number of rooms with roughly the same amount of interior space in a normal grid pattern. The basic premise here is that each new bonded corner in a structure provides a significant amount of additional support against lateral stresses, particularly for walls that are so thin. A bonded corner can be defined as the point at which two or more walls meet and are bonded. Figure 6.14 shows the layout of VIIA Rooms 3–11 compared to the same rooms laid out on a regular grid pattern. The grid pattern provides a total of 17 corners, whereas the VIIA layout has 25 corners, or almost 50 percent more than the grid pattern. This contrast between the two types of layouts can be enumerated in another way. Any room corner can be said to bond in two, three, or four directions. Each direction of bonding provides further structural strength for all the walls involved. If one

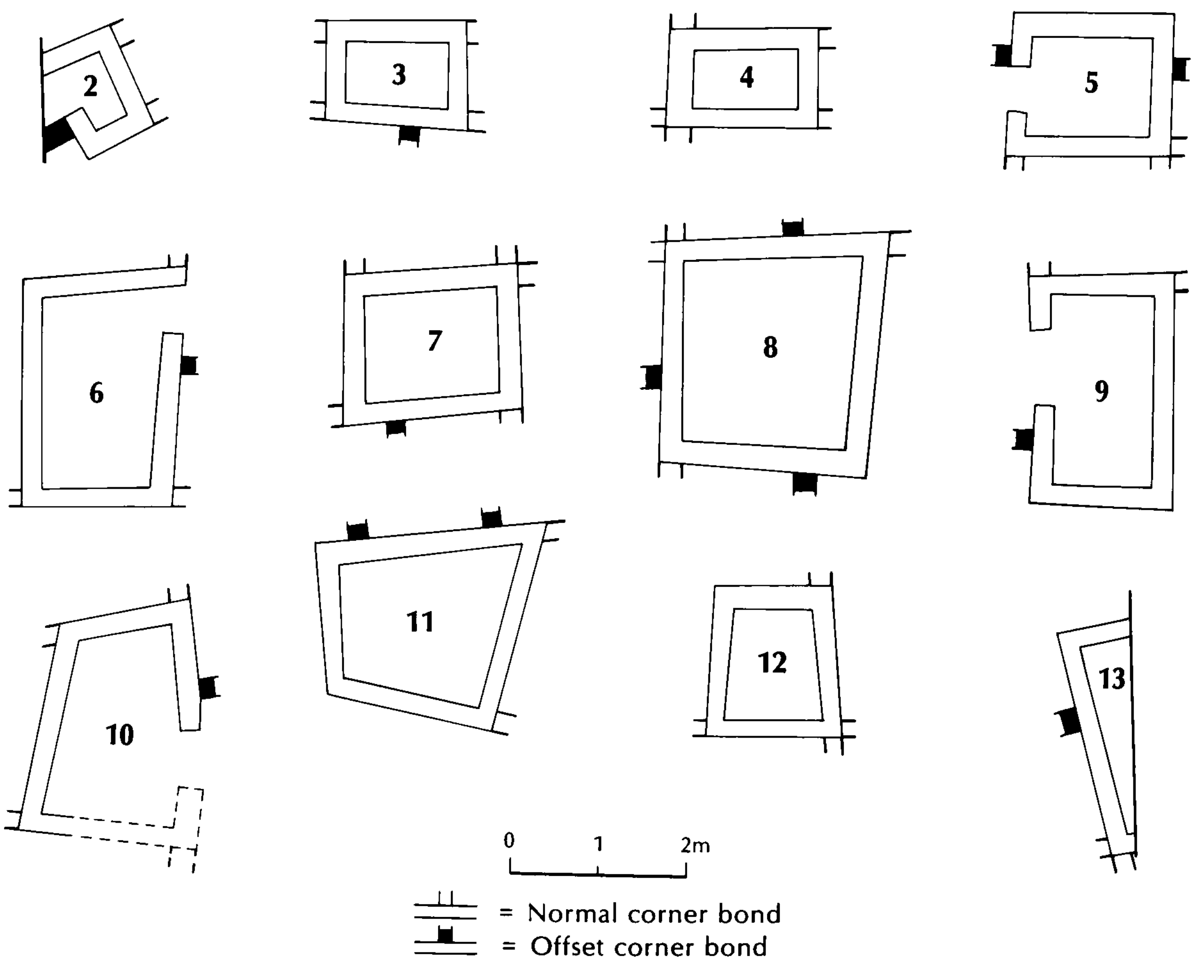


Figure 6.13. Frequency of offset corner bonding in Period VIIA rooms.

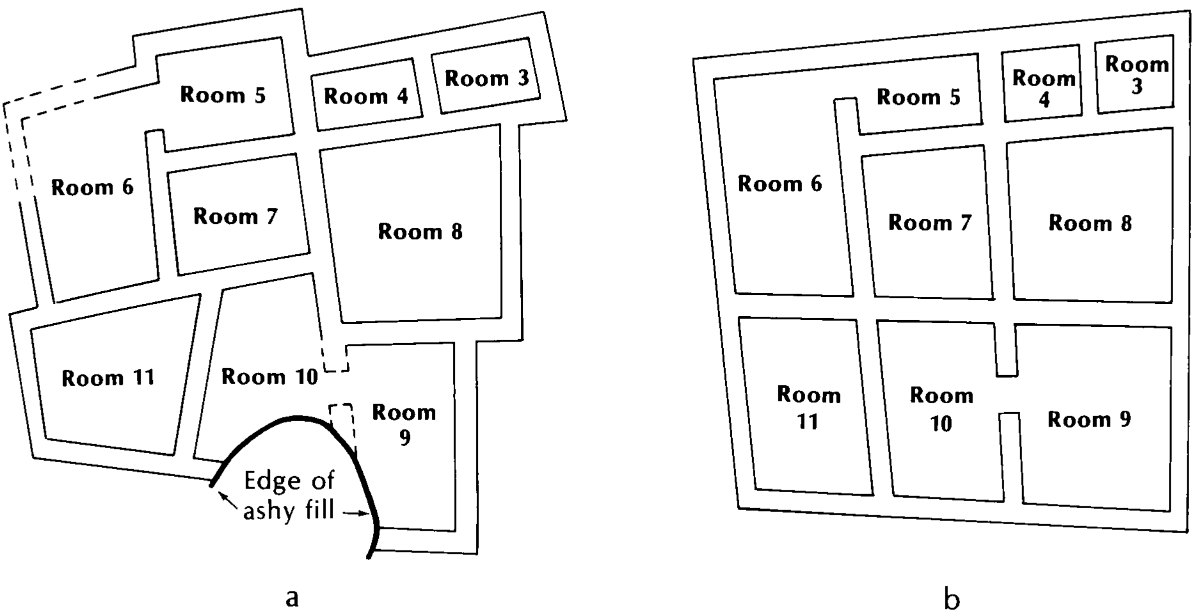


Figure 6.14. Comparison of Period VIIA offset corners (a) with hypothetical grid construction (b).

adds up the number of directions bonded at each corner, the VIIA complex is bonded in a total of 65 directions. The use of offset corner bonding in a somewhat more limited manner also can be observed in the layout of the VIIB.2,4,5, and 6 room complexes, for here, too, stepped exterior wall facades and unaligned interior walls are fairly common.

Period VIIA Features

Courtyard 1 extends across the entire north end of Trench C (fig. 6.12). The surface of the courtyard consists of thin, laminated layers of water-laid silt that slope gradually down to the south and up against Wall 17 and the north facade of Rooms 2–6 (fig. 6.11). In some areas these layers were covered with the white impressions of decayed chaff. The fallen bricks provide an indirect indication of what may have existed in the center of the courtyard or on the courtyard's north side during VIIA. Many of these fallen bricks survived intact and can be seen in the west, north, and east sections of Trench C (figs. 6.2, 6.11). To the south they were found lying up against the north face of Wall 17 and the north facade of Rooms 2–6. What is distinctive about these bricks is that they are yellowish in color, lack thumb impressions (at least on all bricks examined), and average only 8 cm in height. This contrasts with the bricks in the walls of Rooms 2–12, which are dark brown and thumb-impressed and average 10–12 cm in height. In the northeast corner of Trench C whole segments of walls were found that had collapsed onto their sides almost intact, so that bricks in successive courses lay stacked up against each other like fallen dominoes, with the grey, chaff-tempered mud mortar still intact between the bricks. The sides of some of the bricks were caked with charcoal and soot, as if from burning. No complete bricks were measured, but four of the bricks were recorded as 8 cm in height, and one of these four was 30 cm long. Another brick was noted as being 55 cm long and 9 cm in height. In the end, all that can be deduced from these distinctive yellow bricks is that during Period VIIA there was a building in Courtyard 1 closer to the center of the mound, a building that was constructed with a totally different type of hand-molded, sun-dried mud brick than was used for Rooms 2–12 to the south, and that collapsed at some point before the end of VIIA.

The walls of Rooms 2–11 and 12–13 were taken down brick by brick and were found to be bonded to each other at all the corners, so that the complex must have been constructed as a single unit. The interior dimensions of the ten complete rooms exposed are as follows:

	Dimensions					
Room	*N-S*		*E-W*		
3	0.70	×	1.20	=	0.84 m^2
4	0.68	×	1.22	=	0.83 m^2
5	1.15	×	1.50	=	1.73 m^2
6	2.22	×	1.40	=	3.11 m^2
7	1.20	×	1.55	=	1.86 m^2
8	2.20	×	2.02	=	4.44 m^2
9	2.18	×	~1.25	=	~2.73 m^2
10	~2.2	×	~1.4	=	~3.08 m^2
11	1.60	×	1.84	=	2.94 m^2
12	1.25	×	1.02	=	1.28 m^2

Room 2 is a partial room extending into the east balk of Trench C. Because of a stepped-in north wall, Room 2 is only 50 cm wide at one point. No floor or doorways were found in this room, and the interior walls were covered with a rough, chaff-tempered mud plaster. Rooms 3 and 4 are almost as small. Instead of floors, these two rooms have a paving of neatly laid Chaff-Tempered Coarse Ware sherds and fist-sized rocks, over which were found the white impressions of decayed straw or chaff. No doorways were found in the walls of these rooms. Like Room 2, Rooms 3 and 4 have only the roughest chaff-tempered mud plaster on their interior walls. In the southwest corner of Room 4 several sheep/goat teeth were recovered. Given the small dimensions of Rooms 2–4 and the absence of anything in them except the decayed remains of straw and/or chaff, it is tempting to see them as small storage rooms for grain or straw.

Room 5 lacks any discernible floor. A sheep/goat mandible was found in the fill of this room. A gap in the west wall of the room appears to serve as a doorway into Room 6, although this gap may be simply the result of poor wall preservation. None of the room's walls survived to a height of more than one course.

Patches of a rough floor were found in Room 6, but no artifacts were recovered from this floor. The northwest corner of Room 6 was missed in excavation and has been reconstructed on figure 6.12 with dashed lines. Rooms 7 and 8 have no discernible floors or doorways, and only the roughest chaff-tempered mud wall plaster. The fill of these two rooms was loose and unconsolidated, in contrast to the bricky outside fill east of Room 8.

In contrast to Rooms 2–8, Rooms 9 and 10 do have finely plastered floors and walls. This plaster consists of fine yellowish clay with some chaff inclusions. The floor plaster is identical to the wall plaster and contiguous with it, sloping up to meet it at the sides and corners. Both these rooms underwent at least one major replastering during their period of use. Unfortunately, no artifacts were to be found on the floors of either of these rooms. There may have been a doorway between the rooms, but the west wall of Room 9 and much of the south end of both rooms were eroded away during Period VIB.2 with the deposition of ash C.71.T4.3 (fig. 6.11). The fill of both rooms is bricky.

Patches of a plaster floor were found in Room 11, but no good wall plaster or doorways survived. The fill of this room consisted entirely of bricks and brick fragments, in the midst of which were recovered several fine artifacts: an alabaster bowl, an agate pendant, and a reconstructible Chaff-Tempered Coarse Ware vessel.

Room 12 has a rough mud plaster floor, but no discernible doorways. It is not at all clear that the area between Room 12 and Wall 17 functioned as a room, for unlike any other VIIA rooms, the mud plaster at floor level here is not level, but slopes steeply up to the north against Wall 17.

Only a small portion of Room 13 was exposed, but enough to find traces of wall and floor plaster, as well as Period VIIA's only interior hearth. Semicircular Hearth 14 is sunk a few centimeters into the floor in the southeast corner of the room and is lined with several layers of fire-reddened mud plaster.

South of Rooms 9–13 is thick Green Clay Floor 16, which runs southward into Trench D. The curious aspect of this floor is that it is stepped down 40 to 50 cm below the floor levels of Rooms 9–13, but is clearly contemporary with them. Green Clay Floor 16 runs into a steeply pitched embankment 40–50 cm high that runs along the south edge of Rooms 9–13 and is covered by a thick white lime plaster (Sloping Mud Plaster 15) that slopes up from the level of Green Clay Floor 16 to the level of Rooms 9–13. The inside of this plastered embankment is made up of the brick platform from Period VIIB.1 upon which Rooms 9–11 were built.

Rampway 18 consists of a rough mud plaster surface sloping gradually up to the north into Courtyard 1. It provides the only access to the courtyard from the area of Green Clay Floor 16. The area along Rampway 18 was full of bricky debris.

The overall preservation of the Period VIIA room complex is poor. In several areas walls could not be traced or had been eroded away. Most walls survive to a height of only one or two courses. Thus, there very possibly were doorways within the complex, but the surviving walls are simply too low for any thresholds to have been noted.

Certain constructional details became clear only in taking down the walls of the complex. First, chaff-tempered mud wall plaster is especially thick on the exterior faces of outside walls in the complex. For example, the plaster on the outside face of the east wall of Room 8 is 1.5 cm thick, and that on the outside face of the north walls of Rooms 2–6 is 2–3 cm thick. Secondly, there is thick chaff-tempered mud mortar between all bricks and all wall courses in the complex. It was thought upon first exposing the rooms that the walls were of pisé or packed mud rather than brick. Only in taking the walls down did it become evident that the walls were built entirely of hand-molded, sun-dried, thumb-impressed bricks of the same general type used in all the earlier Period VII complexes. As in earlier room complexes, the bricks of the VIIA rooms are laid with the thumb impressions always on the top sides of the bricks. Ten full bricks were measured; their dimensions are shown in appendix A. Measured brick lengths varied from 34 to 60 cm.

Small test-trenching operations to the north and west of the main VIIA exposure revealed some fragmentary architectural remains that appear stratigraphically to belong to Period VIIA, but these were never linked up with the main VIIA exposure in excavation. In the northeast corner of Trench B, a small portion of a room was unearthed. The VIIA remains in this area directly underlie Period VC deposits and show that by the end of VIIA the center of the mound had already built up to a height of at least 6 m above virgin soil.

As can be seen from figure 6.4, VIIA deposits do not extend nearly as far south as those of earlier phases of Period VII, and no rooms were found south of Trench C. The overall settlement density of VIIA is somewhat less than in earlier phases: only 24.20 m^2, or 15.4 percent of the total 157.1 m^2 excavated, consists of interior space.

PERIOD VIB SETTLEMENT

The *area of exposure* of the Period VIB excavations (fig. 6.15) varies between the two phases and will be discussed under the individual phase descriptions. While the distinction between Period VI and Period VII is based primarily on a change in ceramics—a lighter, less dense coarse ware than in Period VII and the first appearance of monochrome- and bichrome-painted fine ware (see ch. 4)—there are also significant changes in construction techniques and architectural styles beginning in Period VIB (fig. 6.15: features 1 -36). The Period VII tradition of brick platforming and paving as leveling devices continues in VIB, but in addition one finds for the first time in VIB the use of rubble as a supplementary means of leveling off sloping areas and filling in depressions and pits. This rubble consists of fist-sized rocks of a type that litters the lower talus slopes of the alluvial fans at the edges of the Soghun valley. The nearest rock-strewn alluvial fans lie between 1 and 2 km from Yahya and would have to have been transported from at least this distance. Many of the rocks appear cracked or broken, but this breakage probably can be attributed to natural conditions: alternate heating and cooling of the rocks as they lay exposed on the alluvial fans caused calcium carbonate and gypsum deposits along microfractures to expand and contract until the rocks cracked along these microfractures.

In addition to these fist-sized rocks, the rubble for leveling has in it occasional small artifacts, considerable quantities of bone, and tremendous numbers of sherds, the vast majority of which are of the Chaff-Tempered Coarse Ware so common in this period.

The other major change introduced in Period VIB is a new house type distinctive for its extensive use of external corner buttressing and side wall buttressing, and for the raised interior corner hearths found in the larger rooms. The VIB example of this new house type is incomplete (Rooms 15 and 16 in fig. 6.15), but a fairly complete ground plan of this type of house was exposed in VC levels (fig. 6.23).

What is curious about VIB is that after so much initial leveling and brick paving construction, few structures were built within the exposed area, especially as compared to the dense clusters of rooms on this part of the site in VIIA and VIIB. In the earlier of the two phases (VIB.2) there are only Rooms 15 and 16 (part of a single house); in VIB.1 a series of poorly constructed, perhaps unroofed structures (Rooms 31, 33, 34) is added just to the north of Rooms 15 and 16. These rooms probably served as animal pens or outbuildings associated with Rooms 15 and 16.

Period VIB, Phase 2 Features

Area of Exposure

8.8 m^2 in Trench B
13.4 m^2 in Trench BW
90.0 m^2 in Trench C
4.4 m^2 in Trench CW
83.5 m^2 in Trench D
30.0 m^2 in Trench CDE

230.1 m^2 total area

Feature Numbers (fig. 6.15)

Wall 1	B.73.T1.3.9, C.69.7.21, C.70.1.22
Upper Brick Paving 2	C.70.1.16, C.70.T6.6.2
Rubble Concentration 2a	C.69.7.20
Wall 3	C.69.7.22
Wall 4	C.70.1.12A
Wall 5	C.70.T6.5.4
Wall 6	C.70.T6.5.2, C.70.T6.5.6
Wall 7	C.70.T6.5.3
Wall 8	C.70.T6.5.5
Rubble Fill 9	C.70.T6.5.1
Wall 10	C.70.T5.3.1, D.69.4.32
Lower Brick Paving 11	C.70.T7.2.1, D.68.5, D.68.T1.7
Wall 13	D.69.4.18, D.69.4.28, CDE.73.2.20, CDE.73.3.13
Hearth 14	No feature number given during excavation
Room 15	D.69.4.31
Room 16	CDE.73.3.10
Wall 17	CDE.73.2.15
Rubble Fill 18	C.71.T4.3.2, D.69.5.1, D.69.5.2, D.69.5.3, D.69.5.4, CDE.73.2.18
Pit 19	D.68.T1.4.1
Pit 20	CDE.73.S.7
Wall 21	D.69.4.33
Ash 36	C.71.T3.2, C.71.T4.3

The first constructional activity of VIB.2 is the filling in of depressions in Trenches D and CDE with Rubble Fill 18. The composition of this rubble has been described above; it is exactly the same type of rubble that continues in use throughout Periods VIB and VIA. Next, a series of retaining walls is built and brick paving laid down behind them. This brick paving extends for more than 21 m north-south across Trenches B, C, and D. The retaining walls associated with the brick paving are 1, 4, 10, and possibly 5. Two additional alignments of bricks, each two bricks thick, were found amidst the brick paving in Trench D, but were considered too indistinguishable from the surrounding brick paving to be designated as walls by themselves.

Because there is a rather steep slope to the VIB mound surface in this area from northwest to southeast, the brick

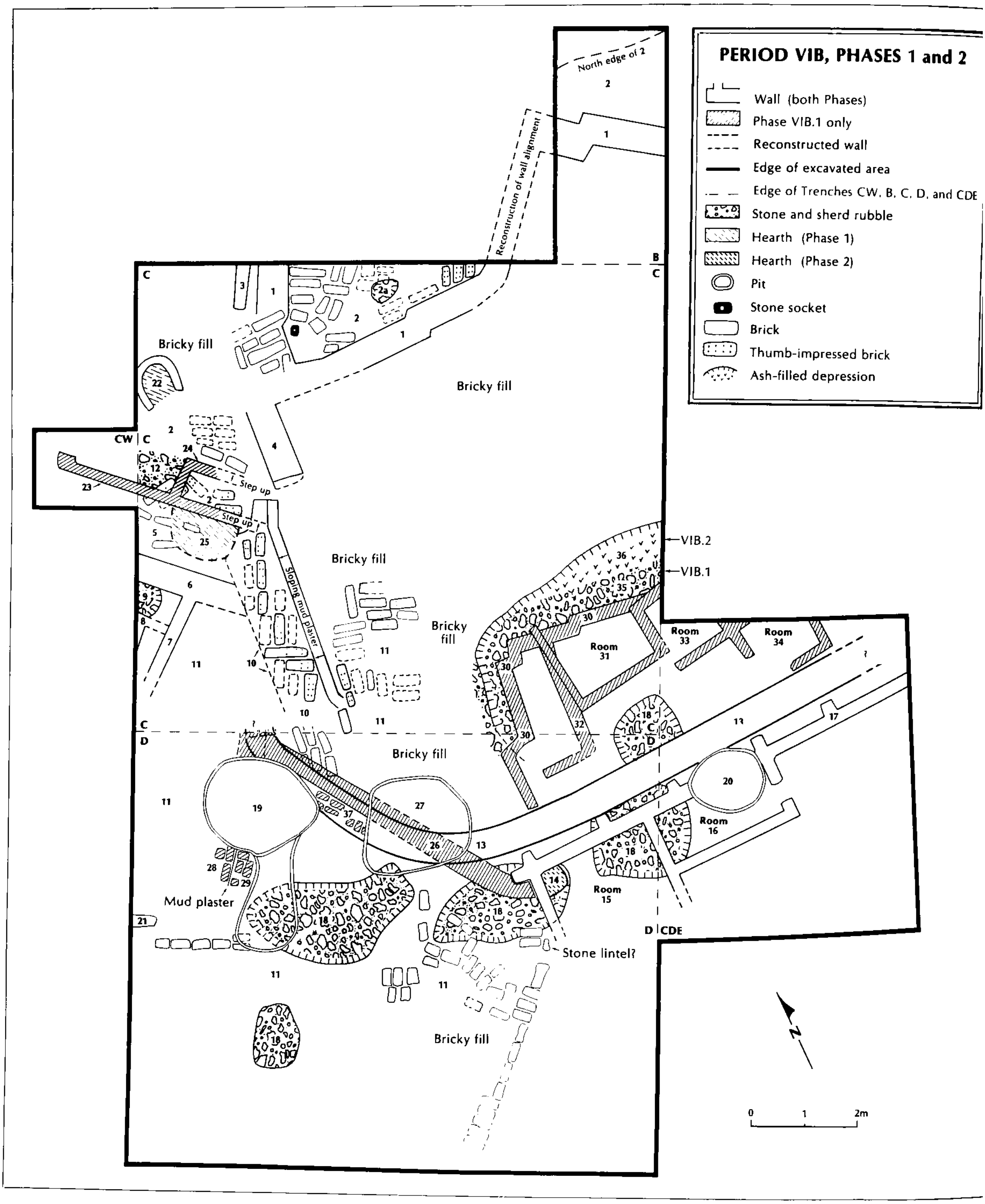


Figure 6.15. Plan of Period VIB.2–1.

paving is divided into an Upper Brick Paving 2 and a Lower Brick Paving 11. The lower paving is between 1.3 and 2 m lower than the upper paving. The transition from the upper area of paving to the lower area of paving lies just to the south and east of Walls 1 and 4, where the dropoff is most precipitous (fig. 6.3). As can be seen from figure 6.15, Brick Pavings 2 and 11 are poorly preserved and in many areas were noted during excavation only as "bricky fill." Even in better preserved areas, individual bricks were difficult to isolate. Identifiable bricks are drawn in on the plan. No complete brick sizes were recorded, but the bricks are all thumb-impressed on their top sides and hand-molded, and they vary greatly in length. They are laid down in a rather haphazard pattern, with half bricks or brick fragments being used to fill in certain areas. The upper and lower brick pavings vary from one to two courses in thickness. The exposed upper surface of the brick pavings does not appear to have been plastered over at all, which may partially account for the poor preservation of the bricks themselves. Upper Brick Paving 2 does not extend northward beyond the dotted line shown on the north side of Wall 1 in Trench B. North of this line the VIIA deposits rise to a level even with Paving 2 (fig. 6.3), so that Paving 2 and the associated retaining Walls 1, 4, and 5 appear to have been built as a means of extending the level area of the mound southward from a point in Trench B where the VIIA deposits began to slope steeply downward to the south. On the other hand, the original southward extent of Lower Brick Paving 11 is not known, for 11 hits the present mound surface near the south end of Trench D, south of which it has been eroded away.

Brick Pavings 2 and 11 were laid in *after* the construction of retaining Walls 1, 4, and 10. Walls 1 and 4 have a rough, chaff-tempered mud plaster on both faces. Wall 1 survives to a height of three courses, Wall 4 to a height of five courses. It could not be determined during excavation if or how Wall 1 joins up with Wall 4. At its west end Wall 1 curves around to the north and runs into the north balk of Trench C. To the east Wall 1 angles to the north and then turns eastward again in Trench B. The reconstructed section of Wall 1 in the unexcavated area of Trench B is purely hypothetical. It is not clear why Wall 1 has so many turns in it. Possibly the VIIA mound contour that it follows was itself uneven. The eastern two-thirds of Wall 1 appear to have remained exposed through VIA, and during VC a hearth is built up against its still-exposed south face in Trench B (fig. 6.23). Both Walls 1 and 4 were constructed with thumb-impressed, hand-molded, dark grey, chaff-tempered bricks. The bricks tend to be wider at the middle than at the ends and are loaf-shaped in profile. Each course in Walls 1 and 4 consists of combinations of headers and stretchers with the thumb impressions always on the top side. The bricks vary considerably in length, but are unusually long on average, the longest being 90 cm. A full listing of individual brick sizes from these walls will be found in appendix A.

Wall 10 is made with the same type of bricks as Walls 1 and 4, with the thumb impressions once again on the bricks' top sides. The difference is that the bricks in Wall 10 are laid so that they have a slightly different alignment than the wall itself. No good west face was ever found for Wall 10, but its east face is covered with a thick, chaff-tempered mud plaster that slopes down beneath Brick Paving 11 to the east. Wall 10 survived to a height of three courses and was built directly upon the southward sloping VIIA mound surface. Its lowest course where it is cut by Wall 13 is about 25 cm lower than the lowest course at its north end. The lowest course at the north end in turn is approximately 80 cm lower than the lowest course of Wall 4, directly to its north.

Wall 5 may be another retaining wall like Walls 1, 4, and 10, but neither its north nor its south face was well defined during excavation, and it was unclear whether Wall 5 bonded with Wall 10 at its east end.

Lower Brick Paving 11 does not extend beneath Rooms 15 and 16, and both Lower Brick Paving 11 and Rooms 15–16 directly overlie Rubble Fill 18, so that the two rooms probably were built at approximately the same time as the brick paving construction. Room 16's interior dimensions are 1.0×2.32 m, or 2.32 m^2 The east-west dimension of Room 15 is 2.32 m, and the north-south dimension at least 1.4 m, but the total room length north-south is unknown because the south end has eroded away where it meets the present mound surface. Room 15 is definitely larger than Room 16 and has in its northwest corner a raised semicircular hearth (Hearth 14) of a type that was to continue in use through Period VC. The Period VII tradition of "offset corner bonding" (see discussion under Period VIIA, above) gives way here in VIB.2 to a new technique of exterior corner buttressing and side wall buttressing. These exterior buttresses are all bonded with the walls of Rooms 15 and 16 and so give significant additional support against lateral stresses, which must have been substantial in walls less than 25 cm thick.

Both the outside and inside wall faces of Rooms 15 and 16 were provided with a thick, chaff-tempered mud plaster. The inside walls of Room 15 were then covered with a much finer, thinner plaster that curves down to meet the thick, green clay floor plaster. The walls and floor of Room 15 were replastered two, or possibly three, times with this fine plaster. Hearth 14, too, underwent two major replasterings, and there is evidence of heavy burning on each of the hearth's surfaces and the walls above the hearth.

The walls of Rooms 15 and 16 survive to a height of ten courses, and the rooms' floors are well preserved except for a later pit (20) cutting through Room 16. Unfortunately, the rooms' floors yielded few artifacts. The rooms probably were thoroughly cleaned out before the construction of the major VIA walls directly upon the floors of the rooms (fig. 6.16). The function of Wall 17, an eastward extension of the north wall of the rooms, is not clear, but it may have served as the north wall of an enclosed courtyard east of the rooms.

Following the construction of Rooms 15 and 16, curving Wall 13 was built directly north of the rooms. Whether Wall 13 was constructed a few days after Rooms 15–16 or years afterward could not be determined, but clearly it is later. Where it abuts against Rooms 15–16 only its north face is plastered, whereas west of Rooms 15–16 both its north and south faces are plastered with a rough, chaff-tempered mud plaster. At its west end Wall 13 cuts through Lower Brick Paving 11 and stands to a height of only three courses. To the east, where it abuts against Rooms 15–16, it survives to a height of ten courses, or approximately the same height as the walls of Rooms 15–16. The particular function of Wall 13 is not clear, except perhaps as a retaining wall to protect Rooms 15 and 16 from the potential erosional damage of rain runoff flowing down from higher up on the mound.

Both Wall 13 and Rooms 15–16 are constructed with the same type of hand-molded, thumb-impressed mud bricks of varying lengths that are used elsewhere in Period VIB.2. But there is an important distinction in the way they are laid: whereas the bricks in the VIB.2 brick pavings and their associated retaining walls, as well as the bricks in all the walls of Period VII, were laid so that the thumb impressions were on the top sides of the bricks, the bricks of Wall 13 and Rooms 15–16 are laid with the thumb impressions on the *bottom* side of the bricks, facing down. Indeed, Wall 13 and Rooms 15–16 appear to mark an important turning point in this respect, for most of the subsequent walls of VIB.2 and VIB.1 are constructed with the thumb impressions facing downward. By VIA, all walls are being built with downward-facing thumb impressions. Whether this change in the manner of laying bricks improved the cohesion between courses at all is not clear, but it does serve as a useful chronological marker.

Against the north face of Wall 13, and to some extent beneath it, a considerable deposit of ash mixed with bones accumulated during VIB.2. Only the north edge of this ashy fill is shown on figure 6.15 (Ash 36), the rest having been covered over by VIB.1 constructions. No brick paving was found in the area of Ash 36.

Walls 6, 7, and 8, along the west edge of Trench C, and Rubble Fill 9 are probably the latest constructions of VIB.2. Although it was impossible to determine exactly when in Period VIB.2 these walls were built, they most likely were put in near the end of VIB.2, since they seem to serve no function other than providing a solid base for the thick mud plaster floor laid down in this area in VIB.1. None of the three walls is more than one course high. All are laid directly on soft, unconsolidated fill. Walls 7 and 8 are one course wide, while Wall 6 is three courses wide. All three walls are constructed with hand-molded, thumb-impressed bricks; the thumb impressions face downward.

Wall 3 in the northwest corner of Trench C and Wall 21 at the west edge of Trench D are wall fragments that were not well defined during excavation, but which appear in section (figs. 6.12, 6.13). Pit 19 cuts down from the surface of the mound. Its exact date is uncertain, but it definitely postdates Period VA.

The overall settlement density for the exposed area of VIB.2 is obviously very low. Only about 5.7 m^2 of the total 230.1 m^2 exposed, or 2.5 percent, consists of interior space.

Period VIB, Phase 1 Features

Area of Exposure

8.8 m^2	in Trench B
13.4 m^2	in Trench BW
90.0 m^2	in Trench C
7.2 m^2	in Trench CW
67.7 m^2	in Trench D
30.0 m^2	in Trench CDE
217.1 m^2	total area

Feature Numbers (fig. 6.15)

Wall 1*	B.73.T1.3.9, C.69.7.21, C.70.1.22
Upper Brick Paving 2*	C.70.1.16, C.70.T6.6.2
Rubble Concentration 2a	C.69.7.20
Wall 3*	C.69.7.22
Wall 4*	C.70.1.12A
Wall 5*	C.70.T6.5.4
Wall 10*	C.70.T5.3.1, D.69.4.32
Lower Brick Paving 11*	C.70.T7.2.1, D.68.5, D.68.T1.7
Rubble Fill 12	C.70.1.19A, C.70.1.24
Wall 13*	D.69.4.18, D.69.4.28, CDE.73.2.20, CDE.73.3.13
Hearth 14*	No feature number given during excavation
Room 15*	D.69.4.31
Room 16*	CDE.73.3.10
Wall 17*	CDE.73.2.15
Rubble Fill 18*	C.71.T4.3.2, D.69.5.1, D.69.5.2, D.69.5.3, D.69.5.4, CDE.73.2.18
Pit 19*	D.68.T1.4.1
Pit 20*	CDE.73.S.7
Wall 21*	D.69.4.33
Hearth 22	C.69.1.19
Wall 23	C.70.1.18
Wall 24	C.70.1.18B
Ash Concentration 25	C.70.1.14
Wall 26	D.69.4.27
Pit 27	D.69.3.8
Wall 28	D.69.4.34A
Wall 29	D.69.4.34B
Wall 30	C.70.3.2, C.71.T4.1.2
Room 31	No feature number given during excavation
Wall 32	C.71.T4.1.3

Room 33	No feature number given during excavation
Room 34	No feature number given during excavation
Rubble Fill 35	C.70.3.1
Ash 36*	C.71.T3.2, C.71.T4.3
Wall 37	D.69.4.27D

*Features that were built or appeared first in Period VIB.2 but that continued in use or remain exposed in VIB.1.

Period VIB.1 brings several small additions to a site layout that remains essentially intact from VIB.2. Rooms 15 and 16 continue in use, and Walls 1, 4, 17, and the eastern half of 13 are still exposed. The three primary additions during VIB.1 are a stepped surface west of Wall 4, a new pair of retaining walls (26 and 37) west of Room 15, and a series of three small rooms north of Wall 13 that are built over what appears to be a drainage system. How long after the VIB.2 constructions the VIB.1 additions were put in is not at all certain, but probably at most a few years later. Rooms 15 and 16 last throughout VIB.2 and VIB.1, so that VIB.2 and VIB.1 together probably do not cover a span of more than 50–100 years, or the approximate maximum lifespan of a mud brick structure like Rooms 15–16 (based on the observed maximum lifespans of comparable sun-dried mud brick structures in the Soghun valley today). It was also impossible to determine stratigraphically the order in which the Period VIB.1 additions were constructed, but again, it seems likely that they were all built within a period of a few years.

Walls 26 and 37 are the simplest constructions of VIB.1. Wall 26 was built first, extending west from the northwest corner of Room 15. It is cut through at its center by Pit 27 and at its west end by Pit 19. East of Pit 27 it survives to a height of only one course; west of this pit it stands three courses high. How much higher it originally stood is unclear, but a small segment of it against Room 15's west wall survived into VIA, standing to a height of ten courses (called 17a in VIA; fig. 6.16) and was incorporated into VIA Wall 17. Wall 26 rests on a prepared surface of chaff-tempered mud mortar. A small portion of its east end directly overlies a three-course-high portion of Wall 13 from VIB.2. Either Wall 13 was never more than three courses high in this area, or, perhaps more likely, it was knocked down here to a height of three courses in preparation for the building of Wall 26. Wall 26 is constructed with hand-molded, thumb-impressed mud bricks, with the thumb impressions facing downward; it has a rough, chaff-tempered mud plaster on both faces.

Wall 37 is a later addition along the south side of Wall 26. Its full extent to the east and west remains unknown, for it is cut by Pits 19 and 27. Wall 37 survives to a height of three courses and was built with the same type of thumb-impressed bricks as Wall 26, with the thumb impressions facing downward. The bricks in Wall 37 are rather haphazardly laid, and there is no plaster on either its north or south face. Quite possibly Wall 37 was put in late in VIB.2 to provide a firm foundation for the VIA walls that were to be built directly over it.

Along the west edge of Trench C a pair of low retaining walls (23 and 24) was built during VIB.1, and a stepped plaster surface then laid over them. This stepped surface provided an easy means of access up over what in VIB.2 had been a fairly steep dropoff from Upper Brick Paving 2 down to Lower Brick Paving 11. There are two steps up. The first goes from the level of Lower Brick Paving 11 up to the top of Wall 23, a rise of about 50 cm. About 75 cm to the north there is a second step up to the top of Wall 24, another rise of approximately 25 cm, which brings one approximately to the level of the VIB.2 Upper Brick Paving 2. The area covered by these two steps is quite limited. To the west, Wall 24 turns south and meets Wall 23. West of this section of Wall 24 and north of the western extension of Wall 23, there are no steps but instead Rubble Fill 12 up to the height of the top of Wall 24, so that the steps do not appear in Trench C's west section. The extent of the steps to the east is not known because the area is badly eroded, but they probably did not extend beyond Wall 4. Wall 24, which constitutes the second step up, is only one course high. The east end of Wall 23, which constitutes the first step up, is three courses high, and its west end, where it serves as a retaining wall for Rubble Fill 12, is four courses high. Both walls are made with hand-molded, thumb-impressed mud bricks, with the thumb impressions facing down, and only the exposed wall faces are plastered with chaff-tempered mud.

Abutting against the south face of Wall 23 is Ash Concentration 25, which may be an ash dump associated with the use of Hearth 22. Hearth 22 is about 60 cm in diameter. The flat surface of the hearth consists of fine mud plaster hardened and reddened by fire.

During VIB.1 a very hard, almost cement-like mud plaster floor was built south of Wall 23 directly over Lower Brick Paving 11 and Walls 6 and 7. It consists of two thick layers of chaff-tempered clay that have an unusually smooth surface. Overlying the floor are several thin layers of water-deposited silt.

The room complex north of Wall 13 was built in two stages. First, Walls 30 and 32 were built directly over the loose Ash 36 of VIB.2. Both walls stand to a height of two to three courses, and the faces of each wall are covered with 1–2 cm of rough, chaff-tempered mud plaster. Where Walls 30 and 32 meet they are bonded together. At its south end Wall 30 abuts against and is later than Wall 13. Both walls were built with hand-molded, thumb-impressed mud bricks of varying lengths (for individual sizes, see appendix A). Curiously enough, all bricks measured had thumb impressions on the *top* sides of the bricks, in contrast to the downward-facing thumb impressions in most other VIB.1 walls.

Next, a small trench 50–70 cm wide and 40–50 cm deep was dug along the north face of Wall 30 and filled with the same type of rubble fill (35) as was used elsewhere during VIB. The area south of Wall 30 and between Walls 30 and 32 was then filled in with bricky material, and finally Rooms 31, 33, and 34 were built on top. The function of Walls 30 and 32 and Rubble Fill 35 presents somewhat of an enigma, for there is no other construction quite like it in all of Periods VII through V. It would seem likely, given the location of the walls and ditch, that they served two basic purposes. First, the walls and fill between provided a firm base for building Rooms 31, 33, 34 in an area that previously had consisted only of loose, ashy fill. Second, the perimeter ditch filled with rubble along the north side of the area protected Rooms 31, 33, 34 from possible erosional damage by catching rain runoff coming down the rather steep slope north of the complex and draining it off harmlessly to the west. This appears the most reasonable hypothesis for so peculiar a construction. Moreover, Pit 27, situated where water would have drained out of the ditch at its south end, is filled primarily with water-laid silts, and probably can be seen more as a sump or erosional gully caused by Rubble Fill 35's runoff than as a man-made pit.

The particular function of Rooms 31, 33, 34 is not certain, but probably they were some sort of outbuildings or unroofed animal pens associated with the domestic complex of Rooms 15–16 directly to the south. Certainly they comprise a very different structural type than Rooms 15–16. No discernible floors exist in Rooms 31, 33, 34, and no trace of roofing material was found within the rooms. The bricks in the walls are unusually narrow (see appendix A), access into Rooms 33 and 34 is through an opening at the corner of the rooms, and Room 31 does not appar to have any north wall at all.

The walls of Rooms 31, 33, 34 are all bonded where they meet at corners, and stand to a height of two to three courses. Some of the hand-molded, thumb-impressed bricks in the walls are laid with the thumb impressions facing down, some with the thumb impressions facing up. No discernible plaster survives on any of the rooms' walls. The interior dimensions of the rooms, to the extent that they could be estimated from a partial exposure, are as follows:

	Dimensions	
Room	*N-S*	*E-W*
31	1.00 × 1.7	= 1.7 m^2
34	1.22 × 1.05	= 1.28 m^2
35	1.10 × 1.22	= 1.34 m^2

The only other additions in VIB.1 are Walls 28 and 29. Only small sections of these walls were isolated, and few constructional details were recorded. Both walls are two courses wide, and since there is mud plaster on the east face of Wall 26, Wall 27 must be a later rebuild up against it.

Because of the addition of Rooms 31, 33, 34, the overall settlement density for the exposed area of VIB.1 is slightly higher than in VIB.2, but is still very low. Only 9.0 m^2 of the total 217.1 m^2 exposed, or 4.1 percent, consists of interior space.

PERIOD VIA

Area of Exposure

43.3 m^2	in Trench BW
90.0 m^2	in Trench C
43.4 m^2	in Trench CW
67.7 m^2	in Trench D
30.0 m^2	in Trench CDE
274.4 m^2	total area

Like VIIB.3 and VIIB.1, Period VIA is a nonoccupational phase. And yet the construction that took place in VIA represents one of the most extraordinary and extensive building projects in the whole history of the site. The project undertaken was to expand the level area on the top of the VIB mound by building massive retaining walls along the mound's contour and then filling in the sloping area behind with an elaborate network of smaller retaining walls and rubble fill. Literally tons of fist-sized rocks had to be carried a kilometer or more from the alluvial fans at the edge of the valley, and thousands of sherds (and bones) were then mixed in with the stone rubble. The leveling stretches for more than 38 m across five trenches and continues on around the mound into unexcavated balks in both directions. In Trench D the leveling is at least 11 m wide: the full original width is not known because the rubble fill is cut by the present mound surface. More rubble fill and probably more retaining walls must originally have existed even farther to the south, but have eroded away or were shaved off in a later period. Indeed, the mound's surface today is littered with the fist-sized rocks that have eroded out from this 5,700-year-old leveling construction. The massiveness of this VIA leveling and the extensive use of rock-and-sherd rubble as a leveling material is unprecedented and unparalleled anywhere else on the Iranian plateau in the early fourth millennium B.C.

The ultimate purpose of so much leveling remains an enigma. While in the area of Trench C the leveling provided a firm and level base for the construction of the VC room complex, it is hard to believe that so much leveling would have been built for the sake of a single domestic complex that was to overlie only a small portion of it. One possible explanation is that the leveling was meant to provide a large, flat, open area around a central structure or structures, and that these lie in a still unexcavated area closer to the center of the mound. An alternative explanation is that there *were* more structures directly on top of the VIA leveling in the area exposed, but that these were totally razed during the construction of the massive Period IVC complex in the same area. Arguing for the second explanation is the fact that the walls of IVC in Trenches CW and BW directly overlie the VIA rubble fill.

Period VIA Features

Feature Numbers (fig. 6.16)

Wall 1	BW.71.12.2, BW.73.2.1, BW.73.T1.2.1, C.69.1.12C, CW.73.7.1, CW.73.T1.8.2.
Wall 2	C.69.1.12A
Retaining Walls 3	C.69.1.10, C.69.1.11, C.69.1.12, C.69.1.16, CW.73.7.4; and other walls in Trenches BW and CW that were not given feature numbers during excavation.
Rubble Fill 4	BW.71.12.8, BW.71.12.10, BW.71.12.14, BW.73.2
Pisé Walls 5	C.69.1.12b, C.70.1.17, C.70.1.18A, CW.73.7.3
Rubble Fill 6	C.70.1.19, CW.73.7.3
Wall 7	CW.73.T1.8.1
Pit 8	C.69.S.5, C.69.T3.1.4, C.70.S.1, D.68.T1.4
Pit 9	CW.71.12.1, CW.73.S.1
Wall 10	C.69.T3.1.7, C.70.1.12, D.69.3.11
Wall 11	C.69.T3.1.9, C.70.1.9, C.70.1.13

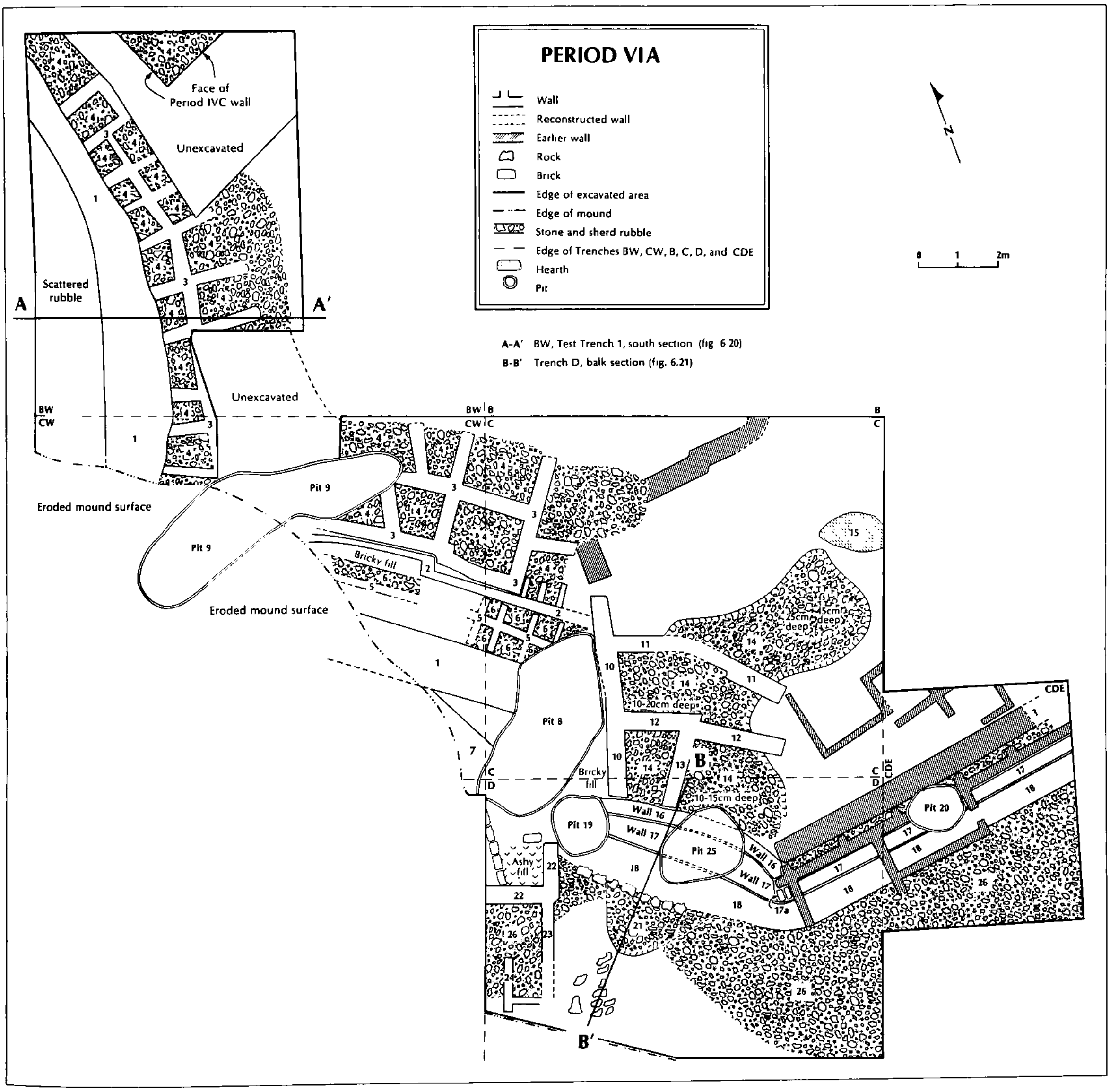


Figure 6.16. Plan of Period VIA.

Figure 6.17. Leveling complex with stone-and-sherd rubble fill of Period VIA, Trenches CW and BW, viewed from the northeast. The corner of Period IVC room at left rests directly on Period VIA leveling. Note curving Period VIA wall on right, which served as primary outside support wall to contain rubble leveling.

Wall 12	C.69.T3.1.3, C.69.T3.1.10, C.70.1.10
Wall 13	C.69.T3.1.8, C.70.1.11, D.69.3.10
Rubble Fill 14	C.69.T3.1.6, C.70.1.2, D.69.3.6, D.69.3.7
Hearth 15	C.70.1.15
Wall 16	D.69.3.19, D.69.3.20
Wall 17	D.69.3.15, D.69.3.21, D.69.3.22, D.69.3.25, CDE.73.2.12
Wall 17a	D.69.3.26
Wall 18	D.69.3.12, D.69.3.14, D.69.3.23, D.69.3.24, CDE.73.2.11
Pit 19	D.68.T1.4.1
Pit 20	CDE.73.S.7
Rubble Fill 21	D.68.4.2
Wall 22	D.69.3.35
Wall 23	No feature number given during excavation
Wall 24	No feature number given during excavation
Pit 25	D.69.3.8
Rubble Fill 26	D.68.4.1, D.69.3.1, D.69.3.2, D.69.3.3, CDE.73.2.10, CDE.73.2.13

The VIA leveling is divided into two large separate segments, both of which were probably built at the same time. To the northwest (in Trenches BW, CW, and the northwest corner of Trench C) is the Upper Leveling (fig. 6.17); to the southeast (in Trenches CDE, D, and the south half of Trench C) lies the Lower Leveling (fig. 6.18), the top surface of which is about 1.2 m lower than the top surface of the Upper Leveling. The VC complex was built over the Lower Leveling and abuts against the southeast edge of the Upper Leveling.

None of the VIA Upper Leveling walls in Trenches CW and BW was taken down. In these areas little more than the outlines of the walls and the location of the rubble fill was

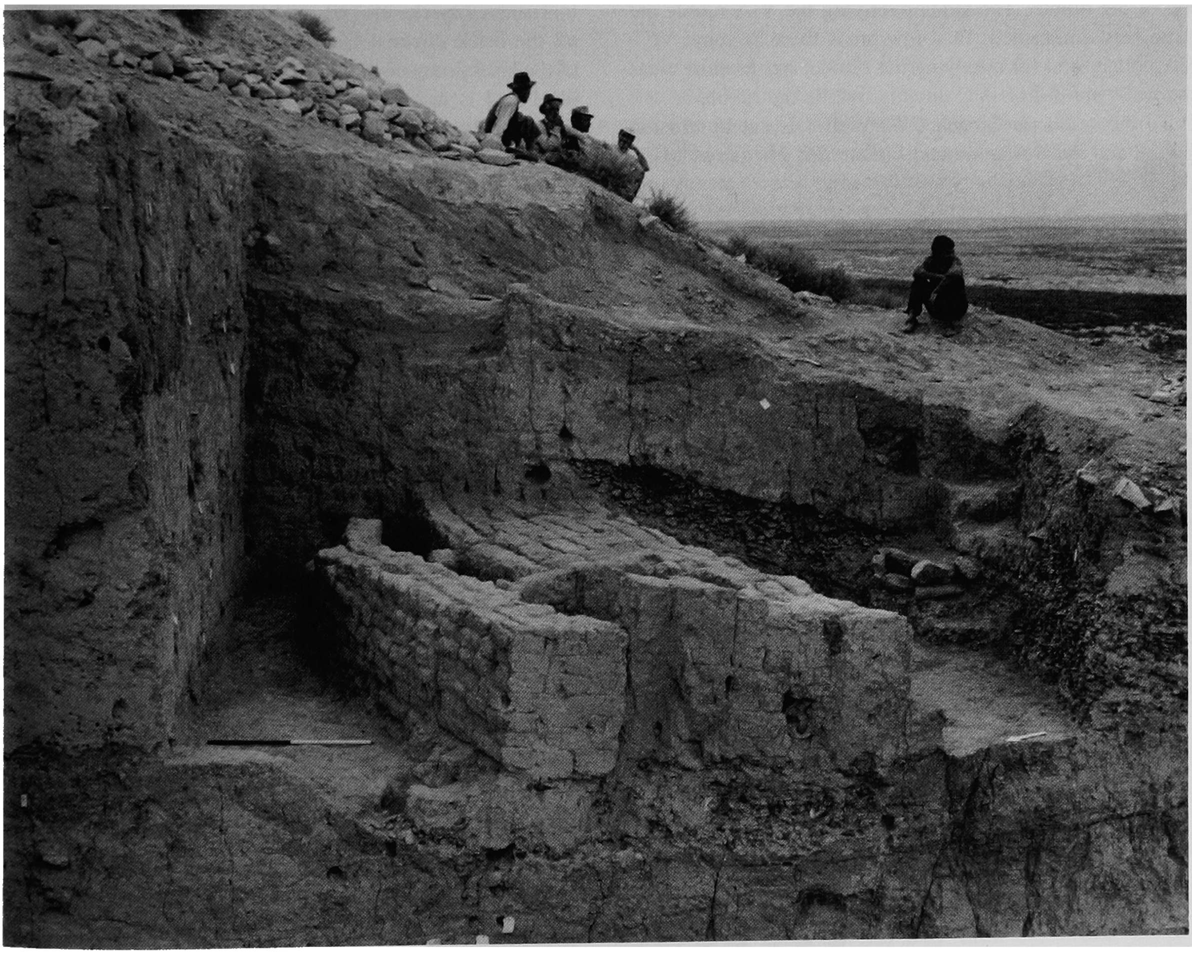


Figure 6.18. Cross section of Period VIA leveling complex showing walls and stone-and-sherd rubble fill, Trench C/DE, viewed from the west.

recorded. Wall 1, the massive outer retaining wall for the leveling, starts in Trench C and reaches a maximum width of 1.7 m in Trench BW. It is made with hand-molded, thumb-impressed bricks, with the thumb impressions facing down (fig. 6.19). A test trench dug down against Wall 1 in BW showed that the wall is built on soft fill that slopes steeply down from east to west (fig. 6.20). Underneath portions of the wall and to the west of it are a few scattered pockets of rubble fill. Wall 1 stands to a height of at least 1.4 m. Why it was built in a slow curve that runs counter to the underlying mound contour is unclear.

After the construction of Wall 1, a network of retaining walls (3) was built on the slope behind it. These walls all bond together at the corners but abut against the east face of Wall 1. They, like Wall 1, are made with hand-molded, thumb-impressed bricks, with the thumb impressions facing down.

Finally, the area between Retaining Walls 3 was filled in with rubble. The rubble fill reaches a maximum depth of approximately 1.4 m beside Wall 1. The depth of the rubble fill is progressively shallower to the east, and it disappears altogether about 3–4 m east of Wall 1 where the underlying slope of the VIB mound has risen to a point level with the top of the rubble. The strata overlying the VIA rubble are extremely compacted. In a few areas there is some VC–VA pottery and fill overlying the rubble, but in most areas the walls and fill of IVC directly overlie the rubble.

To the south (in Trench CW) Wall 1 is cut by erosion gullies and the present mound surface. Pit 9 began as a IVB pit that gradually expanded into an erosion gully. This gully has destroyed the corner where Wall 1 turns eastward. The erosion of this area probably was exacerbated by water draining down through the rubble and up against Wall 1, and then flowing along Wall 1 to this corner.

The wall-and-rubble construction behind Wall 1 in the eastern half of Trench CW and the west side of Trench C is somewhat more complicated. Wall 1 is still the main outside retaining wall, but at approximately the same time (perhaps even slightly earlier) a second wall (Wall 2) was built just north of Wall 1 and running parallel to it. Wall 2 is only one course wide and is plastered on both its north and south faces with a fine, thin plaster. Subsequently the area between Walls 1 and 2 was filled in with a grid of rough pisé walls (5), with rubble fill (6) added in between. Finally, a network of retaining walls (3) is built north of Wall 2 and abutting against it, and more rubble fill is dumped between these walls. Retaining Walls 3 in Trench C were taken down brick by brick; the individual brick sizes will be found in appendix A. All the Retaining Wall 3 walls are two bricks wide, with courses alternating between double rows of stretchers and single rows of headers. The bricks in these walls are much squarer in profile than the more loaf-shaped bricks of VIB, and the increased uniformity in all the brick dimensions implies that a certain percentage of the bricks may now have been mold-made. Because Rubble Fill 4 is in some places found beneath and above, as well as between, the Feature 3 walls, *both* the Rubble Fill 4 and the Feature 3 walls must have been put in at the same

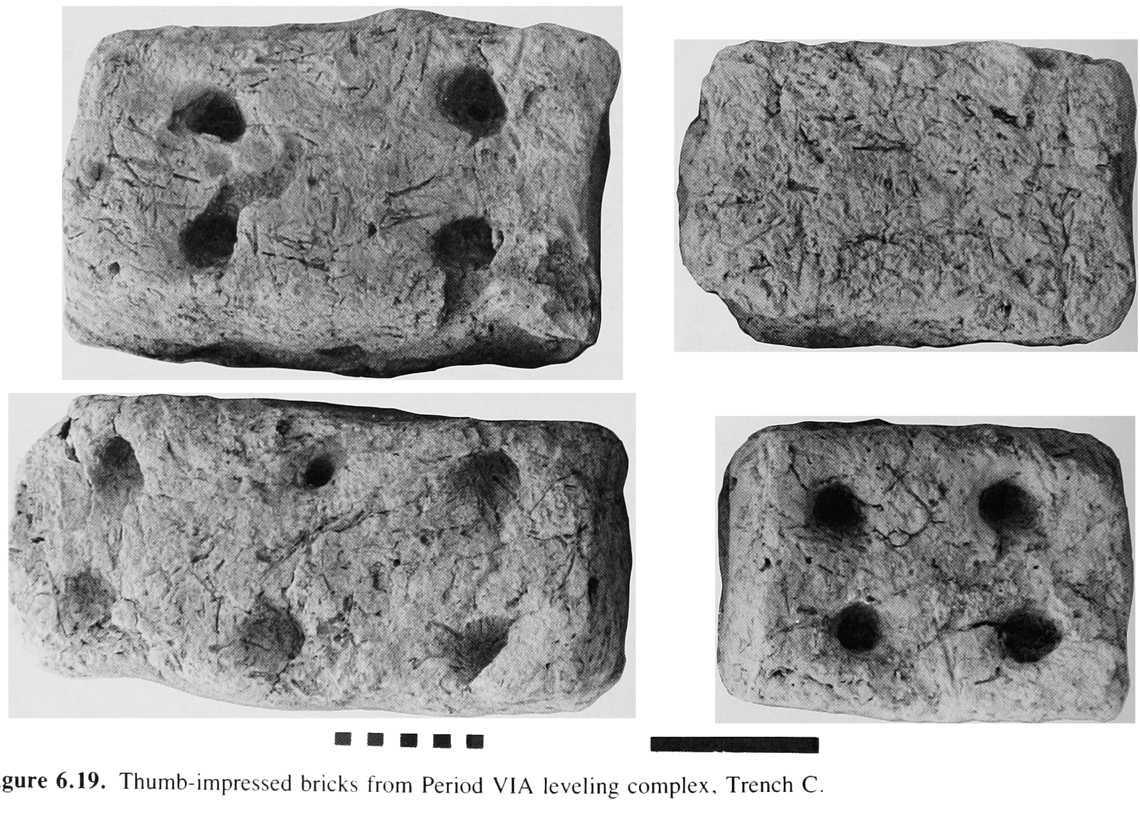


Figure 6.19. Thumb-impressed bricks from Period VIA leveling complex, Trench C.

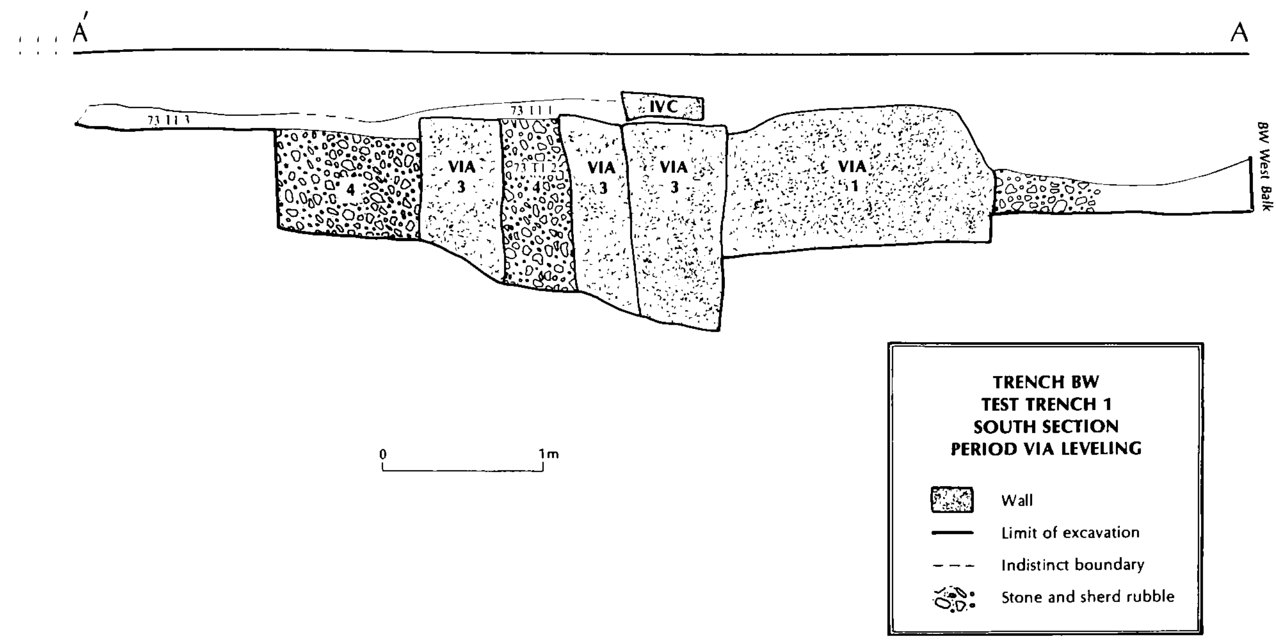


Figure 6.20. Trench BW, Test Trench 1, south section.

time. All the Feature 3 walls taken down were covered with a one-cm-thick chaff-tempered mud plaster.

The VIB surface underlying the Upper Leveling walls and rubble fill (Features 1 through 6) slopes quite steeply down in this area from north to south, as can be seen from figure 6.2. On the north end, Rubble Fill 4 fades out where the underlying period VIB surface rises to a point even with the top of the leveling. At the south end Wall 1 stands to a height of almost 1.6 m. To the east Rubble Fill 4 ends up against some bricky fill that had accumulated in this area around the still-exposed Walls 1 and 4 of VIB.1.

The last addition to the Upper Leveling was Wall 7, which, like all the rest of the walls, is built with thumb-impressed bricks with the thumb impressions facing down. Wall 7 abuts against the south face of Wall 1 at an odd angle, making it triangular in shape. Wall 7 may be the western end of Wall 17 or 18 from the Lower Leveling, but this was impossible to prove because of the presence of Pit 8.

The sequence of wall building for the Lower Leveling was determined by which wall faces were or were not plastered (fig. 6.21). Walls 16, 17, and 18 are the main retaining walls, with Wall 16 being built first, then Wall 17, then 18. Walls 17 and 18 were built directly across the north end of VIB.1–2 Rooms 15–16 and incorporate the walls of these rooms. Before Wall 18 was built, Rubble Fill 21 was added to fill in the depression where Wall 18 was to be erected and to provide a firm base for it. A footing of large rocks was laid along part of the south face of Wall 18. Walls 16–18 are all built with thumb-impressed bricks of varying lengths, with the thumb impressions facing down (appendix A). They vary from two to four bricks wide and stand to heights of four to six courses.

After these three walls were constructed, Rubble Fill 26 was added up against the south face of Wall 18 and between the buttresses of VIB Rooms 15 and 16. The original extent of Rubble Fill 26 to the south remains unknown, for it meets the present mound surface near the south end of Trench D. Almost certainly there was still another large retaining wall farther to the south to hold Rubble Fill 26.

Following the construction of Wall 16, a network of walls (10, 11, 12, and 13) was built abutting it on the north side. These walls are all bonded with one another. All the walls, except the eastern end of Wall 11, are two bricks wide, consisting of alternating courses of headers and stretchers, like the Feature 3 walls. But because of somewhat longer headers in the walls, Walls 10–13 are slightly wider than the Feature 3 walls (appendix A). Rubble Fill 14 was then added between the walls to a depth of 10–20 cm and also placed in a depression northeast of Wall 11. Unlike Rubble Fill 4 in the Upper Leveling, Rubble Fill 14 here does not reach to the tops of Walls 10–13, but instead bricky debris is used to fill in up to the wall tops. This bricky fill is virtually devoid of sherds and other artifacts. East of Rubble Fill 14 the VIB.1 Rooms 31, 33, 34 stood on higher ground, so that no additional leveling was needed other than knocking down the rooms' walls.

After all the Lower Leveling had been completed a final layer of rubble fill 10–20 cm deep was laid across the entire area where the VC room complex was to be built (fig. 6.22). Hearth 15 is an open hearth on the surface over which this final layer of rubble was laid.

Walls 22, 23, 24 are poorly preserved. The only details noted about them are that they were made with thumb-impressed bricks and probably post-date the building of Wall 18.

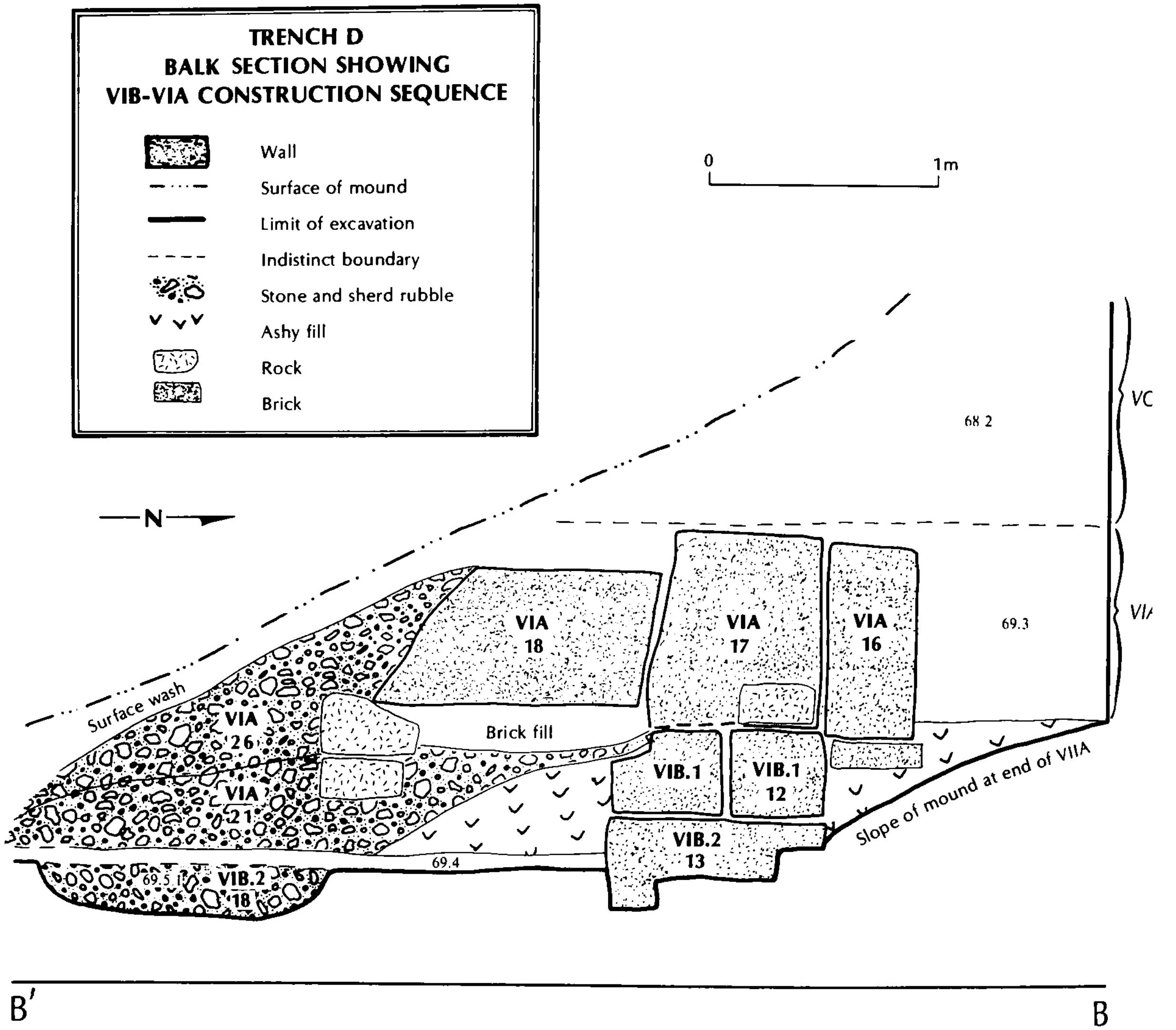


Figure 6.21. Trench D, north-south balk section showing Period VIB–VIA construction sequence.

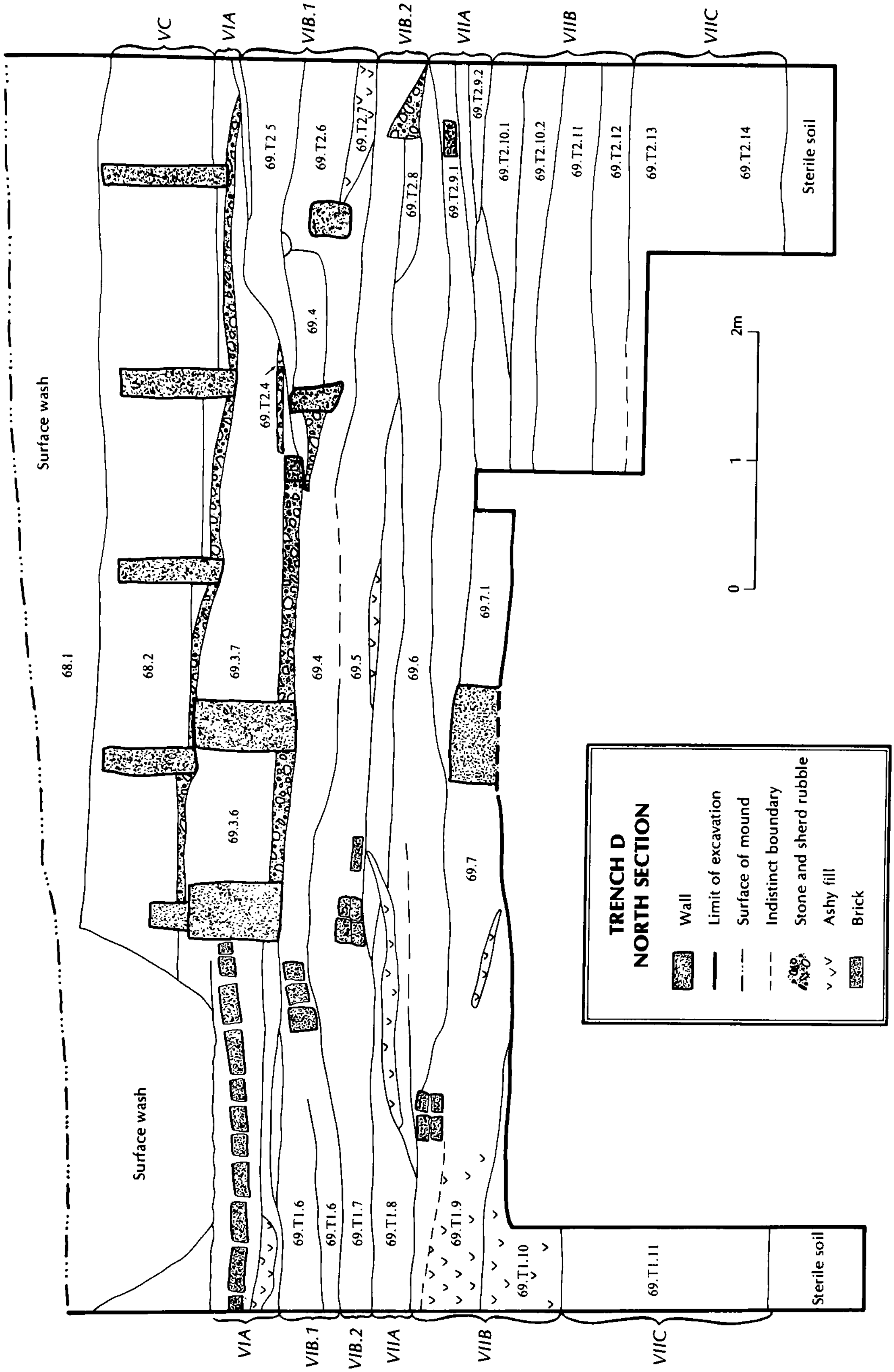


Figure 6.22. Trench D, north section.

PERIOD VC SETTLEMENT

Area of Exposure

24.8 m^2 in Trench B
48.3 m^2 in Trench BW
90.0 m^2 in Trench C
43.4 m^2 in Trench CW
18.0 m^2 in Trench D
30.0 m^2 in Trench CDE

254.5 m^2 total area

At the beginning of Period VC a large residential complex was built on top of the Lower Leveling of VIA. Although the entire complex is not contained within the area of exposure, excavations did recover sixteen complete rooms, together with three additional incomplete rooms (17, 18, 19) whose south ends had eroded away at the surface of the mound. This complex provides an almost complete example of a new architectural style that first appeared in VIB.2. This new style is characterized by corner and side wall buttressing and raised interior corner hearths. The VC complex shows still more new features that serve to distinguish this type of architecture from that of Period VII. In VII there is very little differentiation of interior spaces. Virtually all the rooms are roughly square and within the same general size range. In VC, on the other hand, interior space begins to be quite carefully differentiated. There is a central core of small, square, storage(?) rooms surrounded by several larger, rectangular "living" rooms with corner hearths or platforms in them. The layout of this VC residential complex bears a striking resemblance to those unearthed from contemporary levels at the site of Iblis, so that this architectural style appears to be fairly widespread in southeastern Iran at this time.

The northwest edge of the VC complex lies directly up against the Upper Leveling of VIA, which may explain why there are no doorways or means of access into the complex from this side (cf. Period VIA; fig. 6.16). There is scarcely any VC deposition and no VC architectural remains on top of the VIA Upper Leveling in Trenches CW and BW. Either the VIA Upper Leveling was never meant to have any VC architecture built on it (perhaps being intended instead as an open terrace or courtyard), or else some VC architecture did exist there but was obliterated at the beginning of IVC, when the whole area was leveled to make room for the massive IVC building.

Period VC Features

Feature Numbers (fig. 6.23)

Room 1	C.69.7.9–10
Room 2	C.69.7.1
Room 3	C.69.7.2
Room 4	C.69.7.3
Room 5	C.69.7.8
Room 6	C.69.7.14
Room 7	C.69.7.16
Room 8	C.69.7.15
Room 9	C.70.S.2, D.68.2.14
Room 10	C.69.7.13
Room 11	C.70.S.2, D.68.2.11
Room 12	C.69.7.7
Room 13	C.69.7.6, C.70.S.2, D.68.2.5
Room 14	C.69.7.4
Room 15	C.69.7.5, C.70.S.2, D.68.2.6
Room 16	CDE.73.1.8
Room 17	D.68.2.15
Room 18	D.68.2.12
Room 19	D.68.2.3
Pit 20	CDE.73.S.7
Hearth A	C.69.7.12
Hearth B	C.69.7.19
Hearth C	No feature number given during excavation
Hearth D	B.73.T1.3.2
Platform E	No feature number given during excavation
Platform F	No feature number given during excavation

Since the VC complex is well preserved, with most walls surviving to a height of five to six courses, or about 90 cm, and since the walls were taken down brick by brick, these nineteen VC rooms yield a wealth of constructional details. Perhaps the most important fact established in dismantling the complex was that the walls were bonded together at every corner, so that the whole complex must have been built at the same time. The only exception to this is the curving north-and-east wall of Room 7, which was added after the initial construction of the rest of the complex. These VC walls, like their Period VI predecessors, are built with hand-molded, thumb-impressed bricks of varying lengths, with the thumb impressions almost always facing downward. Brick lengths range from 15 to 70 cm. Walls are 20 to 27 cm wide, or the width of one brick plus the plaster on both faces. The bottom course of each wall rests on a base of chaff-tempered mud mortar 2 to 10 cm thick, which in turn is laid over a foundation layer of VIA rubble leveling. A complete list of brick sizes for this complex will be found in appendix A. The exterior faces of the outside walls of the complex are covered with two or three layers of rough, chaff-tempered mud plaster. Individual layers average 1.0 to 1.5 cm thick and are thickest near the bottom of the walls. Exterior plaster was most carefully studied along the north wall of Room 1. Here the outside plaster is four layers thick:

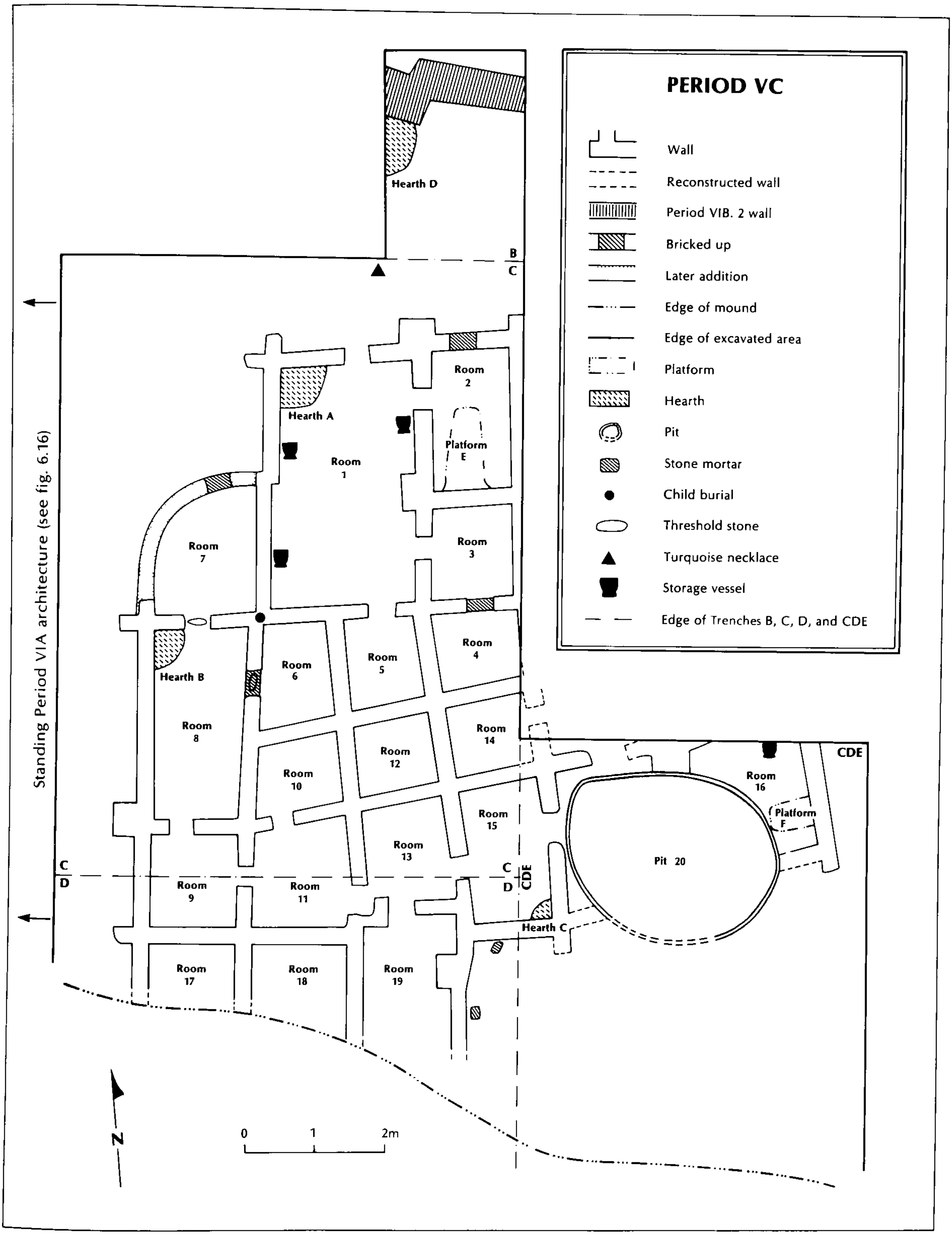


Figure 6.23. Plan of Period VC.

the innermost layer is up to 2 cm thick, the next two layers are 1.0 to 1.5 cm thick, and the outermost layer is only about 0.2 cm thick. Interior wall faces were each given a single coat of rough, chaff-tempered plaster, usually approximately 1.0 cm thick, over which several layers of fine plaster—often combined with a green or red wash—were applied during the span of occupation. Individual layers of this fine plaster are often less than 0.1 cm thick. Floors, too, were covered in most cases with many layers of the same type of fine plaster, which at the sides and corners of the rooms curve up against and are contiguous with the wall plaster.

All the doorways in the complex are neatly plastered and have raised doorsills. The sills are built up to a height ranging from 10 to 27 cm above the rooms' floors, most of them being approximately 20 cm high. In two of the doorways—between Rooms 8 and 6, and 8 and 7—a flat stone (mortar) is embedded in the brick and mortar of the doorsill, evidently to provide added strength and durability against the continual wear and stress from individuals stepping across it. The narrowness of doorways is consistent throughout the complex: all doorways are between 35 and 37 cm wide.

One of the most baffling features of the complex is the walling in of doorways. Four doorways were bricked up and plastered over during the occupation of the complex and remained bricked up until the complex was abandoned. Two of these are outside doorways: from Room 7 to the outside and from Room 2 to the outside. The other two are doorways into small interior rooms: from Room 3 into Room 4, and from Room 8 into Room 6. The bricking up of the two outside doorways may have been done to change and limit the means of access into Rooms 2 and 7, for Room 2 is also accessible from Room 1, and Room 7 accessible from Room 8. But the particular reason for limiting access to these two rooms remains a mystery. The bricking up of the doorways into Rooms 4 and 6 is even more mysterious, for the result was that these two rooms were rendered totally inaccessible. Possibly something was walled up in these rooms to be stored out of the way, but no artifacts were found on the floors of these rooms, nor any traces of vegetal material; and still the question remains why the rooms were never opened up again. Another possibility is that the complex was built to serve the space needs of a certain number of individuals, and that over time that amount of interior space was expanded (Room 7) or contracted (closing off Rooms 4 and 6) as need dictated. However, it still is difficult to visualize circumstances under which the inhabitants of the complex would have felt it necessary to reduce their amount of available interior space by permanently shutting off access to two rooms.

The fill of all the rooms in the complex and the area just north of it consists entirely of fallen bricks, brick fragments, and pieces of roof plaster and wall plaster. The excellent preservation in situ of the rooms' lower wall plaster and floor plaster and the presence of solid brick fill within the rooms imply that the complex did not lie abandoned and deteriorate gradually. Instead, it would appear that the upper walls were knocked down soon after the rooms were vacated and the rooms then filled in with the resulting brick debris to create a solid, level base on which to build the Period VB architecture.

The roof plaster found in the fill of several of the rooms consists of thick, chaff-tempered mud plaster with reed and stick impressions on the underside. The roofing, therefore, was probably flat, being made up of beams overlaid with a layer of sticks and reeds that were in turn plastered with a thick coating of chaff-tempered mud. How the beams were laid is not clear, but it is noteworthy that every room except Rooms 1 and 16 has at least one dimension that is less than 1.45 m. In other words, in none of these rooms would beams have had to span an open space of more than 1.45 m. Thus, there is a possibility that room sizes were being limited because of a practice of not attempting to span open spaces greater than about 1.5 m.

Even Rooms 1 and 16, with widths of 2.0 and 1.85 m, respectively, do not really contradict this theory of structurally imposed size limitations, for it was deemed necessary when constructing these rooms to add large internal buttresses at the midpoints, thus reducing the width of Room 1 to only 1.75 m, and that of Room 16 to about 1.5 m. With major cross beams at these midpoints, both halves of each room could then have been spanned with cross beams like two pairs of smaller rooms. If it is true that VC builders were intentionally avoiding open spans of more than about 1.5 m, the question then is why they felt themselves restricted in this way. In the valley today relatively small tree trunks from local juniper trees are commonly used to span spaces of 3 or 4 m, but the walls on which they rest are 75 cm thick (compared with 20–25 cm thick in Period VC). Possibly in VC smaller spans continued to be the practice because larger spans would have required walls two or three times thicker.

The interior dimensions of the sixteen complete rooms are as follows:

	Dimensions		
Room	*N-S*	*E-W*	
1	3.45 ×	2.0	= 6.90 m^2
2	2.05 ×	1.10	= 2.26 m^2
3	1.30 ×	1.16	= 1.51 m^2
4	1.08 ×	1.22	= 1.32 m^2
5	1.28 ×	1.04	= 1.33 m^2
6	1.45 ×	1.0	= 1.45 m^2
7	1.80 ×	1.44	= 2.27 m^2
8	2.80 ×	1.28	= 3.58 m^2
9	1.32 ×	1.25	= 1.65 m^2
10	1.05 ×	1.20	= 1.26 m^2
11	1.45 ×	1.40	= 2.03 m^2
12	1.00 ×	1.14	= 1.14 m^2

13	$1.40 \times 1.24 = 1.74\ m^2$
14	$1.00 \times 1.15 = 1.15\ m^2$
15	$2.00 \times 1.15 = 2.30\ m^2$
16	$1.85 \times 3.65 = 6.75\ m^2$

The complex, although it was built as a single unit, can be seen as three separate room groupings, each with its own hearth and each with one or two larger, rectangular rooms adjoining a series of smaller, square rooms. The clearest such grouping of rooms is Rooms 1–5. The other two most likely groupings are Rooms 6–11 and Rooms 13–16, 19, although the apparent doorway between Room 11 and Room 13 leaves some ambiguity as to whether these can be considered two discrete units. Room 12 appears not to belong to any grouping; indeed, there are no doorways at all into this room. Rooms 17 and 18 are not accessible from any of the adjoining rooms to the north or east and so may belong to a fourth grouping of rooms to the south that has eroded away.

Rooms 1–5

Room 1 is the largest room in the whole VC complex and the main room of this five-room grouping. Rooms 3–5 are accessible only through Room 1; and after its outside doorway was bricked in and plastered over, Room 2, too, was accessible only through Room 1. The floor of Room 1 consists of at least 15 thin layers of chaff-tempered plaster totaling about 5 cm in thickness. These layers probably were applied several at a time, because there is virtually no buildup of deposit between any two. The wall plaster consists of a 1.0-cm-thick base layer of chaff-tempered mud plaster, over which at least six layers of chaff-tempered mud plaster and wash had been applied, each averaging 0.4 to 0.5 cm thick. Five of the layers were combined with a green wash; the sixth and outermost layer was combined with a red wash. Found in situ on the room's floor were three carinated jars of Chaff-Tempered Coarse Ware, one along the east wall and two along the west wall (fig. 6.24). All three were complete, but had been crushed when the room was filled in with brick debris. Unfortunately, all three jars had been emptied before the room was filled in and nothing but dirt and brick fragments remained in any of them. The only other artifact found in situ on the floor was a small, round, polished "rubbing" stone in the southwest corner of the room.

In the northwest corner of Room 1 is a semicircular, raised hearth (A). The hearth has a maximum width of 70 cm along its north edge. Its base is raised 7 cm above the floor

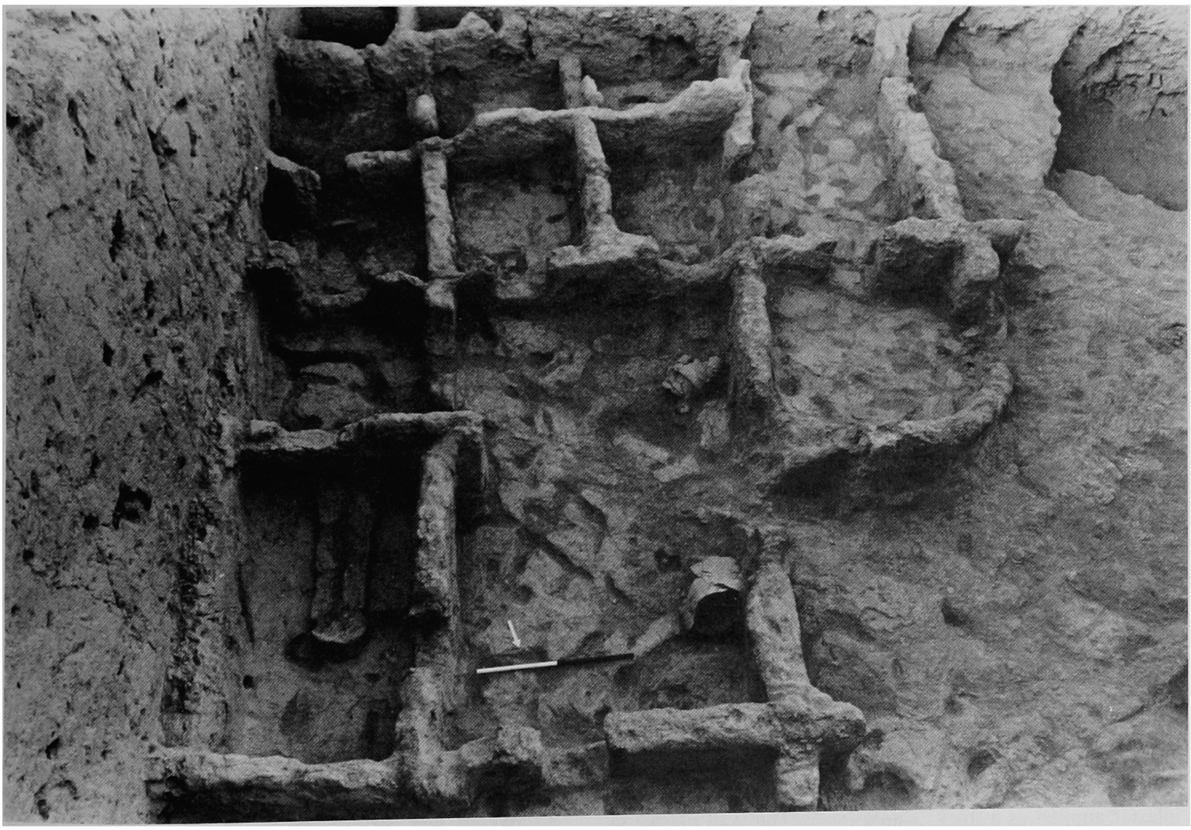


Figure 6.24. Architecture of Period VC, Trench C, viewed from the north. Note two carinated jars of Chaff-Tempered Coarse Ware on floor of central room.

of the room, and the floor plaster curves up against this base. The hearth surface consists of three thick layers of chaff-tempered mud plaster, each 1 cm thick. The bottom two layers are reddish and fire-hardened. The top layer appears fresh and shows no traces of burning. The hearth was enlarged during its period of use, for underneath the lowest plaster layer are traces of an earlier raised hearth 5–10 cm smaller in diameter. From the walls at either end of the hearth plastered stubs protrude. These stubs are 2–4 cm thick. They start 32 cm above the hearth's surface and continue up the walls as high as they are preserved. The most likely explanation is that these stubs are remnants of a plastered chimney, for the wall plaster above the hearth and inside these stubs is blackened with soot, but outside these wall stubs the wall plaster is not blackened at all. The walls above the hearth are covered with a 0.5-cm-thick base layer of chaff-tempered mud, over which four separate layers of chaff-tempered plaster, each 0.3–0.5 cm thick, were applied. The bottom three layers are blackened, but the topmost layer is clean and fresh. It therefore would appear that the hearth was never used again after its last replastering.

To summarize the amount of replastering carried out in different parts of Room 1, the outside face of the room's north wall was replastered three times, the hearth surface and chimney walls were replastered three times, and the walls and floor were replastered at least six times. If one could make a good estimate of the probable frequency of replastering, these multiple layers of plaster might give a very accurate indication of the length of time the Period VC complex was occupied.

Room 2 is an intermediate-sized room whose most distinctive feature is a peninsular platform (E) extending out 1.2 m from the room's south wall. This platform is similar in shape to Platform F in Room 16, although Platform F is somewhat smaller. The function of these platforms is not known. It was postulated during excavation that there might be human burials in them or beneath them, but no such burials were found. The top of Platform E was missed in excavation. Its remaining height is 15 cm, but it must originally have stood somewhat higher. The platform was constructed with thumb-impressed bricks (appendix A), together with large amounts of mud mortar.

Since three of the room's four layers of floor plaster run underneath Platform E, it must have been added fairly late in the room's existence, perhaps when the doorway in the north wall was bricked in. The latest layer of chaff-tempered floor plaster curves up neatly against the base of the platform. The total floor thickness is about 4 cm. Close examination of the floor plaster indicated that each of the four major layers of floor plaster consists of several very fine, thin layers. Possibly one of these very thin layers was added each year. Alternatively, several of these layers may have been added at one time to create a thick, laminated layer that would have greater strength and durability than floor plaster applied as a thick, single layer. The wall plaster in Room 2 consists of two thick base layers of chaff-tempered mud, each 1.0–1.5 cm thick, overlaid with three layers of fine plaster.

A white spot was found on the floor near the door into Room 1 and was interpreted as the remains of fecal matter. Otherwise, no artifacts were found in situ on the floor of the room, and the only artifacts in the fill within 5 cm of the floor were a single flint blade and two undiagnostic Chaff-Tempered Coarse Ware sherds.

Room 3 probably is a storage room. Its walls and floor are not as carefully plastered as those of Rooms 1 and 2. A sample of white-flecked organic material was recovered from the room's floor. Otherwise, no artifacts were found in situ on the floor.

Room 4 is accessible only through Room 3, and at some time during the occupation of the complex its only doorway was bricked in and plastered over. The floor of Room 4 was poorly preserved and totally bare of artifacts.

Room 5, like Rooms 4 and 3, is probably a storage room, but its floor has no organic traces or artifacts in situ on it. The only find from the room is a stone "shaft straightener" in the fill within 20 cm of the floor.

Rooms 6–11

Room 8 is the largest room in this group of rooms and, like Room 1, has a hearth (B) in its northwest corner beside a doorway. The floor, composed of many thin plaster layers, is 6.5 cm thick. The topmost layer of wall plaster is covered with a green wash. Hearth B is raised 7 cm above the floor of the room. Its maximum width along its west edge is 60 cm, making it slightly smaller than Hearth A in Room 1. Like Hearth A, Hearth B has what appear to be chimney stubs protruding from the walls at either end of the hearth and starting 30 cm above the hearth's surface. The hearth surface consists of three 1-cm-thick layers of chaff-tempered mud plaster. The bottom two layers are reddish and fire-hardened, while the top layer appears fresh and shows no traces of burning. The walls above the hearth are covered with three layers of chaff-tempered mud plaster, each 0.3–0.5 cm thick, over a 0.5-cm-thick plaster base. Again, the topmost layer of plaster is fresh and unblackened. Thus, it would appear that Hearth B was replastered only twice, as compared to three times for Hearth A, but that neither hearth was used again after the final replastering.

The only artifact in situ on the floor of Room 8 was a small baked clay pellet. Near Hearth B and in the fill 15 cm above the floor was a single copper pin of hammered native copper.

Room 6, adjoining Room 8, has a beautiful layer of yellow-green plaster on its floor and walls. The only find on or near the floor was a very small turquoise bead within 10 cm of the floor.

One of the most unusual finds in the VC complex comes from the northwest corner of Room 6, where Rooms 1, 6, 7, and 8 meet. Embedded in a mud brick built into this wall intersection was the skeleton of a child estimated to be less than a year old. The brick in which the child's remains were discovered was 60 cm above the floor of Room 6. The skeletal remains were crumbly and fragmentary at best, but enough was in situ to note that the child had been embedded in a flexed position, lying on his/her left side with the legs drawn up under the chest. One of the fragmentary bones was stained blue. No artifacts were found with the burial.

Room 7 is a later addition to the complex, constructed by building a curving north-and-west wall. The wall plaster in this room is green. The floor level is about 25 cm higher than the floors in adjoining rooms. One possible reason for the higher floor and the curving north-and-west wall may be that this room was built directly up against higher Period VIA leveling or even cut into this leveling, and that the unusual shape and high floor level of the room reflect the difficulties of building in such a confined space.

Rooms 9, 10, and 11 probably are storage rooms, but no artifacts were recovered from the floors of these rooms. The wall and floor plaster in these rooms was noted as being green. The situation in the southeast corner of Room 11 was never quite clear, but it would appear that there was a doorway connecting Room 11 with Room 13; and after the bricking in of the outside door of Room 7, this doorway would have provided the only access into Rooms 6–11.

Rooms 13–16, 19

Room 16 is the largest room in this group. Unfortunately, most of its floor and south wall have been obliterated by a later pit (20). In Room 16's southeast corner is a platform (F) 30 cm (or two brick courses) high, extending out 60 cm from the room's east wall. It was not determined during excavation whether this platform was put in when the complex was first built or whether it is a later addition. The only artifact found in situ on the floor was a complete but crushed carinated jar of the type found in Room 1.

Room 15 is another large room with a raised corner hearth (C). The details of Hearth C's construction were not recorded during excavation, but with a maximum width of 30 cm, it clearly is smaller than the other two interior hearths. The only artifact from the floor of this room is a turquoise bead found near the center of the room.

Adjoining Room 15 is Room 13, on whose floor no artifacts were found. Room 14 was probably accessible from Room 16 through the unexcavated room north of Room 16, but this cannot be proven since the doorway into Room 14 probably is in the still unexcavated east wall of the room. A single oval-shaped stone mortar was found on the floor of Room 14.

Room 19 is an incomplete room that is accessible from Room 13. There is a wide internal buttress along the east wall. Several stone mortars and two polished green stones were found near the south end of Room 19, and another stone mortar was found just outside the room along its east wall. Unfortunately, it was not entirely clear that these mortars and polished stones were contemporary with the room occupation, since this area is poorly sealed and close to the mound surface wash.

Rooms 17 and 18 are also incomplete, and nothing was recovered from their floors. Possibly they comprised part of a group of rooms that extended further to the south over the rubble leveling of Period VIA.

The function of Room 12, at the very center of the VC complex, remains a mystery, for there are no doorways into the room and nothing was found on the room's floors. Although it may be dangerous to argue only from negative evidence, no roof plaster was recovered from the fill of the room, so the possibility remains that this room was unroofed. If this is so, then there may have been openings higher up on the walls of the room, with Room 12 serving as a light well and source of light and ventilation for all the adjoining rooms. Of course, there is no specific positive

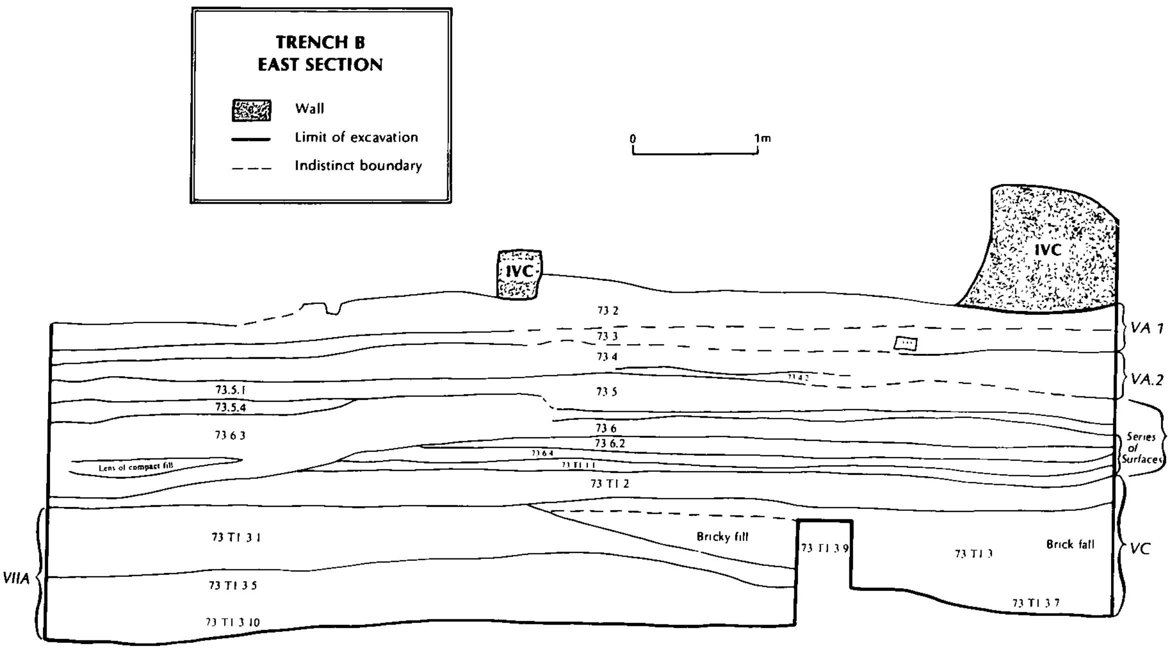


Figure 6.25. Trench B, east section.

evidence for this hypothesis, so that it must be taken as tentative.

North of Rooms 1 and 2 there is an open area extending up to an earlier east-west-running VIB wall. Because of the slope of the mound here and the absence of further construction in the area, this Period VIB wall was still exposed during VC and was on a level with the walls of the VC rooms (figs. 6.11, 6.25). This earlier wall is Wall 1 of Period VIB.2 (fig. 6.15). North of this wall there is no VC architecture and very little deposition, but against the *south* face of the wall an outside hearth (D) was built, and between this wall and the VC complex there is a plastered floor at a level about 25 cm higher than the floors of Rooms 1 and 2. Hearth D, with a width of at least 75 cm, is larger than any of the interior VC hearths. Its surface consists of fire-hardened, chaff-tempered mud plaster and is raised 10 cm above the surrounding floor. The floor plaster curves up against the base of the hearth. The topmost surface of the hearth was found in a blackened condition and covered with considerable quantities of charcoal and ash, some of which had spilled over onto the surrounding floor. It is curious that this outside hearth continued to be used after its last replastering, while the interior hearths all ceased to be used after their final replasterings. A possible explanation for this phenomenon can be found in the differential use of interior and exterior hearths in village compounds today. Outside hearths are the main cooking hearths and are used for this purpose year-round. A single outside hearth is often shared by more than one family. Inside hearths, on the other hand, are used only in the winter, and then primarily as a source of heat rather than as cooking hearths. Only when the winter weather is very severe are interior hearths used as cooking hearths. Such a seasonal use of interior hearths might explain the situation in the VC complex: the interior hearths were replastered after a winter's use, but the whole complex was abandoned during the summer months or at least before the onset of the next winter, so that these hearths were never used again. Meanwhile, outside Hearth D continued to be used as a cooking hearth right up until the time the VC complex was abandoned.

It would be reasonable to expect that the inhabitants of the Period VC complex would have built and moved into new houses during the summer months. That is the practice today because the summer is the best time for making sun-dried mud bricks; in winter the sun is not intense enough to dry the bricks and the ground remains too damp. Thus, the condition of the VC interior and exterior hearths helps confirm the hypothesis that the VC complex was abandoned during one of the warmer months of the year.

About halfway between Hearth D and the doorway of Room 1, a large number of turquoise beads, probably comprising a single necklace, were found resting on the outside floor.

The overall settlement density on this part of the mound is much higher than in the preceding VIB settlement, about the same as the VIA settlement, and significantly less than the VIIB settlements: 43.54 m^2, or 17.1 percent of the total 254.5 m^2 excavated for VC consists of interior space.

The final construction of VC, after the knocking down and filling in of the VC residential complex, was the laying of a level brick paving over the top of the filled-in VC complex. This paving can be seen in the west, north, and east sections of Trench C (C.68.T1–3.3–4 and C.69.3 in figs. 6.2, 6.3, 6.11). To the west it extends out over the top of the Upper Leveling of VIA; to the north it could not be traced more than a few centimeters into Trench B, where it appears to terminate over Hearth D; and to the south it appears to fade out at a point approximately over Room 3 of the VC complex. The paving is only one brick thick and poorly preserved. It was built not only with complete bricks, bu also with brick fragments and large quantities of mud mortar. Only a few bricks were recovered in a condition complete enough to measure (appendix A). The bricks examined are of the same thumb-impressed type used in the VC complex, with the thumb impressions located on the bottoms or sides of the bricks. It is possible that many of the bricks for the paving were robbed from the walls of the VC complex as it was being knocked down. The purpose in laying this paving, as with earlier brick pavings and platforms on the site, was probably to provide a solid, stable base on which to build a new room complex, that of Period VB.

PERIOD VB SETTLEMENT

Area of Exposure

88.2 m^2 in Trench B
48.3 m^2 in Trench BW
55.5 m^2 in Trench C
43.4 m^2 in Trench CW

235.4 m^2 total area

Feature Numbers (fig. 6.26)

Room 1	C.69.1.2–3
Room 2	C.69.1.7
Room 3	No feature number given during excavation
Room 4	C.69.1.17
Wall 5	C.69.S.7
Hearth 6	C.69.1.5
Wall 7	B.73.4.4
Burial 8	B.73.4.5
Intrusive Pit 9	B.73.2.6
Wall 10	B.73.5.5
Room 11	B.73.5.2
Burial 12	B.73.5.3
Concentration of Stake Holes 13	No feature number given during excavation

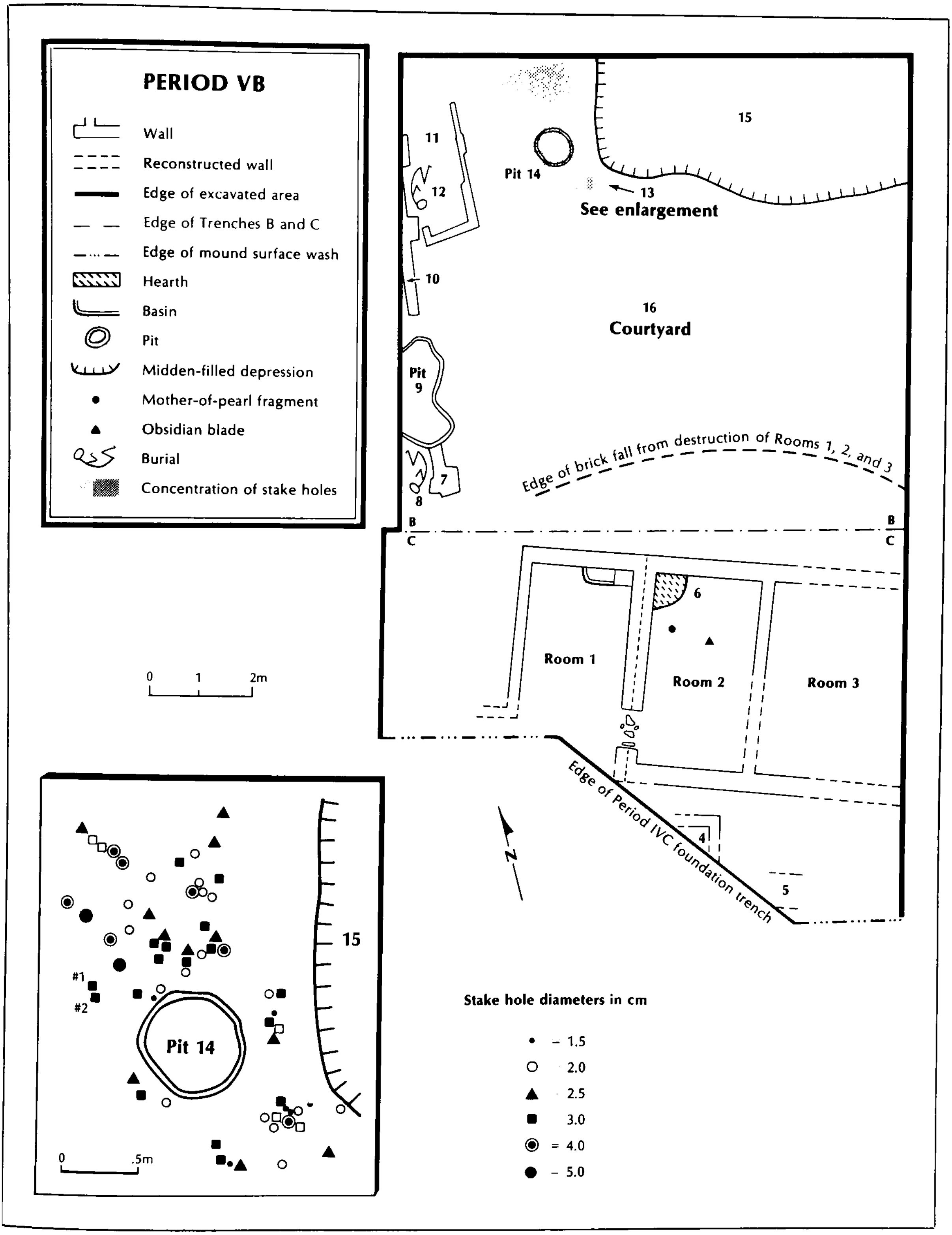


Figure 6.26. Plan of Period VB.

Intrusive Pit 14	B.73.2.8
Midden-Filled Depression 15	B.73.6.3
Courtyard 16	B.73.5.1, B.73.6.2, B.73.6.4

Most of the Period VB exposure consists of an open courtyard area (16). On the courtyard's north side is a shallow depression (15) filled with animal bones and organic midden, and also a cluster of stake holes (13) that date to the end of the VB occupation. On its west side the courtyard is bounded by Walls 7, 10, and enigmatic Room 11, which may represent a burial chamber for Burial 12. A second burial was recovered from this area close to Wall 7. To the south Courtyard 16 is bounded by a residential complex of which portions of at least four rooms were exposed (1–4). This south complex lies close to the mound surface and is poorly preserved. The complex was abandoned well before the end of VB and apparently was allowed to lie exposed and deteriorate gradually for the remainder of VB, with nothing being built over it until VA.2. This gradual decay of the VB rooms contrasts with the intentional knocking down and filling in of the VC complex beneath and may account for the extremely poor preservation of the VB walls relative to those of VC.

To the west, in Trenches BW and CW, the VB deposits thin to almost nothing, and the IVC building rests in some places directly atop Period VIA walls and rubble fill. This area probably was razed at the beginning of IVC, and the only indication of possible VB use of the area was the recovery of a number of VB sherds at the base of the IVC walls. Similarly, in Trench CDE to the east, what VB deposits may have existed were obliterated by a kiln dug into the area during Period VA.

Enough of the VB residential complex was exposed to indicate several changes from VC in construction techniques and interior layout. Thumb-impressed bricks continue to be used, but rooms no longer incorporate exterior corner or side buttresses (although see Wall 10): instead, most walls are now two bricks wide rather than one. Semicircular corner hearths are still used, but now they are sunken rather than raised. The dimensions of Rooms 1 and 2 are very similar to those of the largest rooms (1 and 16) of the VC complex, but unlike VC, the VB complex does not appear to have a central core of smaller rooms.

Rooms 1–4 were built directly over the one-brick-thick paving laid down at the end of Period VC (fig. 6.3), although the western edge of Room 1 rests directly on top of the rubble fill of VIA. The walls of the rooms are poorly preserved. Nowhere do they survive to a height of more than one or two courses. Most of the east wall of Room 2 has not survived at all, its existence having been established by the discovery of a 20-cm-wide line of mortar extending below floor level. The south end of Room 1 has been eroded away by surface wash, while the east wall of Room 3 does not appear within the area of exposure or was missed in excavation. For Room 4 only the northeast corner survives, the rest having eroded away or been cut away by the IVC drainage ditch that runs through this area. Thus, only Room 2 was recovered in its entirety. The dimensions of Rooms 1–3, so far as they could be determined, are as follows:

	Dimensions		
Room	*N-S*	*E-W*	
1	3.4+	× 2.0	= 6.8+ m^2
2	3.70	× 2.0	= 7.4 m^2
3	3.70	× ?	

The absence of external buttresses for Rooms 1–3 appears to have been compensated for by making the outside north and south walls of the complex two courses wide. The wall between Rooms 1 and 2 also is two courses wide. Since the walls were too poorly preserved to study details of bonding, the possibility remains that Room 1 was a later addition to the complex. The walls of the complex rest on a foundation layer of mud mortar that lies below floor level. It was not noted during excavation whether the bricks from Rooms 1–4 were thumb-impressed, but since contemporary Wall 7 and Room 11 to the north are both constructed with thumb-impressed bricks, it is clear that thumb-impressed bricks are still being used in VB and that the bricks of Rooms 1-4 probably also are thumb-impressed. Only three bricks were measured from the south residential complex. Their sizes were 45 × 14 × 20 cm, 45 × 15 × 20 cm, 45 × 13 × 23 cm, and 32 × 10 × 20 cm. It appears even from this small sample that brick lengths in VB still varied considerably and that bricks were not yet mold-made. On the other hand, the VB bricks differ from those of VC in having a consistently greater height.

The floors of Rooms 1–3 are covered with several layers of fine greenish plaster. Room 7's floor was examined in detail and proved to be made up of 10–15 layers of fine, lightly chaff-tempered plaster with no accumulation of deposits between any two layers. The rooms' walls also are covered with several layers of fine plaster. The best-preserved wall face is the west wall of Room 2. Here it was noted that a 2–3-cm-thick base layer of chaff-tempered mud had been laid over the bricks of the wall. On top of this base layer there were at least four layers of fine plaster, one of which had a reddish tint.

Rooms 1–3 were thoroughly cleaned out when they were abandoned. The only artifacts in situ on a floor come from Room 2. Here were found a piece of mother-of-pearl and an obsidian blade, as well as a concentration of Chaff-Tempered Coarse Ware and Black-on-Buff Ware sherds near Hearth 6. Hearth 6 has a diameter of 60–65 cm and is sunk beneath the floor of Room 2. Its bottom is rounded and covered with several layers of fine plaster hardened and reddened by fire. On the hearth's surface were found several small rocks and some wood charcoal. The only other interior feature is a basin or bin in the northeast corner of Room 1. The basin is built up from floor level and its walls are made with packed mud. A door approximately 70 cm wide connects Rooms 1 and 2, with three rocks forming a doorsill.

The lowermost surfaces of Courtyard 16 (B.73.6.2, B.73.6.4) run up against the base of Rooms 1–4 and also up against the base of Walls 7 and 10 and Room 11, so that all these constructions must be roughly contemporary. At some point during VB, however, Rooms 1–4 were abandoned and allowed to decay and collapse, while Walls 7 and 10 and Room 11 remained standing and exposed through the end of VB. This is evident from the fact that the uppermost surface of VB (B.73.5.1) runs up against Walls 7 and 10 and Room 11, whereas to the south it runs over the brick fall from the collapse of Rooms 1–4. This area of fallen bricks and plaster extends about 2 m north of the 1–4 room complex.

Courtyard 16 consists of a large number of hard, water-laid surfaces that during Period VB accumulated to a depth of between 30 and 50 cm (fig. 6.15). So hard are these surfaces that when first uncovered one could see small cracks running across them, as on an old concrete floor. When examined in cross section, the surfaces appear to be made up of very fine, clayey, silty concretions, with no individual surface being more than 0.5–1.0 cm thick. On the lowermost VB surfaces (B.73.6.2 and B.73.6.4), i.e., those associated with the occupation of Rooms 1–4, were found large numbers of sherds from Black-on-Buff Ware open bowls. The average size of these sherds was unusually large, and many, it turned out, could be fitted together to form complete bowl profiles. The surfaces of Courtyard 16 also yielded many small artifacts, certainly far more than the interior floors of Rooms 1–4. Predominant among these finds were beads (of clay, shell, turquoise, and lapis lazuli), flint flakes and blades, clay balls, and chlorite bowl fragments.

On the north side of Courtyard 16 lies a shallow depression (15) filled with soft, ashy, loosely compacted, mottled-looking organic midden. This depression reaches a depth of about 60 cm. Most of the VB courtyard surfaces run up to the edge of the depression; only the uppermost surface (B.73.5.1) runs over it. The reason for the depression is not clear, but it may well have been a brick pit—an area dug out early in VB to obtain material for making mud bricks. It is quite conceivable that the bricks for Rooms 1–4 were made with material dug out from this depression. Certainly today it is common practice to dig brick pits within 10–20 m of intended construction sites. It is also common for the depressions formed by the brick pits to become dumping areas for garbage and other village refuse. The VB depression may well have served exactly the same secondary function: far more bones and organic midden were found in Depression 15 than in the courtyard area or inside any of the rooms.

The function of Walls 7 and 10 on the west side of Courtyard 16 is unclear. Wall 10 has two buttresses along its east face, but there is no good evidence for its being part of a room, for at its south end the wall does not turn westward to form a corner, but simply ends. Likewise, Wall 7's south end stops abruptly and does not appear to turn westward to form a room. Thus, Walls 7 and 10 may constitute nothing more than a low outside wall forming a west boundary for Courtyard 16. Walls 7 and 10 may, in fact, be one and the same wall, for the alignment is the same, but the area where they would have joined is cut through by a Period IVB pit (9). Both walls were left standing, but two partial brick sizes were obtained from Wall 7, both of them 35+ × 15 × ? cm, and both bricks had thumb impressions on their top sides.

Just west of Wall 7 a burial (8) was discovered at the same level as the wall. Since the burial is sealed above by a VA surface and since there is no evidence of a burial pit, it appears likely, though not absolutely certain, that Burial 8 was laid down during VB and after the construction of Wall 7. The body was oriented northeast-southwest, with the skull lying upright at the southwest end facing west. The legs were tightly flexed and the arms raised and resting near the head. The bones were poorly preserved and fragile, but preliminary analysis showed that the epiphyses were not yet fused, so that the skeleton was probably that of a child under the age of 15. The fill around the burial was soft and loosely compacted. Found in direct association with the burial were several Chaff-Tempered Coarse Ware sherds, two flint flakes, a *Bos* pelvis, and a lozenge-shaped lapis lazuli bead resting in situ among the ribs.

A second burial (12) was discovered inside Room 11. Indeed, Room 11 may have been built specifically as a small burial chamber or boundary wall for this inhumation. Certainly the construction of the room's walls is haphazard and it is difficult to conceive of any other function it might have served. There is no north wall to the room; Wall 10 is made use of as a west wall; the south wall (which is not bonded to and does not even touch Wall 10) consists of thumb-impressed bricks with the thumb impressions on the top sides of the bricks; and the east wall, in places only 8 cm wide, is made of packed mud. No good floor or surface was found inside the room. Burial 12 lay in the soft, ashy fill of the room. Since there was no evidence of a burial pit and since the burial is sealed by a VA.2 surface, it is probable that the burial dates to VB times and is roughly contemporary with the construction of Room 11. The body was oriented north-south, with the head at the south end facing east, the legs drawn up in a tightly flexed position, and the arms raised and folded across the ribs. Preliminary analysis indicated that this individual still had a deciduous first molar and so probably was under the age of ten at the time of death. It is noteworthy that both these VB burials are children. The implication is that children who died were buried near living areas, but that the main burial site for adults lay off the mound in an area as yet unknown.

The final construction or constructions of VB are truly enigmatic. Lying just east of Room 11, they are represented by a concentration of small stake holes (13) in the uppermost VB surface (B.73.5.1). This surface runs against the east wall of Room 11 and over Depression 15. The stake holes are concentrated within an area of about 4.5 m^2. Some of them were obliterated by Pit 14, which was dug down from IVB levels. The stake holes vary in diameter from 1.5 to

5.0 cm and are labeled according to diameter size on figure 6.26. Two of the holes (nos. 1 and 2 on fig. 6.26) were sectioned. Both holes were about 7.5 cm deep and vertical in profile, tapering slightly at the bottom. Two further holes proved to be approximately 5 and 7 cm deep, respectively. The implication is that these holes were made by sharpened wooden stakes pounded vertically into the ground. Unfortunately, the stake holes form no coherent pattern as a whole (except that they are all concentrated in one area), and even when divided up according to diameter they show no clearer patterning. The only clue to their function is that the surface they are on is covered with a large ash lens; in the vicinity of the stakes the surface appears somewhat reddened from burning, although there is no real concentration of charcoal and nothing that clearly could be called a hearth. The most reasonable explanation is that this was some sort of outside cooking area and that the stakes were in some way associated with cooking activities, perhaps as upright supports for cooking spits or as tripods for cooking posts. Long use of the same area and frequent repositioning of stakes might account for what appears to be an almost random distribution of stake holes.

In spite of a larger average room size than in any other previous period of settlement, the density of VB occupation on this part of the mound, as measured by the total amount of interior space, is lower than that of all other periods except VIIC.2 and VIB.1–2. Only 24.19 m^2, or 10.3 percent of the total 235.4 m^2 excavated for VB, consists of interior space. Even if Room 11 is included, the amount of interior space is increased only to about 26.2 m^2, or 11.1 percent of the total area exposed.

PERIOD VA SETTLEMENT

There is little well-preserved architecture from either phase of Period VA. The area of exposure varies between the two phases and will be discussed under individual phase descriptions. In VA.2 only three walls were isolated, and no complete rooms. Most of the VA.2 area exposed was in Trenches C and B and consisted of a series of surfaces (an open courtyard?) with a fairly high density of artifacts on them. For VA.1 there is a cluster of small rooms in Trench C, only one of which was recovered in its entirety. These rooms probably were not habitational, for they are exceptionally small and the walls are only 10–14 cm wide and lack doorways. The only other VA.1 construction of note within the area exposed is a kiln resting very close to the mound surface in Trench CDE (fig. 6.27). Some VA sherds

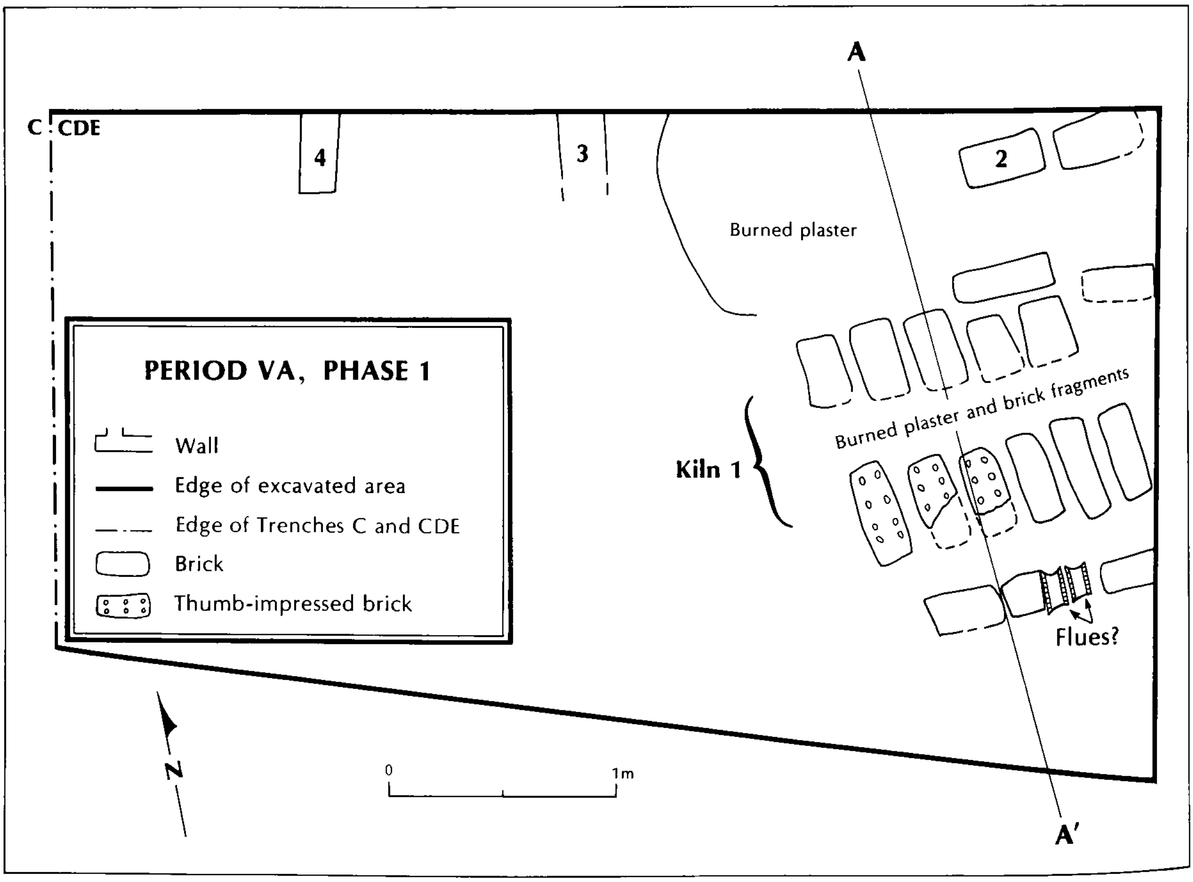


Figure 6.27. Plan of Period VA.1.

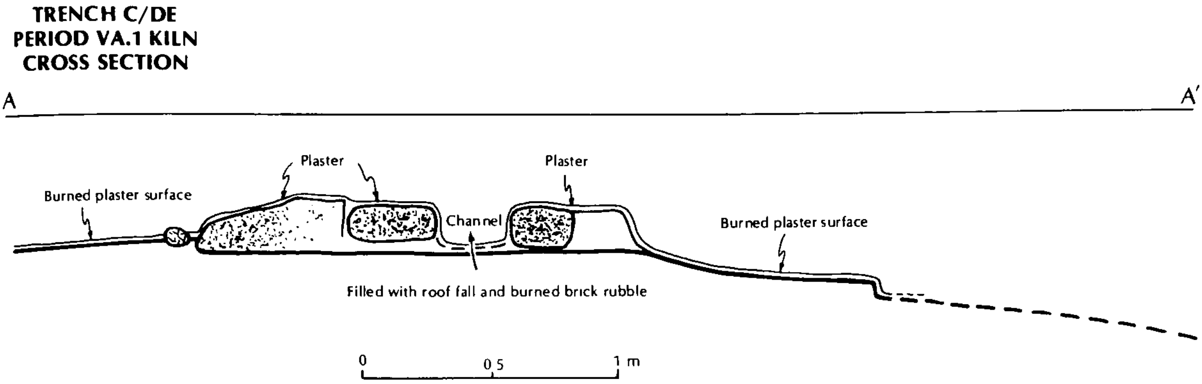


Figure 6.28. Trench CDE Period VA.1, kiln cross section.

were found in Trenches BW and CW at the base of the IVC walls, but the sherds were mixed in with other sherds clearly belonging to VC and VB; whatever VA deposits may have existed here were obliterated by the IVC constructions.

Period VA, Phase 2

Area of Exposure

88.2 m^2 in Trench B
48.3 m^2 in Trench BW
43.2 m^2 in Trench C
43.4 m^2 in Trench CW

223.1 m^2 total area

Although relatively few sherds were recovered from the VA.2 (courtyard) surfaces, these surfaces were quite rich in other types of artifacts. VA.2 finds from Trenches C and B include a clay ball, a shell bead, a turquoise bead, a fragment of mother-of-pearl, a mother-of-pearl pendant, a finely carved chlorite vessel with a disc base, four chlorite bowl fragments, an obsidian blade, a concentration of microlithic blades, and two almost complete Black-on-Red Ware beakers with exterior-painted chevrons.

Period VA, Phase 1

Area of Exposure

88.2 m^2 in Trench B
48.3 m^2 in Trench BW
39.5 m^2 in Trench C
43.4 m^2 in Trench CW
13.5 m^2 in Trench CDE

232.9 m^2 total area

Feature Numbers (fig. 6.27)

Kiln 1	CDE.73.S.1
Wall 2	CDE.73.S.2
Wall 3	CDE.73.S.4
Wall 4	CDE.73.S.3

Other than a series of thin, poorly defined walls in Trenches C and B, the only significant VA.1 find was a burial, which lay just underneath a IVC wall in the uppermost fill of VA.1. Although the burial appeared to be sealed by the IVC wall, it is quite possible that it is associated with the initial construction of the IVC walls rather than with the end of the VA.1 occupation. Whichever is the case, the burial was fragmentary. No vertebrae or pelvic bones were recovered. The skeleton must have been that of an extremely young child, for the skull was almost paper-thin and very fragile. The skull was found in an upright position, with the face oriented toward the north. There were no artifacts with the burial.

There is no certainty that Kiln 1 (figs. 6.27, 6.28) dates to VA.1, but it is described here because there is a good possibility that it dates to this phase. It may, however, belong instead to VA.2 or even VB. The problem is that most of the kiln lies right at the present surface of the mound, so that it is difficult to date the kiln by its stratigraphic position or by associated materials. Black-on-Red chevron-painted sherds are abundant, which would imply a VA.1 or VA.2 date, but some Chaff-Tempered Coarse Ware is present as well, so that a VB date is not inconceivable. The use of thumb-impressed bricks in the kiln would argue for an earlier dating.

Only the base of the kiln (as shown in fig. 6.27) survives. The only traces of the original superstructure or firing chamber are the fallen bricks and pieces of roof plaster with reed impressions on one side that collapsed onto the floor of the kiln. The kiln's floor consists of three rows of thumb-impressed bricks, some laid with the thumb impressions on top and some with them on the bottom. The southernmost row has what appear to be two plastered flues cut through it. There is no trace of an outside wall on the west side of the kiln. The bricks making up the floor are all fire hardened and reddened, and areas of burned plaster extend both to the north and the south of the brick flooring. The burned plaster is up to 8 cm deep at its thickest, with 10–15 replasterings.

On the uppermost of these burned plaster surfaces, too, there are fallen fragments of burned bricks. A north-south cross section through the center of the kiln is provided in figure 6.28.

The kiln probably was used to fire pottery: evidence for such a function is abundant. Just west of the kiln a very over-fired vessel was recovered, together with considerable numbers of over- and under-fired sherds. Next to the over-fired vessel lay a ceramic cone, probably a temperature indicator for the kiln. Finally, a large concentration of fine, levigated clay was also discovered on the west side of the kiln.

The density for the VA.1 area exposed is still extremely low. Only about 6 m, or 2.6 percent of the 232.9 m^2 exposed for VA.1, consists of interior space, and even this assumes that the thin walls exposed in Trench C actually comprised "rooms."

PERIOD N-VII SETTLEMENT

Area of Exposure

37.9 m^2 in Trench XC
54.8 m^2 in Trench XCE
31.9 m^2 in Trench XD

124.6 m^2 total area

Feature Numbers (fig. 6.29)

Room 1	No feature number given during excavation
Room 2	No feature number given during excavation
Room 3	No feature number given during excavation
Room 4	XC.71.9.40
Room 5	XC.71.9.42
Room 6	XC.71.9.38
Possible Room 7	XC.71.9.41
Room 8	XC.71.9.37, XCE.73.T1.10.34A, XCE.73.T1.11.34B
Room 9	XC.71.9.36
Possible Room 10	No feature number given during excavation
Room 11	XC.71.9.30
Possible Room 12	XC.71.9.34
Room 13	XC.71.9.34A
Room 14	XCE.73.T1.10.33A, XCE.73.T1.11.33B
Room 15	XCE.73.T1.10.32A, XCE.73.T1.11.32B, XCE.73.T1.11.32C
Room 16	XCE.73.T1.10.39A
Room 17	XCE.73.10.38
Hearth 18	XCE.73.9.35
Wall 19	XCE.73.9.40
Circular Platform 20	XC.71.9.33
Alley 21	XC.71.8B.35
Intrusive Pit 22	XC.71.1.45
Intrusive Pit 23	XD.70.T2.3.2
Burned Earth Concentration 24	XCE.73.9.37
Tholos A	XC.71.9.23
Courtyard A	XC.71.9N.39, XD.71.1.43
Courtyard B	XC.71.9.32, XCE.73.T1.11, XCE.73.T1.12

The Period N-VII room complex represents the earliest architecture excavated on the north side of the mound (fig. 2.5). There are enough similarities between these N-VII rooms and the VIIB architecture on the mound's south side to argue that both belong to the same general period. Both complexes consist of a tight clustering of contiguous rooms with "offset corner bonding"; both have a notable lack of identifiable doorways; and both are built with similarly sized thumb-impressed bricks with the thumb impressions facing upward. In addition, the ceramics associated with these two complexes are indistinguishable. Like the VIIB complex, the N-VII rooms are built up the slope of a low, earlier mound: the floors of the northernmost N-VII rooms rest almost at the level of the surrounding plain and virgin soil, while the floors of the southernmost rooms, about 1.0–1.5 m higher, overlie earlier deposits. Also like the VIIB complex, the N-VII architecture is poorly sealed at its outer edge. Rooms 1–3 are not sealed at all, and the tops of the walls are almost even with the present mound surface. The rooms to the south are sealed, but only by much later (N-VB) material. Indeed, the upper fill of these N-VII rooms contains N-VB material, implying that the rooms lay exposed from the end of N-VII to the beginning of N-VB and that this area of the site was not occupied at all in Periods VI and VC.

The N-VII exposure includes 14 rooms and a tholos-shaped structure, as well as three additional enclosed areas that may have been rooms (7, 10, 12) (fig. 6.30). The dimensions of the 12 complete (or almost complete) rooms are as follows:

	Dimensions
Rooms	*N-S E-W*
1	1.40 × 1.05 = 1.47 m^2
2	2.30 × 1.70 = 3.91 m^2

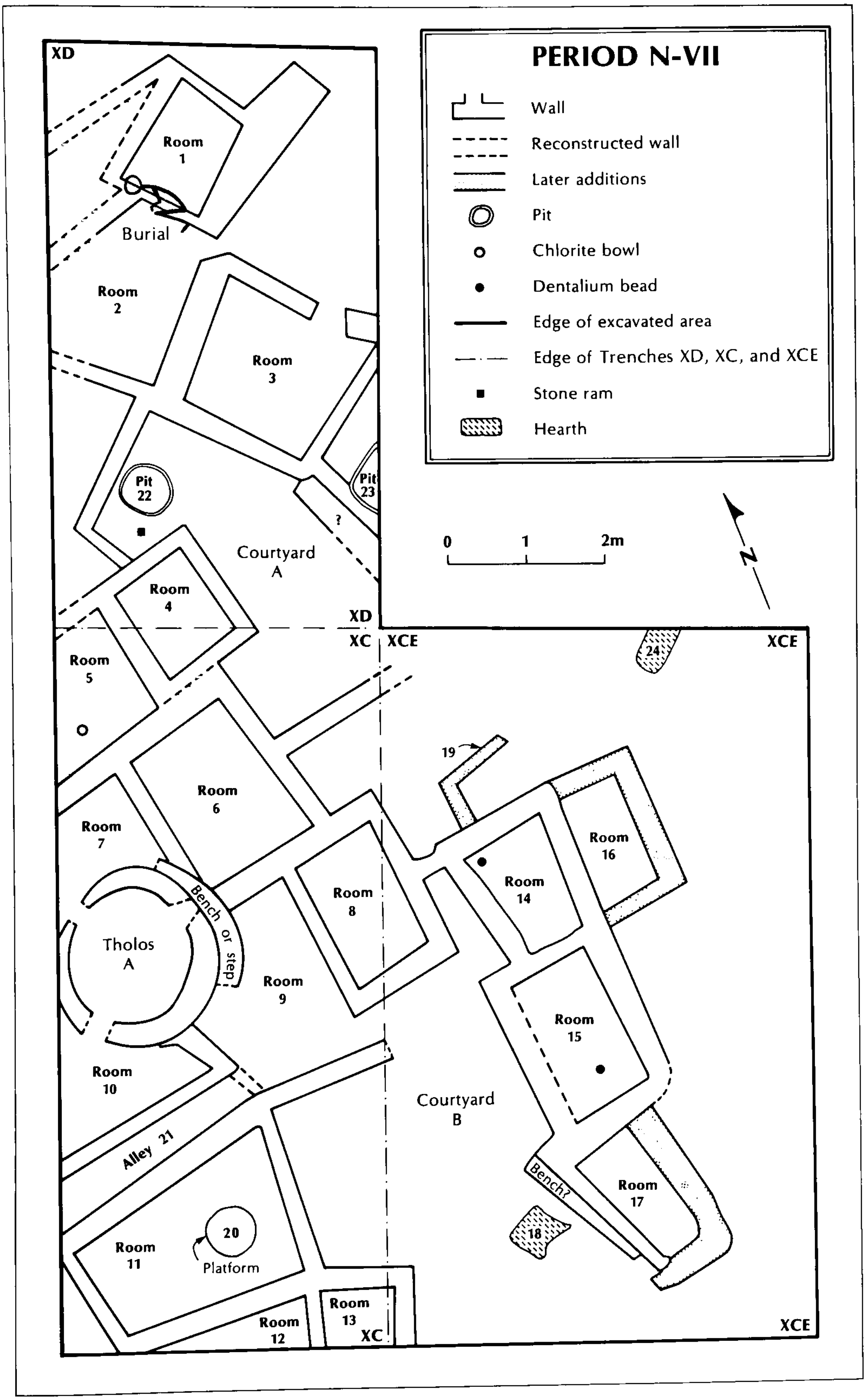


Figure 6.29. Plan of Period N-VII.

Figure 6.30. Architecture of Period N-VII, Trenches XC and XCE, viewed from the east. Note tholos structure in center background.

3	1.70 × 1.90 = 3.23 m^2
4	1.28 × 1.06 = 1.36 m^2
6	2.00 × 1.50 = 3.00 m^2
8	1.88 × 1.10 = 2.07 m^2
9	2.35 × 1.80 = 3.29 m^2 (unusual proportions)
11	1.60 × 2.60 = 4.16 m^2
14	1.55 × 0.95 = 1.47 m^2
15	1.96 × 1.10 = 2.16 m^2
16	1.54 × 0.82 = 1.26 m^2
17	1.76 × 0.82 = 1.44 m^2
Tholos A	1.60–1.75 m in diameter = 2.22 m^2

Not all the N-VII rooms were built at the same time. The exact sequence of construction, however, remains poorly understood because the only rooms in the complex to be dismantled were Rooms 14–17. Rooms 14 and 15 have bonded corners and so must have been built at the same time. Rooms 16 and 17 are later additions (the added walls are shown in cross-hatching). Wall 19, too, is a later addition abutting Room 14. At the north end of the complex, Rooms 1–3 may have been built earlier than the rooms to the south, for their orientation is slightly different. One of the difficulties in unraveling the construction sequence is that the whole complex was built on a slope, with the result that rooms lower down could be contemporary with or even later than rooms higher up the slope; and because most of the rooms were never taken down, the surface(s) on which they were built were never isolated.

The upper fill of the rooms is generally hard and compact, with some bricky debris mixed in. The lower fill just above the N-VII floors is soft and loosely compacted. This room fill differs markedly from the almost solid brick fall that filled the rooms of, for example, Period VC on the mound's south side, where the complex appears to have been knocked down intentionally and filled in with the debris from its own walls soon after it was abandoned. The N-VII rooms, by contrast, appear to have been left exposed and to have decayed gradually. In the upper fill of the rooms, 10–35 cm beneath the tops of the walls, there are intermittent, poorly defined surfaces with cultural debris on them belonging to N-VB. The lowest floors associated with the N-VII occupation were difficult to isolate and appear to have consisted of beaten earth. Only in Room 8 is plaster (fine, white) recorded as being present. How most of the rooms were entered is unclear, for only three of the 17 rooms have doorways (Room 3 along its north wall, Room 2 in its northeast corner, and Room 9 in its southeast corner). The openings in the walls of Tholos A cannot be considered doorways in the normal sense. They are tunnel-like openings situated near the base of the tholos wall and are only 30–35 cm in diameter.

The walls of the complex are preserved in some places as high as 0.8–1.0 m (fig. 6.31). But only from Rooms 14–17, the only rooms dismantled, do we have brick sizes. All the walls are constructed with thumb-impressed, sun-dried mud bricks, laid with the thumb impressions facing

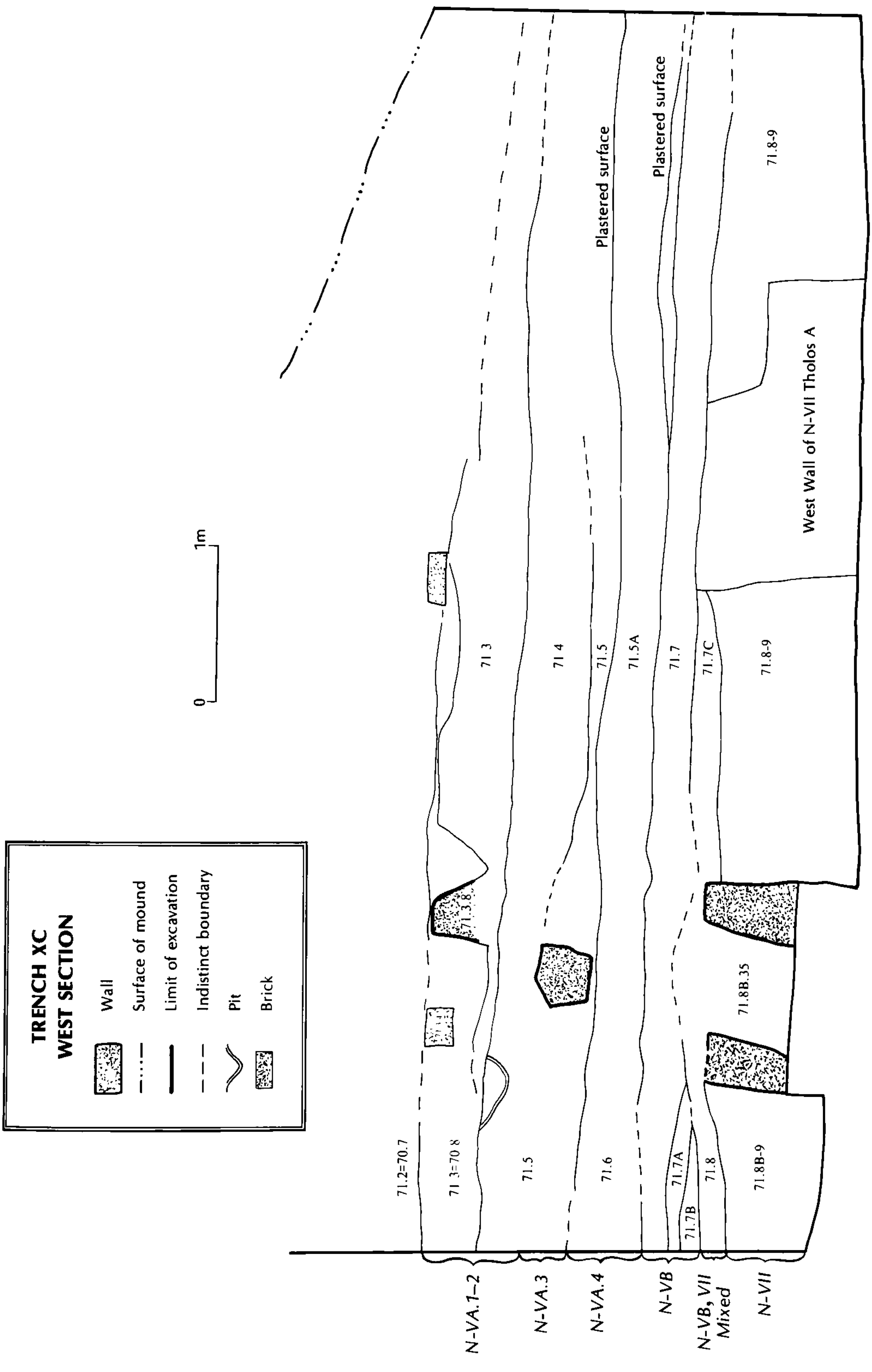


Figure 6.31. Trench XC, west section.

up. The bricks are made of clay, with scarcely any tempering material visible in them. The wall bases overlie a 5-cm-thick foundation of packed mud. The heights of most bricks are between 9 and 11 cm, and the widths between 15 and 18 cm. Brick length is the most variable dimension, ranging from 47 to 54 cm.

Most of the secondary features within the area of exposure are later than the N-VII occupation. Hearth 18 is a concentration of ash and burned earth on an upper surface of Courtyard B. This hearth almost certainly postdates the abandonment of the complex, but is earlier than the N-VB constructions. Burned Earth Concentration 24 may well be associated with the use of Hearth 10 directly above it in N-VA.4 (fig. 6.33). Intrusive Pits 22 and 23 are unsealed and were dug down from the mound's surface in a later period. Pit 23 is filled with Period IVB ceramics. Circular Platform 20 is 65 cm in diameter and made with packed mud. It rises only 2–3 cm above the floor of Room 11 and is contemporary with the use of the room. Its function is unknown, but it clearly was not a hearth, for there is no evidence of burning.

The floors and surfaces of the complex were found to have scarcely any sherds or bones on them, or any other type of artifact that might provide a clue to their function(s). The only significant in situ finds were a crude chlorite bowl found just above the floor of Room 5, a *Dentalium* bead on the floor of Room 15, and a *Dentalium* bead on the floor of Room 14. A carved stone ram was discovered in the western corner of Courtyard A, but in a not very well sealed context about 40 cm above the surface of the courtyard, and so may belong to a later period.

At the north end of the Period N-VII architecture was found an adult human burial (figs. 6.29, 6.32). The skeletal remains were resting directly *above* the southeast wall of Room 1 of the complex, and so must postdate the N-VII architecture. Unfortunately, no burial pit could be isolated and deposits at the mound's edge in this area were poorly sealed, so that a precise dating of the burial was impossible. The close association of the burial with a Chaff-Tempered Coarse Ware jar just to the east of the skeleton (fig. 6.32) implies that it may date roughly to Periods VII–VI. The body was resting on its right side with both legs flexed and drawn up toward the chest. The left arm was raised, with the hand close to the skull. The body was oriented north-south, with the skull at the north end and facing toward the west. The lack of a discernible burial pit and the similarity of the body's position (lying on the right side with legs flexed) to those found in Period VIIC.1 deposits on the mound's south side (described earlier in this chapter; see also fig. 6.1) may indicate that this burial belongs to Period VIIC as well.

The function of this N-VII complex must remain a matter of conjecture. The overall layout seems haphazard (although offset corner bonding may account for some of this asym-

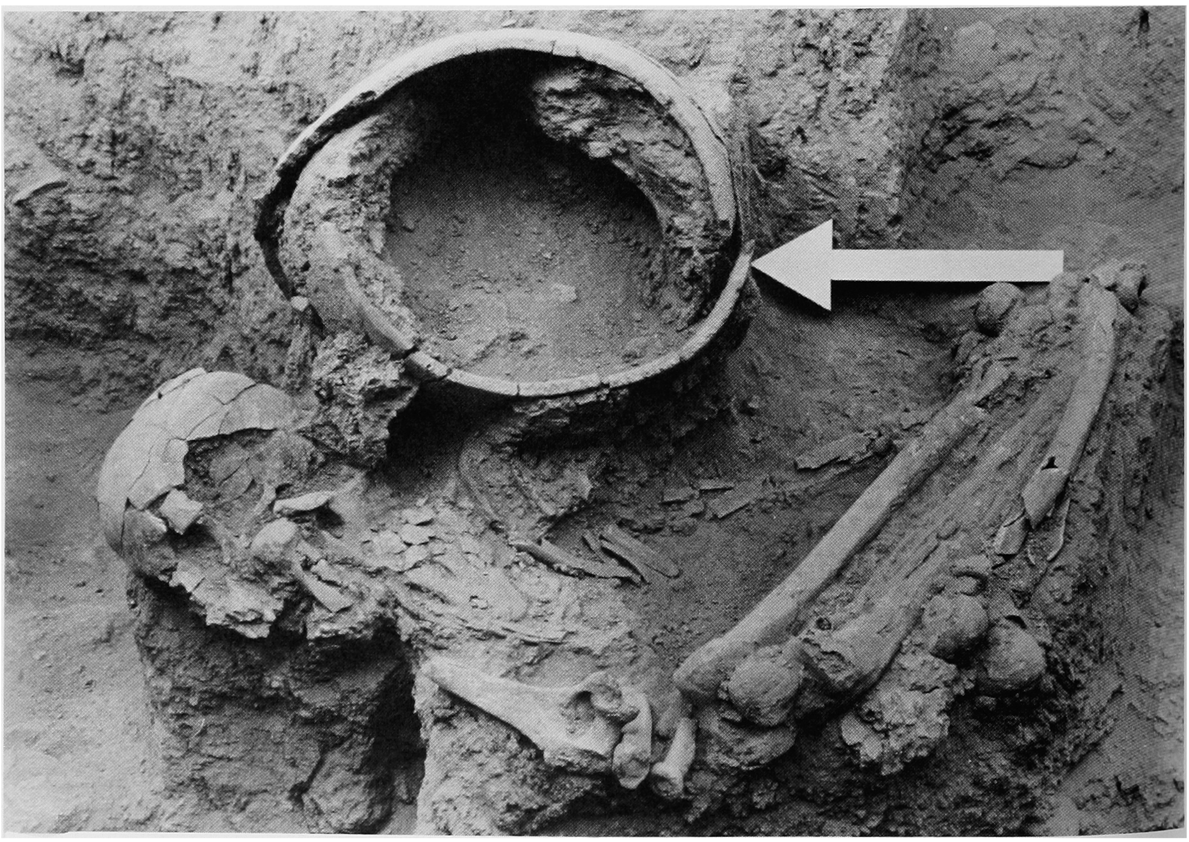


Figure 6.32. Adult burial associated with Chaff-Tempered Coarse Ware jar, Period N-VII(?), Trench XD.

metry) and agglutinative, and there is simply too little cultural debris in or around the rooms to argue that this was an intensively used living area. Not a single hearth was found associated with the rooms in the entire area of exposure. An easy but untestable hypothesis is that some of the rooms were used for storage and that the materials stored either were perishable or were removed before the complex was abandoned. Another possibility is the one suggested for the VIIB complex on the mound's south side, that these were roofed pens used for sheep and goats (and perhaps even cattle) during the winter. There is today at the edge of the valley a collection of simple reed huts, many of them no larger than individual rooms in the N-VII complex. Here the sheep from the surrounding villages are sheltered and fed during the four harshest months of winter. If this was the function of the N-VII complex, then the curious tholos structure could more easily be explained. Tholos A could have been a large storage bin supplying the food for sheep and goats in the surrounding rooms (6, 7, 10). Animals led into Room 9 from Courtyard B, for example, could then have been fed from Tholos A. The semienclosed spaces of Courtyards A and B would have been easy areas into which to herd small flocks of sheep and goats. Alley 21, too, may have served as a means of funneling animals into a Room 9 "feeding area."

Settlement density (in terms of the amount of interior space) is higher in N-VII than in any other period on the north side of the mound. If one includes the "Possible Rooms" 7 and 10, fully 37.78 m^2, or 30.3 percent of the total area exposed, consists of interior space.

PERIOD N-VB SETTLEMENT

Area of Exposure

37.9 m^2 in Trench XC
54.8 m^2 in Trench XCE

92.7 m^2 total area

After the abandonment of the Period N-VII room complex, the north side of the mound (at least within the area excavated) falls into disuse for an extended time period. There is no architecture representing Periods VI and VC on the north side of the mound, and only a minimal amount of deposition during this span of time. Scarcely any sherds diagnostic of Periods VI or VC were recovered from the approximately 20–30 cm of fill between the tops of the N-VII walls and the base of the N-VB walls. Indeed, the upper fill of the N-VII rooms already contains Black-on-Buff VB ceramics, the implication being that the N-VII rooms lay exposed and unsealed from the end of N-VII until the construction of the N-VB room and walls.

The exposure of N-VB architecture is minimal, consisting of the northern corner of a single room oriented north-south and portions of two other walls with approximately the same orientation. The floor of the room is plastered, but no artifacts were recovered from it. The room's walls survive to a height of 40–50 cm and are recorded as being made of packed mud rather than bricks. However, this apparent absence of bricks must not be taken as absolutely certain, since for most periods on the site walls initially thought to be of packed mud were usually found, after careful dismantling, to have been made with mud bricks.

One of the two free-standing walls survives to a height of two to three courses and is built with bricks of roughly uniform dimensions (39 × 11 × 20 cm; for a complete listing of the six bricks measured, see appendix A). This brick type is unusual in that the brick is so narrow relative to its height. The other wall is poorly preserved, surviving only to a height of 25 cm. The bricks are almost identical to those of the first wall, being recorded as 38.5 × 10–11 × 20 cm. These N-VB bricks, despite the closeness of their dimensions, appear to be handmade rather than mold-made, for their corners are too rounded to have been made in a mold.

The density of the N-VB occupation on this part of the site is obviously very low, with only 1.47 m^2, or 1.6 percent of the total 92.7 m^2 excavated for N-VB, consisting of interior space.

PERIOD N-VA.4 SETTLEMENT

Area of Exposure

37.9 m^2 in Trench XC
54.8 m^2 in Trench XCE

92.7 m^2 total area

Feature Numbers (fig. 6.33)

Podium 1	XC.71.5A.18
Podium 2	XCE.73.5.27
Podium 3	XCE.73.5.26
Room 4	XCE.73.5.29
Wall 5	XC.71.5A.19
Wall 6	XCE.73.5.28
Wall 7	XCE.73.T1.4A.21
Possible Wall 8	XCE.73.T1.4A.21
Possible Wall 9	XCE.73.5.30
Hearth 10	XCE.73.T2.4B.25
Cow Burial 11	XCE.73.T2.4A.23

Ceramically, Period N-VA.4 is distinguished from N-VB by the appearance, for the first time, of Black-on-Red ceramics in significant quantities. Black-on-Buff sherds continue to be found, but in diminishing numbers. Thus, N-VA.4 is comparable to VA.2 on the mound's south side, a transitional phase between the exclusively Black-on-Buff ceramics of VB and the exclusively Black-on-Red ceramics of VA.1. The strong continuity between N-VB and N-VA.4 reflected in ceramics also can be seen in the architecture of the two phases. The N-VA.4 constructions have precisely the same north-south orientation as those of N-VB; the walls have the same thinness that is characteristic of the N-VB

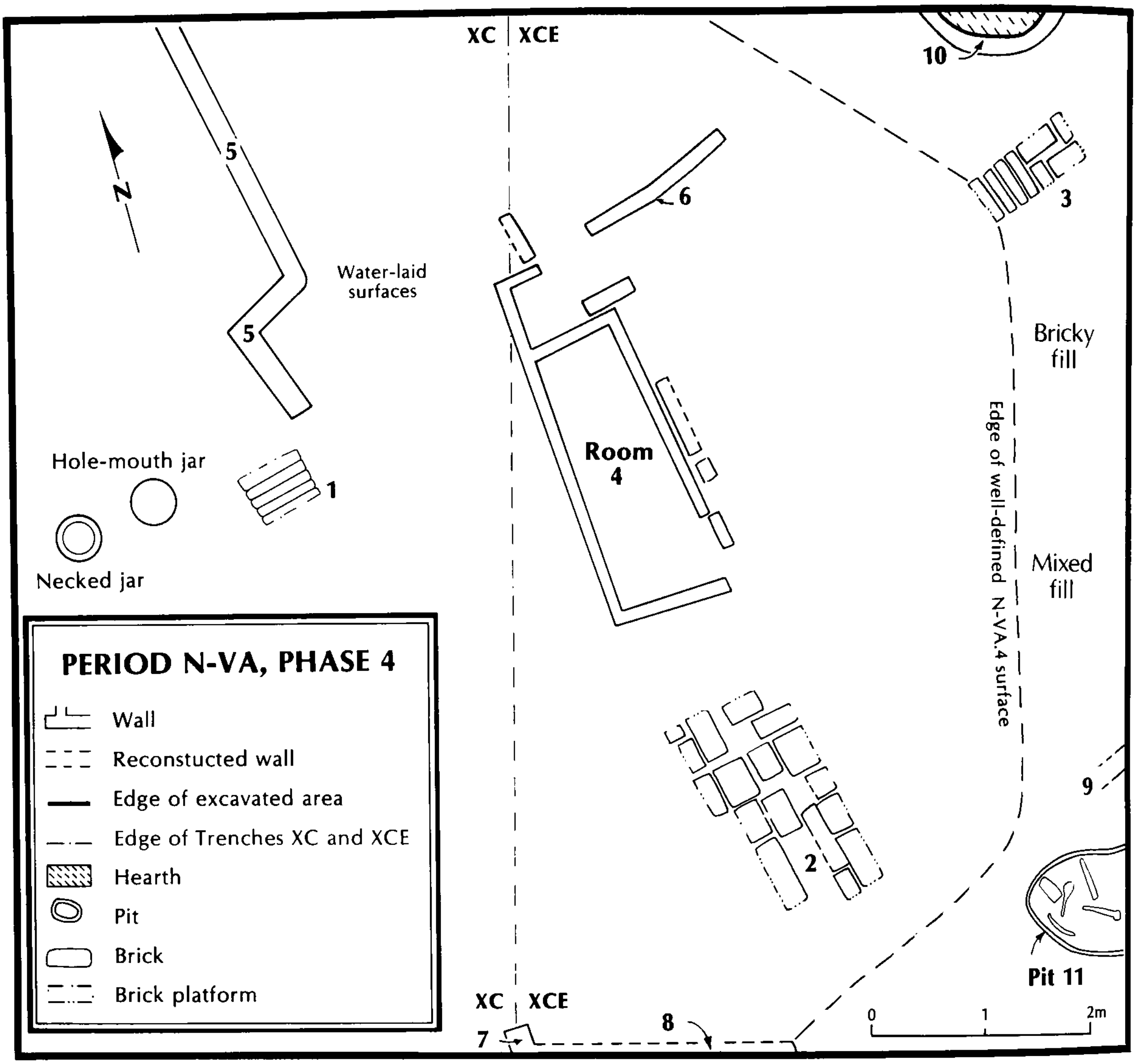


Figure 6.33. Plan of Period N-VA.4.

walls; and in some areas the N-VA.4 floor is as little as 10 cm above that of N-VB. Almost certainly, then, there is no significant time gap between the end of N-VB and the construction of the new N-VA.4 features in the same area.

As with N-VB, the amount of architecture within the N-VA.4 area exposed is minimal. Only one complete room was uncovered (4). This small structure probably represents some sort of outbuilding, stable, or storage area. No evidence of roofing was found. Indeed, the walls—only 10 cm wide—seem too thin to have supported a roof. Although both the floor and walls are plastered, the room contains no interior features, and very few sherds or bones were recovered from the floor. The room is slightly wider at its south end than at its north end, and there is a possible doorway in the southeast corner. The dimensions of Room 4 are 2.40 × 0.85 m, or 2.04 m^2 The room's walls are preserved to a height of only 12 cm, so no complete brick measurements could be obtained. However, the thinness of the walls implies that the same type of narrow brick (or brick set on its edge) was used here as was used in Wall 6.

In the vicinity of Room 4 is a good plaster floor which to the northwest becomes a series of water-laid surfaces and to the east (beyond the dotted line on fig. 6.33) turns into a hard dirt surface. Resting on this plaster floor are traces of reed matting.

Within 3.5 m of Room 4 are three different podia, all with the same north-south orientation as the room, but differing in shape and in the brick sizes used in their construction. None of the three is more than one course high. The function of these curious features remains a mystery. Podium 1, west of Room 4, is rectangular, measuring 0.50 by 0.63 m. It is constructed with five bricks laid side by side, four of them being 63 × 10 × 24 cm, and the fifth measuring 63 × 10 × 12 cm. Podium 2, south of Room 4, is larger and its edges less well defined. Here the bricks are laid in a more random fashion. The brick widths (20–23 cm) and brick heights (8–9 cm) are fairly consistent, but brick lengths vary from 23 cm up to 51 cm (see appendix A for the dimensions of the four bricks measured). One possible explanation for the variability in brick lengths is that the shorter bricks were actually broken bricks or brick fragments derived from a single standardized brick size of 51 × 23 × 9 cm. Podium 3, east of Room 4, is a rectangle measuring 1.02 × 0.53 m. The eastern half consists of four bricks laid side by side, each measuring 40 × 8 × 12 cm. Four more bricks of greater height make up the podium's eastern end (for sizes, see appendix A).

Walls 5, 6, and 7 are isolated walls that do not appear to form part of any structure. The bricks of Wall 5 are recorded as being 63 × 12 × 10 cm, or the same dimensions as one of the bricks of Podium 1. Wall 6 is plastered on both sides with a fine plaster lacking any temper or inclusions. The bricks in this wall are of uniform size: 38.5 × 10.5 × 27 cm. Wall 7 does not extend far into the trench. The only brick measured was 54 × ? × 12 cm. Features 8 and 9 are possible walls as well, but are poorly preserved and were not well defined in excavation. It is not clear why there is so much variability in the brick sizes used in the N-VA.4 walls and podia. Possibly the different features were built at slightly different times. Unfortunately, the exact order of construction of the various unarticulated N-VA.4 features is unknown, except that Room 4 and Wall 6 were built at the same time and before any of the podia.

West of Podium 1 were found a large, complete Black-on-Red Ware necked jar and a large, complete Black-on-Red hole-mouth jar set into the plastered outside floor of N-VA.4. These pots may have continued in use into the following N-VA.3 phase, during which they are still exposed.

Finally, near the eastern edge of the exposure were found two features, 10 and 11, which are at the same level as the rest of N-VA.4, but which cannot with any certainty be ascribed to the N-VA.4 phase of occupation. The difficulty is that in this area of the exposure the N-VA.4 surface is poorly preserved and was not well isolated. Moreover, the deposits in this area are not well sealed and may include materials from N-VA.3–1. Hearth 10 was only partially exposed, but appears to be circular. It is about 1.2 m in diameter, with a 20-cm-wide raised edge of packed mud. Nine different burning surfaces were found curving up against the inside edge of this rim. The burnt earth associated with Hearth 10 extends down into the fill of Period N-VII (see fig. 6.29), and evidence of burning extends up into N-VA.3, so that its exact span of use is unclear. Feature 11 is a cow burial in a pit, but given the poor stratification in this area, it could not be determined in what phase or from what level this pit was dug.

The specific function or functions of the N-VA.4 area exposed remains unclear. The presence of a plastered floor covered with reed matting, together with storage jars set into the ground and a possible outside hearth, suggest that it was a work/storage/stable area associated with a dwelling that lies outside the area of exposure. Thus, despite the lack of structures, the N-VA.4 exposure appears to be an intensively used living area. But our criterion of interior space as a measure of the N-VA.4 occupation density yields a very low figure: only 2.04 m^2, or 2.2 percent of the total 92.7 m^2 excavated, consists of interior space.

PERIOD N-VA.3 SETTLEMENT

Area of Exposure

37.9 m^2	in Trench XC
54.8 m^2	in Trench XCE
92.7 m^2	total area

Ceramically, Period N-VA.3 is indistinguishable from N-VA.4. The two are also very similar in their architectural features. As in N-VA.4, one finds in N-VA.3 podia and unarticulated walls (with the same orientation as before), as well as large storage jars, but no habitational structures. It would appear probable that here, as in the preceding phase, one is dealing with an outside work/storage area delineated by thin partition walls.

The only new type of features present are the two shallow, plastered pits from the southern half of Trench XC. Both have rounded bottoms and are only 15–25 cm deep. Nothing was found in or around them that would indicate their function, although they do bear a general resemblance in size and shape to the much earlier VIIB.4 "basin" found on the south side of the mound. This feature was interpreted as a possible mixing basin for green clay plaster. It is interesting to note that just to the south of one of the pits several layers of water-laid deposits were found, together with some very fine sand or clay with mica inclusions, so that perhaps these pits, too, played a role in the processing of clay for plaster or ceramics. The function of the two large stones with holes bored through them found beside the southernmost plastered pit remains a mystery.

Four small, noncontiguous wall fragments were recovered from the excavated area. All have a north-south orientation. The two bricks recovered from these walls measured 36 × 10.5 × 10 cm and 28 × 24 × 10 cm.

Finally, two podia, both approximately square in shape and constructed in an almost identical manner, were recovered from Trench XCE. The first podium is two courses high and built with bricks set on edge, all measuring 63 × 10 × 18 cm. The lower course consists of five bricks laid side by side and oriented north-south, with a sixth brick laid along one end oriented east-west. The upper course has only two surviving bricks, both oriented north-south. The other podium likewise is two courses high. The bricks all measure 60 × 8 × 18 cm and are set on edge, the lower course consisting of two bricks oriented north-south.

PERIOD N-VA.2 SETTLEMENT

Area of Exposure

37.9 m² in Trench XC
54.8 m² in Trench XCE

92.7 m² total area

Feature Numbers (fig. 6.34)

Room 1	XCE.71.15.43, XCE.73.S.2
Room 2	XCE.71.15.42, XCE.73.S.1
Room 3	XCE.71.15.44, XCE.73.S.4
Probable Room 4	No feature number given during excavation
Wall 5	XC.71.4.1, XC.71.4.2, XC.71.4.3
Wall 6	XCE.73.S.6
Hearth 7	XC.71.3.11

In N-VA.2 appears the first good architecture since that of Period N-VII. Here were found an almost complete dwelling and the corner of a probable second dwelling. Black-on-Red ceramics have by this phase totally replaced the Black-on-Buff ceramics that began in N-VB, so that N-VA.2 is comparable to the VA.1 phase on the south side of the mound.

Although part of the east side of the N-VA.2 building lies outside the area of exposure, there probably were originally no more than three rooms (fig. 6.35). This reconstruction is based on the similarity of the N-VA.2 building's layout to that of the more complete three-room structure built directly over it in N-VA.1 (fig. 6.36). The N-VA.1 structure consists of a larger room adjoining two slightly smaller rooms roughly equal to each other in size. The partition between the two smaller rooms lines up almost exactly with the center of the larger room. The N-VA.2 structure, although oriented in the opposite direction and differing in certain of its details, would appear to have

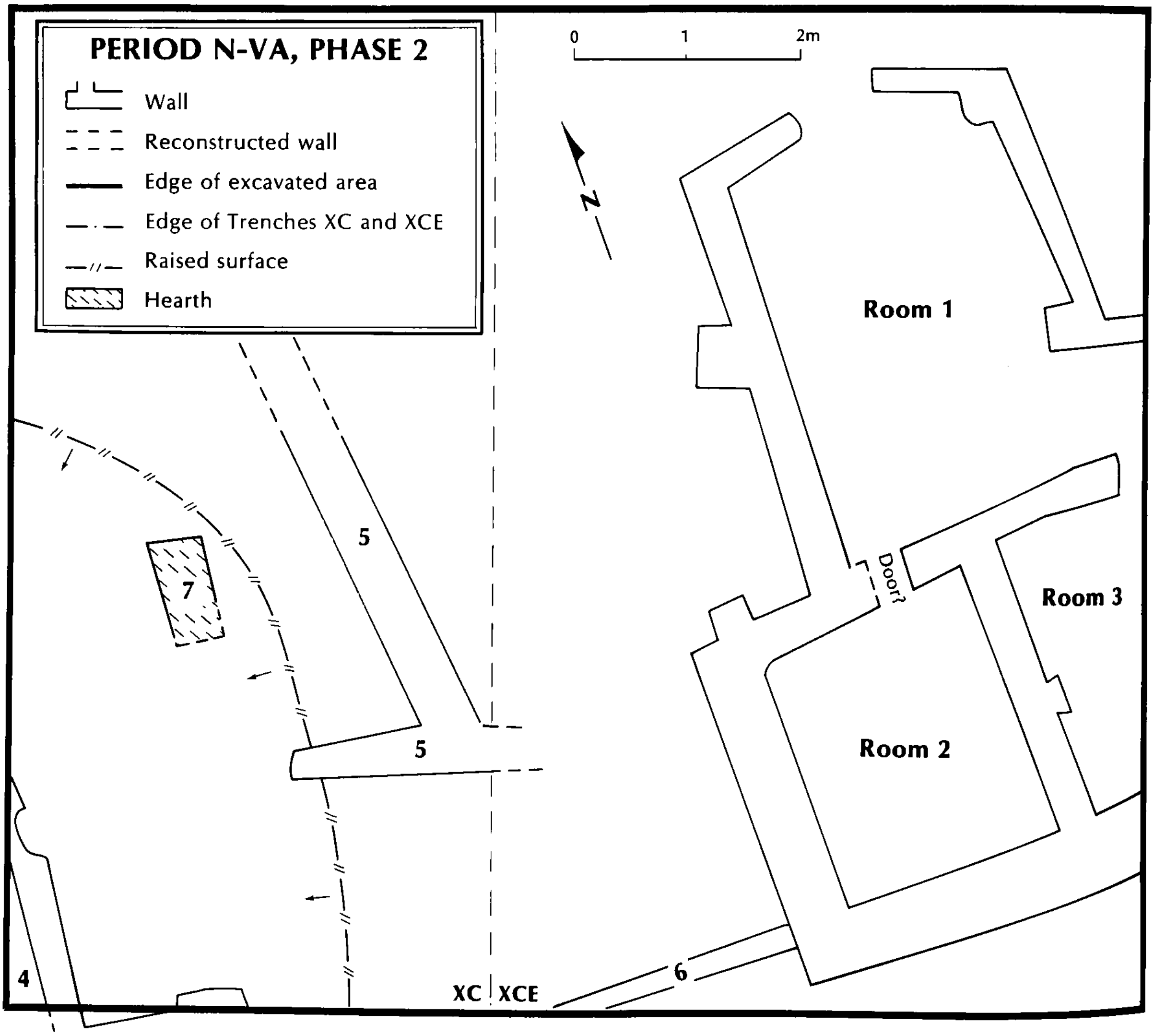


Figure 6.34. Plan of Period N-VA.2.

Figure 6.35. Architecture of Period N-VA.2, Trench XCE, viewed from the south.

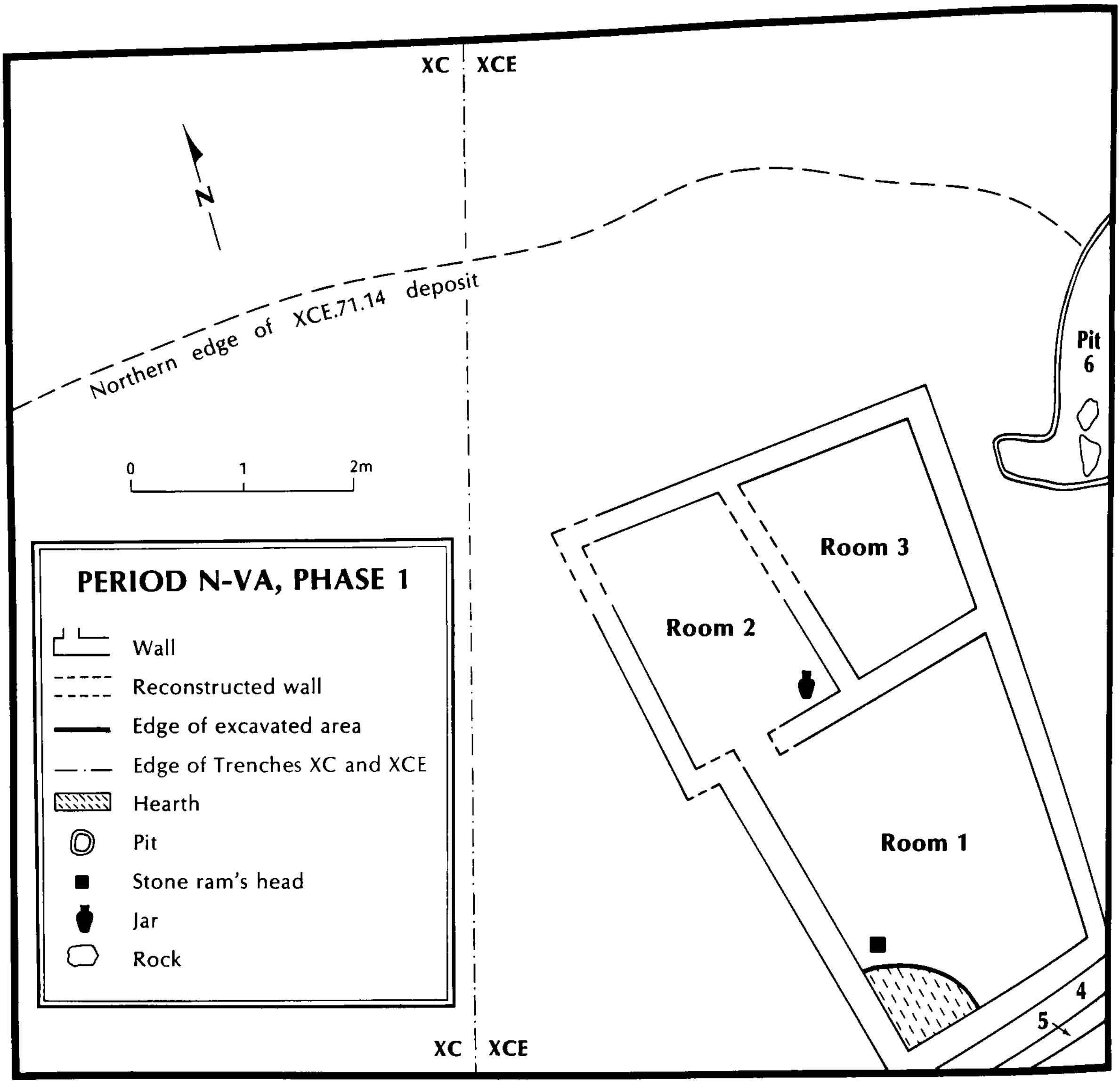


Figure 6.36. Plan of Period N-VA.1.

exactly the same general layout as the later N-VA.1 structure. The dimensions of the two complete N-VA.2 rooms are as follows:

	Dimensions	
Room	*N-S*	*E-W*
1	3.60 × 2.55	$= 9.18\ m^2$
2	2.45 × 2.0	$= 4.90\ m^2$

The floor and walls of all three rooms are plastered. The floor plaster in places is up to 20 cm thick, consisting of many thin replasterings with no cultural debris between any two layers. Indeed, when these rooms finally were abandoned, virtually nothing was left behind on the floors. The only in situ finds were four flint blades on the floor of Room 2 and a lapis lazuli bead with incised decoration on an outside surface east of Room 1.

The complex is built over a 5–10-cm-thick foundation of fist-sized stones mixed with sherds. The rooms' walls are preserved to a maximum height of six courses. The interior partition walls—between Rooms 2 and 3 and between Rooms 1 and 2–3—are only one row of bricks wide, while the exterior walls are two to three rows wide. Along the west wall of Room 3 and the east wall of Room 1 there is evidence of interior buttressing. Also, there is an exterior buttress in the middle of Room 1's west wall and a possible exterior buttress on the northwest corner of Room 2. The bricks used to build the walls are of uniform size: 44 × 18 × 10 cm. Wall 6, abutting against Room 2, is a slightly later addition, perhaps contemporary with the construction of Room 4.

Wall 5 is a T-shaped wall built on the same surface as Rooms 1–3 and is thus probably roughly contemporary with them. The north-south portion of this wall is made with bricks of almost exactly the same dimensions as those of Rooms 1–3: 43 × 18 × 10 cm (for the sizes of all bricks measured, see appendix A). The east-west portion of Wall 5 is made with the same size of brick, but here the bricks are laid on edge to produce a thinner wall.

The last construction of N-VA.2 is Feature 4: the eastern edge of what probably is another three-room structure like 1–3, and oriented in the same direction. If this reconstruction is correct, the north-south wall would be the east wall of a larger room, like the east wall of Room 1, and the buttressed wall appearing in the south section would be analogous to Room 3's north wall. Associated with Probable Room 4 is Hearth 7, a rectangular area of burning directly on the outside living surface associated with Probable Room 4. If Probable Room 4 and Hearth 7 do constitute a separate domestic complex, this raises interesting implications about the function of Wall 5. Wall 5 is parallel to and precisely halfway between the west wall of Room 1 and the east wall of Probable Room 4. Thus, it seems plausible that Wall 5 was built as a boundary marker between two adjoining domestic complexes. If so, it provides a rough idea of how much area around an N-VA.2 house was controlled by that household. This in turn provides a clue as to the overall density of domestic buildings and population on the site in N-VA.2 times. Of course, it remains unknown how far these two domestic compounds extended in other directions, but it can be noted that the Probable Room 4 complex has about 3.4 m of outside space to its east and the Rooms 1–3 complex has about 3.4 m of outside space to its west. Finally, the placement of Hearth 7 in the lee of Wall 5 may have been intentional. The prevailing wind across the valley today comes out of the east-northeast, and outside hearths in domestic compounds of local villages today commonly are situated on the lee side of similarly oriented walls. Thus, if one can assume that the prevailing winds of the N-VA.2 period were more or less the same as today, Wall 5 would have provided a good windbreak for Hearth 7.

The total amount of interior space for N-VA.2 is 17.17 m^2, or 18.5 percent of the total 92.7 m^2 exposed.

PERIOD N-VA.1 SETTLEMENT

Area of Exposure

25.0 m^2 in Trench XB/XBE
37.9 m^2 in Trench XC
54.8 m^2 in Trench XCE

117.7 m^2 total area

Feature Numbers (fig. 6.36)

Room 1	XCE.71.14.30
Room 2	XCE.71.14.34
Room 3	XCE.71.14.34A
Alley 4	No feature number given during excavation
Wall 5	XCE.71.14.32
Intrusive Pit 6	XCE.71.14.37

The excavation of the N-VA.1 levels provided our first and only example of a *complete* domestic dwelling on the north side of the mound. The N-VA.1 structure is built directly over an N-VA.2 building that has an almost identical layout (fig. 6.34). The only significant differences are that the N-VA.1 building is oriented in the opposite direction to its N-VA.2 predecessor; that the N-VA.1 building is slightly smaller in scale and lacks buttressing; and that the N-VA.1 building has an interior hearth in the southwest corner of its largest room, while the N-VA.2 building has no interior hearth.

The interior dimensions of the three rooms in the complex are as follows:

	Dimensions	
Room	*N-S*	*E-W*
1	2.90 ×	2.25 = 6.53 m^2
2	2.20 ×	1.35 = 2.97 m^2
3	1.95 ×	1.45 = 2.83 m^2

The total amount of interior space in this free-standing dwelling is 12.33 m^2 Unfortunately, no exterior doorways were isolated during excavation, but access into the dwelling probably was through the largest room (1), as with the N-VA.2 dwelling. Access into Room 2 is through Room 1. The wall between Rooms 2 and 3 was too poorly preserved to determine whether or not there was a doorway in it, but probably Room 3 was accessible only through Room 2. The walls of the complex are all only one course of bricks wide and are constructed with bricks of a uniform size: 44 × 15–20 × 10 cm. This standardized brick size is identical to that used in N-VA.2. The interior floors and the walls of the complex are plastered. The only significant nonceramic artifact in situ on or just above the floors of the rooms was a carved stone ram's head found in the fill 8 cm above the floor of Room 1 near the hearth (fig. 6.36). In addition, a broken copper pin was found just above the outside surface north of the room complex.

South of Room 1 and running parallel to it is another wall (5), creating a 30-cm-wide alley (4) just south of the complex. Too little of this wall was exposed to determine its function.

Northeast of Rooms 1–3 is an intrusive pit (6) dug down from the mound surface. Its date is unknown, but it definitely postdates N-VA.1.

The total amount of interior space for N-VA.1 is 14.23 m^2, or 12.1 percent of the total 117.7 m^2 exposed.

ARCHITECTURAL PARALLELS WITH OTHER SITES

Tal-i Iblis

Tal-i Iblis (Caldwell 1967) is the closest (180 km to the north) excavated prehistoric site to Yahya. Although only one period (Period I) at Iblis has well-preserved architecture, the exposure from this period is extensive. More than 50 rooms were unearthed in four different, noncontiguous areas (B, D, F, and G). Period I at Iblis, marked by the first appearance of small quantities of Bard Sir Painted Ware, is ceramically equivalent to Period VC, when the comparable Yahya Black-on-Buff Ware is first present on the site. Not surprisingly, the Iblis Period I architecture finds its closest parallels in Yahya VC. What *is* surprising is just how close the parallels are. In almost all their major features, from construction to layout, the room complexes of Iblis Areas D, F, and G are virtually identical to what is found in Yahya VC (compare Yahya fig. 6.23 with the plans in Caldwell 1967:225, 228, 232).

At both sites the architecture clearly is domestic. The general ground plans are the same: extended family or multiple family living units with larger rectangular rooms built around a core of smaller, squarer rooms. The most complete example of this extended family house type comes from Area F at Iblis (Caldwell 1967:228). Here the complex as a whole is in the shape of a cross, with larger "living" rooms extending out in each of four directions around a maze-like central core of "storage" rooms. The particular arrangement of rooms varies somewhat among the Areas D, F, G, and Yahya VC room complexes, but in each case the general ground plan remains the same. Within the Iblis complexes, the size of each living unit or self-contained group of rooms appears fairly uniform. The norm seems to be a larger, rectangular living room (usually with a corner hearth) with access to a medium-sized room and/or a series of two or three small storage rooms. Thus, for example, in Area F at Iblis, large Room 11 is associated with a medium-sized Room 10 and two smaller storage Rooms 3 and 5; large Room 8–9 is associated with medium-sized Room 1 and two smaller storage Rooms 2 and 4. Or in Area D (Caldwell 1967:225), for example, larger Room 1 appears to be associated with three smaller storage Rooms 3, 5, and 7. The same kind of living unit is found in Yahya VC (fig. 6.23): here a larger, rectangular Room 1 (with a corner hearth) is associated with a medium-sized Room 2 and three smaller storage Rooms 3, 4, and 5; and again, a larger, rectangular Room 8 (with a corner hearth) is associated with a medium-sized Room 7 and four smaller storage Rooms 6, 9, 10, and 11.

The only significant difference between the Yahya and Iblis living units is that those at Iblis average at least 30 percent larger in total interior space. At Yahya, there are 13.3 m^2 of interior space in Rooms 1–5, and 11.2 m^2 of interior space in Rooms 6–11. At Iblis on the other hand, Rooms 3, 5, 10, and 11 in Area F add up to 16.7 m^2 of interior space, and Rooms 1, 3, 5, and 7 in Area D comprise 15.1 m^2 of interior space. If one singles out the largest room in each living unit, again they are significantly larger on average at Iblis than at Yahya. Room 1 at Yahya is 6.9 m^2, and Room 8 only 3.6 m^2, while Room 11 in Iblis Area F is 10.2 m^2, and Room 1 in Area D is 9.2 m^2 (Caldwell 1967:241–242). Several other individual rooms at Iblis are even larger. What these differences in amount of interior space per unit may imply, if anything, about social or economic differences between the two sites remains a mystery, but at least the larger average size of the Iblis rooms may account for one of the other few architectural differences between Iblis and Yahya. The walls of most of the rooms at Iblis are two courses wide, or twice as thick as the one-course-wide walls in Yahya VC. This greater wall thickness at Iblis may have been necessitated by the heavier, longer beams that would have been required to span the interior spaces at Iblis.

Other constructional features shared between Iblis I and Yahya VC are corner buttresses, side wall buttresses, interior buttresses, stick and reed roofing material, narrow doorways with flat stones set into raised doorsills, and almost identical brick sizes. In Iblis I, measured bricks consistently had widths of 18–20 cm, heights of 15–16 cm, and lengths varying from 24 to 46 cm (Caldwell 1967:307). In Yahya VC, many of the bricks had precisely the same size range (see appendix A). As in VC at Yahya, all Iblis I bricks were thumb-impressed and laid with the thumb impressions facing down (Caldwell 1967:283). Interior features, too, are virtually indistinguishable at both sites. They include peninsular-shaped interior platforms, raised, plastered corner hearths, red plastered floors and walls, and carinated jars placed along the walls of medium-sized and large rooms. Even the outside cooking hearth in Yahya VC is paralleled by an outside hearth against a courtyard wall in the Area D complex (Caldwell 1967:225). Finally, Iblis I shares with Yahya the phenomenon of filled in and plastered over doorways. At Iblis there are no rooms with blocked up doorways that do not also have at least one other means of access. This fact supports the idea that at Iblis, and probably also at Yahya, the practice of walling in doorways reflects a changing distribution of living space between different living units within one complex. This makes sense when one considers that the number of inhabitants in each living unit almost certainly must have changed dramatically over the life span of the building, what with the birth of children and/or the death of older adults.

The room complex in Area B at Iblis is somewhat different than the other Period I complexes and the VC Yahya complex. Although wall construction is the same and there are the usual corner hearths, there is not as much room size differentiation as in the other complexes, and the overall layout is different (Caldwell 1967:279). Possibly this dwelling represents a slightly earlier (or even later) phase than the other complexes, or perhaps the special grinding querns set up in one of the rooms imply that this building represents a specialized activity area.

Tepe Sialk

Although the ceramic assemblage at Tepe Sialk (Ghirshman 1938) is quite different from that at Yahya, certain architectural features are astonishingly similar. The lowest strata of the earliest period at Sialk (Sialk I) contain no architecture, and the few walls that were recovered from the upper strata of Sialk I are all said to be of pisé (handfuls of hand-molded, chaff-tempered mud plaster). Handmade, sun-dried bricks first appear in Sialk II. These bricks all have pairs of thumb impressions along one surface, just like the bricks of Yahya Periods VII, VI, and VC. In Sialk II.1 these bricks are used for foundations which, consisting of haphazardly laid out brick pavings behind low retaining walls (Ghirshman 1938:pl. LVIII), bear a striking resemblance to the brick pavings and low retaining walls used for leveling and foundations at Yahya, particularly those of Period VIB.2 (fig. 6.16). Unfortunately, no complete rooms were recovered from Sialk II. The only published wall from Sialk II (Ghirshman 1938:pl. LVIII) is different from any of the Yahya thumb-impressed brick walls in two important details. First, the bricks in general appear to be stubbier and more standardized in size (usually approximately 30 cm in length, with no examples over 35 cm, and about 20 cm in width) than the longer and more variable Yahya bricks. Second, the bricks at Sialk are laid so that the thumb impressions always face the side, whereas at Yahya they almost always face up or down. The Yahya technique of thumb-impressed brick retaining walls with stone rubble fill is not found at all at Sialk. The first good architectural exposures at Sialk, in Sialk III, are elaborate in their layouts and bear no resemblance to any of the Yahya buildings except in their occasional use of buttressing (Ghirshman 1938:pls. LX and LXI).

Tal-i Bakun B and Tal-i Gap

Excavations at Bakun B unfortunately yielded no architecture at all (Egami and Masuda 1962). At Gap, on the other hand, well-preserved rooms were recovered from several different strata. The two most extensive exposures—a seven room complex in Gap II, level 4, and a series of partially exposed rooms in Gap I, level 15 (Egami and Sono 1962:fig. 5)—bear little resemblance to any of the Yahya Period VI or V architecture. Moreover, the walls of Gap I and II are said to be of pisé, rather than of thumb-impressed bricks as at Yahya. Finally, floors are often paved with sherds at Gap, while at Yahya this practice is extremely rare, being found only in two rooms of one phase (Period VIIA, Rooms 3 and 4; fig. 6.12).

The Use of Thumb-Impressed Bricks at Other Sites

Thumb-impressing mud bricks is not a practice unique to sixth and fifth millennium Iran, but a method of making bricks that was independently discovered and used in a number of widely separated (and probably not directly related) sites in different periods. For example, as far away as Jericho thumb-impressed bricks are used in the P.P.N.B. levels (Kenyon 1960:48). Thumb-impressed bricks also are used in Temple XV (and *only* Temple XV) at Eridu, dating to about 5100 B.C. (Lloyd and Safar 1948:121), as well as in the "transitional" levels at Chogha Mami (Oates 1973:175).

Summary of Architecture and Parallels with Other Sites

The architecture of Yahya Periods VII–V presents a striking picture of change and development over a 1,600-year period. Each period is marked by a distinctive architectural style that contrasts with what comes before and what follows. During these periods there is a profound shift in the use and layout of roofed and enclosed spaces. Period VII has agglomerative, beehive clusters of rooms of relative undifferentiated size and shape and lacking interior features. In Periods VI and VC emerge distinctive multifamily house plans with larger living rooms, now containing interior features, surrounding a core cluster of smaller storage rooms. By Period VA the three-room house with walled compound and exterior courtyard features becomes the standard form of dwelling. All these changes occur within an environment of apparent cultural stability and continuity. How these changes might be interpreted is taken up in chapters 10 and 11, but the changes themselves remain one of the most striking and salient features of the early settlement at Yahya.

The stone rubble and sherd leveling construction of Period VIA is as yet unparalleled anywhere else on the Iranian plateau in this period and represents one of the most extraordinary single building efforts to have survived from early fourth millennium highland Iran.

Comparisons with other sites, with the exception of Iblis and Sialk, suffer from a relative lack of extensive horizontal exposure for comparable periods. Understanding and explaining architectural change and development at Yahya within a larger regional context undoubtedly will become a more fruitful exercise when greater horizontal exposures of architecture on other early sites in Iran are achieved.

Chapter 7

The Small Finds

Thomas Wight Beale

Peabody Museum, Harvard University

The discussion of small finds has been organized by artifact type, raw materials for each type, chronological distribution, shape, and other attributes. Broad artifact categories under which the discussion of individual types have been arranged are ornaments, stone tools and implements, other tools and implements, stone vessels, counting devices, anthropomorphic and zoomorphic figurines, and miscellaneous types (toy wheels, copper ingots, debitage, probable intrusive types). A summary of the various types and their changes through time is given in chapter 9. Detailed descriptive data and the provenience for each artifact are listed in appendix B.

ORNAMENTS (Beads, Necklaces, Pendants, Unworked Shells, Two-Hole Objects, Labrets, Bracelets, Rings, Pins, Stamp Seals, Buttons, Decorated Discs, Ochre Stones)

Beads

Sample: 221

Material and Number of Examples in Each Material: Agate (2), carnelian (4), turquoise (40), lapis lazuli (3), chlorite (21), calcite (6), serpentine (1), unidentified stone (30), mother-of-pearl (1), *Dentalium* (21), worked shell (50), bone or shell (2), stone or bone (1), bone (8), unfired clay (22), lightly fired clay (9).

Description: Beads (figs. 7.1–7.4, 7.6, 7.9, 7.17) represent the single most common artifact type (besides pottery) in Periods VII–V. To the total of 221 beads listed here should be *added* the 278 beads that made up the two complete necklaces recovered, for an overall total of 499 beads. There is an extraordinary variety of bead shapes represented in this corpus: 25 different bead shapes were distinguished (fig. 7.1 and appendix B), although several of these shapes differ only in minor details.

Chronological Distribution: Beads are common throughout Periods VII–V. There is no one period or phase that appears to have a significantly larger or smaller number of stray beads. What does change through time are the bead shapes and the materials used to make the beads. Indeed, beads in their own way provide just as sensitive a barometer of change as pottery. Tables 7.1 and 7.2 show cross-tabulations of bead material per period and bead shape per period. We shall try to summarize here some of the most distinct and interesting changes the site's bead repertoire undergoes through time.

Bead Shapes: Certain bead shapes are found only in Period VII: "square, thin beads" (Type 15), "square, thin beads with a centrally placed hole" (Type 18), "polygonal segmented cylindrical beads" (Type 11), eight of the nine "biconical, circular beads" (Type 5, all of which are of unfired clay), "spherical beads" (Type 4), and "long cylindrical beads" (Type 1). Certain other bead shapes are found only in Periods VIB through VA: "diamond-shaped beads" (Type 23, all of which are of turquoise) and "droplet-shaped beads" (Type 20). Still other shapes are found only in a single phase. "Truncated biconical, circular beads" (Type 8, all of which are of fired clay), "flattened biconical, circular beads" (Type 7, all of which are of fired clay), and the "asymmetrical rectangular bead" (Type 19, of lapis lazuli) occur only in Period VB. Finally, certain shapes only appear at the end of the sequence, in Periods VB–VA: "trapezoidal beads" (Type 25, all three of which are of turquoise) and "disc-shaped beads" (Type 10).

Bead Materials: The materials from which beads are made also shift through time. Seventeen of the 22 examples of unfired clay, for instance, come from Periods VII and VI; and four of the examples from Period V have shapes totally different from those of Periods VII and VI (fig. 7.2). Nineteen of the 21 examples of *Dentalium* come from Periods VII and VI as well. Nineteen of the 21 examples of chlorite occur in Periods VII and VI, and one of the only two examples from Period V has a shape totally different than any of those used in Periods VII and VI. The only bead of mother-of-pearl comes from Period VIIB. Other materials are found exclusively in the later periods. Seven of the nine examples of lightly fired clay are found in Periods VB and VA. Lapis lazuli beads also are restricted exclusively to Periods VB and VA (fig. 7.3), and carnelian beads and bead blanks occur only in Periods VIA and V. Turquoise is most

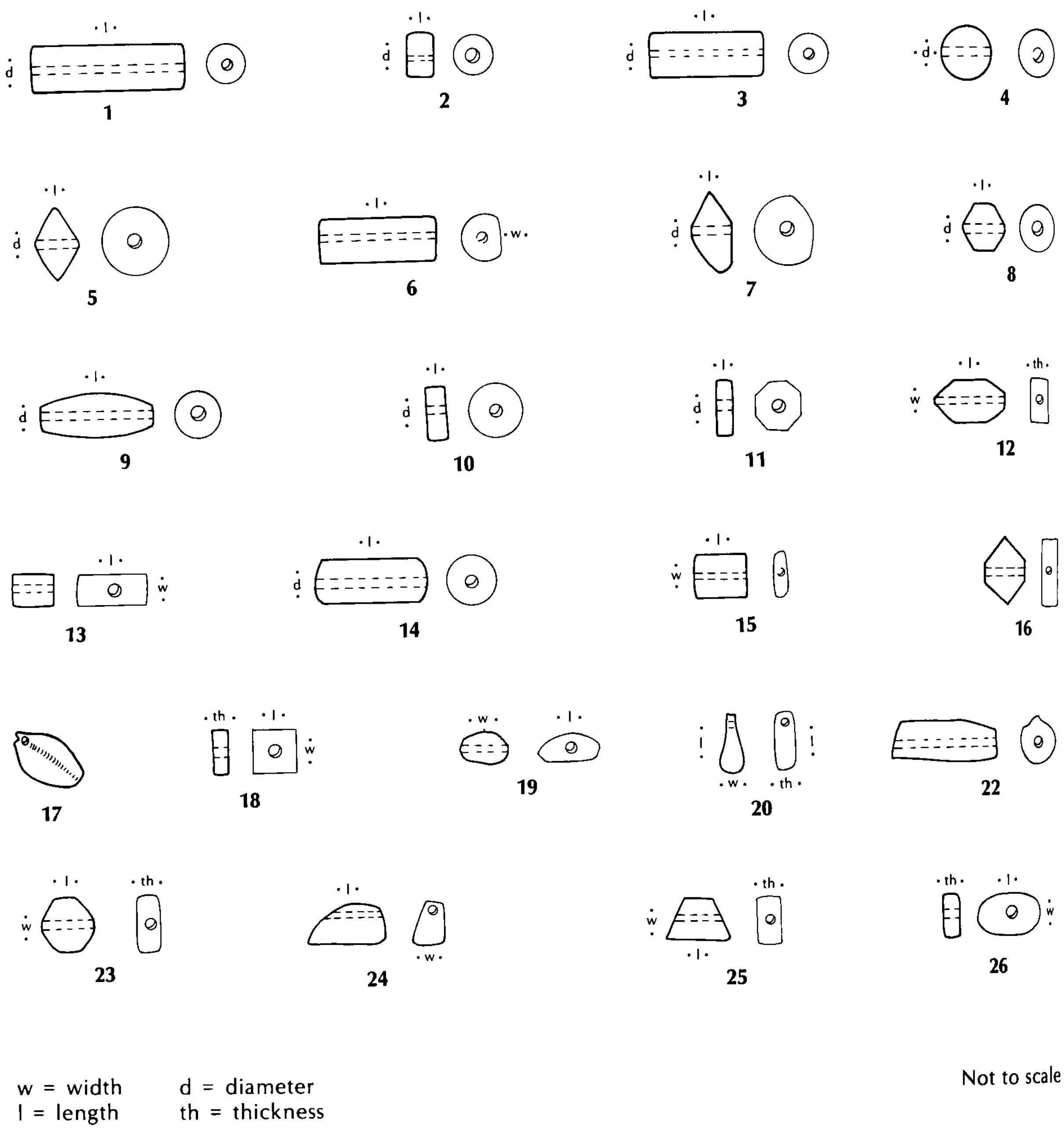


Figure 7.1. Bead types. 1, long, cylindrical; 2, segmented cylindrical; 3, cylindrical; 4, spherical; 5, biconical, circular; 6, asymmetrical cylindrical; 7, flattened biconical, circular; 8, truncated biconical, circular; 9, rounded, cylindrical; 10, disc-shaped; 11, polygonal segmented cylindrical; 12, lozenge-shaped; 13, long, rectangular, with square end profile; 14, cylindrical (like 3) with rounded ends; 15, square, with thin, rectangular end profile; 16, lozenge-shaped, hexagonal; 17, shell-shaped, varying according to shell species; 18, square, with thin, rectangular end profile and short axis hole; 19, long, rectangular, with irregular shape; 20, thin, droplet-shaped; 22, asymmetrical cylindrical, with irregular shape; 23, thin, diamond-shaped, with rounded corners; 24, ovoid, with irregular shape; 25, trapezoidal; 26, ovoid or oblong, degenerate form of 10.

Figure 7.2. Incised clay bead, Period N-VA.1–IVC (XCE.71.13C), 3.5 × 3.0 × 0.8 cm.

Figure 7.3. Incised bead of lapis lazuli, Period N-VA.2 (XCE.71.T2.15.45), 3.2 × 2.2 cm (see scale drawing, fig. 7.8:e).

Table 7.1. Bead material per period.

Period	Agate	Carnelian	Turquoise	Lapis lazuli	Chlorite	Calcite	Serpentine	Unidentified stone	Mother-of-pearl	Dentalium	Worked shell
VIID					9.5%[a]						2.0%
					2						1
VIIC			2.5%		28.6%			20.0%		14.3%	6.0%
			1		6			6		3	3
VIIB			5.0%		9.5%			6.7%	100.0%	9.5%	22.0%
			2		2			2	1	2	11
VIIA			10.0%		14.3%	16.7%		6.7%		9.5%	12.0%
			4		3	1		2		2	6
VIIA–VC								3.3%			2.0%
								1			1
VII			2.5%		4.8%			3.3%		9.5%	6.0%
			1		1			1		2	3
N-VII								6.7%		14.3%	
								2		3	
N-VII, VB			2.5%					3.3%			
			1					1			
VIB	50.0%		5.0%		19.0%	16.7%		10.0%		28.6%	12.0%
	1		2		4	1		3		6	6
VIA		50.0%	17.5%		4.8%			10.0%		4.8%	12.0%
		2	7		1			3		1	6
VC			12.5%		4.8%			3.3%			6.0%
			5		1			1			3
VB			2.5%	66.7%		33.3%		3.3%			
			1	2		2		1			
N-VB	50.0%		10.0%					3.3%			
	1		4					1			
N-VA.4–3		25.0%	7.5%								2.0%
		1	3								1
VA.2			5.0%							4.8%	4.0%
			2							1	2
N-VA.2–1			7.5%	33.3%						4.8%	2.0%
			3	1						1	1
VA.1			5.0%		4.8%	16.7%	100.0%	10.0%			6.0%
			2		1	1	1	3			3
V		25.0%	2.5%					3.3%			
		1	1					1			
V–IVC											
Indeterminable			2.5%			16.7%		6.7%			6.0%
			1			1		2			3
Percentage	0.9	1.8	18.1	1.4	9.5	2.7	0.5	13.6	0.5	9.5	22.6
Total	2	4	40	3	21	6	1	30	1	21	50

Note: Chi-square is 347.087 and is significant at 0.044 with 300 degrees of freedom.
a. Upper cell entries are percentages of column totals.

Bone/ shell	Stone/ bone	Bone	Unfired clay	Fired clay	Total
					1.4%
					3
			4.5%		9.0%
			1		20
50.0%		12.5%	45.5%	11.1%	14.9%
1		1	10	1	33
		25.0%		11.1%	9.5%
		2		1	21
					0.9%
					2
		12.5%	4.5%		4.5%
		1	1		10
			4.5%		2.7%
			1		6
					0.9%
					2
			13.6%		11.8%
			3		26
	100.0%	12.5%			10.0%
	1	1			22
					4.5%
					10
50.0%		12.5%	9.1%	44.4%	6.3%
1		1	2	4	14
		25.0%			3.6%
		2			8
			4.5%	11.1%	3.2%
			1	1	7
				11.1%	2.7%
				1	6
			4.5%		3.2%
			1		7
				11.1%	5.4%
				1	12
					1.4%
					3
			9.1%		0.9%
			2		2
					3.2%
					7
0.9	0.5	3.6	10.0	4.1	100.0%
2	1	8	22	9	221

common in Periods VI and V: only eight of the 40 examples can be clearly dated before Period VIB.2, and only four examples before VIIA.

Geographical Distribution: Beads are found on virtually all early Near Eastern sites, but few can match the diversity in shape and materials that the Yahya corpus has.

Necklaces

Sample: 2

Material: Turquoise, chlorite, bone, *Dentalium*, fish vertebrae, unidentified shell.

Description and Context: While beads are common throughout the Period VII–V sequence, only two complete (or almost complete) necklaces were recovered. The earlier of the necklaces was found in the fill of Period VIIB.3. However, its stratigraphic position was not entirely clear, and it may have been associated with the Period VIIC.1 burial (Human Burial 1) found just beneath (fig. 6.1). All the beads in the necklace are of the "segmented cylindrical" form (the length or width is less than or equal to the diameter). Most of the 214 beads recovered are very small fish vertebrae (188 complete examples, eight fragmentary examples), but at least four other different materials are represented: six unidentified shell beads, five bone beads, four *Dentalium* beads, and three chlorite beads.

The second necklace was found in situ on an outside surface just north of the VC domestic complex (figs. 6.23, 7.4, 7.9). Unlike the earlier necklace, all the beads in this necklace are of one material: turquoise. The necklace consists of 64 beads: 52 complete beads plus 12 bead fragments. The complete beads were of two types: "cylindrical" (eight examples; fig. 7.1:3) and "droplet-shaped" (44 examples; fig. 7.1:20).

Pendants

Sample: 13

Material: Bone, shell, mother-of-pearl, agate, turquoise, chlorite, unidentified stone.

Description and Chronological Distribution: Pendants (figs. 7.5–7.7) are distinguished from beads by being larger overall (with at least one dimension greater than 2 cm) and by having the suspension hole asymmetrically positioned at one end of the artifact. Pendants are rare in Periods VII–V, but they are distributed quite evenly throughout the sequence. Several different materials are used for pendants, but there does not appear to be any strong chronological patterning such that different materials are used exclusively in different periods. The only differences of possible significance are that bone is used only in the earliest period (VIID) and that mother-of-pearl is not used after Period VIA; but even these differences may be a consequence only of the smallness of the sample. Pendant shapes seem more

Table 7.2. Bead shape per period.

	Specific Bead Shape[a]											
Period	Indeterminable	1	2	3	4	5	6	7	8	9	10	11
VIID			1.3%[b] 1		12.5% 1							
VIIC			14.7% 11	7.1% 1	12.5% 1		25.0% 1					80.0% 4
VIIB	18.8% 3		20.0% 15		25.0% 2	77.8% 7	25.0% 1			12.5% 1		
VIIA		14.3% 1	9.3% 7	21.4% 3			25.0% 1			12.5% 1		20.0% 1
VIIA–VC					12.5% 1							
VII	6.3% 1	28.6% 2	6.7% 5			11.1% 1						
N-VII		14.3% 1	4.0% 3	14.3% 2								
N-VII, VB				7.1% 1								
VIB	6.3% 1	42.9% 3	14.7% 11	14.3% 2	37.5% 3							
VIA	43.8% 7		4.0% 3	7.1% 1			25.0% 1			12.5% 1		
VC	6.3% 1		4.0% 3							12.5% 1		
VB			5.3% 4	7.1% 1				66.7% 2	100.0% 2			
N-VB	6.3% 1		4.0% 3									
VB–VA						11.1% 1						
N-VA.4–3	12.5% 2		1.3% 1	7.1% 1						12.5% 1		
VA.2			1.3% 1	7.1% 1				33.3% 1				
N-VA.2–1											60.0% 3	
VA.1			6.7% 5							25.0% 2		
V											40.0% 2	
Indeterminable			2.7% 2	7.1% 1						12.5% 1		
Percentage	7.2	3.2	33.9	6.3	3.6	4.1	1.8	1.4	0.9	3.6	2.3	2.3
Total	16	7	75	14	8	9	4	3	2	8	5	5

Note: Chi-square is 739.807 with significance under 0.001 with 500 degrees of freedom.
a. Numbers 1–20, 22–25 represent bead shapes illustrated in figure 7.1.
b. Upper cell entries are percentages of column totals.

12	13	14	15	16	17	18	19	20	Bead Blank	22	23	24	25	Total
					4.2% 1									1.4% 3
					4.2% 1				25.0% 1					9.0% 20
				16.7% 1	4.2% 1	66.7% 2								14.9% 33
		50.0% 1	100.0% 1		16.7% 4	33.3% 1								9.5% 21
				16.7% 1	4.2% 1									1.4% 3
					4.2% 1									4.5% 10
														2.7% 6
													33.3% 1	0.9% 2
	100% 1				12.5% 3						8.3% 1	50.0% 1		11.8% 26
				16.7% 1	20.8% 5			50.0% 1			16.7% 2			10.0% 22
100% 1					4.2% 1						25.0% 3			4.5% 10
							100.0% 1	50.0% 1		33.3% 1		50.0% 1		5.9% 13
									25.0% 1		25.0% 3			3.6% 8
														0.5% 1
									25.0% 1		8.3% 1			3.2% 7
					8.3% 2				25.0% 1	33.3% 1				3.2% 7
					4.2% 1								66.7% 2	2.7% 6
		50.0% 1		16.7% 1	8.3% 2					33.3% 1				5.4% 12
				16.7% 1							8.3% 1			1.8% 4
				16.7% 1	4.2% 1						8.3% 1			3.2% 7
0.5 1	0.5 1	0.9 2	0.5 1	2.7 6	10.9 24	1.4 3	0.5 1	0.9 2	1.8 4	1.4 3	5.4 12	0.9 2	1.4 3	100.0% 221

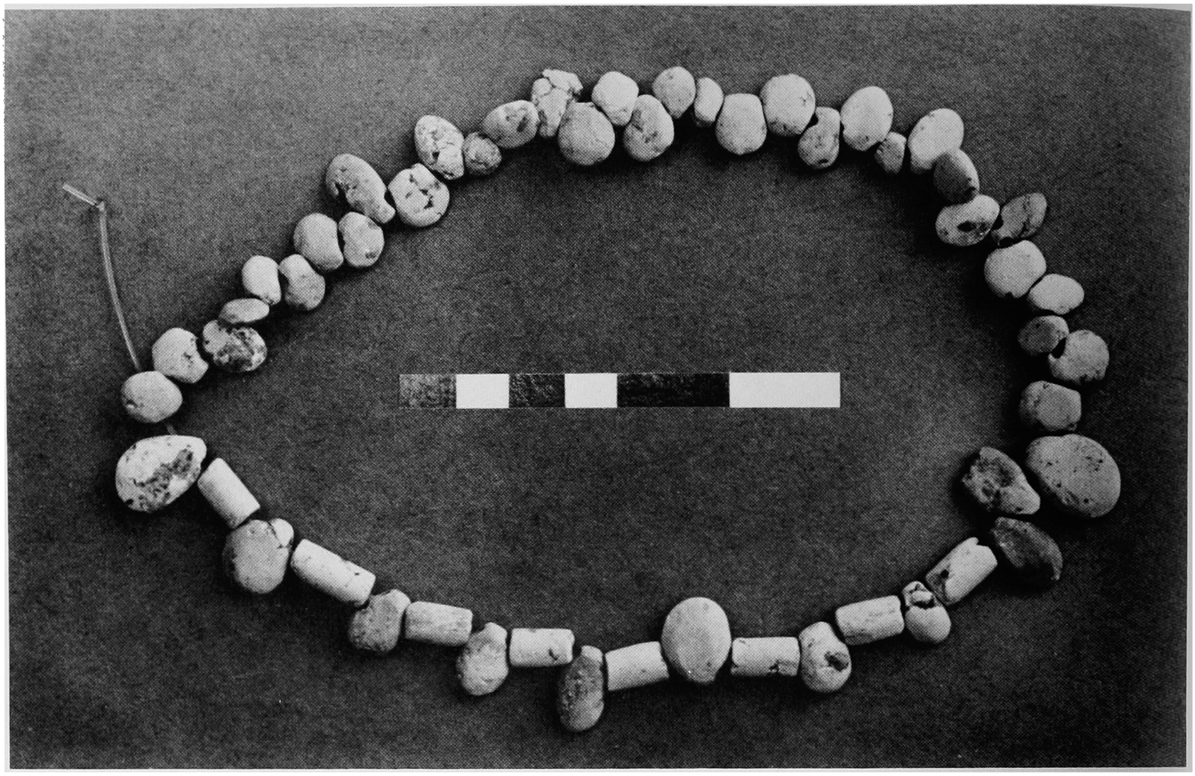


Figure 7.4. Turquoise necklace, Period VC (C.69.7.11).

Figure 7.5. Left, two-hole ornament cut from tooth, Period VIIB.2 (C.71.T6.1.1); right, bone pendant, Period VIID (C.71.T1.1).

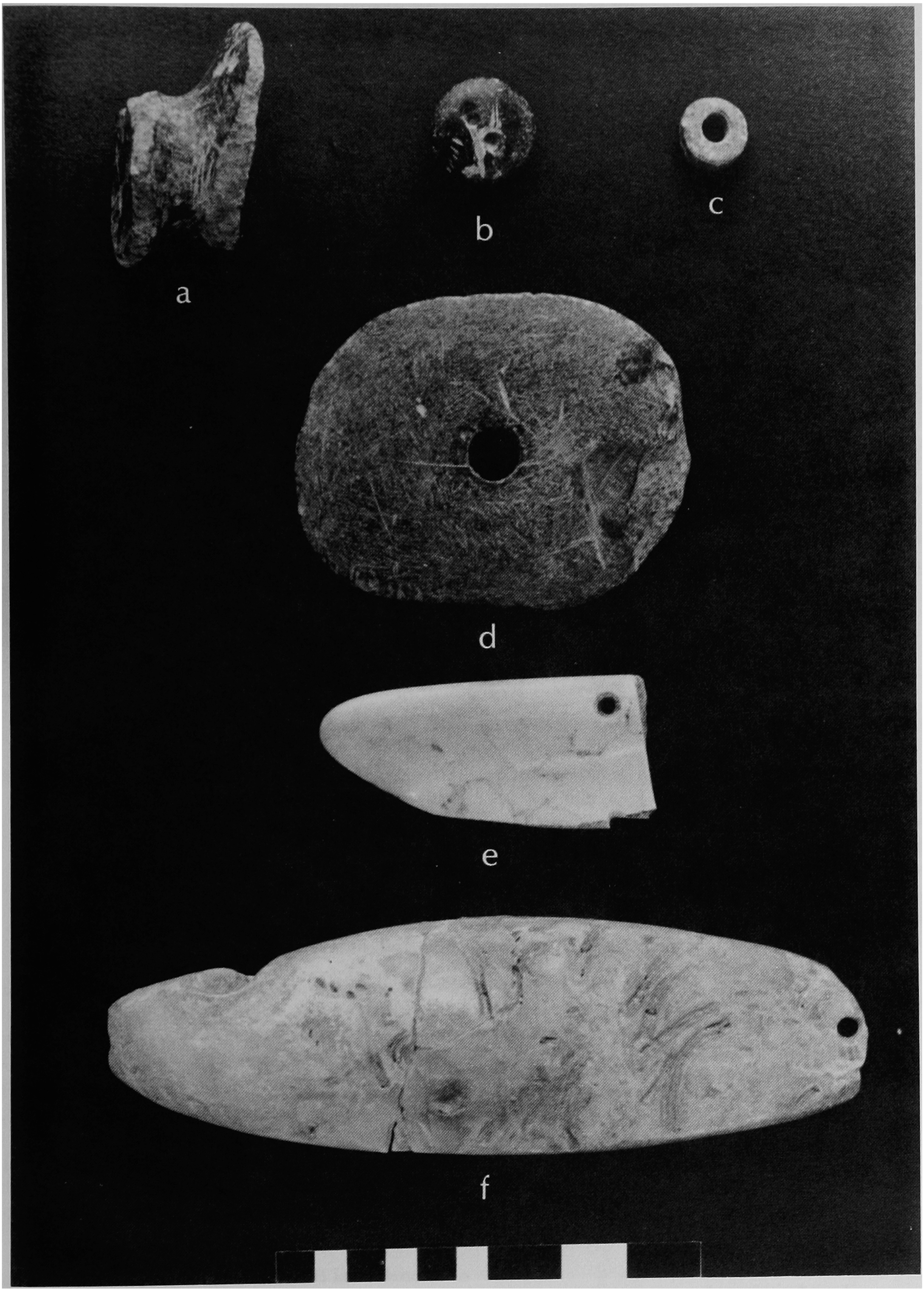


Figure 7.6. Stone and shell ornaments and beads, Periods VIID–VI. a, labret, chlorite, Period VIIC.2–1 (C.70.T6.3); b, bead, purple stone, Period VIB.1 (C.70.1.5); c, bead, chlorite, Period VIID (C.70.T5.6); d, perforated disc, chlorite, Period VIIC.2–1 (C.70.T5.7); e, two-hole ornament, mother-of-pearl, Period VIIC.2–1 (C.70.T6.3); f, pendant, mother-of-pearl, Period VIA (C.70.1.1).

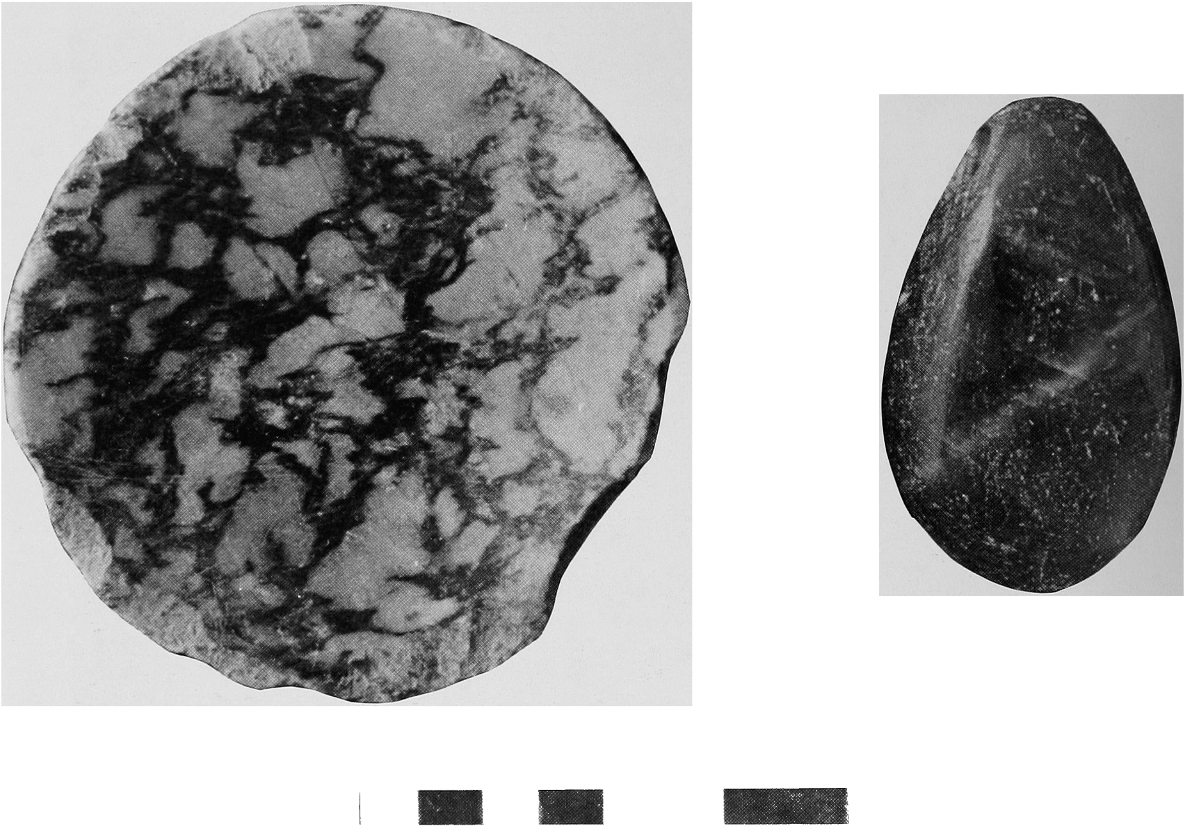


Figure 7.7. Left, marble labret, Period VIIA (C.70.T7.5.1); right, agate pendant, Period VIIA (C.70.T7.4).

closely related to the material used than to any aesthetic preferences. Shell pendants are cut into long, thin, simple forms, or are simply in the shape of a shell; stone pendants are usually droplet-shaped; and the turquoise pendant is irregularly shaped, probably because the pendant maker did not want to reduce the size of this rare raw material any more than was necessary.

The chronological distribution of the pendants is as follows:

Period	*Number and Material*
VIID	1 bone
VIIB.6	1 shell 1 mother-of-pearl
VIIB.3	1 agate
VIIB.2	1 shell
VIIA	1 agate 1 chlorite
VIB.2	1 chlorite
VIA	1 mother-of-pearl
VB	1 unidentified stone
N-VB	1 shell
N-VA.2–1	1 turquoise
VA.1	1 agate

Geographical Distribution: Pendants, like beads, are present on virtually every early Near Eastern site.

Unworked Shells (see appendix B)

Sample: 125

Material: Marine shells.

Description: The marine shells from Yahya have been identified by S. Durante (1979). The variety and overall numbers of marine shells in Periods VII–V are extraordinary: 30 different species and 125 shells. And if one includes the shells made into finished beads and other ornaments (primarily *Dentalium* and *Pinctada margaritifera* L., commonly known as mother-of-pearl), the totals are much higher (see descriptions of beads, pendants, two-hole objects, and debitage). Presumably most of these shells were brought to the site to be made into beads or ornaments, rather than to be used as a source of food.

Chronological Distribution: The most striking chronological distinction is the abrupt fall-off in the total number of shells after Period VIA. Only 36 of the 125 shells, or 29 percent, come from Periods VC, VB, and VA. The variety of species diminishes, too, in the later periods: in Period VII 23 species are represented, in Period VI 14 species, and in Period V only 11 species. Finally, most species have a limited distribution through time and are found only in certain periods. For example, *Conus quercinus* L., *Clypomoreus*, *Rostellaria curvirostris* Lmk., and *Polynices mamilla* Röd. are found only in Period V, with only one example of each. *Conus ebraeus* L., *Nucula* sp., *Columbella*, *Pirroconus*, and *Melaraphe coccinea* Gmelin are found only in Period VIIB. Among the more common species, there appears to be considerable continuity between Periods VII and VI, but very little between Periods VI and V. Several of the more common species do not appear at all after Period VI: *Dentalium*, *Conus* sp., *Littorina*, and *Pleuroploca*.

Geographical Distribution: *Dentalium* is common in Period II at Tepe Sialk, and two examples of *Conus* were reported from Period I (Ghirshman 1938:24, 33). But no other Yahya species of marine shells are represented at Sialk, and except for *Dentalium*, marine shells are very rare on the site. At Tepe Ali Kosh and Tepe Sabz freshwater riverine shells are more common than marine shells. Those marine shells that are present (as beads and bracelets) were not clearly identified, but both *Dentalium* and *Cypraea* (cowrie shell) appear to be represented (Hole, Flannery, and Neely 1969:237, 238). Only eight different species of marine shell were identified for Iblis I (Caldwell 1967:408). Seven of the eight species are also found at Yahya, and some are among the more common Yahya species: *Pinctada margaritifera* L., *Dentalium*, *Conus*, *Polynices mamilla* L., and *Oliva bulbosa* Röd. Curiously enough, one of the most common species of marine shell used for beads at Iblis (*Nerita albicilla* L.) has not been identified as present at Yahya at all in Periods VII–V.

Two-Hole Objects, Probably Ornaments

Sample: 12

Material: Mother-of-pearl, shell, bone, tooth.

Description and Chronological Distribution: these artifacts (figs. 7.5, 7.8, 7.9, 7.12, 7.17) are distinguished as a group from beads and pendants by having two or three holes instead of one. While some of these objects may have been worn on strings or pendants, the pairs of holes raise the possibility that these objects served a somewhat different function, possibly as "brooches" or ornaments attached to the wearer's clothing. Shell is the most popular material for these objects, and in particular mother-of-pearl (seven of 13 examples; fig. 7.12:c). None of these objects can be clearly dated after Period VC. Also, there is a clearcut progression from simple ovoid shapes in Period VII (the smaller, more rectangular examples with centrally placed holes could have functioned as buttons; figs. 7.8:a,b; 7.17) to more elaborately carved zoomorphic forms in Periods VI and VC (a snake and a boar; figs. 7.8:d; 7.9).

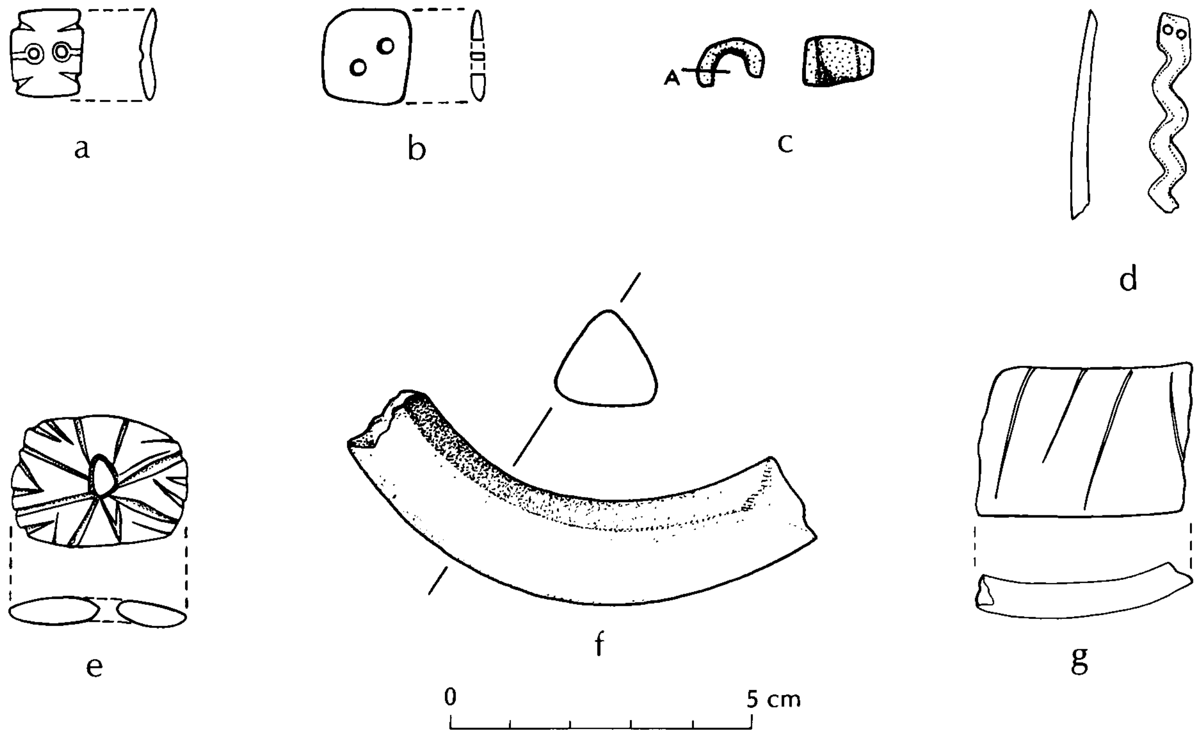


Figure 7.8. Ornaments. a, two-hole ornament, bone (tooth), Period VIIB.2 (C.71.T6.1.1); b, two-hole ornament, shell, Period VIB.2 (C.71.T3.2); c, ring or bead, copper, Period VIB.2 (C.70.T5.3.1); d, snake with two holes, mother-of-pearl, Period VIA (C.69.1.4); e, incised bead, lapis lazuli, Period N-VA.2 (XCE.71.T2.15.45); f, bracelet, marble, Period VIB.2 (D.69.T2.8); g, incised bracelet, chlorite, Period VIIA–VIA (C.70.1).

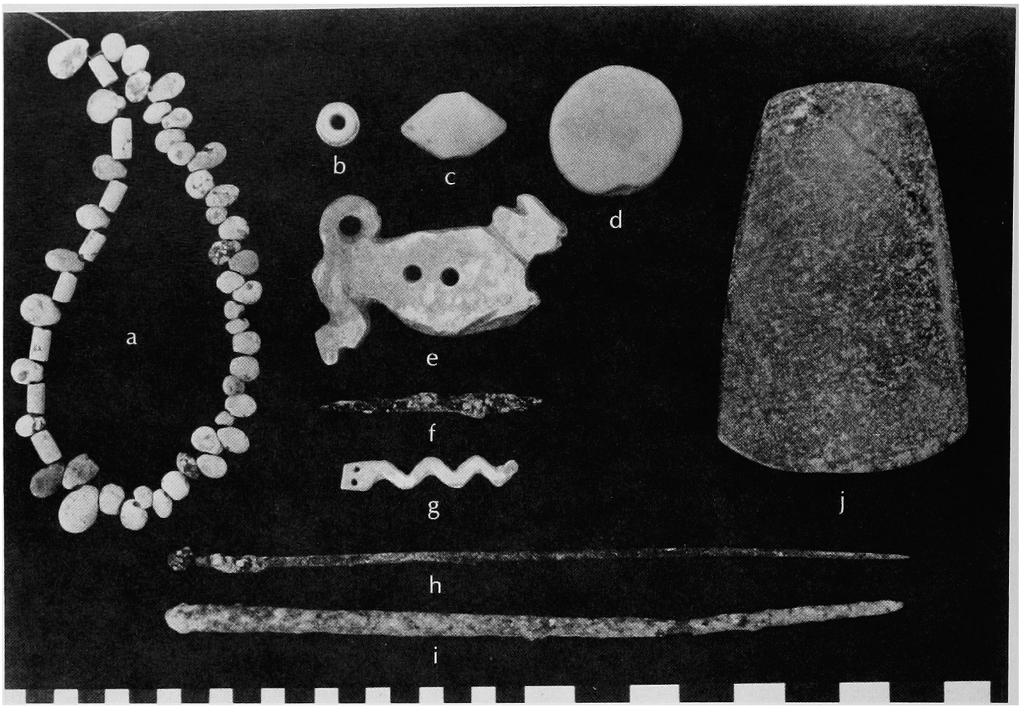


Figure 7.9. Necklace, beads, copper pins, and other ornaments from Periods VIA–V; metal pin from Period IVC and celt from Period I. a, bead necklace, turquoise, Period VC (C.69.7.11); b, bead, shell, Period VC (C.69.7.10–11); c, bead, white stone, Period VC–VA (C.69.Surf.8); d, round polished stone, period indeterminate (C.69.Surface); e, two-hole boar/pig ornament, mother-of-pearl, Period VC–VA (C.69.Surf.8); f, pin, copper, Period VC (C.69.7.15); g, snake ornament, mother-of-pearl, Period VIA (C.69.1.4); h, pin, copper, Period IVC (C.69.Surf.6); i, pin, copper, Period VC–VA (C.69.Surf.8); j, celt, green stone, Period I (A.69.A2.T2.1).

Period	*Number and Material*
VIID	1 mother-of-pearl; large, ovoid shape
VIIC.2–1	1 mother-of-pearl; large, ovoid shape; fig. 7.6:e
VIIC.2–VIIB.3	1 shell; shape unclear
VIIB.6–1	1 bone; large, ovoid shape
VIIB.2	1 tooth; rounded rectangular shape, with centrally placed holes; figs. 7.5 and 7.8:a
	1 mother-of-pearl; rounded rectangular shape, with centrally placed holes; fig. 7.5
VIIB.1	1 mother-of-pearl; large, ovoid shape
VIIB.2–VIIA	1 shell; large, ovoid shape
VIB.2	1 shell; rounded rectangular shape, with centrally placed holes; fig. 7.8:b 1 mother-of-pearl; triple-tanged shape
VIA	1 mother-of-pearl; snake; figs. 7.8:d and 7.9:g
VC–VA	1 mother-of-pearl; boar; probably dates from VC; fig. 7.9:e

Geographical Distribution: Two-hole ornaments are extremely rare at Ali Kosh, and mother-of-pearl is not used at all. The two examples illustrated (Hole, Flannery, and Neely 1969:fig. 100, b and g) are made from bone and local mussel shell and are very similar to the Period VII Yahya forms. Illustrated examples of two-hole objects are lacking at Iblis, although two pieces of "cut" mother-of-pearl were recovered in excavations, one from "no context" and the other from early Iblis IV (Caldwell 1967:408).

Labrets

Sample: 6

Material: Chlorite, marble, unidentified stone.

Description, Context, and Chronological Distribution: The examples of labrets (figs. 7.6, 7.7, 7.10) from Yahya are all in the form of flanged discs with concave sides. The use of these objects as labrets, or lip plugs, was proven by the excavations at Ali Kosh, where one was found in situ lying against the symphysis of the mandible in a burial (Hole, Flannery, and Neely 1969:235–236). The Yahya labrets range from 2.5 to 5.3 cm in diameter, and from 1.5

to 2.9 cm in thickness. The example from VIIA (figs. 7.7, 7.10:b) was found in situ on an outside surface just south of the VIIA room complex (fig. 6.12). It is noteworthy that there are no labrets in any good context after Period VIA.

Period	*Number and Material*
VIIC.2–1	1 chlorite
VIIA	1 marble
N-VII, VB	1 marble
VIA	1 chlorite 1 unidentified stone
Indeterminable	1 unidentified stone

Geographical Distribution: The Yahya labrets appear to be generically related to the "cuff-link shaped" labrets found at Ali Kosh and Tepe Sabz from the Mohammed Jaffar through the early Khazineh phases (Hole, Flannery, and Neely 1969:236–237). However, the Yahya examples are somewhat larger and their flanges more symmetrical.

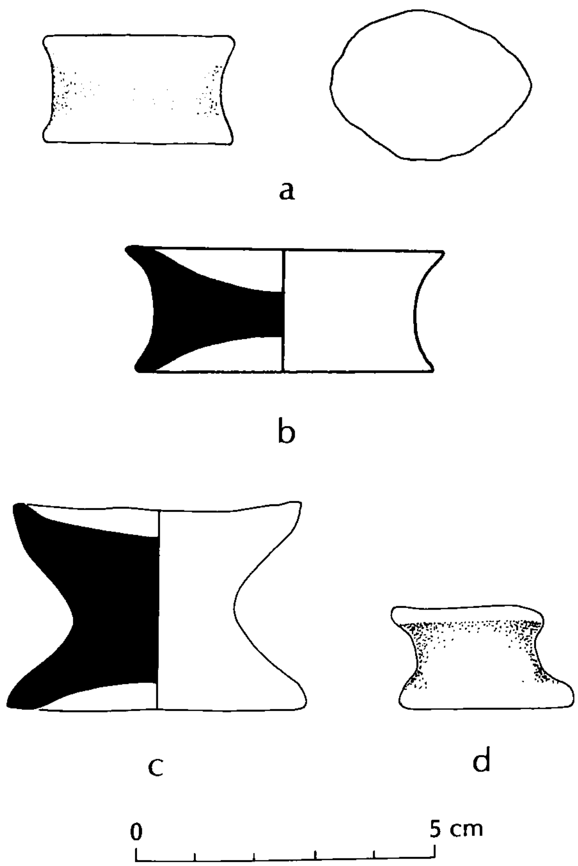


Figure 7.10. Labrets. a, stone, Period VIA (D.68.4.1); b, marble, Period VIIA (C.70.T7.5.1); c, marble, Period N-VII, VB (XC.71.8A.32); d, stone, mound surface (D.69.Surface).

Bracelets

Sample: 21

Material: Shell, chlorite, limestone, marble, unidentified stone.

Description and Chronological Distribution: Bracelets (fig. 7.8:f, g) are not common in Periods VII–V, but do appear sporadically throughout the sequence. Those examples complete enough to measure had inside diameters ranging from 5.5 to 8 cm. Only bracelets made of chlorite had any incised line decoration (three examples). The most interesting chronological differentiation is the shift from chlorite and shell bracelets in Periods VII and VI to marble bracelets in Period V. Marble bracelets first appear in VIIA, and by Period VA most bracelets are made from marble.

Period	*Number and Material*
VIIC.2–1	1 chlorite with incised decoration
VIIB.3	1 limestone
VIIB.2	1 shell
VIIA	1 shell 1 marble or alabaster
N-VII, VB	1 chlorite with incised decoration
VIB.2	1 marble
VIB.2–1	2 chlorite
VIB.1	1 marble
VIIA–VIA	1 chlorite with incised decoration
VIA	2 unidentified stone 2 shell
N-VA.4	1 marble 1 chlorite
N-VA.2	1 marble 1 chlorite
VA.1	1 marble
Indeterminable	1 marble

Geographical Distribution: The only bracelet from Iblis is of copper and comes from Iblis I levels (Caldwell 1967:204). Stone bracelets are relatively common in Sialk I and II (Ghirshman 1938:pl. LII). Interestingly enough, there is a similar shift in raw materials used at Sialk: in Period I bracelets of "pierre grise" predominate; in Period II most bracelets are of marble (Ghirshman 1938:31). Bracelets of copper also begin to appear in Period II (Ghirshman 1938: pl. LII, no. 52). Limestone bracelets appear throughout the Ali Kosh and Tepe Sabz sequence (Hole, Flannery, and Neely 1969:237, 239–240); bracelets with parallel incised line decoration are found in the Sabz Phase and are paralleled by identical examples in Sialk I, but do not appear at Yahya at all.

Ring or Bead

Sample: 1

Material: Copper.

Description and Context: This object (fig. 7.8:c) has been analyzed by Dennis Heskel (Heskel and Lamberg-Karlovsky 1980). Unfortunately, it was totally corroded with malachite and cuprite layers, but most probably it was made from hammered native copper. The object may have functioned as a bead but was categorized here as a ring because of the large hole diameter. This ring was found in good context between bricks in a brick foundation paving belonging to Period VIB.2 (fig. 6.15).

Pins, Needles

Sample: 27

Material: Bone, copper.

Description and Chronological Distribution: Except for a single intrusive example in iron from an unsealed stratum on the north side of the mound, all the pins/needles are of either bone or copper (figs. 7.9, 7.11:a–f; Lamberg-Karlovsky 1973:pl. XXVc).

There are only four bone pins/needles, and only two of them come from good context.

Period	*Number*
VIIB.3	1
VIIB.2	1
After VA.1	1
Indeterminable	1

Although the sample category is too small to make any generalizations, it is noteworthy that no bone pins/needles are found in good context after Period VII. The example of "indeterminable" date is an intact needle, 7 cm long and with a hole for threading cut through one end. The example from VIIB.2 was found in situ on the floor of the main room of a small VIIB.2 domestic complex (fig. 6.8).

Twenty-one of the 23 examples in copper appear to be pins rather than needles. These pins are extremely rare before Period VA; 16 of the 23 examples come from VA levels. Six of the seven pins with heads come from VA, too, and none of the pins with heads can be clearly attributed to a period before VB.

Period	*Number and Shape*
VIID	1
N-VII	1
VIA	1
VC	1

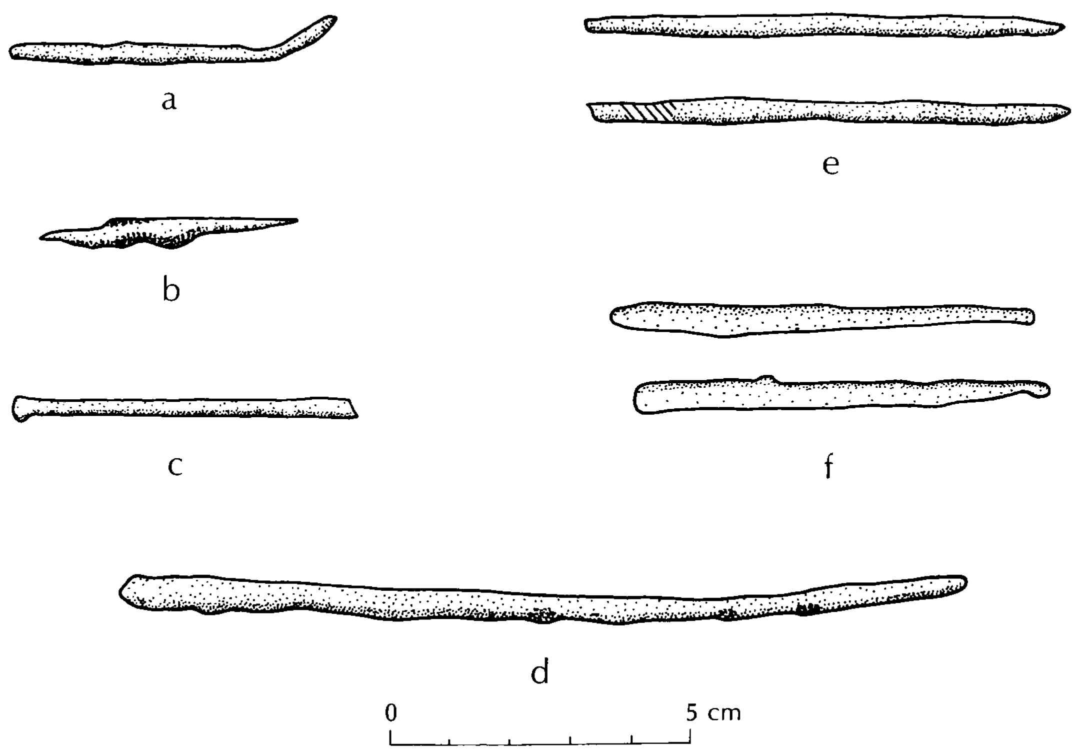


Figure 7.11. Copper pins, stylus (?). Proveniences: a, Period N-VII (XC.73.3); b, Period VC (C.69.7.15); c, Period N-VII, VB (XC.71.8B.40); d, Period VC–VA (C.69.Surf.8); e, Period N-VA (XCE.73.T2.3); f, stylus (?), Period VA.1 (B.71.18).

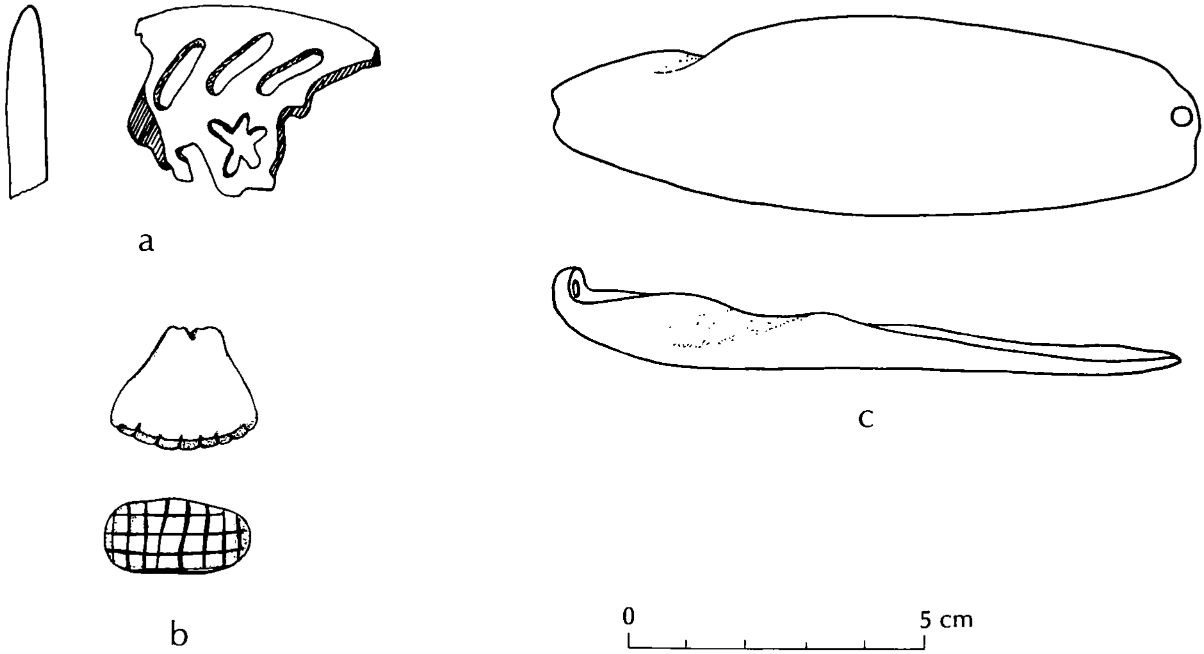


Figure 7.12. Carved disc, stamp seal, pendant. a, carved disc, chlorite, Period N-VA.3 (XCE.73.T3.1); b, geometric stamp seal, baked clay, Period VIB.2 (C.70.T5.3); c, pendant with two holes, mother-of-pearl, Period VIA (C.70.1.1).

VB–VA	1
VC–VA	1
N-VII, VB	1 with head
N-VA.4–3	1 with head
VA.2	1
N-VA.2	3
	1 with head
N-VA	1 with head of blue frit
	1 with rectangular cross section
N-VA.1	2 with heads, including 1 with square cross section
	2
VA.1	1 with head
	3

The N-VII, VA, VC–VA, and N-VII, VB pins have been analyzed by Dennis Heskel (ch. 8). The N-VII pin and the VC pin (found just above the floor of VC Room 8; fig. 6.23) both consist of hammered native copper. The VC–VA and N-VII, VB pins, on the other hand, were cast, cold worked, and annealed. Although the number of analyzed examples is small, there does seem to be an indication here that VC–VB was the critical transitional period in copper technology at Yahya. In VC and earlier periods copper is very rare; smelting and casting are not yet practiced; and the few simple pins that are present are made by cold hammering native copper. In VB a much more elaborate technology appears; smelting and casting are now used; and pin shapes become more elaborate.

Geographical Distribution: Copper pins with heads, as well as copper needles, are already present in Sialk I (Ghirshman 1938:pl. LII, nos. 53–55) and continue into Periods II and III. Bone pins/needles also are present in Sialk I–II (Ghirshman 1938:pl. LIV). Bone pins/needles and copper pins are both fairly common in Iblis I and II (Caldwell 1967:204, 219, 300, 302).

Stamp Seals

Sample: 1

Material: Lightly fired clay.

Description and Context: The only example from a good context (Period VIB.2 fill) is made of lightly fired clay (fig. 7.12:b). The face of the seal is rectangular and slightly convex; the design on the face consists of incised lines forming a simple cross-hatching pattern. The boss on the back is very high and wide. A hole for suspension is present, but was broken off in antiquity. Given the absence of any other artifacts from Periods VII–V identifiable as stamp seals, it is possible that this particular artifact was not used as a seal, but simply as a pendant.

Geographical Distribution: The VIB.2 stamp seal bears only a generic resemblance to the geometric stamp seals of Sialk III (Ghirshman 1938:pl. LXXXVI). The Sialk seals are of stone rather than fired clay, with round or square rather than rectangular faces. The Sialk seals also have bosses on the back that are much lower and thinner than the Yahya example.

Button

Sample: 1

Material: Stone.

Description and Context: This object is shaped like a button, with an unworked but polished circular face and a low boss on the back perforated with a hole for attachment. However, it is also possible that this was a pendant or even an unfinished stamp seal. The object is 1.5 cm in diameter and 0.6 cm high. It was found on an outside surface just north of and contemporary with a Period VIB.1 domestic complex.

Geographical Distribution: Unknown for this time period.

Decorated Disc

Sample: 1

Material: Chlorite.

Description and Context: This decorated disc (figs. 7.12:a; 7.13) was found in bricky fill belonging to Period N-VA.3 on the north side of the mound. The decoration consists of an arrangement of holes cut through the disc in various simple geometric shapes. This type of "cut-out" decoration is unique in Periods VII–V. The disc is 0.7 cm thick; the original diameter of the piece is not known because of its fragmentary condition.

Geographical Distribution: Similarly decorated discs of copper appear in Period IVC at Yahya (Lamberg-Karlovsky and Tosi 1973:fig. 124), and similar chlorite discs appear commonly in third millennium contexts at sites northeast of Yahya, such as Shahr-i Sokhta (Lamberg-Karlovsky and Tosi 1973:figs. 32–40) and Mundigak (Casal 1961:pl. XLV).

Figure 7.13. Chlorite disc with cut-out design, Period N-VA.3 (XCE.73.T3.1).

Ochre Stones

Sample: 15

Material: Variable; some of the stones probably are iron oxides.

Description: These are unworked stones, usually rather soft and chalky, which may have been brought to the site as a source of pigments and ochre. Most of the stones are red (11 of 15 examples), but there are also two yellow examples, and one green and one blue piece. The red and yellow examples probably are iron oxides. The blue and green examples were not identified. The uses of ochre on the site are not all clear, but there is a striking chronological correlation between the presence of red ochre stones and the use of red ochre in burials. All eleven of the examples of red ochre stones come from Period VII, and three of the four excavated burials from Period VII had traces of red ochre on or in the vicinity of the skeleton. On the other hand, none of the three burials from Period V had red ochre associated with it (although the child burial from VC had one bone stained blue).

Chronological Distribution: No red ochre stones after Period VIIA.

Period	*Number and Color*
Sterile soil beneath VII	1 red
VIID	1 red
VIIC.1	1 red
VIIB.6	3 red
VIIB.6–5	1 yellow
VIIB.4	1 green
VIIB.2	2 red
VIIA	2 red
N-VII	1 red
N-VA.2–1	1 yellow 1 blue

STONE TOOLS AND IMPLEMENTS (Obsidian Tools, Weights, Whetstones, "Shaft Straighteners," Mortars, Handstones, Hammer Stones or "Pestles," Axes or Celts)

Obsidian Tools

Sample: 13

Material: Obsidian from sources in eastern Turkey.

Description, Context, and Chronological Distribution: The flint tool assemblage as a whole has undergone preliminary analysis by Marcello Piperno (1973), but the corpus of obsidian tools is being included here because of its importance in providing clues about Yahya's trade relations

Figure 7.14. Miscellaneous stone mortars, pestles, hand grinding stones, weights, and "shaft straightener," Periods VII–V (including C.69.3, C.69.7).

with the outside world in Periods VII–V (fig. 7.19:f). Unfortunately, only ten of the 13 examples come from good contexts. Of the three pieces from poor contexts, one (a backed blade) comes from the mound surfaces in Trench C, one (an unretouched flake) comes from an intrusive pit dug into Trench C from the mound surface, and one (an unretouched flake) comes from a mixed level in Trench CW probably belonging to Period IVC. Obsidian is found in rare quantities throughout the sequence, but most of the examples from good contexts come from Period V (seven out of 10).

Period	*Number and Type*
VIIB.6–3	1 tanged point cut from backed blade (fig. 7.19:f)
VIIA	1 backed blade
VIA	1 unretouched flake
VC	1 backed blade
VB	1 backed blade 1 unretouched flake 1 awl made from a retouched flake
VA.2	1 backed blade
N-VA.2–1	1 backed blade
N-VA.1	1 backed blade

It is difficult to draw inferences from such a small sample, but several facts are worth noting. First, obsidian is exceedingly rare in all periods. Several pieces have been examined by Colin Renfrew (personal communication), and all appear to derive from sources in eastern Turkey. Second, no flakes are found before Period VIA, only finished blades. Even the unique tanged point from VIIB.6–3 appears to have been cut from a backed blade. Thus it would appear (and this must be taken as highly tentative because of the small sample) that in Period VII Yahya was importing obsidian only in the form of finished tools (backed blades), but in Periods VI and V began importing at least some obsidian in unworked form and making it into tools on the site.

Geographical Distribution: Obsidian is extremely rare at Sialk in Period III (Ghirshman 1938:55), and there is only one piece, a backed blade, from all of Periods I and II (Ghirshman 1938:22). At Tepe Sabz three pieces of obsidian were found in the Mehmeh Phase and 6 in the Bayat Phase (Hole, Flannery, and Neely 1969:75). At Ali Kosh obsidian is slightly more common, but never more than 2 percent of the flint assemblage.

Weights

Sample: 2

Material: Chlorite and unidentified stone.

Description and Context: Only two examples were found of worked stones that might be construed as weights (fig. 7.14). Both are round and doughnut-shaped, with a large central hole. The example made of chlorite is 8.6 cm in diameter and comes from a good context in N-VA.2–1; the other is undatable, having been found amidst surface wash in Trench C.

Geographical Distribution: Worked stones of similar size and shape are found in all phases at Tepe Sabz (Hole, Flannery, and Neely 1969:196–197).

Whetstones

Sample: 8

Material: Stone.

Description: These are stones that have been worked into a thin, rectangular shape and are small enough to be held easily in the hand. In most cases the surface of the stones is abrasive, which is why they have been interpreted as "whetstones," or stones used in working or sharpening other materials. Two of the examples, one from VB and one from VIIB.2, were found in situ on outside surfaces near domestic complexes. The whetstones range in length from 4 to 8 cm, in width from 1.1 to 5.5 cm, and in thickness from 0.6 to 2.5 cm.

Chronological Distribution: No apparent chronological patterning, evenly distributed in all periods.

Period	*Number*
VIIB.2	2
VIB.1	1
VB	2
VA.2	1
VC–VA	1
IVC–VC	1

Geographical Distribution: These appear sporadically throughout the sequence at Ali Kosh (Hole, Flannery, and Neely 1969:184).

"Shaft Straighteners"

Sample: 14

Material: Chlorite, serpentine, unidentified stone.

Description: These are stone objects ranging from 5 to 10 cm long and 2.5 to 8 cm wide, with a characteristic groove or channel running lengthwise down the center of one side (figs. 7.15–7.17). Although often referred to as "shaft straighteners" or "shaft smoothers," the true function of these simple artifacts remains unknown. The only contextual clue at Yahya as to their function was the recovery of two

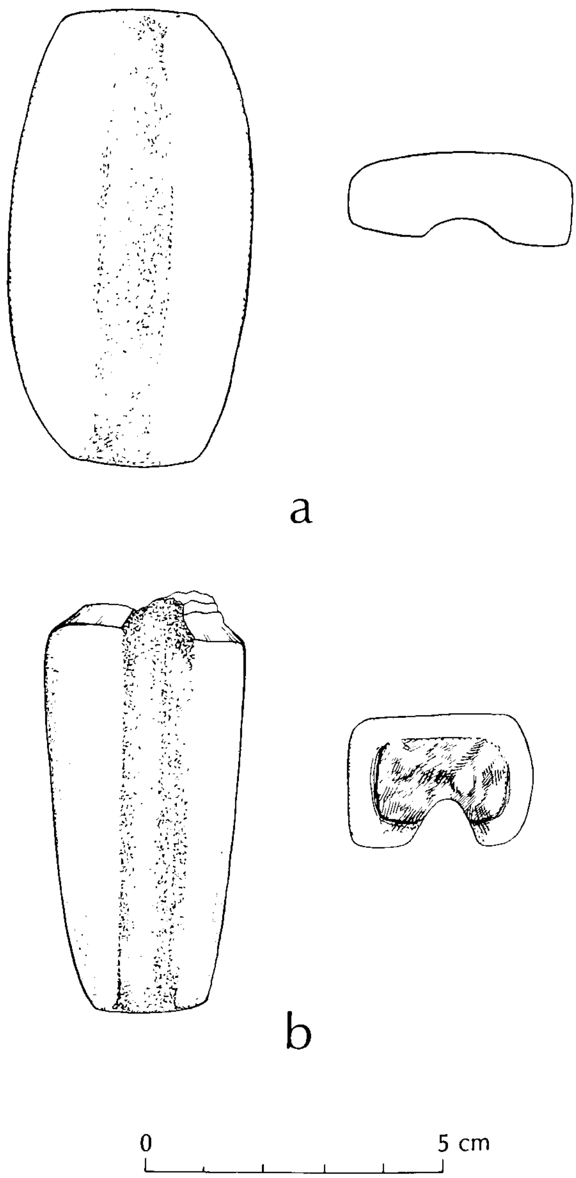


Figure 7.15. "Shaft straighteners." a, chlorite, Period VC (C.69.7.8); b, chlorite, Period VIIB.4 (D.68.6.7), associated with female figurine and other stone tools.

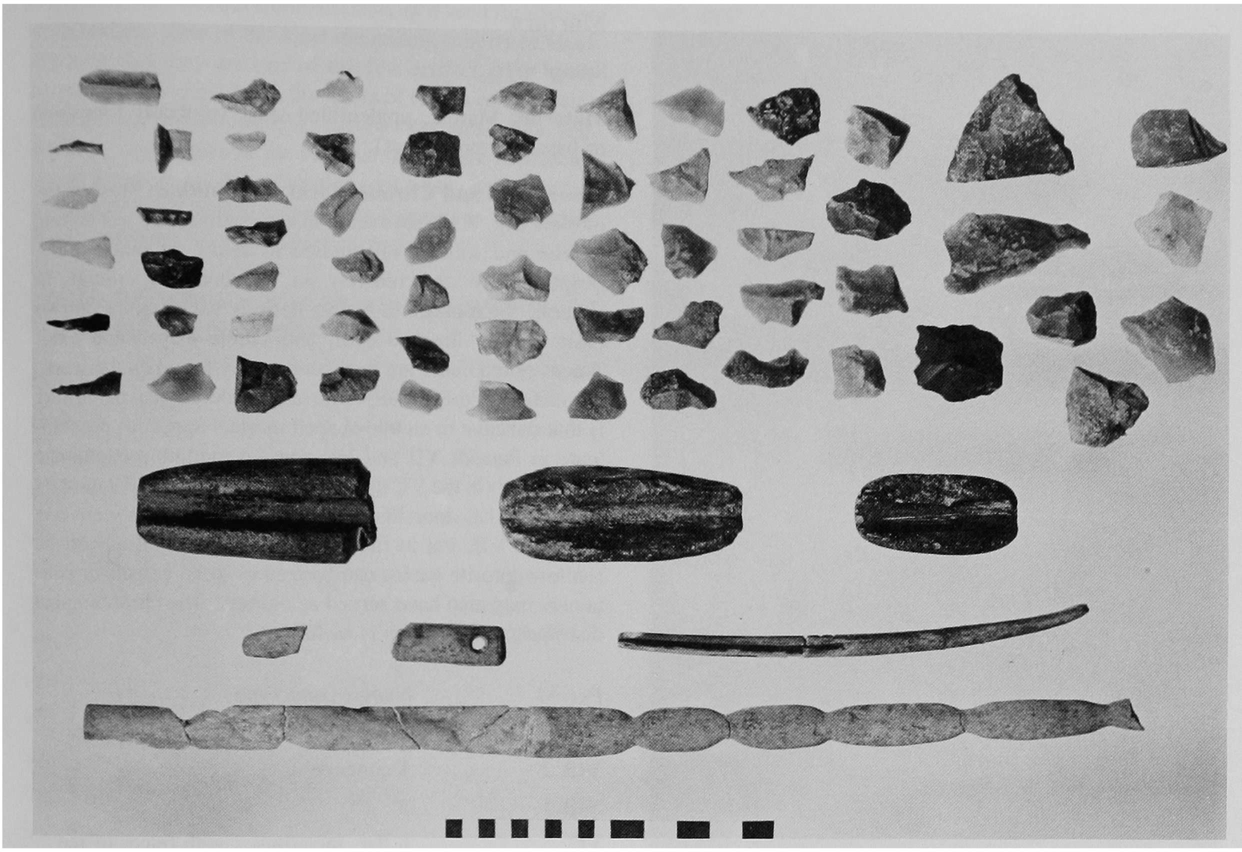


Figure 7.16. Flint sickle blades, chlorite "shaft straighteners," and bone objects found deposited in association with female figurine, Period VIIB.4 (D.68.6.7).

examples in association with a foundation deposit (Period VIIB.4) that included a female figurine of chlorite, two bone sickle or knife handles, a bone spatula, and 63 flint sickle blades (fig. 6.6, Room 20). This collection of artifacts would appear to represent a tool kit. Possibly the "shaft straighteners" were included because they were among the tools used in producing bone implements, or perhaps they were used in conjunction with the bone tools. The grooves on most examples are U-shaped and have been rubbed smooth on both sides and the bottom to an almost glossy finish. This uniform smoothness along the groove implies that an object was pushed back and forth along the length of the channel and that this object was approximately the same shape as the groove: i.e., rounded or circular in cross section. Also, although several of the examples have striations running lengthwise along the groove, it would appear from close examination that these were produced in the initial cutting of the groove, not in the use of the groove after it had been created. And it is the few V-shaped examples that have the clearest striations. One explanation for this might be that the grooves initially were cut in a "V" shape using a sharp gouging tool; then, with use, they gradually wore down into a smooth "U" shape (cf. Hole, Flannery, and Neely 1969:196). In complete examples, the groove is worn down more at the open ends than in the center section. Thus, whatever the specific function of these "shaft straighteners," their "use marks" imply a smoothing or abrading process applied to a fairly soft material such as wood or bone, and probably materials or objects already having a circular or U-shaped profile.

Chronological Distribution: Eleven of the 13 datable examples come from Period VC or earlier.

Period	*Number and Material*
VIID	1 chlorite
VIIC.2–1	1 unidentified stone
VIIB.4	2 chlorite 1 unidentified stone
VIIA	1 serpentine
N-VII, VB	1 chlorite
VIB	1 chlorite
VIA	1 unidentified stone
VC	1 chlorite 1 unidentified stone
VA.1	1 chlorite
VB–IVC	1 chlorite
Indeterminable	1 chlorite

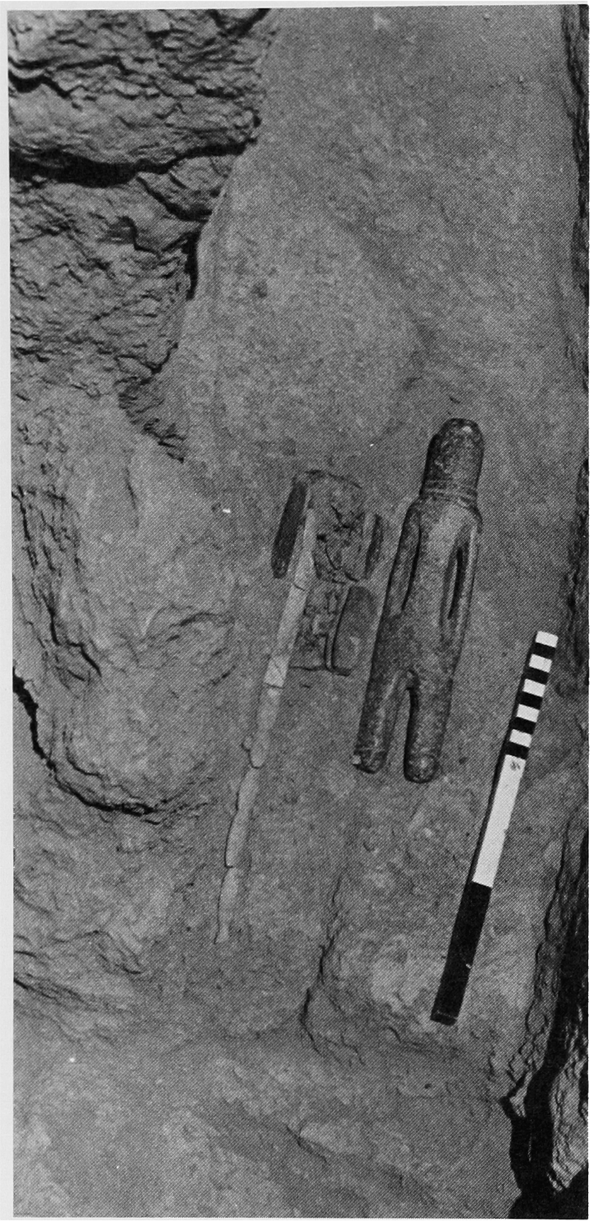


Figure 7.17. Female figurine and associated objects in situ under floor of Period VIIB.4 room (compare with figs. 7.16, 7.26–7.29) (D.68.6.7).

The example from VA.1 was found near an unsealed kiln close to the mound surface, and the example from VB–IVC comes from badly mixed fill. Thus, it could be argued tentatively that "shaft straighteners" are not used after Period VC.

Geographical Distribution: Found on many early Near Eastern sites, including Iblis I (Caldwell 1967:212), Sialk II (Ghirshman 1938:pl. LIII, no. 16), and the Ali Kosh through Mehmeh phases at Ali Kosh and Tepe Sabz (Hole, Flannery, and Neely 1969:196).

Mortars

Sample: 16

Material: Marble, unidentified stone (probably limestone or basalt in most cases).

Description and Chronological Distribution: Most of the mortars (fig. 7.14) recovered in excavation were left behind in Iran and were never studied in detail, so that our description here unfortunately will be fairly superficial. In general, the mortars in Yahya Periods VII–V come in two basic shapes: flat and oval, and saddle-shaped and oval. Traces of red ochre are fairly commonly found on the working surface of the mortars. The only chronological patterning is that concave or saddle-shaped mortars appear to predominate in Periods VII and VI, and flat mortars predominate in Period V (in the VC domestic complex several flat mortars were reused as doorsills between rooms). Mortars seem rare in Period VII, but in fact some (but clearly not all) of the shallow chlorite basins categorized as stone vessels or containers may also have served as mortars. The chronological distribution of mortars is as follows:

Period	*Number and Type*
VIIB.2	1 concave, with traces of red ochre
VIB.2	1 concave
VIB.1	3
VC	6 flat, including 2 with traces of red ochre
VC–VA	1
VB–VA	2, including 1 with traces of red ochre
N–VA.2	1 flat
Indeterminable	1

Geographical Distribution: Saddle-shaped and flat mortars are both common in Period I at Iblis (Caldwell 1967:204, 280, pl. 2, 3, 4). Saddle-shaped and flat mortars also are common in most phases at Ali Kosh and Tepe Sabz (Hole, Flannery, and Neely 1969:171). Indeed, mortars of at least one of these two basic shapes are found on virtually all early Near Eastern sites.

Handstones

Sample: 43

Material: Chlorite, unidentified stone (probably limestone in most cases).

Description and Chronological Distribution: This artifact category (fig. 7.14) consists of stone cobbles worked into a rounded or roughly spherical form that is small enough to be held easily in the hand (usually with a maximum diameter of no more than 15 cm). Some of the examples are rough, as if used for grinding, while many other examples are very smooth along one side, as if used for rubbing or smoothing. One of the most interesting aspects of handstones is that they are one of the few artifact types fairly commonly found in situ on the floors of rooms or on outside surfaces near room complexes (seven examples). This phenomenon may represent the fact that these were considered one of the most easily replaceable tool types, and therefore tended to be left behind when room complexes were abandoned. Another curious aspect of handstones is that they tend to be found in groups of five or ten within the same context. Handstones are found throughout the sequence, but are most common in Period V.

Period	*Number*
VIIB.6	1
VIIB.6–5	1
VIIB.5–3	1
VIIB.2	1
VIIA	1
VIB.2	1
VIB.1	1
VIA	1
VC	7
VB	4
VC–VA	10
VB–VA	8
After VA.1 or indeterminable	6

Geographical Distribution: Simple handstones are found on virtually all early Near Eastern sites.

Hammer Stones or "Pestles"

Sample: 11

Material: Stone.

Description: These implements (fig. 7.14), usually circular in cross section and several times greater in length than in diameter, were probably used for grinding and/or pounding. The complete examples range in length from 6.7 to 18 cm, with four of the five examples measured exceeding 10 cm in length. Their diameters range from 2.2 to 7 cm. The earliest example, from VIB.2, has traces of red ochre at the grinding end.

Chronological Distribution: None earlier than Period VI.

Period	*Number*
VIB.2	1
VIA	1
VC	3
VC–VA	1
VC–IVC	1
VB, VA.2–1	1
N-VA.2–1	1
VA .1	1
VA.1–IVC	1

Geographical Distribution: Similar round-ended pestles are found at Ali Kosh in the Ali Kosh and Mohammed Jaffar phases (Hole, Flannery, and Neely 1969:183,184), which would make them somewhat earlier than the Yahya examples. There are also pestles similar to the Yahya examples in early Iblis I (Caldwell 1967:290).

Axes or Celts

Sample: 4

Material: Ground stone.

Description and Context: This artifact category appears only at the very end of the Period VII–V sequence. Three of the four examples come from Period VA. The fourth example comes from an intrusive IVB.2 pit dug down into Period V levels. All three of the examples from good contexts are simple in form and have convex blade edges. The example from VA.2–1 is quite long (13 cm) and has an incised groove near the butt end for hafting. The two examples from VA.1 are much shorter relative to their blade widths.

Geographical Distribution: A much cruder ground stone celt comes from early Iblis I (Caldwell 1967:290, no. 1), and polished celts similar but not identical in shape are common in the Sabz through Bayat phases at Tepe Sabz (Hole, Flannery, and Neely 1969:189, 192–193), as well as at many other early Near Eastern sites.

OTHER TOOLS AND IMPLEMENTS (Perforated Square Sherds, Perforated Discs, Awls, Sickle or Knife Handles, Styli, Spatulas, Forks, Tacks or Nails)

Perforated Square Sherds, Probably Spindle Whorls

Sample: 6

Material: Chaff-Tempered Coarse Ware sherds.

Description: These are sherds of Chaff-Tempered Coarse Ware that have been cut into a square shape and then perforated with a hole through their centers. Quite possibly they served as spindle whorls. The length along one side of these square sherds ranges from 3 to 6 cm, and the hole diameters from 0.5 to 1.5 cm.

Chronological Distribution: None later than Period VIB.2.

Period	*Number*
VIID	1
VIIC.2–1	1
VIIA	2
VIB.2	2

Geographical Distribution: Perforated disc-shaped sherds are common on many early Near Eastern sites, but occurrences of perforated square sherds at other sites have not been found.

Perforated Discs, Probably Spindle Whorls

Sample: 13

Material: Lightly fired clay, recut ceramic sherds, chlorite, unidentified stone.

Description: These probably are spindle whorls (fig. 7.18:k,l) They range in diameter from 3.1 to 5.7 cm. The five ceramic examples are cut from body sherds of Chaff-Tempered Coarse Ware. Hole diameters range from 0.3 to 1.1 cm.

Chronological Distribution: There is no apparent chronological patterning except that only one of the 13 examples comes from Period V.

Period	*Number and Material*
VIID	1 chlorite
VIIB.6–4	1 unidentified stone
VIIB.5–3	1 lightly fired clay
VIIB.3	1 chlorite
VIIB.1	1 recut sherd 1 unidentified stone
VIIB.2–VIIA	1 unidentified stone
VIIA	1 recut sherd 1 chlorite
VIA	2 recut sherds 1 unidentified stone
VB–VA	1 recut sherd

Geographical Distribution Perforated disc-shaped sherds are common on many Near Eastern sites.

Awls

Sample: 8

Material: Bone.

Description and Chronological Distribution: Awls are distinguished from pins/needles by having a diameter or width across the shaft of more than 0.4 cm as measured 2 cm away from the tip. All eight examples are of bone and have polished tips, and all date to Period VIB.2 or earlier.

Period	*Number*
VIID	2
VIIB.4	1
VIIB.2	1
VIIB.2–VIIA	1
VIIA	1
VIB.2	2

Of course, awls and borers of flint are more common than bone awls (and perhaps served somewhat different functions) and are found throughout Periods VII–V (see Piperno 1973).

Geographical Distribution: Awls are found on almost every early Near Eastern site.

Sickles or Knife Handles

Sample: 4

Material: Bone.

Description: These objects consist of long, thin "slats" of bone (usually rib bones), with a slot cut along the narrow edge, presumably for the insertion of flint sickle blades, although none was found in situ. The bone handles range from 8 to 14.2 cm in length, 1.5 to 2.4 cm in width, and 0.4 to 0.6 cm in thickness. All four examples come from the floor or fill of doorless Period VII rooms. If in fact these were sickles used in the harvesting of grain, then their association with doorless rooms may imply that some of these rooms served as granaries. Two of the sickles were found in direct association with a foundation deposit in a VIIB.4 room (fig. 6.6). This deposit included a female figurine, a bone spatula, three chlorite "shaft straighteners," and 63 flints, some or all of which may have been intended as sickle blades (figs. 7.16, 7.17; Lamberg-Karlovsky and Meadow 1970).

Chronological Distribution: Found only in Periods VIIA and VIIB.

Period	*Number*
VIIB.6–5	1
VIIB.4	2
VIIA	1

Geographical Distribution: Similar bone sickle handles are present in Sialk I, although most are more elaborate than the Yahya examples and have carved ends (Ghirshman

1938:pl. LIV, nos. I–IV). In fact, one Sialk handle is carved in the shape of a human figure, which, with its crossed arms and slim, elongated form, bears a general resemblance to the Yahya female figurine. Possibly both the figurine at Sialk and the one at Yahya represent a fertility goddess, since both are directly associated with what appear to be harvesting implements.

Styli(?)

Sample: 2

Material: Copper.

Description and Context: These objects (fig. 7.11:f) differ from pins in that neither end comes to a sharp point. In both cases one end is circular in cross section, with a rounded tip, and the other end is rectangular in cross section, with a fairly sharp edge. The reason for interpreting these two artifacts as possible styli is that their ends are approximately the right size and shape to have made the incised and impressed marks on the Yahya IVC Proto-Elamite tablets. If this was in fact their function, they almost certainly must be intrusive from IVC. Both were found in the fill of the last stratum below Period IVC (VA.1 and N–VA.1). Alternatively, these two objects simply may have been tools of some sort, possibly implements used in processing cosmetics. In any case, their function appears to have been utilitarian rather than ornamental, and hence they serve as further examples of the increased use of copper for utilitarian purposes in VA. The example from VA.1 has been analyzed by Dennis Heskel (Heskel and Lamberg-Karlovsky 1980). His analysis shows that the "stylus" was probably cast in a rock mold and then hammered and annealed into its final shape. The example from N-VA.1 is 18.2 cm long, and that from VA.1 only 7 cm long.

Geographical Distribution: "Styli" of almost exactly the same size and shape are found in Period III at Sialk (Ghirshman 1938:pl. LXXXIV).

Spatulas

Sample: 8

Material: Bone, copper.

Description: The six examples in bone all consist of long rectangular "slats" of bone, in most cases polished, and probably cut from rib bones (Lamberg-Karlovsky 1970b:pl. 36). The one complete example, found in association with a female figurine and other tools in a VIIB.4 room (fig. 6.6), is 34.5 cm long and has scalloped edges along part of both sides (figs. 7.16, 7.17). All the bone examples come from VIIB.3 or earlier.

The two copper examples come from much later levels: N-VA.2 and mixed VA.1–IVC levels, respectively (figs. 8.1:c, 8.2:a). Both have thin handles and flat, spatulate ends. The example from the mixed VA.1–IVC levels has been analyzed by Ronald F. Tylecote and Hugh McKerrell (see ch. 8 and fig. 8.2:a). Their study shows it to be a copper-arsenic alloy that was smelted, cast, reheated, and hot worked.

The specific function of these bone and copper spatulas is not known. The fact that the bone spatulas are separated from the copper spatulas by perhaps as much as 1,000 years and that the bone spatulas are somewhat different in shape may mean that copper spatulas did not in any sense replace bone spatulas and may have a different function altogether. The copper spatulas are further examples of the increased use of copper for utilitarian purposes in Period VA.

Chronological Distribution: No bone spatulas after Period VIIB.3, and no copper spatulas before N-VA.2.

Period	*Number and Material*
VIID	1 bone
VIIC.1	1 bone
VIIB.6	1 bone
VIIB.5–4	1 bone
VIIB.4	1 bone
VIIB.6–3	1 bone
N-VA.2	1 copper
VA.1–IVC	1 copper

Geographical Distribution: Bone spatulas are found in all phases at Ali Kosh and Tepe Sabz, but are rare (Hole, Flannery, and Neely 1969:217); at Iblis I–II there is a single example of a bone spatula (Caldwell 1967:153, no. 14). The distribution of copper spatulas of such early date is unknown.

Fork

Sample: 1

Material: Copper.

Description and Context: This unique two-pronged object is the most elaborately shaped copper artifact of Period V and one of the earliest examples of a strictly utilitarian (rather than ornamental) use of copper at Yahya. It is 6.7 cm long, and its two prongs are each 2.8 cm in length. This artifact comes from a good N-VA.2–1 context on the north side of the mound.

Geographical Distribution: No comparable example on other sites of such early date.

Tacks or Nails

Sample: 3

Material: Copper.

Description and Context: This artifact category is fairly subjective. The objects are pin-shaped, but with flat, spherical, or square heads, proportionately thick shafts, and lengths of less than 14 cm. Two of the tack/nails are from relatively poor contexts, one having been found in situ inside a rodent hole in a Period VIIB.2 level, and one coming from a mixed VA.1–IVC level and quite possibly belonging to IVC (fig. 8.1:b). The only example from a good context comes from Period VA.2 fill. This "nail" is 9.5 cm long and has a spherical head. Its shaft is rectangular in cross section.

Geographical Distribution: Similarly shaped copper implements are found in Period III at Sialk (Ghirshman 1938:pl. LXXXIV) and in Iblis I–II (Caldwell 1967:153,168).

STONE VESSELS

Stone Vessels

Sample: 166

Material and Number of Examples in Each Material: Chlorite (103), marble (31), marble or alabaster (6), alabaster? (2), diatomaceous limestone (4), limestone (7), unidentified stone (9), glass (3), iron (1).

Description and Chronological Distribution: Stone vessels (table 7.3) are found throughout Periods VII–V, but only become common in Periods VB and VA (there are only 45 examples from VIIC through VC, and 107 examples from VB and VA). Of the 166 examples in total, four—those of iron and glass—come from mixed or unsealed levels and clearly are intrusive from later periods. Marble is first used as a material for vessels in VIIA and continues in use through VA. Throughout these periods the relative numbers of marble vessels appear to remain about the same (averaging about 30 percent of the total corpus). Diatomaceous limestone (only four examples) appears only in Period VA (fig. 7.19). Chlorite is used throughout the sequence, and in every period represents the most common material.

Relatively few complete vessels or full profiles were recovered. Open bowls and thin-walled beakers are the two most common forms. Vessel shapes show a distinct chronological patterning. "Asymmetrical" vessels (crudely formed shallow bowls or basins gouged out of boulders and without uniform or even wall thickness) are found predominantly in Period VII (figs. 7.20:a–c; 7.21, 7.22) and do not appear at all after VIB.1. Some of these crude vessels may also have served as mortars. Vessels of symmetrical form, careful workmanship, and uniform wall thickness first appear in VIIB.6. Thin-walled beakers first appear in VC (one example), but only become common in Periods VB and VA, where they are the dominant shape (fig. 7.23). These stone beakers parallel the ceramic beaker forms that first appear in VC and also become common in VB–VA. Unusual or more complex forms begin to appear in rare quantities only at the very end of the sequence: one flat, rectangular base from N-VA.2–1, one ring base from N-VA.2, one disc base from N-VA.1 (figs. 7.20:f; 7.24). Incised line decoration on bowls is very rare. Of the four examples from good contexts, three come from Period VII and one from VIB.1, and all are of chlorite (figs. 7.20:c; 7.22).

Geographical Distribution: Stone vessels of simple form are found on many early Near Eastern sites. In Iblis I and II the materials most commonly used, as at Yahya, are chlorite, "calcite," and marble (Caldwell 1967:155).

Stone Vessel Handles

Sample: 4

Material: Chlorite.

Description: Like ceramic vessel handles, stone vessel handles are extremely rare in Yahya Periods VII–V. All the examples found are from chlorite vessels and are simple loop handles (fig. 7.22). Unfortunately, none was found still attached to a vessel, so that it is impossible to determine the types of vessels with which they were used.

Chronological Distribution: All datable examples come from Period VIB or earlier.

Period	*Number*
N-VII	1
VIB.2	1
VIB.1	1
Indeterminable	1

Geographical Distribution: Unknown for this time period.

POSSIBLE COUNTING DEVICES (Balls, Pellets, Cones, Clay Pyramids, Discs, Clay Pegs or Cylinders, Lenticular-Shaped Objects or "Sling Missiles")

Balls, Pellets

Sample: 66

Material: Unfired clay, lightly fired clay, chlorite, stone.

Description and Chronological Distribution: These spherical objects range in size from pellets only 0.5 cm in diameter to balls 3.5 cm in diameter (fig. 7.18:a–f). They are common in all the periods discussed here. They can be divided for descriptive purposes into three different materials: unfired clay, lightly fired clay, and stone. Stone balls/pellets represent the least common category (19 examples). They are fairly evenly distributed between all periods, but are less common than clay balls/pellets in each of Periods VII, VI, and V.

Table 7.3. Vessel material per period.

Period	Chlorite	Marble	Marble or alabaster	Alabaster	Diatomaceous limestone	Limestone	Unidentified Stone	Glass	Iron	Total
VIIC	1.9%[a]									1.2%
	2									2
VIIB	5.8%					14.3%				4.2%
	6					1				7
VIIA	2.9%	3.2%	16.7%							3.0%
	3	1	1							5
VIIA–VC							11.1%			0.6%
							1			1
VII	2.9%									1.8%
	3									3
N-VII	6.8%									4.2%
	7									7
N-VII, VB	1.9%									1.2%
	2									2
VIB	10.7%		16.7%							7.2%
	11		1							12
VIA	2.9%	3.2%								2.4%
	3	1								4
VC	1.0%	3.2%					11.1%			1.8%
	1	1					1			3
VB	3.9%	6.5%				14.3%				4.2%
	4	2				1				7
N-VB	3.9%									2.4%
	4									4
N-VB–VA		3.2%								0.6%
		1								1
N-VA.4–3	19.4%	29.0%	16.7%		50.0%	42.9%	11.1%	33.3%		22.3%
	20	9	1		2	3	1	1		37
VA.2	9.7%									6.0%
	10									10
N-VA.2–1	10.7%	35.5%	16.7%		50.0%	14.3%	11.1%			16.3%
	11	11	1		2	1	1			27
VA.1	4.9%	16.1%				14.3%				6.6%
	5	5				1				11
After VA.1							44.4%	33.3%		3.0%
							4	1		5
V–IVC	7.8%		33.3%				11.1%			6.6%
	8		2				1			11
Indeterminable	2.9%			100.0%				33.3%	100.0%	4.2%
	3			2				1	1	7
Percentage	62.0	18.7	3.6	1.2	2.4	4.2	5.4	1.8	0.6	100.0%
Total	103	31	6	2	4	7	9	3	1	166

Note: Chi-square is 216.936 with significance under 0.001 with 152 degrees of freedom.
a. Upper cell entries are percentages of column totals.

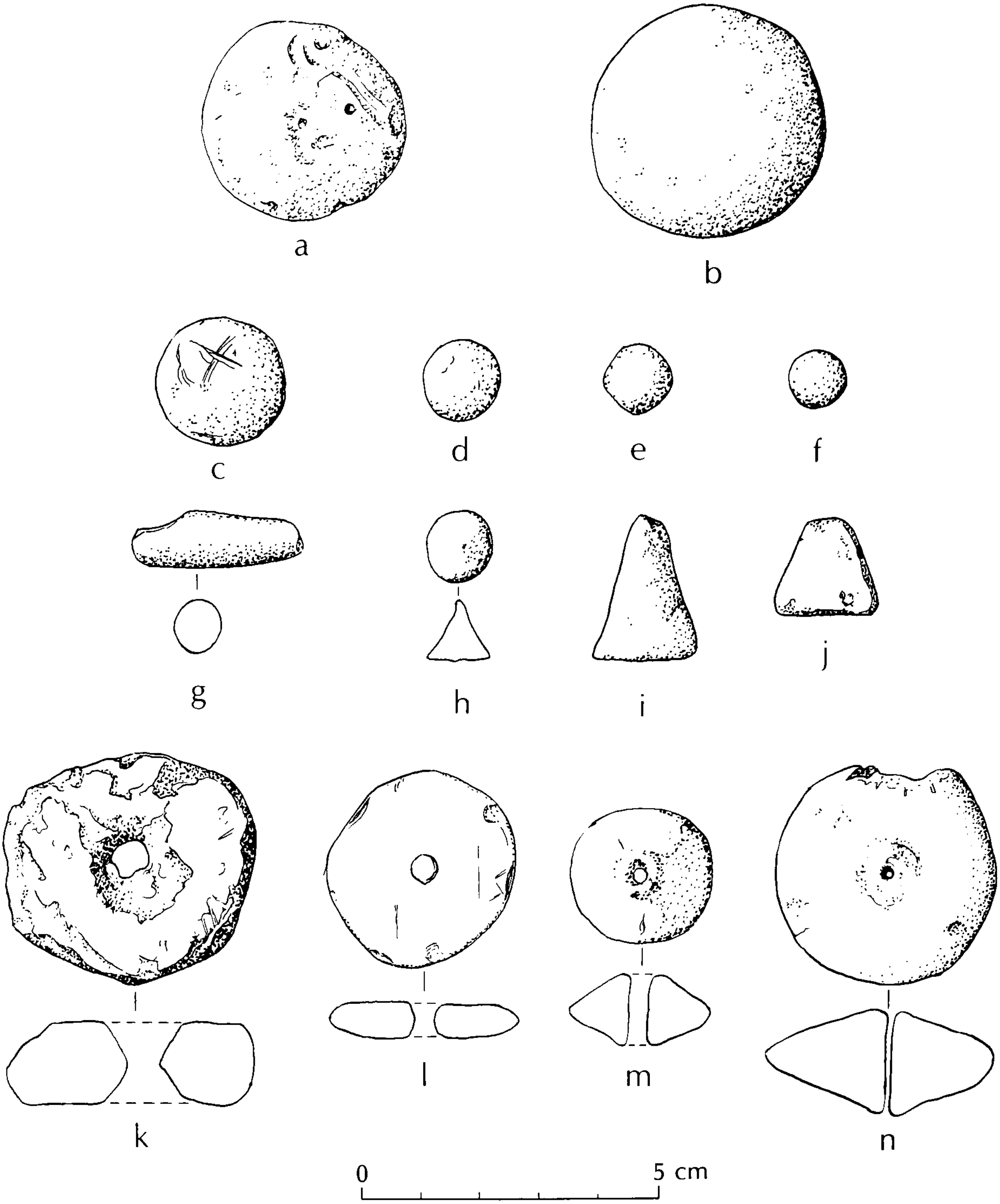


Figure 7.18. Balls, pellets, peg, cones, pyramid, perforated discs, bead, and toy wheel (?) from Periods VII–V. a, ball, clay, Period VIIB.1 (C.71.T6.1A); b, ball, stone, Period VIIB.2 (C.71.T7.2); c, ball, clay, Period VIIB.2 (C.71.T7.2); d, pellet, clay, Period VIIB.2 (C.71.T7.2); e, pellet, clay, Period VIIB.2 (C.71.T7.2); f, pellet, clay, Period VIIB.2 (C.71.T7.2); g, peg, clay, Period VIIA (C.71.T3.1.5); h, cone, clay, Period VIIB.2 (C.71.T6.1.7); i, cone, clay, Period VIB.2–1 (C.71.T4.3); j, pyramid, clay, Period VIB.2–1 (C.71.T4.3); k, perforated disc, recut Chaff-Tempered Coarse Ware sherd, Period VIIB.1 (C.71.T7.1A.1); l, perforated disc, white stone, Period VIIB.2–VIIA (CDE.73.4); m, bead, clay, Period VIIB.2 (C.71.T7.1.1); n, toy wheel (?), clay, Period VB–VA (C.69.T1.1).

Figure 7.19. Beads, vessel fragment, two-hole ornament, tanged obsidian blade, Periods VII–V, IVC, IVB. a, bead, red-and-white stone, Period IVB (XBE.73.T1.1); b, bead, turquoise, Period N-VA.2 (XCE.73.T2.2); c, vessel fragment, diatomaceous limestone, Period N-VA.2 (XCE.73.T2.2); d, bead, turquoise, Period IVC (XBE.73.9); e, two-hole ornament, mother-of-pearl, Period VIIB.2 (C.73.T1.1); f, tanged point, obsidian, Period VIIB.6–3 (C.73.T1.6).

Period	*Number*
VIIB.6	1
VIIB.4	1
VIIB.2	2
VIIA	1
N-VII, VB	1
VIB.2	4
VIB.1	1
VC	5
VA.2	2
Indeterminable	1

These stone balls/pellets cluster into two size ranges. Stone pellets range from 0.7 to 1.2 cm (five examples), and stone balls range from 2.5 to 3.5 cm in diameter (12 examples), with the one other example being 2 cm in diameter.

Unfired clay balls/pellets are the most common category (25 examples) and have a much more distinct chronological patterning. Twenty-two of the 25 examples come from VIA or earlier.

Period	*Number*
VIIB.4	1
VIIB.2	7
VIIB.1	1
VIIA	5
N-VII, VB	2
VIIA–VIA	2
VIB.2	1
VIB.1	1
VIA	2
VB	2
VA.1	1

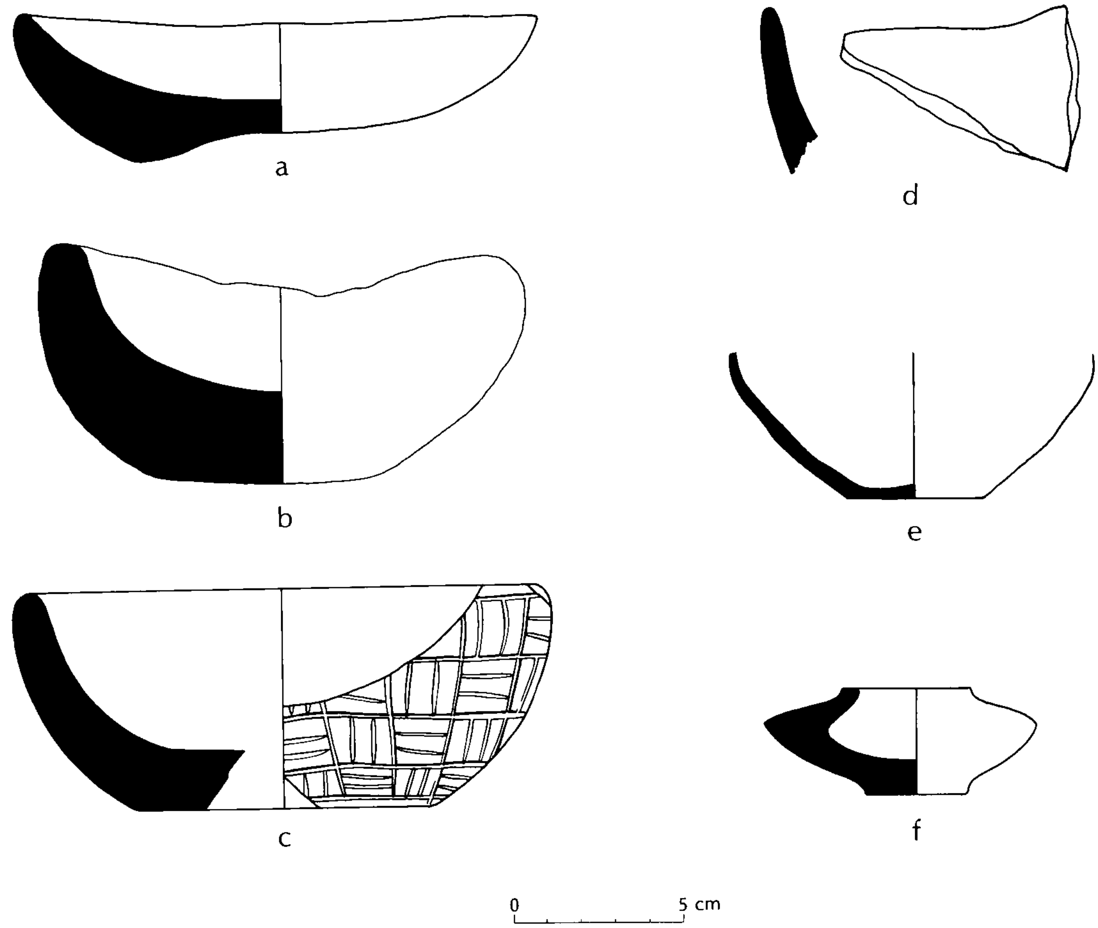


Figure 7.20. Chlorite vessels. a, Period VIIB.2 (C.71.T6.1.2); b, Period N-VII (XC.71.T1.9.41); c, incised decoration, Period VIIB.2–VIIA (CDE.73.4); d, Period VA.2 (B.73.4); e, Period VIA (BW.73.T1.2); f, Period VA.2 (B.73.4.1).

These unfired clay balls/pellets also cluster roughly into two size ranges. Clay pellets range from 0.7 to 1.3 cm (8 examples), and clay balls range from 2 to 3.5 cm (12 examples). The remaining four examples are from 1.5 to 1.7 cm, and two of them come from the north side of the mound. If one breaks the examples down into the different phases, the two size groupings are more distinct.

Lightly fired clay balls/pellets comprise the third category (22 examples) and have a chronological patterning complementary to unfired clay balls/pellets. Eighteen out of the 22 examples come from VC or later:

Period	*Number*
VIIB.2	1
VIIA	2
VIB.2–VC	3
VC	5
VB	5
N-VB	1
VA.2	2
VA.1	2
Indeterminable	1

Once again sizes cluster fairly precisely into two ranges. Clay pellets range from 1.1 to 1.4 cm (seven examples), and clay balls range from 2.3 to 3 cm in diameter (nine examples). Of the three remaining examples, two are from VIIA and are 1.8 cm each, and one is only 0.5 cm.

Schmandt-Besserat (1977:24, chart 7) has interpreted these spherical objects as counting devices, with pellets representing the number "10" and larger spheres representing the number "3,600." Although there *are* two distinct size groupings at Yahya, it seems unlikely that the larger ones stand for a number as large as 3,600, especially since they are more numerous than the smaller spheres. The most likely explanation would seem to be that these spheres are counting devices, but represent numbers or a number system somewhat different than that which appears with the first bullae and first pictographic tablets.

Figure 7.21. Chlorite bowls, Period VIIB.2 (C.71.T6.1.2).

Figure 7.22. Left, chlorite vessel handle, Period N-VII (XCE.73.T1.11); right, chlorite bowl with incised line decoration, Period VIIB.2–VIIA (CDE.73.4).

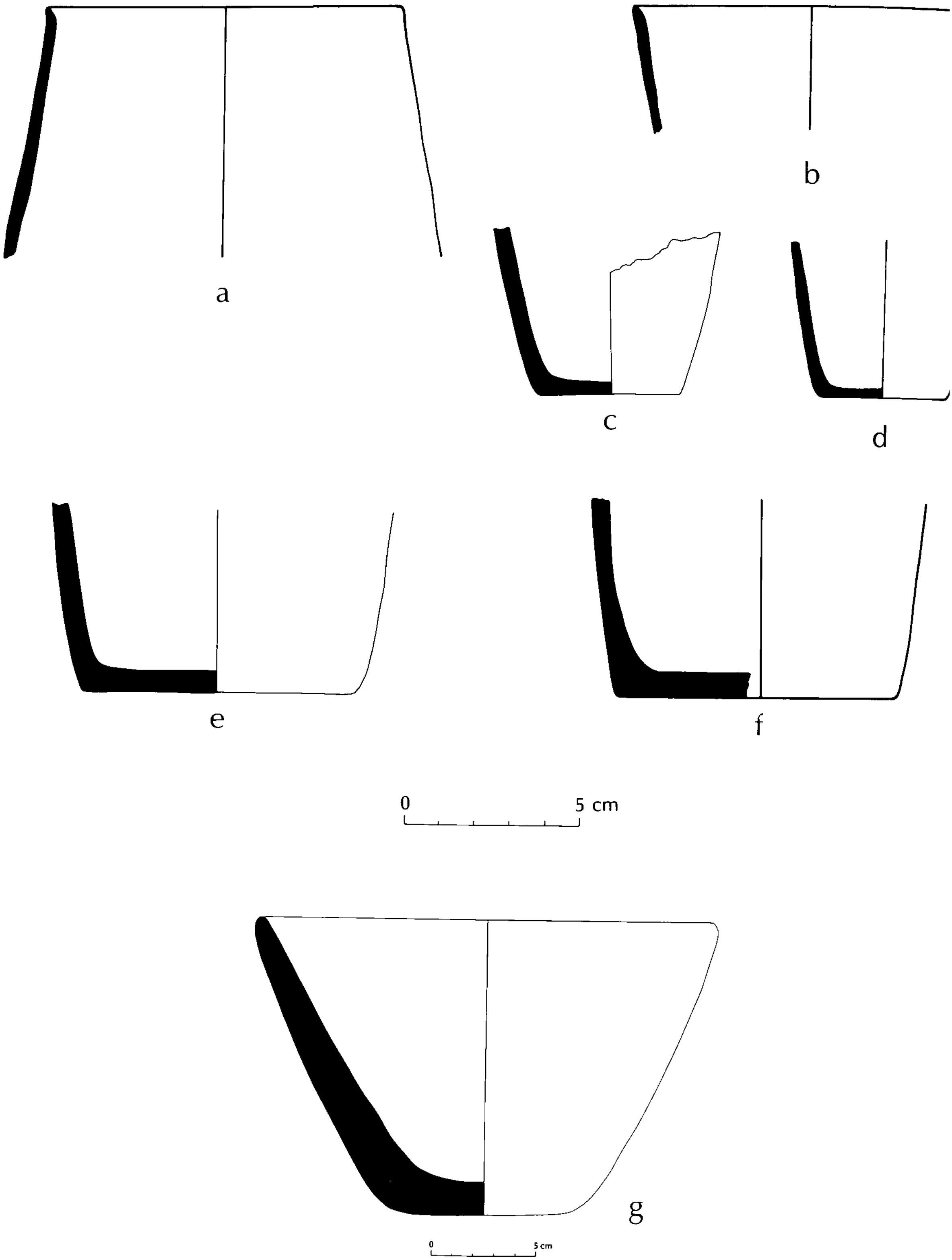


Figure 7.23. Marble, calcite, and limestone vessels. a, limestone, Period N-VA.2 (XCE.73.T2.1); b, marble, Period N-VA.2 (XCE.73.T1.1.1); c, marble, Period VC (D.68.T2); d, limestone, Period VB (C.69.1.2-3); e, limestone, Period VA.1 (C.68.T7.1.2); f, marble/alabaster, Period VC–IVC (BW.69.T5.10); g, marble, Period N-VA.2 (XCE.73.T1.2).

Figure 7.24. Chlorite bowls. Left, Period VA.2 (B.73.4.1); right, Period VB (B.73.5).

Geographical Distribution: Found on virtually every early Near Eastern site, including Iblis (Caldwell 1967:204), and at Ali Kosh and Tepe Sabz in stone (Hole, Flannery, and Neely 1969:200) and clay (ibid.:230).

Cones

Sample: 19

Material: Unfired clay, lightly fired clay, chlorite.

Description: These simple cone-shaped objects are found throughout the Period VII–V sequence (fig. 7.18:h, i). Schmandt-Besserat (1977: chart 7) has interpreted cones such as these as counting devices, with each cone representing "1." Eighteen of the 19 Yahya examples are of unfired clay or lightly fired clay; only one, from the very latest levels (VA.1), is of chlorite. The clay cones are fairly equally distributed among all the periods. Unfired clay cones are found primarily in Periods VII and VI (five out of seven), lightly fired clay cones primarily in Period V (eight out of 11). An even better chronological marker seems to be the base diameters of the cones, whether fired or unfired. The diameters appear to increase through time: six out of the seven examples from Period VII have diameters between 1.1 and 1.6 cm; the examples from VIB.2 and VC are 1.8 cm in diameter; and the nine examples from VB and VA range from 2 to 4 cm in diameter. Schmandt-Besserat has noted this distinction in cone sizes and base diameters, but sees it as a functional differentiation, with the smaller cones standing for the number "1" and the larger cones for the number "60" (1977:26, chart 7). While this may be true of later bullae from Susa, it would appear from the Yahya evidence that for earlier periods differences in cone sizes (or at least base diameters) represent chronological rather than functional differences.

Chronological Distribution:

Period	*Number and Material*
VIIC.2	1 clay
VIIC.2–1	1 clay
VIIB.5–3	4 clay
VIIB.2	1 clay
VIB.2–1	1 clay
VC	1 clay
VB	6 clay
VA.1	3 clay 1 chlorite

Geographical Distribution: Found on early sites throughout the Near East. Schmandt-Besserat (1977:12) cites 27 different sites with cones, including Iblis, Ganj Dareh, and Hajji Firuz. Curiously enough, cones are rare at Iblis (there is one example from early Iblis I; Caldwell 1967:302, no. 8) and are not reported at all at Sialk, Ali Kosh, or Tepe Sabz.

Clay Pyramid

Sample: 1

Material: Unfired clay.

Description and Context: The function of this artifact (fig. 7.18:j) is not clear: it may be an unfinished bead/pendant or perhaps a counting device. The confusion arises from the two punched holes on opposite sides of the pyramid near the top (the holes do not perforate the pyramid). These may represent unfinished holes that were meant for suspension, which would imply a function as a bead/pendant. On the other hand, this object could have been a counting device, with the punched holes having a special numerical significance. Many of the cones cited by Schmandt-Besserat have a punched hole at their tip or along the side; she interprets these as representations of a large number such as "600" (Schmandt-Besserat 1977:chart 7). The Yahya example was found in the ashy fill of a shallow pit just to the north of a Period VIB.2 domestic complex (fig. 6.15).

Geographical Distribution: A somewhat taller truncated clay pyramid was recovered from an early Iblis I context (Caldwell 1967:302, no. 8). Schmandt-Besserat (1977:16) also notes truncated clay pyramids at Bakun and Ganj Dareh.

Discs

Sample: 32

Material: Unfired clay, lightly fired clay, recut ceramic sherds, chlorite, unidentified stone.

Description: These discs range in diameter from 1.7 to 8.3 cm, with no evident clustering around any particular size or sizes. What their function was is unclear. It can be noted, however, that they were made only from the most easily available materials. Schmandt-Besserat has interpreted these widely found disc shapes as counting devices or as part of an early recording system (Schmandt-Besserat 1977:11), although the discs she cites are of molded clay and average only 1.5 cm in diameter.

Chronological Distribution: Discs are common in each of the periods, and there is no clear preference for one material over another in any period:

Period	*Number and Material*
VIIC.2–VIIB.3	1 chlorite
VIIB.2	1 lightly fired clay
VIIA	1 unidentified stone
VIB.2	1 unidentified stone 4 unfired clay
VIB.1	1 unfired clay 1 unidentified stone
VIA	1 lightly fired clay 1 unidentified stone
VC	5 recut sherds
VC–VA	1 unfired clay
VB	1 unidentified stone
N-VII, VB	1 chlorite
N-VB–VA	1 unidentified stone
N-VA.4	2 chlorite 1 recut sherd
N-VA.2	1 recut sherd 1 chlorite
N-VA	1 chlorite
VA.1	4 recut sherds
Indeterminable	1 unidentified stone

Geographical Distribution: Sherd discs and clay discs are common on many early Near Eastern sites.

Clay Pegs or Cylinders

Sample: 3

Material: Unfired clay and lightly fired clay.

Description: The function of these small, cylindrically shaped objects (fig. 7.18:g) is not known. None was found in situ on or close to a floor or surface in a context that might give some indication of function. Possibly these cylinders served as a semiabstract representation of some commodity. Schmandt-Besserat (1977:chart 7) has suggested that these "rods" represent the commodity "wood." The lengths of the Yahya examples range from 2.9 to 4.5 cm, and their diameters from 0.7 to 1.8 cm.

Chronological Distribution: These occur only in Periods VIIB and VIIA.

Period	*Number and Material*
VIIB.5–3	1 lightly fired clay
VIIB.1	1 unfired clay
VIIA	1 unfired clay (fig. 7.18:g)

Geographical Distribution: "Rods" are noted by Schmandt-Besserat (1977:17) at Ganj Dareh and at Tell Abu Hureyra, although the Yahya examples do not have sharp ends, as do the examples she cites. Slightly differently shaped varieties of clay cylinders appear in large numbers in Ali Kosh in the Bus Mordeh and Ali Kosh phases (Hole, Flannery, and Neely 1969:227–231) and in rare quantities in Iblis I (Caldwell 1967:218, nos. 3–4).

Lenticular-Shaped Object or "Sling Missile"

Sample: 1

Material: Lightly fired clay.

Description: Although this type of artifact is commonly referred to as a "sling missile," it is not clear that this was its function. The sole example from Yahya Periods VII–V is 3.3 cm long, with a maximum diameter of 2.8 cm.

Context: Found in ashy fill in good VA.1 context.

Geographical Distribution: Found on many sites on the Iranian plateau, Khuzistan, and Mesopotamia; for example, at Sialk I–II (Ghirshman 1938:pl. LII:35–36), Iblis I (Caldwell 1967:218, no. 6) and Tepe Sabz, Khazineh and Bayat phases (Hole, Flannery, and Neely 1969:213).

MISCELLANEOUS ARTIFACT TYPES (Figurines, "Toy Wheels," Copper Ingots, Debitage)

Human Figurines, Animal Figurines

Sample: 22

Material: Chlorite, marble or alabaster, unidentified stone, lightly fired clay, unfired clay.

Description, Context, and Chronological Distribution: The Yahya figurines can be divided for descriptive purposes into two distinct groups: carved stone and modeled clay.

CARVED STONE FIGURINES (FIVE EXAMPLES)

Period	*Number, Material, and Shape*
VIIB.4	1 chlorite human female figurine
N-VII, VB	1 chlorite human head 1 marble or alabaster ram
N-VA.4–3	1 unidentified stone sheep's head
N-VA.1	1 limestone ram's head

Four of these examples are among the finest pieces recovered from Periods VII–V and represent a level of craftsmanship for carving in the round virtually unparalleled in this era on the Iranian plateau. The female figurine (figs. 7.25–7.28) was found resting on a bed of chlorite, bone, and flint tools in the corner of one of the VIIB.4 rooms (fig. 6.26:Room 20; fig. 7.29). Its unusual form—long, thin, almost phallic-shaped—finds no ready parallels on other Iranian or Mesopotamian sites, with the possible exception of the much smaller Sialk I figurine carved from bone (Ghirshman 1938:pl. VII). This figurine was first described in detail by Lamberg-Karlovsky and Meadow (1970). The human head of chlorite from a mixed N-VII, VB level, with its long, straight nose, overhanging eyebrows, drilled eyes, and incised line decoration, bears a strong resemblance stylistically to the female figurine and thus probably should be attributed to Period N-VII as well (figs. 7.30:c, 7.31, 7.32). The ram's head from N-VA.1 (fig. 7.33) and the complete ram from a mixed N-VII, VB level (fig. 7.34) are similar to one another in the simplicity of their modeling (fig. 7.30:b). The graceful sweep of the horns is the only emphasized feature on either one. The N-VA.1 ram's head was found close to the floor in the main room of the N-VA.1 house (fig. 6.36).

MODELED CLAY FIGURINES (17 EXAMPLES)

Period	*Number, Material, and Shape*
N-VII	1 unfired clay human head
VIIB.5–3	1 lightly fired clay; possibly anthropomorphic 1 lightly fired clay; indeterminate form
VIB.2	1 unfired clay; indeterminate form
VIB.1	1 unfired clay dog
VIA	3 unfired clay; indeterminate form 2 unfired clay sheep/goat; fig. 7.30:d
VC	1 unfired clay sheep/goat; fig. 7.35
N-VII, VB	1 lightly fired clay humped bull
VB–VA.2–1	1 lightly fired clay sheep/goat's head
N-VA.1	1 lightly fired clay; possibly anthropomorphic
Indeterminable, possibly N-VII, VB	1 lightly fired clay human head 1 unfired clay; indeterminate form
Intrusive IVB.2 pit	1 lightly fired clay pig or boar

The finest example among the clay figurines is the humped bull illustrated in figure 7.35. Although the context in which it was found was not well sealed, this figurine probably dates to Period N-VII, VB. The modeling of the short, stubby legs is strongly reminiscent of the modeling in stone of the alabaster ram (fig. 7.34), also from Period N-VII, VB. With the exception of the humped bull, most of the clay figurines are not very carefully modeled (fig. 7.30:d), and all except the humped bull and the Period VC sheep/goat are quite small (no dimension exceeding 8 cm).

When both the clay and stone figurines are examined as a single group, two interesting facts stand out. First, figurines of cattle are notably rare. Second, there are anthropomorphic figurines only in Period VII. If anthropomorphic figurines are in some way related to religious beliefs or practices, then the absence of such figurines in any good context after Period VII possibly may imply a shift in these beliefs and practices in Periods VI and V.

Geographical Distribution: The possible parallel for the female figurine has already been cited above. In addition, Ruth Amiran (1973:184) has suggested parallels with figurines from Chalcolithic Palestine. The carved stone rams are unparalleled for this time period, although again Amiran (1976:157–159) has pointed out similarities between the Yahya rams and carved stone rams from Chalcolithic Palestine. Clay animal figurines are common in Sialk I–III

Figure 7.25. Female figurine of chlorite, Period VIIB.4, frontal view (D.68.6.7).

Figure 7.26. Female figurine of chlorite, Period VIIB.4, side view (D.68.6.7).

Figure 7.27. Female figurine of chlorite, Period VIIB.4, rear view (D.68.6.7).

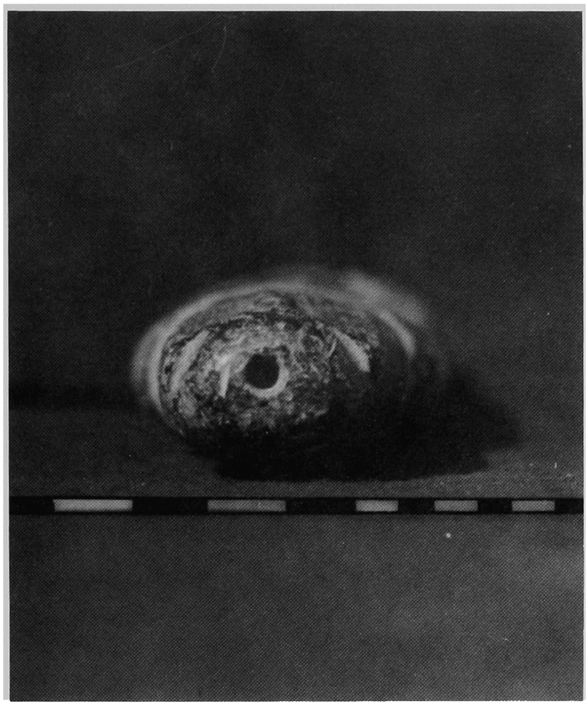


Figure 7.28. Female figurine of chlorite, Period VIIB.4, top view (D.68.6.7).

(Ghirshman 1938:pl. LIII, LXXXV), Iblis I and II (Caldwell 1967:161,163,204), and at Ali Kosh (Hole, Flannery, and Neely 1969:224–225).

"Toy Wheels"

Sample: 2

Material: Unfired clay and lightly fired clay.

Description: These objects are disc-shaped in plan and roughly lenticular when viewed in profile, with a markedly greater thickness around the "hubs." The function of these clay objects is unclear. It is possible that the example from VA.2–1 is a spindle whorl, for it is perforated by a hole through its center. The other similarly shaped example, however, has such a small perforation that it is unlikely to have been a spindle whorl (fig. 7.18:n). Both "wheels" are approximately 4 cm in diameter, and the example from VB has a maximum thickness of 1.4 cm. The VB example was found resting directly on the surface of the courtyard north of the VB domestic structure (fig. 6.26).

Chronological Distribution: These occur only in Periods VB and VA.

Period	*Number and Material*
VB	1 lightly fired clay
VB–VA	1 unfired clay

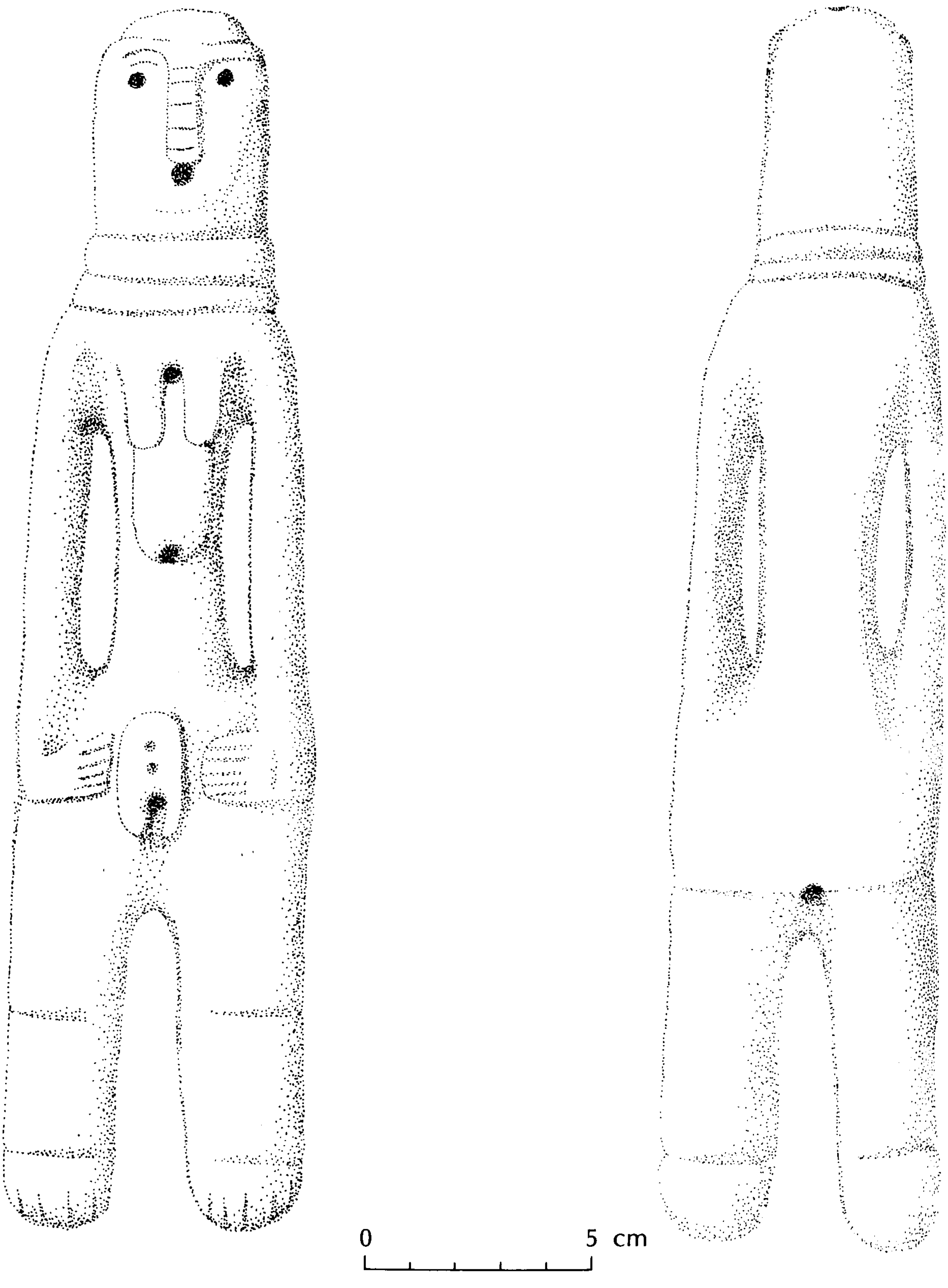


Figure 7.29. Female figurine of chlorite, Period VIIB.4, front and back views (D.68.6.7).

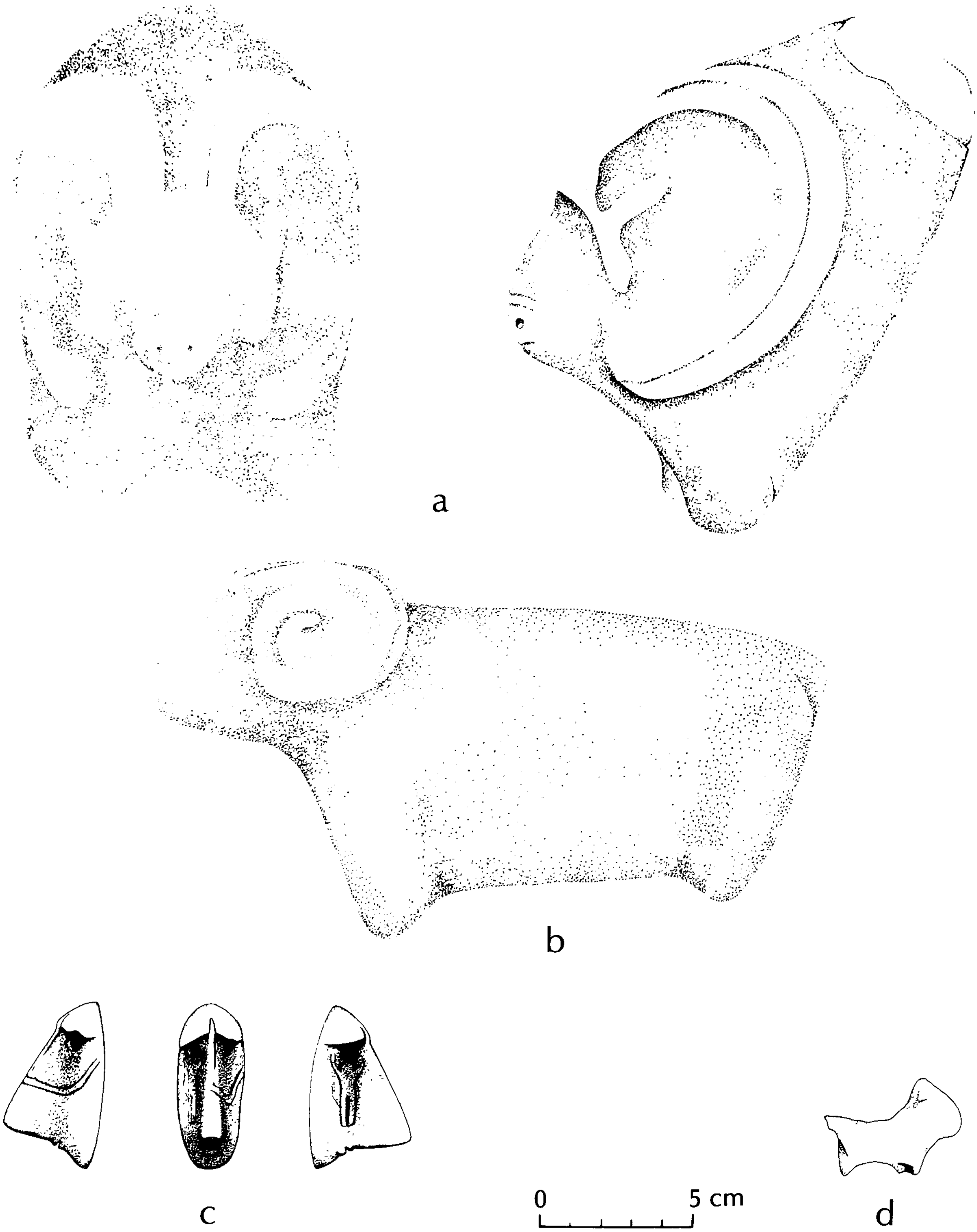


Figure 7.30. Animal figurines and human head of chlorite with incised decoration. a, ram's head, limestone, Period N-VA.1 (XCE.71.14.30); b, ram, marble or alabaster, Period N-VII, VB (XD.70.T1.2-4); c, human head with incised decoration, chlorite, Period N-VII, VB (XCE.73.T1.9); d, sheep figurine, unfired clay, Period VIA (CW.73.T3.1).

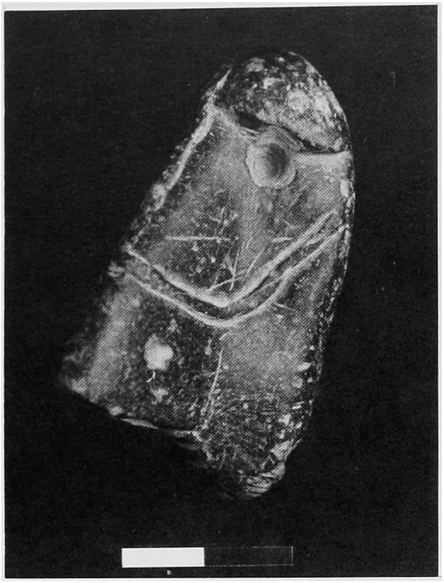


Figure 7.31. Human head of chlorite, Period N-VII, VB, view form the left (XCE.73.T1.9).

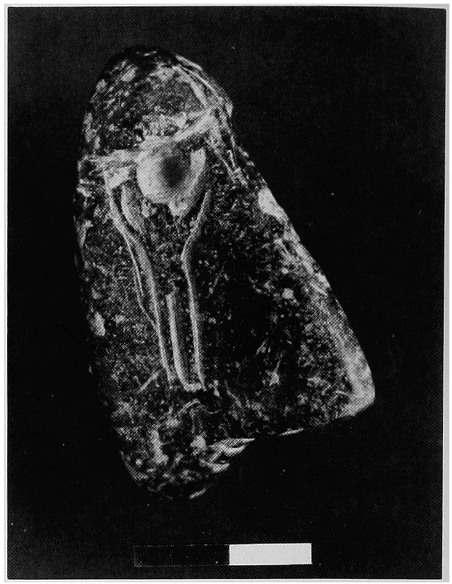


Figure 7.32. Human head of chlorite, Period N-VII, VB, view from the right (XCE.73.T1.9).

Figure 7.33. Ram's head of limestone, Period N-VA.1 (XCE.71.14.30).

Figure 7.34. Ram of marble or alabaster, Period N-VII, VB (XD.70.T1.2-4).

Figure 7.35. Clay figurine of humped bull, Period N-VII, VB (XD.70.T2.3).

Geographical Distribution: Clay objects of this general shape are found on numerous sites in Mesopotamia, Khuzistan, and the Iranian plateau and are usually interpreted as spindle whorls. Some of the closer examples are at Tepe Sialk in Period II.2 (Ghirshman 1938:pl. LII, no. 9), Iblis I (Caldwell 1967:218, no. 7), and in the Mehmeh and Bayat phases at Tepe Sabz (Hole, Flannery, and Neely 1969:209).

Copper Ingot

Sample: 1

Material: Copper.

Description: This ingot measured 6.2 × 5 × 4 cm. Its presence in N-VA.4 indicates clearly the use of produced metal rather than native copper in this period (cf. Heskel and Lamberg-Karlovsky 1980). Its presence also implies that copper was being imported as a raw material in this period and then made into objects locally, using a distinctive local technology (Heskel and Lamberg-Karlovsky 1980).

Context: Found less than 10 cm above an outside surface in a good N-VA.4 context on the north side of the mound (fig. 6.33).

Debitage

Sample: 36

Material: Mother-of-pearl, chlorite, rock crystal, unidentified stone, intrusive iron.

Description and Context: Included in this category are small pieces and fragments of various materials that show no evidence of being from a finished object and probably were debitage from the production of objects in these materials. Virtually all the debitage recovered was either chlorite or mother-of-pearl. Three of the five concentrations of chlorite debitage come from VA.2–1 levels in Trench B. This area is not near any identifiable domestic structures (domestic structures for these phases are found only on the north side of the mound) and may represent an outside production area for chlorite objects (probably bowls). Although no half-finished chlorite bowls were found in this area, bowls constitute the most common chlorite artifact type in this period and on this part of the site.

The mother-of-pearl debitage is more difficult to interpret. Twenty-seven of the 39 pieces of mother-of-pearl found in Periods VII–V fall under this "debitage" category. The pieces were counted individually, which may have skewed the overall numbers on the high side. Individual pieces, when found in isolation, may not represent debitage at all, but merely unidentifiable, small fragments from a finished object. Even when several pieces are found near each other, as is the case in VB, they may represent just one or two objects that were badly crushed and then scattered over the area. In any case, if one includes the pieces of mother-of-pearl "debitage" with the pieces of identifiable mother-of-pearl artifacts, then this material appears to be equally common throughout Periods VII, VI, and V, even though most of the identifiable finished objects of mother-of-pearl come from Periods VII and VI (and 24 of the 27 pieces of "debitage" come from Periods VI and V).

NOTE: TEXTILE IMPRESSION FROM TEPE LANGAR

James M. Adovasio,
Department of Anthropology, University of Pittsburgh

C. C. Lamberg-Karlovsky,
Department of Anthropology, Harvard University

In our 1967 archaeological survey we located a small mound, Tepe Langar, 35 km southeast of Kerman. The mound was littered with chaff-tempered coarse ware of the type characteristic of Tepe Yahya Period VI. We undertook a small 2- × -2 m test square, and at a depth of 1.85 m we recovered a human burial. The excavations uncovered numerous surfaces, no architecture, and a consistent chaff-tempered coarse ware. The burial was of a female, between 15 and 20 years old and 162.5 cm in height (our thanks to Dr. W. W. Howells for this information). Around the pelvis area of the burial we recovered excellently preserved impressions of textile. A single technique is represented on the impressions. The technique is known as simple over-and-under-one weaving and was used here to produce fabric rather than matting (fig. 7.36). The cloth has 40 warps and wefts per square cm and is remarkably well made. The fineness of execution argues for a stationary loom. No decoration is visible nor is any of the cloth preserved. A simple broken open bowl (similar to those of fig. 4.4) accompanied the burial. Charcoal collected provided a date (WSU 671) of 6050 ± 270 B.P. or 4282 ± 280 b.c. (5730 half-life, uncalibrated).

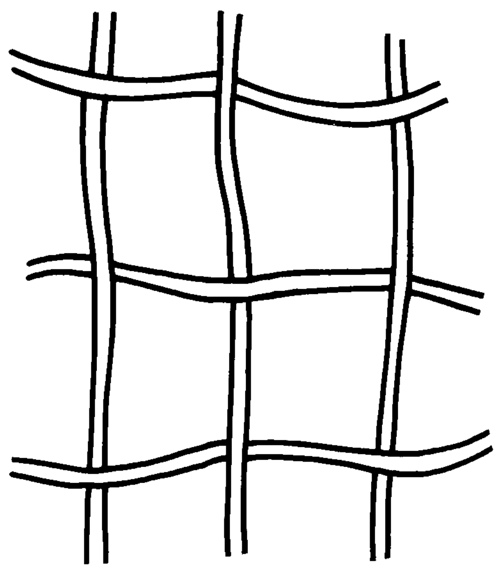


Figure 7.36. Weaving pattern of preserved textile impres

Chapter 8

Metallurgical Technology

Dennis Heskel

Department of Anthropology, University of Utah

C. C. Lamberg-Karlovsky

Department of Anthropology, Harvard University

Metallographic analysis has had an unfortunately limited role in the examination of fourth and third millennia B.C. Iranian metal artifacts. Although many studies were performed as part of diversified site reports (Contenau and Ghirshman 1935; Ghirshman 1939), little use of the analytical information was applied to understanding the cultural history of the individual sites or to presenting a regional framework of technological development.

The use of metallographic analysis on fourth and third millennia Iranian metal artifacts was pioneered by Mlle. Halm in the excavation reports of Tepe Giyan (Contenau and Ghirshman 1935) and Tepe Sialk (Ghirshman 1939). Halm analyzed some selected objects from both sites. Two pieces were examined from Tepe Giyan: a square section tool, 5 cm in length, from Couche V and a sheet metal cone with three pierced holes from Couche III.

The sheet metal cone piece is a copper-nickel alloy with 1.35 percent Ni. The nickel is in solid solution with the copper. This piece was hammered and annealed. It has copper carbonate and chloride corrosion products (Contenau and Ghirshman 1935:137).

A tool with square cross section is also copper-nickel alloy with 1 percent Ni. It is covered with copper carbonate corrosion. The nickel is not in solid solution with the copper. The hammering of the piece has distorted the as-cast structure (ibid.:137–138).

Halm also examined four objects from the early levels at Sialk. The head of a pin from Tepe Sialk I is very pure and is probably native copper. It has the common corrosion products.

A fragment of mineral from Sialk II was shown to be chalcopyrite with impurities of tin, zinc, and silver. It is not likely that this sample was to have been used as an ore.

Three boulets from a habitation area of Sialk II (about 4500–4000 B.C.) were also examined (Ghirshman 1939: 206). They are roughly spherical, made of meteoritic iron, and are the earliest such pieces known in Iran.

A needle from Sialk III-5 (approximately 3200 B.C.) was very corroded and impossible to examine metallographically. It has the common copper oxide and carbonate corrosion products. It contained about 2.5 percent tin, which makes it one of the earliest tin bronzes known in Iran (ibid.).

Voce examined six artifacts from the fourth and third millennia levels of Geoy Tepe (Burton-Brown 1951:179ff). Metallographic analysis of a small splashing of metal (1209 from Period M) was impossible because of the high degree of corrosion present. There was some "indication, however, that the structure was similar to that of object 1210" (ibid.). Object 1209 was made of pure copper with copper oxide and carbonate corrosion present. The corrosion outlined the grain boundaries.

A shapeless, heavily corroded piece (1210) had copper oxide inclusions indicating that it had been melted. There was no coring, and the analysis indicates that this is a pure copper. The piece was very porous and contained some adhering slag. Voce (Burton-Brown 1951:180) felt that this "may have been the direct product of a primitive smelting process."

Several pieces from Period K were also examined by Voce: ring 1201, ring 1203, pin 1204, and pin 1205. Ring 1201 was made of a copper–1 percent arsenic alloy. It has copper oxide inclusions but not in an eutectic pattern. It appears to have been hammered and annealed, but Voce feels it may have had extensive hot working.

Ring 1203 is made of pure copper metal with moderate-sized spherical copper oxide inclusions. It was hammered and annealed and left in an annealed condition. It is heavily corroded and contains a thick surface layer of cuprous oxide and green salts. It has extensive intergranular corrosion.

Pin 1204 is also severely corroded with copper chloride products. It was made of pure copper and has been annealed. Pin 1205 is also made of pure copper and is totally corroded. It was manufactured from a piece of triangular sheet metal and rolled into a tube.

Cyril Stanley Smith (Goff 1964) analyzed two objects from Tal-i Nokhodi dated to the fourth millennium: a pin and a square bar. The pin was cast. The square bar has "the remains of a cast structure (ibid.:49), but the piece has been hot worked or cold worked and annealed to reduce it by four or five times to the present section.

Smith also examined a copper bead from Ali Kosh metallographically. This bead is the earliest known copper object from Iran and is dated to approximately 6500 B.C. It was manufactured from a piece of native copper flattened by hammering and then rolled up into a bead. It was totally corroded with no trace of metal remaining. The corrosion products are the usual malachite and cuprite minerals. It is thought that the metal used to produce the bead was cut from a flattened sheet with a chisel and was originally 0.4 cm thick (Hole, Flannery, and Neeley 1969:427–428). No metallic structures remain.

The earliest known piece of relatively uncorroded copper in Iran that has been examined metallographically comes from Sialk I-4 and was analyzed by Smith (1965). It is a piece of heavily cold-worked native copper that has not been annealed. The structure is an interesting one and consists of "fragments of the large crystals in the original copper broken up by numerous intersecting deformation bands and slip bands, and no grain boundaries are visible" (ibid.:239). The structure and composition of this piece are very similar to a piece of native copper from the Talmessi mine that was hammered in an experiment.

Although the Tal-i Iblis project (Caldwell 1967) held promise for a complete and valuable study of the metallurgical industry, no metallographic work has been done on the objects recovered. Valuable data on mines, smelting centers, etc., have been recovered, but little analytical data and correlation to the archaeological material has been detailed.

Hauptmann (1980) examined a number of slag and ore samples from Shahr-i Sokhta using metallographic and chemical analyses. He identified the use of chalcocite, covellite, and chalcopyrite ores at Shahr-i Sokhta. Analysis of the slags indicated that the firing temperature of the furnace for producing copper ranged from 1,245–1,450° C.

It is obvious that while all the metallographic examinations mentioned above produced informative technological data, none provided a well-rounded picture of the metallurgical industry and its development or any correlation between the development and use of technology diachronically and synchronically in Iran and the development and changes of other political-socioeconomic aspects of society.

In a more recent and sophisticated research project, Berthoud and Françaix (1980) used spectroscopy to examine 179 metal objects from Susa, Tepe Sialk, and Tepe Giyan. Analyses of the results indicate three distinct compositional groups of metal objects correlate to distinct chronological divisions.

The oldest objects, a total of 67 axes and mirrors from the Necropole at Susa (corresponding to levels 27A–25 in the new excavations) are made of very pure copper with arsenic as the only notable impurity. Berthoud and Françaix (1980:81) state that these objects are made of native copper alloyed naturally or artificially with arsenic.

A second group, dated to the end of the fourth millennium B.C., is also comprised primarily of objects from Susa and consists of 7 mirrors, 2 axes, 20 pins, and 3 hoes. The composition of these objects is characterized as copper with up to 20 percent lead, arsenic at levels on the order of 2–5 percent, and elevated levels of antimony.

The third group consists of 65 objects divided into two subgroups (a and b). Subgroup a consists primarily of objects from protodynastic III at Susa. These objects are primarily made of copper with arsenic content of up to 5 percent. Seven of these objects are bronzes with more than 7 percent tin. The objects of subgroup b are dated to the third millennium B.C. The composition of the objects of this group does not seem to have a consistent pattern.

The results of these spectrographic analyses are valuable both as data and, more importantly, as evidence for changes in the composition of fourth and third millennia B.C. Iranian metal objects. These changes, independently obtained in our work, suggest changes during this period in the knowledge of metallurgy by the ancient smiths and changes in the political and social world of the Bronze Age Iranian societies.

An attempt to examine fully the technological history and development of metal objects from a particular site, region, or general area has not been made previously in the Middle East. The nature and scope of the present research is unique in Iran and hopefully will be informative (for a full discussion, see Heskel 1981).

It is apparent from the results presented here that metallographic studies are a valuable addition to the analysis of metal objects and can provide useful data on the mechanical and thermal history of the objects examined. This is one of the best analytical methods available to provide diachronic and synchronic technological information that can be related to other socioeconomic-technological archaeological data.

The major disadvantages of metallographic analysis, and these are not always crucial concerns, are the need to use destructive sampling techniques and the large amounts of time necessary to choose carefully and prepare the samples for analysis.

The methods used to sample and prepare metallographic samples from Tepe Yahya are those recommended by Kehl (1943) and Rodgers (1964). The heavy corrosion of the objects required that more care be taken in sampling and that smaller, more delicate saw blades and other equipment be used than those recommended by these texts. Careful visual examination and photographs of each object were made preceding any sampling. The standard mounting, grinding, and polishing procedures were followed. Photographs were taken of metallic sections in both the polished and etched conditions. Potassium dichromate etch was found to be the best for bringing out the copper-arsenic phases. Ferric chloride (alcohol) was used to reveal the metallographic structures and grain size. It was found that objects that contain arsenic etched very quickly. The polished metal was the most useful for identifying the copper-arsenic corrosion products, and the etched metal produced evidence for the various copper-arsenic phases.

Thirty-four objects from Periods VII–IVA at Tepe Yahya, not including the four pieces analyzed by Tylecote (see note following this chapter), were metallographically analyzed. These included finished objects, slags, and ores found on the site. This material from Tepe Yahya is particularly important in that it includes the first documented shift from hammering native copper to a full range of techniques used to process metal. It is also important to realize the degree of technological continuity throughout the fourth and third millennia B.C. at Yahya and to correlate the significant changes with those occurring on contemporaneous sites.

The Periods VII through VIB (4900–3800 B.C.) metal corpus consists of two small crude awls (or pins), circular in cross section, a corroded bead (or ring), and four small unidentified fragments. The points of the awls are deformed and flattened. Analysis of one of the awls indicated it was made of native copper. The Period VIA–VC (3800–3700 B.C.) metal corpus consists of four pieces: two pins, a bent sheet metal ring, and a corroded piece of sheet metal. Periods VII–VC contain small utilitarian objects.

Periods VB (3700–3600 B.C.) and VA (3600–3300 B.C.) represent a dramatic change in quantity and quality of metal objects found at Tepe Yahya. Approximately thirty objects have been found in VB–VA contexts, including simple pins, spatulae, a knob-headed pin, tacks, needles, decorated pins, a copper ingot, and waste ore pieces. The objects tend to be tools rather than trinkets. The technology used to produce the artifacts includes a full range of the processes used for the succeeding 2,000 years: cold working, annealing, flat casting, edge hardening, and copper-arsenic alloying. The latter probably resulted from the use of the copper arsenides and cannot be considered intentional alloying, at least in the early periods. These copper arsenides are: algodonite, Cu_{5-8}-AS or 80–87 percent Cu by weight; and domeykite, Cu_3-AS or 72 percent Cu by weight. It is important to note the presence of significant quantities of copper arsenides with copper oxide and copper carbonate ore gossans and with native copper deposits in the Anarak-Talmessi mine region in Iran. This mineral deposit is a rare and unique source, certainly in Iran and probably in the entire Near East. This type of polymetallic deposit, including uranium, cobalt, nickel, zinc, and other elements, is essential to the formation of these arsenides.

There have, unfortunately, been few studies of the physical properties of copper-arsenic alloys. Marechal (1958) compared the hardness of a range of different copper-arsenic alloys to their copper-tin counterparts. His results conclusively indicate that copper-arsenic alloys are at least as hard as copper-tin bronzes with equal percentages of arsenic and tin. Arsenic also acts as a deoxidant when added to copper. This improves the ease of casting objects by reducing formation of gases that result in blowhole formation in the solid metal. These results should help dispel the belief that copper-tin bronzes are metallurgically superior to copper-arsenic alloys and that this supposed superiority was the reason behind the late third millennium shift to tin bronze.

A sample of metal objects from Periods VII–VA was examined by metallographic and semiquantitative emission spectrographic analysis. Tepe Yahya XC.73.3 (fig. 7.11:a) is a small Period VII copper awl (or pin), 5.6 cm in length by a maximum of 0.3 cm in width. Transverse sections from the point and body area were taken for metallographic analysis.

The point is irregularly circular. It has thin surface malachite, chloride, and cuprite layers of corrosion. There is also granular corrosion between the cuprite and the metallic area. The deformation visible in cross section indicates extensive hammering. There are several large and irregular cavities, now filled with cuprite, throughout the section. The metal contains very few impurities and has no copper oxide inclusions.

This section, when etched with potassium dichromate, shows intersecting slip bands with no annealing twins. It is highly deformed native copper with large grain size. The deformation of the grains is parallel to the cavities in the polished section. There are no visible grain boundaries and no evidence to indicate that the piece was ever heat treated.

The body section of the awl (or pin) is roughly circular. It contains no copper oxide inclusions and very few impurities. It has a V-shaped cavity now filled with cuprite. It has the same elongated and highly deformed appearance as the point when etched. The metal has several "white phase" inclusions which may be silver or possibly domeykite. Spectrographic analysis of a similar body section from the same object shows only 0.002 percent silver present as an impurity. A Vickers hardness test of the point indicates little edge hardening and an average hardness of VHN 115.

Tepe Yahya C.70.T5.3.1 (fig. 7.8:c) is a copper bead or ring fragment, 1.1 cm in width, from Period VIB.2. It is totally corroded, with malachite and cuprite layers. It is roughly rectangular in cross section and has rounded corners.

A single Period VC object was analyzed. Tepe Yahya C.69.7.15 (fig. 7.11:b) is a pin, circular in cross section. The point is sharp and slightly deformed. It is 4.3 cm in length by 0.3 cm in maximum diameter. Two transverse sections were taken, one from the point area and the other from the body section.

The section of the point area is deformed by cold hammering. The hammering of the metal to form the object created a cavity where the metal was not totally joined. The metallic area is very pure with no copper oxide inclusions. Spectrographic analysis of a sample from this artifact indicates only 0.002 percent Ag as an impurity. The section has the usual copper corrosion products. The body section of the pin is less deformed than the point. It is also very pure copper and lacks copper oxide inclusions.

Both sections, when etched with potassium dichromate, exhibit the same elongated and deformed copper grain structure as the Period VII awl. This object was never heat treated and is made from native copper.

Period VB–VA represents a fluorescence of technological innovations at Tepe Yahya. The Period VB knob-headed pin, XC.71.8B.40 (fig. 7.11:c), indicates a different production technique. The point of this pin is broken off. The piece is circular in cross section, and the knob head has been extensively worked. Two sections were examined from this piece: a transverse body section and a longitudinal knob head section.

The circular cross section body sample has common copper corrosion products. The metal is pale in color and there are grey-blue non–copper oxide inclusions present. Spectrographic analysis indicates that this is a pure copper with only 0.002 percent Ag as an impurity. It has definitely been cast and subsequently worked and heat treated.

The longitudinal knob head section is roughly pentagonal. The top and corner areas show some deformation. The flow lines and slip bands, which appear upon etching, indicate that the knob head was hammered into its present shape almost entirely from the cast rod that constitutes the body of the pin. The piece was also annealed but not after its last cold working.

The body section has large equiaxed grains with numerous slip bands and twins when etched. It was also worked after the last anneal. Flow lines indicate hammering perpendicular to the long axis of the pin, which resulted in the circular cross section. A Vickers hardness test of the knob head indicates some edge hardening and a very high average VHN of 185.

Copper pin XCE.73.T2.3 of Period VA (fig. 7.11:e) is 8.1 cm long × 0.3 cm wide. It has some light grey resin, probably used as hafting material, attached to the upper body on all sides. The pin is rectangular in cross section until 2.8 cm above the point, where the metal has been hammered into a circular shape.

A longitudinal section of the point area has common copper corrosion products. The point is narrow but deformed. There are a number of large spherical copper oxide inclusions with no apparent directionality. The metal has a reddish hue. The section when etched has very small grains, annealing twins, and a few slip bands. Spectrographic analysis reveals only 0.04 percent Ag as an impurity. A Vickers hardness test on the point area indicated no edge hardening and an average VHN of 120.

A transverse section at the opposite end of the pin is rectangular in cross section with rounded corners. There are several small cavities along the surface. The copper oxide inclusions are not distorted. The etched section has very small equiaxed grains, slip bands, and twins. This pin was cast into a rod and then hammered and annealed into its final shape.

Copper pin C.69.S.8 (figs. 7.11:d and 7.9:i) is circular in cross section with a rounded, blunt, and deformed point. Dating from Period VC–VA, it is 14 cm in length × 0.6 cm in maximum diameter. The nonpointed end of the pin is rounded, while a transverse section of the point is semicircular. It has the common corrosion products. There are very large, undistorted copper oxide inclusions. The piece appears essentially as cast. The section when etched has twins, small equiaxed grain size, and a few slip bands near the edge. The spectrographic analysis indicates the presence of only 0.008 percent Ag as an impurity.

A transverse section of the end of the pin is circular. There are very large, undistorted copper oxide inclusions. Etching with potassium dichromate and ferric chloride in alcohol reveals twins and some slip bands around the edges of the section. This pin was cast into a rod and hammered and annealed into its final form.

A flat axe, XC.70.T1.7 (fig. 8.1:a), from a Period IVC context (Proto-Elamite), appears to have been cast in a single piece mold. It is 7.7 cm in length × 3.5 cm in width × 0.1 cm in thickness. The blade edge is wide and has rounded corners. A transverse section of the blade edge has the usual copper corrosion products. The edge is rounded, blunt, and undeformed. There are numerous copper oxide inclusions which are elongated parallel to the top and bottom of the axe. The piece was hammered and annealed. The etched section has small equiaxed grains, annealing twins, and slip bands. The edge has not been work hardened. Spectrographic analysis indicates only 0.07 percent Ag as an impurity. This axe was cast and then extensively hammered and annealed.

Copper nail XC.71.T2.2.5 (fig 8.1:b; Period IVC) is 1.6 cm in length × 0.7 cm in diameter at the head × 0.05 cm in diameter at the point. The point is blunt and deformed from use. It has the usual copper corrosion products. This sample has numerous copper oxide inclusions which have been elongated by hammering. These inclusions curve in the direction of the point. Etching reveals annealing twins, slip bands, and medium-sized grains.

A longitudinal section of the nail head shows little distortion and a well-formed shape. It contains numerous very large copper oxide inclusions with no distortion. The nail head surface has several small depressions along its edge. When etched, the section contains numerous twins, no slip bands, and a large grain size. A hardness test across the nail head section indicates a small amount of edge hardening and an average VHN of 100. This nail was cast into shape and slightly retouched by hammering and annealing. It was slowly cooled after the last anneal.

A copper spatula, B.73.2.6 (fig. 8.1:c), from an intrusive pit probably dating to Period IVB (third millennium B.C.), is roughly rectangular in cross section with rounded edges. The tang is tapered and the corners rounded, probably for hafting. It is 7.3 cm in length × 1.6 cm in maximum blade width × 0.3 cm in thickness. The spectrographic analysis of a sample from this piece contains 1.4 percent As, 0.001 percent Ag, and 0.05 percent Ni.

A transverse section of the tang end shows an irregular and distorted edge. A large diagonal cavity in the section indicates that the spatula was cast in a single piece mold and the tang section was hammered into shape. There are a large number of copper oxide inclusions which are elongated in the same direction as the cavity. The etched section reveals the presence of a highly cored cast structure heavily deformed from working. There are a large number of slip bands and very small grains.

A transverse section of the spatula blade reveals a rounded, blunt, and deformed edge. There is intergranular corrosion

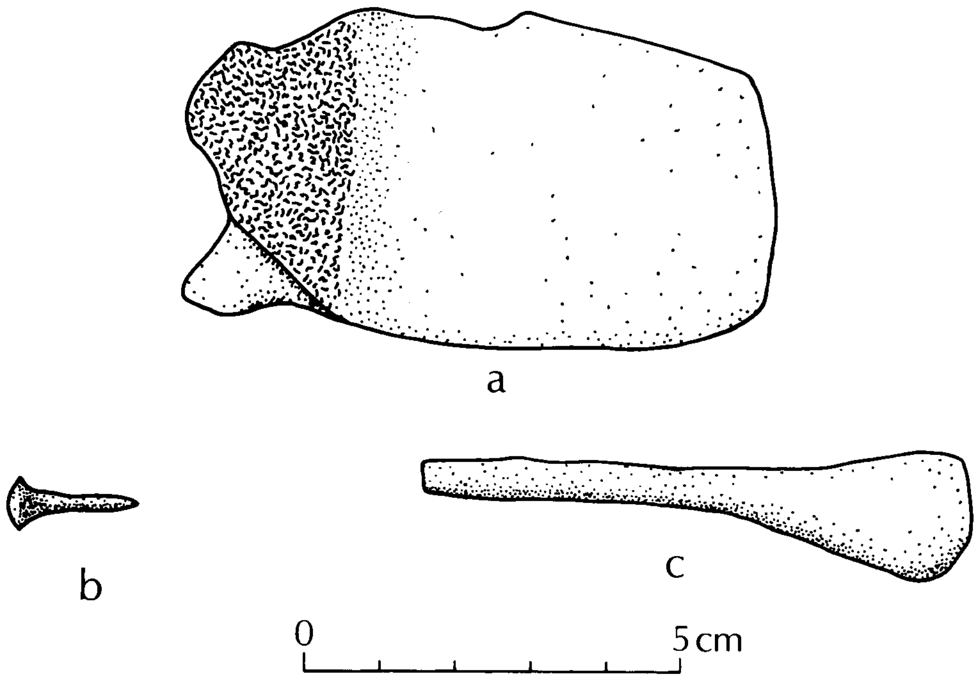


Figure 8.1. Copper-arsenic artifacts. a, axe fragment, Period IVC (XC.70.T1.7); b, nail, Period IVC (XC.71.T2.2.5); c, chisel, Period IVB (B.73.2.6).

present, particularly at the blade edge. The metal is pale in color, probably from the presence of the arsenic in the object. The numerous copper oxide inclusions are elongated and broken up, indicating a number of cold-working and annealing sequences. Etching shows the extensive deformation of the copper–copper arsenic phases. There are many slip bands and a medium grain size.

Two ore samples were also examined: XBE.73.14 and XBE.73.9A (Period VA). Both ore pieces were partially shaped by hammering, but they were not used for smelting. As determined by spectrographic analysis, they are complex sulfide ores containing chalcopyrite, pyrite, covellite, iron oxide, and chalcocite. The ore is consistent as an apparent native copper and copper oxide and carbonate as revealed by the objects' impurity patterns. A large copper ingot (XCE.73.T1.5), 6.3 cm × 5 cm × 4 cm, was also found in a Period VA context. This object was retained by the Iran-Bastan Museum, Teheran, and was not analyzed. It indicates the use of produced metal rather than only native copper by Period VA times.

The early fourth millennium sequence at Yahya is extremely important for detailing the development of metallurgy at the site. It is during this period that the shift takes place from hammering native copper to casting, hammering, and annealing native copper and the copper arsenides, and that the production of copper by smelting ores first occurs.

There is also extensive use of natural copper-arsenic minerals—algodonite and domeykite—in the production of metal objects at several sites. It is important to add that the Anarak-Talmessi mine region, located 90 km east of Tepe Sialk, is one of the few deposits in the world and the only one in the Near East to contain a significant amount of domeykite (Cu_3As) and algodonite (Cu_5As) close to the surface and included in copper oxide and carbonate ore gossans (*Geological Survey of Iran* 1969; Schurenberg 1963:200ff).

The copper arsenides can be treated like native copper or refined metal, although the native Cu-As metal has a lower melting point and must be produced and treated under reducing conditions. Skinner and Luce (1971) feel that the impurity patterns of early Near Eastern copper-arsenic alloyed objects are consistent with the use of algodonite and domeykite. Selimkhanov (1962) has also suggested the use and presence of domeykite in early alloyed objects from Trans-Caucasia.

The Anarak-Talmessi region is the most interesting polymetallic deposit in Iran. The major metallic mineralizations include copper, nickel, cobalt, lead, zinc, iron, and arsenic. There are many individual mines in this area. The major copper deposits are at the Talmessi and Meskani mines. Chalcocite is the primary ore, and it occurs in veins and impregnations. Nickel arsenides and cobalt arsenides occur as small veinlets. "During the mineralization the content of sulfur diminished while the concentration of arsenic increased so that parts of the copper sulfides were displaced by algodonite and domeykite" (Schurenberg 1963). These copper arsenides are located primarily near the surface and within the oxidized and secondary enriched zones. This is the area in which native copper is located, and these mines have substantial amounts of this material. Smith (1965) felt that native copper from the Talmessi mine was used at Tepe Sialk in the earliest periods and continued to be used through the first millennium. This native metal contains some copper-arsenic phases.

The presence of a polymetallic ore deposit with significant quantities of domeykite and algodonite is unique in Iran and rare in the world. When this easily accessible and relatively plentiful source of arsenic is contrasted with the total lack of enargite and other sulf-arsenides in Iran, and in view of the early fourth millennium use of natural copper-arsenic alloys, it is very attractive to postulate this mine region as the single source of the arsenic used in early Iran.

The similar appearance of weathered native copper and copper arsenides suggests the use of copper arsenide minerals along with native copper. Native copper, which had been hammered, is documented in fifth and fourth millennia Iran. The use of copper-arsenic alloys during the first introduction of true metallurgy has also been documented here. The rapid spread of copper-arsenic mineral utilization throughout Iran attests to the success of the alloy, to experimentation and observation by the ancient smiths, and to the communication network of technological concepts of early fourth millennium Iran. The impurity patterns, ores, and slags examined from Iran suggest an oxide-carbonate ore-to-metal technology consistent both geologically and metallurgically with the use of algodonite and domeykite minerals as the source of arsenic found in the finished objects. The uniqueness of this deposit adds validity to this conclusion and certainly assuages the doubts associated with most examinations of resource source and utilization.

It is also important to state that the metal objects were made at each of the sites examined throughout Iran, not only at sites specializing in metal production. This metallurgical tradition forms the basis and foundation for technological developments throughout the Bronze Age.

The metal objects from the early fourth millennium, 4000–3800 B.C., are primarily tools, with pins and blades predominant. The pieces are carefully manufactured and attest to the competence and skill of the smiths during this period. At many sites the number of metal objects is small. The major technological changes that occur during this period are found over a geographically widespread region.

The best available evidence for the change from the hammering of native copper to the first use of metallurgy is a knob-headed pin, XC.71.8B.40, from Tepe Yahya Period VB (fig. 7.11:c). Analysis of this pin indicates that it was definitely cast and subsequently hammered and annealed.

Although there is no other site that demonstrates this shift in metallurgical technology as dramatically, metallographic evidence from metal objects from Tepe Giyan V (Contenau and Ghirshman 1935), Qabrestan (Neghaban 1977), Susa A, and Tepe Hissar I strongly indicates that this technological change occurs throughout Iran contemporaneously (Heskel 1981).

It is important to recognize, however, that at those sites occupied from the late fifth through early fourth millennia B.C., there is little to suggest the introduction of other cultural materials or abrupt changes in the architectural or material inventory during this period. The ceramic industry in particular shows gradual and cumulative changes that are quantitative rather than qualitative in nature. It is possible, however, that the increased sophistication in kiln design that occurs during this period is associated with the development of metallurgy. There is evidence, however, that indicates that metals were not produced in kilns throughout the Bronze Age in Iran and thus that kiln changes would not be crucial for the development of metal technology.

There is also no substantial change either in the village settlement pattern or in the small domestic-type architecture present at these sites, except for the puzzling Acropole at Susa (Perrot 1971). The distribution of materials within the sites does not indicate any differential distribution of wealth within the community, nor does the architecture indicate differences in function or status (Heskel and Lamberg-Karlovsky 1980).

Thus, whether or not the origin of metallurgy is indigenous to Iran, is part of a "coherent technical art" of the Near East, or is introduced into Iran from another area, it seems that there is no apparent rapid or significant change in associated pyrotechnologies or in social, political, or economic complexity as a result of the initial development of metallurgy.

This does not imply, however, that the development of metallurgy does not affect the increasing complexity of society during the fourth millennium. It is also evident that whatever the original source of this technology, metallurgy develops rapidly and indigenously in fourth millennium Iran.

The available evidence shows that technological innovations continue throughout the rest of the fourth millennium B.C. During the period from 3800–3300 B.C. in Iran, there is an increase in the quantity of metal objects produced. There is also increased competence in the casting, annealing, edge hardening, melting, and smelting of metal. The metals used during this period were produced from native copper, from copper arsenides, and smelted from copper oxide and carbonate ores. It can be stated that except for changes in the metallic ores utilized and range of metals produced, the techniques of production do not change significantly for the 2,000 years following the mid-fourth millennium B.C.

The evidence for these technological trends is derived from analyses of objects from Susa A, Tepe Hissar I, Tepe Sialk III, and Tepe Yahya VB–VA (Heskel 1981). The metal corpus from these and other sites contains equal amounts of tools and ornaments. These objects are made from copper and a wide range of unintentional copper alloys, primarily of copper arsenic. The increased use of smelting is suspected from the presence of various impurities in the finished metal and from a copper ingot and copper gossan ore samples found in Tepe Yahya VB–VA contexts. There is good evidence to suggest that the source of the arsenic found in these metal artifacts is the Anarak-Talmessi mine region.

The increased development of metallurgical technology during the fourth millennium B.C. is also associated with increased experimentation, evidenced by the use of metals with a wide range of different compositions as shown by spectrographic analyses (Heskel 1981). The copper used for the finished objects contains 1–4 percent of either arsenic, lead, nickel, or some combination of these impurities. The presence of these impurities in the copper would change the properties of the metal significantly and may have led to the discovery of intentional alloying.

The complexity of Iranian societies increases during the period from 3800–3300 B.C. Ceramic production becomes more controlled and sophisticated, with higher firing temperatures, more variations in pigments, and the presence of wheel-made wares and possibly better kilns (Coghlan 1942; Heskel and Lamberg-Karlovsky 1980). Population increases and settlements become more numerous, probably as a result of increasing efficiency in agriculture. There is also an increase in the use of imported materials, which indicates expanding external contacts and exploitation of natural resources.

The growing sophistication of metal technology is associated with an increasing population and cultural complexity. The basis for these changes probably can be found in the interaction of increased agricultural production with the development of technological knowledge, in a manner not yet understood.

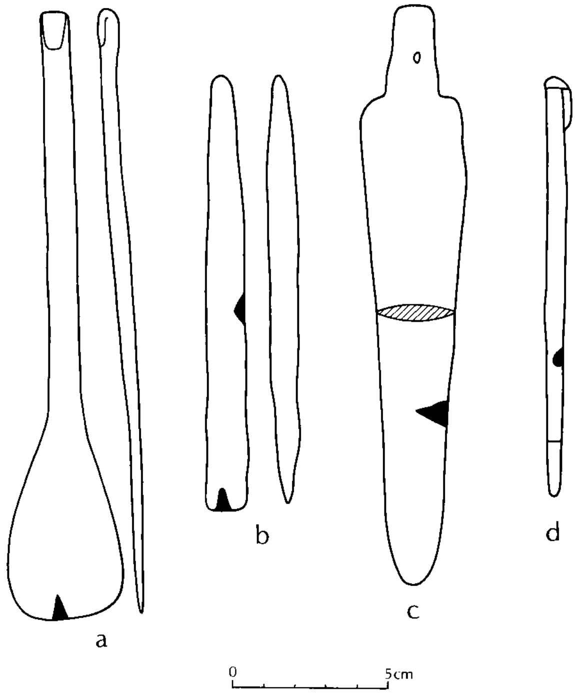


Figure 8.2. Copper alloy tools from Tepe Yahya. a, spatula, Period VA.1–IVC (C.68.T6.9); b, chisel, Period IVC (C.68.T6.7); c, dagger, Period IVA (BW.69.4); d, nail or awl, Period VA.1–IVC (C.68.T6.9). [Note: In the preliminary report (Lamberg-Karlovsky 1970b:pl. 36), objects illustrated in figure 8.2:a, b were designated as coming from Period VB, while other publications cited the dagger as from Period IVC. Careful reanalysis dates the spatula (a) to Period VA.1–IVC, the chisel (b) to Period IVC, the dagger (c) to Period IVA, and the nail or awl (d) to Period VA.1–IVC. This is of particular significance because the dagger is a tin-bronze, and rather than dating to the early third millennium it should be dated to the first half of the second millennium. CCL-K]

NOTE: EXAMINATION OF COPPER ALLOY TOOLS FROM TEPE YAHYA[1]

Ronald F. Tylecote,
Institute of Archaeology, University of London

Hugh McKerrell,
Research Laboratory, National Museum, Edinburgh

Metallographic examination

Spatula (Sample A). This Period VA.1–IVC spatula (fig. 8.2:a) weighed 65 g and had an even green patina, covered in a few places with a limy deposit. The blade had been forged flat, but the shank had a rectangular section that had been doubled over at the head. A microsection was taken from the edge of the blade and showed cuprous oxide globules elongated in the direction of the edge. Upon etching in ferric chloride a faint trace of coring became apparent, together with a fine, evenly dispersed precipitate. The grain structure was coarse and equiaxed with twins. The hardness was 97 HV 1.

Chisel (Sample B). This Period IVC chisel (fig. 8.2:b) weighed 95 g and was in a remarkably good state, with a few green encrustations and some limy deposit. The central section was rectangular and had a slight twist, suggesting that it had been used like a screwdriver. There was no mushrooming of the chisel-shaped head, which suggested that it had not been used as a cold chisel directly hit by the hammer but as a wood chisel with a wooden handle. Two sections were taken: one was from the sharper of the two edges, which had a limy coating, and the other from the center of the shank.

The edge showed an enormous quantity of elongated black inclusions strung out almost as laminations going right up to the edge. On etching, heavy concentrations of slip lines were visible, but there seemed to be a complete absence of any twins. Grain boundaries were few, and the grain size seemed to be very coarse. The hardness was 163.

The center section showed rounded inclusions (seen end-on) and some residual coring and second phase. Again there

1. See also R. F. Tylecote and H. McKerrell, "Examination of Copper Alloy Tools from Tal y Yahya, Iran," *Bulletin of the Historical Metallurgy Group* 5 (1971):37–38.

were few grain boundaries and plenty of slip bands. The hardness was 148.

Dagger (Sample C). This Period IVA dagger (fig. 8.2:c) weighed 85 g and was in a very corroded condition; a section near the middle showed only a small amount of residual metal in the center. This had a recrystallized grain structure with preferentially corroded slip bands. Very fine slag stringers were visible in the center of the cross section. The grains were large and equiaxed with twins and slip bands. The hardness was 105.

Awl or nail (Sample D). This Period VA.1–IVC awl or nail (fig. 8.2:d) had a square section and weighed 29 g. The point appeared to have been forged round, but the head had been folded over like the head of the spatula and then mushroomed, showing that it had been hit with a hammer. There was no green encrustation but some limy deposit. The tip was blunt, and the end was possibly missing; otherwise the tool was in good condition. The microspecimen was cut from the square section near the tip.

This was by far the most coppery of the four tools and therefore appeared to be the least alloyed, an assumption which was borne out by the analysis. It had some inclusions of cuprous oxide and a fine precipitate like the spatula. Due to its purity it etched very slowly and showed a fine equiaxed grain structure with no residual coring. There were a few bent twins, and triangular etch figures were easily produced, showing evidence of cold work. The hardness was 106.

Analysis

The composition of the specimens was determined on the swarf resulting from the cutting-out of the specimens for microexamination. In the case of the badly corroded dagger, this would be largely corrosion product, but in the other cases it was almost all metal with a small amount of surface patina.

Samples of metal from the four implements were analyzed as received both qualitatively by arc spectrography and quantitatively by X-ray fluorescence. Unfortunately all the specimens contained some mineralized component which it was impractical to remove, and the quantitative results must therefore be interpreted with caution.

The qualitative analysis showed that arsenic was present as a minor component in all four implements and that tin was similarly present in Sample C (dagger) only. A trace of lead (approximately 0.05 percent) was found in all four samples, but no nickel or bismuth (<0.01 percent). The tin contents of Samples A, B, and D were all less than 0.01 percent. Antimony was not detected and would be present below 0.1 percent for all samples.

The quantitative results determined are listed in table 8.1. Considerable variation in these results was observed for differing portions of the same sample, and, as stressed above, they should be interpreted appropriately.

Conclusions

The analyses show that all the objects except the awl have significant alloying elements. The arsenic would not be added but would arise from judicious selection of ore. It is possible that the As content of the awl was originally higher, but that some of the As has been lost during working. It is now an impure copper with cuprous oxide both as coarse inclusions and as a fine precipitate. It has been both hot and cold worked and its relatively high hardness is the product of both the composition and the working that it has received.

Table 8.1. Quantitative analysis of metal samples determined by x-ray fluorescence.

	% As	% Sn
Sample A: Spatula	1.7	< 0.01
Sample B: Chisel	3.7	< 0.01
Sample C: Dagger	1.1	3.0
Sample D: Awl	0.3	< 0.01

The chisel is a very modern looking implement, and the hardness of its edge (163 HV 1) is equivalent to that of a modern medium carbon steel as forged but not heat treated. The edge would not seem to have been used to cut anything hard as it shows no deformation. The hardness has been achieved by cold hammering after some prolonged heating to remove most of the segregation that arises on casting. Either the chisel has not been used or it has had the back end embedded in a wooden handle like a wood chisel. It would make a very efficient tool.

Only the blade of the spatula was examined, and this was formed mainly by hot working. We see that the hardness is less than that of the awl, yet the As content is appreciably higher. This is because it has received no cold work, which suggests that it was not intended as a cutting implement.

The dagger was the most corroded of all the implements and the only one to contain any tin. The analyzed tin content is in agreement with the hardness and the structure of the residual metal, and there is no reason to suppose that the metal was very different from the corrosion product except for the presence of oxides and carbonates in the latter. This, therefore, is one of the many arsenical low-tin bronzes which appear in many parts of the world in the transitional period between arsenical copper and nonarsenical tin bronze. As in this case, they are made by forging rather than casting as in the tin bronzes. The dagger should have been capable of work hardening as much as the chisel, and it is probable that the edge was a good deal harder than that of the central spine.

All the implements have been made from smelted, cast, and forged copper or copper-base alloy, reheated and hot worked. Some of the edges of the tools have been cold worked to a considerable extent, probably resulting in a reduction of thickness of 50 percent or more. The maximum hardness achieved was at the edge of the chisel.

The technique is typical of the Copper or Early Bronze age. It is possible that the tools may have been made elsewhere; the nearest known copper deposit is at Rafsanjan, about 100 km west of Kerman. We have no knowledge of the composition of this deposit, but it is clear that the copper used did not have an appreciable nickel content like so many of the Near Eastern artifacts of this period. None of the implements could have been made of native copper.

Chapter 9

Settlement during the Early Periods

Martha Prickett

Department of Anthropology, Harvard University

It would be naive to view the prehistoric settlement at Tepe Yahya as a solitary village isolated by extreme distances from other contemporary populations. The purpose of this article is to summarize our present knowledge of the surrounding population both within the Soghun valley and beyond. Comparison of the local with the larger regional settlement patterns reveals additional clues unavailable in the excavation of the single mound to the questions of where and how the prehistoric inhabitants lived.

The patterns and interpretations presented here are far from conclusive and raise many problems requiring further investigation. Many of the archaeological "facts" that underlie the structure are open to alternative interpretations on different levels. The interpretative ambiguities are discussed as much as is possible within the space constraints of this chapter. Further details are available in Prickett 1985. Even recognizing these problems and carefully weighing alternative possibilities, the actual conclusions may still need revision. Frequently one more bit of information would confirm or negate an interpretation. The ongoing excavations at Tepe Yahya were still establishing the stratigraphic sequence and ceramic chronology while the regional survey work was progressing. Thus the survey results lack the luxury of the well-honed and revised underlying sequence structure available in areas with many workers, several different research projects, and many years of review, reanalysis, and resynthesis.

The fieldwork providing the settlement data in the Soghun valley was carried out by Thomas Beale during July and August 1975 (Beale 1976 and personal communication). The work elsewhere in the upper portion of the Rud-i Gushk drainage was done by this author in September 1971, June 1973 to January 1974, and June to October 1975 (Prickett 1976, 1979). Supplemental information on the Soghun valley itself has been provided by William Fitz's survey in the valley in 1970 (Fitz 1971) and by Eda and Marcello Vidali's work adjacent to the mound of Tepe Yahya in 1973 (Vidali, Vidali, and Lamberg-Karlovsky 1976). In central Kerman, the 1964 and 1966 research by J. R. Caldwell and team (Caldwell 1967) and the more recent survey in 1976 and 1977 by S. M. S. Sajjadi (Sadjjadi and Wright 1976; Sajjadi 1979) in the Bard Sir (Mashiz) plain have greatly amplified the original discoveries by Sir M. A. Stein in that area in 1932 (Stein 1937). Further information on the southern Kerman region has been provided by the Harvard Kerman Survey of 1967 led by C. C. Lamberg-Karlovsky (Lamberg-Karlovsky 1968; Lamberg-Karlovsky and Humphries 1968; Meadow 1968); by the 1932 exploration by Sir M. A. Stein in the Jiroft and Rudan (Stein 1937); and by the work of the author in association with Andrew Williamson from 1969 to 1971 in the latter two areas, as well as in coastal Kerman during fieldwork focused on the Persian Gulf coast from Bushahr to Jask (Williamson 1970, 1972a, 1972b; Whitehouse and Williamson 1973; Prickett 1972).

The data collection methods of these various surveys were not the same. The researchers differed in the equipment they used, the resulting accuracy with which sites were located, measured, and described, and the thoroughness of areal coverage. Likewise the results varied with their experience, even as the accuracy and coverage within this author's own surveys improved with increasing experience and sensitivity to minor but significant details. Another problem with data uniformity is differences in the observational biases of the workers, since the purpose of a survey strongly affects the resulting observations. Although the emphases of most researchers were on identifying and dating sites, the goals of this author expanded beyond that to questions of environment and land use. Comparable data for these latter two concerns are often unavailable in other survey descriptions. The interpretations made here come not only from analyzing the verbal descriptions of others, but also from actually visiting the majority of sites involved—from which is derived a sense of the landscape and its possibilities. Many of Stein's sites were visited, as were two or three of those in the Soghun valley. None of the Bard Sir plain sites were visited by this author.

The chronological dating of sites is based primarily on their surface ceramics and on the parallels of these ceramics with the excavated ceramic sequences established at Tepe Yahya and Tal-i Iblis. Problems encountered include the preliminary nature of these sequence formulations and the inadequate ceramic assemblage descriptions for portions of the Iblis sequence (e.g., Iblis III; or the distinctions between Iblis IV and V, which have therefore been lumped in this survey work as a single period, Iblis IV/V). Closely linked to this is the practice of various researchers of classifying their pottery on the basis of different attributes. Sometimes paint color is used, at other times different surface decoration techniques, manufacturing method, fabric tempering, fabric color, fabric character, vessel wall thickness, vessel size, vessel coarseness, vessel form, vessel function, or some combination of these is employed.

As much as possible, the ceramic sequence criteria for the survey pottery of the early periods are restricted to fabric types (Prickett 1985: appendix III). Only secondarily are decoration and form considered. The emphasis on fabric types is necessary with surface survey material in order to date the multitudes of small, badly weathered sherds that may lack information on surface finish, decoration, and even vessel form. However, sequences based on chronological changes evident in ceramic fabrics may not prove useful for all purposes. As the sequences are now understood, fabric changes do not necessarily correspond with period changes defined on the basis of architectural criteria, especially during long periods of continuous occupation. Hence there is a great need to define the variations in both ceramic fabrics and assemblages within shorter chronological increments through finer stratigraphic control of excavation samples. This is paralleled by the need for more excavation localities in order to investigate the regional variations in contemporary fabrics. The definition of geographical variation has also been hampered by the lack of pre-Islamic kilns or ceramic production installations, as these would indicate the range of fabrics actually produced at individual localities. With the possible exceptions of kilns on R154 in the Shah Maran-Daulatabad basin and in Trench CDE at Tepe Yahya (Beale 1978 and this volume, ch. 6), no pre-Islamic kilns have yet been reported from the southern Kerman region, even though ceramics were probably in production in every major village if not every household during much of the early periods.

The ceramic sequence used to analyze the survey material of the early periods is divided into fairly long periods that are based on the architecturally-defined stratigraphic sequences at Tepe Yahya and Tal-i Iblis (Beale, this volume, ch. 6; Prickett 1985; Caldwell 1967). The long periods result in settlement patterns that are difficult to interpret in relation to actual population sizes. Different thicknesses of site deposits may indicate differing lengths of occupation, but whether site occupations extend throughout a complete period or only a fraction thereof is difficult to ascertain. A further complication is that thickness of archaeological deposit may reflect size of underlying structures and type of construction materials used (perhaps relating to site function) as much as it does duration of occupation. Depending on site location, the currently observed thicknesses of deposits may also result from differential exposures to erosional processes. In an attempt to control at least partially for these problems, the sites have been divided into two major categories: mounded sites and scatter sites. A *mounded site* is an accumulation of silt and occupation debris raised above the surrounding ground surface. A *scatter site* is a ground surface accumulation of sherds lacking both mounding and architectural debris. It can be either a *site-related scatter site* contiguous to a mounded site or an *independent scatter site* not associated with other archaeological materials.

In addition to the two main site types, the mounded sites and large scatter sites also have been divided into major, minor, and "stray" occupation components. A *major occupation* component occurs when all of the surface artifacts (on a single component site) or a major proportion of the surface artifacts (on a multicomponent site) are from the designated period. A *minor occupation* component occurs when the proportion of artifacts of a given period is significantly reduced. *Stray artifacts* are artifacts attributable to a designated period that occur in insufficient density to represent an actual occupation or even a sustained camping use. Depending somewhat on collection size, this is usually only one or two sherds. The attribution of a portion of a collection to one of the occupation types depends not only on the proportion of artifacts of that date in the collection, but also on the position of the period in the stratigraphic sequence of the site. Thus a very small number of sherds present from a period preceding the last period of site occupation may represent a minor occupation, while the same number from the latest period would more likely represent "stray" artifacts.

The major problems with this type of site component differentiation are the reliability and period specificity of the dating criteria (discussed in detail in Prickett 1985: appendix III). These are, in turn, usually based on the pottery collections or other dating methods. The Rud-i Gushk survey ceramic collection methods, the only methods known to this author with certainty, were far from consistent or representative. Ceramic dating was done primarily through observations that were recorded in the field notes. Only a few unusual or interesting sherds were collected from some sites. This was the result of extreme limitations of space in transportation and in potential storage. Thus the evaluation of the site dates is based on field notes, collections stored at Harvard University (most of the 1971 sites and a few sherds from the 1973 and 1975 survey seasons), and detailed notes and drawings of the majority of the limited 1973 collection, which is stored in the Naranjastan-i Ghavam in Shiraz. Sherds from a few of the 1971 sites are in the Ashmolean Museum, Oxford, and some 1975 season material was left in storage in the Tepe Yahya dig house annex at Baghin. Beale's material from the 1975 Soghun valley survey is in the Peabody Museum, Harvard University, where it was studied by this author. Also studied were the British Museum and Harvard portions of the Stein collection and the 1967 Harvard Survey collection that is housed at the Peabody Museum.

The Soghun valley surface sherd collections at Harvard that were made by Beale are larger and apparently more representative of their original sites than are the Rud-i Gushk site collections. The dates assigned to the Soghun valley sites are based on the assumption of the representativeness of the collections. The dating attributions occasionally vary from those previously published (Beale 1976; 1978).

Although analysis by a single worker provides uniformity in dating assessments, the many years over which this work was undertaken are a complicating factor. Finer details of ceramic variability have become apparent with increased study of the Harvard collections. In addition, Beale's stratigraphic analysis has redated some types (Lamberg-Karlovsky 1970b; Lamberg-Karlovsky and Tosi 1973; Beale 1978 and this volume, ch. 4). Unfortunately only the sites represented in the Harvard collections have had their dating accurately refined by these developments.

The absolute chronology of the periods is based primarily on the stratigraphic interpretation of radiocarbon dates from Tepe Yahya and three small excavations in the Shah Maran-Daulatabad basin (Prickett 1985: tables 3.1–3.5; Beale, this volume, ch. 2). The dates discussed in this chapter are based on radiocarbon determinations that have been recalibrated using the best currently available calibration curve (Klein, Lerman, Damon, and Ralph 1982). Specific radiocarbon dates, if cited as such with their laboratory numbers, are uncalibrated and are quoted using the 5,568 years (Libby) half-life of their original reporting. The following list specifies the correlation of the site stratigraphic periods with more generalized millennial dates (based on the recalibrated radiocarbon dates) as they are being used in this chapter (Prickett 1985: ch. 3).

Period	*Date*
Early Yahya VII (Rud-i Gushk)	Mid to late sixth millennium B.C.
Yahya VIID–C	Late sixth millennium B.C.
Yahya VIIB–A	Early (first half of the) fifth millennium B.C.
Yahya VI–VB	Mid-fifth millennium B.C.
Yahya VIB	Early mid-fifth millennium B.C.
Yahya VIA/VC	Middle mid-fifth millennium B.C.
Yahya VB	Late mid-fifth millennium B.C.
Yahya VA	Late fifth to initial fourth millennia B.C.
Iblis IV/V	Early (first half of the) fourth millennium B.C.
"Jamdat Nasr"	Late (second half of the) fourth to initial third millennia B.C.
Yahya IVC	Late mid-fourth millennium B.C.
Yahya IVB	Third millennium B.C.
Yahya IVA	Early (first half of the) second millennium B.C.

The Yahya VI, Yahya VC, and Yahya VB periods are grouped together for survey purposes as a single period, Yahya VI–VB, because their ceramic indicators are additive. If a Yahya VI occupation is covered by Yahya VC or Yahya VB, the earlier occupation only rarely can be distinguished ceramically. The only ceramics restricted to the earlier Yahya VI–VC portion of the period, the Soghun wares and a variety of the Black-on-Buff, occur so infrequently that their absence from a surface sample easily could be fortuitous. Similarly, the later Yahya IVC and Yahya IVB periods are combined for survey purposes as Yahya IVC–IVB because many of their ceramic types are continuous (Potts 1980).

An additional "period," the Yahya VA-Iblis IV/V Transitional, is mentioned in the discussion of the Rud-i Gushk survey material. This is a construct used to separate the initial Iblis IV/V from later Iblis IV/V materials. The division is based primarily on surface associations as well as on collections of excavated Yahya VA and Iblis IV/V ceramics from Tepe Muradabad (R26) and Gholi Tepe (R40). The Yahya VA-Iblis IV/V Transitional is arbitrarily defined as the time in which the pottery forms and decoration are still related to those of Yahya VA, although some of the fabrics have become more speckled, sandy, or dotted with the characteristic rimmed holes of Iblis IV/V. Meanwhile, other fabrics apparently continue from Yahya VA through the Transitional into Iblis IV/V with few tempering or other fabric changes visible during early Iblis IV/V. A complicating factor is that very light speckling or mottling apparently occurs in some fabrics as early as Yahya VB.

The Yahya VA forms and some of the decorative motifs can be viewed as a slowly changing continuum into those of Iblis IV/V. Thus the fabric differences between Yahya VA and Iblis IV/V may reflect a similarly gradual transition in manufacturing technique that cannot be chronologically differentiated due to the conflation of the sherds in surface assemblages. Alternatively, the fabric variations can be interpreted as contemporary geographical variation from several production centers. However, since many forms and motifs seem to change slowly, the fabrics probably do likewise. Thus, chronological development is being interpreted as the main cause for the fabric variation, even though it is apparent that the broad range of fabrics probably indicates several manufacturing centers as well. If any of the distinctively Iblis IV/V forms, painted decorations (whether they are on fabrics with visible tempering or not), or fabrics unique to that period are present, the assemblage is attributed to the Iblis IV/V period, not just to the Transitional subperiod. By these "rules" for ceramic dating, the Yahya VA-Iblis IV/V Transitional material (of speckled fabrics) is placed in Iblis IV/V by this author, although others might place it in Yahya VA on the basis of form or decoration.

In addition, the Yahya VA-Iblis IV/V Transitional does not stand on its own as a true period, for it can be identified only rarely as a separate entity in surface collections from sites with Iblis IV/V assemblages. Its presence could be assumed, however, on sites having both Yahya VA and Iblis IV/V materials. Thus, the Yahya VA-Iblis IV/V Transitional is identified when it occurs alone or at the end of a settlement sequence—at the termination of a Yahya VA occupation. As such, the subdivision is helpful for defining a more gradual transition in settlement relocation between these two periods (Yahya VA and Iblis IV/V), which are both of relatively long duration.

One final factor that also complicates the conclusions is that there is some variation in the pottery between the Soghun valley and the Shah Maran-Daulatabad basin, at least during the Yahya VA period. Although detailed comparisons have not been made, this probably reflects local variation between production centers and possibly some differences in the available clays. Minor stylistic variations in motifs probably also reflect these workshop differences. However, chronological or other cultural factors must also be considered, since some additional motifs appear to be present in the western region. These possibilities require substantially more field research in order to acquire validly comparable assemblages.

SOGHUN VALLEY SETTLEMENT

The regional settlement of the early periods will be viewed first within the Soghun valley, then within the Shah Maran-Daulatabad basin to its west, and then briefly on the broader scale of the southern Kerman region as a whole.

Site Numbers and Total Occupation Areas[1]

Beale's survey in the Soghun valley indicates that Tepe Yahya (2.75 ha) is the only prehistoric mounded site within the valley during the entire span of the early periods. During Yahya VII it is the only recorded occupation within the valley. However, after Yahya VII there is a gradual increase in total scatter site occupation areas and in the number of independent scatter localities with minor components, or at least several stray sherds. In Yahya VI–VB there are four independent scatter sites with minor components (5.72 ha) and two possible stray artifact sites. This increases to five independent scatter sites with minor components (6.08 ha) and five possible stray artifact sites during Yahya VA. Following this the off-mound settlement increases substantially in the early fourth millennium B.C. in Iblis IV/V, when Tepe Yahya itself was abandoned. Only two stray sherds definitive of Iblis IV/V were found in the over 250-m^2 excavated area of Yahya VA and post–Yahya VA erosional deposits underlying the Yahya IV architectural complexes. During Iblis IV/V not only does the number of independent scatter sites increase to nine (8.16 ha; from five in Yahya VA), but eight of these are now major components, comprising the majority of the surface pottery. Only one of the nine scatters is a minor component, in strong contrast to the preceding Yahya VA when only one of the five scatters might be considered to approach a "major component" status. Moreover, the collections from three additional scatter sites show possible Iblis IV/V stray artifacts. However, despite the increase in Iblis IV/V scatter site number and total area, the "standardized" total area in hectares per year (Weiss 1977) indicates a decrease.

1. See appendix 9.A for a listing of all early period sites and their periods of occupation.

The increase in Iblis IV/V scatter area may partly reflect the movement of settlement off the mound of Tepe Yahya. However, only two of the scatter sites had ceramic evidence of a Yahya VA-Iblis IV/V Transitional or Early Iblis IV/V component (more Yahya VA-related forms and motifs than later). This is somewhat surprising since much of the Iblis IV/V material in the Shah Maran-Daulatabad basin seems to date fairly early in the Iblis IV/V sequence. Furthermore, early assemblages would be expected if the scatter sites represent a move by the inhabitants of Tepe Yahya to nearby localities. Thus the Soghun valley Iblis IV/V settlements seem, in general, to be later than the abandonment of settlement on Tepe Yahya itself. Hence their number is unlikely to reflect only the movement of habitation from the mound to lower or less steep heights.[2]

Over the five-hundred-year span of Iblis IV/V the continuing choice of occupation off the Tepe Yahya mound by a population of fairly stable size may account for much of the increase in dense Iblis IV/V scatter sites. However, without the excavation of a substantial stratified sequence of Iblis IV/V, it is not possible to differentiate the chronological subdivisions of the ceramic assemblages in order to date these scatter sites more precisely. All but one of the nine Soghun valley Iblis IV/V scatter sites continue into Yahya IVC with a few diagnostic sherds. These scatter sites do not have the large number or full range of Yahya IVC diagnostic ceramics that would indicate a substantial Yahya IVC population. Even so, the number of Soghun valley scatter sites contrasts remarkably with that in the Shah Maran-Daulatabad basin, where Yahya IVC sherds were found solely as stray artifacts and restricted to two sites (only one of which had a substantial occupation during the preceding Iblis IV/V period).

Individual Site Sizes

Through each of the early periods and Iblis IV/V, the median size of the independent scatter sites decreases steadily from 1.3 to 0.75 ha. This trend continues throughout the third millennium B.C. From the late fifth through the third millennia B.C., the mean scatter site sizes are slightly larger (by less than 0.5 ha) than the median sizes and show the same decreasing size trend described for the median sizes.

Site Locations

Although the basal strata of Tepe Yahya were explored only in limited exposures, radiocarbon evidence indicates that the mound was first settled at least several centuries after the initial village settlement in the Tepe Gaz Tavila area of

2. The estimated height of Tepe Yahya over modern plain level at the end of Yahya VA is 9.8 m, excluding the possible erosional removal of additional height during the Iblis IV/V occupation hiatus. Roughly 8 m of this is cultural deposit; based on Vidali, Vidali, and Lamberg-Karlovsky (1976:247) and Snead and Durgin (1975:13).

the Shah Maran-Daulatabad basin (Prickett 1985). The base of the Tepe Yahya occupation deposit now lies approximately 1.83 m above the current surrounding plain level (Snead and Durgin 1975:13). Although the site may have been settled first on a low silt erosional remnant, the village is more likely to have been founded on nearly level ground, following which the soil that surrounded it and was unprotected by overlying cultural deposits was removed by wind and water action across the surface of the plain.

A limited area of baked, fire-reddened soil, apparently a campsite, is reported by Snead and Durgin (1975:11) some distance northwest of Tepe Yahya at 1.68 m below the current plain surface (hence about 3.5 m below the base of the Tepe Yahya cultural material, assuming lateral horizontality). Charcoal from this locality is dated about 5600 b.c. by radiocarbon (GX 3517, 5730 half-life, uncalibrated), or if recalibrated, approximately 6200 B.C.[3] This locality almost certainly indicates earlier camping activities in the valley, despite the absence of associated artifacts or other activity indicators. It is apparent that this camping episode occurred while a post-Pleistocene lake regime was still partially active, for the campsite is covered by green lakebed silt deposits. The green color of these silts indicates either a sufficient depth of lake water for low oxygen circulation, which generated anoxic conditions in the deepest water near the lakebed, or more likely, a highly organic swamp or shallow water body in which the alluvial sediments were reduced after deposition. The presence of the camp beneath the lakebed deposits indicates that the areal extent of the lake or swamp changed periodically. However, it probably did not dry and reform annually, or the reducing conditions would not have been maintained.

This lake regime, during which the reduced lakebed clays and silts accumulated, was followed by a further period of alluviation, but of oxidized, more seasonal lake (playa) clay, silt, and sand deposits. More than two meters (approximately 2.4 m) of alluvial playa, sheet-flood, and aeolian sediments were deposited over the lakebed clays near Tepe Yahya before the first settlement of that site (Snead and Durgin 1975:6). Initial mound settlement probably occurred about a millennium after the camping episode. At about this time the environment shifted from a depositional regime causing the aggradation of the basin center (first by the water-logged lakebed sediments and then by the more intermittent playa and aeolian sediments) to an erosional regime generally removing the alluvial deposits. It is not known whether this shift to an erosional regime, which produced the natural silt rise beneath the Tepe Yahya cultural deposit, also began before the end of the millennium between the lakeside camping episode and the first Tepe Yahya settlement. If it did, the site may have been founded on a low silt residual as mentioned above.

The lack of any mounded sites except Tepe Yahya in the Soghun valley during the early periods is an important consideration for interpreting the settlement pattern. It remains unclear whether the absence of mounded sites reflects the insubstantial original nature of nearby settlements. Alternatively, considering the 1.83 m of valley center erosion demonstrated around Tepe Yahya, low mounded sites may have been eroded after abandonment. The erosion of a site would occur if its durable debris contents were too limited to form a lag deposit that would protect the remaining site deposit from wind and water action, or if the site was not preserved by burial under later settlement deposits.

The genesis of the sherd scatter sites is of importance for understanding the patterns of occupation in the valley, since artifacts redeposited by erosional processes do not directly represent ancient occupation. Tepe Yahya itself has a large site-related scatter extending southwestward along the bank of the Rud-i Soghun (approximately 14 ha with a density of over one sherd per m^2; Vidali, Vidali, and Lamberg-Karlovsky 1976:243–244). Its sherds are an erosional lag deposit (Snead and Durgin 1975:7) representing virtually all occupation periods found on Tepe Yahya. Another scatter area, Site 22, with a few early period (Yahya VA) sherds and many small flint flakes lies along the banks of the Rud-i Soghun downstream of Tepe Yahya. Both the Tepe Yahya site-related scatter and Site 22 could have originated either as settlements (now thoroughly eroded) along the riverbank or as occupation debris from further upstream that was redeposited by flooding. Such flood deposition would probably predate the current regime of channel incision. The Rud-i Soghun is now incised about 4 m below plain level at Baghin, the village just south of Tepe Yahya, although when dissection occurred is unknown. The extension of the Site 22 scatter for hundreds of meters along the riverbank and the admixture of pottery of later periods with the earlier both tend to support the flooding hypothesis, at least for the Site 22 scatter.

The presence of a large scatter site, Site 1, about 0.5 km northwest of Tepe Yahya (Vidali, Vidali, and Lamberg-Karlovsky 1976) is a similarly intriguing problem. It raises two questions. The first is why such a large site, virtually the same area as basal Tepe Yahya or possibly even considerably larger, lies so close to Tepe Yahya.[4] The second is why such a site, which is occupied throughout all the prehistoric periods represented at Tepe Yahya save Periods VII and IVA and which has a considerable concentration of Iblis IV/V ceramics that are missing at Tepe Yahya, remained only a scatter site. The long-standing proximity to Tepe Yahya probably indicates considerable interaction between the two sites. One possible cause of the lack of mounding is that it was subjected to heavier wind and water erosion than Tepe Yahya, but how such a differential could have occurred is hard to explain. Alternatively, the site may

3. The original date is GX 3517, 5375 b.c. ± 225 years (5568 half-life). The estimated calibration using Klein et al. (1982), although beyond their chart range, would provide a midpoint in the vicinity of 6200 B.C.

4. Site 1 is 2.64 ha as drawn by Vidali, Vidali, and Lamberg-Karlovsky (1976), while Tepe Yahya is 2.75 ha. Site 1 is reported to be over 10 ha by Beale (1976 and personal communication).

have consisted of constructions like field workers' storage areas and rest places or herders' camps and corrals, any of which would be too insubstantial for the accumulation of mounding. If the site had different or subsidiary functions related to the Tepe Yahya village that did not require the typical, mound-forming architecture, it seems odd that the site remained in the same locality during the two-and-a-half millennia of its prehistoric occupation, rather than moving around the plain.

A potential explanation that takes both of these possibilities into consideration is that Site 1 was related to a water source (but not the Ab Daulatabad canal that today cuts the east edge of the site), either a spring emerging above the lakebed clay here or a stream formed by a spring emerging from bedrock northwestward at the silt plain edge. This latter possibility is suggested by the presence on aerial photographs of a lineation, possibly an ancient channel, crossing this area. If correct, the area may have been periodically subjected to flooding from this channel, although the flooding would not seriously affect Tepe Yahya farther out on the silt plain away from the spring's runoff channel. In addition, the association of this large scatter site with a water supply might also explain why it did not move. Site 1 may have served as the focus for many water-procurement activities by the Tepe Yahya villagers, such as collecting drinking water, bathing, and watering animals, without a substantial accumulation of habitation debris.

The location of early period settlements near springs would provide evidence for a limited water supply in the Soghun valley. Today there are three perennial springs located on the silt plain periphery in the southwestern portion of the Soghun valley that are shown on the modern 1:50,000 Iranian National Cartographic Center map (1971, Sheet 7346I, Ab Dasht). It is surprising, however, that no spring locality shows occupation before Yahya VA and that there is no consistency in the periods of prehistoric occupation associated with them. Although scatter sites near each of the three springs (Sites 25, 29, 41) have at least two components, each shows evidence of occupation during different periods (see appendix 9.A for site period listing). Site 29, which lies on the southwestern silt plain margin at an elevation of about 1,500 m, is the only spring site that may have an early period component (Yahya VA). At the extreme north of the valley at the apices of the northern valley edge fans, no sites are associated with the three springs above the village of Ashin or with the two springs above Saghinak, although these areas were not thoroughly investigated. (For a map with modern Soghun valley place names, see Lamberg-Karlovsky 1973: pl. 20, which shows the Ab Dasht sheet mentioned above.) Unless the spring positions are the result of more recent earthquake activity, this lack of both early and consistent use of spring localities appears to indicate a low intensity of settlement pressure on water supply. This may show that a small standing water marsh or more seasonal playa was still present in the extreme southwest and alleviated the need to settle near springs.

The possibility that water restriction did indeed affect the settlement pattern is increased, however, by the lack of valley-wide settlement at all periods prior to the introduction of *qanat* irrigation in the mid to late first millennium B.C. The modern rainfall in the Soghun valley, approximately 250–300 mm (Robert Raikes, personal communication, 1973),[5] is sufficient for dry farming. In fact, dry farming has been practiced during this century, although irrigated agriculture is preferred in order to enhance crop yields. If dry farming were viable in antiquity, it seems strange that the settlements cluster in the southwestern portion of the valley. If agriculture were adequately rain-fed, the 68 km^2 (6,800 ha) of basin center silt (figs. 2.3, 3.1) could produce many times the amount of grain needed for a village the size of Tepe Yahya.[6] The use of the fairly extreme estimates of one-fourth the modern irrigated grain yield,[7] decreased efficiency, and long (four-year) fallow cycles (i.e., only one quarter of the land being used for crop production each year)[8] provides an estimated sustaining area of 3.2 ha of dry-farmed land per person per four-year fallow cycle (0.8 ha per person per year). Using this figure, the Soghun valley should have been able to support four villages the size of the estimated maximum population of Tepe Yahya. Thus if a population estimate of 200 people per hectare is used, the resultant population of Tepe Yahya would be 550 people, requiring 1,760 ha of agricultural sustaining area; if mul-

5. Robert Raikes, a consulting hydrological engineer with long experience in the hydrology and ecology of Southwest Asia, spent several days in the Soghun valley with the Tepe Yahya Project, as well as two days with the author in the upper Rud-i Gushk catchment in June 1973. His many observations and suggestions were invaluable guides toward understanding the regional environment.

6. Y. Ladjevardi (1976) reports that modern, irrigated wheat production in the Soghun valley requires 0.19 ha to produce 300 kg, which provides one year's wheat supply for one person. This per capita consumption rate is higher than most of those reported for other Iranian areas, which are summarized by C. Kramer (1982:37–39). However, Ladjevardi's yield figure is based on a field production figure of 90 kg of harvest per 0.06 ha field. Thus the use of this high consumption value may partly compensate for portions of the production not consumed as food—that saved for seed (approximately 150 kg per ha in Kramer [1982:181], or about 120 kg per ha according to local informants in the Soghun valley), as well as the portions lost during threshing and storage.

7. Y. Ladjevardi's (1976) production figure provides a yield of approximately 1,580 kg per ha, which corresponds well with the yields for irrigated wheat elsewhere in Iran, summarized by C. Kramer (1982:38–39). One-fourth of the modern Soghun valley yield would be 395 kg per ha, which is not far above the dry-farmed yield of 290 to 360 kg per ha cited for the even lower rainfall areas of Central Iran by the First Iranian National Census of Agriculture in 1960 (Bowen-Jones 1968:571).

8. Modern farmers in the Soghun valley report using an alternate-year fallow pattern when dry farming today. A two-year instead of four-year fallow cycle would halve the sustaining area required for a given population.

tiplied times four sites, this would theoretically require 7,040 ha or 70 km^2 The use of a lower and more probable population estimate of 100 people per hectare[9] would yield a village population of 275 people, requiring 880 ha, and would allow eight villages the size of Tepe Yahya in the Soghun valley. Thus the lack of other mounded sites, if they have not been removed or obscured by erosional processes, either indicates a large invisible population (a diffused settlement pattern that has not been found by the survey techniques employed) or indicates that the Soghun valley population density was very low, possibly limited by water supply, the availability of other resources, or cultural factors.

The effect of limited water supply on the settlement pattern is further corroborated by the restriction of all the early period settlement to the southwestern edge of the basin, either those scatter sites along the channel edges or near spring localities, discussed above, or another group of scatters (Sites 15, 15A, 39) on raised hillocks or alluvial gravels at the extreme southwestern edge of the basin (fig. 2.3). Whether this second group of scatter sites lies on bedrock or on erosional alluvial remnants is not clear from the available evidence. The correlation of an aerial photograph of the valley edge with M. Sabzehei's geological map of the area shows the locality of these sites to be low outcrops of metamorphic rocks of the Sar Gaz formation (Sabzehei n.d.). The tufa deposits shown on the map of Snead and Durgin (1975; this volume, fig. 3.1) abut these outcrops and represent ancient lakeshores, most likely of Pleistocene or Early Holocene date. The shorelines apparently lie between 1,480 and 1,500 m in elevation, most likely nearer the latter, although their elevations have not been leveled and faulting may have tilted the sediments slightly southward (Snead and Durgin 1975:29).

Since only Site 22, the site possibly erosionally redeposited along the Rud-i Soghun, lies below 1,500 m, the question is whether the other Soghun valley early period scatter sites are all located encircling the edge of a more restricted but still extant marsh or shallow-water lake lying at or near 1,500 m. This surface water could have supplied water for domestic purposes to all the other identified settlements: Tepe Yahya, Sites 1, 29, 15, 15A, and 39. Likewise, the high water table would have provided additional soil moisture to enhance crop growth in the vicinity. Alternatively, each of the sites could have used its own more localized water sources: Site 1 and Tepe Yahya, perhaps the spring or channel discussed above; Site 29, a spring; and Sites 15, 15A, and 39 either the Site 29 spring or shallow pools of emergent groundwater that even today form on the edge of the bedrock outcrops at the basin exit.

With the currently available evidence, it is impossible to determine whether the earlier shallow-water lake or swamp was still extant in the extreme southwest of the valley during the early periods, for it is unclear if the three early period scatters lying on these outcrops are above the lakeshore tufa. If they lie at elevations lower than the tufa, their presence would demonstrate that the long-standing surface water regime was no longer in effect. But if they lie above the lakeshore deposits, there is no simple way to prove or disprove the continued presence of a perennial or seasonal lake. In fact, the site location evidence alone might argue that standing surface water or a swamp continued as late as Iblis IV/V, when the three scatter sites on these hills increase to five.

Following another line of argument, there are no early period sites on the silt below 1,500 m except for the large stream-edge scatter downstream from Tepe Yahya (Site 22) discussed above.[10] If it is an in situ scatter, such a lake was almost certainly not present, as the site would have been covered by water. Alternatively, if the site is a downstream erosion deposit from Tepe Yahya or its vicinity, the scatter's presence would have no bearing on the possibility of standing surface water during the early periods. Thus the presence or absence of standing water in the extreme southwestern area of the Soghun valley during the early periods is not verifiable with the current evidence.

Even if the area was not covered with lake water or swamp, the lack of sites other than Site 22 on the silt plain under 1,500 m may not indicate that the area was devoid of occupation. Rather, small sites may have been obliterated by wind and water erosion. The scatter site group in the far southwest may have survived because the underlying rock base was not susceptible to erosion. Regardless of the presence or absence of a lake environment during the early periods, or of the removal or nonremoval of sites on the silt by erosion, it is evident by the very existence of Tepe Yahya that at least above 1,506 m, substantial villages produced mounded sites that have not been totally destroyed by erosion (Tepe Yahya had about 8.0 m of cultural deposit at the end of Yahya VA; Vidali, Vidali, and Lamberg-Karlovsky 1976). Ninety-seven percent of the basin center silt plain lies above 1,500 m and has no mounded site other than Tepe Yahya during the early periods.

Another prehistoric site, Site 23, lies near the village of Dasht-i Dih at the juncture of the basin center silt and the lower periphery or distal edge of the southern alluvial fan. Site 23 is of uncertain size, but may have once covered at least one hectare, under or adjacent to the 35-ha Islamic site of Tepe Dasht-i Dih (Williamson 1971, 1972c, 1972d). The precise locality of in situ prehistoric occupation has not been identified. Judging from the proportions of pottery found in reworked contexts, it was probably a minor site during Yahya VI–VB and Yahya VA, substantially larger in Iblis IV/V, and possibly had a very minor occupation in

9. After a review of the current data, C. Kramer (1982:155–168) suggests that population estimates of 100 to 150 persons per hectare are probably appropriate for villages in the somewhat better-watered Zagros, while estimates of under 100 persons per hectare are probably best for the even drier Central Plateau.

10. The base of Tepe Yahya is at an elevation of approximately 1,504 m. The 1.83 m of natural silt above the plain level would put the base of the cultural deposits at approximately 1,506 m.

Yahya IVC–IVB. Prehistoric ceramics, mostly of Iblis IV/V date, were incorporated throughout the tertiary contexts of the twelfth- to fourteenth-century "*khan*'s house." These ceramics did not, however, underlie the Islamic deposits where the excavation was continued to the basal sterile soil (Williamson 1971:182–183). Excavation by the author in 1971 of a shallow 5-by-3-m trench several hundred meters north of the main mound revealed prehistoric material incorporated into reworked contexts at a considerable distance from this major structure. The amount of prehistoric ceramic material and its distribution indicate that there was once a fairly substantial prehistoric mound or scatter site somewhere in the vicinity that has been disturbed and possibly redistributed by both erosion and the medieval occupation.

The prehistoric water supply for the Tepe Dasht-i Dih area was probably derived from the perennial spring still evident at the Imamzada Jaffarat-i Zakaria, located at the apex of the Dasht-i Dih fan, deep within the surrounding mountains about 3 km south of the silt plain margin. The scatter site reported by Beale near this spring (Site 25) shows no occupation prior to Iblis IV/V, although Site 23, which lies downstream from this spring at the interface of the fan and the basin center silt, begins in Yahya VB. This suggests that the spring's water output was great enough to reach the alluvial silt edge, where it was usable for agricultural purposes. Whether there was sufficient perennial spring flow to reach the silt or whether the spring flow was only seasonally adequate, perhaps augmented by flood runoff from within the catchment, is unknown. Alternatively, the fan may have had a wet zone at its toe (at approximately 1,520 m), resulting from the emergence of groundwater from within the upper aquifer of the fan gravels, which would have attracted the settlement. Whatever the precise combination of water supply, the inhabitants of Site 23 were using emergent groundwater (from the spring at the Imamzada Jaffarat-i Zakaria or a wet zone at the distal fan edge) as well as possibly flood runoff across the fan surface after storms.

Whether the area under cultivation near Site 23 was further increased by the construction on the Dasht-i Dih fan of a terraced field system of the type farther west in the Shah Maran-Daulatabad basin, using periodic flood runoff (see "Terraced Field System," below), remains to be thoroughly investigated. The total mountainous catchment above the modern village of Dasht-i Dih is only about 25 km^2. Although the prehistoric settlement at Tepe Dasht-i Dih is founded contemporaneously with the first north fan field settlements in the Shah Maran-Daulatabad basin, no terraced field walls were observed in the Soghun valley on the Dasht-i Dih or other alluvial fans. Site 23 at the toe of the Dasht-i Dih fan is the only early period site located with potential to use the flood runoff of an alluvial fan. Nevertheless, there is as yet no evidence that the Shah Maran-Daulatabad basin type of terraced field, spate runoff irrigation system was ever employed in the Soghun valley. The basin edge catchments in the Soghun valley are so small that storm spates are probably inadequate to produce sufficient silt and water for a significant area to use that type of irrigation technology.

Two other scatter sites, Sites 10 and 12, both with major historic period occupations, have single sherds of several different prehistoric periods. They both lie on the basin center silt less than 1 km north-northeast of Tepe Yahya and easily could have been constructed of bricks made from Tepe Yahya soil. A third scatter site, Site 14, lies near the distal end of a major alluvial fan approximately 0.5 km northeast of Lajatan (Lajeshen). It is quite likely that the site lacks an early period component—that the three vegetal-tempered sherds noted from the site derive from historic period vessels.

Other than the increase in scatters during Iblis IV/V discussed above, no other patterned shift in prehistoric settlement of the Soghun valley is evident. The localities of the settlements remain the same throughout the early periods: the southwestern edge of the central silt plain and the Dasht-i Dih fan. Despite an apparently major increase in settlement during Iblis IV/V, the geography of the settlement location actually remains the same as earlier. The pattern of settlement restricted to the southwestern corner of the Soghun valley persists throughout the prehistoric and protohistoric periods. A change in the mid- to late first millennium B.C. is almost certainly associated with the introduction of *qanat* irrigation systems. Broad expanses of potentially arable alluvial silt in the center of the valley remained unexploited prior to the first millennium B.C. The continued clustering of settlements in the southwestern corner of the valley (except for the possibly spring-fed occupation near Dasht-i Dih) implies a restriction on settlement location by available water. Variation in settlement density within the southwestern portion of the Soghun valley reflects either fluctuations in water supply and thus in population size, or changes in the pattern of distributing a fairly stable but limited population between the mound of Tepe Yahya and nearby localities in order to maximize settlement and agriculture based on available water.

Although this argument is based solely on settlement distribution, not geomorphological evidence, the same set of environmental constraints, primarily the lack of water for agricultural purposes, undoubtedly controlled the extent of agriculture, settlement location, and population growth in the Soghun valley as well as in the Shah Maran-Daulatabad basin to the west. However, the same constraints affected the settlements and water-supplemented agricultural systems differently due to environmental differences in where and how sufficient water was available in the two areas. Lacking an external catchment beyond the immediately surrounding ring of hills, the surface water supply in the Soghun valley is totally controlled by local rainfall and emergent groundwater springs and marshes from a high water table. There is no evidence in the Soghun valley from the prehistoric site locations, artifact scatters, or other constructions that rain-fed surface runoff was used as it entered the silt plain during the early periods. In the Shah Maran-Daulatabad basin, however, there is ample evidence indicating the use of rain-fed surface runoff for agricultural purposes. This contrast may result partially from the availability in the Soghun valley of springs and standing surface water, or at least a very high water table, which lessened the need to utilize surface runoff. But in addition, it also reflects the limited catchment size of the valley edge tributaries in the Soghun valley and the restricted amounts of runoff that they could provide, despite higher rainfall, when compared with the large catchment of the Rud-i Gushk above the Shah Maran-Daulatabad basin silt plain.[11]

SHAH MARAN-DAULATABAD BASIN SETTLEMENT

The alluvial silt-filled center of the Shah Maran-Daulatabad basin begins about 24 km west of the Soghun valley and extends just over 50 km westward, while ranging from 10 to 15 km in width from north to south (fig. 9.1). It lies at an elevation of 1,000 to 1,080 m above sea level, 500 m lower than the Soghun valley center. The basin is the first broad alluvial silt plain in the upper catchment of the Rud-i Gushk. The Rud-i Gushk begins about 60 km northward on southern peaks of the Kerman ranges at elevations as high as 3,386 m (Kuh-i Gushk). Within the basin the Rud-i Gushk is joined by other tributaries including the Rud-i Soghun, which drains the Soghun valley to the east, the Rud-i Ab Dasht from the east-northeast, and the Rud-i Kadan from the far northwest. Southwestward beyond the basin, the Rud-i Gushk is augmented by several other tributaries before it joins the Rud-i Shur draining southeastern Fars. The river eventually reaches the Persian Gulf about 45 km west of Bandar 'Abbas as the Rud-i Kul, approximately 340 km southwest of its headwaters on Kuh-i Mehrek and Kuh-i Gushk.

The silt plain of the Shah Maran-Daulatabad basin covers an area of about 611 km^2. The catchment of the Rud-i Gushk above the plain covers 1,298 km^2, that of the Rud-i Soghun 266 km^2, of the Rud-i Ab Dasht 340 km^2, and of the Rud-i Kadan 2,723 km^2. The encircling alluvial fans, over twenty barren rock inselbergs protruding within the basin center, and minor mountain edge tributary catchments add another 1,738 km^2 for a total catchment area of about 6,976 km^2 above the two Shah Maran-Daulatabad basin exits. Another approximately 340 km^2 of catchment area is added before these two streams join, 13 to 18 km southwestward at the Tang-i Dih-i Shaikh.

The temperature of the basin is estimated to be 3° to 5° C warmer than in the Soghun valley (Snead and Durgin 1975:8; Raikes, personal communication) and the mean annual rainfall to be about 150 mm (Raikes, personal communication). This rainfall amounts to about half that of the Soghun valley (approximately 250 to 300 mm). The substantially higher, especially southern, slopes in the upper catchment of the Rud-i Gushk receive 300 mm or more rainfall in localities beginning at heights of 1,600 to 1,700 m (Raikes, personal communication). The extremely restricted rainfall within the Shah Maran-Daulatabad basin produces an arid environment with sparse xerophytic and halophytic shrub and grass vegetation except where natural runoff collects or modern groundwater can be extracted to supplement the rainfall and permit denser plant growth. Like the Soghun valley, the basin is filled with a thick sequence of Pleistocene lakebed sediments of unknown depth. These were deposited behind bedrock basin exit barriers where groundwater rises to the surface east of Dih-i Shaikh and south of Dara Bagh. (For a map with modern place names and environment in the Shah Maran-Daulatabad basin, see Prickett 1985.) These two "emergent" groundwater springs at the southwestern basin exits provide the only perennial surface-water flow on the basin center silt plain.

Only the eastern two-thirds of this basin was surveyed (fig. 9.1). The survey concentrated in the northern portion of the basin, especially in the northeast on the alluvial fan of the Rud-i Gushk and on the adjacent areas of the central silt plain at the confluence of the Rud-i Gushk and Rud-i Ab Dasht near the modern town of Daulatabad (fig. 9.2). The Rud-i Gushk crossing this alluvial fan is today nonperennial. Its channel is a broad anastomosing network of 20- to 300-m-wide braided channels with banks under 2 m in height, forming a river flood-bed 0.25 to 0.75 km in width. The early period settlements of the basin are primarily clustered immediately west of the main Rud-i Gushk channel on stable areas of relict fan surface within the central and southern portions of the Rud-i Gushk fan and on the adjacent area of basin center silt plain.

Site Numbers and Total Occupation Areas[12]

Except for a possible Paleolithic occupation in a small cave (R76) in one of the limestone inselbergs emerging from the silt plain in the west, the earliest habitation so far identified is a group of mid to late sixth to early fifth millennia B.C. mounds. The ceramics on these sites relate to what is defined at Tepe Yahya as Yahya VII (Beale 1978 and this volume, ch. 4). The current radiocarbon and physical stratigraphic evidence from Tepe Yahya and from excavations on Tepe Gaz Tavila (R37) in 1973 indicate that the Tepe Yahya settlement begins somewhat later than sites in the Shah Maran-Daulatabad basin. The Tepe Gaz Tavila site complex, a group of four mounds (R35, R36, R36A, and R37) separated by erosional discontinuities, covers 8.46 ha (fig. 9.3). These were probably a single continuous ancient site of about 9.9 ha (180 by 550 m), more recently separated by erosion. Two other nearly contiguous, contemporary sites (R33, R34) add another 1.67 ha to form a total area of 11.57 ha of Yahya VII occupation in the Tepe Gaz Tavila vicinity. Seven other Yahya VII mounds, four independent scatter sites, and two stray artifact sites complete a picture of substantial agricultural village settlement (19.68 ha mounded

11. The entire catchment above the Soghun valley's central silt plain is under 200 km^2. This value is divided among the many small valleys encircling the basin. In contrast, the catchment of the Rud-i Gushk alone is about 1,300 km^2 above the Shah Maran-Daulatabad basin silt plain.

12. See appendix 9.A for a listing of all early period sites and their periods of occupation.

within a 20 km^2 area) during the 1,200 years of Yahya VII. An additional mounded site and four independent scatter sites were inadequately recorded and may be of either Yahya VII or Yahya VI–VB date.

The radiocarbon dates from the Tepe Gaz Tavila (R37) excavations suggest a rapid accumulation during the course of only two or three centuries.[13] The over 6.5 m of cultural deposit are comprised of alluvial deposits containing increasing quantities of occupational debris and six overlying architectural phases. The short duration raises the possibility that the large Tepe Gaz Tavila site complex may represent a gradual lateral migration of settlement rather than a wholly contemporaneously occupied community. Similarly, the other Yahya VII sites may have been occupied for only a portion of the Yahya VII millennium-plus duration. Since most sites are now post-erosional residuals, their current sizes and depths of deposit may not be directly indicative of their original sizes and durations of occupation.

The following 400-year period of Yahya VI–VB shows an increase in occupation, with thirty-nine mounded sites displaying major or minor components (28.53 ha), seven independent scatter sites (total of nineteen areas with scatters), and two stray artifact sites.[14] The trend of increasing site numbers and total site areas continues more dramatically during the 300-year period of Yahya VA when there are fifty-three mounded sites (39.06 ha), forty-seven independent scatter sites (of seventy-two scatter areas), and five stray artifact sites.

Although the Iblis IV/V period postdates the Yahya early periods, the data on this and the following two periods, Yahya IVC–IVB and Yahya IVA, are summarized here to complete the prehistoric settlement picture. During the 500-year Iblis IV/V period (including the Yahya VA-Iblis IV/V Transitional) site numbers decrease to thirty-four mounded sites (twenty-six measured for 24.74 ha), ten independent scatter sites (of a total of fifteen scatter areas), and sixteen stray artifact sites. A further decline in occupation within the basin occurs before the end of Iblis IV/V. The only substantial mounded site in the surveyed drainage area (except in the Soghun valley) during the entire 1,500-year time span of the following Yahya IVC–IVB period (R178, 2.2 ha) lies about 30 km south of the southern edge of the Shah Maran-Daulatabad basin silt plain on the Rud-i Nisa', a tributary of the Rud-i Gushk. Three sites, however, do have a few "stray artifacts" probably dating within the Yahya IVC–IVB time range, although only two of these are in the Shah Maran-Daulatabad basin, while the third lies to the south near R178. In addition, a small Yahya IVB site was located by the 1967 Harvard Survey near Dih-i Sard in the mountainous upper catchment of the Rud-i Gushk (Lamberg-Karlovsky, personal communication). The only site with traces of the following 350-year Yahya IVA period (R45, 0.05 ha) lies in the mountains at Bidu, about 13 km southeastward beyond the edge of the Shah Maran-Daulatabad basin silt plain.

Thus village occupation in the Shah Maran-Daulatabad basin ceases by the end of Iblis IV/V. It is important to note that three different statistics—site number per period, occupation area per period, and "standardized" hectares of occupation per year (Weiss 1977)—show the same trends of growth and decline, although the percentages of change vary with the statistic chosen.

Individual Site Sizes

Equally important as this data on site numbers and their total occupation areas for indications of population and cultural change is the information on individual site sizes. No mounded site is larger than 4.5 ha in the early periods except the combined Tepe Gaz Tavila complex and a single 4.9-ha Yahya VI–VA site (R308) that lies over 100 km west of the Shah Maran-Daulatabad basin and is therefore outside the survey area under discussion. Of remarkable interest is the fact that there are more mounded sites over 2.5 ha in size (four) in the Shah Maran-Daulatabad basin during Yahya VII than during any later period, despite the much longer exposure of the Yahya VII sites to erosional processes. Although much larger total occupation areas and several much larger individual site sizes are present during the Sasanian and Islamic periods, the number of individual sites larger than 2.5 ha within a period never exceeds three. Even if there is, as frequently assumed, some correlation of site size with duration of occupation (Schacht 1984:682) and the three periods succeeding Yahya VII (Yahya VI–VB, Yahya VA, and Iblis IV/V) are combined into an equally long 1,200-year period, there are still more mounded sites over 2.5 ha during Yahya VII.[15] Thus this greater number of large mounded sites in Yahya VII in comparison with

13. Three radiocarbon determinations were run on Tepe Gaz Tavila samples, two from strata preceding and one from a stratum during the architectural phases. In stratigraphic order from lowest to highest, the dates are PRL 749, 4700 b.c. ± 180 years (5568 half-life), 5955–5220 B.C. (Klein et al. 1982); PRL 748, 4690 b.c. ± 180 years (5568 half-life), 5940–5215 B.C. (Klein et al. 1982); PRL 744, 4720 b.c. ± 150 years (5568 half-life), 5925–5260 B.C. (Klein et al. 1982)

14. As mentioned above, another mounded site and four independent scatter sites were inadequately recorded and may be of either Yahya VII or Yahya VI–VB date.

15. The consistent correlation of larger site size with longer occupation is not indicated by the Rud-i Gushk survey data. Only three of the seventy-one combined Yahya VI-Iblis V period mounded sites (R6, R148, R168) and five of the seventy-nine scatter sites (R170AS, R206S, R207S, R210S, R211S) were occupied during all three subperiods (Yahya VI–VB, Yahya VA, and Iblis IV/V) and hence had the longest durations. Two of these three mounded sites were under 0.5 ha and all of the scatters were under one hectare in size. However, another four mounded sites that were occupied for a shorter duration, from Yahya VI–VB through the initial Iblis IV/V (the Yahya VA-Iblis IV/V Transitional) were larger, with only one of the four sites under 1.0 ha. In contrast, the radiocarbon dates from one large Yahya VII site (R37, 2.04 ha, 8.26 m high with over 6.5 m of cultural deposit) indicate that it was not occupied for more than a few centuries despite its substantial size (see fn. 13 and Prickett 1985).

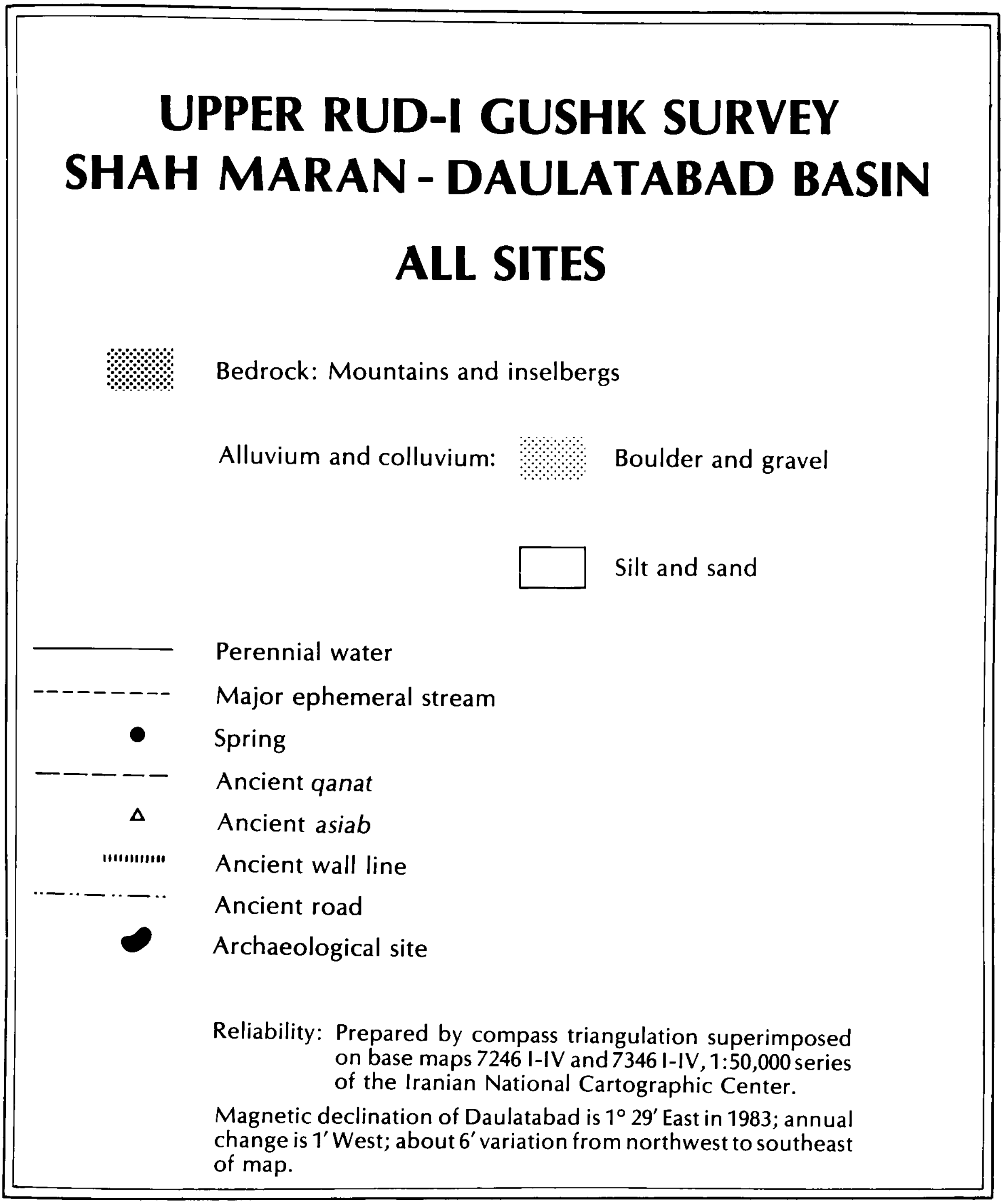
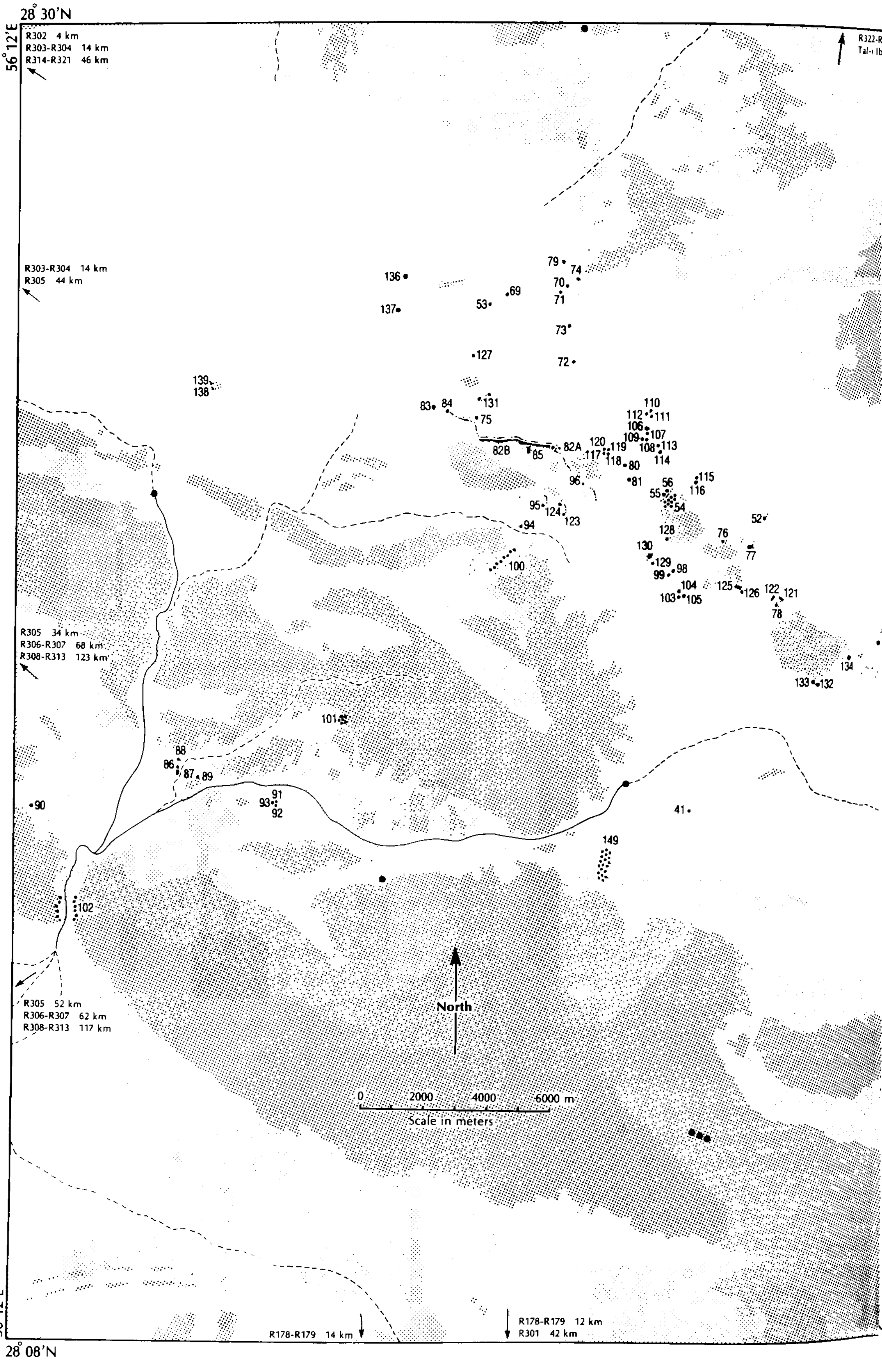
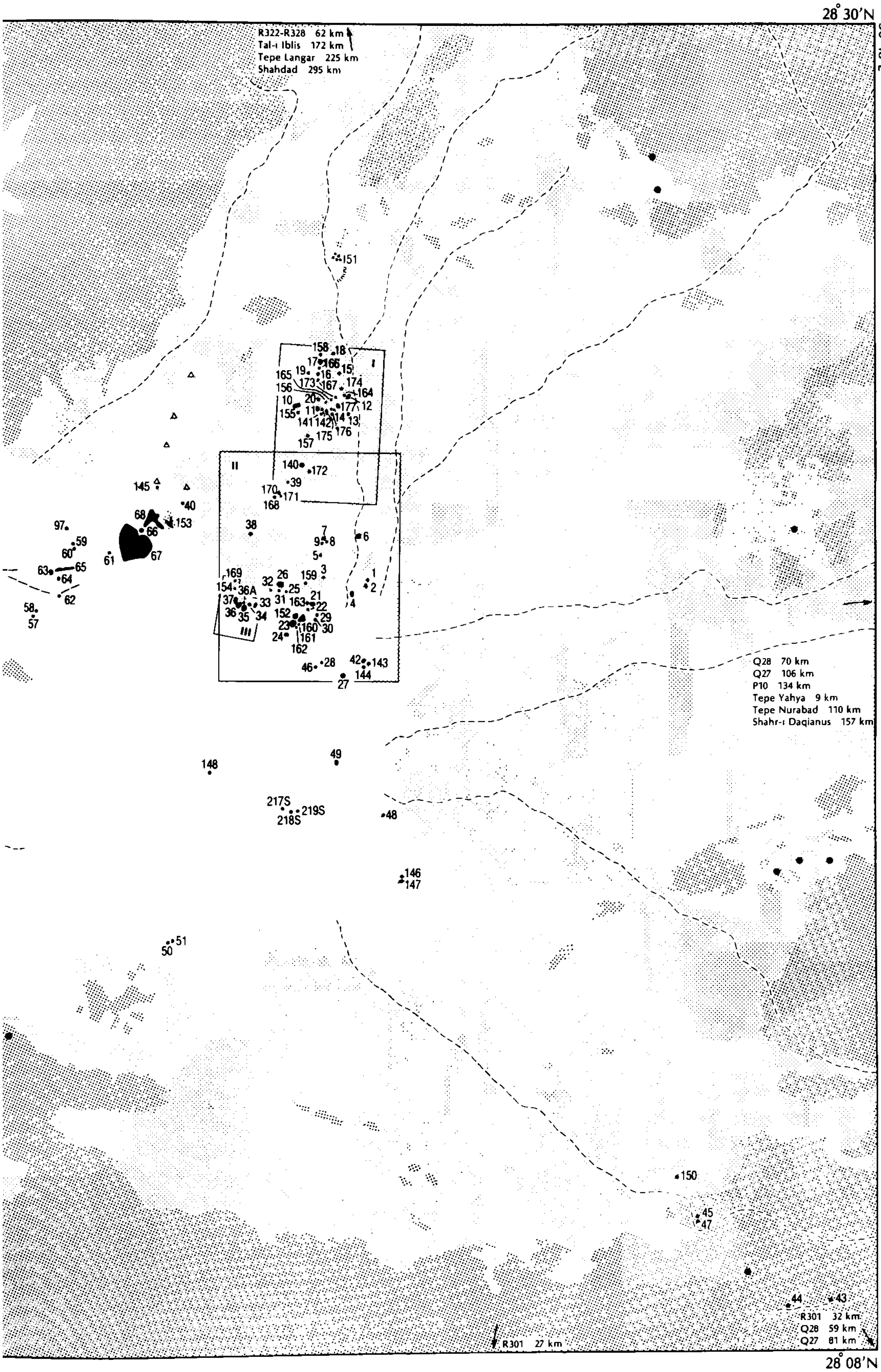


Figure 9.1. Upper Rud-i Gushk survey: Shah Maran-Daulatabad basin, all sites. Submap I refers to figure 9.5; submap II, to figure 9.2; submap III, to figure 9.3.


28° 30'N
56° 12'E
R302 4 km
R303-R304 14 km
R314-R321 46 km
R303-R304 14 km
R305 44 km
R305 34 km
R306-R307 68 km
R308-R313 123 km
R305 52 km
R306-R307 62 km
R308-R313 117 km
R178-R179 14 km
R178-R179 12 km
R301 42 km
North
0 2000 4000 6000 m
Scale in meters
56° 12'E
28° 08'N


28° 30'N
56° 48'E
R322-R328 62 km
Tal-i Iblis 172 km
Tepe Langar 225 km
Shahdad 295 km
Q28 70 km
Q27 106 km
P10 134 km
Tepe Yahya 9 km
Tepe Nurabad 110 km
Shahr-i Daqianus 157 km
R301 32 km
Q28 59 km
Q27 81 km
R301 27 km
56° 48'E
28° 08'N

the combined settlement of the following periods is not simply the effect of period length. Furthermore, even if the Tepe Gaz Tavila complex is considered as a single large site, the number of Yahya VII sites over 2.5 ha (three) is not surpassed in subsequent periods.

This decrease in the size of the largest villages after Yahya VII is accompanied by an explosion in the number of small villages. Half the mounded sites in each of the three succeeding periods, or if combined, in the following 1,200 years as a whole, are under 0.5 ha in size, compared to only 30 percent under 0.5 ha during Yahya VII. During Yahya VII the number of small villages under 0.5 ha equals the number of large villages over 2.5 ha (regardless of whether the Gaz Tavila complex is considered a single large 9.9-ha site or a group of four separate mounds). In each of the following three periods, even if they are combined as a single long period, the number of sites under 0.5 ha is at least four times larger than the number of sites over 2.5 ha.

Considering the strong possibility that the Yahya VII settlements begin approximately at a shift from depositional to erosional regime, post-depositional environmental factors may have had some influence on the lack of early small sites (Prickett 1985). A site removal process that is unique to Yahya VII time and would not affect the survival of the later small sites as well is, however, unlikely. The position of the Yahya VII sites, at the distal fan-basin center interface, is on the border between areas of net erosion (stable fan) and net deposition (basin center), although subject to enormous localized variations within this narrow zone. Thus any generalized process that obliterates sites would almost certainly have destroyed or buried only a portion of the small sites in this area. The higher frequency of small sites and the lower incidence of large sites beginning in Yahya VI–VB imply some change between Yahya VII and Yahya VI–VB in community organization: in the size of the social group residing as a community or in the intensity of the community's use of space. Whatever the precise change, its effect continued throughout the following millennium.

Corroboration of this change in individual site size is established by the average mound sizes, indicating that this change is not merely at the extremes of the site size range. The mean mounded site size during Yahya VII (1.48 ha) drops to half in Yahya VI–VB (0.73 ha) and fluctuates around that value during the following two periods (Yahya VA, 0.74 ha; Iblis IV/V, 0.95 ha;[16] or combined Yahya

16. The calculation of site area during each occupation period by using the total site size somewhat inflates the Iblis IV/V site size statistics because they include a number of large Yahya VA mounds with minor Iblis IV/V or even just Yahya VA-Iblis IV/V Transitional terminal occupations. If the five mounds terminating during the Transitional are removed from the data so that only sites with definitive Iblis IV/V ceramics are included, the total occupation area drops by 7.92 ha, the mean site size drops to 0.80 ha, and the median site size to 0.35 ha.

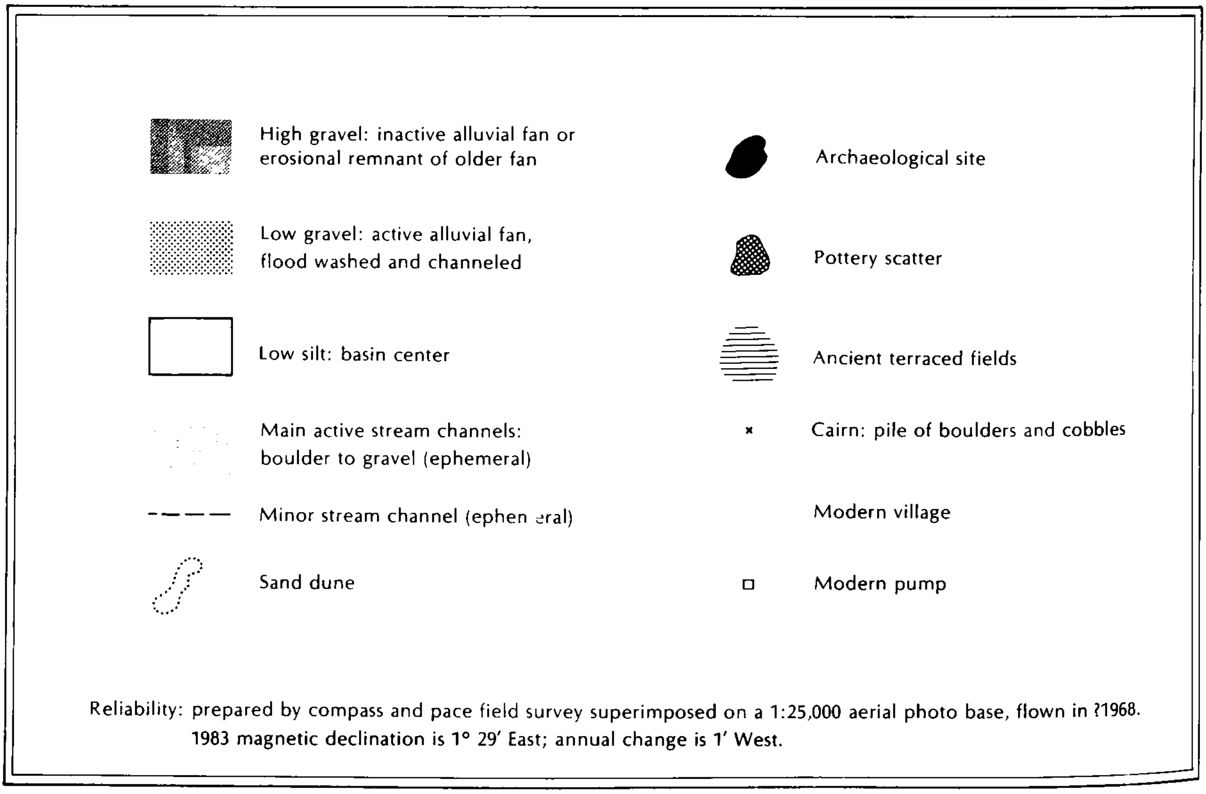
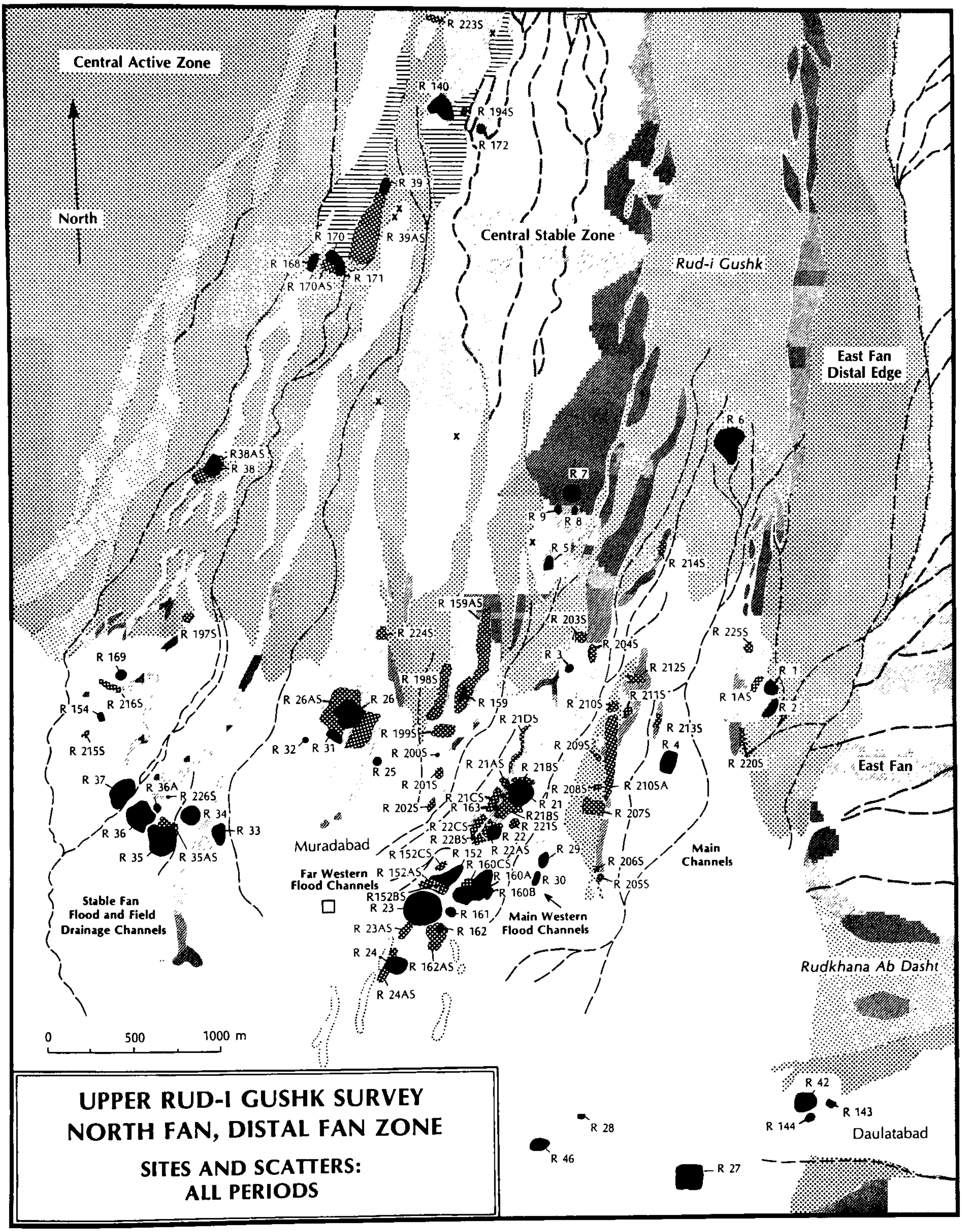


Figure 9.2. Upper Rud-i Gushk survey: north fan, distal fan zone, sites and scatters: all periods (submap II in fig. 9.1).


Central Active Zone
North
Central Stable Zone
Rud-i Gushk
East Fan Distal Edge
East Fan
Main Channels
Muradabad
Far Western Flood Channels
Main Western Flood Channels
Stable Fan Flood and Field Drainage Channels
Rudkhana Ab Dasht
Daulatabad
0 500 1000 m
R 223S
R 140
R 194S
R 172
R 39
R 39AS
R 170
R 168
R 170AS
R 171
R 38AS
R 38
R 6
R 7
R 9
R 8
R 5
R 214S
R 159AS
R 203S
R 204S
R 224S
R 197S
R 169
R 216S
R 154
R 215S
R 3
R 212S
R 225S
R 1
R 1AS
R 2
R 198S
R 26AS
R 26
R 159
R 210S
R 211S
R 21DS
R 213S
R 199S
R 32
R 31
R 200S
R 209S
R 4
R 220S
R 25
R 21AS
R 21BS
R 201S
R 208S
R 210SA
R 37
R 36A
R 226S
R 21CS
R 21
R 202S
R 163
R21BS
R 207S
R 34
R 36
R 33
R 22CS
R 221S
R 22BS
R 22
R 35
R 35AS
R 152CS
R 152
R 22AS
R 29
R 160CS
R 206S
R 152AS
R 160A
R 30
R 205S
R152BS
R 160B
R 23
R 161
R 23AS
R 162
R 24
R 162AS
R 24AS
R 42
R 143
R 144
R 28
R 46
R 27
UPPER RUD-I GUSHK SURVEY
NORTH FAN, DISTAL FAN ZONE
SITES AND SCATTERS:
ALL PERIODS

VI-Iblis V, 0.72 ha). Median sizes, which range between 58 percent and 70 percent of the mean size, do likewise, although with slightly greater variation (50 percent to 69 percent of the Yahya VII value, 0.86 ha) than is seen in the more stable mean site sizes. Thus, both mean and median mounded site sizes drop to about half of their Yahya VII value during the following three periods and remain fairly consistent throughout the 1,200-year span, whether divided into its three periods or combined into a single unit. Certainly changes in community size or in the way equally large communities utilized space seem to be indicated by these Rud-i Gushk site size changes between Yahya VII and Yahya VI–VB.

It seems unlikely, however, that the change in domestic house form and room sizes documented at Tepe Yahya between Periods VC and VB (Beale 1978) could be the cause of these site size changes between Yahya VII and Yahya VI–VB in the Shah Maran-Daulatabad basin, unless the building changes there occur several hundred years earlier than in the Soghun valley. There is no indication from the Yahya VII excavations or surface evidence at Tepe Gaz Tavila (portions of at least twenty-nine small-roomed buildings on R35, at least forty on R36, and at least thirty-two on R37; fig. 9.4) that these multiroom structures were community storage facilities as was suggested by Beale (1978:433) for the multiroom Period VII buildings at Tepe Yahya. The Yahya VII buildings excavated on Tepe Gaz Tavila seem to be domestic structures (Prickett 1985), probably occupied by extended families (as Beale suggested for the similar but later Yahya VI–VC structures), not public, communally controlled storage units. If this is the case, the suggested change in the use of these multiroom structures from communal storage units to extended family houses between Periods VII and VI at Tepe Yahya can likewise be rejected as the underlying causal factor for the changes in site sizes observed in the Shah Maran-Daulatabad basin.

An additional change in the early period sites is in site heights. Both mean and median site heights show a steady decrease from Yahya VII to Iblis IV/V, regardless of whether the data is computed by including all sites with a component of the given period or is restricted to those sites occupied only during that period. The cause of this change in site height is not clearly defined but apparently reflects changes in the interrelated variables of site duration, site function, and intensity of site use. Site height is generally considered to denote the length of time during which the debris accumulates. However, site function largely determines the nature of the ancient structures, which are the primary source

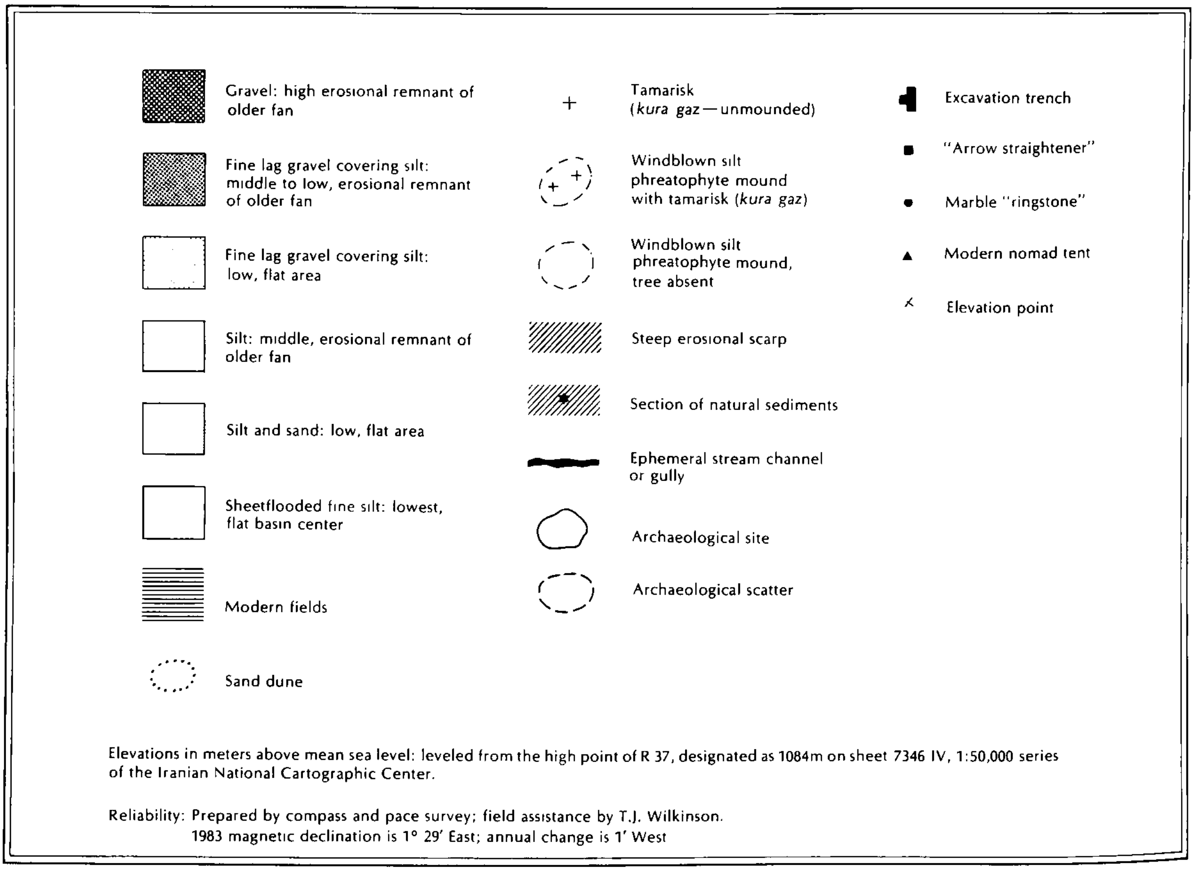
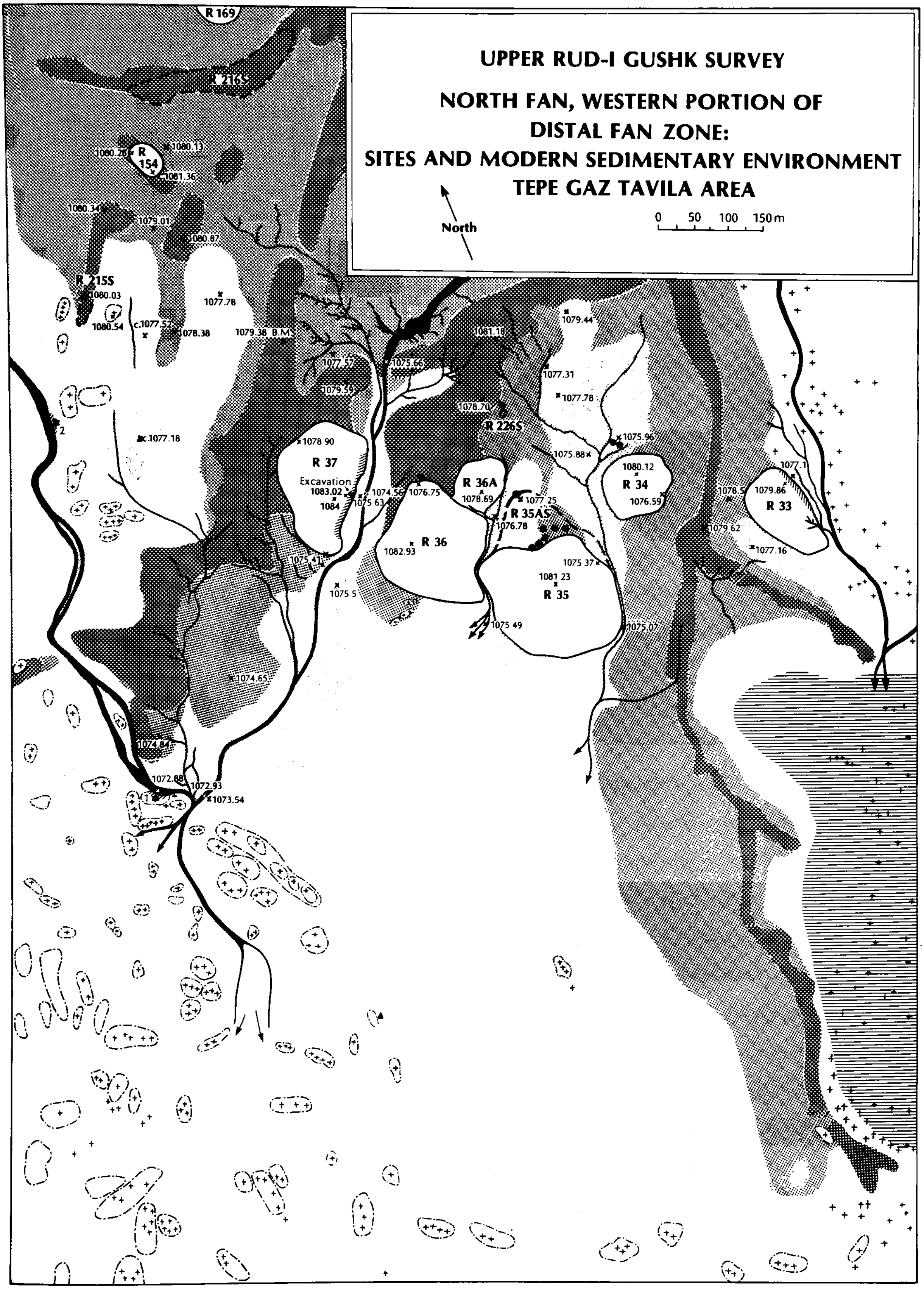


Figure 9.3. Upper Rud-i Gushk survey: north fan, western portion of the distal fan zone: sites and modern sedimentary environment, Tepe Gaz Tavila area (submap III in fig. 9.1).


UPPER RUD-I GUSHK SURVEY
NORTH FAN, WESTERN PORTION OF DISTAL FAN ZONE:
SITES AND MODERN SEDIMENTARY ENVIRONMENT
TEPE GAZ TAVILA AREA
North
0 50 100 150 m
R 169
R 216S
R 154
R 215S
R 37
Excavation
R 36
R 36A
R 35AS
R 35
R 226S
R 34
R 33
1079.38 B.M.

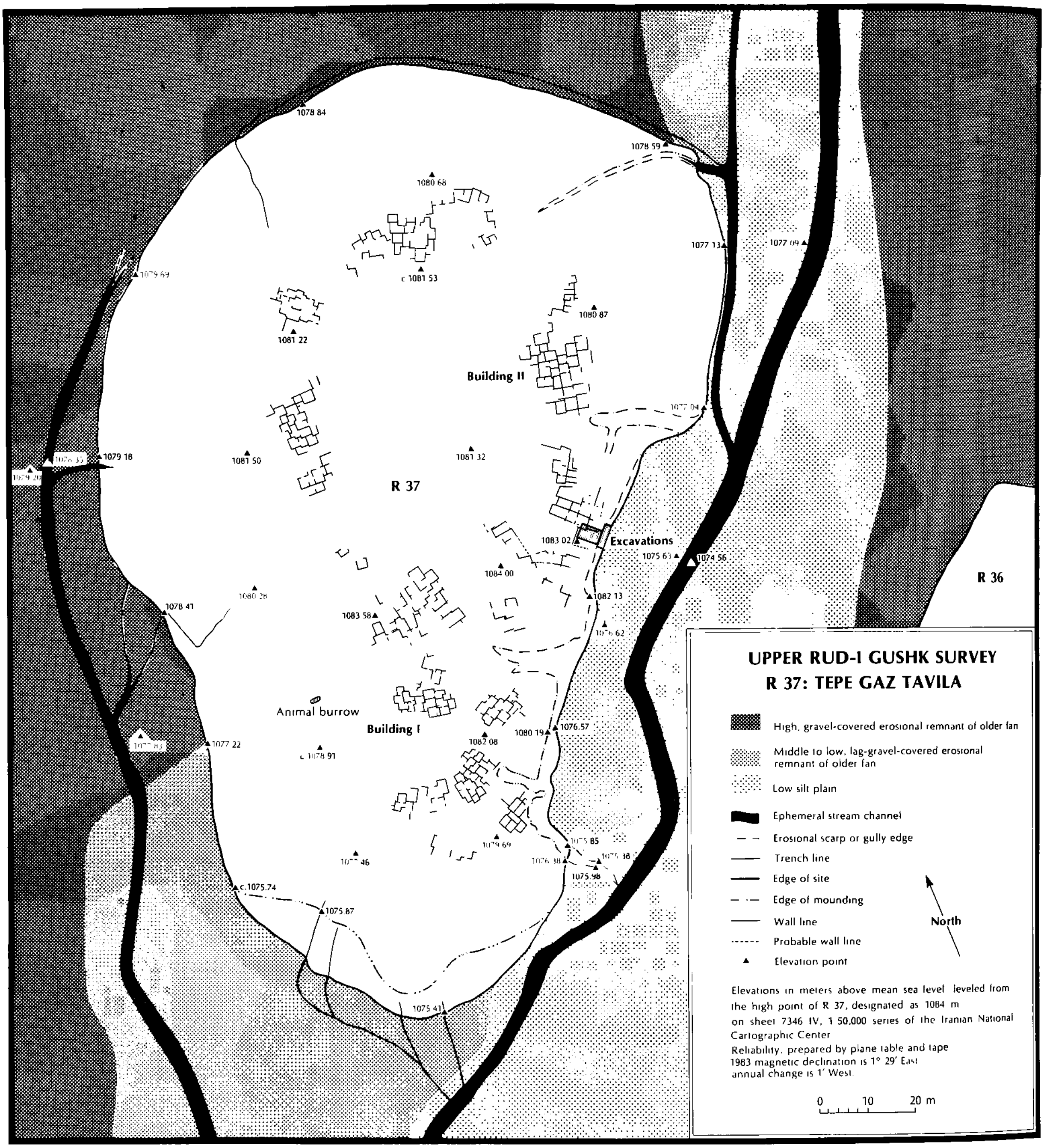


Figure 9.4. Upper Rud-i Gushk survey: R37, Tepe Gaz Tavila.

of the mounding accumulation. The amount of ceramics and other undegraded surface debris likewise reflects site function and site duration, although intensity of site use is also a significant factor in the collection of ceramic debris. These sherds and other residual debris not only contribute to the development of site height, but are also major determinants of the site's erosional susceptibility after abandonment, since they provide the protective armor that shields the site surface from further erosion. Thus more intensive site use, resulting in larger quantities of ceramics and other debris accumulation, not only increases site height but also slows post-occupation erosion.

Site Locations

The final major characteristics of the early period settlements in the Shah Maran-Daulatabad basin are their geographical placement and the changes in these locations through time.

For this purpose the basin has been divided into a series of four major topographic zones (fig. 9.1): the mountain edges of the basin, the encircling alluvial fans, the distal edges (or lower peripheries) of the alluvial fans on the margins of the basin center, and the central alluvial silt plain. Detailing the shifts in settlement in these areas documents the changes in ancient settlement locations. Although nine coalescing, low alluvial fans encircle the silt plain, the references here to the "north fan" are to the fan of the Rud-i Gushk in the eastern third of the north side of the basin.

Yahya VII

All but one of the Yahya VII mounds cluster along the distal edge of the north fan (at the fan toe; ten sites) and on the immediately adjacent area of the basin center silt (two sites; fig. 9.2). The Tepe Gaz Tavila complex of three to six sites (depending on the method of calculation) lies on the edge of the basin center silt in the flood shadow provided by a bifurcating gravel-covered silt ridge that is the erosional remnant of an earlier fan surface (fig. 9.3). These erosional residuals reach heights as great as 4 m in the distal fan area. Excavations, stream channel sections, and leveling near Tepe Gaz Tavila show that about a meter of general erosion has occurred since the sites were founded, but that an uneven ground surface relating to the erosional remnants was already present prior to their foundation.[17] Hence, the early settlers intentionally chose an area with some relief at the interface of areas of fan erosion and deposition. The small streambed running between R36 and R37 and backcutting the R37 section on figure 9.3 is an extension of the field drainage channels from the later fields in the R39–R170 area (fig. 9.2). This channel probably was not present in the sixth millennium B.C. In contrast, the flood channel backcutting R33 is more likely to have been an ancient flood channel draining the central stable fan.

Three of the other four distal fan sites (R3, R159, R163) dot either side of the far western flood channels of the main Rud-i Gushk. The latter two sit on the top of erosional remnants, and the first lies on low silts shielded from the flood channels by another remnant. The fourth distal fan site, R2, also lies adjacent to flood channels but on a somewhat lower erosional residual east of the main Rud-i Gushk. These four sites as well as Tepe Gaz Tavila are adjacent to silt, not to gravel-covered areas of ground surface.

Of the two basin center sites, one, R46, lies amidst dense tamarisk vegetation over one kilometer from the fan-toes of the Rud-i Gushk and Rud-i Ab Dasht. The other, R23, is the largest individual mound of the early periods (4.45 ha, 5.95 m high). It lies on the silt just beyond the distal fan erosional remnants on the eastern side of the same far western flood channels on which three of the distal fan sites lie. Thus there are two major settlement clusters, one the Tepe Gaz Tavila complex to the west and the other a more dispersed group flanking the far western flood channels that funnel downstream past R23.

The final Yahya VII mound, R10, lies on the central stable zone of the north fan, about 6 km north of Tepe Gaz Tavila (fig. 9.5). This site and a few stray sherds on the nearby R155 are the only evidence for a Yahya VII use of the north fan. The function of these sites prior to the development of terraced fields in this area is unclear. Unlike other large Yahya VII sites, R10 does not lie near an area of arable silt. It lacks much surface evidence for underlying structures, and surface artifacts, either sherds or flints, are very sparse. There are, however, higher than usual proportions of fragments and flakes of a green siliceous stone of unclear function, since flint was obviously imported in quantity to contemporary sites. In addition, a burned area in the saddle on the south side is associated with fragments of what may be burned clay, crude fired brick, or roof debris from a burned structure or pyrotechnic installation. No evidence of ceramic wasters, slag, or other metalworking was observed. However, the site is the closest Yahya VII site to the Siah Kuh porphyry copper deposits about 20 km northeastward. A few scattered *kura gaz* (*Tamarisk aphylla*)[18] remain in the nearby braided channel bed that edges the adjacent central active fan area and may indicate that substantially more wood, which could serve as fuel, was probably available in the sixth millennium B.C.

The twelve scatter sites[19] that cluster near the Yahya VII mounds show a similar distribution pattern. One scatter site lies within the Tepe Gaz Tavila complex, nine flank the far western flood channels, and one lies near R2 on the eastern side of the main Rud-i Gushk riverbed. One, R209S, deviates from the pattern by lying on the western flank of an erosional remnant intervening between the main Rud-i Gushk and the main western flood channels. It is the only Yahya VII occupation situated for possible use of these two channels, although considerably more intensive settlement occurred in this area during Yahya VI–VB. However, it was not recorded whether the R209S vegetal-tempered coarse ceramics are of Yahya VII or Yahya VI type. The more intensive later use of this location greatly increases the probability that the site's ceramics are, in fact, of the later, more porous Yahya VI–VB type.

Yahya VI–VB

During Yahya VI–VB there is an abandonment of the basin center sites, substantial changes in site locations in the distal

17. T. J. Wilkinson, a specialist in archaeological ge orphology, kindly provided field consultation and mapping assistance for nine days during November 1973. His observations and suggestions have greatly enhanced the geomorphological and environmental observations presented here.

18. Dr. Isan al-Shehbaz of the Harvard University Herbaria most kindly provided identifications of the modern macrobotanical specimens collected in the Shah Maran-Daulatabad basin and Soghun valley. Dr Naomi Miller of Washington University in Saint Louis and Profe . Carroll Wood of the Harvard University Herbaria also furnished assistance with identifications.

19. All independent and site-related scatter site identification numbers contain an "S," which is not present in a mounded site's identification number.

fan area, and a great increase in the number of sites on the north fan. In the distal fan area, settlement shifts northeastward. This could reflect either a need to occupy higher ground due to increased flooding or a movement upstream toward the main channels because of decreased flood flow. The latter seems more likely since R4 and R6, two of the three largest sites in the distal fan zone, are both located within the main channel of the Rud-i Gushk. All Yahya VII sites and scatters on the basin center silt are abandoned, as is the entire Tepe Gaz Tavila complex. The large settlement concentration in the latter area appears to shift about one kilometer northeastward to Tepe Muradabad (R26), the largest Yahya VI–VB site in the distal fan area. Tepe Muradabad is surrounded by three small sites (R25, R31, R32), as well as a large scatter area. All four Yahya VII sites flanking the far western flood channels are abandoned, as are four of the seven scatters. The three scatter sites remaining were inadequately recorded and may be either Yahya VII or VI–VB. The lack of nearby Yahya VI–VB sites or scatters may indicate the former.

Accompanying the abandonment of the southern portion of the far western flood channels, four new mounds (R5, R7, R8, R9) are founded on stable gravel-covered fan toward their northern end. Another site, R22, is founded farther downstream on the distal fan along the main western flood channels. The number of scatter sites located on higher erosional remnants of old fan associated with these main western flood channels or with the main Rud-i Gushk rises to six from the single one possibly present in Yahya VII. Even the single site location east of the main Rud-i Gushk shifts slightly northward from R2 to R1. Thus, there are a series of upstream, northward or eastward settlement shifts. It is unclear why these shifts occur, for it seems likely that the channels adjacent to the newly settled areas carried floodwater in earlier times as well.

On the western side of the stable distal fan, a single small site, R154, is established. As this site may be a pottery manufacturing site, its solitary location may be for proximity to fuel. The large tamarisks that colonize the basin center (*Tamarisk aphylla*) today begin only 220 m southwestward. Another new site farther north, R38, perches atop an erosional remnant overlooking a wide expanse of active braided cobble and gravel channels. The practice of agriculture by the inhabitants of the sites on the northern distal fan (R5 to R9 and R38) is uncertain, for all are in areas with gravel or coarser ground-surface cover. R6 even lies in the midst of gravel-, cobble-, and boulder-filled river channels. The total area of these six mounds on the northern edge of the distal fan is substantial, as it equals virtually half the area of the Yahya VI–VB distal fan mounded sites or one-fifth the total Yahya VI–VB mounded site area.

The founding of nineteen new sites, five with related scatter areas, farther north on the Rud-i Gushk fan is much clearer (fig. 9.5). This settlement increase is associated with the development of terraced agricultural fields on the north fan, which apparently began during Yahya VI–VB, possibly toward the end of the period. The sites are spread throughout the 400-ha area with agricultural fields (see "Terraced Field System," below), although no Yahya VI–VB mounds or scatter sites lie in the far western segment of the fields. The concentration of twelve of the nineteen new sites within the 62-ha area cornered by sites R12, R13, R11, and R20 may indicate that this was the area of most intense, if not also earliest, activity.

The presence of several thick sherds of crumbly, coarse-vegetal-tempered fabric in basal Gholi Tepe (R40) strata may indicate a Yahya VI–VB settlement somewhere in that western portion of the distal north fan. Alternatively, the sherds may have been transported long distances downstream by flood action.

The occupation of basin areas not directly related to the Rud-i Gushk fan first occurs during Yahya VI–VB. Although no basin center silt sites lie within the Rud-i Gushk flood area, two sites (R135, R148) and an independent scatter (R217S) lie elsewhere on the central silt plain, while a third mounded site (R179) lies in a basin center environment, possibly adjacent to the distal fan edge but along the Rud-i Nisa', 30 km south of the edge of the Shah Maran-Daulatabad basin's silt plain. Two other sites lie on higher erosional residuals. R74 sits on a high, narrow, ridge-like alluvial remnant extending southward from the fan edge near Shah Maran, and R87 rests on a river terrace overlooking the modern Rud-i Gushk flood plain west of Dih-i Shaikh. A sixth mounded site, R147, lies in the southeastern Shah Maran-Daulatabad basin on the distal edge of the east fan. All these sites are directly contiguous to silt areas with arable soils for agriculture.

A complete discontinuity in settlement occurs between Yahya VII and Yahya VI–VB in the Shah Maran-Daulatabad basin. No known Yahya VII sites continue to be occupied into Yahya VI–VB, although a few are reinhabited considerably later. Tepe Yahya, in the Soghun valley, remains unique as the only mound known to have this continuity in occupation. At Tepe Yahya the Period VII ceramics were not distinguished until after the 1973 season. Yahya VII sherds may lie similarly undetected under some of the larger mounds elsewhere in the upper Rud-i Gushk drainage.

Settlement continuity becomes more prevalent during Yahya VI–VB and the immediately following periods. Although only three of seventy-one mounded sites are occupied throughout all three of the periods, Yahya VI–VB, Yahya VA, and Iblis IV/V, four more are occupied from Yahya VI–VB through the Yahya VA-Iblis IV/V Transitional, and over 50 percent have at least two successive components, either Yahya VI–VB and VA or Yahya VA and Iblis IV/V. These same two trends—a lack of continuity between Yahya VII and later sites and a continuity from Yahya VI–VB to its following period—are also present among the scatter sites. The settlement continuity, however, is less prevalent among the scatter sites. Only five of the seventy-nine scatter sites were inhabited during all three of the periods between Yahya VI and Iblis V, while another fifteen were occupied for two of the three, either Yahya VI–VB and Yahya VA or Yahya VA and Iblis IV/V. Thus only about 25 percent of the scatters show any continuity during the three periods. Even if this apparent settlement continuity results partly

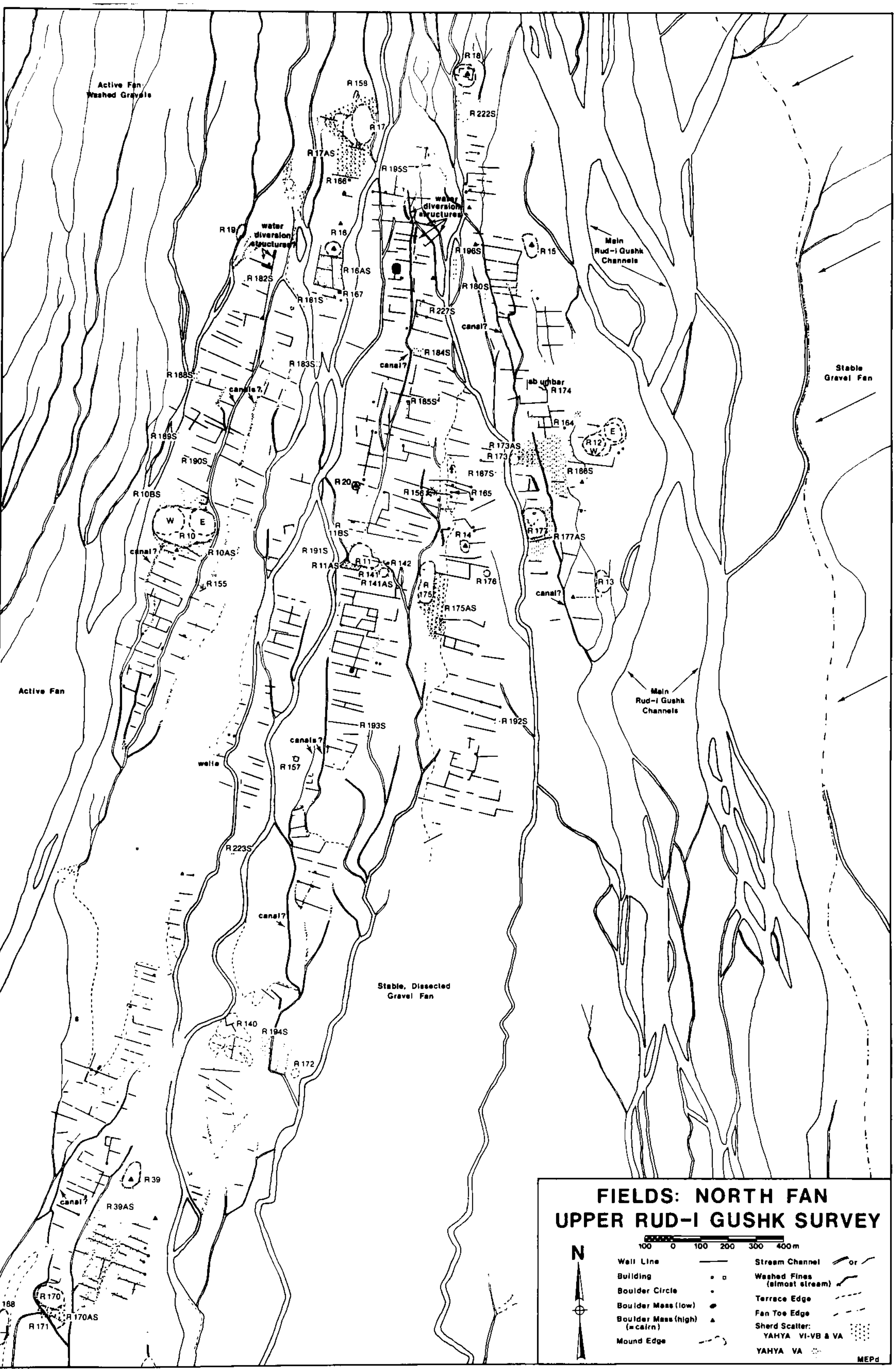


Figure 9.5. Upper Rud-i Gushk survey: fields, north fan (submap I in fig. 9.1).

from imprecisions in field dating[20] and in the definition of the ceramic sequence,[21] greater settlement continuity than that from Yahya VII to VI–VB is certainly evident.

Yahya VA

As can be inferred from the settlement continuity between Yahya VI–VB and Yahya VA, new site foundations are not as common as during Yahya VI–VB. Thirty-six of the thirty-nine Yahya VI–VB sites continue during Yahya VA. The three that are abandoned lie in the distal fan area: R154, the possible kiln site; R32, one of the minor satellite settlements of R26; and the large, mid-main channel mound, R4. The three deserted are replaced by three new sites in the distal fan zone. Two of these, R3 and R21, lie between the far western and main western flood channels, and the third, R2, is east of the main channel. Both R2 and R3 are reoccupations of Yahya VII sites. In addition, eleven of the thirteen Yahya VI–VB scatter sites in the distal fan area continue, accompanied by the founding of seventeen new independent scatter sites and the development of six site-related scatters. The seventeen independent scatter sites are broadly spread across the distal fan zone flanking all the major distributary flood channels. Beyond the Rud-i Gushk distal fan, one site (R42) is founded on the adjacent distal fan of the Rud-i Ab Dasht, and three low sites (R24, R28, R152) begin on the basin center silt near the distal fans of these two rivers. Three site-related scatters develop in association with two of these sites.

Upstream the Yahya VI–VB grouping of northern distal fan sites continues, with R38 in the far west of the central stable area, R5, R7, R8, and R9 near the western channels of the main Rud-i Gushk, and R6 in mid-channel. Farther north, the north fan field area experiences its maximum development, with a total of twenty-six sites (an increase of seven: R18, R19, R39, R140, R155, R167, R172), twenty-one independent scatter sites and eleven site-related scatters. Occupation continues on all nineteen of the earlier Yahya VI–VB mounds. The distribution of Yahya VA mounded sites and scatters throughout the area presumably indicates that all areas of the agricultural fields were being cultivated. During both Yahya VI–VB and Yahya VA the mean sizes of the mounded sites associated with the agricultural fields are about half the mean sizes of contemporary sites in the distal fan and basin center silt zones.

Beyond the Rud-i Gushk north fan area all six Yahya VI–VB mounded sites elsewhere in the basin remain inhabited during Yahya VA. In addition, three new settlements appear, one (R49) on the basin center silt and two (R51, R146) in the southern and southeastern distal fan zones. The single small Yahya VI–VB scatter on the eastern basin center silt expands to three scatter areas. In addition, a cairn and building complex (?cemetery), R151, at the Rudi-i Gushk fan apex at the far north of the north fan was in use during the Yahya VA period.

Iblis IV/V

Following the end of the early periods, the number of settlements halves during Iblis IV/V. The decrease in site number occurs primarily through the abandonment of most of the north fan fields. The two highest Yahya VA mounds within the north fan field area (R11, R12), as well as the smaller mound (R39), have minor Yahya VA-Iblis IV/V Transitional occupations. After these Transitional occupations cease, only the southwestern corner of the north fan field area is inhabited, although a few stray Iblis IV/V sherds indicate some minimal activities on the larger mounds (R10, R12, R18) elsewhere in the field area.

Farther south, five of the six sites on the northern distal fan are abandoned. Only the mid-channel R6 remains occupied. In the southern portion of the Rud-i Gushk distal fan all Yahya VA sites (three mounds and ten scatter sites) west of the far western flood channels are abandoned after a minor Yahya VA-Iblis IV/V Transitional occupation on only one mound, Tepe Muradabad (R26), and two scatter sites (R159AS, R216S). Only a single new small site (R169) was settled west of the far western flood channels during Iblis IV/V. The two Yahya VA mounded sites (R24 and a Yahya VA-Iblis IV/V Transitional occupation on R22) and seven scatter sites, which do continue in use during Iblis IV/V, all cluster along the main western flood channels and on the main Rud-i Gushk channel itself. Likewise, seven new mounded sites (R27, R29, R30, R143, R160, R161, R162) and three new scatter sites lie in this same area. Although superficially a location pattern somewhat similar to that of Yahya VI–VB, the Iblis IV/V sites all cluster farther south on the extreme limits of the distal fan than did those of Yahya VI–VB, as well as on the adjacent basin center silt, an area uninhabited during Yahya VI–VB. A distal fan-basin center interface location precisely similar to this Iblis IV/V one, but on the western side of the central active area of the Rud-i Gushk fan, now experiences its first substantial use with three new sites (R40, R66, R153).

Despite all the site abandonment and settlement discontinuity on the Rud-i Gushk distal fan, there is as much total mounded site area in the combined distal fan and adjacent basin center fairly early in Iblis IV/V (18.5 ha) as during any other period (Yahya VII, 16.8 ha; Yahya VI–VB, 12.7 ha; Yahya VA, 18.4 ha). However, this Iblis IV/V total is probably inflated by the large size of Tepe Muradabad (R26), which is inhabited only during the Yahya VA-Iblis IV/V Transitional. Excluding the two Transitional sites on the distal fan (R22, R26), the Iblis IV/V site area in these two zones is 14.3 ha. Like the mounded site pattern, the scatter sites on the basin center silt show little change in number or total area from Yahya VA to Iblis IV/V, although their precise locations move slightly. In contrast, but also like the mounded site pattern, large decreases in scatter areas occur on the Rud-i Gushk distal fan and in the northern field

20. Five mounded sites and four site-related scatter sites are listed for both Yahya VI–VB and Yahya VA periods because their sherd types were insufficiently specified.

21. Ten mounded sites and six scatter sites with Yahya VA components are also attributed to Yahya VI–VB on the basis of a single ceramic type, the porous, coarse-vegetal-tempered fabric.

area between Yahya VA and Iblis IV/V. Scatter sites on the distal fan drop to about one-third their former number and area. In the north fan field area mentioned above, 15.9 ha of earlier scatter sites are abandoned. Only one of the thirty-two Yahya VA scatter sites, the site-related scatter R170AS, continues in use.

Beyond the Rud-i Gushk fan area, three of the four Yahya VA sites on the basin center silt are abandoned. Only R148 continues. In contrast, the previous pattern of settlement on the eastern and southern distal fans largely continues. Although R147 on the east fan is virtually abandoned except for a few stray artifacts, a new settlement, R50, is founded on the south fan. In the central basin the only site, R133, lies on a spur of the Kuh-i Jannatabad inselberg and is obscured by later Islamic construction. A large cairn field, R149, lies on the fan in the southwestern corner of the basin. The few surface sherds here appear to be extremely weathered Iblis IV/V fabric types. This location for a cemetery (if that is, in fact, the site's function) seems unusual, since no contemporary settlements exist within 10 km. Other Iblis IV/V sites within the upper Rud-i Gushk catchment dot the surrounding mountainous uplands. A small site (R45) lies at 1,670 m by a mountain valley streambed at Bidu, about 13 km southeast of the silt plain edge, and a string of sites (R314–R321) lies about 37 km north of the basin silt edge approximately 1,500 m in a small valley on the upper reaches of the Rud-i Kadan, the main northwestern tributary joining the Rud-i Gushk in the Shah Maran-Daulatabad basin.

Summary

The nearly two millennia spanned by the early periods are accompanied by two major settlement relocations in the Shah Maran-Daulatabad basin. First is the northeastward shift of Yahya VI–VB sites on the distal fan and the contemporary development of the north fan fields. Second is the abandonment toward the end of Yahya VA of virtually the entire terraced field system on the north fan. This is accompanied by an intensive relocation to the extreme southern end of the distal fan flanking the main Rud-i Gushk and its main western flood channels and onto the adjacent basin center silt. The total abandonment of the Shah Maran-Daulatabad basin before the end of Iblis IV/V is a third shift, postdating the chronological focus of this chapter. Throughout the two millennia under consideration, the mean mounded site sizes and heights and the mean scatter site sizes decrease. Site numbers and total areas of occupation, however, increase, peaking sometime during the late fifth to initial fourth millennia B.C. (Yahya VA). Following Yahya VA a downward slide in settlement results in the total abandonment of all sites sometime before the late mid-fourth millennium B.C. (Yahya IVC).

Comparable size and location shifts are not evident in Beale's Soghun valley survey data. There, mounded site number and area (of the single mound, Tepe Yahya) remained constant, while the use of that intrasite space is believed to have decreased in intensity (Beale 1978:428). As in the Shah Maran-Daulatabad basin, scatter site numbers and total areas in the Soghun valley increase throughout the early periods, while mean and median scatter site sizes decrease. Settlement continuity, rather than locational shifts, is apparent in the occupation of Tepe Yahya and the Soghun valley scatter site localities. Even during the Iblis IV/V period when Tepe Yahya is uninhabited, the scatter sites remain in the same localities. The location pattern remains similar while the primary change is the addition of nearby scatter sites. The increase in the total occupation area of Iblis IV/V scatter sites almost equalizes the absence of settlement at Tepe Yahya.

REGIONAL SETTLEMENT

Outside the Shah Maran-Daulatabad basin, the southern Kerman settlement patterns for the early periods remain virtually unknown. None of the known sites has a Yahya VII occupation. Reported sites of Yahya VI–VB and Yahya VA are widely separated geographically. With a single exception, each of the fifteen sites with an early period component lies at least 10 km from the nearest contemporary site: Tal-i Iblis, M-1, and Ghubayra (Tal-i Iblis Survey; Chase, Fehérvári, and Caldwell 1967); Site 106 (Qobaira Survey; Sajjadi 1979); Tepe Langar (Harvard 1967 and Prickett Surveys; Lamberg-Karlovsky 1968; Meadow 1968; Prickett 1985); Tump-i Surkh South, Tump-i Surkh Qalat, Tepe-i Mauru, and Tepe Sultan Miri (Stein 1937; P18S, P19, Q17, and Q23 respectively of the Prickett Survey, Prickett 1985); Q1, Q2, and Q27 (Prickett Survey; Prickett 1985); Shahdad (Iranian National Center for Archaeological Research excavations; Hakemi 1970, 1976; Salvatori and Vidale 1982); Qariat al-Arab (Stein and Qobaira Surveys; Stein 1937; Sadjjadi and Wright 1976; Sajjadi 1979); and 100 m south of Tepe Nurabad (Stein and Harvard 1967 Surveys; Stein 1937; Meadow 1968 and personal communication). The only exception is in extreme southeastern Kerman on the Rud-i Jagin, about 30 km south-southwest of Manujan, where two mounds with Yahya VA components (Q1 and Q2) lie about 2 km apart. The first twelve sites listed above apparently lie in basin center environments, while the others are on alluvial fans or possibly distal fan areas.[22]

The wide dispersion of the recorded settlements precludes a lengthy discussion of regional settlement patterns in southern Kerman during the early periods. It is only later during Iblis IV/V that there is a substantial increase in site numbers on the Bard Sir plain, the only other area rigorously surveyed (Chase, Fehérvári, and Caldwell 1967; Sadjjadi and Wright 1976; Sajjadi 1979; discussion in Prickett 1985). The Shah Maran-Daulatabad basin clustering of early period settlements remains unique within Kerman Province.

The settlement density in the Shah Maran-Daulatabad basin much more strongly resembles the earliest two settlement phases in the major basins of eastern Fars (de Miroschedji 1973; Sumner 1977). There, fairly large numbers

22. The environmental descriptions in the literature are not always clear. Only Tepe Langar and the P and Q sites were visited by this author.

of sixth millennium B.C. settlements of the Mushki and related fabrics horizon (which the early Yahya VII dense, vegetal-tempered coarse ware, although unpainted, somewhat resembles) cluster in the Darab and Fasa basins. The early coarse fabric horizon is followed by a slightly changed and much denser settlement system marked by the Bakun B coarse wares and the Bakun A black-on-buff painted wares. This second ceramic horizon in Fars extends from Late Susiana (contemporary with Yahya VI–VB) through Susa A (contemporary with Yahya VA) and possibly later.

AGRICULTURAL TECHNOLOGY

Shifts in settlement in the Shah Maran-Daulatabad area are at least partially determined by changes in the agricultural system, including the development of terraced fields on the north fan. These agricultural and irrigation systems are briefly summarized here. The evidence is divided into four categories: the artifacts used for agricultural activities, the physical evidence of food remains, the irrigation potential of settlement locations inferred to have been used by agriculturalists, and the physical evidence of ancient terraced fields.

Artifacts

The artifacts reflecting agricultural activities are few and give no clear indication of the activities performed. None of the twenty-eight worked bone artifacts of Yahya VII date excavated at Tepe Gaz Tavila are verifiable as agricultural tools, although the fine handle forms of several are highly suggestive. The many ground stone implements—bowls, pounders, grinding stones, and others—document grinding and other food preparation activities, although they do not directly confirm agricultural production. No ground stone hoes or other soil preparation devices are identifiable. This negative evidence probably means that wooden agricultural implements were used for field cultivation. The chipped stone artifacts of Tepe Gaz Tavila, mostly of flint and chert, are all microlithic and include a few microblades with "silica polish." Whether the polished microblades were used in sickles for grain harvesting or in other plant processing tools cannot be verified. Most probably bone- or wood-hafted stone knives or sickles were used for harvesting. No truncated trapezoidal segments of macroblades of the traditional sickle blade form were excavated or found on the surface of the Tepe Gaz Tavila complex or on contemporary sites in the Shah Maran-Daulatabad basin. Truncated or snapped macroblades were found, however, on several Yahya VA sites.

A similar dearth of agricultural implements, other than small chipped stone artifacts, occurs at Tepe Yahya. No hoes or other possible cultivation tools are reported earlier than Yahya VA.1, when three small ground-stone implements occur in unclear contexts beneath the Yahya IVC architecture and above, or at least unsealed by, Yahya VA.1 construction strata.

Food Remains

The physical food evidence is comprised of bones and botanical samples from the excavations of Tepe Gaz Tavila (R37) and R12. The mid-sixth millennium B.C. Tepe Gaz Tavila faunal material, studied by Richard Meadow, shows reliance on sheep (*Ovis*), goat (*Capra*), and, to a lesser extent, cattle (*Bos*, probably *B. indicus*) herding (Meadow, this volume, ch. 3). The botanical samples were processed in the field by Maurizio Tosi using flotation techniques (Tosi 1976) and studied by Lorenzo Costantini, whose results are also discussed in chapter 3. The Tepe Gaz Tavila samples show mid-sixth millennium B.C. use of mixed cereal (wheat, barley, and millet) cultivation (both einkorn and emmer wheats, *Triticum monococcum* and *T. dicoccum*; hulled two- and six-row barley and naked six-row barley, *Hordeum distichum*, *H. vulgare*, and *H. vulgare* var. *nudum*; and proso or broomcorn millet, *Panicum miliaceum*). The presence of *Astragalus* sp., a leguminous field weed, is not surprising, although it was not observed in the modern fields. Two other supplemental foods recovered, caper (*Capparis* sp.) and cultivated dates (*Phoenix dactylifera*) still grow today on the basin center silt plain. The former are common on disused fields near villages, while the latter are carefully cultivated in irrigated gardens. A third, pistachio, *Pistacia vera*, is a traditional product of interior Kerman. Wild pistachio trees today grow as close as 35 km northward within the Upper Rud-i Gushk catchment on the southern slopes of the Kerman ranges at elevations of 1,800 to 2,170 m. Pistachios easily could have been harvested or even traded in early times.

The most remarkable aspect of this macrobotanical evidence is that the intricacies of date pollination and cultivation were sufficiently understood to enable production of this nutritious, storable food crop of the desert warm zones. Whether imported or, as is more likely, grown locally, it signifies that a major step in the agricultural self-sufficiency of *garmsir* areas had already occurred. The spread of date cultivation may have acted as a major enabling factor for the great increases in sixth millennium B.C. and later agricultural settlements in southern Mesopotamia, southern Iran, and Arabia.

No botanical material was collected from Yahya VI–VB sites in the Shah Maran-Daulatabad basin. At Tepe Yahya this period sees the introduction of the two new cereal varieties, one that is possibly bread wheat (*T. durum-aestivum* s.l.) and the other, naked round-seeded barley (*H. sphaerococcum*), as well as goat-face grass (*Aegilops* sp.) as a field weed. The presence of all three (as well as the continued presence of the earlier Yahya VII wheat, barley, and millet varieties) is confirmed in the Shah Maran-Daulatabad basin in the following Yahya VA period. The Tepe Yahya material from Periods VI–VB also contains several fruits, the hackberry (*Celtis australis*), cultivated grape (*Vitis vinifera*), and an unidentified fruit. Their absence in the Shah Maran-Daulatabad basin samples may reflect the much drier environment of this area. In addition, two cereal field weeds, *Agrostemma* sp. (some species of which are poisonous and damaging to wheat flour; Renfrew 1973:165) and *Lithospermum arvensis*, first appear at Tepe Yahya in Periods VI and VA respectively, although they are not present in the Shah Maran-Daulatabad basin samples. In this latter area the Yahya VA samples (from R12) also show the introduction of *Triticum sphaerococcum* (Indian dwarf or shot wheat); of *Avena* sp. (probably a wild oat) reported earlier at Tepe Yahya in Period VII; of the field weed, *Phalaris* sp. (canary grass); of the frequently eaten legume, *Lathyrus* sp. (grass pea, vetchling, or chickling, depending on the species); of *Cucumis/Citrullus* (whether an edible melon or cucumber or the modernly present wild bitter gourd, *Citrullus colocynthis*, is unknown); and of poppy, *Papaver* sp., possibly grown for either or both its nutritional and/or narcotic properties. The locally common caper, *Capparis* sp., continues from the earliest occupation.

Irrigation Potential of Site Locations

Much evidence for agricultural activity derives from the locations of the sites themselves. This is based on the assumptions that the people lived near their work and that the primary "work" of the sixth through fourth millennia B.C. villagers was agricultural subsistence. Thus, settlement locations and their shifts provide evidence for ancient agricultural activities.

The Yahya VII sites all cluster at the interface of the distal fan of the Rud-i Gushk and the basin center silt. This area is subject to both rainfall and runoff collection, the two forms of surface water potentially available. There is no evidence that the ancient agricultural system in the Shah Maran-Daulatabad basin was ever wholly dependent on rainfall (i.e., dry farming). The modern rainfall is too low for dry-farmed cereals. Dry farming in Iran is usually considered to require about 250 to 300 mm mean annual rainfall (Bobek 1955:27), although that quantity can be reduced if the seasonal scheduling is appropriate (Zohary 1973:38; Raikes 1965b:192). If settlements were wholly dependent on dry farming rather than runoff collection, a more scattered or random pattern of settlement throughout the areas with appropriate soils would be expected. Instead, all the Yahya VII sites except R10 (which lies in the north fan field area only 30 m east of a 50-m-wide braided channel edging the central active fan area) are tightly clustered at the debouchement of the Rud-i Gushk fan channels onto the basin center silt plain.

At the entrance of the flood channels onto the silt plain the meager rainfall is supplemented by periodic inundation, by both sheet-flood and river-flood runoff. The fine texture of the alluvial silt provides a highly impermeable ground surface that encourages both rainfall and floodwater to run off downslope rather than infiltrate. Thus even minor showers produce local sheet-flooding, during which the water flows off fairly uniformly across the whole ground surface. The extreme sparseness of the vegetation cover provides little hindrance to this sheet-flood flow. Because the basin center is virtually flat, the water running off the sloping fans rapidly collects along their peripheries in any slight swales or depressions. Here most water remains puddled until it evaporates, because of the impermeability of the fine silt. But some water slowly infiltrates, providing soil moisture to the plant root zone. Despite the amount of summer insolation, even midsummer storm runoff remains puddled on the surface for several days until dried by evaporation. In addition to this local, generalized sheet-flood runoff, the Rud-i Gushk channels transport the runoff water accumulated throughout its 1,300 km^2 catchment. When this river floodwater reaches the basin center silt through the river's fan distributary channels, it spreads out horizontally as an enormous additional flood sheet. This fanned-out river floodwater naturally unites with the locally accumulating sheet-flood runoff in the same locale at the edge of the basin center silt. The two floodwater types substantially augment the meager water provided by local rainfall. The proximity of the early period sites on the distal fan and basin center silt to the Rud-i Gushk fan distributary channels provides their sustaining areas with enormous quantities of additional floodwater.

During the late sixth and early fifth millennia B.C. this spate flow (flood runoff) was undoubtedly used to augment rainfall for agricultural purposes. Although there is no concrete evidence during Yahya VII for irrigation either by flood spate or by perennial water sources using constructed channels, circumstantial evidence for the former is substantial. As mentioned above, site locations provide strong associational evidence. The Yahya VII sites concentrate where the river floodwater spreads across the basin center silt. If dry farming alone were practiced, a settlement distribution throughout the areas with arable soils would be expected. If only sheet floodwater were being used to supplement rainfall, the sites would cluster at the interface of the distal fans and basin center silt. The settlements do indeed lie at this interface, but they are also restricted to those areas today reached by Rud-i Gushk floodwater. In contrast, if sheet floodwater were being used alone, the distribution should more randomly encircle the basin center within the interface area.

Several additional clues further substantiate that water was manipulated by the ancient agriculturalists. Enigmatic evidence for small channels cutting the sediments beneath Tepe Gaz Tavila may indicate that such channels were employed for flood drainage and site protection or for other aspects of local water transport. The ancient fields, which were probably adjacent to the settlements, apparently produced mixed cereals and dates. The mixed cereals have somewhat varying but seasonal moisture requirements. In contrast, the dates, well-adapted to arid and saline environments, need infrequent watering, but do require water applications throughout the year. And finally, a hygroscopic, ancient soil horizon exposed in two stream bank sections several hundred meters from Tepe Gaz Tavila (fig. 9.3:1 and 2) may indicate that fields near these early sites were bounded by low silt rises to retain the flood water (forerunners of the modern Iranian *marz-band*). During field use these silt ridges would have encouraged the surface accumulation of soil and groundwater salts, raised through capillary action with the rise and fall in soil moisture after the repeated ponding and evaporation of surface floodwater. Likewise, silt ridges of any height would have substantially slowed flood flow in the nearly flat basin center, and thus would have limited the ability of the floodwater to flush away accumulating surface salts.[23]

This flood-runoff agriculture environment contrasts with that of the Soghun valley, where the settlement pattern is much more stable during the early periods. In the Soghun valley, Tepe Yahya and many of the scatter sites are located near a low-lying area, once possibly swampy, at the basin exit. There groundwater is easily available as it rises over the impermeable lakebed clays of the valley floor. Even in the mid-1970s, after millennia of *qanat* use and a decade of diesel pumping, the groundwater level near Tepe Yahya was only 6 to 8 m below ground surface (Snead and Durgin 1975:17).

The accessibility of naturally entrapped runoff groundwater enables enormous settlement stability in the Soghun valley. The slow percolation of groundwater through the aquifer helps to minimize the effects of the region's highly variable rainfall. The high level of groundwater storage provides easily available water and subsurface soil moisture long after the rainfall has evaporated and the flood spate subsided. This groundwater is supplied by a mean annual rainfall almost twice that of the Shah Maran-Daulatabad basin. In fact, rainfall in the Soghun valley today is sufficient for dry farming. However, a random, valley-wide settlement pattern demonstrating the use of dry farming is not evident during the early periods, nor is there a settlement distribution along the distal fan-basin center interface indicating the use of generalized sheet-flood runoff from the alluvial fans. No evidence for river-flood use in this interface area is seen either, with the possible exception of the Tepe Dasht-i Dih vicinity discussed previously. Thus neither sheet-flood nor river-flood runoff was used at the water's entrance into the basin center along the fan edges, as was done in the Shah Maran-Daulatabad basin.

Furthermore, there is no evidence that the Rud-i Soghun was used directly for spate irrigation. If it were, the area toward the basin exit near Tepe Yahya would probably have been used, as it is the first area where sufficient surface runoff from the limited catchment is concentrated. Alternatively, the surface runoff may have been used only after it reached the natural storage area at the basin exit, where a bedrock basin exit barrier concentrates both the surface floodwater and the groundwater runoff. This runoff collection produces a high water table, if not a standing surface-water marsh or lake. The height of the ground- and surface-water retained depends not only on the rainfall input but also on the height of the basin exit barrier. This bedrock barrier has probably been lowered through the millennia by both man's activity and natural erosion, but its actual height during the early periods is unknown. As a result of the higher rainfall and the easy availability of trapped surface- and groundwater runoff in the southwest, the Soghun valley settlement is much less dependent on a storm's immediate surface runoff for its agricultural water supply than is settlement in the Shah Maran-Daulatabad basin. If the water table were adequately high, the capillary rise of vadose water would maintain soil moisture for plant growth long after both surface runoff and even groundwater discharge had ceased. Thus the settlement system would be less sensitive to slight shifts in rainfall patterns or intensity than would be settlement in the flood-runoff-dependent Shah Maran-Daulatabad basin. These environmental characteristics undoubtedly helped to stabilize the Soghun valley settlement pattern.

In the Shah Maran-Daulatabad basin, insufficient rainfall for dry farming and a deep water table in the distal fan area (today about 55 m below ground surface at Daulatabad) apparently forced prehistoric agriculturalists to depend on surface runoff. In an arid to semiarid catchment this dependence on surface runoff required strategies that maximized runoff use during rapid flood peaks after infrequent storms. Dependence on this runoff undoubtedly influenced settlements to locate near the river's flood channels. Frequent changes in the flood channels are characteristic of braided channels on active alluvial fans. Substantial channel changes would undoubtedly have forced the relocation of the villages of agriculturalists dependent on the floodwater but fearful of its flood-peak destructiveness.

Although difficult to demonstrate, the major settlement location shifts around different Rud-i Gushk fan distributary channels may reflect changes in these runoff channels or in the technologies people devised for utilizing the runoff. The northeastward spread of settlement during Yahya VI–VB times included the founding of two major mounds, R4 and R6, in the main riverbed. It seems plausible to argue that these were surrounded by fields within the river channel, as is still done today near R4 by farmers from Daulatabad. Agriculture would not have been difficult near R4, for the surrounding silt could have been cultivated in the same manner as around the earlier Yahya VII sites. In contrast, the R6 area of the river channel is today composed of gravels, cobbles, and even small boulders interstitially filled with silt. If the riverbed were like that during the mid-fifth millennium B.C., a different agricultural technology would have been required for crop production. The agricultural potential of the area surrounding the other five Yahya VI–VB and Yahya VA sites on the central stable fan at the northern end of the distal fan is also unclear. Areas of nearby arable soils are not apparent. Whether these five site loca-

23. Unfortunately this ancient soil horizon is as yet undated, since any direct physical stratigraphic tie with Tepe Gaz Tavila has been removed by erosion. Although it cannot be verified to be of Yahya VII date, the rarity of ancient soil horizons within the basin and the lack of any other known period when such a soil may have developed in this area argue strongly for this date. Further fieldwork is required for its verification.

tions, as well as that of R6, indicate nonagricultural specializations or the use of different agricultural techniques is not known. Farther north on this central stable area of the north fan and immediately west of the wide braided channel of the main Rud-i Gushk is the area that experienced the largest settlement increases and agricultural development using a "new" technology during Yahya VI–VB and Yahya VA.

Terraced Field System

The Yahya VI–VB and Yahya VA sites on the north fan (fig. 9.5) lie in an area of over 400 ha containing river-flood (spate) irrigated fields. The fields are demarcated by terrace walls constructed on the stony fan surface. The walls generate cultivable field soils by trapping silt-bearing water diverted from the adjacent river channels during intermittent flood flow. The construction of similarly functioning ancient and modern floodwater (*sailaba*) fields in Pakistani Baluchistan is discussed at length by Raikes (1965a).

The north fan fields are located in eroded areas adjacent to flood channels of the main Rud-i Gushk and on portions of higher, less eroded stable fan with a black, "desert-varnished" gravel surface. The fields are preserved primarily because they lie on or adjacent to this stable, erosional remnant of older fan surface which is sandwiched between the main braided Rud-i Gushk channels and a broad central fan area of active, braided flood channels. The general gradient of the fan in the field area is low. Since areas of greater channel erosion create a slightly undulating fan surface, the ancient ground surface slope was probably not uniform. The distribution of the ancient fields, however, indicates that approximately the modern gradient (1.35 percent ± 0.25 percent) had developed before their construction.

In the over 400-ha area containing fields on figure 9.5, the areas demarcated by visible walls total about 220 ha. Some of the remaining areas are too high to be reached easily by water from the current flood channels. Other areas with agricultural potential lack surface evidence for field walls, most probably due to their destruction or burial. The local topography suggests that an additional 100 ha or more may have been under cultivation. Thus the estimated area of ancient terraced fields lies between 220 and 350 ha; 300 ha can be used as an approximate figure. Within this area over 30.5 km of wall lines—either traceable surface alignments of cobbles and boulders or linear gravel-covered ridges—were mapped. Many others were too poorly defined to be recorded.

Transverse walls, extending east-west across the drainage, are fairly obvious because their alignments are unlikely to be of natural origin. In addition, their slight rises occasionally still trap light tan silt patches that contrast with the surrounding black gravel fan surface. However, disturbed north-south walls paralleling stream channel edges frequently resemble flood deposits and are more difficult to define. Thus fields visibly surrounded by four walls are rare. The resultant estimates of field size are only approximate at best. Size variations result partly from the destruction or burial of intermediate walls. Missing or buried transverse walls would generally reduce the estimated field areas, while missing or buried walls paralleling the drainage near the channel edges might well enlarge the estimates. The recorded ancient fields vary considerably in size from as small as 0.06 ha to over 0.8 ha. The general north-to-south interval between walls is 30 to 40 m, although intervals as small as 18 m occur. The fan gradient is so minimal that the difference in downslope elevation across a 30-m-wide field is about 0.40 m. The downslope distance between field walls is partly dependent on the need to generate sufficient soil depth on the upstream side of the field.

The other major control of field soil depth is the height of the field wall itself. Although wall construction description is hampered by the lack of excavation, one small trench and half-a-dozen eroded channel sections exposed details of wall construction. These sections reveal boulder and cobble walls still standing to heights of three to five courses—roughly 0.5 m. Burial and erosional processes, however, usually prevent exposure of more than the top course of stones. The maximum stone wall height observed was 0.8 m. Considering ground slope, such a wall would provide a soil depth of 0.3 m (upslope) to 0.7 m (downslope) across the previously stony fan surface of a 30-m-wide field.

The walls bounding and separating the fields are of two types: either vertically piled cobbles and boulders or low linear banks of gravel and soil. The vertical piles of stones may have been constructed incrementally by adding new courses after the ones below were partially buried and stabilized by the accumulating field soil. It seems likely that the gravel of the fan surface and the field soil (once available from initial flood collection) were intentionally heaped against the stone walls, especially on their upstream sides. The gravel and silt would infill the spaces between the large stones, thereby slowing water percolation and increasing silt trapping. If walls were constructed incrementally, the upstream side of the wall might display a series of gravel and silt bankings thrown up against successively higher stones. Occasionally cobble walls are two courses wide. No association is evident between these double-stone-wide walls and the location of either similarly constructed field walls or other obvious features of the field system. It is possible that double-stone-wide wall courses were alternately coursed with larger single boulders.

The gravel-covered silt ridges may have been constructed in the same manner, although the top stone courses have been disturbed, leaving a silt-covered ridge. Alternatively, they may be of a different construction technique—low silt ridges heaped up in much the same manner as the silt ridges or *marz-band* that surround modern irrigated fields (Wulff 1966:268–269; Bonine 1982:153). One erosion channel section indicates that some silt ridge walls were constructed incrementally as a series of two superimposed gravel-covered silt banks. The greater overall width of the ancient silt field ridges, up to about 1.4 m wide, may have been intentional or the result of later erosional phenomena. Both techniques of wall construction were probably used in different places or at different times, or perhaps even in the same wall, depending upon available labor and resources.

In addition to the field walls—be they the actual stone constructions or the low gravel banks—is the presence of much larger masses of stones. These are low piles of cobbles and boulders, most frequently only one or two layers high and probably never over 0.4 to 0.5 m. They extend up to 40 m in length and 5 to 10 m in width and are usually aligned parallel to, or more rarely transverse or even oblique to, the drainage. They lie near major channels along the lateral edges of the fields, primarily at the northern end of the field system. Some may be the remnants of destroyed or buried stone constructions.

Some boulder masses may have originally functioned as water diversion structures, stronger barriers to the flood flow than the normal field walls. Such stone reinforcement would have been used in locations subject to flood breaching, either of the fields which they bounded, or more likely, of the channels they edged. Those channels that have boulder masses as bank reinforcements along their edges may well have functioned as major distributary channels for the flood flow. In several instances the boulder masses run obliquely along channels, perhaps as floodwater deflectors. Elsewhere, others even extend directly across channels, perhaps as stone reinforcements for temporary dams.

The system as a whole would have functioned through the use of temporary dams, generally of impermanent materials like brush, earth, and boulders across major natural flood channels. These dams would have diverted the flood water into the slightly higher, generally dry, secondary flood channels and distributary canals. Their initial construction (and reconstruction after each major flood washout) would undoubtedly have been aided by stone reinforcements on the channel banks marking the proper dam locations and helping to hold the damming materials against the force of the flood flow. All the boulder masses mapped in figure 9.5 can be reasonably interpreted as field-system-related water diversion structures. Other boulder masses, however, especially smaller ones only a few meters long, may be the remains of collapsed structures or even the stone foundations for mudbrick buildings. Others may be piles of stones collected during preliminary clearing of the fan surface prior to the initial flooding.

In addition to flood diversion, the boulder masses that articulate perpendicularly with the regular field walls also function, like the perpendicular field walls themselves, to form shallow impounding basins. It is these impounding basins that trap the field soil by collecting turbid flood water within their enclosures (Raikes 1965a: fig. 1). The previously fast-moving water drops its suspended sediments as its velocity decreases. Thus, sand is rapidly deposited, followed by the slower-settling finer sand and silt. This process creates cultivable soils and fields on the otherwise stony gravel fan. As much of the water as possible is forced to sink into the field soil and underlying fan sediments rather than be dissipated by runoff or evaporation. The lighter, sandier soils trapped in these fields would have permitted much more rapid water infiltration than did the dense, almost impermeable, silts and silty clays of the basin center. Once sufficient soil depth for adequate moisture storage and root growth accumulated, the field soils may have been far superior to those in the basin center.

Vast numbers of small stone circles and stone piles were also found in the field area. The persistent association of these circles with field walls led to the conclusion that at least some were features of the ancient field system. Their precise function remains enigmatic. Even after the obviously more recent features constructed by nomads are eliminated, a variety of different features may be combined together in this category. The group contains not only open circles, but also some solid circular piles of cobbles and boulders. The open-centered circles, a single cobble or boulder wide, are generally under 3 m in diameter. They are a distinctive feature associated with the field walls, most frequently with an end or a break in a wall. If lying along a wall or at a short wall break, the stone circle is often not directly contiguous to that wall, but lies detached by less than 3 m, usually on the upslope or channel side. These locations may indicate that the visible circles are part of some underlying wall reinforcement structures at floodwater inlets and outlets, as these locations would be most susceptible to undermining by the floodwater. Alternatively, the circles may be part of some structure for managing the flow of that floodwater from one field to another, perhaps as supports for temporary barriers to regulate the water flow. Although it is assumed that they play a role in the functioning of the spate irrigation system, the stone circles could have had some other agricultural field-related use associated with water control.[24]

Another feature of outstanding importance is several probable canals. The smaller rills and erosional depressions common on braided alluvial fans can, of course, be of any date—before, during, or after the field use. The definition of some of these channels as canals is extremely difficult and somewhat tenuous without excavation to ascertain their form or depth. The definition here of certain channels as possible canals is based on their unusually straight courses, their contiguity to areas of fields, and/or the way their locations would serve to transport water from one sector of the field system to another.

24. Caution must be used in interpreting the circles and other small undated constructions in the north fan field area. A proximity to but not direct superposition on field walls is an ideal location for the tents of nomadic campers. The walls can then be "robbed" of stones (producing wall breaks) for hearths, tent pole braces, storage platforms, and other household features. If tents were intentionally placed near walls for stone supply, they would produce a consistent but misleading association of tent construction features with field walls, even though the constructions are neither contemporary in date nor related in function. Eighty-four localities of nomadic tenting activities were recorded in the north fan field area.

The modern surface depressions identified as ancient canals are generally 5 to 10 m in maximum breadth and under 0.4 m in modern depth. These canal sizes, however, may be partly the effect of ancient silting and more recent erosion. There are, in fact, two types of depressions that may once have been canals. First are the major feeder channels or canals. These probably originated as natural secondary flood channels, perhaps later deepened and straightened, which carried some of the flood to the fields downstream. They would have maximized the amount of land covered with water during the short flood peaks. Many major feeder channels have probably been reclaimed by the natural flood channels in more recent times. These major feeder channels are possibly larger and more incised now than in the fourth millennium B.C. The second type of depression today appears to begin as local runoff rills in the northernmost field areas. Some of these increase southward to become more significant channels, while others weave from field to field through what appear to be minor transverse wall "washouts" (but which may be buried, intentional gaps in the ancient field walls) without ever substantially changing size. These smaller feeder channels, which serve as connectors between fields within major field sectors, are today generally silt filled. Large shrubs, especially *Lycium depressum* and *Zizyphus nummularia*, grow sparsely along the interior edges of several of these smaller canals. Their growth may indicate a greater soil depth in the channel fill than on the surrounding fan. This deeper channel fill soil is sandy and therefore retains considerable interstitial soil moisture enabling the plant growth.

The uniqueness of this field system does not lie in its documenting the use of floodwater as a rainfall supplement for watering crops, since spate flow had apparently been used since Yahya VII. Rather its uniqueness lies in the introduction of the silt-catching terrace walls to produce fields on an otherwise unarable gravel fan. This innovation proved to be such a successful adaptation that it supported a large settlement growth for over half a millennium. It seems surprising that the intensive labor input and organization required for constructing tens of kilometers of walls in order to produce fields on the fan would have been worth the effort to the ancient agriculturalists when settlement and fields on the basin center silt could have been expanded indefinitely, or at least far more than the 300 ha involved on the north fan, with less labor input.

The reasons for the terraced field development await clarification, but may relate to a complex interaction of social, technological, and environmental variables. The new wheat and barley varieties documented at Tepe Yahya in Yahya VI and VC may have performed better on the sandier soils. Not only are these soils easier to cultivate and weed, but their greater porosity allows more rapid water infiltration during small flood events. The amount of moisture obtained for plant growth would have been greater than in the basin center within a given time of exposure to flood runoff. The value of the soil moisture would have been even further enhanced by much longer moisture retention if the moisture conservation technique of pulverizing and compacting the surface soil to form an insulation layer (dust mulch; Raikes 1968:124–127) was already developed. The greater crop yields enabled by easier cultivation and weeding and by new cultivation techniques (allowing soil moisture to be retained for months after flooding) may have counterbalanced the increased labor and management costs of field development and maintenance. But other social factors, such as the land tenure system in the basin center areas already in use for over a millennium preceding the terraced field development, and other environmental factors, such as changes in the flood runoff characteristics or timing, certainly also may have played roles.

These and other possible factors influencing the terraced field development and a more comprehensive discussion of the settlement survey details are available in Prickett (1985) and will be published in a forthcoming volume of this series. These reports also include the results of three excavations on prehistoric sites in the Shah Maran-Daulatabad basin and the settlement of the later prehistoric and historic periods.

APPENDIX 9.A

Occupation Periods of Sites with Early Period Components

SOGHUN VALLEY

Mounded Sites	*Occupation Periods*
Tepe Yahya	Yahya VII, Yahya VI, Yahya VC, Yahya VB, Yahya VA, Iblis IV/V (stray), Yahya IVC, Yahya IVB, Yahya IVA, Yahya III, Yahya IIB and IIA, Yahya IB and IA, Islamic (stray)
Scatter Sites[25]	*Occupation Periods*
Tepe Yahya Site-Related Scatter	Yahya VI, Yahya V, Yahya IVC, Yahya IVB, Yahya IVA, Yahya III, Yahya II, Yahya I, Islamic (stray)
Site 1	Yahya VI–VB, Yahya VA, Yahya VA-Iblis IV/V Transitional, Iblis IV/V, Yahya IVC–IVB, Yahya II, Yahya I, Islamic (stray)
Site 10	?Yahya VA (stray), ?Yahya IVB or later (stray), ?Yahya IVA or later (stray), Late component (?Islamic)
Site 12	?Yahya VA (stray), Iblis IV/V (stray), ?Yahya IVB (stray), ?Yahya IVA (stray), Islamic

25. The Tepe Yahya site-related scatter component information is based on Vidali, Vidali, and Lamberg-Karlovsky (1976:245). The other twelve Soghun valley independent scatter sites are from Beale's 1975 survey (Beale, personal communication). The date attributions of the survey site components are the responsibility of the author.

Site 14	?Yahya VB (stray), ?Yahya VA or later (stray), ?Iblis IV/V (stray), Sasanian or Islamic
Site 15	?Yahya VI–VB (stray), Yahya VA (stray) or Yahya VA-Iblis IV/V Transitional (stray), Iblis IV/V, Yahya IVC–IVB (stray), Undefined late (Yahya II or later)
Site 15A	Yahya VI–VB, Yahya VA (stray), Iblis IV/V, Yahya IVC (stray), Undefined late (Yahya II or later), Late Islamic
Site 22	?Yahya VA, Iblis IV/V (stray), Yahya IVC–IVB (stray), ?Yahya IVA, Undefined late (Yahya II or later)
Site 23	Yahya VI–VB, Yahya VA, Iblis IV/V, Yahya IVC–IVB (stray), Islamic
Site 25	Iblis IV/V, Yahya IVC–IVB (stray), Islamic
Site 29	?Yahya VA, Islamic
Site 39	Yahya VI–VB, Yahya VA, Iblis IV/V, ?Sasanian, Islamic
Site 41	?Yahya IVA, Undefined late (Yahya II or later)

SHAH MARAN-DAULATABAD BASIN

Mounded Sites	*Occupation Periods*
R1	Yahya VI–VB, Yahya VA, Iblis IV/V (stray)
R2	Yahya VII, Yahya VA, Islamic (stray)
R3	Yahya VII, Yahya VA, Yahya VA-Iblis IV/V Transitional (stray)
R4	Yahya VI–VB, Yahya VA (stray)
R5	Yahya VI–VB, Yahya VA, Yahya VA-Iblis IV/V Transitional (stray)
R6	Yahya VI–VB, Yahya VA, Iblis IV/V, Sasanian or later (stray)
R7	Yahya VI–VB, Yahya VA, Iblis IV/V (stray)
R8	Yahya VI–VB and/or Yahya VA
R9	Yahya VI–VB and/or Yahya VA
R10	Yahya VII, Yahya VI–VB (stray), Yahya VA (stray), Iblis IV/V (stray), Islamic (stray)
R11	Yahya VI–VB, Yahya VA, Yahya VA-Iblis IV/V Transitional
R12	Yaya VI–VB, Yahya VA, Yahya VA-Iblis IV/V Transitional, Iblis IV/V (stray), Islamic (stray)
R13	Yahya VI–VB, Yahya VA, Yahya VA-Iblis IV/V Transitional (stray)
R14	Yahya VI–VB, Yahya VA
R15	Yahya VI–VB, Yahya VA
R16	Yahya VI–VB, Yahya VA
R17	Yahya VI–VB, Yahya VA, Yahya VA-Iblis IV/V Transitional (stray)
R18	Yahya VA, Iblis IV/V (stray), Unidentified post-Iblis IV/V (stray)
R19	Yahya VA
R20	Yahya VI–VB, Yahya VA
R21	Yahya VA, ?Yahya VA-Iblis IV/V Transitional (stray), Modern (stray)
R22	Yahya VI–VB, Yahya VA, Yahya VA-Iblis IV/V Transitional, Iblis IV/V (stray), ?Yahya IVC–IVB (stray)
R23	Yahya VII
R24	Yahya VA, Iblis IV/V, Mid-first millennium B.C. or later (stray)
R25	Yahya VI–VB, Yahya VA
R26	Yahya VI–VB, Yahya VA, Yahya VA-Iblis IV/V Transitional
R27	Yahya VA (stray), Iblis IV/V, Islamic, ?Nineteenth century
R28	Yahya VA, Sasanian, Islamic (stray)
R31	Yahya VI–VB and/or Yahya VA
R32	Yahya VI–VB
R33	Yahya VII, Yahya VA-Iblis IV/V Transitional (stray)
R34	Yahya VII, Mid-first millennium B.C. or later (stray)
R35	Yahya VII, Unidentified post-Yahya IVA (stray)
R36	Yahya VII, Late Yahya VII–VI (stray)
R36A	Yahya VII
R37	Yahya VII, Late Yahya VII–VI (stray), Sasanian-Early Islamic (stray)
R38	Yahya VI–VB, Yahya VA, Iblis IV/V (stray)
R39	Yahya VA, Yahya VA-Iblis IV/V Transitional, Iblis IV/V (stray)
R40	Yahya VI–VB (stray), Iblis IV/V, Islamic (stray)
R42	Yahya VA, Nineteenth century–Modern (stray)
R46	Yahya VII, Unidentified post-Iblis IV/V (stray)
R49	Yahya VA
R51	Yahya VA, Iblis IV/V
R74	Yahya VI–VB, Yahya VA
R76	Possibly Upper Paleolithic, Modern
R87	Yahya VI–VB, Yahya VA, Islamic

R135	Yahya VI–VB, Yahya VA
R140	?Yahya VA
R141	Yahya VI–VB, Yahya VA
R142	Yahya VI–VB and/or Yahya VA
R146	Yahya VA, Iblis IV/V, Modern (stray)
R147	Yahya VI–VB, Yahya VA, Iblis IV/V (stray)
R148	?Yahya VI–VB, Yahya VA, Iblis IV/V
R150	Undateable (?Prehistoric)
R151	Yahya VA, Islamic (stray)
R152	Yahya VA
R154	Yahya VII (stray), Yahya VI–VC
R155	Yahya VII (scatter), Yahya VA
R156	Yahya VI–VB, Yahya VA
R157	?Yahya VI–VB, ?Yahya VA
R158	?Yahya VI–VB, ?Yahya VA
R159	Yahya VII, Yahya VA (stray), Yahya VA-Iblis IV/V Transitional (stray)
R161	Yahya VA (stray), Iblis IV/V, ?Mid–late first millennium B.C. (stray), Sasanian or later (stray)
R162	Yahya VA-Iblis IV/V Transitional, Iblis IV/V
R163	Yahya VII
R166	?Yahya VA or ?later (nomad)
R167	?Yahya VA or ?later (nomad)
R168	Yahya VI–VB, Yahya VA, Iblis IV/V
R170	Yahya VI–VB, Yahya VA
R172	?Yahya VA
R173	Yahya VI–VB and/or Yahya VA, Islamic (stray)
R175	Yahya VI–VB, Yahya VA
R176	Yahya VI–VB, Yahya VA
R177	Yahya VI–VB, Yahya VA
R179	Yahya VI–VB, Yahya VA, Yahya IVC–IVB (stray)
R302	Undated prehistoric (?Paleolithic)
R308	Yahya VI–VB, Yahya VA
R309	Yahya VII or Yahya VI–VB
R310	?Pre-Iblis IV/V
R311	?Pre-Iblis IV/V
R312	?Pre-Iblis IV/V
R313	?Pre-Iblis IV/V
Scatter Sites	*Occupation Periods*
R1AS	Yahya VII, Yahya VA
R10AS	Yahya VA
R10BS	Yahya VA
R11AS	Yahya VI–VB and/or Yahya VA
R11BS	Yahya VA
R16AS	Yahya VA
R17AS	Yahya VI–VB and/or Yahya VA
R21AS	Yahya VII or Yahya VI–VB, Yahya VA
R21BS	?Yahya VA
R21CS	Yahya VII, Yahya VA, Iblis IV/V
R21DS	Yahya VII or Yahya VI–VB, Yahya VA
R22AS	Yahya VI–VB, Yahya VA
R22BS	Yahya VA
R22CS	?Yahya VII, Yahya VA
R23AS	Yahya VII, Iblis IV/V or later
R24AS	?Yahya VA
R26AS	Yahya VI–VB, Yahya VA
R35AS	Yahya VII
R38AS	Yahya VI–VB and/or Yahya VA
R39AS	Yahya VA
R141AS	Yahya VA
R152AS	Yahya VA
R152BS	Yahya VII
R152CS	Yahya VA
R159AS	Yahya VII, Yahya VA, Yahya VA-Iblis IV/V Transitional
R162AS	Iblis IV/V
R170AS	Yahya VI–VB and/or Yahya VA, and/or Iblis IV/V
R173AS	Yahya VI–VB, Yahya VA
R175AS	?Yahya VI–VB, Yahya VA
R177AS	Yahya VA
R180S	Yahya VA
R181S	Yahya VA
R182S	Yahya VA
R183S	Yahya VA
R184S	Yahya VA
R185S	Yahya VA
R186S	Yahya VA
R187S	Yahya VA
R188S	Yahya VA
R189S	Yahya VA
R190S	Yahya VA
R191S	Yahya VA
R192S	Yahya VA
R193S	Yahya VA
R194S	Yahya VA
R195S	Yahya VA
R196S	Yahya VA

R197S	Yahya VI–VB, Yahya VA
R198S	Yahya VII, Yahya VA
R199S	Yahya VA
R200S	?Yahya VA or later
R201S	Yahya VA
R202S	Yahya VII or Yahya VI–VB
R203S	Yahya VA
R204S	Yahya VA, Iblis IV/V
R205S	Yahya VA
R206S	Yahya VI–VB, Yahya VA, Iblis IV/V
R207S	Yahya VI–VB, Yahya VA, Iblis IV/V
R208S	Yahya VA
R209S	Yahya VII or Yahya VI–VB, Yahya VA
R210S	?Yahya VI–VB, Yahya VA, Iblis IV/V
R210SA	Yahya VA
R211S	Yahya VI–VB, Yahya VA, Iblis IV/V
R212S	Yahya VA
R213S	Yahya VI–VB
R214S	Yahya VA
R215S	Yahya VA
R216S	Yahya VA, Yahya VA-Iblis IV/V Transitional, Mid-first millennium B.C. or later (stray)
R217S	Yahya VI–VB, Yahya VA
R218S	Yahya VA
R219S	Yahya VA, Islamic
R220S	Yahya VA, Iblis IV/V
R221S	Yahya VA
R222S	Yahya VA
R223S	Yahya VA
R224S	Yahya VA, Islamic
R225S	Yahya VA
R227S	?Yahya VA

Chapter 10

Summary of Change and Development in the Early Periods at Tepe Yahya, 4900–3300 B.C.

Thomas Wight Beale
Peabody Museum, Harvard University

C. C. Lamberg-Karlovsky
Department of Anthropology, Harvard University

THE NATURE OF CHANGE IN THE EARLY PERIODS AT TEPE YAHYA

The body of data from Yahya Periods VII–V is rich in every sense of the word. We have for this approximately 1,600-year period (4900–3300 B.C.) a more detailed stratigraphic sequence and a more extensive body of architectural and artifactual data than from any other excavated site of this period in Iran. In summarizing this very large data base, we will take as our framework an internal analysis of changes at the site during this time period in the following key areas: architecture, ceramics, small finds, and population/demography (table 10.1). This seems an especially appropriate way to examine the Yahya material because the site represents an unbroken span of occupation over this length of time with no evidence of major cultural discontinuities in the sequence. What makes the analysis of internal change at Tepe Yahya so rewarding is that *within* a general framework of cultural continuity and a stable subsistence base, there is still an extraordinary amount of change occurring over this time span.

In the course of this discussion, we will put forward some tentative hypotheses about *why* these changes occurred and *how* different changes—technological, stylistic, socioeconomic, demographic—may have been causally interrelated. In the concluding chapter (ch. 11), we will make a preliminary attempt to integrate this analysis of local change with changes occurring in the larger regional sphere of highland Iran and lowland Mesopotamia during this critical developmental period.

Architectural Changes

This analysis will necessarily be limited by the selectivity of the recording system used in the field. For example, we can document changes in brick sizes through time (appendix A), but neither the size of the chaff temper in the bricks nor the diameters of thumb impressions on each brick were recorded, so they cannot be used to analyze change in these particular features. What follows, then, is a selective summary based on field-recorded changes in architectural features that appear to have the most relevance in trying to understand underlying socioeconomic patterns.

Within the time span being analyzed, the raw materials and certain basic aspects of construction technology do not change at all: structures always are built of sun-dried mud brick; the technique of roofing is unchanging (thick, chaff-tempered mud plaster over a layer of branches, poles, and/or reeds that in turn overlie horizontally laid wooden beams); and the method of plastering remains the same throughout (thick, chaff-tempered mud plaster on exterior walls and fine yellow, green, or red plaster on interior walls and floors). In fact, these general constructional features are still the same in the valley today. The only significant change in 5,000 years has been the introduction of the domed or barrel-vaulted mud brick roof, which appears to have come into use in part because of the expense and scarcity of roofing beams.

These raw materials and techniques of construction probably survived unchanged because they were so well adapted and because there was no particular incentive or pressure to change them. All the raw materials involved were readily available, almost unlimited in quantity, and easy to use. Sun-dried mud brick architecture could be adapted with a minimum of effort to almost any constructional requirements.

Sun-dried mud brick architecture can be considered a collective feature or feature "complex" (cf. Clarke 1968:665), consisting of a group of features that always appear together. When one focuses on mud bricks in particular—which, strictly speaking, are simply a more limited feature complex—it immediately becomes apparent that many changes take place in individual features of the brick through time. For example, in Period VIIC.2 some bricks are not chaff tempered; after Period VIIC.2 bricks always are chaff

Table 10.1. Patterns of change at Tepe Yahya, Periods VII–V.

	Period VIID 4900–4500 B.C.	Period VIIC 4500–4200 B.C.	Period VIIB 4200–4000 B.C.
Socioeconomic change	Economic unit = entire community (Land communally owned)		
Architecture			
Construction techniques/ materials	Inconsistent brick-making techniques: some bricks not chaff-tempered	All bricks chaff-tempered	
		Brick heights: 7–10 cm	
		Brick widths: 14–18 cm	
	General brick shape: convex or "loaf-shaped" along upper and lateral surfaces, rounded corner, all handmade		
	Thumb impressions: all face upward		
	Buttressing: side wall buttresses and "offset corner bonding"		
Organization of interior/ exterior space			Residential unit: 4–5 rooms, undifferentiated interior space; detached, centralized (communal?) storage complex adjacent but detached
Pottery			
Shapes	Rectangular trays		
	Ovoid bowls with loop handles		
	No large storage jars, no beaker form, no globular pots		
	Chaff-Tempered Coarse Ware: flattened rims, burnishing, concave bases		

Period VIIA 4000–3900 B.C.	Period VIB 3900–3800 B.C.	Periods VIA, VC 3800–3700 B.C.	Period VB 3700–3600 B.C.	Period VA 3600–3300 B.C
	Economic unit = 3–4 families, kin-related (Each 3–4 family unit controls [owns?] land)			Economic unit = nuclear or extended family (Each single family unit controls [owns?] land)
Brick heights: 9–12 cm		Brick heights: 10–15 cm	Brick heights: 20–23 cm	
Brick widths: 18–20 cm		Brick widths: 15–18 cm	Brick widths: 13–15 cm	
		General brick shape: more rectilinear with flatter surfaces and more squared-off corners; more regular shape and consistent sizes imply possible use of mold		
	Thumb impressions: some face up, some face down	Thumb impressions: all face downward		Thumb impressions: no longer used
	Corner buttresses		Walls two courses wide replace corner buttresses	
Residential unit: 4–6+ rooms; first differentiated interior spaces: significant variation in room size, storage rooms now part of each residential complex; first interior features: floors paved with sherds, interior hearths	Residential unit: 4–6+ rooms; first walled compounds with out-buildings within compound; first raised and plastered interior platforms; first raised interior hearths; first major leveling with specially built walls and rubble/sherd/bone infilling			Residential unit: 3 rooms within walled compound; new outside features within compound: pole holes, brick platforms, storage jars set into the ground
	No rectangular trays			
	No ovoid bowls with loop handles			
	First large storage jars, no beaker form, no globular pots		First beaker form, first ring-base open bowl form, first globular pot form (Black-on-Fine Orange Ware)	First very large storage jars (set into ground), flat-base open bowl form replaces ring-base bowl form
	Chaff-Tempered Coarse Ware: flattened rims, burnishing, concave bases all absent or rare			

Table 10.1. Continued.

	Period VIID 4900–4500 B.C.	Period VIIC 4500–4200 B.C.	Period VIIB 4200–4000 B.C.
Painted designs	No painted designs		
Small finds			
Ornaments	Two-hole objects: simple geometric shapes		
	Bracelets: incised decoration		
	Labrets: present		
Figurines			Figurines: zoomorphic and anthropomorphic
Toys			
Counting devices	Clay balls: unfired		
	Clay discs		
Stone vessels	Crudely worked chlorite bowls hollowed from boulders, no marble		
	Incised line decoration		
Tools/implements	Bone sickles/knife handles		
	Bone spatulas		
	Bone awls		
	Flint tools: microlithic geometrics, end-scrapers, denticulated discoidals, drills, burins		
	Backed blades of obsidian		
	Concave mortars		
	Perforated square sherd spindle whorls		
Raw materials			

Period VIIA 4000–3900 B.C.	Period VIB 3900–3800 B.C.	Periods VIA, VC 3800–3700 B.C.	Period VB 3700–3600 B.C.	Period VA 3600–3300 B.C.
	First painted designs			First large-scale use of potter's marks on beakers
	Rectilinear designs			Rectilinear designs and curvilinear designs
		Two-hole objects: elaborated zoomorphic shapes	Two-hole objects	Two-hole objects: absent, replaced by copper pins with heads (?)
		Bracelets: no incised decoration		
	Beads: 5 shapes go out of use		Beads: 5 new shapes introduced	
		Labrets: absent		
	Figurines: only zoomorphic			
			Toy wheels first introduced	
		Clay balls: lightly fired clay		
		Clay discs: absent		
Finely carved, symmetrically shaped vessels, marble introduced			Large increase in total numbers of vessels, new shapes (ring bases, disc bases)	
	No incised line decoration			
	No bone sickles/knife handles			
No bone spatulas				
		No bone awls		
			No microlithic geometrics, end scrapers, denticulated discoidals, drills	
				No burins
		First retouched flakes of obsidian		
		Flat mortars		
		No perforated square sherd spindle whorls		
				Significant increase in specialized tool types and use of copper: first stone weights, first ground stones axes/celts, first copper ingot, first copper spatuli
				Significant increase in imported materials: turquoise, copper
				New imported materials: agate, diatomaceous limestone

tempered. In Period VII bricks are laid with the thumb impressions down; in Period VIB some are laid with the thumb impressions up and some with them down; from Period VIA onward they are laid with the thumb impressions up. Brick heights increase rather consistently through time, with modal values of 7–10 cm in VIIC and VIIB; 9–12 cm in VIIA; 9–11 cm in VIB; 10–15 cm in VIA and VC; and 20–23 cm in VB. Brick widths, on the other hand, increase and peak in VIIA and VIB and then become narrower again, with modal values of 14–18 cm in VIIC and VIIB; 18–20 cm in VIIA and VIB; 15–18 cm in VIA and VC; and 13–15 cm in VB. Thumb impressions are used on bricks in all periods through VB, but, except for a poorly dated kiln (fig. 6.27), cease to be used in VA. Bricks from VII and VIB tend to be loaf-shaped or convex along their upper and lateral surfaces, while bricks from VIA onward are more rectilinear in profile and squarer at the corners.

What all these diachronic changes have in common is that they are small or incremental, and appear directly related *only* to evolving construction techniques and not to any higher-level ideological or economic change. The primary use of these types of changes is as chronological markers, because they tend to change with great frequency.

Other architectural changes are more clearly functional adaptations to changing space and layout requirements over time. The introduction of exterior corner buttresses in Periods VIB and VC, and the appearance in VB and N-VA.2 of house walls that are more than one brick-width in thickness are two examples of clearly functional adaptations. Side wall buttresses and offset corner bonding are the practice through Period VIIA. But in Period VIB.2 a new form of architecture appears that includes rooms significantly larger than those of VII. The introduction of the corner buttress in VIB.2 appears to be a functional adaptation to strengthen the thin exterior walls against increased lateral stresses from longer beam spans and larger roofs. In Period VB, as the size of main rooms increases still more, a further functional change occurs. Corner buttresses are replaced by thicker walls (two courses wide instead of one), apparently for the same purpose of increasing wall strength in response to larger room sizes. These changes can thus be explained as functional adaptations, probably contingent upon other structural changes such as larger rooms and larger, heavier roofing beams.

The most revealing category of architectural change is the manner in which both interior and exterior space on the site are divided up and access is controlled. Here changes may directly reflect changes in the social and/or economic structure. Period VII is characterized by beehive-like clusters of small, contiguous rooms probably used for storage and/or winter animal pens. Associated with these room clusters are detached four- or five-room houses that have their main entrance oriented toward the beehive storage complexes. Perhaps just as significant is the fact that more than one detached house appears to be associated with the same storage complex and that the different houses, although not attached, are built extremely close to one another. The best example of this site layout comes from Period VIIB.2 (fig. 6.8), where there are at least two detached houses (Rooms 2–6 and 8–9) and possibly a third (Rooms 25–28), associated with a single storage/pen complex of at least 11 rooms.

The socioeconomic implications of this site layout in Period VIIB remain enigmatic, since the best modern ethnoarchaeological studies in comparable village settings of highland Iran (Kramer 1982; Watson 1979; Jacobs 1979) do not provide comparable layouts. In all the modern examples, the basic domestic unit is a house and storage rooms built around or in association with an enclosed open courtyard. Such layouts find their closest parallel in the Yahya Period VA architecture but bear little resemblance to the Period VIIB beehive clusters of rooms (presumably for storage) associated with detached, but closely spaced residential units lacking courtyard walls.

We are in the position, then, of only speculating about socioeconomic structure with the hope that some of these ideas may be tested or changed with better ethnoarchaeological parallels. The detached four- or five-room houses imply that the "living unit" was the nuclear or extended family, but the apparently open-access large storage complex might imply that the "economic unit" was much larger, perhaps the whole community or large groups of families (probably with kin ties) within the community. Multifamily or community-wide sharing of at least some of the means of subsistence could imply in turn a rather egalitarian economic structure. The close spacing of houses has a similar implication: if village land were owned by single nuclear/extended family units, it is unlikely that one house would be built with so haphazard an orientation so closely to another house. In other words, nuclear/extended families do not appear to control the space immediately around their houses. The result of this dense spacing is that Period VIIB has a higher density of settlement than any other period on the site, with interior space taking up between 20 percent and 30.3 percent of the total excavated village area.

Major changes in the use of space begin to appear in Period VIIA (fig. 6.26), but because the exposure was relatively limited it is difficult to interpret them in terms of cultural change. Interior space begins to be clearly differentiated for the first time on the site in VIIA. Whereas VIIB rooms have a continuous range of sizes, VIIA rooms (fig. 6.12) show a much more distinct clustering of small rooms versus large rooms (compare Rooms 3 and 4 with Room 8). In addition, there begin to be interior feature complexes in rooms. Interior hearths make their first appearance, and the floors of two of the small rooms (3 and 4) are paved with sherds. What this means is that rooms are beginning to be defined according to function by the emplacement of permanent interior features. In VIIB interior space was undifferentiated; in VIIA certain activities begin to be regularly associated with certain areas of interior space. Thus, interior space begins to become more of a "living" space and "activity" space, as well as a "storage" or "shelter" space.

A dramatic change takes place in Periods VIB through

VC. The VIB.2 and VIB.1 exposures are very limited (fig. 6.15), but both the site layout and organization of interior space appear to have changed dramatically. Individual house complexes now appear to have their own courtyards as defined by a courtyard wall (Wall 17). Instead of large central storage complexes, there are small outbuildings apparently associated with individual domestic complexes. Interior hearths become raised and carefully plastered. The density of settlement on the site drops dramatically; interior space makes up only 2.5 percent to 4.1 percent of the excavated area on the south side of the mound and the excavated area on the north side of the mound does not appear to be occupied at all in this period. The lower density may be the result of single households controlling the area in their immediate vicinity and demarcating it with courtyard walls. The absence of occupational debris on the north side may imply a lower overall population on the site, or at least a much more dispersed settlement layout.

This lowering of intrasite population density after Period VII finds an interesting parallel in the more dispersed pattern of settlements themselves after Period VII both in the Soghun valley and the Daulatabad basin (see Prickett this volume, ch. 9). If one can hypothesize that mounded settlements may represent denser intrasite clustering of architecture, then the budding off and increase of nonmounded "scatter sites" in Periods VI and V both around Yahya and in the Daulatabad basin may be directly related to the increased space taken up, on average, by individual household units, with associated open courtyards appearing to become the norm. It is not clear whether the simple process of an increasing amount of budding off of new settlements starting in Period VI encourages and leads to larger and more dispersed individual house compounds at new settlements, as documented at the modern village of Tell-i Nun (Jacobs 1979), or whether the process was working in reverse. The shift to larger individual compounds with associated open courtyards may have encouraged, perhaps even necessitated, the budding off of new communities from the original mounded sites.

Period VC (fig. 6.23) provides a much clearer and more complete example. The foundations for the VC room complex themselves represent a major change from Period VII. In Periods VII and VIB.2 it was a standard practice to build low brick retaining walls and lay down brick paving in order to level off the sloping mound surface before building on it, as in VIIB.6 (fig. 6.6), VIIB.1, and VIB.2 (fig. 6.15), but the massive leveling operation in VIA (fig. 6.16) has to be considered a qualitative rather than quantitative change. Retaining walls are built to a height of more than 1.5 m, and stone and sherd rubble is used on a massive scale for the first time not just to level off an area but to substantially increase the amount of level ground on this part of the site. Stone rubble fill is used first in VIB.2 on a small scale to fill in small depressions and in VIB.1 to build what appears to be a small drainage system (Rubble 35 in fig. 6.15). The use of stone rubble on a huge scale only comes in Period VIA. The VIA construction—unique for this time period in Iran—has several possible implications for cultural change. First, the apparent willingness and desire to undertake so major an operation only to extend the level area on the top of the mound implies that land for residential use was increasingly scarce in this end of the valley during this period. This fits well with the survey evidence that a much higher proportion of this land area became occupied during Period V (see Prickett, this volume, ch. 9). An additional reason for the importance of this particular location may have been that this end of the valley, its lowest point, probably was quite swampy in low-lying flat areas, thus severely limiting potential building sites. Even today, local villagers tell of a time about 30 years ago, before diesel pumps began lowering the valley's water table, when no one lived on these low-lying areas because the ground was so swampy and so susceptible to flooding during rain runoff. Thus, the reason for leveling and maximizing the mounded area in VIA–VC may have been its *elevated* position above a very swampy valley floor. This interpretation fits well with the fact that all the other Period V settlements are located on small rock outcrops or higher ground at the edges of this end of the valley (fig. 2.3). Dampness problems may also help explain why stone rubble and sherds rather than bricks were used for infilling: stone rubble provided a greater adaptive advantage in being able to drain rain runoff over the leveled area much more effectively than bricks and to prevent water-induced erosion. A similar purpose appears to be involved in the construction of the rubble-filled ditch in VIB.1 (fig. 6.15).

The Period VC room complex (fig. 6.23) itself shows a major shift from Period VII in how interior space is used and arranged. In contrast to Period VII's detached single-family houses and "beehive" storage complexes, VC has a single structure—all but one room of it built at the same time—in which several nuclear or extended families lived. Larger living rooms with corner hearths are arranged around a central core of smaller storage rooms. Within the larger complex as a whole, the rooms are divided up into distinct five- or six-room "living units," each with its own hearth. Although the entire room complex was not exposed, two complete living units of this type were isolated (Rooms 1–5 and 6–11). The significant implication here is that the "living" unit in Periods VI and VC is still the nuclear/extended family, but that the economic unit—the basic unit by which the means of production is controlled—may have become smaller. Storage complexes have restricted access through courtyards or "living" rooms rather than the more open access of the detached units in Period VII and appear to be in the control of units of just three or four nuclear/extended families cohabiting a single structure. Although impossible to prove, it is probable that these economically related nuclear/extended families were also kin-related, as seems to be common in multifamily compounds in modern Iranian villages (Jacobs 1979:180).

The introduction of new interior features to further define the function of interior space continues in VC. Peninsular platforms (E and F in fig. 6.23) are found for the first time in medium-size and large rooms, although what sort of activity they represent is unknown. Storage jars, too, appear for the first time positioned along the walls of one of the large "living" rooms (Room 1). Also, there are for the first time in the VC structure clear distinctions in *both* room sizes *and* room shapes. Finally, walled-in doorways within the complex are a new feature and appear to reflect changing population within the complex and realignment of interior spaces during the use-life of the building.

In Periods VB and VA there are further significant changes in the use of space. The multifamily complexes of VC give way to single-family complexes probably inhabited by only one nuclear or extended family. The VB house (fig. 6.26) on the mound's south side unfortunately is too fragmentary to give a clear idea of house size and layout, but two complete three-room houses were recovered from N-VA.2 and N-VA.1 on the mound's north side (figs 6.34, 6.36). To the north of the VB house, and between the two N-VA.2 houses, are what appear to be courtyard walls dividing the site into separate compounds. Many activities now take place outside the houses but within well-defined compounds controlled by single nuclear/extended families. These activities are reflected by the introduction in VB and VA of new outside features such as pole holes (fig. 6.26), platforms in N-VA.4 and N-VA.3 (fig. 6.33), and large storage jars set into the courtyard surface (N-VA.4 and N-VA.3). The settlement density in Period VB on the south side is 11.1 percent, as measured by the amount of interior space, and in N-VA.2 on the north side is as high as 18.5 percent. But these figures are misleading, for in VB the only house exposed was on the south side of the mound; in VA the only houses exposed were on the north side of the mound. If one combines the north and south side densities for VB and VA, the overall site density from phase to phase averages between 5 percent and 10 percent (interior space/ total area). Clearly, the house distribution across the site is at least as widely dispersed as in VI and VC, and, we might speculate, for the same reason: private control of land in the vicinity of individual houses inevitably produced a more dispersed settlement pattern.

Whether individual families actually "owned" their houses and land around them in this period is not easily deduced. In two modern village studies the layout of house compounds and storage areas is quite similar, but in one of the villages (Aliabad) many villagers own their own land (Kramer 1982), while in the other (Hasanabad) the villagers are all landless tenants working village fields owned by a single family (Watson 1979).

In summary, then, Periods VB and VA see the culmination of a series of major changes in the use of interior and exterior space that began in Period VII, changes that appear to reflect fundamental shifts in social and economic organization on the site. The change we would hypothesize is from large, more communal economic units in Period VII to extended-family or smaller multifamily units in Periods VI and VC to single nuclear- or extended-family units in VB and VA. Over the same period, control of land within the village proper appears to go from being more communally controlled space in VII to walled compounds controlled by single nuclear/extended families in Period VA.

What is noteworthy here is that as the amount of space controlled per individual or per nuclear/extended family on the site appears to *increase* through time, the amount of roofed *interior* space per nuclear/extended family does not change significantly at all. Following are the amounts of interior space per "living" unit for all the complete units unearthed:

Period	*Rooms*	*Interior Space*
VIIB	2–6	12.8 m^2
VC	2–5	13.3 m^2
	6–11	11.2 m^2
N-VA.2	1–3	19.0 m^2
N-VA.1	1–3	12.3 m^2

Combining these complete household units, one gets an average size of 13.7 m^2 per unit for Periods VII–V, with a median size of 12.8 m^2 To estimate square meters of living space per individual, one would simply divide an estimate for the average number of persons per household into 13.72 m^2 For ancient populations, Russell (1958:53) suggests using an average household size of 3.5 individuals, but as Sumner has pointed out in dicussing estimates of ancient populations from archaeological evidence (1979:170), one probably should allow for a *range* of estimates because census figures from Iran in the 1950s and 1960s (during a period of rapid population growth of 2.5 percent per year) indicate an average household size as high as 5.9 persons. In her village study of Aliabad, Kramer (1982:123) reports a high median household size of 6.0 individuals.

Because the *rate* of population growth over the 1,600-year span of Periods VII–V appears low at Yahya and in the surrounding area (see below, "Changes in Population/ Demography"), we would favor the lower household estimate of 3.5. On this basis, living space per individual would have averaged 3.9 m^2. This is a substantially lower figure than the 10 m^2 per person estimate that is widely cited in the literature and is based on a broad cross-cultural sampling of modern nonurban settlements (Naroll 1962; Leblanc 1971; Kramer 1982:125; Sumner 1979). Naroll's sample, however, when broken down into individual examples, shows substantial variability. Of the societies he cites, the Kapauka (2.0 m^2 per person), the Kiwai (3.58 m^2 per person), and the Cuna (3.03 m^2 per person) all have figures fairly closely approximating those at Yahya. Moreover, our estimate for Yahya also falls only slightly below the range calculated for ancient Bakun by Sumner (1979:170). This evidence suggests that the amount of interior space per person in different cultures can be quite variable and depends first on how "living" units are defined and second on how interior space was used in these cultures. In Periods VII through V at Yahya, to assume that outside space near the dwelling was used for most activities other than sleeping might help account for the seemingly low figure.

Making an estimate of ancient populations at Yahya is complicated even more by the fact that the total amount of space on the site controlled by each household appears to change (increase) substantially through time. Kramer has demonstrated in her village study (1979, 1982) that because the average dwelling space per person holds roughly constant (an observation that appears to fit the Yahya data as well), the *total* amount of roofed dwelling space is the most reliable statistic for estimating total village population. Using this approach, a rough estimate can be made here for Yahya's population density in Periods VA and VIIB. If one adds together the total amount of interior space for the later occupational phases of VA on both sides of the mound (37.4 m^2 for N-VA.2, N-VA.1) and divides by 3.9, one gets a figure of 9.6 persons. If these 9.6 persons are then divided by the total area excavated for these different phases (443.3 m^2), the result is a rough estimate of a Period VA site population amounting to 2.17 persons per 100 m^2, or 217 persons per ha. This figure corresponds surprisingly closely to the median density for 53 villages of 223 person per ha recorded in modern Khuzistan by Gremliza (1962). The Yahya VA density estimate also is quite close to that estimated by Adams (Adams and Nissen 1972:29) for modern Marsh Arab settlements in southern Mesopotamia (199 persons per ha) and not too much greater than the density of the comparable modern village of Aliabad in northwestern Iran studied by Kramer (1979, 1982) (420 persons in a three-ha area, or 140 persons per ha).

However, if the same series of calculations is made for the occupied phases of Periods VIIB and N-VII, the population density figure is 710 persons per ha. Even if one allows for the fact that the inclusion of what may be roofed animal sheds or pens as "interior space" may have skewed this density figure on the high side, the population density of Period VIIB appears to have been substantially higher than that of VA. The evidence suggests that population densities in the earliest period discussed here were substantially higher than those of mud brick agricultural villages in Iraq and Iran today, a possibility already suggested for prehistoric Bakun by Sumner (1979:172).

In conclusion, some prehistoric population estimates that have been based on modern analogies (cf. Adams and Nissen 1972) may be on the low side. Furthermore, population density appears to be highly variable through time, with at least some of the variability related closely to changes in economic organization.

Kramer (1982) also notes that overall compound size in her modern village provides a rough indicator of the relative wealth of that compound. At Yahya, unfortunately, we do not have two compounds in any one phase whose sizes we can compare to see if economic stratification might exist. However, to use Kramer's observation diachronically rather than synchronically, we can note that enclosed compounds do appear to have existed and that the lower population densities beginning in Period VI and continuing through VA might imply greater average wealth per household than in Period VII. But the population densities are based on too limited an exposure to make the further hypothesis that compound size, and therefore average family wealth, was increasing between VC and VA.

Ceramic Changes

There are many instances of stylistic changes, or changes related directly to manufacturing techniques, in the ceramics of Periods VII–V. Examples include the shift from multiple chevrons to short chevrons between Period VA.2 and VA.1; the shift from rectilinear designs on Black-on-Buff Ware and Black-on-Red Ware in VB and VA to rectilinear *and* curvilinear designs on the Black-on-Smooth Buff Ware of VA; the scarcity or absence of flattened rims, burnishing, and concave bases in Chaff-Tempered Coarse Ware after Period VII; the shift in tempering material for Chaff-Tempered Coarse Ware from short pieces of chaff in VII to longer pieces of chaff in VI and V; and the shift from ring-base open bowls in VB and VA.2 Black-on-Buff Ware to flat-base bowls in VA.1 Black-on-Red Ware.

An example of ceramic change that may more directly reflect social and economic change is the introduction of potter's marks on Period VA beakers. We inferred in the descriptive discussion of these marks that they were causally or functionally related to: (1) the large-scale production of look-alike beakers that necessitated identification marks; and/or (2) possible changes from household to communal kilns that required ownership of stacked beakers to be identified during the firing process. These are inferences at best, which may or may not hold true when more data are collected.

The introduction of major new vessel forms provides another category of change that may reflect higher level socioeconomic change. But again, since there is so little good contextual evidence for the specific functions of different vessel forms, one is quickly reduced to inference by general analogy. For example, the rare rectangular trays and ovoid bowls with loop handles of Period VII do not appear at all in Periods VI and V. The disappearance of these two shapes after VII may imply a change in diet, eating habits, or food processing technology. But the lack of direct evidence for the function of these vessel forms makes it impossible to determine the causes for these changes.

The two most significant changes in vessel forms are the introduction of large storage jars beginning in Period VI and the introduction of the small beaker form in Period VB. The large carinated jar of Chaff-Tempered Coarse Ware, which first appears in VIB.2, marks the earliest use of "large storage jars" on the site. Although there are few full profiles from Period VII, what data we have from measuring rims and bases (no bases over 20 cm in diameter and only one rim over 21 cm in diameter) would indicate no vessels of a size comparable to the carinated jars in Periods VI and V. It is clear that these carinated jars *did* function as storage jars because three of them were found in situ along the walls of Room 1 and one against a wall of Room 16 in Period VC (fig. 6.23), although all were crushed and empty when discovered. These jars become the most common Chaff-Tempered Coarse Ware vessel form in Periods VC and VB. In VA.2 and VA.1 there is a shift to even larger necked or hole-mouth storage jars (Black-on-Red Ware or Plain Coarse Ware), which are set into the ground outside in courtyard areas (see N-VA.4, fig. 6.33).

In Period VII, then, the primary unit of storage was the storage *room*; although bags made from perishable materials such as skins or baskets of woven reeds may also have been used, they have not survived in the record. Periods VI and V see the addition of smaller units of storage in the form of storage jars. What this may imply about shifts in the use or control of agricultural products is unclear, but at the very least one can say that such storage containers provided for easy, separate, portable, and accessible storage of a wider range of foodstuffs. Ceramic containers probably also provided better protection against rodents and other potential scavengers.

The introduction of the small beaker form in Black-on-Buff Ware in Period VB also has significant implications. By general analogy we would assume that these beakers most likely were used as individual drinking vessels. Certainly their variability in size rules out the possibility that they were used for measuring standardized volumes. If liquids were consumed without beakers prior to VB, then the introduction of beakers might suggest the introduction of a specific new type of liquid drink that was drunk only from beakers. The presence of several agricultural products that could have been fermented (grapes, date palms, barley; see Meadow, this volume, ch. 3) even raises the possibility of the introduction of a new *alcoholic* beverage in this period.

Although alcohol is not consumed in the Soghun valley today, an analogy can be found in the present-day use of tea glasses. Virtually every family, no matter how poor, has a "set" of tea glasses in which tea alone is served. Other liquids such as water and milk are drunk out of communal bowls, but tea, whether served to guests or drunk within the family, is served only in tea glasses. Circumstantial evidence supporting the idea of "sets" of beakers for each nuclear family are the large numbers of beakers found relative to any other single vessel type, the fact that they were fired in groups (stacks) rather than singly, and the lack of variability in their decoration, as if the intention was to make beakers as much like each other as possible. If these beakers were used in sets for drinking something new like beer, they imply significant changes in social habits and social interaction beginning in Period VB.

Another simple change with wider implications is the shift from multiple chevrons in VA.2 to short chevrons in VA.1. This reflects increasing specialization in the production of ceramics, as has already been suggested from uniformities in production techniques (Vandiver, this volume, ch. 5). Multiple chevrons covering the whole upper third of a beaker would have taken significantly longer to paint than the often sloppily applied short chevrons just below the rim. In other words, it would appear that there was a conscious attempt to cut down the time spent producing each beaker. Such an attempt at reducing time and effort per beaker, combined with the probability that sets of beakers were becoming standard household items, implies that ceramic production, at least of beakers, may by VA.1 have been in the hands of part-time or full-time craftsmen for whom there would have been an incentive to produce more beakers with greater speed (see analysis of beaker production in Vandiver, this volume, ch. 5). To carry this hypothesis a final step, we have already suggested the possibility, based on potter's marks, that there were centralized kilns in Period VA.1. It is perhaps not coincidental that the only evidence we have for a ceramic kiln comes from VA.1, and this kiln does not appear to be associated with any specific domestic complex.

Still another useful example of change in vessel forms is the introduction of the small globular pot of Black-on-Fine Orange Ware in VB. This type of pot is found only in Black-on-Fine Orange Ware. Moreover, it is the *only* Black-on-Fine Orange Ware vessel form. The rarity of Black-on-Fine Orange Ware, the fact that it appears to be wheel-made, and the similarity of its designs not to designs used at Yahya, but to designs used on sites to the east of Yahya, all suggest that Black-on-Fine Orange Ware was an import. The presence of only one shape (a shape already present in slightly different forms at Yayha) in this ware suggests further that it was not the pots alone that were being imported, but a particular commodity that was regularly transported *in* this particular type of pot.

Ceramic changes that can be related directly to major social or economic changes seem most apparent in the introduction of major fine wares, because new fine wares, particularly when they are imports, are good indicators of changing economic relationships with the outside world. The earliest fine ware at Yahya, the Soghun Ware of Periods VII and VI, is problematical. While Soghun Ware never represents more than 0.5 percent of the ceramic assemblage in VII and VI, it is not clear that this fine ware is imported. A mineralogical analysis of a Soghun ware sherd (Kamilli and Lamberg-Karlovsky 1979) showed that the mineralogical makeup of the sherd did not differ significantly from the locally made fine wares of VB and VA. In addition, all Soghun Ware shows the same sequential slab construction as the local Chaff-Tempered Coarse Ware (Vandiver, this volume, ch. 5). There are also no close parallels to Soghun Ware at other contemporary sites in the region. Thus it remains a possibility that the Soghun Mottled Purple Ware, Soghun Red-Painted Ware, and Soghun Bichrome Ware of Period VI were all local developments out of the Soghun Plain Ware of Period VII. Red-painted decorations also appear on locally produced Chaff-Tempered Coarse Ware in Period VI, suggesting that red-painted decoration could be a local development in Period VI applied to all locally made wares (see Vandiver, this volume, ch. 5).

The first clear evidence for imported fine wares comes from the two Ubaid sherds in VIA (fig. 4.42) on the Black-on-Buff Ware of VC (fig. 4.21). As noted in the descriptive discussion of ceramics, the VC Black-on-Buff Ware sherds almost certainly represent imports from the west. Whether this ceramic arrival represents trade in other artifacts and raw materials to the west remains to be seen, but at least these sherds indicate that Yahya in VIA and VC has become, perhaps for the first time, part of an interaction sphere that includes areas to the west (Bakun and Gap) and to the north (Iblis). The first appearance in VIA–VC of Lapui Ware, another fine ware characteristic of sites to the west, reinforces the conclusion that Yahya had increased contact with areas to the west at this time.

Subsequent changes in ceramic wares show Yahya shifting its outside contacts more to the *east* in VB and VA. Lapui Ware continues through VA.2, but never represents more than 5 percent of the assemblage. Meanwhile, in VB the Black-on-Buff Ware becomes locally produced, imitating the imported VC Black-on-Buff Ware but developing a distinctive design repertoire of its own. At the same time, the VB Black-on-Buff Ware reflects new influences from the east with the introduction of the chevron-painted beaker, which is never common on sites west of Yahya. This shift to the east in Yahya's interaction sphere is further underlined by the first appearance in VB of another (probably) imported fine ware (Black-on-Fine Orange Ware) whose closest parallels are on sites east of Yahya. This trade and contact with the east continues in VA with the introduction of locally produced Black-on-Red Ware. Black-on-Red Ware clearly develops directly out of Black-on-Buff Ware, with the only major difference being the shift from a buff to a red paste and surface color (increase in kiln temperature and a more oxidizing atmosphere). This transition suggests an increasing cultural orientation toward the east, where similar red wares predominate in VA times, rather than to the west, where the buff ware tradition continues and new design repertoires develop that are quite different from anything at Yahya. The fact that Iblis appears to undergo the same transition from Black-on-Buff Ware to Black-on-Red Ware at about the same time suggests that intraregional contact, perhaps in the form of trade, was strong and continual in this period.

The appearance in VA.2 of Black-on-Smooth Buff Ware, probably as an import, provides still further evidence for Yahya's increased outside contacts in VA, but the source from which Black-on-Smooth Ware originated is not clear.

Changes in Small Finds

Small finds discussed here include all artifact categories other than pottery and the flint tool assemblage. To reduce this large number of artifacts (approximately 1,000 pieces) to meaningful units of analysis, we have divided the corpus—as we did in chapter 7—into five different functional categories: stone vessels, small stone or clay counting devices, tools, ornaments, and miscellaneous artifact types.

Stone Vessels

Stone vessels are present throughout Periods VII–V (except in the earliest strata of VIID). The changes in stone vessel shapes, materials, and decoration through time already have been discussed in some detail under the descriptive section on small finds. Chlorite and marble remain the two most common raw materials for stone vessels throughout the sequence, although marble first appears somewhat later (VIIA) than chlorite. Both are locally available materials (Kohl 1974; Sabzehei 1974). The use of simple incised line decoration on chlorite vessels from Periods VII through VIB, but not thereafter, is a good chronological marker.

More significant, perhaps, is the increasing variability in shapes and materials as one moves from early to later periods, the rise in total numbers of vessels, and the increasing labor input per vessel. The first evidence for increased labor input per vessel comes in VIIA, when marble—a harder material to work than chlorite—first appears, and when in the same phase there begins to be a shift from crudely worked bowls hollowed out of chlorite boulders (fig. 7.20:a–c) to more finely carved, symmetrically shaped vessels of both chlorite and calcite/marble that must have taken significantly more time to produce (figs. 7.20:f, 7.23). However, stone vessels remain rare until VB–VA, when there is a dramatic increase in the numbers of stone vessel sherds. This striking increase may imply that beginning in VB there is centralized and larger scale production of stone vessels (by part-time specialists?) and/or that stone vessels have become a standard household item by VB–VA times. The thin-walled small beaker becomes the most common form in VB–VA, probably representing a functional change related to the introduction of identically shaped ceramic beakers. In VA.2, sherds of a new, rare, imported material (diatomaceous limestone) are found. The closest known source of this particular variety of limestone is coastal Oman. In VA.1 a variety of new shapes appear: ring bases, disc bases, and rectangular bases.

If finely worked chlorite and marble vessels, as labor-intensive products and an artifact category not directly related to subsistence, can be considered luxury or status items, then the significantly increased vessel numbers and variability in forms and materials in VB–VA suggest a greater level of wealth and prosperity in the Yahya settlement beginning in VB and accelerating in VA (at least 75 stone vessel fragments, or more than half the total corpus from all of Periods VII–V, come from VA alone).

Small Stone or Clay Counting(?) Devices

This grouping of artifacts—including stone balls, clay balls, cones, discs, clay pyramids, clay pegs, and a lenticular-shaped object—is not especially useful in understanding culture change, for each type is distributed fairly evenly throughout the sequence. It would appear that throughout Periods VII–V there was a need for the use of counting devices, if in fact this was the function of most of the enigmatic objects (Schmandt-Besserat 1977). What would be intriguing would be evidence for a change in the counting *system* during this time period. But the only "counting devices" with a limited distribution are clay pegs (only three examples, all from VII) and lenticular-shaped objects (one example from VA.1 and several examples from IVC), neither of which may actually be counting devices. Indeed, the only clear-cut changes in the "counting devices" through time are minor: a shift from unfired clay balls in VII and VI to lightly fired clay balls in V, gradually increasing base diameters on clay cones between VII and V, and the absence of clay discs after VC. If one really is to interpret these objects as counting devices, then the most common shape probably stands for the most commonly used number (1). This would mean that clay or stone balls (61 examples) represent "1," while clay discs (31 examples) would represent a higher number (perhaps "10"), and clay cones (18 examples) a still higher number (perhaps "100").

Tools

Stone tools that are used for the simplest tasks, such as grinding, pounding, rubbing, and abrading, are also the simplest in form and undergo the least change between Periods VII and V. Such tools include mortars, handstones, hammer stones, whetstones, and "shaft straighteners." These five tool types appear throughout the sequence, with the only observable change being a shift from predominantly concave mortars in VII and VI to flat mortars in V. It is not clear what adaptive advantage such a change in shape had. Possibly the grinding of grain and other materials between two flat slabs was found to be faster and more efficient than using a rolling or rotating motion on a concave surface, in which case this shift in VC would qualify as a purely functional change. The absence of hammer stones in VII may have some significance, but it is not clear what new hammering or grinding or rolling activity their first appearance in VIB might reflect.

Another simple tool for a simple task was the spindle whorl. It is probable that the perforated discs and square sherds found throughout the sequence were being used for this purpose. Again, changes in this artifact type through time are minimal. The only observable change is stylistic: perforated square-sherd spindle whorls go out of use after VIB.

If a particular tool type reflects a particular human activity (or activities), then the most revealing change related to tools would be the sudden appearance, disappearance, or limited distribution through time of a specific tool type. For example, it would appear that VA.2 and VA.1 were periods of greater and more diversified economic activity when several different new and specialized tool types appear, including stone weights (in VA.1), ground stone axes or celts (in VA.2 and VA.1), and arsenical copper nails (VA.2), spatulas (VA.1), and styli (VA.1). Moreover, the recovery of a copper ingot in N-VA.4 suggests that these new arsenical copper tool types were being produced on the site. What is interesting about the appearance of cast arsenical copper tools in VA is that they represent a *secondary* use of arsenical copper that evolves only after the metal has been used for a long period for ornaments, first as hammered copper pins (in VII through VC), and then as smelted and cast arsenical copper pins (in VB; see Heskell, this volume, ch. 8). Thus, the Yahya evidence implies that the major technological advance of smelting and casting arsenical copper may have come about in order to produce finer personal ornaments, not tools, and that tools were a subsequent and perhaps even unanticipated development out of this new metallurgical technology.

Other tool types with a limited distribution are bone sickle/knife handles (only in VII), bone spatulas (only in VIID through VIIB), and bone awls (VIID through VIB). It would appear from this evidence that bone goes out of use as a material for making tools after VIB. The limited time span of these three tool types probably does *not* indicate that the activities for which these types were used were no longer carried out, but only that bone ceased to be the material used to make these tools. Bone awls probably were supplanted by flint awls and borers, which appear sporadically throughout Periods VII, VI, and V (Piperno 1973). Bone sickle/knife handles, too, probably were supplanted by another material such as wood handles. In any case, it is clear that sickles do not go out of use, for sickle blades continue to be common through the end of Period V (Piperno 1973:66).

Obsidian is present in rare quantities throughout the sequence, usually in the form of backed blades. The one change of interest is the appearance of retouched obsidian flakes in addition to backed blades starting in VIA and continuing through V. One of these retouched flakes (from VB) was made into an awl or drill. The retouched flakes and new tool types made from them suggest that in Period VI obsidian began to be imported not in the form of finished tools of a single type (backed blades), but as a raw material out of which the desired tool types were made on the site.

The flint tool assemblage as a whole is being analyzed by Marcello Piperno. We shall only summarize his preliminary results here (Piperno 1973) in terms of the observed changes through time in the flint tool repertoire. Virtually all the most common flint tool types are found throughout the VII–V sequence: retouched blades, nonretouched blades, sickle blades, truncated blades, denticulated blades or flakes, backed tools (including borers), notched flakes, and retouched flakes. Cores, too, are present throughout the sequence. The only significant change is in the gradual disappearance of several of the rare, earlier tool types of Period VII. Microlithic geometrics (particularly lunated shapes) are the one very common category of Period VII tools that ends abruptly after VC. Other rare types found in VII–VC but not later are end-scrapers, denticulated discoidals, and drills. Burins are found from VII through VB, but are absent in VA. To conclude, Periods VB and VA see a significant diminution of the range of flint tool types used on the site.

Ornaments

Of all the categories of small finds, ornaments utilize the greatest number of different raw materials, so that ornaments provide some of the best insights into trade with the outside world. Beads, pendants, complete necklaces, and unworked shells (which can be treated as bead blanks) are all artifact types that are strung and worn on the body as ornaments. There is a remarkable range of shapes represented in the bead and pendant corpus (fig. 7.1). The changes in these shapes through time have been discussed in detail under the descriptive section for beads and pendants. These shape changes are excellent chronological markers but probably should be considered nonadaptive stylistic changes. Even so, the most dramatic shape changes do coincide with major changes in other categories of material remains. The two major stylistic turning points are between VII and VI and between VC and VB. At the end of Period VII fully five different bead shapes go out of use altogether, and VB sees the introduction of five other new bead shapes. Moreover, if changing shell species can be interpreted as a changing choice in shapes, then it can be noted that five shell species appear only in VIIB, three species go out of use at the end of VC, and four new species appear only in VB–VA.

The great variety in bead shapes may imply that beads are being imported in finished form from several different sources. One of the sources of finished turquoise beads could be the area around Iblis to the north, for the "segmented, cylindrical," "rounded, cylindrical," and "droplet-shaped" turquoise beads at Yahya are all paralleled by identically shaped beads in Iblis Periods I and II (Caldwell 1967:166, 216, 302). Furthermore, the area around Iblis is known to be a natural source of turquoise (Beale 1973:137).

Changes in bead and pendant raw materials are more direct indicators of changes in trade patterns and economic organization. In Period VII the only nonlocal material found in abundance is marine shell. Indeed, marine shells in VII are more abundant than any single local material used in the production of beads. This would suggest that there was a strong ongoing regional trading network extending down to the Persian Gulf, which lies approximately 150 km (a five-day walk) south of the site. Alternatively, the abundance and variety in marine shells may not represent ongoing trade at all. Shells are an unusual raw material in that it would have been difficult to monopolize and control their source. Once an individual reached the coast, he could procure them almost anywhere, in large numbers, and with a minimum of effort. Thus, unlike certain types of mined stones such as obsidian or chlorite, marine shells could be found and obtained easily by anyone venturing south to the coast from Yahya. The possibility therefore remains that the Yahya shells were not obtained through trade, but from annual or semiannual trips to the coast by some of the Yahya inhabitants themselves. The apparent absence of organized regional trade is supported by the fact that only a very small number of marine shells are found at Iblis (Caldwell 1967:408), which is approximately twice as far from the coast as Yahya. This steep fall-off in marine shell numbers with distance from the source suggests unscheduled Down-the-Line Trade (Renfrew 1972:465) or Trickle Trade (Beale 1973:141).

The only other nonlocal materials in VII, and here we will include all artifact categories for the sake of completeness, are as follows:

Material	*Period*	*Artifact*
Obsidian	VIIB	1 tanged point
	VIIA	1 backed blade
Copper	VIID	1 pin of hammered native copper
	VIIB	3 unidentified fragments
	N-VII	1 pin
		1 unidentified fragment
Agate	VIIB	1 pendant
	VIIA	1 pendant
Carnelian	VIIB–VIIA	1 possible bead blank
Turquoise	VIIC–VIIB	2 beads
	VIIB	2 beads
	VIIA	4 beads

As can be seen, all these raw materials are extremely rare in VII. The total of 19 pieces represents only 6 percent of the approximately 310 artifacts coming from well-defined Period VII contexts. In Period VII, then, Yahya can be seen as a largely self-sufficient settlement with very limited quantities of exogenous materials (excluding marine shells, which may constitute a special case) that most probably are coming through unscheduled Down-the-Line Trade or Trickle Trade from sources as near as 150–200 km (turquoise) or as far as eastern Turkey (obsidian), more than 1,800 km away.

In Periods VI and V there appears to be no further development in the trade for obsidian, agate, and carnelian; all three continue to be found in extremely small quantities and comprise only a minute portion of the overall artifact assemblage. In addition, there is a general diminution in the numbers and species of marine shells in VI and V. Turquoise and copper, however, are the tantalizing exceptions. Turquoise gradually becomes more common in VI and V, and copper suddenly becomes very common in VA (23 of the 34 pieces in total from VII–V come from good VA contexts). All analyzed copper artifacts from VB and VA are of smelted and cast arsenical copper, which is known to come from a single source area near the prehistoric site of Sialk (Heskel and Lamberg-Karlovsky 1980). The fact that cast and smelted arsenical copper is so rare in VB and then so common in VA, together with the discovery of a copper ingot in VA, suggests tht arsenical copper objects made using this new metallurgical technology are first imported in small quantities in VB as finished objects, but that in VA larger quantities are imported in the form of arsenical copper ingots and then made into objects locally. This evidence for a more regular and carefully organized regional trading system beginning in VA also is reflected in the introduction of small quantities of two new types of raw materials: two vessel fragments of diatomaceous limestone from VA and three lapis lazuli beads from VB–VA. The source for the diatomaceous limestone probably is Oman.

The closest known source for lapis lazuli is northern Afghanistan (Herrmann 1968).

In summary, the chronological distribution of raw materials at Yahya suggests that the settlement led a fairly isolated existence through most of Periods VII, VI, and V. Only in VA are there hints, with the appearance of new types of exogenous raw materials and the dramatic increase of imported arsenical copper, that what until then had been unscheduled Trickle Trade was now a more regular and more organized regional trading network (Beale 1973).

To return to other types of ornament changes—decorated discs, buttons, clay stamp seals, and copper rings—is of little help because there is only one example of each in Periods VII–V. It is quite possible that the single clay "stamp seal" was not used as a "seal" at all, but merely as a decorated pendant. The single decorated disc of chlorite from N-VA.3 has close but predominantly later parallels at Shahr-i Sokhta and Mundigak, sites far to the northeast, and therefore fits in well with the model presented above for increased contacts to the north in VA.

Bracelets appear sporadically throughout the sequence. The only significant change is the absence of bracelets with incised decoration after VIA.

Two-hole objects, probably attached to clothing, show an interesting stylistic development from simple geometric shapes in VII to more elaborate zoomorphic shapes in VIA–VC (a boar and a snake). This ornament type is not found at all in good context after VC. Labrets (lip plugs), too, have a limited distribution and are not found in good context after VIA. The disappearance of these two ornament types suggests a change in habits of personal adornment in VC–VB. Simple pins are found sporadically throughout Periods VII, VI, and VC. It is noteworthy that bone pins, like most bone tools, go out of use at the end of VII. Smelted and cast pins with heads first appear in VB, and become quite common in VA. Besides reflecting the introduction of a new metallurgical technology, the appearance of headed pins in VB–VA coincides with the disappearance of labrets and two-hole objects of shell and mother-of-pearl and may indicate that pins with heads were *replacing* two-hole shell ornaments and labrets as one of the desired means of personal adornment.

Miscellaneous Artifact Types

We conclude this section on small finds changes with two artifact types that do not easily fall under any of the above categories. First are the concentrations of chlorite debitage found in VA levels in Trench B. While these concentrations do not necessarily imply craft specialization or the centralized production of chlorite artifacts in VA, it is noteworthy that this is the earliest appearance of chlorite debitage on the site, even though chlorite is the most common single material for artifacts throughout Periods VII–V.

Second is the most enigmatic category of all: figurines. The human head of chlorite (fig. 7.31), with the carefully incised designs on its face, and the female figurine of chlorite (fig. 7.29), with its bisexual features, are among the most intriguing artifacts on the whole site. Both belong to Period VII (although the head does come from a mixed N-VII, VB context). The association of the female figurine with a foundation deposit of harvesting tools placed within a storage complex strongly suggests that the figurine represents a female goddess of fertility. The designs incised onto the human head of chlorite also suggest a religious or ritual function for this artifact. These two objects remain our only insights into the religion and ideology of these periods. It is curious that there are no clear representations of humans/gods, either in stone or clay, in good context after the end of Period VII. Although one must be cautious in arguing from negative evidence, it is possible that this absence in VI and V represents a basic change in the religion or the ritual associated with the religion.

The simply modeled figurines of sheep and goats that appear throughout the sequence probably are toys. The significance of the two finely carved stone rams, one from inside an N-VA.1 house (fig. 7.30:a) and one from N-VII, VB (fig. 7.30:b), is not clear, but they are the earliest examples on the site of sculpture in the round in materials other than chlorite and represent two of the finest examples of prehistoric "art" on the Iranian plateau in this period.

Changes in Population/Demography

In summarizing the evidence for population changes and shifts in the area around Yahya during the fifth and fourth millennia B.C. (see Prickett, this volume, ch. 9), it should be emphasized that we are dealing with two geographically separated and ecologically distinct areas: the area immediately around the site of Yahya in the southwest corner of the Soghun valley, and the much larger Daulatabad basin starting 24 km west of the Soghun valley. The Soghun valley enjoys almost twice as much annual rainfall (approximately 250–300 mm) as the Daulatabad basin (150 mm) and has temperatures that average 3°–5° C cooler. While almost certainly in frequent contact, these two settled areas were separated by 24 km of mostly uninhabited terrain during Periods VII–V, while beyond these two distinct settlement areas there appears to have been virtually no other early occupation within this large catchment area.

The explanation for the presence of two such highly concentrated settlement areas surrounded by large expanses of terrain with no settlements must lie with the limitations of the ecological setting for these early agriculturalists. In the Soghun valley (apparently out of choice) and in the Daulatabad basin (out of necessity), these early villagers did not rely on dry farming. Instead they obtained water for crops by proximity to a very high water table and several local springs (in the Soghun valley) or by an elaborate water management technology utilizing rain-fed surface runoff (in the Daulatabad basin).

As a result, whether in the Daulatabad basin or around Yahya, early settlements and population increases appear to have been conforming to the dictates of Liebig's law (Odum 1971). This law of the minimum operates to restrain plant or animal growth below the level set by factors of

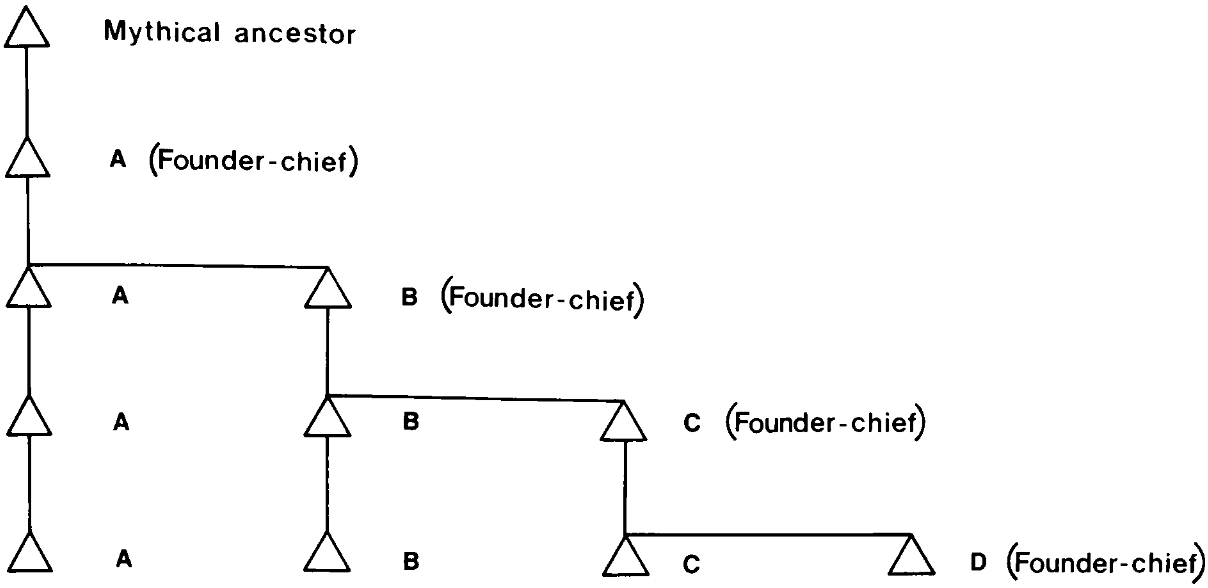


Figure 10.1. The structure of a segmentary lineage. Triangles represent males in line of descent and functioning as chiefs or headmen of villages.

least adequacy, whether that be water, animals, shelter, or whatever human populations require. This means that populations that are relatively homeostatic are constrained at a level set by the availability of an essential factor at the time of its most limited supply or of its greatest requirement. Settlements near Yahya, particularly in the Daulatabad basin, appear to have been constrained by the availability of water and the technology used in harnessing its availability.

These ecological constraints on settlement location also appear to have been a factor in limiting population growth during Periods VII–V. The Daulatabad basin was first settled slightly earlier than Yahya (Prickett, this volume, ch. 9). Even after Yahya was settled, it appears to have remained a smaller settlement than several of those (such as Tepe Gaz Tavila) in the Daulatabad basin. After the initial settlement of both areas by the late sixth or early fifth millennium B.C., there was a gradual increase in number of sites and total occupied area, with population peaking in Period VA in both the Soghun valley and Daulatabad basin.

While the area's population may have been increasing during these periods, its *rate* of increase was very low. In the Daulatabad basin, for example, a total of 19.68 ha of mounded sites was recorded for the estimated 1,200-year-long Period VII. For the 300-year span of Period VA, 39.06 ha of mounded occupation was recorded. If, for simplicity's sake, we divide the Period VII occupation by 4 (its occupation span is four times as long as that of VA) to make it more comparable to Period VA, the increase over a roughly 1,600-year period from 4.92 ha to 39.06 ha represents a growth rate of only 0.4 percent per year. Moreover, the excavated areas at Yahya would indicate that population density within settlements was far greater in Period VII than in Period VA. If we use the estimates cited earlier in this chapter of 710 people per hectare in Period VII and 217 people per hectare in Period VA, we estimate a population of 3,490 people for Period VII and 8,470 people for Period VA, representing a growth rate of approximately 0.1 percent a year. The actual growth rate, then, by our best estimate, probably was in the range of 0.1 percent to 0.4 percent per year, roughly equivalent to the low 0.11 percent rate estimated by Hole (1977) for the Ali Kosh through Mohammed Jaffar phases in Khuzistan and in agreement with the very low rates of growth that seem to have prevailed for most prehistoric populations (Cowgill 1975). In conclusion, population growth and population pressure do not appear to have been major factors in the process of cultural change during these early periods.

The other significant demographic change between Periods VII and V is a significant decrease over time in the average size of sites. In Period VII small villages (under 0.5 ha) are no more numerous than large villages (over 2.5 ha), while in subsequent periods there are *four times* as many small villages as large villages. As Prickett suggests (this volume, ch. 9), the higher incidence of small sites beginning in Period VI–VB implies changes in community organization and may relate to the changes noted above in house forms and intrasite settlement density.

As just one hypothesis for what processes may have been at work to produce this shift, we suggest a theoretical model for the budding off of numerous smaller communities from single large communities (fig. 10.1). The problem is to show how the apparently large but essentially egalitarian society of Period VII is transformed into another settlement pattern in which hierarchy prevails but allows for the budding off of increasingly numerous individual communities. Our chart illustrates a genealogy of a chiefly ramage, indicating rank and order of precedence in the creation of villages. Village A could represent the large Period VII community of Tepe Gaz Tavila, which over the course of several centuries sees the budding off of communities from that center to establish new communities (settlements B, C, D in fig. 10.1). We may hypothesize that from larger settlements of essentially egalitarian and communally structured social organization there emerged by Period VB individual households within distinct smaller communities. Here production was in the hands of individual family units, as compared to the earlier larger sites in which larger kin groups were manifesting communal land ownership and production with concomitant communal storage facilities. From Period VC to Period VA the architectural exposures do not argue for any centralizing tendencies or an administrative control of production in the hands of the elites.

It appears more likely that an *oikos*, a unit consisting not merely of the family but of all the people of a household together with its lands and its goods, was the fundamental unit of production. The change from large sites of greater communal organization to smaller sites with apparent household production takes place in Periods VC and VB at a time of increased contact with communities in southwestern Iran. Given the limited evidence, we can only speculate as to whether this apparent shift to a new structure of social organization was brought about as a result of acculturation with communities to the west.

Following the population peak in Period VA, Yahya itself was abruptly abandoned, and population declined significantly in both the Soghun valley and Daulatabad basin, culminating in the complete abandonment of the Daulatabad basin by the beginning of Period IVC. Why this marked decline and abandonment occurred is discussed extensively by Prickett (1985) and will be addressed briefly in our concluding chapter.

A MODEL OF CHANGE AND DEVELOPMENT AT TEPE YAHYA, 4900–3300 B.C.

Having summarized the different lines of evidence for cultural change, we come to the most difficult and challenging task of all: trying to explain in a single coherent model *why* these different changes took place and *how* they might be causally related. Seen as a whole, material culture at Yahya is undergoing change in diverse and complex ways throughout the sequence (table 10.1). Indeed, it is astonishing how much change does occur in this relatively isolated mountain valley over a 1,600-year period. This in itself is a fundamental point. Even within relatively isolated and seemingly stable cultural systems, change *always* is going on. And yet, even with a wealth of documented change within a long and tightly stratified sequence, our ability to ascribe causal linkages between different types of change remains painfully limited.

Changing Economic and Social Organization: Cause or Effect of Other Change?

The most significant cultural change at Yahya during Periods VII–V is a hypothesized internal change in economic and social organization: an apparent shift from a larger, community-wide unit of economic self-sufficiency to a smaller, multifamily unit of self-sufficiency, ending in VA with the nuclear or extended family as the probable primary unit of production. What local series of events or processes over time might have selected for a *smaller* unit of economic self-sufficiency, if in fact this is what is implied by the architectural changes? Regrettably, we find no clear answer to this question within the archaeological sequence at Yahya because there is very little discernible change in the material remains during Period VII that might suggest specific causal antecedents or incentives for this subsequent change.

Pressures from a changing paleoenvironment do not provide a ready explanation for this organizational shift because local fauna and flora, together with the documented subsistence base of plant and animal domesticates, remain stable and little changed throughout the sequence (Meadow, this volume). There may have been some diminution of rain-fed runoff in the Daulatabad basin related to population shifts and declines in the Daulatabad basin in Period VA and thereafter (Prickett, this volume), but these possible changes in the local ecology occur only at the *end* of the VII–V occupation, too late to be a causal factor.

The same can be said for other commonly cited catalysts for change: population pressure, trade, and technological change. Population pressure, given the evident carrying capacity of the Soghun valley (Prickett, this volume), probably became a potential problem only in VA, at best concurrent with other late changes. There also is no evidence that trade with the outside world amounts to anything more than unscheduled Trickle Trade (Beale 1973) until the end of the sequence (VA). The only major technological change in the entire sequence is the introduction of metallurgy—the smelting and casting of arsenical copper—and this, too, does not appear in quantity until VA.

Perhaps this issue of causality is best answered by reversing the presumed cause and effect, since the observed shift in social and economic organization was well under way *before* other major changes in technology, trade, craft specialization, and population size. Given the sequence of changes observed, it seems at least possible that this internal change in economic and social organization was itself the catalyst and prime mover that led to these other changes. Technological change and the development of trade may have been the *result* rather than the *cause* of internal changes in the prevailing social relations that characterized the ancient community at Yahya. As Finley (1973:53) has written in his analysis of the ancient economy, "Technical progress, economic growth, productivity, even efficiency, have not been significant goals since the beginning of our time. So long as an acceptable lifestyle could be maintained, however that was defined, other values held the stage." The evidence at hand might also be interpreted as support for the view of Durkheim (1933:238) that "the first origins of all social processes of any importance should be sought in the *internal* constitution of the social group."

It is difficult to show, of course, exactly how a gradual shift to the nuclear family as the basic economic unit could have led to these other developments. But, as Kent Flannery aptly points out in discussing the rise of villages in the Near East (1972:48), "When we shift to societies where the individual household is the basic production unit and the sharing of storage more selective, the opportunities for intensification (of production) greatly increase." Flannery's statement is not a rigorously defined universal law of cultural development, but it does provide a reasonable explanation for what happened at Yahya. The key term here may be *incentive*. If the economic unit was the whole community and subsistence goods were pooled among the various members of the community, there was less incentive to increase productivity and no structure for accumulating a subsistence surplus on an individual basis. On the other hand, if the nuclear family becomes the unit of economic self-sufficiency and controls its own land and means of production, then there is both the structure and the incentive through which a surplus of subsistence goods and other material forms of wealth or status can be accumulated and held by the individual or the family. Obviously, there are many ethnographic examples of societies where the family is the basic production unit and where there also are built-in cultural mechanisms that prevent the accumulation of permanent material wealth or surpluses by individuals or single families (Sahlins 1972). But there are also many other examples where the single household as production unit *does* lead to major fluctuations in wealth and prosperity between households, even in the absence of social stratification (cf. Flannery 1972:48).

At Yahya, because of the limited exposure, it is impossible to document possible differences in wealth *between* households. But the appearance in VB and VA (particularly in VA) of a greater variety of artifacts and of larger numbers of labor-intensive products (marble bowls and beakers and more elaborately shaped vessel forms) and technology-intensive ornaments (cast arsenical copper pins with heads) implies a generally higher level of material wealth and prosperity and a greater accumulation of objects that might be considered "status" items or portable forms of wealth. To give just one hypothetical example of what processes may have been involved, if marble bowls or pins with heads or sets of chevron-painted beakers came to be considered *standard* status items (for whatever internal reasons of social and economic competition), then there would have been a need and a rationale for instituting the larger-scale, centralized, local production of such items apparent by Period VA.

THE NATURE OF CHANGE AT TEPE YAHYA: RECEPTIVITY TO CHANGE AND INNOVATION, RATES OF CHANGE, AND UNANTICIPATED RESULTS

Despite the difficulties in *explaining* change at Yahya, we can make some closing observations on the *nature* of change: receptivity to change and innovation, rates of change, and unanticipated results of change. These are issues that might usefully be examined on other ancient sites with long, unbroken occupation sequences.

At Tepe Yahya it is fascinating to see the various ways in which this ancient settlement showed itself to be innovative and/or actively receptive to outside influences. There are several examples of small innovations or changes in one period being capitalized on and turned into major adaptive changes in the following period. For example, in Period VIB for the first time small amounts of rubble were used instead of mud bricks to fill in and level off shallow depressions, and then somewhat later to create what appears to be a small drainage system. Having discovered the advantages of rubble as a material for leveling and drainage, the inhabitants of the following period, VIA, went on to construct the largest stone rubble leveling and terracing complex known in prehistoric Iran. In Period VII, Yahya inhabitants painted the bodies of their dead with red ochre; in VI it would appear that they took this concept of applying color and adapted it to their ceramics, starting to paint red designs on Chaff-Tempered Coarse Ware and developing Red-Painted Soghun Ware out of the unpainted Period VII Soghun Plain Ware. In VC Yahya was receiving small quantities of imported Black-on-Buff ware from the west; in VB Yahya stopped importing Black-on-Buff and began large-scale local production of its own imitative version of Black-on-Buff Ware. Finally, the importing of finished objects made with a new metallurgical technology in VB led in VA to a development of trade in arsenical copper and local production on a significant scale of the same arsenical copper objects as well as new types of arsenical copper tools.

Whatever the specific causes for Yahya's receptiveness to change, the nature of change at Yahya suggests two interesting general points that deserve further examination on other sites. First, what began at Yahya as small changes to adapt to a particular need often appear to have led to major and probably unanticipated changes in and cross-fertilization with other aspects of culture. Thus, an initially limited use of rubble in one period leads to a massive use of rubble in a somewhat different way in the following period; a metallurgical technology that seems to develop initially in response to a desire to create more elaborately shaped pin ornaments (Period VB) leads to very different and more practical uses of the same technology for tools (VA) and eventually to weapons that revolutionize warfare. Even the use of a sequential slab production technology in making ceramics may have influenced (or been influenced by) the development of a totally different clay-working technology: the making of mud bricks and related techniques of house wall construction (Vandiver, this volume, ch. 5).

Second, rates of change appear to differ in different periods. Throughout the several-hundred-year-long Period VII there is little change, and what changes do occur are minor in nature. In Periods VI–VC and then in VB–VA, the rate of change accelerates, both in technology and in the variety, diversity, and quantity of raw materials and finished objects. This apparent manifestation of long periods of conservatism punctuated by shorter periods of rapid change in cultural development finds interesting parallels in the recent evidence for "punctuated" evolution in biology (Gould 1982:184).

Chapter 11

Conclusion: Tepe Yahya in the Context of a Wider Core-Periphery Interaction Sphere in the Fifth and Fourth Millennia B.C.

C. C. Lamberg-Karlovsky
Department of Anthropology, Harvard University

Thomas Wight Beale
Peabody Museum, Harvard University

There is great continuity and relative stability of sites and population throughout the Iranian plateau and western Zagros for much of the fifth and fourth millennia B.C. From the perspective of Tepe Yahya Periods VII–V one sees three major phases in Iran during this 2,000-year period. During the first phase, Yahya Period VII (most of the fifth millennium B.C.), there is a long, slow-changing Late Neolithic configuration of farming villages that share many generalized aspects of technology and subsistence adaptation. The second phase (Yahya Periods VI–V), encompassing the early to mid-fourth millennium B.C., is characterized by greater outside influence (from Late Ubaid Mesopotamia and Susiana), faster rates of change and accelerated development, increased trade and movement of raw materials, and a trend toward more distinct regional characteristics in cultural assemblages, especially in painted fine wares. The third and final phase, represented by the more ephemeral Iblis IV/V settlements around an abandoned Tepe Yahya (the last centuries of the fourth millennium B.C.), sees an interruption of this growth and is marked by a poorly understood but widespread decline in settlements and population. This in turn sets the stage for the eventual spread of record-keeping Proto-Elamite colonies into various areas of the Iranian plateau (at Godin, Sialk, and Yahya).

PERIOD VII (4900–3900 B.C.)

The earliest settlements in the Yahya region (beginning before 5000 B.C. in the Daulatabad basin) already possess the same agrarian economy and range of plant and animal domesticates shared by most of the early farming communities in Iran. Present in the first settlements are domesticated sheep, goat, and cattle, together with domesticated wheat (einkorn and emmer), barley (two-row as well as hulled and naked six-row), millet, and oats. In fact, the only surprising paleoethnobotanical remains recovered were date stones from (probably) cultivated date palms (only in the warmer Daulatabad basin) in the earliest Period VII settlements, and grapes (only from Yahya, in the cooler, wetter Soghun valley).

In addition to a common subsistence base, Iranian settlements of the fifth millennium B.C. shared basic types of production and tool technology. Vandiver's chapter (this volume, ch. 5) detailing production technology of the early "Soft Ware Horizon" (Dyson 1966) provides an important contribution toward understanding the widely shared ceramic production techniques for the manufacture of these early wares. While the production technique elucidated in chapter 5 pertains specifically to the Yahya coarse wares, a similar method of construction—the sequential slab technique—is evidenced in comparable ceramics at Chogha Mish (Kantor 1985) and at widely scattered sites on the Iranian plateau and in the Zagros. Coarse "Soft Ware Horizon" sherds from the sites of Seh Gabi, Sarab, Ali Kosh, and distant Mehrgarh in Pakistani Baluchistan have been studied by Vandiver. The similarity in construction technique is notable (Vandiver, personal communication).

Shared production technologies in this period also extend to flint tool industries and metal working. In a preliminary analysis of the Yahya flint industry, Piperno (1973) has suggested that the methods used in the production of sickle blades, burins, truncated blades, and drills, to mention but a few tool types, are similar to those of comparable date found on other sites of the Iranian plateau and the Zagros. Hammered native copper in the form of simple pins (and/or awls) and rings also is widespread on the Iranian plateau in this early period, with the copper coming from a single source: the Anarak-Talmessi mines near the site of Sialk (Heskel, this volume).

A sign of the essentially conservative nature of technological change extending throughout the fifth and fourth millennia B.C. in Iran is the fact that flint tool types and the sequential slab construction technique continue on Iranian plateau sites for much of this period. Coarse ware at Yahya continues to be made by the sequential slab technique into Period VA. Moreover, the Soghun fine wares of Period VI and even the Black-on-Red wares of Period VA also continue to be made with the sequential slab technique.

In a third major area, water management technology, the use of irrigation systems from the beginning of this period appears to be a widespread phenomenon as well. In his research in the Deh Luran area of southwestern Iran, Hole (1977) has argued for a migration of peoples representing a "separate and distinct tradition" into this region from northern Mesopotamia. This "separate and distinct tradition" appears at Chogha Sefid in a period referred to as the Chogha Mami Transitional, a phase related to the late Samarran of northern Mesopotamia. Hole further argues that it is in the last centuries of the sixth millennium in the Sabz Phase that one sees the onset of irrigation. Chogha Mami, a site east of the Diyala in Iraq excavated by Oates (1973), also has evidence for simple fan irrigation by about 5400 B.C. In the Daulatabad basin at a comparable period (Period VII) there is abundant evidence of the same simple fan irrigation, as well as an identical exploitation of plants and animals within a similar inventory of coarse chaff-tempered ceramics.

We are unable to answer the question whether these techniques of production, so similar at different sites, are the result of a common shared technology or are of independent invention. It is likely, however, given the overall comparability of the adaptive patterns of these early farming communities, that these shared attributes of production technology reflect some degree of communication and diffusion within this large region during the fifth millennium B.C.

PERIOD VI–VC (3900–3700 B.C.)

This period sees continuity in shared production technology but increasing outside influence entering into southwestern Iran and, perhaps in a ripple effect, an emerging Black-on-Buff Ware influence reaching a previously ceramically distinctive Yahya. Following the Sabz Phase in the Deh Luran area is Hole's Mehmeh Phase (4800–4400 B.C.), still squarely within the time frame of Yahya Period VII. Hole (1977) sees the Deh Luran area in this phase as a backwater of greater Mesopotamia, while in the following Bayat Phase (roughly comparable with late Period VII and Period VI–VC at Yahya) the area is perceived by Hole as squarely in the Ubaid tradition.

This Late Ubaid influence reaches Yahya in Period VIA, but in the form of just three Ubaid sherds, which constitute the sole substantive evidence for a relationship to the ceramics of the Ubaid tradition. The region of southwestern Iran, then, falls early under the influence of a direct Ubaid tradition that finds little evidence farther to the east in the vicinity of Yahya, which continues with a distinctive localized tradition of Soghun fine wares.

Period VC, however, sees the first appearance, in small quantities, of a new Black-on-Buff Ware with close typological affinities to comparable wares at Jaffarabad, Bakun, and Gap. The VC Black-on-Buff Ware may represent direct imports from the west, but by VB this fine ware becomes quite common and clearly is made locally. The continuity of contact with the west also is reflected in the arrival in Period VI of Lapui Ware of a type similar to that recorded by Sumner in Fars. This Lapui Ware continues at Yahya into Period VA.

In summary, it would appear that an early Mesopotamian acculturation affects the region of Khuzistan, after which the Iranian southwest in turn has a direct influence on the cultures of Yahya in Periods VC and VB.

PERIOD VB–VA (3700–3300 B.C.)

During this final phase, the cultural affinities reflected in the painted fine wares at Tepe Yahya point more to the east than to the west and show distinctive regionalized characteristics not to be found at this period in southwestern Iran (Susa A). At the same time, the pace of change and development in this final phase accelerates markedly, with greater importation of nonlocal raw materials and evidence for the first true metallurgy.

The Black-on-Red Ware that dominates VA has as its most distinctive motif the single or multiple chevron (or herringbone pattern). Typologically almost identical ceramic assemblages are found for this phase from Iblis in the north down to the Persian Gulf, and from Yahya eastward to sites in Baluchistan such as Chah Husaini, an area measuring approximately 400 km in each direction, or 160,000 km^2, within which one finds a distinctive and uniform material culture.

Interaction and trade within and beyond this region must have surpassed anything that had gone before, if the variety of nonlocal raw materials is any indication. Whereas previously there had been only a trickle of exotic materials such as obsidian from the Lake Van region of Turkey (Renfrew, personal communication) and copper from the Anarak-Talmessi mines near Sialk, there now appear larger quantities of previously rare materials such as turquoise and copper and entirely new materials such as diatomaceous limestone (from Oman) and lapis lazuli (from northern Afghanistan).

The most striking change is the introduction of the technology for producing copper arsenic alloys, not just at Yahya but all across the Iranian plateau over a fairly brief time span. Heskel (1981 and this volume), who has examined materials from Susa, Sialk, Hissar, Yahya, and Shahr-i Sokhta, has shown that not only is there a widely shared technology in the production of copper arsenic alloys in this period, but that the specific ores from the Anarak-Talmessi mines were being exploited by the sites of Susa, Hissar, and Yahya. These arsenic-rich ores contain significant quantities of domeykite and algodonite, which are known geologically only from a single resource area on the Iranian plateau, the Anarak-Talmessi mine close to the site of Sialk. Heskel's analysis also shows that objects of this natural copper arsenic alloy were not exported from one specialized metal-working site, but were manufactured (using smelting, casting, hammering, and annealing) on each of the different sites. We are thus led to conclude that there continues to be a very substantial exchange of technological information in this period across highland Iran *in spite of* the relative absence of a shared ceramic typology among such sites as Susa, Hissar, Sialk, and Yahya.

Period VB–VA sees a peaking of population in the Yahya area, but, as pointed out in chapter 9, this increase appears to represent the culmination of a slow and gradual increase over a 1,600-year period rather than a sudden population explosion. The absence of *sharp* population increases also appears to be the rule elsewhere. Population shows a steady increase on the Deh Luran plain through the Susiana *d* period and then begins to drop off during Susa A, which is followed by a precipitous decline in the Terminal Ubaid (Wright, Neely, Johnson, and Speth 1975:111). Wright (1981) estimates the population of southern Sumer in the late Ubaid to be no greater than 4,000 people, a total figure possibly even lower than the population of the Daulatabad basin in Period VA, although Wright's low estimate may reflect the inability to record scatter sites in the thick southern alluvium of Mesopotamia.

THE COLLAPSE AND ABANDONMENT AT THE END OF PERIOD VA

Seemingly in the midst of a period of growth, widening trade, and relative prosperity based on an apparently stable subsistence base, the settlement at Tepe Yahya is abruptly abandoned at the end of VA without any evidence for conflict or destruction. To summarize the demographic shifts at the end of Period VA (Prickett, this volume), Yahya itself ceases to be a settlement around 3300 B.C. and is not reoccupied until Period IVC (after a 400–500-year hiatus). There also may have been a complete abandonment of the other existing settlements in the Soghun valley. However, during at least part of the intervening period (ceramically defined by Prickett as "Iblis IV/V") settlement resumes in the Soghun valley, though probably at a significantly reduced population level. In the Daulatabad basin the shift is less abrupt but more dramatic in the end. Settlements continue in the Daulatabad basin immediately after VA, but there is a substantial decline in numbers of sites and total area occupied. By the end of Iblis IV/V the basin is entirely devoid of settlement, not to be reoccupied until the first millennium B.C.

Reasons for the break in settlement and irrigation patterns after Yahya VA remain unresolved. There are no significant changes during this time period evident in the paleoenvironmental record (Meadow, this volume) that might account for the decline, although for the Daulatabad basin, at least, insufficient rainfall for dry farming and complete dependence on flood runoff for irrigation may have left settlements especially vulnerable to drought periods or even minor shifts in the seasonal rainfall patterns (for a more complete discussion, see Prickett 1985).

It would appear clear, however, that following this break there is some social fragmentation, as communities live in smaller aggregates on sites that are more ephemeral. It is possible that Iblis IV/V represents a period of development of, or reversion to, a more nomadic lifestyle, the impetus for which remains enigmatic. It is important, however, to be aware that the subsequent period in the settlement of Yahya represents a Proto-Elamite colony, referred to as Period IVC. With the arrival of this Proto-Elamite colony, there emerge more direct economic trade involvements with regions to the west as well as the probable importation of new political and religious ideologies with a concomitant social technology indicative of control mechanisms, including the use of tablets, cylinder seals, and sealings.

The sudden abandonment of Yahya and demographic collapse of the surrounding region after Period VA is perhaps better understood in the context of wide-ranging demographic shifts occurring both in periphery areas of highland Iran and in more developed core areas of Khuzistan and Mesopotamia. The mid to late fourth millennium social fragmentation and settlement constriction that bring an end to Period VA and continue in the subsequent Iblis IV/V Transitional period, occur during virtually the same period in which Adams (1981) has documented substantial demographic shifts in southern Mesopotamia. Adams has indicated a tenfold increase in the population growth of urban centers toward the end of the fourth millennium. Concomitant with what are believed to be large-scale demographic shifts in southern Mesopotamia, one sees the development of temple complexes, hierarchically structured bureaucratic organizations, written tablets, seals, sealings, etc. These changes in the demographic patterns of settlement in southern Sumer find their counterpart in a slightly later period in the region of Khuzistan, where Wright and Johnson (1975) have recorded a threefold increase in population. It is unlikely that these large-scale population increases are the result of an internal increase in population caused by an increased birth rate. Far more likely is the possibility that the apparent population increases within Mesopotamia and Khuzistan occur as a result of immigration into these regions. It is perhaps more than mere coincidence that the increasing populations of urban centers and an increased social complexity in southern Mesopotamia and Khuzistan appear within the same range of time that more peripheral areas to the north and east, not only around Yahya but also in such areas as the Hulailan valley of northern Luristan (Mortensen 1974:32) and the Marv Dasht plain around the site of Malyun in Fars (Sumner 1972:190, 247), are experiencing an equally dramatic period of disruption, disorganization, and "decline."

We would suggest that what happened in the later fourth millennium was merely another, if more dramatic, chapter in the interactive processes of a core-periphery relationship extending back at least as far as the fifth millennium B.C. Thus, the Ubaid impact on Khuzistan is already evident in the Mehmeh and Bayat phases. Following the Ubaid influence on southwestern Iran, a comparable impact on Period VC–VB at Tepe Yahya is evidenced by the spread of the southwest Iranian black-on-buff ware tradition to southeastern Iran. This acculturative impact, in turn, has a direct influence on increasingly successful adaptations to an agricultural economy evident in the increased number of farming communities in Period VA and an internal development of widely distributed cultural complexity throughout southeastern Iran that was not evident before this period. Subsequent demographic shifts in the late Uruk period in Mesopotamia and in Khuzistan are contemporary with the dissolution of the complexity that characterized Period VA. Although at present there is no direct evidence to suggest a connection between these two phenomena, it seems not unlikely that they were in some way related.

Appendix A

Brick Sizes

The following brick sizes are listed by period and phase and by feature within each phase. If the feature or provenience from which a brick came is not shown on a plan, the original feature or stratum designation is given as a reference. All measurements are in centimeters. The width and height were always measured across the center of a brick. Dimensions that were not or could not be measured in the field (as with fragmentary bricks) are designated by a question mark.

In the final column, "up," "down," and "side" refer to whether the brick was laid in position with the thumb impressions facing up, down, or to the side. Where there is no number in the final column, thumb impressions were present but were not counted. "Absent" indicates that the brick *was* examined and that there were *no* thumb impressions. The final column was left blank if the presence or absence of thumb impressions was not noted.

Four representative thumb-impressed bricks from Period VIA are illustrated in figure 6.19.

Period, Phase, and Feature	*Length*	*Width*	*Height*	*Thumb Impressions*
Period VIID				
No complete bricks measured				
Period VIIC.2 (fig. 6.1)				
From the fill of Room 1	38	14	7	up
Period VIIB.6 (fig. 6.6)				
Wall 26	36	15	9–10	6 up
	36	16	9–10	6 up
Periods VIIB.5, VIIB.4, VIIB.3				
No complete bricks measured				
Period VIIB.2 (fig. 6.8)				
From west walls of Rooms 3 and 6	57	12	11	
	57	12	11	
	64	16	9	up
	60	17	11	up
	17	17	10	up
	66	17	9	up
	76	15	9	up
	59	19	12	up
	58	21	10	up
	19	16	11	up
	41	18	7	up

Period, Phase, and Feature	*Length*	*Width*	*Height*	*Thumb Impressions*
	56	18	10	up
	20	13	10	up
	48	19	10	up
	20	13	10	up
	45	15	10	up
	55	19	10	up
	20	13	10	up
	74	17	10	up
	72	16	9	up
From north, south, and west walls of Room 4	38	20	16	up
	35	18	13	up
	28	22	13	up
	33	16	12	up
	46	16	8	side
	32	14	8	up
	35	13	8	up
	32	15	10	side
	38	14	8	up
	42	15	16	up
	21	14	8	side
	40	13	13	up
	43	14	10	up
	16	14	12	side
	37	15	16	up
	18	13	18	up
	33	13	8	up
From south wall of Room 5	45	18	10	up
	27	16	9	up
	43	14	10	8 up
	37	14	8	6 up
	55	14	8	up
	64	16	10	up
	53	19	9	up
	18	18	8	
	60	17	11	up
	92	15	9	up
	69	18	9	up
From north walls of Rooms 5 and 6	15	16	9	absent
	51	18	10	6 up
	73	19	8	up
	67	17	11	up
	73	14	9	up
	64	19	10	up
	50	17	9	up

Period, Phase, and Feature	*Length*	*Width*	*Height*	*Thumb Impressions*
	19	15	8	up
	18	17	9	up
	29	17	9	up
	41	16	8	up
	33	16	9	up
	41	13	10	up
	52	19	10	up
	69	17	9	up
	16	16	9	up
	18	15	8	up
	54	15	9	up
	56	15	10	up
	56	15	10	up
	19	17	7	up
	48	17	7	up
	50	15	10	up
	19	15	10	up
	11	16	10	
	47	18	10	up
	61	14	9	up
From east wall of Room 6	48	17	7	up
	33	18	7	up
	19	14	8	up
	31	15	10	up
	19	17	9	up
	53	16	9	up
	21	15	9	up
	41	15	10	up
	40	15	10	up
	40	16	10	up
	29	15	8	up
	22	17	8	up
	57	17	8	up
	40	15	10	up
	62	13	8	up
	15	13	9	up
	41	15	8	up
	13	13	9	up
	40	14	9	up
	70	15	10	up
	30	14	10	up
	64	14	9	up
	75	14	9	up
	37	15	10	up
	47	18	10	up
	67	14	9	up
	89	15	10	up
	15	15	10	up
	46	16	6	up
	66	17	9	up
	66	18	8	up
	55	14	9	up
From south wall of Room 6	40	16	9	up
	38	14	9	up

Period, Phase, and Feature	*Length*	*Width*	*Height*	*Thumb Impressions*
	19	19	10	up
	41	15	10	up
	42	17	9	up
	42	13	7	up
	24	17	7	up
	64	15	9	up
	15	15	9	up
	64	18	10	up
	32	19	9	up
	59	16	10	up
	52	16	10	up
	96	15	10	up
	78	15	10	up
Period VIIB.1				
From brick platform	40	19	10	8 up
	43	18	10	8 up
	43	18	10	8 up
	45	21	11	8 up
Period VIIA (fig. 6.12)				
From fill of Courtyard 1	30	?	8	absent
	55	?	9	absent
From west wall of Room 2	57	20	10	12 up
From north walls of Room 2–5	60	20	12	10 up
	55	20	10	8 up
	38	19	9	6 up
	50	20	9	8 up
From east wall of Room 8	34	20	12	6 up
	34	19	14	6 up
From north wall of Room 8	52	20	12	8 up
	60	18	13	10 up
From west wall of Room 10	40	20	11	8 up
Period VIB.2 (fig. 6.15)				
From Wall 1	60	22	10	10 up
	32	18	10	4 up
	48	20	10	8 up
	45	20	10	8 up
	90	20	10	16 up
	66	19	9	12 up
	40	19	10	6 up
	61	20	10	12 up
From Wall 4	57	18	11	12 up
	35	20	10	6 up
	64	20	10	10 up
	50	18	10	8 up
	52	20	10	10 up
From Wall 10	53	20	10	8 up
	50	20	10	8 up
	61	20	10	10 up

Period, Phase, and Feature	*Length*	*Width*	*Height*	*Thumb Impressions*
	50	20	10	8 up
	43	20	10	8 down
	50	20	10	8 up
	57	19	11	10 up
	47	20	10	8 up
	49	19	11	8 up
From Lower Brick Paving 11	42	24	15	
	35	20	13	
Period VIB.1 (fig. 6.15)				
From Wall 30	30	16	12	6 up
	30	18	11	6 up
	50	18	14	8 up
	72	18	11	12 up
	36	16	12	6 up
From walls of Room 31	43	15	12	
	38	16	10	8 down
	40	17	10	8 up
	20	12	11	4 up
	20	12	11	4 up
	20	12	11	4 up
	35	12	10	8 up
	47	14	12	8 up
From south wall of Room 33	35	22	12	
	40	20	12	
	32	17	11	
	28	20	11	
Period VIA (fig. 6.16)				
From Wall 10	55	16	12	10 down
	50	16	12	8 down
	40	14	10	8 down
	40	13	11	8 down
	40	15	12	8 down
	22	15	11	4 down
	23	18	12	4 down
	50	18	12	
	40	18	12	8 down
	43	17	11	6 down
	50	17	12	10 down
	40	19	12	
	50	18	12	8 down
	43	17	12	10 down
	35	15	11	6 down
	50	16	11	10 down
	40	16	12	8 down
	38	16	12	6 down
	38	15	12	8 down
	40	16	12	8 down
	40	16	10	8 down
	40	16	11	8 down
From Walls 10 and 11	40	16	11	8 down
	40	16	12	8 down
	60	17	12	10 down

Period, Phase, and Feature	*Length*	*Width*	*Height*	*Thumb Impressions*
	55	16	12	
	55	16	12	
	60	16	12	
	24	15	13	6 up
	40	16	10	8 down
	40	16	11	6 down
	37	15	12	8 down
	37	15	12	6 down
	37	15	12	8 down
	37	15	12	8 down
	43	14	12	8 down
	30	16	12	6 down
	25	16	12	4 down
	60	16	12	12 down
	35	15	12	6 down
	35	15	11	6 down
	35	16	12	6 down
	35	15	12	6 down
	37	16	12	8 down
	35	15	12	8 down
	35	15	12	8 down
	35	15	12	8 down
	35	15	10	6 down
	35	16	11	6 down
	45	17	12	absent
	50	17	12	8 down
	30	16	11	6 down
	30	16	11	6 down
	50	18	12	
	50	18	12	8 down
From Wall 11	60	18	13	10 down
	23	15	13	4 down
	30	15	12	4 down
	60	15	12	8 down
	60	15	12	8 down
	37	16	12	6 down
	35	17	12	6 up
	40	17	12	6 down
	35	17	12	6 down
	40	16	12	8 down
	40	16	12	6 down
	36	15	12	6 down
	37	16	12	6 down
	42	15	12	8 down
	40	15	12	6 down
From Walls 12 and 13	30	15	11	6 down
	30	15	11	6 down
	40	15	12	6 down
	40	15	12	6 down
	40	16	12	6 down
	50	17	12	10 down
	55	18	12	8 down
	30	16	11	6 down
	65	18	11	10 down

Period, Phase, and Feature	*Length*	*Width*	*Height*	*Thumb Impressions*
	45	16	12	10 down
	30	16	12	6 down
	40	16	12	8 down
	45	16	12	10 down
	57	18	12	10 down
	38	16	11	absent
	38	17	10	
	30	16	11	6 down
	60	16	11	12 down
	32	15	13	6 down
	45	16	12	10 down
	50	17	12	
	40	16	12	8 down
	42	16	12	8 down
	46	18	12	8 down
	45	18	12	10 down
	64	17	12	10 down
	55	18	12	10 down
	30	16	12	6 down
	35	15	10	8 down
	36	16	12	
	40	17	11	8 down
	40	17	12	8 down
	40	16	12	8 down
	40	15	12	8 down
	45	15	12	8 down
	45	17	10	8 down
	30	16	11	
	50	18	12	10 down
	60	18	10	10 down
	59	15	11	10 down
	58	17	10	12 down
	36	18	12	8 down
	36	15	11	6 down
	32	16	12	6 down
	30	16	10	6 down
	62	17	11	10 down
	48	17	11	10 down
	52	16	11	10 down
From Retaining Walls 3 in Trench C	30	15	15	6 down
	30	15	15	6 down
	30	15	15	6 down
	30	15	15	6 down
	23	17	15	6 down
	30	15	15	6 down
	30	17	15	6 down
	30	15	15	6 side
	35	15	15	6 down
	35	15	15	6 down
	30	15	15	6 down
	65	15	17	12 down
	45	18	15	8 down
	45	18	15	8 down
	30	15	15	6 down

Period, Phase, and Feature	*Length*	*Width*	*Height*	*Thumb Impressions*
	45	15	15	8 down
	45	15	15	8 down
	45	15	15	8 down
	40	15	15	6 down
	40	15	15	8 down
	40	15	15	8 down
	35	15	15	6 down
	35	15	15	6 down
	40	15	15	8 down
	30	15	15	6 down
	30	15	15	6 down
	30	15	15	6 down
	30	15	15	6 down
	30	15	15	6 down
	30	15	15	6 down
	40	15	15	8 down
	40	15	15	absent
	30	15	15	6 down
	40	15	15	8 down
	30	15	15	absent
	30	15	15	6 down
	30	15	15	absent
	30	15	15	6 down
	25	15	15	6 down
	30	15	15	4 down
	35	15	15	6 down
	40	15	15	8 down
	40	15	15	8 down
	60	15	15	12 down
	60	15	15	12 down
	40	15	15	6 down
	30	15	10	absent
	35	15	10	6 down
	35	15	10	6 down
	35	15	13	6 down
	35	15	13	6 down
	50	15	15	10 down
	40	15	15	8 down
	40	15	15	6 down
	30	15	15	6 down
	45	15	15	8 down
	50	19	15	10 down
	25	15	15	6 down
	40	15	15	6 down
	28	17	15	4 down
	30	15	15	6 down
	30	15	15	6 down
	35	17	15	6 down
	38	15	15	8 down
	30	17	15	6 down
	38	15	15	8 down
	30	15	15	6 down
	50+	15	15	8+ down
	43	15	15	6 side
	30	15	15	6 down

Period, Phase, and Feature	*Length*	*Width*	*Height*	*Thumb Impressions*
	43	17	15	absent
	43	17	15	8 down
	40	18	15	absent
	35	15	15	6 down
	35	15	15	6 down
	65	15	15	12 down
	37	20	15	6 down
	30	15	15	4 down
	50	15	15	10 down
	35	15	15	absent
	40	15	15	8 down
	50	15	15	10 down
	50	17	15	10 down
	45	17	15	8 down
	40	17	15	6 down
	35	17	15	6 down
	30	15	15	absent
	40	17	15	8 down
	30	15	15	6 down
	68	18	15	absent
	37	17	15	6 down
	40	15	15	8 down
	25	15	15	4 down
	25	15	15	4 down
	60	15	15	10 down
	45	18	15	10 down
	25+	15	15	absent
	35	15	15	6 down
	35	15	15	6 down
	33	15	15	6 down
	35	17	15	6 down
	65	17	15	12 down
	35	15	15	6 down
	35	15	15	
	35	15	15	absent
	40	15	15	absent
	30	15	15	4 down
	65	17	15	absent
	45	15	15	8 down
	30	15	15	absent
	45	15	15	8 down
	35	15	15	6 down
	50	17	15	
	37	15	15	8 down
	25	25	15	4 down
	35	17	15	8 down
Period VC (fig. 6.23)				
From northwest corner of Room 1	70	18	12	12 down
	40	15	12	8 down
	15	15	12	4 down
	45	18	12	6 down
	30	15	15	4 down
	47	18	12	8 down
	45	15	12	8 down

Period, Phase, and Feature	*Length*	*Width*	*Height*	*Thumb Impressions*
	36	17	12	6 down
	45	17	12	8 down
	27	15	12	4 down
	60	17	12	10 down
	30	15	12	6 down
	25	13	12	4 down
	45	17	12	
	43	17	12	8 down
	50	17	12	8 down
From east wall of Room 1	55	15	12	10 down
	30	15	12	6 down
	35	20	12	6 down
	35	15	12	6 down
	30	15	12	6 down
	25	15	12	4 down
	35	15	12	
	45	15	12	
	55	15	12	10 down
	30	15	12	6 down
	35	20	12	6 down
	35	15	12	6 down
	30	15	12	6 down
	25	15	12	4 down
	35	15	12	
	45	15	12	
	52	17	12	8 down
	22	17	12	4 down
	45	17	12	8 down
	35	17	12	6 down
	40	18	12	8 down
	50	18	12	10 down
	35	17	12	6 down
	35	17	12	6 down
	40	17	12	8 down
	40	17	12	8 down
	15	12	12	2 down
	20	12	12	
	20	18	12	4 down
	50	18	12	8 down
	40	15	12	6 down
	35	17	12	
	50	17	12	8 down
	43	17	12	8 down
From northwest corner of Room 8	35	16	14	6 down
	47	15	12	8 down
	25	16	12	
	28	16	12	4 down
	25	15	12	
	45	15	12	8 down
	15	18	12	4 down
	50	17	13	
	25	15	12	4 down
	33	16	13	
	35	17	12	6 down

Period, Phase, and Feature	*Length*	*Width*	*Height*	*Thumb Impressions*
	18	20	13	
	40	19	13	8 down
	20	15	12	4 down
	50	16	12	8 down
	25	15	12	4 down
	30	18	13	4 down
From walls of Rooms 10, 12, 14	50	20	15	8 down
	30	20	15	4 down
	35	17	15	6 down
	37	16	15	8 down
	30	15	15	6 down
	40	17	15	8 down
	40	17	15	8 down
	60	17	15	10 down
	35	15	15	6 down
	35	20	15	6 down
From Platform E in Room 2	35	18	?	
	30	13	?	6 side
	30	13	?	absent
From brick paving C.68.T13.4, C.69.1.8, C.69.3, CW.73.T1.6 (see figs. 6.2, 6.3, 6.11)	18	15	13	
	?	18	18	down
	?	21	18	down
	30+	16	14	down
	26+	16	15	side
	22+	15	13	absent
	22+	14	15	absent
	20+	14	15	absent
	45	15	15	absent
Period VB (fig. 6.26)				
From walls of Rooms 1 and 2	45	14	20	
	45	15	20	
	45	13	23	
	32	10	20	
From Wall 7	35+	15	?	up
	35+	15	?	up
Period VA.2				
From Trench C wall	42	11	23	
Period VA.1				
From Trench B wall	30+	14	10	
Period N-VII (fig. 6.29)				
From east wall of Room 14	50	13	9	present up
From west wall of Room 14	54	14	?	present up
	50	16	11	present up
From south wall of Room 15	52	16	14	present up
From east wall of Room 16	50	16	9	present up
From north wall of Room 16	49	13	15	present up
	47	12	15	present up
From west wall of Room 17	51	15	11	present up
	51	15	11	present up
From wall 19	50	17–18	12	present up
Period N-VB				
From Trench XC wall	38	11	20	
	39	11	20	
	38	12	21	
	39	12	20	
	39	11	23	
	36	11	23	
From Trench XCE wall	39	10–11	20	
Period N-VA.4 (fig. 6.33)				
From Podium 1	63	10	24	
	63	10	24	
	63	10	24	
	63	10	24	
	63	10	12	
From Podium 2	51	23	8	
	41	23	9	
	23	20	8	
	30	20	9	
From Podium 3	40	8	12	
	40	8	12	
	40	8	12	
	40	8	12	
	25	20	23	
	25	20	23	
	38	26	23	
	38	26	23	
From Wall 6	39	11	27	
From Wall 7	54	?	12	
Period N-VA.3				
From Wall XC.71.5.14	36	11	10	
From Wall XC.71.5.15	28	24	10	
From Podium XCE. 73.T1.4.19	63	10	18	absent
	63	10	18	absent
	63	10	18	absent
	63	10	18	absent
	63	10	18	absent
	63	10	18	absent
	63	10	18	absent
	63	10	18	absent
From Podium XCE.73.T1.4.18	60	8	18	absent
	60	8	18	absent
	60	8	18	absent

Period, Phase, and Feature	*Length*	*Width*	*Height*	*Thumb Impressions*
	60	8	18	absent
	60	8	18	absent
	60	8	18	absent
	60	8	18	absent
Period N-VA.2 (fig. 6.34)				
From Wall 5	43	18	10	absent
	43	18	10	absent
	?	20	10	absent
	43	17	11	absent

Period, Phase, and Feature	*Length*	*Width*	*Height*	*Thumb Impressions*
	?	16	10	absent
From walls of Rooms 1 and 2	44	18	10	absent
Period N-VA.1 (fig. 6.36)				
From walls of Rooms 1, 2, and 3	44	15–20	10	absent
From Wall 5	30	20	10	absent

Appendix B

Small Finds List

Small finds are listed in the following descending hierarchical order: general material (clay, stone, bone, shell, metal, glass), artifact type (alphabetically), specific material (alphabetically), and registration number. Figure references for illustrated artifacts are listed in the attributes column.

KEY TO ABBREVIATIONS (by column, as appropriate)

Location of Artifact (L)

P = Peabody Museum, Harvard University, Cambridge, MA

T = National Archaeological Museum, Tehran, Iran

Material

chaff-temp clay = chaff-tempered clay

unidentfd stone = unidentified stone

wh-opaque stone = white, opaque stone

marble/alabstr = marble or alabaster

blue-grn stone = blue-green stone

diat limestone = diatomaceous limestone

br-purple stone = brownish-purple stone

reused chlorite = artifact made from chlorite vessel sherd

Type

indetermin = indeterminable

roof fall = fragment of roofing plaster

shft strghtnr = shaft straightener

Surface Decoration

carvd channl = carved channel

carvd relief = carved relief

rd pnt/ochre = red paint or ochre

Condition of Artifact

fin,comp = finished and complete (except for small chips)

fin,incomp = finished but incomplete (broken in antiquity)

unfin,incomp = unfinished and incomplete (broken during manufacture)

unfin,compl = unfinished but complete (includes bead blanks)

fin,incomp,rep = finished but incomplete, with repair hole(s) (broken in antiquity but then repaired)

General Context

room w/out door = room without door

room w/ hearth = room with hearth

room w/ feature = room with feature (interior feature other than hearth)

tholos w/ door = tholos with door

near room = general outside occupational fill/deposits/debris in strata/phases that are associated with residential structures

open space = general outside fill with no rooms or structural remains within 10 meters

surf = mound surface of Tepe Yahya

paving/platform = brick paving or platform or low retaining wall

rubble fill = intentional leveling fill consisting of fist-size stone cobbles mixed with artifacts and high concentrations of sherds and animal bones

leveling fill = intentional leveling fill between retaining walls, with low artifact content (in nonoccupational phases/strata)

Feature Association

fill ex room = fill outside of but within 10 m of residential structures

pav/pltfrm = paving/platform (brick paving or platform or low retaining wall)

surf wash = mound surface of Tepe Yahya

rbble fill = rubble fill (intentional leveling fill consisting of fist-size stone cobbles mixed with artifacts and high concentrations of sherds and animal bones) fndatn dep = foundation deposit

w/in wall = within wall

infilling = intentional leveling fill between retaining walls, with low artifact content (in nonoccupational phases/strata)

depression = wide, shallow, man-made pit contemporary with associated deposits/features

shaped pit = pit with well-defined edges dug down from later period/stratum

unshpd pit = unshaped pit with poorly delineated or eroded shape dug down from later period/ stratum

rodnt hole = rodent hole

on flr = on floor (man-made mud plaster floor or beaten earth surface)

w/in flr = within floor (found in situ within a series of man-made plaster floors or beaten earth surfaces)

flr +10cm = floor +10 cm (found on or within the first 10 cm of deposits above a mud plaster floor or beaten earth surface)

flr +10cm? = floor +10 cm? (probably found within the first 10 cm of deposits above a mud plaster floor or beaten earth surface)

Fill Type

Since differences in the color of soil and deposits in different strata and contexts were often negligible, fill descriptions in field notes usually referred to the texture and content of the fill rather than its color.

indetermin = indeterminable (fill type could not be determined or was not described in field notes)

surf = mound surface wash of Tepe Yahya

rubble = rubble fill (described above under "General Context" and "Feature Association")

lamintd lenses = laminated lenses (possibly water lain)

ash,brick frag = ash mixed with brick fragments

bricky = high concentration of brick fragments

Quality of Context

unclear = quality of context indeterminable

v. good = very good (highest rating: discrete, well-defined, well-sealed single stratum/feature)

good = well-defined, well-sealed context, but includes more than one stratum

fair = not well-defined context, but is sealed

poor = unsealed contexts with mixed deposits; includes mound surface wash, pits dug down from mound surface, and rodent holes

Attributes (listed by artifact type)

The following abbreviations are standard throughout the attribute list:

L = length

W = width

TH = thickness

H = height

HD = hole diameter

ID = inside diameter (bracelets)

BD = base diameter

RD = rim diameter

CW = channel width

PHD = pin head diameter

Additional attribute abbreviations and descriptive explanations are listed below for specific artifact types (in alphabetical order):

2 hole object = two-hole objects (in text), probably ornaments

arrowhead

awl

diameter (D) measured 2 cm away from tip along shaft if tip unbroken

ax or celt

length (L) measured from blade edge to butt or back

ball-pellet

***base sherd* (stone)**

BTH = maximum base thickness

TH = maximum body wall thickness

symmetr profle = symmetrical profile (body thickness is even and overall profile symmetrical)

asymmetr profle = asymmetrical profile (body thickness is uneven and overall profile asymmetrical)

polshd ext,scrapd int = polished exterior, scraped interior

unpolshd = unpolished

flt = flat

rectang = rectangular

beakr = beaker

bead

For shapes and description of length, width, diameter, and thickness loci for each shape, see figure 7.1. The following are bead types:

(1) = long, cylindrical bead; length is greater than three times width or diameter

(2) = segmented cylindrical bead; length is less than or equal to diameter

(3) = cylindrical bead; length is greater than width or diameter but less than or equal to three times the width or diameter

(4) = spherical

(5) = biconical, circular bead; in the shape of a miniature top or wheel, with hole running across biconical profile

(6) = asymmetrical cylindrical bead; circular profile is slightly flattened along one side

(7) = biconical, circular bead; biconical profile has been slightly flattened along one side so that the biconical profile is slightly asymmetrical

(8) = biconical, circular bead; biconical profile has been truncated or cut at hole ends, making bead look hexagonal along its biconical profile

(9) = rounded, cylindrical bead; slightly rounded or convex along its long profile

(10) = disc-shaped bead; hole runs across rectangular profile

(11) = polygonal segmented cylindrical bead; a segmented cylindrical bead that has been cut along its cylindrical profile to create a rectilinear, octagonal, or polygonal profile

(12) = lozenge-shaped bead, with hole running the length of the bead; this shape is similar to (8), but hole is placed differently and short profile is rectangular rather than circular

(13) = long, rectangular bead; square end profile, rectangular side profile; hole runs across short axis or width of bead; ends are slightly rounded

(14) = cylindrical bead like (3), but with rounded ends

(15) = square bead with thin, rectangular end profile; hole runs across square axis of bead

(16) = lozenge-shaped bead like (12), but with hole running from side to side rather than corner to corner, as in (12); similar also to (11), but hexagonal rather than octagonal; similar also to (23), which is more rounded and diamond-shaped

(17) = shell bead consisting of a complete shell with a hole drilled through it; shapes vary according to shell species

(18) = square bead with thin, rectangular end profile; shape is identical to (15), but hole is cut differently, running across center of short axis (width) of bead

(19) = long, rectangular bead; similar to (13), but asymmetrical and irregular in overall shape; hole runs across short axis (width) of bead

(20) = thin, droplet-shaped bead, with hole running across width of bead at narrow end; like a very small pendant

(22) = asymmetrical cylindrical bead very much like (6), but more generally uneven and asymmetrical in shape

(23) = thin, diamond-shaped bead with rounded corners; hole runs along long axis (length) of bead; in its more degenerate forms, this shape tends to be more ovoid than diamond-shaped; resembles (16), but is quadrilateral rather than hexagonal

(24) = generally ovoid shape, but uneven and asymmetrical; hole runs the length of the bead but is placed symmetrically or off-center

(25) = trapezoid-shaped bead, with hole running across width of bead

biconcl, biconcal hole = biconical hole

***body sherd* (stone)**

unpolshd = unpolished

polshd ext + int = polished exterior and interior

indetermin = symmetrical vs. asymmetrical profile indeterminable

even wall TH = even wall thickness (probably symmetrical vessel profile)

uneven wall TH = uneven wall thickness (probably asymmetrical vessel profile)

cylindrcl shape = cylindrical shape

bracelet

thickness (TH) measured along axis of diameter

width (W) measured along axis perpendicular to diameter

***button* (possibly a pendant or unfinished stamp seal)**

carved disc = "decorated disc" in text

clay pyramid

TW = top width

cone

copper ingot

debitage

disc

Ch-Tmp Coarse Ware = Chaff-Tempered Coarse Ware
Blk-on-Rd Ware = Black on Red Ware

figurine

indeterm = indeterminate form

fork

***full profile* (stone vessels)**

unpolshd = unpolished
polshd ext = polished exterior
asymmetr profle = asymmetrical profile
symmetr profle = symmetrical profile
rnded rim,flt base = rounded rim, flat base
sqrd rim = squared rim
rd ochre trace = red ochre residue

hammer stone

handle

handstone

indetermin = indeterminable (function/type not identifiable)

labret

lenticular = lenticular-shaped artifact

mortar

necklace

unident shell = unidentified shell
cylindr = segmented cylindrical beads (2)
droplet = thin, droplet-shaped beads (20)
fish vertebr = fish vertebrae

obsidian tool

ochre stone

peg

pendant

polshd = polished

pin-needle

LB = length if broken
diameter (D) measured 2 cm away from tip along shaft if tip unbroken

***rim sherd* (stone)**

symmetr profle = symmetrical profile
asymmetr profle = asymmetrical profile
unpolshd = unpolished
polshd ext + int = polished exterior and interior
rnded rim = rounded rim
invrted = inverted
indetermin = vessel shape and symmetry indeterminable

ring

roof fall

shft strghtnr = shaft straightener

sickle-knife

spatula

LB = length if broken
WB = width if broken

spindle whorl

***square sherd* (ceramic)**

stamp seal

stylus

rnd = round
flt = flat

tack or nail

NHD = nail head diameter

toy wheel

unworked shell

unident = species unidentified

weight

whetstone

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
CLAY											
1093	P	VC	C	69		3		fired clay	ball-pellet	none	fin,comp
1094	P	VIB.1-VC	C	69		7		fired clay	ball-pellet	none	fin,comp
1095	P	VC	C	69		7	9	fired clay	ball-pellet	none	fin,comp
1096	T	VC	C	69		7	9-10	fired clay	ball-pellet	none	fin,comp
1099	P	VC	C	69		7	15	fired clay	ball-pellet	none	fin,comp
1245	T	VA.1	B	73		2		fired clay	ball-pellet	none	fin,comp
1251	T	VA.1	B	73		3		fired clay	ball-pellet	none	fin,comp
1253	T	VA.2	B	73		4		fired clay	ball-pellet	none	fin,comp
1255	T	VA.2	B	73		4	2	fired clay	ball-pellet	none	fin,comp
1258	T	VB	B	73		6		fired clay	ball-pellet	none	fin,comp
1259	T	VB	B	73		6		fired clay	ball-pellet	none	fin,comp
1261	T	VB	B	73		6	2	fired clay	ball-pellet	none	fin,comp
1267	T	VB	B	73		6	4	fired clay	ball-pellet	none	fin,comp
1269	T	VB	B	73	T1	1		fired clay	ball-pellet	none	fin,comp
1270	T	VIIA	B	73	T1	3	1	fired clay	ball-pellet	none	fin,comp
1271	T	VIIA	B	73	T1	3	1	fired clay	ball-pellet	none	fin,incomp
1296	T	VIIB.2	D	73		6	41	fired clay	ball-pellet	none	fin,comp
3529	P	VC	C	69		7	17	fired clay	ball-pellet	none	fin,comp
3844	P	N-VB	XC	71	T2	6B		fired clay	ball-pellet	none	fin,incomp
z082	P	VIB.1-VC	C	69		7		fired clay	ball-pellet	none	fin,comp
z707	P	indetermin	CDE	73		surf		fired clay	ball-pellet	none	fin,comp
z743	P	VIB.2	E	69		5B		fired clay	ball-pellet	none	fin,comp
1090	P	VB	C	69		1	2-3	unfired clay	ball-pellet	none	fin,comp
1091	T	VB	C	69		1	2-3	unfired clay	ball-pellet	none	fin,incomp
1102	P	VIA	D	69		4	1	unfired clay	ball-pellet	none	fin,comp
1104	T	VIB.1	D	69	T2	6		unfired clay	ball-pellet	none	fin,comp
1121	T	VIIA-VIA	C	70		1		unfired clay	ball-pellet	none	fin,comp
1122	T	VIIA-VIA	C	70		1		unfired clay	ball-pellet	none	fin,comp
1123	T	VIA	C	70		1	1	unfired clay	ball-pellet	none	fin,comp
1124	T	VIIA	C	70	T1	1		unfired clay	ball-pellet	none	fin,comp
1166	T	VIIA	C	71	T2	1		unfired clay	ball-pellet	none	fin,incomp
1168	P	VIIA	C	71	T3	1	3	unfired clay	ball-pellet	none	fin,comp
1169	P	VIIA	C	71	T3	1	4	unfired clay	ball-pellet	none	fin,comp
1170	P	VIIA	C	71	T3	1	4	unfired clay	ball-pellet	none	fin,comp
1172	T	VIB.2	C	71	T3	2		unfired clay	ball-pellet	none	fin,comp
1189	P	VIIB.1	C	71	T6	1A		unfired clay	ball-pellet	none	fin,comp
1295	T	VIIB.2	D	73		6	41	unfired clay	ball-pellet	none	fin,comp
1305	P	VIIB.2	D	73		7	43	unfired clay	ball-pellet	none	fin,comp
2195	T	VIIB.2	E	68	T2	3	1	unfired clay	ball-pellet	none	fin,comp
3394	T	VIIB.4	D	68		5A		unfired clay	ball-pellet	none	fin,comp
3530	P	VIIB.2	C	71	T7	2		unfired clay	ball-pellet	none	fin,comp
3531	P	VIIB.2	C	71	T7	2		unfired clay	ball-pellet	none	fin,comp
3532	P	VIIB.2	C	71	T7	2		unfired clay	ball-pellet	none	fin,comp
3533	P	VIIB.2	C	71	T7	2		unfired clay	ball-pellet	none	fin,comp
3830	P	N-VII,VB	XD	70	T2	3		unfired clay	ball-pellet	none	fin,comp
3831	P	N-VII,VB	XD	70	T2	3		unfired clay	ball-pellet	none	fin,comp
z631	P	VA.1	CDE	73		surf	2-3	unfired clay	ball-pellet	none	fin,comp
1174	T	VIIA	C	71	T3	3	1	fired clay	bead	incised line	fin,comp
1246	P	VA.1	B	73		2		fired clay	bead	none	fin,comp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
paving/platform	pav/pltfrm	bricky	v. good	13mmD
near room	fill ex rm	bricky	good	28mmD
room w/hearth	fill in rm	bricky	v. good	12mmD
room w/hearth	fill in rm	bricky	v. good	23mmD
room w/hearth	on flr		v. good	5mmD
near room	fill ex rm	ash	v. good	25mmD
near room	fill ex rm	ash	v. good	13mmD
open space	fill ex rm	soft,loose	v. good	11mmD
open space	w/in flr	water lain	v. good	30mmD
courtyard	fill ex rm	soft,loose	v. good	12mmD
courtyard	fill ex rm	soft,loose	v. good	12mmD
courtyard	w/in flr		v. good	25mmD
courtyard	w/in flr		v. good	23mmD
courtyard	w/in flr		v. good	14mmD
near room	fill ex rm	soft,loose	v. good	18mmD
near room	fill ex rm	soft,loose	v. good	18mmD
paving/platform	pav/pltfrm	gel,wall melt	v. good	26mmD
near room	flr +10cm	bricky	v. good	26mmD
near room	fill ex rm	indetermin	v. good	23mmD
near room	fill ex rm	bricky	good	23mmD
surf	surf wash	surf	poor	21mmD
near room	depression	ash	v. good	25mmD
room w/feature	fill in rm	bricky	v. good	15mmD
room w/feature	fill in rm	bricky	v. good	30mmD
rubble fill	rbble fill	rubble	v. good	24mmD
near room	fill ex rm	ash	v. good	30mmD
near room	fill ex rm	bricky	good	10mmD
near room	fill ex rm	bricky	good	13mmD
rubble fill	rbble fill	rubble	v. good	7mmD
near room	fill ex rm	bricky	v. good	20mmD
near room	fill ex rm	bricky	v. good	22mmD
room w/out door	flr +10cm?	bricky	v. good	24mmD
room w/out door	flr +10cm?	bricky	v. good	17mmD
room w/out door	flr +10cm?	bricky	v. good	24mmD
near room	fill ex rm	ash	v. good	25mmD
leveling fill	infilling	soft,loose	v. good	35mmD (fig. 7.18:a)
paving/platform	pav/pltfrm	gel,wall melt	v. good	8mmD
near room	fill ex rm	ash	v. good	9mmD
near room	fill ex rm	indetermin	v. good	25mmD
near room	fill ex rm	sandy	v. good	25mmD
near room	fill ex rm	ash	v. good	12mmD (fig. 7.18:e)
near room	fill ex rm	ash	v. good	9mmD (fig. 7.18:f)
near room	fill ex rm	ash	v. good	13mmD (fig. 7.18:d)
near room	fill ex rm	ash	v. good	22mmD (fig. 7.18:c)
near room	fill ex rm	soft,loose	poor	17mmD
near room	fill ex rm	soft,loose	poor	15mmD
near room	fill ex rm	bricky	poor	11mmD
room w/out door	flr +10cm?	soft,loose	v. good	10mmL/H 5mmW/D/TH 2.5mmHD cylndrcl(3)
near room	fill ex rm	ash	v. good	14mmL/H 8mmW/D/TH 2mmHD rnded,circlr(9)

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
1254	P	VA.2	B	73		4		fired clay	bead	none	fin,comp
1256	P	VB	B	73		6		fired clay	bead	none	fin,comp
1257	P	VB	B	73		6		fired clay	bead	none	fin,comp
1260	T	VB	B	73		6	2	fired clay	bead	none	fin,comp
1265	P	VB	B	73		6	3	fired clay	bead	none	fin,comp
1301	P	VIIB.5-3	D	73		7	42	fired clay	bead	incised line	fin,comp
3835	P	N-VA.4	XC	71	T1	5A		fired clay	bead	none	fin,comp
1106	P	VIIB.6	E	69	T2	5		unfired clay	bead	none	fin,comp
1120	P	VIIA-VIA	C	70		1		unfired clay	bead	none	fin,comp
1156	T	VC-IVC	BW	71	T1	6		unfired clay	bead	none	fin,comp
1157	T	VC-IVC	BW	71	T1	6		unfired clay	bead	none	fin,comp
1173	P	VIB.2	C	71	T3	2	1	unfired clay	bead	none	fin,comp
1185	P	VIIB.2	C	71	T6	1	3	unfired clay	bead	none	fin,comp
1188	T	VIIB.2	C	71	T6	1	8	unfired clay	bead	none	fin,comp
1190	P	VIIB.2	C	71	T7	1	1	unfired clay	bead	incised line	fin,comp
1192	P	VIIB.2	C	71	T7	2		unfired clay	bead	none	fin,comp
1275	T	VIB.1	BW	73	T2	3		unfired clay	bead	none	fin,comp
1276	T	VIIB.2	C	73		1		unfired clay	bead	none	fin,comp
1277	P	VIIC-VIIB.3	C	73	T1	6-9		unfired clay	bead	none	fin,comp
1278	P	VIIB.3	C	73	T1	3		unfired clay	bead	none	fin,incomp
1279	P	VIIB.3	C	73	T1	4		unfired clay	bead	none	fin,incomp
1280	P	VIIC.2	C	73		9		unfired clay	bead	none	fin,incomp
1294	P	VIB.2	CDE	73		3	18	unfired clay	bead	none	fin,incomp
1298	P	VIIB.5-3	D	73		7	42	unfired clay	bead	none	fin,comp
1306	P	VIIB.2	D	73		7	43	unfired clay	bead	none	fin,incomp
1900	T	N-VA	XCE	73	T2	5		unfired clay	bead	none	fin,comp
3527	T	VB	B	71		26		unfired clay	bead	none	fin,incomp
3839	T	N-VII	XD	70	T1	2-4		unfired clay	bead	none	fin,incomp
z720	P	N-VA.1-IVC	XCE	71		13C		unfired clay	bead	incised line	fin,comp
1180	P	VIB.2	C	71	T4	3		unfired clay	clay pyramid	none	unfin,comp
1098	T	VC	C	69		7	11	fired clay	cone	none	fin,comp
1248	T	VA.1	B	73		3		fired clay	cone	none	fin,incomp
1249	P	VA.1	B	73		3		fired clay	cone	none	fin,comp
1262	T	VB	B	73		6	3	fired clay	cone	none	fin,comp
1263	T	VB	B	73		6	3	fired clay	cone	none	fin,comp
1264	T	VB	B	73		6	3	fired clay	cone	none	fin,comp
1266	T	VB	B	73		6	3	fired clay	cone	none	fin,comp
1290	P	VA.1	CDE	73		surf		fired clay	cone	none	fin,incomp
1300	P	VIIB.5-3	D	73		7	42	fired clay	cone	none	fin,comp
1303	P	VIIB.5-3	D	73		7	42	fired clay	cone	none	fin,incomp
z632	P	VIIB.5-3	D	73		7	42	fired clay	cone	none	fin,comp
1126	P	VIIC.2-1	C	70	T5	6		unfired clay	cone	none	fin,comp
1181	P	VIB.2-1	C	71	T4	3		unfired clay	cone	none	fin,comp
1187	P	VIIB.2	C	71	T6	1	7	unfired clay	cone	none	fin,comp
1281	P	VIIC.2	C	73		9		unfired clay	cone	none	fin,incomp
1297	P	VIIB.5-3	D	73		7	42	unfired clay	cone	none	fin,comp
1895	T	VB	B	73		5		unfired clay	cone	none	fin,incomp
1896	T	VB	B	73		5		unfired clay	cone	none	fin,incomp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
open space	fill ex rm	soft,loose	v. good	7mmL/H 10mmW/D/TH 1.2mmHD flt bicon,circlr(7)
courtyard	fill ex rm	soft,loose	v. good	8mmL/H 12mmW/D/TH 1mmHD trunc bicon,circlr(8)
courtyard	fill ex rm	soft,loose	v. good	8mmL/H 9mmW/D/TH 1mmHD trunc bicon,circlr(8)
courtyard	w/in flr	water lain	v. good	13mmL/H 25mmW/D/TH 1mmHD flt bicon,circlr(7)
courtyard	depression	ash	v. good	6mmL/H 9mmW/D/TH 2mmHD flt bicon,circlr(7)
near room	fill ex rm	ash	good	20mmL/H 18mmW/D/TH asym,cylndrcl-1(6)
near room	fill ex rm	indetermin	v. good	13mmL/H 7mmW/D/TH rnded,circlr(9)
near room	fill ex rm	bricky	v. good	13mmL/H 20mmW/D/TH bicon,circlr(5)
near room	fill ex rm	bricky	good	20mmW/D/TH 2mmHD spherical(4)
near room	fill ex rm	indetermin	fair	24mmW/D/TH .6mmHD disc-shaped(10)
near room	fill ex rm	indetermin	fair	24mmW/D/TH .8mmHD disc-shaped(10)
near room	on flr		v. good	8mmW/D/TH 1mmHD spherical(4)
room with door	flr +10cm	bricky	v. good	10mmL/H 17mmW/D/TH 2mmHD bicon,circlr(5)
near room	on flr		v. good	17mmW/D/TH 4mmHD spherical(4)
courtyard	on flr		v. good	11mmL/H 23mmW/D/TH 3mmHD bicon,circlr(5) (fig. 7.18:m)
near room	fill ex rm	ash	v. good	8mmW/D/TH 2mmHD indetermin
near room	fill ex rm	soft,loose	v. good	22mmL/H 27mmW/D/TH 3mmHD indetermin
room with door	flr +10cm?	bricky	v. good	10mmL/H 20mmW/D/TH 4mmHD bicon,circlr(5)
near room	fill ex rm	hard,bricky	good	18mmL/H 22mmW/D/TH .6mmHD bicon,circlr(5)
near room	fill ex rm	soft,loose	v. good	9mmL/H 12mmW/D/TH 3mmHD bicon,circlr(5)
near room	on flr		v. good	15mmL/H 20mmW/D/TH 5mmHD bicon,circlr(5)
near room	fill ex rm	bricky	v. good	17mmW/D/TH 3.5mmHD spherical(4)
rubble fill	rbble fill	rubble	v. good	23mmW/D/TH spherical(4); biconical hole
near room	fill ex rm	ash	good	27mmW/D/TH spherical(4)
near room	fill ex rm	lamintd lenses	v. good	10mmL/H 19mmW/D/TH bicon,circlr(5)
near room	fill ex rm	bricky	good	15mmL/H 27mmW/D/TH bicon,circlr(5)
courtyard	fill ex rm	hard,clayey	v. good	13mmW/D/TH 3mmHD asym ovoid(24)
near room	fill ex rm	indetermin	poor	17mmL/H 15mmW/D/TH cylndrcl(3)
near room	fill ex rm		good	35mmW/D/TH disc-shaped(10) (fig. 7.2)
near room	depression	ash	v. good	18mmH 19mmBW 9mmTW shape: 4-sided truncated pyramid (fig. 7.18:j)
near room	flr +10cm	bricky	v. good	18mmBD 18mmH
near room	fill ex rm	ash	v. good	20mmBD
near room	fill ex rm	ash	v. good	37mmBD 15mmH
courtyard	depression	ash	v. good	28mmBD 33mmH
courtyard	depression	ash	v. good	28mmBD 32mmH
courtyard	depression	ash	v. good	40mmBD 34mmH
courtyard	depression	ash	v. good	30mmBD 39mmH
kiln	in kiln	burned earth	poor	20mmBD 20mmH
near room	fill ex rm	ash	good	14mmBD 16mmH
near room	fill ex rm	ash	good	13mmBD
near room	fill ex rm	ash	good	11mmBD 11mmH
near room	fill ex rm	hard,clayey	good	12mmBD 12mmH
near room	depression	ash	v. good	18mmBD 24mmH (fig. 7.18:i)
room with door	fill in rm	bricky	v. good	13mmBD 11mmH (fig. 7.18:h)
near room	fill ex rm	bricky	v. good	20mmBD 10mmH
near room	fill ex rm	ash	good	16mmBD 14mmH
courtyard	fill ex rm	soft,loose	v. good	25mmBD
courtyard	fill ex rm	soft,loose	v. good	28mmBD

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
1089	T	VB-VA	C	69		1		fired ceramic	disc	none	fin,comp
1092	P	VC	C	69		3		fired ceramic	disc	none	fin,comp
1097	P	VC	C	69		7	10	fired ceramic	disc	none	fin,comp
1191	T	VIIB.1	C	71	T7	1A	1	fired ceramic	disc	none	fin,comp
1243	T	VA.1	B	73		2		fired ceramic	disc	none	fin,comp
1244	T	VA.1	B	73		2		fired ceramic	disc	none	fin,comp
1250	T	VA.1	B	73		3		fired ceramic	disc	none	fin,comp
1272	T	VIIA	B	73	T1	3	5	fired ceramic	disc	none	fin,incomp
1286	T	VC	CW	70	T1	6		fired ceramic	disc	none	fin,comp
1287	T	VC	CW	70	T1	6		fired ceramic	disc	none	fin,comp
3523	T	VIA	C	70		1	1	fired ceramic	disc	none	fin,incomp
3525	P	VIA	C	70		1	2	fired ceramic	disc	none	fin,comp
3526	T	VA.1	C	68	T3	2		fired ceramic	disc	none	fin,comp
3845	P	N-VA.4	XCE	73	T1	4B		fired ceramic	disc	none	fin,comp
3846	P	N-VA.2	XCE	71		15	47	fired ceramic	disc	none	fin,comp
2048	P	VC	C	68	T3	4		fired ceramic	disc	none	fin,incomp
1101	P	VIA	C	69	T3	1	6	fired clay	disc	none	fin,comp
1184	T	VIIB.2	C	71	T6	1	1	fired clay	disc	none	fin,comp
1302	P	VIIB.5-3	D	73		7	42	fired clay	disc	none	fin,comp
1088	T	VC-VA	C	69		surf	8	unfired clay	disc	none	fin,incomp
1175	P	VIB.1	C	71	T4	1		unfired clay	disc	none	fin,comp
1176	T	VIB.2	C	71	T4	3		unfired clay	disc	none	fin,comp
1177	T	VIB.2	C	71	T4	3		unfired clay	disc	none	fin,comp
1178	T	VIB.2	C	71	T4	3		unfired clay	disc	none	fin,comp
1183	T	VIB.2	C	71	T4	3	2	unfired clay	disc	none	fin,comp
1164	P	VB-VA	C	69		1		fired clay	figurine	none	fin,incomp
1233	P	N-VA.1	XCE	71	T2	14	35	fired clay	figurine	none	fin,incomp
1299	T	VIIB.5-3	D	73		7	42	fired clay	figurine	none	fin,incomp
1304	P	VIIB.5-3	D	73		7	42	fired clay	figurine	none	fin,incomp
1894	T	IVB.2	B	73		2	6	fired clay	figurine	none	fin,incomp
3836	P	N-VII,VB	XD	70	T2	3		fired clay	figurine	none	fin,incomp
5001	T	N-VII,VB	XD	70	T2	3		fired clay	figurine	none	fin,incomp
1103	T	VIB.2	D	69		5		unfired clay	figurine	none	fin,incomp
1273	T	VIA	BW	73	T1	2		unfired clay	figurine	none	fin,incomp
1274	T	VIA	BW	73	T1	2		unfired clay	figurine	none	fin,incomp
1288	T	VIA	CW	73	T3	1		unfired clay	figurine	none	fin,comp
1289	P	VIA	CW	73	T3	1		unfired clay	figurine	none	fin,incomp
1869	T	VIB.1	C	69		7A		unfired clay	figurine	none	fin,incomp
1870	T	VIA	C	69	T3	1		unfired clay	figurine	none	fin,incomp
1897	T	VC	CW	73	T1	6		unfired clay	figurine	none	fin,comp
1898	P	N-VII	XC	73		3	3A	unfired clay	figurine	none	fin,comp
1899	P	N-VII,VB	XCE	73	T1	9	32	unfired clay	figurine	none	fin,incomp
1876	T	VIID	C	71	T1	1	2	chaff-temp clay	indetermin	none	fin,incomp
1877	T	VIID	C	71	T1	1	2	chaff-temp clay	indetermin	none	fin,incomp
1107	T	VIIB.6	E	69	T2	8		fired clay	indetermin	carvd channl	fin,comp
1252	T	VA.1	B	73		3	5	fired clay	indetermin	none	fin,incomp
1292	T	VA.1	CDE	73		surf	1	fired clay	indetermin	none	fin,comp
1293	T	VIB.2	CDE	73		3	18	fired clay	indetermin	none	fin,comp
3543	T	VC	D	68		2		fired clay	indetermin	none	fin,comp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
near room	fill ex rm	indetermin	good	37mmD 9mmTH 7mmHD center hole
paving/platform	pav/pltfrm	bricky	v. good	35mmD 5mmTh no hole
room w/hearth	flr +10cm	bricky	v. good	50mmD 10mmTH no hole; Ch-Tmp Coarse Ware
foundation	on flr		v. good	43mmD 14mmTH 5mmHD center hole; Ch-Tmp Coarse Ware (fig. 7.18:k)
near room	fill ex rm	ash	v. good	35mmD 10mmTH no hole; Ch-Tmp Coarse Ware
near room	fill ex rm	ash	v. good	45mmD 18mmTH no hole; Ch-Tmp Coarse Ware
near room	fill ex rm	ash	v. good	45mmD 6mmTH no hole; Fine Orange Ware
near room	flr +10cm	organic midden	v. good	47mmD 11mmHD center hole; Ch-Tmp Coarse Ware
paving/platform	flr +10cm	bricky	v. good	33mmD 9mmTH no hole; Ch-Tmp Coarse Ware
paving/platform	flr +10cm	bricky	v. good	23mmD 7mmTH no hole; Ch-Tmp Coarse Ware
rubble fill	rbble fill	rubble	v. good	50mmD 5mmHD center hole; Ch-Tmp Coarse Ware
rubble fill	rbble fill	rubble	v. good	35mmD 10mmTH center hole; Ch-Tmp Coarse Ware
near room	fill ex rm	indetermin	v. good	25mmD 5mmTH no hole
near room	fill ex rm	indetermin	v. good	34mmD 6mmTH no hole; Blk-on-Rd Ware
near room	fill ex rm	indetermin	v. good	35mmD 5mmTH no hole Blk-on-Rd Ware
near room	fill ex rm	bricky	good	41mmD 11mmTH no hole; plain coarse ware
rubble fill	rbble fill	rubble	v. good	35mmD 12mmTH no hole
room with door	fill in rm	bricky	v. good	22mmD 7mmTH no hole
near room	fill ex rm	ash	good	31mmD 11mmTH center hole
rubble fill	rbble fill	rubble	poor	83mmD 10mmTH no hole
near room	fill ex rm	bricky	v. good	27mmD 7mmTH no hole
near room	depression	ash	v. good	32mmD 10mmTH no hole
near room	depression	ash	v. good	31mmD 10mmTH no hole
near room	depression	ash	v. good	32mmD 9mmTH no hole
rubble fill	rbble fill	rubble	v. good	32mmD 9mmTH no hole
near room	fill ex rm	indetermin	good	40mmL 16mmW sheep/goat head; red-slipped
near room	fill ex rm	indetermin	v. good	24mmW anthropomorphic(?)
near room	fill ex rm	ash	good	22mmH 14mmW sheep/goat body
near room	fill ex rm	ash	good	11mmH 9mmW anthropomorphic(?)
intrusive pit	shaped pit	soft,loose	v. good	46mmL 15mmH pig/boar
near room	fill ex rm	indetermin	poor	44mmL 27mmH human head
near room	fill ex rm	indetermin	poor	60mmH hump-backed bull (fig. 7.35)
near room	fill ex rm	sandy	v. good	indeterm
rubble fill	rbble fill	rubble	v. good	25mmH 17mmW indeterm
rubble fill	rbble fill	rubble	v. good	25mmH 15mmW indeterm
rubble fill	rbble fill	rubble	v. good	40mmL 28mmH 14mmW sheep/goat body (fig. 7.30:d)
rubble fill	rbble fill	rubble	v. good	38mmH 15mmW indeterm
near room	fill ex rm	bricky	v. good	53mmL 43mmW dog(?)
leveling fill	infilling	bricky	v. good	45mmL 34mmH sheep/goat body
paving/platform	pav/pltfrm	bricky	v. good	92mmL 70mmH sheep/goat body
near room	flr +10cm	indetermin	v. good	6mmL 37mmH 20mmW human head
room w/out door	fill in rm		good	indeterm
open space	hearth	burned earth	v. good	
open space	hearth	burned earth	v. good	
near room	fill ex rm	ash	v. good	44mmL 44mmW 44mmTH
near room	fill ex rm	ash	v. good	50mmL 30mmW
near kiln	surf wash	surf	poor	40mmL 23mmW
rubble fill	rbble fill	rubble	v. good	80mmL 55mmW 55mmTH
room with door	flr +10cm	bricky	v. good	92mmL 15mmW polished

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
1893	T	IVB.2	B	73		2	5	unfired clay	indetermin	none	fin,comp
3542	T	VIB.1	D	69	T2	6		unfired clay	indetermin	carvd channl	fin,incomp
3837	T	N-VII,VB	XC	71		7C	27-28	unfired clay	indetermin	none	fin,incomp
1242	T	VA.1	B	73		2		fired clay	lenticular	none	fin,comp
3547	P	VIIB.5-3	D	73		7	42	fired clay	peg	none	fin,comp
1878	P	VIIA	C	71	T3	1	5	unfired clay	peg	none	fin,comp
1879	T	VIIB.1	C	71	T7	1A		unfired clay	peg	none	fin,comp
3292	T	VC	C	69		7		chaff-temp clay	roof fall	none	fin,incomp
3293	T	VC	C	69		7	1	chaff-temp clay	roof fall	none	fin,incomp
3294	T	VC	C	69		7	10	chaff-temp clay	roof fall	none	fin,incomp
3295	T	VC	C	69		7	10	chaff-temp clay	roof fall	none	fin,incomp
3296	T	VC	C	69		7	10	chaff-temp clay	roof fall	none	fin,incomp
3297	T	VC	C	69		7	14	chaff-temp clay	roof fall	none	fin,incomp
3298	T	VC	C	69		7	15	chaff-temp clay	roof fall	none	fin,incomp
3299	T	VIA	C	69	T3	1	1	chaff-temp clay	roof fall	none	fin,incomp
3300	T	VIA	C	69	T3	1	1	chaff-temp clay	roof fall	none	fin,incomp
3301	T	VIIA-VIA	C	70		1		chaff-temp clay	roof fall	none	fin,incomp
3302	T	VIA	C	70		1	1	chaff-temp clay	roof fall	none	fin,incomp
3303	T	VIA	C	70		1	4	chaff-temp clay	roof fall	none	fin,incomp
3304	T	VIIA	C	71	T3	3	1	chaff-temp clay	roof fall	none	fin,incomp
2065	P	VIA	D	69		3		fired clay	spindle whorl	none	fin,incomp
1165	P	VIID	C	71	T1	1		fired ceramic	square sherd	none	fin,incomp
1167	P	VIIA	C	71	T2	1		fired ceramic	square sherd	none	fin,incomp
1171	P	VIB.2	C	71	T2	2		fired ceramic	square sherd	none	fin,incomp
1179	T	VIB.2	C	71	T4	3		fired ceramic	square sherd	none	fin,incomp
1182	T	VIIA	C	71	T4	3	1	fired ceramic	square sherd	none	fin,incomp
3524	T	VIIC.2-1	C	70	T5	6		fired ceramic	square sherd	none	fin,incomp
1125	T	VIB.2	C	70	T5	3		fired clay	stamp seal	incised line	fin,incomp
1268	T	VB	B	73		6	4	fired clay	toy wheel	none	fin,comp
1100	P	VB-VA	C	69	T1	1		unfired clay	toy wheel	none	fin,comp
STONE											
2508	T	IVB.2	B	73		2	6	gray stone	ax or celt	none	fin,incomp
1967	T	VA.1	C	68	T7	1		limestone	ax or celt	none	fin,comp
349	T	VA.2-1	B	73		2A		unidentfd stone	ax or celt	none	fin,comp
1964	P	VA.1	C	68	T7	1		unidentfd stone	ax or celt	none	fin,comp
2329	T	indetermin	XD	70	T2	3	1	black stone	ball-pellet	none	fin,comp
418	P	VIB.2	C	70	T6	5		chlorite	ball-pellet	incised line	fin,comp
570	P	VIB.2	C	71	T3	2		chlorite	ball-pellet	none	fin,comp
2511	T	VA.2	B	73		4		gray stone	ball-pellet	none	fin,comp
2525	T	VC	CA	73	T1	6		gray stone	ball-pellet	none	fin,comp
3545	P	VIIB.6	E	69	T2	5		green stone	ball-pellet	none	fin,comp
2159	P	VC	C	69		7		unidentfd stone	ball-pellet	none	fin,incomp
2160	P	VIB.1	C	69		7		unidentfd stone	ball-pellet	none	fin,comp
2433	T	VIB.2	C	71	T4	3		unidentfd stone	ball-pellet	none	fin,comp
2513	T	VA.2	B	73		4		unidentfd stone	ball-pellet	none	fin,comp
2600	T	N-VII,VB	XCE	73	T1	10		unidentfd stone	ball-pellet	none	fin,comp
3325	T	VC	C	69		7	17	unidentfd stone	ball-pellet	none	fin,comp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
intrusive pit	shaped pit	soft,loose	v. good	45mmL 38mmW 20mmTH
near room	fill ex rm	ash	v. good	25mmL 15mmW
near room	fill ex rm	indetermin	good	25mmL 25mmW
near room	fill ex rm	ash	v. good	33mmL 28mmD
near room	fill ex rm	ash	good	40mmL 7mmD
room with door	fill in rm	bricky	v. good	29mmL 10mmD (fig. 7.18:g)
leveling fill	infilling	soft,loose	v. good	45mmL 18mmD
near room	fill ex rm	bricky	v. good	
room w/feature	fill in rm	bricky	v. good	
room w/hearth	fill in rm	bricky	v. good	
room w/hearth	fill in rm	bricky	v. good	
room w/hearth	fill in rm	bricky	v. good	
room with door	on flr		v. good	
room w/hearth	flr +10cm	bricky	v. good	
rubble fill	rbble fill	rubble	v. good	
rubble fill	rbble fill	rubble	v. good	
leveling fill	infilling	bricky	good	10mmD of reed/pole impression 50mmTH
rubble fill	rbble fill	rubble	v. good	10mmD of reed/pole impression
leveling fill	on flr		v. good	15mmD of reed/pole impression
room w/out door	flr +10cm?	soft,loose	v. good	12mmD of reed/pole impression
rubble fill	rubble fill	rubble	v. good	24mmD 4mmTH
open space	fill ex rm	hard,clayey	v. good	45mmL 9mmTH 12mmHD
near room	fill ex rm	bricky	v. good	30mmL 13mmTH 15mmHD
near room	depression	ash	v. good	55mmL 5mmHD
near room	depression	ash	v. good	30mmL 10mmTH 6mmHD
room w/out door	flr +10cm?	bricky	v. good	30mmL 13mmTH 7mmHD
near room	fill ex rm	hard,clayey	good	30mmL 9mmHD
near room	fill ex rm	bricky	v. good	26mmL 12mmW 21mmTH geometric design; perforated; polished (fig. 7.12:b
courtyard	on flr		v. good	37mmD 14mmTH 2mmHD but unperforated
near room	fill ex rm	indetermin	good	40mmD (fig. 7.18:n)

intrusive pit	shaped pit	soft,loose	v. good	103mmw 32mmTH convex blade
near room	fill ex rm	indetermin	v. good	65mmL 40mmW convex blade
near room	fill ex rm	ash	good	130mmL 55mmW 20mmTH convex blade; grooved butt
near room	fill ex rm	indetermin	v. good	60mmL 34mmW convex blade
near room	fill ex rm	indetermin	poor	12mmD
near room	fill ex rm	bricky	v. good	35mmD
near room	depression	ash	v. good	9mmD
open space	fill ex rm	bricky	v. good	30mmD
paving/platform	pav/pltfrm	bricky	v. good	28mmD
near room	fill ex rm	bricky	v. good	25mmD
near room	fill ex rm	bricky	v. good	30mmD
near room	fill ex rm	bricky	v. good	7mmD
near room	depression	ash	v. good	25mmD
open space	fill ex rm	bricky	v. good	35mmD
near room	on flr		good	30mmD
near room	fill ex rm	bricky	v. good	27mmD

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
3333	T	VIIB.2	C	71	T7	2		unidentfd stone	ball-pellet	none	fin,comp
3395	T	VIIB.4	D	68		5A		unidentfd stone	ball-pellet	none	fin,comp
3528	P	VC	C	69		7	17	unidentfd stone	ball-pellet	none	fin,comp
3534	P	VIIB.2	C	71	T7	2		unidentfd stone	ball-pellet	none	fin,comp
z755	P	VIB.2	D	69		5B		unidentfd stone	ball-pellet	none	fin,comp
2309	P	VIIA	C	70	T7	3		white stone	ball-pellet	none	fin,comp
2409	T	VC	B	71		29		wh-opaque stone	ball-pellet	none	fin,comp
2185	T	indetermin	D	69		surf		alabaster	base sherd	none	fin,incomp
2288	P	indetermin	C	70		surf		alabaster	base sherd	none	fin,incomp
191	T	VC-IVC	BW	69	T6	4		chlorite	base sherd	incised line	fin,incomp
192	T	VC-IVC	BW	69	T6	4		chlorite	base sherd	incised line	fin,incomp
401	P	VIB.1	C	70		1	18	chlorite	base sherd	incised line	fin,incomp
420	P	VIIA	C	70	T6	6		chlorite	base sherd	none	fin,incomp
422	P	VIB.2	C	70	T7	2		chlorite	base sherd	none	fin,incomp
470	P	indetermin	XD	70	T2	3		chlorite	base sherd	none	fin,incomp
473	P	indetermin	XD	70	T2	3		chlorite	base sherd	none	fin,incomp
707	T	N-VA.4	XC	71	T1	6		chlorite	base sherd	none	fin,incomp
708	P	N-VB	XC	71	T1	6A		chlorite	base sherd	none	fin,incomp
853	P	VIIA	B	73	T1	3	1	chlorite	base sherd	none	fin,incomp
868	T	VB	B	73	T1	6	2	chlorite	base sherd	none	fin,incomp
873	T	VIA	BW	73	T1	3		chlorite	base sherd	none	fin,incomp
981	T	N-VA.1	XBE	73	T1	13		chlorite	base sherd	none	fin,incomp
1033	P	N-VA.2	XCE	73	T1	2		chlorite	base sherd	none	fin,incomp
1056	P	N-VA	XCE	73	T2	6		chlorite	base sherd	none	fin,incomp
1059	T	N-VA.3	XCE	73	T3	1		chlorite	base sherd	none	fin,incomp
2606	T	N-VA.2	XCE	73	T2	2		gray stone	base sherd	none	fin,incomp
2113	T	VC-IVC	BW	69	T6	4		green stone	base sherd	none	fin,incomp
c009	P	VA.1	C	68	T7	1	2-3	limestone	base sherd	none	fin,incomp
z127	P	VB	C	69		1	2-3	limestone	base sherd	none	fin,incomp
1973	T	VC	D	68		t2		marble	base sherd	none	fin,incomp
2482	P	N-VA.1	XCE	71	T2	14		marble	base sherd	none	fin,incomp
2515	P	VB	B	73		5		marble	base sherd	none	fin,incomp
2589	T	N-VA.2	XCE	73	T1	2		marble	base sherd	none	fin,incomp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
near room	fill ex rm	ash	v. good	35mmD
near room	fill ex rm	sandy	v. good	20mmD
near room	flr +10cm	bricky	v. good	27mmD
near room	fill ex rm	ash	v. good	35mmD (fig. 7.18:b)
near room	depression	ash	v. good	19mmD
near room	fill ex rm	bricky	v. good	9mmD
near room	fill ex rm	ash,brick frag	v. good	11mmD
surf	surf wash	surf	poor	45mmL 10mmBTH 12mmTH symmetr profle; beaker,flat base
surf	surf wash	surf	poor	60mmBD 80mmL 30mmW 12mmBTH symmetr profle; beaker,flat base
near room	fill ex rm	indetermin	fair	52mmL symmetr profle
near room	fill ex rm	indetermin	fair	40mmL symmetr profle
isolated wall	pav/pltfrm		v. good	40mmL 18mmW 8mmBTH polshd ext; asymmetr profle; open bowl,flat base
courtyard	fill ex rm	bricky	v. good	40mml 25mmW 7mmBTH polshd ext,scrapd int; asymmetr profle; open bowl,flat base
near room	fill ex rm	bricky	v. good	15mmL 12mmW 5mmBTH unpolshd
near room	fill ex rm	bricky	poor	104mmL 60mmW 10mmBTH symmetr profle
near room	fill ex rm	bricky	poor	58mmL 45mmW symmetr profle; beaker,flat base
near room	fill ex rm	indetermin	v. good	200mmBD unpolshd
near room	w/in flr	water lain	v. good	50mmL 30mmW 3mmBTH 7mmTH symmetr profle: beaker, flat base
near room	on flr		v. good	54mmL 50mmW 7mmTH unpolshd; symmetr profle;flat base
courtyard	w/in flr	water lain	v. good	42mmL 22mmW 7mmBTH 8mmTH symmetr profle; open bowl,flat base
rubble fill	rbble fill	rubble	v. good	63mmL 6mmBTH symmetr profle; open bowl,flat base (fig 7.20:e)
near room	fill ex rm	soft,loose	v. good	130mmL 41mmW 14mmBTH 13mmTH symmetr profle
foundation	fill ex rm	indetermin	v. good	70mmBD 70mmL 25mmW symmetr profle; beaker,flat base
near room	fill ex rm	indetermin	good	67mmL 62mmW symmetr profle: rectang tray,flat base
near room	fill ex rm	bricky	v. good	120mmBD 110mmL 54mmW symmetr profle; open bowl, flat base
foundation	fill ex rm	indetermin	v. good	62mmL 38mmW symmetr profle; open bowl,ring base
near room	fill ex rm	indetermin	fair	65mmL 35mmW symmetr profle
near room	fill ex rm	indetermin	v. good	80mmBD 98mmL 65mmW symmetr profle; beaker, flat base (fig. 7.23:e)
room w/feature	fill in rm	bricky	v. good	39mmBD 45mmL symmetr profle; beaker, flat base (fig. 7.23:d)
near room	fill ex rm	gel,wall melt	v. good	40mmBD 35mmW symmetr profle; beaker,flat base (fig. 7.23:c)
near room	fill ex rm	bricky	v. good	70mmBD 110mmL 110mmW 10mmTH symmetr profle; open bowl,disc base
courtyard	fill ex rm	soft,loose	v. good	34mmL 22mmW 19mmBTH symmetr profle; beaker,flat base
foundation	fill ex rm	indetermin	v. good	50mmL 40mmW unpolshd; symmetr profle; beaker, flat base

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
2614	T	N-VB-VA	XCE	73	T2	10		marble	base sherd	none	fin,incomp
2111	P	VC-IVC	BW	69	T5	10		marble/alabastr	base sherd	none	fin,incomp
2921	T	VIB.1	D	69	T1	6		agate	bead	none	fin,comp
2980	P	N-VB	XC	71	T1	6A		agate	bead	none	unfin,comp
2990	P	VA.1	B	73		2		blue-grn stone	bead	none	fin,comp
2998	P	VB	B	73		5	1	blue-grn stone	bead	none	fin,comp
2518	P	indetermin	BW	73		surf		calcite	bead	none	fin,comp
2897	T	VB	B	73		6		calcite	bead	none	fin,comp
2898	P	VB	B	73		5		calcite	bead	none	fin,comp
2900	P	VA.1	CDE	73		surf	1	calcite	bead	none	fin,comp
2953	T	VIB.2-1	C	70		1	16	calcite	bead	none	fin,incomp
3498	T	VIIA	C	71	T2	1		calcite	bead	none	fin,incomp
2950	P	VIA	C	70		1	1	carnelian	bead	none	unfin,comp
2951	P	VIA	C	70		1	1	carnelian	bead	none	unfin,comp
2992	P	VA.2-1	B	73		2A		carnelian	bead	none	unfin,comp
3022	P	N-VA.3	XCE	73	T1	4		carnelian	bead	none	unfin,comp
204	T	VIIB.2	D	69		7		chlorite	bead	none	fin,comp
400	T	VIA	C	70		1	1	chlorite	bead	none	fin,comp
405	P	VIIA	C	70	T5	5	1	chlorite	bead	none	fin,comp
406	P	VIIC.2-1	C	70	T5	6		chlorite	bead	none	fin,comp
407	P	VIIC.2-1	C	70	T5	6		chlorite	bead	none	fin,comp
410	P	VIID	C	70	T5	7		chlorite	bead	none	fin,comp
416	T	VIID	C	70	T6	4		chlorite	bead	none	fin,incomp
568	T	VIIA	C	71	T3	1	5	chlorite	bead	none	fin,comp
569	T	VIIA	C	71	T3	1	5	chlorite	bead	none	fin,comp
571	P	VIB.2	C	71	T3	2	1	chlorite	bead	none	fin,comp
574	P	VIB.2-1	C	71	T4	3		chlorite	bead	none	fin,comp
575	P	VIB.2-1	C	71	T4	3		chlorite	bead	none	fin,comp
576	P	VIB.2-1	C	71	T4	3		chlorite	bead	none	fin,comp
844	P	VA.1	B	73		2		chlorite	bead	none	fin,comp
875	P	VIIB.2	C	73		1		chlorite	bead	none	fin,comp
876	P	VIIC-VIIB.3	C	73		6-9		chlorite	bead	none	fin,comp
879	P	VIIC.1	C	73	T1	7		chlorite	bead	none	fin,incomp
881	P	VIIC.2	C	73	T1	9		chlorite	bead	none	fin,incomp
890	P	VC	CW	73	T1	6		chlorite	bead	none	fin,comp
3523	P	VIIC.2-1	C	70	T5	6		chlorite	bead	none	fin,incomp
c008	P	VIIC.2	C	73		9		chlorite	bead	none	unfin,comp
2579	P	N-VII	XC	73		1		gray stone	bead	none	fin,comp
1979	T	VIIB.2	D	68		6	11	green stone	bead	none	fin,comp
2431	P	VIIA	C	71	T2	1		green stone	bead	none	fin,incomp
2505	P	VA.1	B	73		2		green stone	bead	none	fin,comp
2580	T	N-VII	XC	73		1		green stone	bead	none	fin,comp
2984	T	N-VA.2	XCE	71	T2	15	45	lapis lazuli	bead	incised line	fin,comp
2997	T	VB	B	73		4	5	lapis lazuli	bead	none	fin,comp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
near room	fill ex rm	indetermin	good	35mmL 30mmW 10mmBTH symmetr profle; beaker,flat base
near room	fill ex rm	indetermin	fair	80mmBD 86mmL 60mmW symmetr profle; beaker, flt base (fig. 7.23:f)
near room	fill ex rm	ash	v. good	6mmW/D/TH spherical(4)
near room	fill ex rm	indetermin	v. good	20mmL/H 10mmW/D/TH bead blank 6mmTH
near room	fill ex rm	ash	v. good	2mmL/H 6mmW/D/TH 2mmHD seg cylndrcl(2)
courtyard	on flr		v. good	10mmL/H 6mmW/D/TH 1mmHD droplet shape(20); 3mmTH
surf	surf wash	surf	poor	20mmL/H 15mmW/D/TH 7mmHD rnded,circlr(9)
courtyard	fill ex rm	soft,loose	v. good	3mmL/H 6mmW/D/TH 2mmHD seg cylndrcl(2)
courtyard	fill ex rm	soft,loose	v. good	2mmL/H 4mmW/D/TH .9mmHD seg cylndrcl(2)
kiln	in kiln	burned earth	v. good	11mmL/H 5mmW/D/TH lozenge-2(16) biconcal hole; 3mmTH
paving/platform	pav/pltfrm		v. good	1mmL/H 4mmW/D/TH 1mmHD seg cylndrcl(2)
near room	fill ex rm	bricky	v. good	10mmL/H 4mmHD sqr,thin-2(18)
rubble fill	rbble fill	rubble	v. good	13mmL/H 7mmW/D/TH indetermin
rubble fill	rbble fill	rubble	v. good	11mmL/H 10mmW/D/TH indetermin
near room	fill ex rm	ash	good	11mmL/H 10mmW/D/TH bead blank
near room	fill ex rm	bricky	v. good	22mmL/H 22mmW/D/TH bead blank 12mmTH
room w/out door	fill in rm	bricky	v. good	5mmW/D/TH seg cylndrcl(2)
rubble fill	rbble fill	rubble	v. good	2mmL/H 5mmW/D/TH 3mmHD seg cylndrcl(2)
near room	on flr		v. good	3mmL/H 6mmW/D/TH 1.8mmHD seg cylndrcl(2)
near room	fill ex rm	hard,clayey	good	2mmL/H 8mmW/D/TH 1.5mmHD polygnl,seg cylndrcl(11)
near room	fill ex rm	hard,clayey	good	3mmL/H 9mmW/D/TH 2mmHD polygnl,seg cylndrcl(11) (fig. 7.6:c)
open space	fill ex rm	hard,clayey	v. good	10mmW/D/TH spherical(4)
open space	fill ex rm	hard,clayey	v. good	7mmW/D/TH 1.5mmHD seg cylndrcl(2)
room with door	flr +10cm?	bricky	v. good	1mmL/H 5mmW/D/TH 2.5mmHD polygnl,seg cylndrcl(11)
room with door	flr +10cm?	bricky	v. good	3mmL/H 7mmW/D/TH 3mmHD seg cylndrcl(2)
near room	depression	ash	v. good	3mmL/H 9mmW/D/TH 1mmHD seg cylndrcl(2) conical
near room	depression	ash	v. good	3mmL/H 5mmW/D/TH 1.5mmHD seg cylndrcl(2)
near room	depression	ash	v. good	3mmL/H 5mmW/D/TH 1.5mmHD seg cylndrcl(2)
near room	depression	ash	v. good	2mmL/H 5mmW/D/TH 2mmHD seg cylndrcl(2)
near room	fill ex rm	ash	v. good	5mmL/H 7mmW/D/TH 1.5mmHD seg cylndrcl(2); biconcal hole; polshd
courtyard	on flr		v. good	3mmL/H 6mmW/D/TH 2mmHD seg cylindrcl(2)
near room	fill ex rm	hard,bricky	good	4mmL/H 6mmW/D/TH 3mmHD seg cylndrcl(2)
open space	fill ex rm	hard,clayey	v. good	3mmL/H 8mmW/D/TH 3mmHD polygnl,seg cylndrcl(11)
near room	fill ex rm	bricky	v. good	1mmL/H 11mmW/D/TH 2mmHD seg cylndrcl(2)
paving/platform	pav/pltfrm	bricky	v. good	20mmL/H 5mmW/D/TH 2mmHD lozenge-1(12): polshd
near room	fill ex rm	hard,clayey	good	2mmL/H 6mmW/D/TH polygnl,seg cylndrcl(11)
near room	fill ex rm	bricky	v. good	11mmL/H 8mmW/D/TH bead blank
near room	fill ex rm	indetermin	poor	12mmL/H 16mmW/D/TH seg cylndrcl(2)
room w/out door	fill in rm	sandy,clayey	v. good	30mmL/H 23mmW/D/TH 5mmHD rnded,circlr(9)
near room	fill ex rm	bricky	v. good	9mmL/H 8mmW/D/TH rnded,cylndrcl(14)
near room	fill ex rm	ash	v. good	2mmL/H 5mmW/D/TH 1mmHD seg cylndrcl(2)
near room	fill ex rm	indetermin	poor	4mmL/H 9mmW/D/TH seg cylndrcl(2)
near room	on flr		v. good	32mmL/H 22mmW/D/TH disc-shaped (10) (figs. 7.3, 7.8:e)
near room	grave	soft,loose	v. good	19mmL/H 6mmW/D/TH 2mmHD asym sqr,rectang(19); biconcal hole; polshd

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
3000	P	VB	B	73		6	4	lapis lazuli	bead	none	fin,comp
2297	P	VIB.1	C	70		1	5	purple stone	bead	none	fin,comp
2299	T	VIA	C	70		2		purple stone	bead	none	fin,incomp
2994	T	VA.1	B	73		3		serpentine	bead	none	fin,comp
1295	T	VIA	C	70		1	1	stone or bone	bead	none	fin,comp
2436	P	VIB.1	C	71	T4	1		tan stone	bead	none	fin,comp
2901	P	VIA	D	68		t3	1	turquoise	bead	none	fin,incomp
2914	T	VC-VA	C	69		surf	8	turquoise	bead	none	fin,comp
2916	P	VC	C	69		7	14	turquoise	bead	none	fin,comp
2917	P	VC	C	69		3		turquoise	bead	none	fin,comp
2918	P	VIA	D	69		3		turquoise	bead	none	fin,comp
2919	T	VIA	D	69		3		turquoise	bead	none	fin,incomp
2922	P	VIA	D	69	T2	4		turquoise	bead	none	fin,comp
2948	P	VC	C	70		surf	2	turquoise	bead	none	fin,comp
2949	P	VC	C	70		surf	2	turquoise	bead	none	fin,comp
2952	P	VIA	C	70		1	12	turquoise	bead	none	fin,comp
2954	P	VIB.2	C	70	T6	5		turquoise	bead	none	fin,comp
2955	T	VIIA	C	70	T6	6		turquoise	bead	none	fin,incomp
2974	P	VIIA	C	71	T3	1	5	turquoise	bead	none	fin,comp
2981	P	N-VA.4	XC	71	T2	6		turquoise	bead	none	fin,incomp
2982	P	N-VB	XC	71	T1	7B	23	turquoise	bead	none	fin,incomp
2983	P	N-VB	XC	71	T1	7B	23	turquoise	bead	none	fin,comp
2989	P	VC	B	73	T1	2		turquoise	bead	none	fin,comp
2993	P	VA.1	B	73		3	1	turquoise	bead	none	fin,incomp
2995	P	VA.2	B	73		4	3	turquoise	bead	none	fin,incomp
2996	T	VA.2	B	73		4		turquoise	bead	none	fin,incomp
2999	P	VB	B	73		6		turquoise	bead	none	fin,comp
3001	P	VIIA	CDE	73	T1	3	5	turquoise	bead	none	fin,comp
3002	P	VIB.1	BW	73	T2	3		turquoise	bead	none	fin,comp
3003	T	VIIB.3	C	73	T1	3		turquoise	bead	none	fin,incomp
3004	T	VIIC-VIIB.3	C	73		6-9		turquoise	bead	none	fin,incomp
3005	P	VIIB.4-6	C	73	T1	8		turquoise	bead	none	fin,comp
3006	P	VA.1	CDE	73		surf		turquoise	bead	none	fin,comp
3019	P	N-VA.1	XBE	73		14		turquoise	bead	none	fin,comp
3021	T	N-VA.2	XCE	73	T1	2A		turquoise	bead	none	fin,comp
3023	T	N-VA.4	XCE	73	T1	6		turquoise	bead	none	fin,comp
3024	T	N-VA.4	XCE	73	T1	6		turquoise	bead	none	fin,incomp
3025	T	N-VII,VB	XCE	73	T1	11A		turquoise	bead	none	fin,comp
3026	T	N-VA.2	XCE	73	T2	2		turquoise	bead	none	fin,comp
3832	T	N-VB	XC	71	T1	7B	23	turquoise	bead	none	fin,comp
3833	T	N-VB	XC	71	T1	7B	23	turquoise	bead	none	fin,comp
z058	P	VIIA	D	69		6		turquoise	bead	none	fin,incomp
z198	P	indetermin	XD	70	T1	3		turquoise	bead	none	fin,comp
z606	P	VIIC.2	C	73	T2	9		turquoise	bead	none	fin,comp
z617	P	VIA	BW	73	T1	2		turquoise	bead	none	fin,comp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
courtyard	on flr		v. good	2mmL/H 6mmW/D/TH 1.2mmHD seg cylindrcl(2)
near room	on flr		v. good	3mmL/H 6mmW/D/TH 2.5mmHD seg cylindrcl(2) (fig. 7.6:b)
leveling fill	infilling	bricky	v. good	3mmHD indetermin
near room	fill ex rm	ash	v. good	10mmL/H 9mmW/D/TH 4mmHD asym,cylndrcl-2(22); polshd
rubble fill	rbble fill	rubble	v. good	4mmL/H 4mmW/D/TH 2mmHD seg cylndrcl(2)
near room	fill ex rm	bricky	v. good	3mmL/H 6mmW/D/TH 1.5mmHD seg cylndrcl(2)
rubble fill	rbble fill	rubble	v. good	9mmW/D/TH droplet shape(20); 5mmTH
rubble fill	rbble fill	rubble	poor	10mmL/H 8mmW/D/TH diamond shape(23); biconcal hole
room with door	flr +10cm	bricky	v. good	2mmL/H 4mmW/D/TH 1mmHD seg cylndrcl(2)
paving/platform	pav/pltfrm	bricky	v. good	16mmL/H 10mmW/D/TH rnded,circlr(9)
rubble fill	rbble fill	rubble	v. good	10mmL/H 8mmW/D/TH diamond shape(23)
rubble fill	rbble fill	rubble	fair	indetermin
leveling fill	infilling	hard,clayey	v. good	20mmL/H 15mmW/D/TH diamond shape(23)
room with door	flr +10cm?	bricky	v. good	22mmL/H 17mmW/D/TH 2mmHD diamond shape(23); 8mmTH
room with door	flr +10cm?	sandy,bricky	unclear	9mmL/H 8mmW/D/TH 1mmHD diamond shape(23); 3mmTH
isolated wall	pav/pltfrm		v. good	1mmL/H 3mmW/D/TH 1mmHD seg cylndrcl(2)
near room	fill ex rm	bricky	v. good	9mmL/H 9mmW/D/TH 2mmHD asym ovoid(24)
courtyard	fill ex rm	bricky	v. good	2mmL/H 4mmW/D/TH 2mmHD seg cylndrcl(2)
room with door	flr +10cm?	bricky	v. good	12mmL/H 8mmW/D/TH 3mmHD rnded,circlr(9)
near room	fill ex rm	indetermin	v. good	indetermin
tholos w/door	fill in rm	indetermin	v. good	indetermin 2mmTH
tholos w/door	fill in rm	indetermin	v. good	7mmL/H 6mmW/D/TH diamond shape(23) 3mmTH
near room	fill ex rm	ash	v. good	11mmL/H 8mmW/D/TH 2mmHD diamond shape(23); 3mmTH
near room	on flr		v. good	2mmL/H 7mmW/D/TH 1mmHD seg cylndrcl(2)
open space	on flr	water lain	v. good	13mmW/D/TH 3mmHD asym,cylndrcl-2(22); biconcal hole
open space	fill ex rm	soft,loose	v. good	1mmL/H 3mmW/D/TH 1mmHD seg cylndrcl(2)
courtyard	fill ex rm	soft,loose	v. good	14mmL/H 9mmW/D/TH 2mmHD asym,cylndrcl-2(22)
near room	flr +10cm	organic midden	v. good	2mmL/H 3mmW/D/TH 1mmHD seg cylndrcl(2)
near room	fill ex rm	bricky	v. good	11mmL/H 9mmW/D/TH diamond shape(23); 2mmTH
near room	fill ex rm	soft,loose	v. good	indetermin
near room	fill ex rm	hard,bricky	good	indetermin
near room	fill ex rm	bricky	good	2mmL/H 4mmW/D/TH 2mmHD seg cylndrcl(2)
near room	fill ex rm	bricky	poor	10mmL/H 4mmW/D/TH rnded,circlr(9)
near room	fill ex rm	soft,loose	v. good	5mmW/D/TH disc-shaped(10)
rubble fill	rbble fill	rubble	v. good	8mmL/H 8mmW/D/TH trapezoidal(25) 4mmHD
near room	fill ex rm	indetermin	v. good	8mmL/H 7mmW/D/TH diamond shape(23) 3mmTH
near room	fill ex rm	indetermin	v. good	indetermin
near room	fill ex rm	soft,loose	good	5mmL/H 5mmW/D/TH trapezoidal(25) 3mmTH
foundation	fill ex rm	indetermin	v. good	11mmL/H 9mmW/D/TH 1.5mmHD trapezoidal(25); 5mmTH (fig. 7.19:b)
tholos w/door	fill in rm	indetermin	v. good	7mmL/H 6mmW/D/TH diamond shape(23) 3mmTH
tholos w/door	fill in rm	indetermin	v. good	4mmL/H 3mmW/D/TH diamond shape(23) 2mmTH
near room	fill ex rm	indetermin	v. good	28mmL/H 20mmW/D/TH asym,cylndrcl-1(6)
near room	fill ex rm	indetermin	poor	diamond shape(23); 6mmTH
near room	fill ex rm	hard, bricky	v. good	7mmL/H 5mmW/D/TH 2mmHD asym,cylndrcl-1(6)
rubble fill	rubble fill	rubble	v. good	8mmL/H 5mmW/D/TH 1.5mmHD asym,cylndrcl-1(6)

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
2618	P	VIA	CDE	73		2	10	turquoise	bead	none	fin,comp
716	T	N-VB	XC	71	T2	7		unidentfd stone	bead	none	fin,comp
1970	T	VC	D	68		2		unidentfd stone	bead	none	fin,comp
2434	P	VIIA	C	71	T3	3	1	unidentfd stone	bead	none	fin,comp
2509	P	VA.1	B	73		3		unidentfd stone	bead	none	fin,comp
2524	T	VIIC-VIIB.3	C	73	T1	6-9		unidentfd stone	bead	none	fin,comp
2525	P	VIIC.1	C	73	T1	7		unidentfd stone	bead	none	fin,incomp
2891	T	virgin soil	C	71	T1	2		unidentfd stone	bead	none	fin,incomp
3520	T	indetermin	CDE	73		surf		unidentfd stone	bead	none	fin,comp
1703	T	VIIB.5-3	D	73		7	37	white stone	bead	none	fin,comp
1974	T	VIA	D	68		t3	1	white stone	bead	none	fin,incomp
2135	P	VC-VA	C	69		surf	8	white stone	bead	none	fin,comp
2291	P	VIIA-VIA	C	70		1		white stone	bead	none	fin,comp
2301	T	VIIC.2-1	C	70	T5	6		white stone	bead	none	fin,comp
2306	T	VIB.2	C	70	T6	5		white stone	bead	none	fin,comp
2519	P	VIA	BW	73	T1	2		white stone	bead	none	fin,incomp
2520	T	VIIC.2	C	73		9-1		white stone	bead	none	fin,comp
2521	T	VIIC.2	C	73		9		white stone	bead	none	fin,comp
2526	T	VIIC.1	C	73	T1	7		white stone	bead	none	fin,comp
2599	T	N-VII,VB	XCE	73	T1	10		white stone	bead	none	fin,comp
2899	P	VIIC.2	C	73	T2	9		white stone	bead	none	fin,comp
13	P	VA.1-IVC	C	68	T1-2	8		chlorite	body sherd	incised line	fin,incomp
544	T	VC-IVC	BW	71		10		chlorite	body sherd	none	fin,incomp
545	P	VC-IVC	BW	71	T1	6		chlorite	body sherd	none	fin,incomp
546	P	VC-IVC	BW	71	T1	6		chlorite	body sherd	none	fin,incomp
578	P	VIB.2	C	71	T4	3	2	chlorite	body sherd	none	fin,incomp
712	P	N-VA.3	XC	71	T2	5		chlorite	body sherd	none	fin,incomp
715	P	N-VB	XC	71	T2	6A		chlorite	body sherd	none	fin,incomp
746	P	N-VII,VB	XD	71		1	43	chlorite	body sherd	none	fin,incomp
845	P	VA.1	B	73		2		chlorite	body sherd	none	fin,incomp
846	T	VA.1	B	73		2		chlorite	body sherd	none	fin,incomp
855	T	VA.2	B	73		4		chlorite	body sherd	none	fin,incomp
858	P	VA.2	B	73		4		chlorite	body sherd	none	fin,incomp
861	P	VA.2	B	73		4	2	chlorite	body sherd	none	fin,incomp
862	T	VA.2	B	73		4	2	chlorite	body sherd	none	fin,incomp
863	T	VA.2	B	73		4	2	chlorite	body sherd	rd pnt/ochre	fin,incomp
864	T	VA.2	B	73		4	2	chlorite	body sherd	none	fin,incomp
867	T	VB	B	73		6		chlorite	body sherd	none	fin,incomp
880	T	VIIB.6-4	C	73	T1	8		chlorite	body sherd	none	fin,incomp
898	P	VIIB.2-VIIA	CDE	73		4		chlorite	body sherd	none	fin,incomp
928	T	N-VA.1	XB	73	T2	13		chlorite	body sherd	none	fin,incomp
980	T	N-VA.1	XBE	73	T1	13		chlorite	body sherd	none	fin,incomp
1022	T	N-VA.1	XBE	73	T2	13		chlorite	body sherd	none	fin,incomp
1024	T	N-VA.1	XBE	73	T5	4		chlorite	body sherd	none	fin,incomp
1026	P	N-VII	XC	73		3		chlorite	body sherd	none	fin,incomp
1028	P	N-VA.4	XCE	73		5		chlorite	body sherd	none	fin,incomp
1030	P	N-VA.4	XCE	73		5		chlorite	body sherd	none	fin,incomp
1031	P	N-VA.2	XCE	73	T1	1	9	chlorite	body sherd	none	fin,incomp
1032	T	N-VA.2	XCE	73	T1	2		chlorite	body sherd	none	fin,incomp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
rubble fill	rbble fill	rubble	v. good	9mmL/H 7mmW/D/TH 2mmHD rnded,circlr(9)
near room	fill ex rm	indetermin	v. good	2mmL/H 4mmW/D/TH seg cylndrcl(2)
room with door	fill in rm	bricky	v. good	8mmW/D/TH indetermin; polshd
room w/out door	flr +10cm?	soft,loose	v. good	3mmL/H 7mmW/D/TH 2mmHD seg cylndrcl(2)
near room	fill ex rm	ash	v. good	11mmL/H 8mmW/D/TH 1mmHD rnded cylndrcl(14)
near room	fill ex rm	hard,bricky	good	2mmL/H 6mmW/D/TH 2mmHD seg cylndrcl(2)
open space	fill ex rm	hard,clayey	v. good	8mmL/H 10mmW/D/TH 5mmHD seg cylndrcl(2)
virgin soil	rodnt hole	rodent hole	poor	10mmL/H 10mmW/D/TH 2mmHD lozenge-2(16); 4mmTH
surf	surf wash	surf	poor	3mmW/D/TH seg cyldrcl(2)
near room	fill ex rm	lamintd lenses	v. good	4mmL/H 9mmW/D/TH seg cylndrcl(2)
rubble fill	rbble fill	rubble	v. good	20mmL/H 1mmW/D/TH indetermin; polshd
rubble fill	rbble fill	rubble	poor	20mmL/H 12mmW/D/TH lozenge-2(16) (fig. 7.19:c)
near room	fill ex rm	bricky	good	10mmL/H 7mmW/D/TH 2mmHD lozenge-2(16) 3mmTH
near room	fill ex rm	hard,clayey	good	4mmL/H 4mmW/D/TH 2.5mmHD seg cylndrcl(2)
near room	fill ex rm	bricky	v. good	8mmL/H 4mmW/D/TH 2mmHD sqr,rectang(13)
rubble fill	rbble fill	rubble	v. good	23mmL/H lozenge-2(16) biconcal hole 7mmTH
near room	fill ex rm	ash	v. good	3mmL/H 5mmW/D/TH 3mmHD seg cylndrcl(2)
near room	fill ex rm	bricky	v. good	2mmL/H 3mmW/D/TH 2mmHD seg cylndrcl(2)
open space	fill ex rm	hard,clayey	v. good	2mmL/H 6mmW/D/TH 3mmHD seg cylndrcl(2)
near room	fill ex rm	hard,clayey	good	7mmL/H 5mmW/D/TH cylndrcl(3)
near room	fill ex rm	bricky	v. good	7mmL/H 5mmW/D/TH cylndrcl(3)
near room	fill ex rm	indetermin	good	17mmL 13mmW
near room	fill ex rm	soft.loose	fair	56mmL 37mmW 10mmTH unpolshd
near room	fill ex rm	indetermin	fair	even wall TH
near room	fill ex rm	indetermin	fair	65mmL 6mmTH even wall TH
rubble fill	rbble fill	rubble	v. good	12mmTH polshd ext + int; uneven wall TH
near room	fill ex rm	indetermin	v. good	32mmL 21mmW 4mmTH even wall TH
near room	w/in flr	water lain	v. good	35mmL 10mmW 5mmTH even wall TH
courtyard	fill in rm	indetermin	good	57mmL 23mmW 6mmTH even wall TH
near room	fill ex rm	ash	v. good	50mmL 30mmW 6mmTH unpolshd; even wall TH,cylndrcl shape
near room	fill ex rm	ash	v. good	40mmL 24mmW 7mmTH unpolshd; even wall TH
open space	fill ex rm	soft,loose	v. good	46mmL 35mmW 8mmTH polshd int; even wall TH
open space	fill ex rm	soft,loose	v. good	50mmL 25mmW 7mmTH unpolshd; even wall TH
open space	w/in flr	water lain	v. good	30mmL 27mmW 6mmTH unpolshd; even wall TH
open space	w/in flr	water lain	v. good	22mmL 18mmW 6mmTH unpolshd; even wall TH
open space	w/in flr	water lain	v. good	32mmL 30mmW 5mmTH unpolshd; even wall TH
open space	w/in flr	water lain	v. good	35mmL 30mmW 6mmTH unpolshd; even wall TH
courtyard	fill ex rm	soft,loose	v. good	11mmL 10mmW 5mmTH polshd ext + int; even wall TH
near room	fill ex rm	bricky	good	68mmL 25mmW 9mmTH indetermin
near room	fill ex rm	bricky	good	20mmL 18mmW 5mmTH indetermin
near room	fill ex rm	soft,loose	v. good	92mmL 60mmW 9mmTH even wall TH
near room	fill ex rm	soft,loose	v. good	68mmL 44mmW 7mmTH
near room	fill ex rm	soft,loose	v. good	104mmL 38mmW 12mmTH even wall TH
near room	fill ex rm	bricky	v. good	83mmL 66mmW 16mmTH even wall TH
near room	fill ex rm	indetermin	v. good	23mmL 15mmW indetermin
near room	fill ex rm	hard,clayey	v. good	56mmL 32mmW 7mmTH even wall TH
near room	fill ex rm	hard,clayey	v. good	36mmL 30mmW 5mmTH polshd ext; even wall TH
rubble fill	rbble fill	rubble	v. good	203mmL 85mmW 25mmTH even wall TH
foundation	fill ex rm	indetermin	v. good	30mmL 25mmW 7mmTH even wall TH

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
1034	P	N-VA.2	XCE	73	T1	2		chlorite	body sherd	none	fin,incomp
1036	P	N-VA.2	XCE	73	T1	2		chlorite	body sherd	none	fin,incomp
1039	P	N-VA.4-3	XCE	73	T1	4A		chlorite	body sherd	none	fin,incomp
1040	P	N-VA.4	XCE	73	T1	4B		chlorite	body sherd	none	fin,incomp
1041	T	N-VA	XCE	73	T2	4C		chlorite	body sherd	none	fin,incomp
1043	P	N-VA.4	XCE	73	T1	6		chlorite	body sherd	none	fin,incomp
1044	P	N-VA.4	XCE	73	T1	6		chlorite	body sherd	none	fin,incomp
1048	P	N-VII	XCE	73	T1	12		chlorite	body sherd	none	fin,incomp
1050	P	N-VA	XCE	73	T5	3		chlorite	body sherd	none	fin,incomp
1054	P	N-VA	XCE	73	T2	6		chlorite	body sherd	none	fin,incomp
1055	P	N-VA	XCE	73	T2	6		chlorite	body sherd	none	fin,incomp
c001	P	VIA	CDE	73		2	10	chlorite	body sherd	none	fin,incomp
c002	P	VIIC.2	C	73	T2	9		chlorite	body sherd	none	fin,incomp
c011	P	VA.1	C	68	T7	1		chlorite	body sherd	none	fin,incomp
c013	P	VC-IVC	BW	71	T1	6		chlorite	body sherd	none	fin,incomp
2605	T	N-VA.2	XCE	73	T2	2		diat limestone	body sherd	none	fin,incomp
z554	P	N-VA.3	XC	71	T1-2	5		diat limestone	body sherd	none	fin,incomp
z719	P	N-VA.1	XCE	71		14		diat limestone	body sherd	none	fin,incomp
2462	P	N-VA.4	XC	71	T2	6		limestone	body sherd	none	fin,incomp
2408	P	VB	B	71		27	3	marble	body sherd	none	fin,incomp
2461	P	N-VA.4	XC	71	T2	6		marble	body sherd	none	fin,incomp
2504	P	VA.1	B	73		2		marble	body sherd	none	fin,incomp
2506	T	VA.1	B	73		2		marble	body sherd	none	fin,incomp
2507	P	VA.1	B	73		2		marble	body sherd	none	fin,incomp
2541	P	VA.1	CDE	73		surf		marble	body sherd	none	fin,incomp
2582	T	N-VA.4	XCE	73		5		marble	body sherd	none	fin,incomp
2583	T	N-VA.4	XCE	73		5		marble	body sherd	none	fin,incomp
2587	T	N-VA.2	XCE	73	T1	2		marble	body sherd	none	fin,incomp
2588	T	N-VA.2	XCE	73	T1	2		marble	body sherd	none	fin,incomp
2590	T	N-VA.2	XCE	73	T1	2		marble	body sherd	none	fin,incomp
2594	T	N-VA.4	XCE	73	T1	5		marble	body sherd	none	fin,incomp
2596	T	N-VA.4	XCE	73	T1	6		marble	body sherd	none	fin,incomp
2604	T	N-VA.2	XCE	73	T2	1		marble	body sherd	none	fin,incomp
2607	T	N-VA.2	XCE	73	T2	2		marble	body sherd	none	fin,incomp
2610	T	N-VA	XCE	73	T2	4B		marble	body sherd	none	fin,incomp
2611	T	N-VA	XCE	73	T2	6		marble	body sherd	none	fin,incomp
2615	T	N-VA.3	XCE	73	T3	1		marble	body sherd	none	fin,incomp
2616	T	N-VA.3	XCE	73	T3	1		marble	body sherd	none	fin,incomp
1962	P	VA.1-IVC	C	68	T1-2	8		marble/alabastr	body sherd	none	fin,incomp,re
2543	P	after VA.1	CDE	73		surf	7	unidentfd stone	body sherd	none	fin,incomp
2544	T	after VA.1	CDE	73		surf	7	unidentfd stone	body sherd	incised line	fin,incomp
z358	P	VIIA-VIA	C	70		1		unidentfd stone	body sherd	none	fin,incomp
2612	T	N-VA	XCE	73	T2	8		white stone	body sherd	none	fin,incomp
399	P	VIIA-VIA	C	70		1		chlorite	bracelet	incised line	fin,incomp
409	P	VIIC.2-1	C	70	T5	6		chlorite	bracelet	incised line	fin,incomp
714	P	N-VA.4	XC	71	T2	6		chlorite	bracelet	none	fin,incomp
717	P	N-VII,VB	XC	71	T2	7C		chlorite	bracelet	incised line	fin,incomp
c006	P	N-VA.2	XCE	73	T1	2		chlorite	bracelet	none	fin,incomp
z679	P	VIB.2-1	CDE	73		3	10	chlorite	bracelet	none	fin,incomp
z680	P	VIB.2-1	CDE	73		3	10	chlorite	bracelet	none	fin,incomp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
foundation	fill ex rm	indetermin	v. good	38mmL 25mmW even wall TH
foundation	fill ex rm	indetermin	v. good	59mmL 44mmW 8mmTH even wall TH
near room	fill ex rm	bricky	good	57mmL 28mmW 5mmTH even wall TH,cylndrcl shape
near room	fill ex rm	bricky	v. good	
near room	fill ex rm	indetermin	good	30mmL 20mmW 11mmTH even wall TH
foundation	fill ex rm	bricky	v. good	25mmL 22mmW 4mmTH even wall TH
foundation	fill ex rm	bricky	v. good	24mmL 23mmW 4mmTH even wall TH
courtyard	fill ex rm	indetermin	v. good	70mmL 60mmW 5mmTH polshd ext + int
near room	fill ex rm	indetermin	good	20mmL 19mmW 5mmTH even wall TH
near room	fill ex rm	indetermin	good	50mmL 25mmW 4mmTH even wall TH
near room	fill ex rm	indetermin	good	15mmL 15mmW 7mmTH even wall TH
rubble fill	rbble fill	rubble	v. good	69mmL 47mmW 10mmTH polshd ext; uneven wall TH
near room	fill ex rm	bricky	v. good	65mmL 29mmW 8mmTH uneven wall TH
near room	fill ex rm	indetermin	v. good	52mmL 49mmW 5mmTH unpolshd; even wall TH
near room	fill ex rm	indetermin	good	34mmL 30mmW 6mmTH polshd int; even wall TH
open space	fill ex rm	indetermin	v. good	67mmL 33mmW 5mmTH even wall TH (fig. 7.19:c)
near room	fill ex rm	indetermin	v. good	62mmL 28mmW 7mmTH polshd ext; even wall TH
near room	fill ex rm	bricky	v. good	60mmL 43mmW 12mmTH polshd ext; even wall TH
near room	fill ex rm	indetermin	v. good	55mmL 43mmW 3mmTH even wall TH
courtyard	on flr		v. good	34mmL 20mmW 10mmTH polshd ext + int; even wall TH
near room	fill ex rm	indetermin	v. good	23mmL 14mmW 8mmTH unpolshd; even wall TH
near room	fill ex rm	ash	v. good	30mmL 26mmW 5mmTH even wall TH
near room	fill ex rm	ash	v. good	60mmL 30mmW 11mmTH polshd ext; even wall TH
near room	fill ex rm	ash	v. good	45mmL 23mmW 8mmTH polshd ext + int; even wall TH
kiln	in kiln	burned earth	v. good	60mmL 40mmW 11mmTH polshd ext; even wall TH
near room	fill ex rm	hard,clayey	v. good	27mmL 20mmW 5mmTH even wall TH
near room	fill ex rm	hard,clayey	v. good	17mmL 15mmW 5mmTH even wall TH
foundation	fill ex rm	indetermin	v. good	77mmL 30mmW 6mmTH even wall TH
foundation	fill ex rm	indetermin	v. good	40mmL 21mmW 12mmTH polshd ext; even wall TH
foundation	fill ex rm	indetermin	v. good	30mmL 25mmW 4mmTH 'well-smoothed'; even wall TH
near room	fill ex rm	indetermin	v. good	60mmL 25mmW 7mmTH even wall TH
near room	fill ex rm	indetermin	v. good	20mmL 19mmW 4mmTH even wall TH
near room	on flr		v. good	36mmL 24mmW 7mmTH even wall TH,cylndrcl shape
open space	fill ex rm	indetermin	v. good	43mmL 35mmW 5mmTH even wall TH
near room	fill ex rm	indetermin	good	85mmL 52mmW 5mmTH even wall TH
near room	fill ex rm	indetermin	good	60mmL 37mmW 6mmTH polshd ext; even wall TH
near room	fill ex rm	indetermin	v. good	40mmL 30mmW 6mmTH even wall TH
near room	fill ex rm	indetermin	v. good	35mmL 32mmW 4mmTH even wall TH
near room	fill ex rm	indetermin	good	75mmL 53mmW 4mmTH even wall TH; drilled hole
intrusive pit	unshpd pit	soft,loose	poor	65mmL unpolshd; even wall TH
intrusive pit	unshpd pit	soft,loose	poor	50mmL polshd int; even wall TH
near room	fill ex rm	bricky	good	62mmL 28mmW 9mmTH polshd ext
near room	fill ex rm	bricky	good	110mmL 76mmW 10mmTH even wall TH,cylndrcl shape
near room	fill ex rm	bricky	good	7mmTH 23mmW (fig. 7.8:g)
near room	fill ex rm	hard,clayey	good	5mmTH 15mmW
near room	fill ex rm	indetermin	v. good	
near room	fill ex rm	indetermin	good	22mmL 10mmW 6mmTH
foundation	fill ex rm	indetermin	v. good	8mmTH 14mmW polshd
room with door	on flr		v. good	10mmTH 18mmW polshd
room with door	on flr		v. good	6mmTH 13mmW polshd

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
2292	P	VIA	C	70		1	1	green stone	bracelet	none	fin,incomp
2523	T	VIIB.3	C	73	T1	3		limestone	bracelet	none	fin,incomp
2190	T	VIB.1	D	69	T2	6		marble	bracelet	none	fin,incomp
2191	P	VIB.2	D	69	T2	8		marble	bracelet	none	fin,incomp
2460	P	N-VA.2	XC	71	T1	3		marble	bracelet	none	fin,incomp
2538	P	indetermin	CDE	73		surf		marble	bracelet	none	fin,incomp
2539	T	VA.1	CDE	73		surf	1	marble	bracelet	none	fin,incomp
2597	T	N-VA.4	XCE	73	T1	6		marble	bracelet	none	fin,incomp
2432	P	VIIA	C	71	T3	1	5	marble/alabastr	bracelet	none	fin,incomp
1975	T	VIA	D	68		t3	1	unidentfd stone	bracelet	none	fin,incomp
2298	T	VIB.1	C	70		1	5	unidentfd stone	button	none	fin,comp
1060	T	N-VA.3	XCE	73	T3	1		chlorite	carved disc	incised line	fin,incomp
847	P	VA.1	B	73		2	2	chlorite	cone	none	fin,comp
850	T	VA.1	B	73		3		chlorite	debitage	none	debitage
852	P	VA.1	B	73		3	5	chlorite	debitage	none	fin,incomp
854	T	VA.2	B	73		4		chlorite	debitage	none	debitage
866	T	VB	B	73		6		chlorite	debitage	none	unfin,incom
z340	P	VIB.2	C	70	T5	3	1	chlorite	debitage	none	debitage
z698	P	VIIC.2	C	73		9		rock crystal	debitage	none	debitage
3326	T	VIIB.6-5	E	69	T3	2	1	unidentfd stone	debitage	none	debitage
205	T	VIIB.3	D	69		7	2	chlorite	disc	none	fin,incomp
404	P	VIIA	C	70	T5	5		chlorite	disc	none	fin,comp
412	P	VIID	C	70	T5	7		chlorite	disc	use marks	fin,comp
705	P	N-VII,VB	XC	71		8N		chlorite	disc	none	fin,incomp
978	P	VIIC-VIIB.3	C	73	T1	6-9		chlorite	disc	none	fin,comp
1029	P	N-VA.4	XCE	73		5		chlorite	disc	none	fin,comp
1035	P	N-VA.2	XCE	73	T1	2		chlorite	disc	none	fin,comp
1042	P	N-VA.4	XCE	73	T1	5		chlorite	disc	incised line	fin,comp
1052	P	N-VA	XCE	73	T2	4C		chlorite	disc	none	fin,comp
2438	T	VIIB.1	C	71	T5	1	6A	gray stone	disc	none	fin,comp
2407	P	VB	B	71		25		quartz or agate	disc	none	fin,comp
402	P	VIB.1	C	70		1	18	unidentfd stone	disc	none	fin,incomp
1977	P	VIA	D	68		4	1	unidentfd stone	disc	none	fin,incomp
2304	T	VIA	C	70		2		unidentfd stone	disc	none	fin,comp
2613	P	N-VB-VA	XCE	73	T2	9		unidentfd stone	disc	none	fin,comp
3544	T	VIIB.6-4	C	73	T1	8		unidentfd stone	disc	none	fin,incomp
z744	P	VIIA	D	69		6		unidentfd stone	disc	none	fin,comp
2118	P	indetermin	C	69		surf		white stone	disc	none	fin,comp
z706	P	VIIB.2-VIIA	CDE	73		4		white stone	disc	none	fin,comp
2305	P	VIB.2	C	70	T6	5		wn-opaque stone	disc	none	fin,comp
17	T	VIIB.4	D	68		6	7	chlorite	figurine	incised line	fin,comp
1046	T	N-VII,VB	XCE	73	T1	9		chlorite	figurine	incised line	fin,comp
2592	T	N-VA.4-3	XCE	73	T1	4A		gray stone	figurine	none	fin,incomp
5000	T	N-VA.1	XCE	71		14	30	limestone	figurine	none	fin,comp
2326	T	N-VII,VB	XD	70	T1	2-4		marble/alabastr	figurine	none	fin,comp
21	P	VIIB.6	D	68		6	19	chlorite	full profile	use marks	fin,comp
196	P	VB-VA	C	69	T1	1		chlorite	full profile	none	fin,comp
210	P	VIIB.5	E	69	T3	2		chlorite	full profile	none	fin,incomp
580	T	VIIB.2	C	71	T6	1	2	chlorite	full profile	none	fin,comp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
rubble fill	rbble fill	rubble	v. good	3mmTH 6mmW
near room	fill ex rm	soft,loose	v. good	10mmTH 25mmW
near room	fill ex rm	ash	v. good	25mmTH 9mmW
near room	depression	ash	v. good	19mmTH 16mmW (fig. 7.8:f)
near room	fill ex rm	indetermin	good	18mmW
surf	surf wash	surf	poor	7mmTH 25mmW polshd
kiln	in kiln	burned earth	v. good	20mmW polshd
near room	fill ex rm	indetermin	v. good	10mmTH 35mmW
room with door	flr +10cm?	bricky	v. good	80mmID 7mmTH 33mmW polshd
rubble fill	rbble fill	rubble	v. good	60mmID
near room	on flr		v. good	6mmH 15mmD polished
near room	fill ex rm	bricky	v. good	7mmTH geometric design (figs. 7.12:a, 7.13)
near room	on flr		v. good	12mmBD 19mmH
near room	fill ex rm	ash	v. good	
near room	fill ex rm	ash	v. good	15mmL 10mmW 4mmTH
near room	fill ex rm	soft,loose	v. good	
courtyard	fill ex rm	soft,loose	v. good	46mmL 38mmW 10mmTH
isolated wall	pav/pltfrm		v. good	
near room	fill ex rm	bricky	v. good	
room w/out door	fill in rm	bricky	good	
possible room	fill ex rm	lamintd lenses	v. good	45mmD 3mmTH 6mmHD center hole
near room	fill ex rm	bricky	v. good	42mmD 3mmTH 3mmHD center hole
open space	fill ex rm	hard,clayey	v. good	57mmD 7mmTH 7mmHD center hole (fig. 7.6:d)
near room	fill ex rm	indetermin	good	60mmD 4mmTH no hole
near room	fill ex rm	hard,bricky	good	22mmD 4mmTH no hole
near room	flr +10cm	indetermin	v. good	30mmD 7mmTH no hole
foundation	fill ex rm	indetermin	v. good	22mmD 5mmTH no hole
near room	flr +10cm	indetermin	v. good	35mmD 12mmTH no hole
near room	fill ex rm	indetermin	good	45mmD 6mmTH no hole
near room	fill ex rm	soft,loose	v. good	50mmD 5mmTH 4mmHD center hole; biconical hole
courtyard	fill ex rm	hard,clayey	v. good	20mmD 12mmTH no hole
isolated wall	pav/pltfrm	bricky	v. good	44mmD 5mmTh no hole
rubble fill	rbble fill	rubble	v. good	center hole
open space	fill ex rm	hard,clayey	v. good	33mmD 9mmTH no hole
near room	fill ex rm	indetermin	good	17mmD 5mmTH no hole
near room	fill ex rm	bricky	good	32mmD 12mmTH center hole
near room	fill ex rm	indetermin	v. good	40mmD 1mmTH no hole
surf	surf wash	surf	poor	24mmD 5mmTH no hole; polished
near room	fill ex rm	bricky	good	33mmD 3mmTH 5mmHD center hole (fig. 7.18:1)
near room	fill ex rm	bricky	v. good	22mmD 10mmTH no hole; polished
room w/out door	fndatn dep		v. good	265mmL 60mmH 30mmW human female (figs. 7.17, 7.25-7.29)
near room	fill ex rm	bricky	good	33mmL 50mmH 20mmW human head (figs. 7.30:c, 7.31, 7.32)
near room	fill ex rm	indetermin	good	35mmL 29mmH 30mmW sheep/goat head
room w/hearth	flr +10cm	indetermin	v. good	180mmL ram head (fig. 7.30:a, 7.33)
near room	fill ex rm	indetermin	fair	226mmL 121mmH ram body (fig. 7.30:b, 7.34)
near room	fill ex rm	sandy,clayey	v. good	unpolshd; rnded rim, flat base; asymmetr profle
near room	fill ex rm	indetermin	poor	unpolshd; rnded rim,flat base; symmetr profle
near room	fill ex rm	bricky	v. good	unpolshd; rnded rim,flat base; asymmetr profle
alley	flr +10cm	organic midden	v. good	120mmRD 40mmH unpolshd; rnded rim,flat base; asymmetr profle (figs. 7.20:a, 7.21)

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
581	P	VIIB.2	C	71	T6	1	2	chlorite	full profile	none	fin,incomp
706	P	N-VA.4	XC	71	T1	6		chlorite	full profile	none	fin,incomp
711	P	N-VII	XC	71	T1	9	41	chlorite	full profile	none	fin,comp
851	P	VA.1	B	73		3		chlorite	full profile	none	fin,incomp
860	T	VA.2	B	73		4	1	chlorite	full profile	none	fin,comp
865	T	VB	B	73		5		chlorite	full profile	none	fin,incomp
896	T	VIIB.2-VIIA	CDE	73		4		chlorite	full profile	incised line	fin,incomp
1049	P	N-VII	XCE	73	T1	12		chlorite	full profile	none	unfin,incom
1057	T	N-VA	XCE	73	T2	7		chlorite	full profile	none	fin,incomp
c005	P	VIB.2	CDE	73		3	18	chlorite	full profile	none	fin,incomp
c007	P	VIB.2-1	CDE	73		3	10	chlorite	full profile	none	fin,incomp
c012	P	VA.1	C	68	T3	2	3	chlorite	full profile	none	fin,comp
2593	T	N-VA.4	XCE	73	T1	4B		limestone	full profile	none	fin,incomp
2586	P	N-VA.2	XCE	73	T1	2		marble	full profile	none	fin,incomp
2545	T	VIB.2	CDE	73		3	18	marble/alabastr	full profile	none	fin,incomp
2536	T	VC	CW	73	T1	6		unidentfd stone	full profile	none	fin,comp
3539	T	after VA.1	C	69		surf	5	unidentfd stone	full profile	use marks	fin,comp
2115	T	VC-IVC	BW	69	T6	4		green stone	hammer stone	none	fin,comp
2155	T	VC	C	69		3		purple stone	hammer stone	none	fin,comp
1963	T	VA.1-IVC	C	68	T6	9		unidentfd stone	hammer stone	none	fin,comp
2143	T	VC-VA	C	69		surf	8	unidentfd stone	hammer stone	none	fin,comp
2150	T	VIA	C	69		1	4	unidentfd stone	hammer stone	none	fin,incomp
2171	P	VC	C	69		7	9-10	unidentfd stone	hammer stone	none	fin,comp
2181	T	VB-VA	C	69	T1	1		unidentfd stone	hammer stone	none	fin,comp
2308	T	VIB.2	C	70	T6	5		unidentfd stone	hammer stone	none	fin,comp
2540	T	VA.1	CDE	73		surf	1	unidentfd stone	hammer stone	none	fin,incomp
2608	T	N-VA	XCE	73	T2	3		unidentfd stone	hammer stone	none	fin,comp
z047	P	VC	D	68		2		unidentfd stone	hammer stone	none	fin,incomp
193	T	indetermin	C	69		surf		chlorite	handle	none	fin,incomp
577	P	VIB.2	C	71	T4	3	2	chlorite	handle	none	fin,incomp
874	T	VIB.1	BW	73	T2	3		chlorite	handle	none	fin,incomp
1047	T	N-VII	XCE	73	T1	11		chlorite	handle	none	fin,incomp
3546	T	VIIB.6-5	E	69	T7	4	1	black stone	handstone	none	fin,incomp
203	T	VIIA	D	69		6		chlorite	handstone	none	fin,comp
2187	P	VIB.1	D	69		4		green stone	handstone	none	fin,incomp
870	T	VB	B	73	T1	1		unidentfd stone	handstone	none	fin,comp
2116	T	indetermin	C	69		surf		unidentfd stone	handstone	none	fin,comp
2121	T	after VA.1	C	69		surf	5	unidentfd stone	handstone	none	fin,comp
2122	T	after VA.1	C	69		surf	5	unidentfd stone	handstone	none	fin,comp
2123	T	after VA.1	C	69		surf	5	unidentfd stone	handstone	none	fin,comp
2124	T	after VA.1	C	69		surf	5	unidentfd stone	handstone	none	fin,comp
2125	T	after VA.1	C	69		surf	5	unidentfd stone	handstone	none	fin,comp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
alley	flr +10cm	organic midden	v. good	105mmBD 60mmH unpolshd; rnded rim,flat base: asymmetr profle (fig. 7.21)
near room	fill ex rm	indetermin	v. good	55mmBD 70mmL 55mmW beaker,flat base
partial room	flr +10cm	indetermin	v. good	140mmRD 60mmH rnded rim + base; asymmetr profle (fig. 7.20:b)
near room	fill ex rm	ash	v. good	unpolshd; sqrd rim,flat base; symmetr profle
open space	on flr		v. good	unpolshd; sqrd rim,flat base; symmetr profle (figs. 7.20:f, 7.24:left)
courtyard	fill ex rm	ash	v. good	58mmBD unpolshd; rnded rim,flat base; symmetr profle (fig. 7.24:right)
near room	fill ex rm	bricky	good	65mmH polshd ext; rnded rim,flat base; asymmetr profle (figs. 7.20:c, 7.22:right)
courtyard	fill ex rm	indetermin	v. good	sqrd rim,flat base
near room	on flr		good	225mmRD 85mmH sqrd rim, flat base; symmetr profle
rubble fill	rbble fill	rubble	v. good	130mmBD 150mmRD 40mmH unpolshd; rnded rim,flat base; asymmetr profle
room with door	on flr		v. good	unpolshd;rnded rim,flat base; asymmetr profle
wall	w/in wall	brick	good	65mmBD 65mmRD unpolshd; pointed rim,flat base; symmetr profle
near room	fill ex rm	bricky	v. good	80mmH rnded rim,flat base; symmetr profle
foundation	fill ex rm	indetermin	v. good	symmetr profle (fig. 7.23:g)
rubble fill	rbble fill	rubble	v. good	80mmH rnded rim,flat base; symmetr prfle
paving/platform	pav/pltfrm	bricky	v. good	75mmRD sqrd rim,flat base
intrusive pit	unshpd pit	soft,loose	poor	80mmRD 60mmBD 48mmH unpolshd; rnded rim + base; symmetr profle; rd ochre trace
near room	fill ex rm	indetermin	fair	160mmL 65mmD
paving/platform	pav/pltfrm	bricky	v. good	140mmL 35mmD
near room	fill ex rm	bricky	good	175mmL 70mmD
rubble fill	rbble fill	rubble	poor	
rubble fill	rbble fill	rubble	v. good	45mmD
room w/hearth	fill in rm	bricky	v. good	180mmL 40mmD (e.g., fig. 7.14)
near room	fill ex rm	indetermin	fair	
near room	fill ex rm	bricky	v. good	105mmL 40mmD red ochre residue
kiln	in kiln	burned earth	v. good	50mmD
near room	fill ex rm	indetermin	good	67mmL 22mmD
room with door	fill in rm	bricky	v. good	92mmL 16mmD
surf	surf wash	surf	poor	simple loop handle; circular cross-section
rubble fill	rbble fill	rubble	v. good	simple loop handle; circular cross-section
near room	fill ex rm	bricky	v. good	simple loop handle; circular cross-section
near room	fill ex rm	indetermin	v. good	simple loop handle; circular cross-section (fig. 7.22:left)
room with door	flr +10cm	soft,bricky	good	
near room	fill ex rm	indetermin	v. good	55mmL 50mmW 10mmTH
near room	on flr		v. good	
courtyard	on flr		v. good	60mmL 55mmW 23mmTH
surf	surf wash	surf	poor	
intrusive pit	unshpd pit	soft,loose	poor	
intrusive pit	unshpd pit	soft,loose	poor	
intrusive pit	unshpd pit	soft,loose	poor	
intrusive pit	unshpd pit	soft,loose	poor	
intrusive pit	unshpd pit	soft,loose	poor	

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
2133	T	VC-VA	C	69		surf	8	unidentfd stone	handstone	none	fin,comp
2134	T	VC-VA	C	69		surf	8	unidentfd stone	handstone	none	fin,comp
2136	T	VC-VA	C	69		surf	8	unidentfd stone	handstone	none	fin,comp
2137	T	VC-VA	C	69		surf	8	unidentfd stone	handstone	none	fin,comp
2138	T	VC-VA	C	69		surf	8	unidentfd stone	handstone	none	fin,comp
2139	T	VC-VA	C	69		surf	8	unidentfd stone	handstone	none	fin,comp
2140	T	VC-VA	C	69		surf	8	unidentfd stone	handstone	none	fin,comp
2141	T	VC-VA	C	69		surf	8	unidentfd stone	handstone	none	fin,comp
2142	T	VC-VA	C	69		surf	8	unidentfd stone	handstone	none	fin,comp
2146	T	VC-VA	C	69		surf	8	unidentfd stone	handstone	none	fin,comp
2147	T	VB	C	69		1	2-3	unidentfd stone	handstone	none	fin,comp
2148	T	VB	C	69		1	2-3	unidentfd stone	handstone	none	fin,comp
2149	T	VB	C	69		1	2-3	unidentfd stone	handstone	none	fin,comp
2156	T	VC	C	69		3		unidentfd stone	handstone	none	fin,comp
2157	T	VC	C	69		3		unidentfd stone	handstone	none	fin,comp
2165	T	VC	C	69		7	9	unidentfd stone	handstone	none	fin,comp
2166	T	VC	C	69		7	9-10	unidentfd stone	handstone	none	fin,comp
2167	T	VC	C	69		7	9-10	unidentfd stone	handstone	none	fin,comp
2168	T	VC	C	69		7	9-10	unidentfd stone	handstone	none	fin,comp
2169	T	VC	C	69		7	9-10	unidentfd stone	handstone	none	fin,comp
2173	T	VB-VA	C	69	T1	1		unidentfd stone	handstone	none	fin,comp
2174	T	VB-VA	C	69	T1	1		unidentfd stone	handstone	none	fin,comp
2175	T	VB-VA	C	69	T1	1		unidentfd stone	handstone	none	fin,comp
2176	T	VB-VA	C	69	T1	1		unidentfd stone	handstone	none	fin,comp
2177	T	VB-VA	C	69	T1	1		unidentfd stone	handstone	none	fin,comp
2178	T	VB-VA	C	69	T1	1		unidentfd stone	handstone	none	fin,comp
2179	T	VB-VA	C	69	T1	1		unidentfd stone	handstone	none	fin,comp
2180	T	VB-VA	C	69	T1	1		unidentfd stone	handstone	none	fin,comp
2184	T	VIA	C	69	T3	1	1	unidentfd stone	handstone	none	fin,incomp
2193	T	VIIB.2	E	68	T2	3	1	unidentfd stone	handstone	none	fin,comp
2194	T	VIIB.6	E	69	T3	11		unidentfd stone	handstone	none	fin,comp
2307	T	VIB.2	C	70	T6	5		unidentfd stone	handstone	none	fin,incomp
3549	T	VIIB.5-3	D	68		6	8	unidentfd stone	handstone	none	fin,comp
197	P	VIA	C	69	T3	1	6	black stone	indetermin	none	fin,incomp
2527	P	VIIC.2	C	73	T1	9		black stone	indetermin	none	fin,incomp
3007	P	VIIB.2-VIIA	CDE	73		4		carnelian	indetermin	none	unfin,comp
411	P	VIID	C	70	T5	7		chlorite	indetermin	none	fin,comp
414	P	VIIC	C	70	T6	4		chlorite	indetermin	none	unfin,comp
415	P	VIIC	C	70	T6	4		chlorite	indetermin	none	unfin,comp
417	P	VIIC	C	70	T6	4		chlorite	indetermin	none	unfin,comp
419	T	VIIA	C	70	T6	6		chlorite	indetermin	incised line	fin,incomp
464	T	N-VA.2	XC	70	T1	7-1		chlorite	indetermin	none	fin,incomp
1023	T	N-VA.1	XBE	73	T2	13		chlorite	indetermin	none	fin,comp
1045	P	N-VA.4	XCE	73	T1	6		chlorite	indetermin	none	fin,incomp
c003	P	VIIB.4	CDE	73	T2	5		chlorite	indetermin	use marks	fin,incomp
2114	T	VC-IVC	BW	69	T6	4		gray stone	indetermin	none	fin,incomp
23	P	VIB.1	D	68	T2	5		green stone	indetermin	none	fin,comp
725	T	N-VA.1	XCE	71		14	33	green stone	indetermin	none	fin,comp
2172	P	VIB.1	C	69		7A		green stone	indetermin	none	unfin,comp
2290	T	VIIA-VIA	C	70		1		green stone	indetermin	none	unfin,comp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
rubble fill	rbble fill	rubble	poor	
rubble fill	rbble fill	rubble	poor	
rubble fill	rbble fill	rubble	poor	
rubble fill	rbble fill	rubble	poor	
rubble fill	rbble fill	rubble	poor	
rubble fill	rbble fill	rubble	poor	
rubble fill	rbble fill	rubble	poor	
rubble fill	rbble fill	rubble	poor	
rubble fill	rbble fill	rubble	poor	
rubble fill	rbble fill	rubble	poor	
room w/feature	on flr		v. good	
room w/feature	flr +10cm	bricky	v. good	
room w/feature	flr +10cm	bricky	v. good	
paving/platform	pav/pltfrm	bricky	v. good	(e.g., fig. 7.14)
paving/platform	pav/pltfrm	bricky	v. good	(e.g., fig. 7.14)
room w/hearth	on flr		v. good	(e.g., fig. 7.14)
room w/hearth	fill in rm	bricky	v. good	(e.g., fig. 7.14)
room w/hearth	fill in rm	bricky	v. good	(e.g., fig. 7.14)
room w/hearth	fill in rm	bricky	v. good	(e.g., fig. 7.14)
room w/hearth	fill in rm	bricky	v. good	(e.g., fig. 7.14)
near room	fill ex rm	indetermin	fair	
near room	fill ex rm	indetermin	fair	
near room	fill ex rm	indetermin	fair	
near room	fill ex rm	indetermin	fair	
near room	fill ex rm	indetermin	fair	
near room	fill ex rm	indetermin	fair	
near room	fill ex rm	indetermin	fair	
near room	fill ex rm	indetermin	fair	
rubble fill	rbble fill	rubble	v. good	
near room	fill ex rm	indetermin	v. good	94mmL 72mmW 62mmTH surface deposit of red ochre
near room	fill ex rm	hard,clayey	v. good	110mmL 70mmW 43mmTH
near room	fill ex rm	bricky	v. good	80mmW 12mmTH surface deposit of red ochre
near room	fill ex rm	sandy,clayey	v. good	38mmL surface deposit of red ochre
rubble fill	rbble fill	rubble	v. good	100mmL 70mmW 13mmTH polished
near room	fill ex rm	bricky	v. good	polished
near room	fill ex rm	bricky	good	14mmL 8mmW 6mmTH bead blank?
open space	fill ex rm	hard,clayey	v. good	12mmL 10mmW
open space	fill ex rm	hard,clayey	v. good	9mmL 5mmW
open space	fill ex rm	hard,clayey	v. good	17mmL 9mmW 20mmTH
open space	fill ex rm	hard,clayey	v. good	11mmL 11mmW 4mmTH
courtyard	fill ex rm	bricky	v. good	28mmL 22mmW 3mm TH
near room	fill ex rm	indetermin	v. good	66mmL 33mmW
near room	fill ex rm	soft,loose	v. good	163mmL 57mmW 24mmTH polished
near room	fill ex rm	indetermin	v. good	70mmL 28mmW 13mmTH
partial room	fill in rm	bricky	v. good	65mmL 40mmW shaft straightener?
near room	fill ex rm	indetermin	fair	21mmL
near room	fill ex rm	hard,clayey	v. good	70mmL 60mmW 25mmTH
near room	on flr		v. good	140mmL 95mmW polished
near room	fill ex rm	indetermin	v. good	12mmL 8mmW 5mmTH
near room	fill ex rm	bricky	good	14mmL 11mmW 3mmTH polished

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
2300	T	VIB.2	C	70	T5	3		green stone	indetermin	none	unfin,comp
2406	T	VB	B	71		23		green stone	indetermin	none	unfin,comp
3535	T	VIB.2	D	69		5		green stone	indetermin	none	unfin,incomp
2975	T	VIB.2	C	71	T3	2		serpentine	indetermin	none	unfin,comp
3538	P	VIIC-VIIB.3	C	73		6-9		serpentine	indetermin	none	unfin,comp
8537	T	VA.2	B	73		4		serpentine	indetermin	none	unfin,comp
2549	P	VIIB.5-3	D	73		7	42	slate	indetermin	use marks	fin,incomp
198	P	indetermin	D	69		surf		unidentfd stone	indetermin	incised line	fin,comp
894	T	VIB.2	CDE	73		3	18	unidentfd stone	indetermin	none	fin,comp
1965	T	VC	D	68		t2		unidentfd stone	indetermin	none	fin,comp
1971	T	VC	D	68		t2		unidentfd stone	indetermin	none	fin,comp
1972	T	VC	D	68		t2		unidentfd stone	indetermin	none	fin,comp
2289	T	after VA.1	C	70		surf	1	unidentfd stone	indetermin	none	unfin,comp
2293	P	VIA	C	70		1	1	unidentfd stone	indetermin	none	unfin,incomp
2294	T	VIA	C	70		1	1	unidentfd stone	indetermin	none	unfin,incomp
2302	P	VIID	C	70	T5	7		unidentfd stone	indetermin	none	unfin,incomp
2303	P	VIIB.6-1	C	70	T6	1		unidentfd stone	indetermin	none	unfin,comp
2548	T	VIIB.5-3	D	73		7	42	unidentfd stone	indetermin	none	fin,comp
3536	P	VA.1	B	73		3		unidentfd stone	indetermin	none	fin,comp
16	P	VIA	D	68		3		chlorite	labret	none	fin,comp
413	T	VIIC.2-1	C	70	T6	3		chlorite	labret	none	fin,incomp
2311	P	VIIA	C	70	T7	5	1	marble	labret	none	fin,comp
2459	P	N-VB,N-VII	XC	71		8A	32	marble	labret	none	fin,comp
1976	P	VIA	D	68		4	1	unidentfd stone	labret	none	fin,comp
2186	P	indetermin	D	69		surf		unidentfd stone	labret	none	fin,comp
2591	T	N-VA.2	XCE	73	T1	2		marble	mortar	none	fin,incomp
2120	T	indetermin	C	69		surf		unidentfd stone	mortar	none	fin,incomp
2144	T	VC-VA	C	69		surf	8	unidentfd stone	mortar	none	fin,comp
2152	T	VC	C	69		3		unidentfd stone	mortar	none	fin,comp
2153	T	VC	C	69		3		unidentfd stone	mortar	none	fin,comp
2154	T	VC	C	69		3		unidentfd stone	mortar	none	fin,comp
2158	T	VC	C	69		7		unidentfd stone	mortar	none	fin,incomp
2161	T	VIB.1	C	69		7		unidentfd stone	mortar	none	fin,incomp
2162	T	VIB.1	C	69		7		unidentfd stone	mortar	none	fin,incomp
2163	T	VIB.1	C	69		7		unidentfd stone	mortar	none	fin,incomp
2164	T	VC	C	69		7	4	unidentfd stone	mortar	none	fin,comp
2170	T	VC	C	69		7	9-10	unidentfd stone	mortar	none	fin,incomp
2182	T	VB-VA	C	69	T1	1		unidentfd stone	mortar	none	fin,comp
2183	T	VB-VA	C	69	T1	1		unidentfd stone	mortar	none	fin,comp
2546	T	VIB.2	CDE	73		3	18	unidentfd stone	mortar	none	fin,incomp
2547	T	VIIB.2	D	73		6	41	unidentfd stone	mortar	none	fin,incomp
2915	T	VC	C	69		7	11	turquoise	necklace	none	fin,comp
2117	T	indetermin	C	69		surf		obsidian	obsidian tool	none	fin,comp
2151	T	VB	C	69		1	7	obsidian	obsidian tool	none	fin,comp
2435	T	VIIA	C	71	T3	3	4	obsidian	obsidian tool	none	fin,comp
2473	T	N-VA.1	XCE	71	T1	14	35	obsidian	obsidian tool	none	fin,incomp
2512	T	VA.2	B	73		4	2	obsidian	obsidian tool	none	fin,comp
2514	T	VB	B	73		5		obsidian	obsidian tool	none	fin,comp
2522	T	VIIB.6-3	C	73	T1	6		obsidian	obsidian tool	none	fin,incomp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
near room	fill ex rm	bricky	v. good	13mmL 10mmW polished
courtyard	fill ex rm	soft,loose	v. good	24mmL 22mmW 18mmTH
near room	fill ex rm	sandy,bricky	v. good	45mmL
near room	fill ex rm	ash	v. good	12mmL 7mmW
near room	fill ex rm	hard,bricky	good	47mmL 15mmW 3mmTH
open space	fill ex rm	soft,loose	v. good	30mmL 20mmW
near room	fill ex rm	ash	good	29mmW 2mmTH
surf	surf wash	surf	poor	22mmL 22mmW 3mmTH seal?
rubble fill	rbble fill	rubble	v. good	80mmL 65mmW
near room	fill ex rm	bricky	good	
near room	fill ex rm	bricky	good	230mmL 130mmW 40mmTH
near room	fill ex rm	bricky	good	260mmL 130mmW 50mmTH
intrusive pit	unshpd pit	soft,loose	poor	46mmL 11mmW
rubble fill	rbble fill	rubble	v. good	polished
rubble fill	rbble fill	rubble	v. good	polished
open space	fill ex rm	hard,clayey	v. good	62mmL 15mmW polished
near room	fill ex rm	hard,clayey	good	52mmL 39mmW 17mmTH polished, traces of red ochre
near room	fill ex rm	ash	good	81mmL 46mmL 40mmTH polished, traces of red ochre
near room	fill ex rm	ash	v. good	103mmL 37mmW 45mmTH
rubble fill	rbble fill	rubble	poor	35mmD 20mmTH
near room	fill ex rm	hard,clayey	good	30mmD 17mmTH (fig. 7.6:a)
near room	on flr		v. good	53mmD 20mmTH (figs. 7.7:left, 7.10:b)
courtyard	fill in rm	indetermin	good	50mmD 29mmTH (fig. 7.10:c)
rubble fill	rbble fill	rubble	v. good	30mmD 15mmTH (fig. 7.10:a)
surf	surf wash	surf	poor	25mmD 17mmTH (fig. 7.10:d)
foundation	fill ex rm	indetermin	v. good	55mmTH red ochre residue; flat working surface
surf	surf wash	surf	poor	
rubble fill	rbble fill	rubble	poor	
paving/platform	pav/pltfrm	bricky	v. good	(e.g., fig. 7.14)
paving/platform	pav/pltfrm	bricky	v. good	(e.g., fig. 7.14)
paving/platform	pav/pltfrm	bricky	v. good	red ochre residue (e.g., fig. 7.14)
near room	fill ex rm	bricky	v. good	red ochre residue (e.g., fig. 7.14)
near room	fill ex rm	bricky	v. good	(e.g., fig. 7.14)
near room	fill ex rm	bricky	v. good	(e.g., fig. 7.14)
near room	fill ex rm	bricky	v. good	(e.g., fig. 7.14)
partial room	on flr		v. good	flat working surface
room w/hearth	fill in rm	bricky	v. good	
near room	fill ex rm	indetermin	fair	
near room	fill ex rm	indetermin	fair	red ochre residue
rubble fill	rbble fill	rubble	v. good	20mmTH concave working surface
paving/platform	pav/pltfrm	bricky	v. good	3mmTH red ochre residue; concave working surface
near room	flr +10cm	bricky	v. good	64 beads(turquoise) Shapes: cylindrcl(3), droplet-shaped(20) (figs. 7.4, 7.9:a)
surf	surf wash	surf	poor	backed blade 29mmL 6mmW
room w/hearth	on flr		v. good	backed blade 42mmL 12mmW
room w/out door	flr +10cm?	bricky	v. good	backed blade 24mmL 9mmW
near room	fill ex rm	indetermin	v. good	backed blade 18mmL 7mmW
open space	w/in flr		v. good	backed blade 19mmL 8mmW
courtyard	fill ex rm	soft,loose	v. good	possible awl 23mmL 19mmW
near room	fill ex rm	ash	good	projectile point 17mmL 12mmW (fig. 7.19:f)

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
2537	T	IVC	CW	73	T1	8		obsidian	obsidian tool	none	fin,incomp
2609	T	N-VA	XCE	73	T2	3		obsidian	obsidian tool	none	fin,incomp
3324	T	after VA.1	C	69		surf	5	obsidian	obsidian tool	none	debitage
3328	T	VIA	C	70		2		obsidian	obsidian tool	none	debitage
3339	T	VB	B	73		5		obsidian	obsidian tool	none	debitage
3548	T	VC	C	69		7	13	obsidian	obsidian tool	none	fin,incomp
1978	P	VIIB.4	D	68		5A		ochre stone	ochre stone	none	fin,comp
3453	T	VIIC.1	D	69	T1	11		ochre stone	ochre stone	none	fin,comp
3456	T	VIIB.6	E	68	T1	3	1	ochre stone	ochre stone	none	fin,comp
3457	T	VIIB.6	E	68	T1	3	1	ochre stone	ochre stone	none	fin,comp
3458	T	VIIB.6	E	68	T1	3	1	ochre stone	ochre stone	none	fin,comp
3459	T	virgin soil	E	69	T2	6		ochre stone	ochre stone	none	fin,comp
3463	T	VIIB.6-5	E	69	T7	4	1	ochre stone	ochre stone	none	fin,comp
3495	P	VIID	C	71	T1	1		ochre stone	ochre stone	none	fin,comp
3496	P	VIIA	C	71	T2	1		ochre stone	ochre stone	none	fin,comp
3497	P	VIIA	C	71	T2	1		ochre stone	ochre stone	none	fin,comp
3499	T	N-VA	XC	71	T1	3		ochre stone	ochre stone	none	fin,comp
3501	P	N-VII	XD	71		1	43	ochre stone	ochre stone	none	fin,comp
3519	T	VIIB.2	C	73		1	1-2	ochre stone	ochre stone	none	fin,comp
3521	T	N-VA	XCE	73	T2	3		ochre stone	ochre stone	none	fin,comp
2668	P	VIIB.2-VIIA	CDE	73		4		ochre stone	ochre stone	none	fin,comp
2920	T	VIIB.3	D	69		7	2	agate	pendant	none	fin,incomp
2956	T	VIIA	C	70	T7	4		agate	pendant	none	fin,comp
2991	T	VA.1	B	73		2		agate	pendant	none	fin,comp
2516	T	VB	B	73		5	1	br-purple stone	pendant	none	fin,comp
579	T	VIIA	C	71	T5	1	1	chlorite	pendant	none	fin,comp
573	T	VIB.2	C	71	T3	2		reused chlorite	pendant	none	fin,comp
3027	T	N-VA	XCE	73	T2	3		turquoise	pendant	none	fin,comp
200	P	VIA	D	69		3	7	chlorite	rim sherd	none	fin,incomp
202	T	VIB.2	D	69		5	2	chlorite	rim sherd	none	fin,incomp
206	P	VIIB.6	D	69		9	12	chlorite	rim sherd	none	fin,incomp,
207	P	VIB.2	D	69	T2	8		chlorite	rim sherd	none	fin,incomp
208	P	VIB.2	D	69	T2	8		chlorite	rim sherd	none	fin,incomp
403	P	VIB.1	C	70		3	1	chlorite	rim sherd	incised line	fin,incomp,
572	T	VIB.2	C	71	T3	2		chlorite	rim sherd	none	fin,incomp
709	P	N-VB	XC	71	T1	6A		chlorite	rim sherd	none	fin,incomp
710	P	N-VB	XC	71	T1	7		chlorite	rim sherd	none	fin,incomp
713	P	N-VA.4	XC	71	T2	6		chlorite	rim sherd	none	fin,incomp
718	T	N-VII,VB	XC	71	T2	8C	34A	chlorite	rim sherd	none	fin,incomp
856	P	VA.2	B	73		4		chlorite	rim sherd	none	fin,incomp
857	P	VA.2	B	73		4		chlorite	rim sherd	none	fin,incomp
859	T	VA.2	B	73		4		chlorite	rim sherd	none	fin,incomp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
near room	fill ex rm	soft,loose	poor	flake 15mmL 8mmW
near room	fill ex rm	indetermin	good	backed blade 8mmL 8mmW
intrusive pit	unshpd pit	soft,loose	poor	flake
leveling fill	infilling	indetermin	v. good	flake 31mmL 27mmW
courtyard	fill ex rm	soft,loose	v. good	flake 22mL 13mmW
room with door	on flr		v. good	backed blade 33mmL 20mmW
near room	fill ex rm	sandy	v. good	green ochre
open space	fill ex rm	sandy,ashy	v. good	red ochre
wall	fill ex rm	brick	v. good	red ochre
wall	fill ex rm	brick	v. good	red ochre
wall	fill ex rm	brick	v. good	red ochre
virgin soil	virgn soil	virgin soil	v. good	red ochre
room with door	w/in flr		good	yellow ochre
open space	fill ex rm	hard,clayey	v. good	red ochre
near room	fill ex rm	bricky	v. good	red ochre
near room	fill ex rm	bricky	v. good	red ochre
near room	fill ex rm	indetermin	good	blue ochre
courtyard	flr +10cm?	indetermin	v. good	red ochre
near room	on flr		v. good	red ochre
near room	fill ex rm	indetermin	good	yellow ochre
near room	fill ex rm	bricky	good	red ochre
possible room	fill ex rm	lamintd lenses	v. good	indetermin; biconical hole
near room	fill ex rm	bricky	v. good	39mmL 25mmW 13mmTH 5mmHD droplet-shaped; biconical hole (fig. 7.7:right)
near room	fill ex rm	ash	v. good	25mmL 19mmW 6mmTH 1mmHD droplet-shaped; biconical hole
courtyard	on flr		v. good	48mmL 19mmW 2mmHD inverted droplet-shaped(hole at wide end); biconical hole
isolated wall	pav/pltfrm	bricky	v. good	24mmL 14mmW 2mmTH droplet-shaped
near room	depression	ash	v. good	34mmL 14mmW 8mmTH notched,droplet-shaped; polshd
near room	fill ex rm	indetermin	good	55mmL 24mmW 7mmTH irregular shape
rubble fill	rbble fill	rubble	v. good	45mmL 10mmTH unpolshd; symmetr profle; rnded rim
rubble fill	rbble fill	rubble	v. good	unpolshd; symmetr profle; rnded rim
room with door	flr +10cm	sandy,ashy	v. good	30mmL 25mmW 4mmTH symmetr profle; inverted,rnded rim
near room	depression	ash	v. good	55mmL 5mmTH unpolshed; symmetr profle; rnded rim
near room	depression	ash	v. good	30mmL 10mmTH unpolshd; indetermin; rnded rim
rubble fill	rbble fill	rubble	v. good	11mmL 20mmTH unpolshd; asymmetr profle; rnded rim; 2 drilled holes
near room	depression	ash	v. good	30mmL 30mmW 10mmTH unpolshd; indetermin; rnded rim
near room	w/in flr	soft,bricky	unclear	90mmRD 90mmL 5mmTH symmetr profle
near room	fill ex rm	indetermin	v. good	51mmL 13mmW 4mmTH symmetr profle; rnded rim
near room	fill ex rm	indetermin	v. good	50mmL 35mmW 6mmTH symmetr profle; rnded rim
partial room	fill in rm	indetermin	good	50mmL 44mmW 6mmTH symmetr profle; rnded rim
open space	fill ex rm	soft,loose	v. good	40mmL 35mmW 6mmTH unpolshd; symmetr profle; rnded rim
open space	fill ex rm	soft,loose	v. good	43mmL 35mmW 7mmTH unpolshd; symmetr profle; rnded rim
open space	fill ex rm	soft,loose	v. good	70mmL 45mmW 10mmTH unpolshd; symmetr profle; rnded rim (fig. 7.20:d)

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
869	P	VB	B	73		6	4	chlorite	rim sherd	none	fin,incomp
871	P	VC	B	73	T1	3		chlorite	rim sherd	none	fin,incomp
872	P	VIIA	B	73	T1	3	5	chlorite	rim sherd	none	fin,incomp
877	P	VIIC.2	C	73		9		chlorite	rim sherd	none	fin,incomp
895	T	VIB.2	CDE	73		3	18	chlorite	rim sherd	none	fin,incomp
897	P	VIIB.2-VIIA	CDE	73		4		chlorite	rim sherd	none	fin,incomp
1025	P	N-VII	XC	73		3		chlorite	rim sherd	none	fin,incomp
1027	P	N-VII	XC	73		3	3A	chlorite	rim sherd	none	fin,incomp
1037	P	N-VA.2	XCE	73	T1	2		chlorite	rim sherd	none	fin,incomp
1038	P	N-VA.3	XCE	73	T1	4		chlorite	rim sherd	none	fin,incomp
1051	T	N-VA	XCE	73	T2	3		chlorite	rim sherd	none	fin,incomp
1058	P	N-VA	XCE	73	T2	10		chlorite	rim sherd	none	fin,incomp
2328	P	N-VII	XD	70	T1	3	1	chlorite	rim sherd	incised line	fin,incomp
c014	P	indetermin	XD	70	T1	2-4		chlorite	rim sherd	none	fin,incomp
2595	T	N-VA.4	XCE	73	T1	6		dist limestone	rim sherd	none	fin,incomp
2192	T	VIIB.6-1	E	69	T7	1		limestone	rim sherd	none	fin,incomp
2598	T	N-VA.4	XCE	73	T1	6		limestone	rim sherd	none	fin,incomp
3843	P	N-VA.2	XCE	73	T2	1		limestone	rim sherd	none	fin,incomp
1968	P	VA.1	C	68	T7	1		marble	rim sherd	none	fin,incomp
2189	P	VIA	D	69	T2	3		marble	rim sherd	none	fin,incomp
2437	P	VIIA	C	71	T4	4	2	marble	rim sherd	none	fin,incomp
2467	T	N-VA.2	XCE	71		15	46	marble	rim sherd	none	fin,incomp
2584	T	N-VA.2	XCE	73	T1	1	1	marble	rim sherd	none	fin,incomp
2585	T	N-VA.2	XCE	73	T1	2		marble	rim sherd	none	fin,incomp
2310	P	VIIA	C	70	T7	4		marble/alabastr	rim sherd	none	fin,incomp,r
2324	P	N-VA.2	XC	70	T1	7-1		marble/alabastr	rim sherd	none	fin,incomp
2563	P	N-VA.4	XC	71	T1	6		marble/alabastr	rim sherd	none	fin,incomp
892	P	after VA.1	CDE	73		surf	7	unidentfd stone	rim sherd	none	fin,incomp
19	P	VIIB.4	D	68		6	7	chlorite	shft strghtnr	carvd channl	fin,comp
20	T	VIIB.4	D	68		6	7	chlorite	shft strghtnr	carvd channl	fin,comp
195	P	VC	C	69		7	8	chlorite	shft strghtnr	carvd channl	fin,comp
471	P	N-VII,VB	XD	70	T2	3		chlorite	shft strghtnr	carvd channl	fin,incomp
889	P	VB-IVC	CW	73	T1	5	2	chlorite	shft strghtnr	carvd channl	fin,comp
891	P	VA.1	CDE	73		surf	1	chlorite	shft strghtnr	carvd channl	fin,comp
1953	T	indetermin	surf	68				chlorite	shft strghtnr	carvd channl	fin,comp
c004	P	VIB.2-1	CDE	73		2	20	chlorite	shft strghtnr	carvd channl	fin,comp
c017	P	VIID	C	70	T6	4		chlorite	shft strghtnr	carvd channl	fin,incomp
421	P	VIIA	C	70	T6	6		serpentine	shft strghtnr	carvd channl	fin,incomp
18	T	VIIB.4	D	68		6	7	unidentfd stone	shft strghtnr	carvd channl	fin,comp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
courtyard	on flr		v. good	34mmL 10mmW 3mmTH polshd int; symmetr profle; everted,flat rim
near room	fill ex rm	bricky	v. good	45mmL 40mmW 15mmTH unpolshd; symmetr profle; rnded rim
near room	flr +10cm	organic midden	v. good	46mmL 13mmW 6mmTH unpolshd; symmetr profle; rnded rim
near room	fill ex rm	bricky	v. good	25mmW 10TH polshd ext + int; indetermin; rnded rim
rubble fill	rbble fill	rubble	v. good	60mmL 30mmW 10mmTH unpolshd; indetermin; rnded rim
near room	fill ex rm	bricky	good	unpolshd; asymmetr profle
near room	fill ex rm	indetermin	v. good	22mmL 18mmW rnded rim
near room	fill ex rm	indetermin	v. good	32mmL 27mmW 15mmTH unpolshd; asymmetr profle; rnded rim
foundation	fill ex rm	indetermin	v. good	23mmL 18mmW 4mmTH symmetr profle
near room	fill ex rm	bricky	v. good	70mmL 11mmW 5mmTH symmetr profle; rnded rim
near room	fill ex rm	indetermin	good	40mmL 20mmW symmetr profle; rnded rim
near room	fill ex rm	bricky	good	17mmL 15mmW 5mmTH symmetr profle
near room	fill ex rm	indetermin	poor	25mmL 16mmW asymmetr profle; rnded rim
near room	fill ex rm	indetermin	poor	146mmL 80mmW 12mmTH unpolshd; symmetr profle; flat rim
near room	fill ex rm	indetermin	v. good	50mmL 45mmW 6mmTH symmetr profle
near room	fill ex rm	soft,loose	good	90mmL 26mmTH unpolshd; symmetr profle; rnded rim
near room	fill ex rm	indetermin	v. good	115mmL 105mmW 8mmTH symmetr profle; rnded rim
near room	fill ex rm	indetermin	v. good	75mmL 60mmW 3mmTH unpolshd; symmetr profle; pointed rim (fig. 7.23:a)
near room	fill ex rm	indetermin	v. good	75mmL 10mmTH symmetr profle; rnded rim
rubble fill	rbble fill	rubble	v. good	40mmL 25mmW 5mmTH symmetr profle; sqrd rim
room w/out door	flr +10cm?	bricky	v. good	60mmRD 20mmL 3mmTH symmetr profle
near room	on flr		v. good	74mmL 30mmW 10mmTH polshd ext; symmetr profle
room with door	w/in flr		v. good	33mmL 32mmW 4mmTH symmetr profle; rnded rim (fig. 7.23:b)
foundation	fill ex rm	indetermin	v. good	26mmL 22mmW symmetr profle; rnded rim
near room	fill ex rm	bricky	v. good	80mmL 68mmW 11mmTH symmetr profle; rnded rim
near room	fill ex rm	indetermin	v. good	25mmL 20mmW 2mmTH symmetr profle; pointed rim
near room	fill ex rm	indetermin	v. good	45mmL 22mmW 8mmTH polshd ext+int; symmetr profle; rnded rim
intrusive pit	unshpd pit	soft,loose	poor	90mmL 46mmW 12mmTH unpolshd; symmetr profle; rnded rim
room w/out door	fndatn dep		v. good	50mmL 25mmW 10mmTH 12mmCW (figs. 7.16, 7.17)
room w/out door	fndatn dep		v. good	70mmL 30mmW 25mmTH 12.6mmCW (fig. 7.15:b)
room with door	flr +10cm	bricky	v. good	74mmL 40mmW 10mmCW (fig. 7.15:a)
near room	fill ex rm	soft,loose	poor	75mmL 27mmW 30mmTH
near room	fill ex rm	ash	good	80mmL 30mmW 28mmTH 9mmCW
kiln	in kiln	burned earth	v. good	50mmL 30mmW 13mmTH 10mmCW
surf	surf wash	surf	poor	65mmL 43mmW 25mmTH 15mmCW
retaining wall	w/in wall	brick	v. good	60mmL 33mmW 11mmTH 11mmCW
open space	fill ex rm	hard,clayey	v. good	72mmL 28mmW 23mmTH 11mmCW
courtyard	fill ex rm	bricky	v. good	38mmW 5mmTH 4mmCW
room w/out door	fndatn dep		v. good	70mmL 30mmW 10mmTH 15mmCW (figs. 7.16, 7.17)

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
22	P	VIA	D	68		T3	1	unidentfd stone	shft strghtnr	carvd channl	fin,incom
194	T	VC	C	69		3		unidentfd stone	shft strghtnr	carvd channl	fin,comp
408	P	VIIC.2-1	C	70	T5	6		unidentfd stone	shft strghtnr	carvd channl	fin,incom
472	P	indetermin	XD	70	T2	3		chlorite	spindle whorl	incised line	fin,comp
893	T	after VA.1	CDE	73		surf	7	chlorite	stamp seal	carvd relief	fin,comp
1053	T	N-VA	XCE	73	T2	5		chlorite	weight	none	fin,comp
2119	T	indetermin	C	69		surf		unidentfd stone	weight	none	fin,comp
2517	P	VB	B	73		6	2	gray stone	whetstone	none	fin,incomp
201	P	VIB.1	D	69		4		green stone	whetstone	use marks	fin,incomp
2145	T	VC-VA	C	69		surf	8	unidentfd stone	whetstone	none	fin,comp
2405	T	VB	B	71		23		unidentfd stone	whetstone	none	fin,comp
2422	P	VC-IVC	BW	71		10		unidentfd stone	whetstone	none	fin,incomp
2510	T	VA.2	B	73		4		unidentfd stone	whetstone	none	fin,comp
3334	T	VIIB.2	C	71	T7	2		unidentfd stone	whetstone	none	fin,comp
3518	T	VIIB.2	C	73		1	1	unidentfd stone	whetstone	none	fin,incomp
BONE											
1347	T	VIIB.6-1	C	70	T5	2		worked bone	2 hole object	none	fin,incomp
1362	T	VIIB.2	C	71	T6	1	1	worked tooth	2 hole object	incised line	fin,comp
1337	T	VIIB.2	D	69		7		worked bone	awl	none	fin,comp
1339	T	VIB.2	D	69	T2	8		worked bone	awl	none	fin,comp
1350	P	VIIA	C	70	T7	1		worked bone	awl	none	fin,incomp
1356	T	VIID	C	71	T1	1		worked bone	awl	none	fin,comp
1357	T	VIID	C	71	T1	1		worked bone	awl	none	fin,incomp
1380	T	VIB.2	CDE	73		3	18	worked bone	awl	none	fin,incomp
1381	P	VIIB.2-VIIA	CDE	73		4		worked bone	awl	none	fin,incomp
1383	T	VIIB.4	CDE	73	T2	5		worked bone	awl	none	fin,incomp
1702	T	VIIB.5-3	D	73		7	37	bone or shell	bead	none	fin,comp
2896	T	VB	B	73		5		bone or shell	bead	none	fin,comp
1319	T	VIA	D	68		T3	1	worked bone	bead	none	fin,comp
1348	T	VIIA	C	70	T5	5	1	worked bone	bead	none	fin,comp
1360	T	VIIA	C	71	T2	1		worked bone?	bead	none	fin,comp
1374	T	VIIB.2	C	73		1		worked bone?	bead	none	fin,comp
1382	T	VIIB.2-VIIA	CDE	73		4		worked bone	bead	none	fin,comp
3291	T	N-VB	XC	71	T1	7B		worked bone	bead	none	fin,comp
3834	T	N-VB	XC	71	T1	7B	23	worked bone	bead	none	fin,comp
1373	P	VB	B	73		5	1	worked tooth	bead	none	fin,comp
1320	T	VIIB.2	D	68		T6	1	worked bone	indetermin	none	fin,incomp
1367	T	N-VB	XC	71	T2	7		worked bone	indetermin	none	fin,incomp
1378	T	VA.1	CDE	73		surf		worked bone	indetermin	none	fin,incomp
1377	P	VIIB.3	C	73	T1	3		worked bone	necklace	none	fin,comp
1359	T	VIID	C	71	T1	1		worked bone	pendant	none	unfin,comp
1363	T	VIIB.2	C	71	T6	1	1	worked bone	pin-needle	none	fin,incomp,
1364	T	indetermin	CW	71		12		worked bone	pin-needle	none	fin,comp
1376	T	VIIB.3	C	73	T1	3		worked bone	pin-needle	none	fin,incomp
1379	T	after VA.1	CDE	73		surf	7	worked bone	pin-needle	none	fin,incomp
1322	T	VIIB.4	D	68		6	7	worked bone	sickle-knife	incised line	fin,comp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
rubble fill	rbble fill	rubble	v. good	46mmW 20mmTH 9mmCW
paving/platform	pav/pltfrm	bricky	v. good	100mmL 80mmW 48mmTH 10mmCW (fig. 7.14)
near room	fill ex rm	hard,clayey	good	32mmW 18mmTH 11mmCW
near room	fill ex rm	soft,loose	poor	17mmD 11mmHT
intrusive pit	unshpd pit	soft,loose	poor	25mmL 20mmW 6mmTH geometric design; no hole
near room	fill ex rm	bricky	good	86mmD 7mmHD
surf	surf wash	surf	poor	(e.g., fig. 7.14)
courtyard	on flr	water lain	v. good	53mmW 6mmTH
near room	fill ex rm	indetermin	v. good	60mmL 55mmW
rubble fill	rbble fill	rubble	poor	80mmL 40mmW
courtyard	fill ex rm	soft,loose	v. good	42mmL 15mmW 8mmTH
near room	fill ex rm	soft,loose	good	11mmW 6mmTH
open space	fill ex rm	soft,loose	v. good	60mmL 25mmW 25mmTH
near room	fill ex rm	ash	v. good	40mmL 15mmW 6mmTH
near room	on flr		v. good	35mmW 9mmTH
near room	fill ex rm	hard,clayey	good	18mmW 3mmTH large,ovoid
room with door	fill in rm	bricky	v. good	2mmHD 14mmL 13mmW (figs. 7.5:left,7.8:a)
near room	rodnt hole	rodent hole	poor	9mmD 100mmL polished tip
near room	fill ex rm	ash	v. good	7.5mmD 80mmL polished tip
near room	fill ex rm	bricky	v. good	8mmD polished tip
open space	fill ex rm	hard,clayey	v. good	5.5mmD 97mmL polished tip
open space	fill ex rm	hard,clayey	v. good	5.5mmD polished tip
rubble fill	rbble fill	rubble	v. good	polished tip
paving/platform	pav/pltfrm	bricky	good	5.5mmD 28mmL polished tip
partial room	fill in rm	bricky	v. good	8mmD
near room	fill ex rm	lamintd lenses	good	12mmL/H 8mmW/D/TH seg cylndrcl(2)
courtyard	fill ex rm	soft,loose	v. good	2mmL/H 5mmW/D/TH 2mmHD seg cylndrcl(2)
rubble fill	rbble fill	rubble	v. good	indetermin
near room	on flr		v. good	2mmL/H 6mmW/D/TH 2.5mmHD seg cylndrcl(2)
near room	fill ex rm	bricky	v. good	9mmL/H 4mmW/D/TH 2mmHD cylndrcl(3)
room with door	on flr		v. good	3mmL/H 6mmW/D/TH 3mmHD seg cylndrcl(2)
paving/platform	pav/pltfrm	bricky	good	3mmL/H 3mmW/D/TH seg cylndrcl(2)
near room	fill ex rm	indetermin	v. good	1mmW/D/TH seg cylndrcl(2)
tholos w/door	fill in rm	indetermin	v. good	1mmW/D/TH seg cylndrcl(2)
courtyard	on flr		v. good	9mmL/H 4mmW/D/TH 3.5mmHD cylndrcl(3)
partial room	flr +10cm	hard,clayey	v. good	70mmL 30mmW 5mmTH polished
near room	fill ex rm	indetermin	v. good	40mmL 10mmW
surf	surf wash	surf	poor	40mmL 12mmW
near room	fill ex rm	indetermin	good	214 beads(196 fish vertebr,4 Dentalium,6 unident shell,5 bone,3 chlorite) Shapes: cylindr,droplet
open space	fill ex rm	hard,clayey	v. good	16mmW 2mmTH 3mmHD scalloped edges (fig. 7.5:right)
room with door	fill in rm	burned earth	poor	4mmD
surf	surf wash	surf	poor	4mmD 70mmL
near room	fill ex rm	soft,loose	v. good	4mmD
intrusive pit	unshpd pit	soft,loose	poor	4mmD
room w/out door	fndatn dep		v. good	142mmL 15mmW 4mmTH polished; unperforated (figs. 7.16, 7.17)

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITIO
1323	T	VIIB.4	D	68		6	7	worked bone	sickle-knife	incised line	fin,comp
1341	T	VIIB.6-5	E	69	T3	2	1	worked bone	sickle-knife	none	fin,comp
1361	T	VIIA	C	71	T3	3	2	worked bone	sickle-knife	none	fin,inco
1321	T	VIIB.4	D	68		6	7	worked bone	spatula	incised line	fin,comp
1338	T	VIIB.6	D	69	T1	10		worked bone	spatula	none	fin,comp
1340	T	VIIB.5-4	E	69	T2	4	1	worked bone	spatula	none	fin,incom
1349	P	VIIC.1	C	70	T6	2		worked bone	spatula	none	fin,incom
1358	T	VIID	C	71	T1	1		worked bone	spatula	none	fin,incom
1375	T	VIIB.6-3	C	73	T1	6		worked bone	spatula	none	fin,incom

SHELL

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITIO
1719	T	VC-VA	C	69		surf	8	mother-of-pearl	2 hole object	incised line	fin,comp
1721	P	VIA	C	69		1	4	mother-of-pearl	2 hole object	none	fin,comp
1744	T	VIID	C	70	T5	7		mother-of-pearl	2 hole object	none	fin,incom
1745	T	VIIC.2-1	C	70	T6	3		mother-of-pearl	2 hole object	none	fin,incom
1748	T	VIB.2	C	70	T6	5		mother-of-pearl	2 hole object	none	fin,incom
1785	T	VIIB.1	C	71	T6	1A	1	mother-of-pearl	2 hole object	none	fin,incom
1817	T	VIIB.2	C	73	T1	1		mother-of-pearl	2 hole object	none	fin,comp
1701	P	VIIC-VIIB.3	C	73	T1	6-9		worked shell	2 hole object	none	fin,incom
1772	T	VIB.2	C	71	T3	2		worked shell	2 hole object	none	fin,comp
1846	P	VIIB.2-VIIA	CDE	73		4		worked shell	2 hole object	none	fin,incom
1690	T	VIA	D	69		2	23	Dentalium	bead	none	fin,comp
1699	T	N-VA	XC	71	T1	3		Dentalium	bead	none	fin,comp
1725	T	VIB.1	D	69		4		Dentalium	bead	none	fin,comp
1746	T	VIB.2	C	70	T6	5		Dentalium	bead	none	fin,comp
1749	T	VIB.2	C	70	T7	2	1	Dentalium	bead	none	fin,comp
1770	T	VIB.2	C	71	T3	2		Dentalium	bead	none	fin,comp
1774	T	VIIA	C	71	T3	3	1	Dentalium	bead	none	fin,comp
1775	T	VIB.1	C	71	T4	1		Dentalium	bead	none	fin,comp
1777	T	VIIA	C	71	T4	4	1	Dentalium	bead	none	fin,comp
1786	T	VIIB.1	C	71	T6	1A	2	Dentalium	bead	none	fin,comp
1787	T	VIIB.2	C	71	T7	1	1	Dentalium	bead	none	fin,comp
1802	T	VA.2	B	73		4		Dentalium	bead	none	fin,comp
1812	P	VIIC.1	C	73	T1	7		Dentalium	bead	none	fin,comp
1814	T	VIIC.1	C	73	T1	7		Dentalium	bead	none	fin,comp
1843	T	VIIB.2-VIIA	CDE	73		4		Dentalium	bead	none	fin,comp
1844	T	VIIB.2-VIIA	CDE	73		4		Dentalium	bead	none	fin,comp
2601	T	N-VII	XCE	73	T1	10	32A	Dentalium	bead	none	fin,comp
2602	P	N-VII	XCE	73	T1	10	33A	Dentalium	bead	none	fin,comp
2603	T	N-VII	XCE	73	T1	12		Dentalium	bead	none	fin,comp
2872	T	VIB.2	D	69	T2	8		Dentalium	bead	none	fin,comp
z624	P	VIIC.2	C	73		9		Dentalium	bead	none	fin,comp
1727	T	VIIB.3	D	69		7	2	mother-of-pearl	bead	none	fin,comp
1336	T	VC	C	69		7	10-11	worked shell	bead	none	fin,comp
1707	T	VC	D	68		t2	5	worked shell	bead	none	fin,comp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
room w/out door	fndatn dep		v. good	80mmL 15mmW unpolished; perforated; biconical hole (figs. 7.16, 7.17)
room w/out door	fill in rm	bricky	good	90mmL 24mmW 5mmTH
room w/out door	flr +10cm?	soft,loose	v. good	15mmW 6mmTH polished
room w/out door	fndatn dep		v. good	345mmL 20mmW 4mmTH unpolished; scalloped edges (figs. 7.16, 7.17)
near room	fill ex rm	ash	v. good	48mmLB 18mmWB burnt
possible room	on flr		good	
open space	fill ex rm	hard,clayey	v. good	35mmLB 18mmWB 1mmTH polished
open space	fill ex rm	hard,clayey	v. good	61mmLB 15mmWB polished
near room	fill ex rm	ash	good	95mmLB 23mmW 6mmTH polished

rubble fill	rbble fill	rubble	poor	3mmHD 50mmL 30mmW pig/boar (fig. 7.9:e)
rubble fill	rbble fill	rubble	v. good	1mmHD 34mmL 4mmW snake (figs. 7.8:d, 7.9:g)
open space	fill ex rm	hard,clayey	v. good	1.5mmHD 40mmL 14mmW 3mmTH large,ovoid; red ochre residue
near room	fill ex rm	hard,clayey	good	1.5mmHD 47mmL 24mmW 3mmTH large,ovoid (fig. 7.6:e)
near room	fill ex rm	bricky	v. good	1.5mmHD 23mmL 15mmW 1mmTH triple-tanged
foundation	on flr		v. good	3mmHD 15mmW 2mmTH large,ovoid; conical hole
courtyard	on flr		v. good	2mmL 16mmL 11mmW 5mmTH square; conical hole (fig. 7.19:e)
near room	fill ex rm	hard,bricky	good	1.5mmHD 14mmL 10mmW
near room	depression	ash	v. good	2.5mmHD 14mmL 14mmW 2mmTH square (fig. 7.8:b)
near room	fill ex rm	bricky	good	3mmHD 23mmW 1mmTH large,ovoid
foundation	infilling	indetermin	v. good	9mmL/H 3mmW/D/TH cylndrcl(3)
near room	fill ex rm	indetermin	good	13mmL/H 5mmW/D/TH cylndrcl(3)
near room	fill ex rm	indetermin	v. good	20mmL/H 3mmW/D/TH long,cylndrcl(1)
near room	fill ex rm	bricky	v. good	7mmL/H 4mmW/D/TH cylndrcl(3)
paving/platform	pav/pltfrm	bricky	v. good	15mmL/H 4mmW/D/TH 3mmHD long,cylndrcl(1)
near room	w/in flr	ash	v. good	10mmL/H 4mmW/D/TH 2mmHD cylndrcl(3)
room w/out door	flr +10cm?	soft,loose	v. good	12mmL/H 4mmW/D/TH 2.5mmHD long,cylndrcl(1)
near room	fill ex rm	bricky	v. good	3mmL/H 4mmW/D/TH 2mmHD seg cylndrcl(2)
room w/out door	flr +10cm?	bricky	v. good	9mmL/H 5mmW/D/TH 4mmHD cylndrcl(3)
paving/platform	pav/pltfrm	bricky	v. good	3mmL/H 4mmW/D/TH 2mmHD seg cylndrcl(2)
courtyard	on flr		v. good	3mmL/H 5mmW/D/TH 2.5mmHD seg cylndrcl(2)
open space	fill ex rm	soft,loose	v. good	8mmL/H 4mmW/D/TH cylndrcl(3)
open space	fill ex rm	hard,clayey	v. good	3mmL/H 4mmW/D/TH 2mmHD seg cylndrcl(2)
open space	fill ex rm	hard,clayey	v. good	3mmL/H 4mmW/D/TH 3mmHD seg cylndrcl(2)
near room	fill ex rm	bricky	good	25mmL/H 4mmW/D/TH long,cylndrcl(1)
near room	fill ex rm	bricky	good	35mmL/H 4mmW/D/TH long,cylndrcl(1)
room w/out door	on flr		v. good	5mmL/H 4mmW/D/TH cylndrcl(3)
room w/out door	on flr		v. good	11mmL/H 3mmW/D/TH long,cylndrcl(1)
courtyard	fill ex rm	indetermin	v. good	3mmL/H 5mmW/D/TH seg cylndrcl(2)
near room	depression	ash	v. good	13mmL/H 4mmW/D/TH long,cylndrcl(1)
near room	fill ex rm	bricky	v. good	2mmL/H 4mmW/D/TH 2mmHD seg cylndrcl(2)
possible room	fill ex rm	lamintd lenses	v. good	8mmW/D/TH 2mmHD seg cylndrcl(2)
room w/hearth	on flr		v. good	9mmW/D/TH seg cylndrcl(2) (fig. 7.9:b)
room with door	flr +10cm	sandy	v. good	1mmL/H 5mmW/D/TH seg cylndrcl(2)

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
1708	T	VIA	D	68		t3	1	worked shell	bead	none	
1720	T	indetermin	C	69		surf		worked shell	bead	incised line	fin,comp
1722	T	VIB.1-VC	C	69		7		worked shell	bead	none	fin,comp
1724	T	VIA	D	69		4	1	worked shell	bead	none	fin,comp
1726	T	VIB.2	D	69		5		worked shell	bead	none	fin,comp
1730	T	VIIB.6	D	69	T1	10		worked shell	bead	none	fin,comp
1741	T	VC	C	69		7	9-10	worked shell	bead	none	fin,comp
1742	T	VIIA	C	70	T4	1		worked shell	bead	none	fin,comp
1743	T	VIB.2	C	70	T5	3		worked shell	bead	none	fin,comp
1750	T	VIIB.1	C	70	T7	6		worked shell	bead	none	fin,comp
1765	T	VIID	C	71	T1	1		worked shell	bead	none	fin,comp
1766	T	VIIA	C	71	T2	1	1	worked shell	bead	none	fin,comp
1767	T	VIIA	C	71	T3	1	3	worked shell	bead	none	fin,comp
1768	T	VIIA	C	71	T3	1	5	worked shell	bead	none	fin,comp
1769	T	VIIA	C	71	T3	1	5	worked shell	bead	none	fin,comp
1771	T	VIB.2	C	71	T3	2		worked shell	bead	none	fin,comp
1776	T	VIB.2-1	C	71	T4	3		worked shell	bead	none	fin,comp
1781	T	VIIB.2	C	71	T6	1	9	worked shell	bead	none	fin,comp
1782	T	VIIB.2	C	71	T6	1	8	worked shell	bead	none	fin,incomp
1783	T	VIIB.1	C	71	T6	1A		worked shell	bead	none	fin,comp
1784	T	VIIB.1	C	71	T6	1A		worked shell	bead	none	fin,incomp
1788	T	VIIB.2	C	71	T7	2		worked shell	bead	incised line	fin,comp
1803	T	VA.2	B	73		4	2	worked shell	bead	none	fin,comp
1805	T	VA.2	B	73		4		worked shell	bead	none	fin,comp
1806	T	VIIA	B	73	T1	3	1	worked shell	bead	none	fin,comp
1810	T	VIIB.2	C	73		1	1	worked shell	bead	none	fin,comp
1811	T	VIIB.2	C	73		1	1	worked shell	bead	none	fin,comp
1813	T	VIIC.1	C	73	T1	7		worked shell	bead	none	fin,comp
1815	T	VIIC.2	C	73	T1	9		worked shell	bead	none	fin,comp
1816	T	VIIC.2	C	73	T1	9		worked shell	bead	none	fin,comp
1834	T	VIA	CW	73	T3	1		worked shell	bead	none	fin,comp
1836	T	VIB.1	CW	73	T3	2		worked shell	bead	none	fin,comp
1838	T	VA.1	CDE	73		surf	2-3	worked shell	bead	none	fin,comp
1839	T	VA.1	CDE	73		surf		worked shell	bead	none	fin,comp
1840	T	VA.1	CDE	73		surf		worked shell	bead	none	fin,comp
1841	T	VIB.2	CDE	73		3	18	worked shell	bead	none	fin,comp
1842	T	VIIB.2-VIIA	CDE	73		4		worked shell	bead	none	fin,comp
1845	P	VIIB.2-VIIA	CDE	73		4		worked shell	bead	none	fin,comp
1847	T	VIIB.2-VIIA	CDE	73		4		worked shell	bead	none	fin,comp
1848	T	VIIB.5-3	D	73		7	37	worked shell	bead	none	fin,comp
1852	T	N-VA.1	XBE	73	T5	4		worked shell	bead	none	fin,comp
2871	T	VIIB.2	D	69		7		worked shell	bead	none	fin,comp
2893	P	N-VA.4	XC	71	T2	6		worked shell	bead	none	fin,comp
3838	T	indetermin	XD	70	T1	2-4		worked shell	bead	none	fin,comp
3841	P	indetermin	XD	70	T1	3		worked shell	bead	none	fin,comp
z006	P	VIA	D	68		4	2	worked shell	bead	none	fin,comp
z007	P	VIA	D	68		4	2	worked shell	bead	none	fin,comp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
rubble fill	rbble fill	rubble	v. good	
surf	surf wash	surf	poor	25mmL/H 16mmW/D/TH shell shape(17); Oliva bulbosa Roding
near room	fill ex rm	bricky	good	52mmL/H 33mmW/D/TH shell shape(17)
rubble fill	rbble fill	rubble	v. good	14mmL/H shell shape(17)
near room	fill ex rm	bricky	v. good	36mmL/H 25mmW/D/TH shell shape(17)
near room	fill ex rm	ash	v. good	indetermin; biconical hole
room w/hearth	pav/pltfrm		v. good	17mmL/H 10mmW/D/TH shell shape(17)
near room	fill ex rm	bricky	v. good	18mmL/H 9mmW/D/TH 4mmHD shell shape(17)
near room	fill ex rm	bricky	v. good	2mmL/H 5mmW/D/TH 2mmHD seg cylndrcl(2)
leveling fill	infilling	bricky	v. good	5mmL/H 8mmW/D/TH 3mmHD seg cylndrcl(2)
open space	fill ex rm	hard,clayey	v. good	10mmL/H 6mmW/D/TH 2mmHD shell shape(17)
wall	pav/pltfrm		v. good	8mmL/H 5mmW/D/TH 1mmHD shell shape(17)
room w/out door	flr +10cm?	bricky	v. good	5mmL/H 8mmW/D/TH 2mmHD seg cylndrcl(2)
room with door	flr +10cm?	bricky	v. good	12mmL/H 11mmW/D/TH 3mmHD sqr,thin-1(15); biconical hole; polshd; 4mmTH
room with door	flr +10cm?	bricky	v. good	17mmL/H 16mmW/D/TH shell shape(17); polshd
near room	depression	ash	unclear	4mmL/H 7mmW/D/TH 2mmHD seg cylndrcl(2); biconical hole
near room	depression	ash	v. good	5mmL/H 12mmW/D/TH 5mmHD seg cylndrcl(2)
room with door	fill in rm	bricky	v. good	5mmL/H 15mmW/D/TH 5mmHD seg clndrcl(2)
near room	on flr		v. good	8mmL/H 8mmW/D/TH 2mmHD sqr,thin-2(18); 2mmTH
leveling fill	infilling	soft,loose	v. good	10mmL/H 8mmW/D/TH 1.5mmHD shell shape(17)
leveling fill	infilling	soft,loose	v. good	11mmL/H 2.5mmHD lozenge-2(16); polshd; 4mmTH
near room	fill ex rm	ash	v. good	10mmL/H 8mmW/D/TH 2.5mmHD sqr,thin-2(18); 1mmTH
open space	w/in flr	water lain	v. good	18mmL/H 9mmW/D/TH shell shape(17)
open space	fill ex rm	soft,loose	v. good	15mmL/H 12mmW/D/TH shell shape(17); polshd
near room	fill ex rm	soft,loose	v. good	13mmL/H 10mmW/D/TH shell shape(17)
near room	on flr		v. good	3mmL/H 6mmW/D/TH 2mmHD seg cylndrcl(2)
near room	on flr		v. good	5mmL/H 12mmW/D/TH 5mmHD seg cylndrcl(2)
open space	fill ex rm	hard,clayey	v. good	2mmL/H 6mmW/D/TH 4mmHD seg cylndrcl(2)
near room	fill ex rm	bricky	v. good	5mmL/H 5mmW/D/TH 3mmHD seg cylndrcl(2)
near room	fill ex rm	bricky	v. good	23mmL/H 17mmW/D/TH shell shape (17); 11mmTH
rubble fill	rbble fill	rubble	v. good	21mmL/H 9mmW/D/TH shell shape(17)
near room	fill ex rm	soft,loose	v. good	37mmL/H 18mmW/D/TH shell shape(17)
near room	fill ex rm	bricky	poor	20mmL/H 15mmW/D/TH shell shape(17)
near room	fill ex rm	bricky	poor	15mmL/H 8mmW/D/TH shell shape(17)
near room	fill ex rm	bricky	poor	3mmL/H 7mmW/D/TH seg cylndrcl(2)
rubble fill	rbble fill	rubble	v. good	12mmL/H 7mmW/D/TH shell shape(17)
paving/platform	pav/pltfrm	bricky	good	3mmL/H 10mmW/D/TH seg cylndrcl(2)
near room	fill ex rm	bricky	good	2mmL/H 14mmW/D/TH seg cylndrcl(2)
near room	fill ex rm	bricky	good	12mmL/H shell shape(17)
near room	fill ex rm	lamintd lenses	good	5mmL/H 9mmW/D/TH seg cylndrcl(2)
near room	fill ex rm	bricky	v. good	29mmL/H 24mmW/D/TH shell shape(17) 17mmTH
near room	fill ex rm	bricky	v. good	3mmW/D/TH seg cylndrcl(2)
near room	fill ex rm	indetermin	v. good	4mmW/D/TH seg cylndrcl(2)
near room	fill ex rm	indetermin	poor	4mmL/H 3mmW/D/TH cylndrcl(3)
near room	fill ex rm	indetermin	poor	4mmL/H 9mmW/D/TH 2mmHD seg cylndrcl(2)
rubble fill	rbble fill	rubble	v. good	23mmL/H 18mmW/D/TH shell shape(17)
rubble fill	rbble fill	rubble	v. good	20mmL/H 17mmW/D/TH shell shape(17)

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
z008	P	VIA	D	68		4	2	worked shell	bead	none	fin,incomp
1773	T	VIIA	C	71	T3	3	1	worked shell	bracelet	none	fin,incomp
1818	T	VIIB.2	C	71	T6	1	1	worked shell	bracelet	none	fin,incomp
1837	T	VIA	CW	73	T3	1		worked shell	bracelet	none	fin,incomp
z672	P	VIA	CW	73	T3	1		worked shell	bracelet	none	fin,incomp
1747	T	VIB.2	C	70	T6	5		mother-of-pearl	debitage	none	debitage
1903	T	indetermin	C	69		surf		mother-of-pearl	debitage	none	debitage
1904	T	indetermin	C	69		surf		mother-of-pearl	debitage	none	debitage
1905	T	VB	C	69		1	2-3	mother-of-pearl	debitage	none	debitage
1906	T	VB	C	69		1	7	mother-of-pearl	debitage	none	debitage
1907	T	VIA	C	69	T3	1	1	mother-of-pearl	debitage	none	debitage
1908	T	VIA	C	69	T3	1	1	mother-of-pearl	debitage	none	debitage
1909	T	VC	C	69		7	14	mother-of-pearl	debitage	none	debitage
1910	T	VIB.1-VC	C	69		7		mother-of-pearl	debitage	none	debitage
1911	T	VIB.1-VC	C	69		7		mother-of-pearl	debitage	none	debitage
1912	T	VIB.1-VC	C	69		7		mother-of-pearl	debitage	none	debitage
1913	T	VIA	C	70		1	1	mother-of-pearl	debitage	none	debitage
1914	T	VIA	C	70		1	1	mother-of-pearl	debitage	none	debitage
1915	T	VIA	C	70		1	1	mother-of-pearl	debitage	none	debitage
1916	T	VIIA-VIA	C	70		1		mother-of-pearl	debitage	none	debitage
1925	T	VIB.2-1	C	71	T4	3		mother-of-pearl	debitage	none	debitage
1926	T	VA.1	B	73		3	1	mother-of-pearl	debitage	none	debitage
1927	T	VA.2	B	73		4	2	mother-of-pearl	debitage	none	debitage
1928	T	VB	B	73		5		mother-of-pearl	debitage	none	debitage
1929	T	VB	B	73		6		mother-of-pearl	debitage	none	debitage
1930	T	VB	B	73		6	2	mother-of-pearl	debitage	none	debitage
1931	T	VB	B	73		6		mother-of-pearl	debitage	none	debitage
1932	T	VB	B	73		6	3	mother-of-pearl	debitage	none	debitage
1933	T	VB	B	73		6	3	mother-of-pearl	debitage	none	debitage
1934	T	VIIB.2	C	73	T1	1		mother-of-pearl	debitage	none	debitage
m238	T	VIIA	C	71	T3	1	5	mother-of-pearl	debitage	none	debitage
m251	T	VIA	C	70		1	1	mother-of-pearl	debitage	none	debitage
1804	T	VA.2	B	73		4	2	mother-of-pearl	indetermin	none	unfin,incomp
1902	T	VC-IVC	BW	69	T6	4		mother-of-pearl	indetermin	none	fin,incomp
1801	P	VA.1	B	73		3	5	worked shell	indetermin	incised line	fin,incomp
1807	T	VA.1-IVC	BW	73		1		worked shell	indetermin	incised line	fin,incomp
1808	P	VIA	BW	73	T1	2		worked shell	indetermin	none	fin,incomp
1809	T	VIB.1	BW	73	T1	3		worked shell	indetermin	none	fin,incomp
1835	T	VIA	CW	73	T3	1		worked shell	indetermin	none	fin,incomp
1853	T	N-VA	XCE	73	T1	8		worked shell	indetermin	none	fin,incomp
3486	T	VC-IVC	BW	71	T1	6		worked shell	indetermin	none	fin,comp
3487	T	VC-IVC	BW	71	T1	6		worked shell	indetermin	none	fin,comp
1729	T	VIIB.6	D	69	T1	10		mother-of-pearl	pendant	none	fin,incomp
1740	T	VIA	C	70		1	1	mother-of-pearl	pendant	none	
1728	T	VIIB.6	D	69		9	12	worked shell	pendant	none	
1778	T	VIIB.2	C	71	T6	1	2	worked shell	pendant	none	
1794	T	N-VB	XC	71	T1	7		worked shell	pendant	none	fin,incomp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
rubble fill	rbble fill	rubble	v. good	16mmL/H 11mmW/D/TH shell shape(17)
room w/out door	flr +10cm?	soft,loose	v. good	60mmID 4mmTH 36mmW polshd
room with door	fill in rm	bricky	v. good	80mmID 5mmTH polshd
rubble fill	rbble fill	rubble	v. good	55mmID 4mmTH 29mmW
rubble fill	rbble fill	rubble	v. good	5mmTH 30mmW polshd
near room	fill ex rm	bricky	v. good	20mmL 19mmW 1mmTH
surf	surf wash	surf	poor	30mmL 18mmW
surf	surf wash	surf	poor	23mmL 9mmW
room w/feature	flr +10cm		v. good	24mmL 11mmW
room w/hearth	on flr		v. good	26mmL 25mmW
rubble fill	rbble fill	rubble	v. good	40mmL 30mmW
rubble fill	rbble fill	rubble	v. good	14mmL 9mmW
room with door	on flr		v. good	30mmL
near room	fill ex rm	bricky	good	20mmL 15mmW
near room	fill ex rm	bricky	good	25mmL 12mmW
near room	fill ex rm	bricky	good	8mmL 8mmW
rubble fill	rbble fill	rubble	v. good	14mmL 6mmW
rubble fill	rbble fill	rubble	v. good	17mmL 15mmW
rubble fill	rbble fill	rubble	v. good	17mmL 12mmW
near room	fill ex rm	bricky	good	49mmL 38mmW
near room	depression	ash	v. good	10mmL 2mmTH
near room	on flr		v. good	11mmL 10mmW
open space	on flr	water lain	v. good	11mmL 9mmW
courtyard	fill ex rm	soft,loose	v. good	30mmL 25mmW 6mmTH
courtyard	fill ex rm	soft,loose	v. good	20mmL 18mmW 5mmTH
courtyard	w/in flr	water lain	v. good	14mmL 7mmW 2mmTH
courtyard	fill ex rm	soft,loose	v. good	29mmL 14mmW 3mmTH
courtyard	depression	ash	v. good	30mmL 28mmW 4mmTH
courtyard	depression	ash	v. good	15mmL 11mmW 4mmTH
courtyard	on flr		v. good	5mmL 3mmW 1mmTH
room with door	flr +10cm?	bricky	v. good	
rubble fill	rbble fill	rubble	v. good	
open space	w/in flr	water lain	v. good	40mmL 37mmL 8mmTH
near room	fill ex rm	indetermin	fair	60mmL 42mmW
near room	on flr		v. good	18mmL 13mmW polished
near room	fill ex rm	ash	good	140mmL 41mmW 4mmTH polished
rubble fill	rbble fill	rubble	v. good	24mmL 19mmW 6mmTH polished
near room	fill ex rm	soft,loose	v. good	77mmL 54mmW 5mmTH
rubble fill	rbble fill	rubble	v. good	95mmL 40mmW
near room	fill ex rm	indetermin	good	30mmL 20mmW 5mmTH
near room	fill ex rm	indetermin	good	5mmW 1mmTH
near room	fill ex rm	indetermin	good	5mmW 1mmTH
near room	fill ex rm	ash	v. good	8mmW 1.5mmHD rnded top,straight sides; conical hole
rubble fill	rbble fill	rubble	v. good	99mmL 33mmW 2.5mmHD rnded top,straight sides (fig. 7.6:f, 7.12:c)
room with door	flr +10cm		v. good	80mmL 70mmW shell-shaped
alley	alley fill	bricky	v. good	21mmL 18mmW 2mmTH 3.5mmHD simple curved profile; conical hole
near room	fill ex rm	indetermin	v. good	33mmW 4mmTH rnded top,straight sides

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
m078	P	VIIA	C	70	T4	1		Dentalium	unworkd shell	none	
m234	P	VIIB.2	C	71	T7	1	1	Dentalium	unworkd shell	none	
m244	P	VIIA	C	71	T4	4	1	Dentalium	unworkd shell	none	
m249	P	VIIA	C	71	T2	1		Dentalium	unworkd shell	none	
m250	P	VIIB.1	C	71	T6	1A	2	Dentalium	unworkd shell	none	
m252	P	VIIA	C	71	T2	1		Dentalium	unworkd shell	none	
m272	P	VIB.2	D	69	T2	8		Dentalium	unworkd shell	none	
m273	P	VIB.1	D	69		4		Dentalium	unworkd shell	none	
m274	P	VIB.2	C	71	T3	2		Dentalium	unworkd shell	none	
1779	T	VIIB.2	C	71	T6	1	4	unworked shell	unworkd shell	none	
1780	T	VIIB.2	C	71	T6	1	4	unworked shell	unworkd shell	none	
1854	T	N-VA	XCE	73	T2	3		unworked shell	unworkd shell	none	
1936	P	VIIA	C	70		1A		unworked shell	unworkd shell	none	
1939	T	VIIA	C	71	T3	3	1	unworked shell	unworkd shell	none	
1943	T	N-VII	XC	71		9	23	unworked shell	unworkd shell	none	
1945	T	VA.1	B	73		2		unworked shell	unworkd shell	none	
1946	T	VB	B	73		5		unworked shell	unworkd shell	none	
1947	T	VIIB.2	C	73		1	1-2	unworked shell	unworkd shell	none	
1948	T	VIIC.2	C	73	T1	9		unworked shell	unworkd shell	none	
m002	P	VIIB.2-VIIA	CDE	73		4		unworked shell	unworkd shell	none	
m003	P	VIIB.4	CDE	73		5		unworked shell	unworkd shell	none	
m004	P	VC	CDE	73		1	8	unworked shell	unworkd shell	none	
m006	P	VIIB.4	CDE	73		5		unworked shell	unworkd shell	none	
m007	P	VIB.1	CDE	73		3		unworked shell	unworkd shell	none	
m008	P	VIIB.5-3	D	73		7	37	unworked shell	unworkd shell	none	
m009	P	VIIB.4	CDE	73		5		unworked shell	unworkd shell	none	
m010	P	VIA	D	68		T3	1	unworked shell	unworkd shell	none	
m011	P	VIIB.2	C	71	T6	1	8	unworked shell	unworkd shell	none	
m013	P	VIB.2	CDE	73		3	18	unworked shell	unworkd shell	none	
m021	P	VIA	CDE	73		2	10	unworked shell	unworkd shell	none	
m022	P	VIIB.2-VIIA	CDE	73		4		unworked shell	unworkd shell	none	
m023	P	N-VA	XCE	73	T1	8		unworked shell	unworkd shell	none	
m024	P	VIIA-VIA	C	70		1		unworked shell	unworkd shell	none	
m025	P	VIB.2	D	69	T2	8		unworked shell	unworkd shell	none	
m026	P	VIB.1	D	69	T2	5		unworked shell	unworkd shell	none	
m027	P	VIIB.6	D	69	T1	10		unworked shell	unworkd shell	none	
m028	P	VIB.1	D	69	T1	6		unworked shell	unworkd shell	none	
m029	P	VIB.2	D	69		5		unworked shell	unworkd shell	none	
m030	P	VIA	D	69		4	1	unworked shell	unworkd shell	none	
m031	P	VIB.1	D	69		4		unworked shell	unworkd shell	none	
m032	P	VIA	D	69		2	23	unworked shell	unworkd shell	none	
m033	P	VIID	C	71	T1	1		unworked shell	unworkd shell	none	
m034	P	VIIB.2	C	71	T7	2		unworked shell	unworkd shell	none	
m035	P	VIIC.2	C	73	T1	9		unworked shell	unworkd shell	none	
m036	P	VIIA	C	71	T3	1	5	unworked shell	unworkd shell	none	
m037	P	VIB.2	C	71	T3	2		unworked shell	unworkd shell	none	
m038	P	VIIB.2	C	71	T6	1	9	unworked shell	unworkd shell	none	
m039	P	VIB.1	C	71	T4	1		unworked shell	unworkd shell	none	
m041	P	VIIA	C	71	T3	3	1	unworked shell	unworkd shell	none	
m042	P	VC	C	69		7		unworked shell	unworkd shell	none	

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
near room	fill ex rm	bricky	v. good	Dentalium sp.
courtyard	on flr		v. good	Dentalium sp.
room w/out door	flr +10cm?	bricky	v. good	Dentalium octogonum Desh. or L.
near room	fill ex rm	bricky	v. good	Dentalium sp.
paving/platform	pav/pltfrm		v. good	Dentalium octogonum Desh. or L.
near room	fill ex rm	bricky	v. good	Dentalium variabile Deshayes
near room	depression	ash	v. good	Dentalium sp.
near room	fill ex rm	indetermin	v. good	Dentalium octogonum Desh. or L.
near room	depression	ash	v. good	Dentalium sp.
room with door	flr +10cm	ash,brick frag	v. good	unident 13mmL 5mmW
room with door	flr +10cm	ash,brick frag	v. good	unident 15mmL 11mmW
near room	fill ex rm	indetermin	good	Polynices mamilla L. 11mmL 9mmW
near room	fill ex rm	soft,loose	v. good	unident 23mmL 18mmW
room w/out door	flr +10cm?	soft,loose	v. good	Polynices mamilla L. 8mmL 5mmW
tholos w/door	flr +10cm?	indetermin	v. good	Polynices didyma Rod. 40mmL
near room	fill ex rm	ash	v. good	Rostellaria curvirostris Lmk. 60mmL 40mmW
courtyard	fill ex rm	soft,loose	v. good	Clypomoreus coeruleum Sowerby 16mmL 11mmW
near room	on flr		v. good	Oliva sp. 23mmL 8mmW
near room	fill ex rm	bricky	v. good	Polynices mamilla L. 025mmL 009mmW
near room	fill ex rm	ash,brick frag	good	unident
near room	fill ex rm	bricky	v. good	Nucula sp.
room w/feature	on flr		v. good	Cheliconus figulinus L.38mmL 16mmW
near room	fill ex rm	bricky	v. good	Engina mendicaria L.
near room	fill ex rm	hard,clayey	v. good	Conus sp.
near room	fill ex rm	lamintd lenses	good	Conus sp.
near room	fill ex rm	bricky	v. good	Columbella sp.
rubble fill	rbble fill	rubble	v. good	Leptoconus cacuminatus Hwass
near room	on flr		v. good	Pirroconus omaria Brug.
rubble fill	rbble fill	rubble	v. good	Polynices mamilla L.
rubble fill	rbble fill	rubble	v. good	Conus sp.
near room	fill ex rm	ash,brick frag	good	Conus sp.
near room	fill ex rm	bricky	good	unident
near room	fill ex rm	bricky	good	Pinctada margaritifera L.
near room	depression	ash	v. good	Pinctada margaritifera L.
near room	fill ex rm	hard,clayey	v. good	Pleuroploca trapezium L.
near room	fill ex rm	ash	v. good	Pinctada margaritifera L.
near room	fill ex rm	ash	v. good	Polynices mamilla L. 10mmL
near room	fill ex rm	bricky	v. good	Oliva bulbosa Roding
rubble fill	rbble fill	rubble	v. good	Oliva bulbosa Roding
near room	fill ex rm	indetermin	v. good	Amphinerita polita L.
foundation	infilling	indetermin	v. good	unident
open space	fill ex rm	hard,clayey	v. good	Conus sp.
near room	fill ex rm	ash	v. good	Pinctada margaritifera L.
near room	fill ex rm	bricky	v. good	Oliva sericea Rod.
room with door	flr +10cm?	bricky	v. good	Oliva bulbosa Roding
near room	depression	ash	v. good	Engina mendicaria L. 9mmL 5mmW
room with door	flr +10cm	bricky	v. good	Conus ebraeus L.
near room	fill ex rm	bricky	v. good	Oliva bulbosa Roding
room w/out door	flr +10cm?	soft,loose	v. good	Pinctada margaritifera L.
near room	fill ex rm	bricky	v. good	Conus quercinus L. 21mmL 17mmW

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
m043	P	VC	C	69		7	10-11	unworked shell	unworkd shell	none	
m044	P	VC	C	69		7	12	unworked shell	unworkd shell	none	
m045	P	indetermin	C	69		surf		unworked shell	unworkd shell	none	
m046	P	indetermin	C	69		surf		unworked shell	unworkd shell	none	
m047	P	VC	C	69		7	14	unworked shell	unworkd shell	none	
m048	P	VC	C	69		7	18	unworked shell	unworkd shell	none	
m049	P	VIA	C	69	T3	1		unworked shell	unworkd shell	none	
m050	P	VIA	C	69	T3	1	1	unworked shell	unworkd shell	none	
m052	P	VC-VA	C	69		surf	8	unworked shell	unworkd shell	none	
m053	P	VIIB.2	C	73		1	1	unworked shell	unworkd shell	none	
m054	P	VIIC.2	C	73	T1	9		unworked shell	unworkd shell	none	
m055	P	N-VII	XCE	73	T1	11		unworked shell	unworkd shell	none	
m057	P	N-VA.2	XCE	73	T2	1		unworked shell	unworkd shell	none	
m059	P	N-VA.2	XCE	73	T1	1	9	unworked shell	unworkd shell	none	
m060	P	N-VA.3	XCE	73	T1	4		unworked shell	unworkd shell	none	
m061	P	N-VA.2	XCE	73	T1	2		unworked shell	unworkd shell	none	
m062	P	VIIB.2	C	71	T6	1	1	unworked shell	unworkd shell	none	
m063	P	VIIB.1	C	71	T6	1A		unworked shell	unworkd shell	none	
m064	P	VIIA	C	71	T3	1	3	unworked shell	unworkd shell	none	
m065	P	VIB.2	C	71	T3	2		unworked shell	unworkd shell	none	
m067	P	N-VB	XC	71	T1	7		unworked shell	unworkd shell	none	
m069	P	VIIA	C	71	T3	1	5	unworked shell	unworkd shell	none	
m070	P	VIB.1-VC	C	69		7		unworked shell	unworkd shell	none	
m072	P	VIIB.1	C	71	T6	1A	1	unworked shell	unworkd shell	none	
m073	P	N-VII	XC	73		3	36	unworked shell	unworkd shell	none	
m074	P	N-VII	XC	73		3		unworked shell	unworkd shell	none	
m075	P	VIA	C	70		1	1	unworked shell	unworkd shell	none	
m076	P	VC	C	69		7	9-10	unworked shell	unworkd shell	none	
m077	P	VIIC.1	C	70	T5	4		unworked shell	unworkd shell	none	
m079	P	VIID	C	70	T5	7		unworked shell	unworkd shell	none	
m080	P	VIID	C	70	T5	7		unworked shell	unworkd shell	none	
m081	P	VIB.2	C	70	T6	5		unworked shell	unworkd shell	none	
m082	P	VIB.2	C	70	T5	3		unworked shell	unworkd shell	none	
m083	P	VIA	C	70		1	1	unworked shell	unworkd shell	none	
m084	P	VIB.2	C	70	T6	5		unworked shell	unworkd shell	none	
m085	P	VIB.2	C	70	T6	5		unworked shell	unworkd shell	none	
m086	P	VIIC.2-1	C	70	T6	3		unworked shell	unworkd shell	none	
m087	P	VIA	C	69		1	4	unworked shell	unworkd shell	none	
m088	P	VB	C	69		1	7	unworked shell	unworkd shell	none	
m090	P	VA.2	B	73		4		unworked shell	unworkd shell	none	
m091	P	VB	B	73		6	4	unworked shell	unworkd shell	none	
m093	P	VB	B	73		6		unworked shell	unworkd shell	none	
m094	P	VB	B	73		6	3	unworked shell	unworkd shell	none	
m099	P	VA.1	B	71		19		unworked shell	unworkd shell	none	
m100	P	VIA	CW	73	T3	1		unworked shell	unworkd shell	none	
m101	P	VIB.1	CW	73	T3	2		unworked shell	unworkd shell	none	
m102	P	VA.2	B	73		4	2	unworked shell	unworkd shell	none	
m103	P	VA.2	B	73		4		unworked shell	unworkd shell	none	
m105	P	VA.2	B	73		4	2	unworked shell	unworkd shell	none	
m108	P	VC-IVC	BW	71		10		unworked shell	unworkd shell	none	

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
near room	fill ex rm	bricky	v. good	Engina mendicaria L.
room w/hearth	hearth		v. good	unident
surf	surf wash	surf	poor	Astralium andersoni L.?
surf	surf wash	surf	poor	unident
room with door	flr +10cm?	bricky	v. good	unident
near room	fill ex rm	bricky	v. good	unident 20mmL
leveling fill	infilling	bricky	v. good	Polynices mamilla L.
rubble fill	rbble fill	rubble	v. good	Pinctada margaritifera L.
rubble fill	rbble fill	rubble	poor	unident 25mmL
near room	on flr		v. good	Conus sp.
near room	fill ex rm	bricky	v. good	Cardium sp.
courtyard	fill ex rm	indetermin	v. good	unident
near room	fill ex rm	indetermin	v. good	Arca inaequivalvis L.
near room	fill ex rm	indetermin	v. good	Arca inaequivalvis L.
near room	fill ex rm	indetermin	v. good	unident
foundation	fill ex rm	indetermin	v. good	Oliva bulbosa Roding
room with door	flr +10cm?	bricky	v. good	Pleuroploca trapezium L.
leveling fill	infilling	soft,loose	v. good	Cheliconus figulinus L.
room w/out door	flr +10cm?	bricky	v. good	Engina mendicaria L.
near room	depression	ash	v. good	unident
near room	fill ex rm	indetermin	v. good	Pinctada margaritifera L.
room with door	flr +10cm?	bricky	v. good	unident
near room	fill ex rm	bricky	good	unident
open space	on flr		v. good	Pinctada margaritifera L.
room with door	flr +10cm?	indetermin	v. good	Polynices mamilla L.
near room	fill ex rm	indetermin	v. good	Polynices mamilla L.
rubble fill	rbble fill	rubble	v. good	unident 16mmL 5mmW
room w/hearth	flr +10cm?	bricky	v. good	Polynices mamilla Rod.
open space	fill ex rm	hard,clayey	v. good	Amphinerita polita L. 9mmL
open space	fill ex rm	hard,clayey	v. good	Cyprea sp. 23mmL 10mmW
open space	fill ex rm	hard,clayey	v. good	Pinctada margaritifera L.
near room	fill ex rm	bricky	v. good	unident
near room	fill ex rm	bricky	v. good	Engina mendicaria L.
rubble fill	rbble fill	rubble	v. good	unident
near room	fill ex rm	bricky	v. good	Pinctada margaritifera L.
near room	fill ex rm	bricky	v. good	Pinctada margaritifera L.
near room	fill ex rm	hard,clayey	good	unident
rubble fill	rbble fill	rubble	v. good	Polynices mamilla L. 35mm
room w/hearth	flr +10cm?	bricky	v. good	Oliva bulbosa Roding
open space	fill ex rm	soft,loose	v. good	Oliva bulbosa Roding 44mmL 25mmW
courtyard	on flr		v. good	unident 20mmL 7mmW
courtyard	fill ex rm	soft,loose	v. good	unident 30mmL 9mmW
courtyard	depression	ash	v. good	Pinctada margaritifera L.
near room	fill ex rm	ash	v. good	Polynices mamilla L.
rubble fill	rbble fill	rubble	v. good	Oliva bulbosa Roding
near room	fill ex rm	bricky	v. good	Oliva bulbosa Roding
open space	w/in flr	water lain	v. good	Oliva bulbosa Roding
open space	fill ex rm	soft,loose	v. good	Amphinerita polita L.
open space	w/in flr	water lain	v. good	Pinctada margaritifera L.
near room	fill ex rm	indetermin	good	Amphinerita polita L.

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
m109	P	VIB.1	BW	73	T1	3		unworked shell	unworkd shell	none	
m113	P	N-VA.1	XBE	73	T5	4		unworked shell	unworkd shell	none	
m138	P	VIIA	B	73	T1	3	1	unworked shell	unworkd shell	none	
m227	P	VIIB.1	C	71	T7	1A		unworked shell	unworkd shell	none	
m235	P	VIIB.2	C	71	T6	1	2	unworked shell	unworkd shell	none	
m236	P	VC	CDE	73		1	6	unworked shell	unworkd shell	none	
m240	P	VIB.1-VC	C	69		7		unworked shell	unworkd shell	none	
m243	P	VIIB.1	C	71	T7	1A		unworked shell	unworkd shell	none	
m246	P	VIA	C	69		1	4	unworked shell	unworkd shell	none	
m247	P	VIB.2	D	69		5	1	unworked shell	unworkd shell	none	
m248	P	VIB.2	D	69		5		unworked shell	unworkd shell	none	
m255	P	N-VA.4-3	XCE	73	T1	4A		unworked shell	unworkd shell	none	
m261	P	N-VA	XCE	73	T2	4		unworked shell	unworkd shell	none	
m262	P	VC	C	69		7	17	unworked shell	unworkd shell	none	
m263	P	VC	C	69		7	17	unworked shell	unworkd shell	none	
m264	P	VB	B	73		6	2	unworked shell	unworkd shell	none	
m265	P	VB	B	73		6	2	unworked shell	unworkd shell	none	
m266	P	VB	B	73		6	2	unworked shell	unworkd shell	none	
m267	P	VIA	D	68		t3	1	unworked shell	unworkd shell	none	
m268	P	VIA	D	68		t3	1	unworked shell	unworkd shell	none	
m269	P	VIA	D	68		t3	1	unworked shell	unworkd shell	none	
m270	P	VIA	D	68		t3	1	unworked shell	unworkd shell	none	
m271	P	VIB.2	D	69	T2	8		unworked shell	unworkd shell	none	
m275	P	VIIB.2	C	73		1	1	unworked shell	unworkd shell	none	
m276	P	VIIB.1	C	71	T7	1A		unworked shell	unworkd shell	none	
METAL											
3152	T	indetermin	XD	70	T2	3		iron	arrowhead	none	fin,comp
3380	T	N-VA.4	XCE	73	T1	5		copper	copper ingot	none	fin,comp
3238	T	VA.2	B	73		4		iron	debitage	none	debitage
z518	P	N-VA.3	XC	71	T2	5		malachite?	debitage	none	debitage
2869	T	N-VA	XCE	73	T2	4C		copper	fork	none	fin,comp
2755	T	indetermin	XD	70	T2	3		iron	full profile	none	fin,comp
2812	T	N-VB	XC	71	T2	7A		copper	indetermin	none	fin,incomp
2836	T	VA.2	B	73		4		copper	indetermin	none	fin,incomp
2841	T	VIIB.2	C	73		1	1-2	copper	indetermin	none	fin,incomp
2842	T	VC	CW	73		5		copper	indetermin	none	fin,incomp
2845	P	VIIB.2	D	73		7	43	copper	indetermin	none	fin,incomp
2631	T	VA.1	C	68	T7	1		copper	pin-needle	none	fin,comp
2750	P	N-VA.2	XC	70	T1	7-1		copper	pin-needle	none	fin,comp
2790	P	VIID	C	71	T1	1		copper	pin-needle	none	fin,comp
2815	T	N-VA.1	XCE	71		14	38	copper	pin-needle	none	fin,incomp
2835	T	VA.1	B	73		3	4	copper	pin-needle	none	fin,comp
2838	P	VA.1	CDE	73		surf		copper	pin-needle	none	fin,incomp
2839	T	VA.1	CDE	73		surf	1	copper	pin-needle	none	fin,comp
2854	T	N-VA.1	XBE	73		14		copper	pin-needle	none	fin,incomp
2855	T	N-VA.1	XBE	73		14		copper	pin-needle	none	fin,incomp
2866	T	N-VA.2	XCE	73	T1	2		copper	pin-needle	none	fin,comp
2867	P	N-VA.2	XCE	73	T1	2		copper	pin-needle	none	fin,comp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
near room	fill ex rm	soft,loose	v. good	Pinctada margaritifera L.
near room	fill ex rm	indetermin	v. good	Polynices mamilla L.
near room	fill ex rm	soft,loose	v. good	Engina mendicaria L.
leveling fill	infilling	soft,loose	v. good	Melaraphe coccinea Gmelin
alley	flr +10cm	organic midden	v. good	unident
room w/feature	pav/pltfrm		v. good	Cheliconus figulinus L.
near room	fill ex rm	bricky	good	Pinctada margaritifera L.
leveling fill	infilling	soft,loose	v. good	Melaraphe coccinea Gmelin
rubble fill	rbble fill	rubble	v. good	unident
rubble fill	rbble fill	rubble	v. good	Arca inaequivalvis L.
near room	fill ex rm	bricky	v. good	Stephenoconus chaldeus Rod.
near room	fill ex rm	bricky	good	unident
near room	fill ex rm	indetermin	good	Arca inaequivalvis L.
near room	fill ex rm	bricky	v. good	unident 25mmL
near room	fill ex rm	bricky	v. good	unident 17mmL
courtyard	w/in flr	water lain	v. good	unident 21mmL 8mmW
courtyard	w/in flr	water lain	v. good	unident 12mmL
courtyard	w/in flr	water lain	v. good	unident 18mmL
rubble fill	rbble fill	rubble	v. good	Oliva bulbosa Roding
rubble fill	rbble fill	rubble	v. good	Arca inaequivalvis L.
rubble fill	rbble fill	rubble	v. good	Amphinerita polita L.
rubble fill	rbble fill	rubble	v. good	Littorina sp.
near room	depression	ash	v. good	Tonna galea L.
near room	on flr		v. good	Pinctada margaritifera L.
leveling fill	infilling	soft,loose	v. good	Littorina sp.

near room	fill ex rm	indetermin	poor	57mmL 34mmW at base
near room	flr +10cm	indetermin	v. good	62mmL 50mmW 40mmTH
near room	rodnt hole	rodent hole	poor	35mmL
near room	fill ex rm	indetermin	v. good	9mmL 6mmW 4mmTH
near room	fill ex rm	bricky	good	67mmL 28mmL(prong)
near room	fill ex rm	indetermin	poor	36mmH
near room	flr +10cm	indetermin	v. good	20mmL 15mmW 6mmTH
open space	fill ex rm	soft,loose	v. good	9mmL 9mmW 2mmTH
near room	on flr		v. good	16mmL 12mmW 6mmTH
paving/platform	pav/pltfrm	bricky	v. good	
near room	rodnt hole	rodent hole	poor	43mmL 4mmW 1mmTH
near room	fill ex rm	indetermin	v. good	128mmL
near room	fill ex rm	indetermin	v. good	131mmL
open space	fill ex rm	hard,clayey	v. good	3mmD 110mmL
near room	fill ex rm	indetermin	v. good	23mmLB
rubble fill	rbble fill	rubble	v. good	4mmD 148mmL 8mmPHD spherical head
surf	surf wash	surf	poor	4mmD
kiln	in kiln	burned earth	v. good	110mmL
near room	fill ex rm	soft,loose	v. good	119mmLB 19mmPHD flat head
near room	fill ex rm	soft,loose	v. good	122mmLB 10mmPHD flat head; square x-section
foundation	fill ex rm	indetermin	v. good	1.5mmD 73mmL
foundation	fill ex rm	indetermin	v. good	83mmL

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
2868	T	N-VA.4-3	XCE	73	T1	4A		copper	pin-needle	none	fin,comp
2870	T	N-VA	XCE	73	T2	4C		copper	pin-needle	none	fin,comp
3359	P	VC-VA	C	69		surf	8	copper	pin-needle	none	fin,comp
3360	P	VC	C	69		7	15	copper	pin-needle	none	fin,comp
3361	T	VA.2	C	68	T7	2		copper	pin-needle	none	fin,comp
3370	P	N-VII,VB	XC	71		8B	40	copper	pin-needle	none	fin,incomp
3379	P	N-VII	XC	73		3		copper	pin-needle	none	fin,comp
3381	P	N-VA	XCE	73	T2	3		copper	pin-needle	none	fin,comp
z017	P	VIA	D	68		4	2	copper	pin-needle	none	fin,comp
z098	P	VB-VA	C	69		1		copper	pin-needle	none	fin,incomp
z483	P	N-VA.1	XCE	71	T2	14	36	copper	pin-needle	none	fin,comp
z737	P	N-VA.2	XC	70		8-1		copper	pin-needle	none	fin,comp
2754	T	indetermin	XD	70	T2	3		iron	pin-needle	none	fin,comp
3365	T	VIB.2	C	70	T5	3	1	copper	ring	none	fin,incomp
2630	T	VA.1-IVC	C	68	T6	9		copper	spatula	none	fin,comp
2865	T	N-VA.2	XCE	73	T1	2		copper	spatula	none	fin,incomp
2864	T	N-VA.1	XBE	73	T5	1		copper	stylus	none	fin,comp
3368	P	VA.1	B	71		18		copper	stylus	none	fin,comp
2629	T	VA.1-IVC	C	68	T6	9		copper	tack or nail	none	fin,comp
2837	T	VA.2	B	73		4		copper	tack or nail	none	fin,comp
2844	P	indetermin	D	73		7	43	copper	tack or nail	none	fin,comp

GLASS

REG#	L	PERIOD	TRNCH	YR	TT	STRAT	FEAT	MATERIAL	TYPE	SURFACE DEC	CONDITION
1678	T	after VA.1	CDE	73		surf	7	glass	body sherd	none	fin,incomp
1684	T	N-VA	XCE	73	T2	3		glass	body sherd	none	fin,incomp
1574	T	virgin soil	E	69	T2	3		glass	rim sherd	none	fin,incomp

GEN'L CONTEXT	FEAT ASSOC	FILL TYPE	QUALITY	ATTRIBUTES
near room	fill ex rm	bricky	good	19mmL 5mmPHD diamond-shaped head
near room	fill ex rm	bricky	good	155mmL 10mmPHD spherical head
rubble fill	rbble fill	rubble	poor	140mmL (figs. 7.9:i, 7.11:d)
room w/hearth	flr +10cm	bricky	v. good	1.5mmD 43mmL (figs. 7.9:f, 7.11:b)
near room	pav/pltfrm		v. good	85mmL
near room	fill ex rm	indetermin	v. good	2.5mmD 50mmLB 5mmPHD flat head (fig. 7.11:c)
near room	fill ex rm	indetermin	v. good	3mmD 56mmL (fig. 7.11:a)
near room	fill ex rm	indetermin	good	81mmL rectangular x-section (fig. 7.11:e)
rubble fill	rbble fill	rubble	v.good	5mmD 87mmL square section
near room	fill ex rm	indetermin	good	1.5mmD 60mmL
near room	fill ex rm	indetermin	v. good	4mmD 96mmL
near room	fill ex rm	indetermin	v. good	1.5mmD 145mmL rnded head w/hole
near room	fill ex rm	indetermin	poor	66mmL
isolated wall	pav/pltfrm		v. good	8mm inside diameter (fig. 7.8:c)
near room	flr +10cm	indetermin	good	196mmL (fig. 8.2:a)
foundation	fill ex rm	indetermin	v. good	55mmLB 25mmW
near room	fill ex rm	indetermin	v. good	182mmL; 4mmD at rnd end; 7mmL 1mmW at flt end
near room	fill ex rm	ash	v. good	70mmL; 1.5mmD at rnd end; 3.5mmL 1mmW at flt end (fig. 7.11:f)
near room	flr +10cm	indetermin	good	137mmL square head (fig. 8.2:d)
open space	fill ex rm	soft,loose	v. good	95mmL 8mmNHD spherical head; square x-section
near room	rodnt hole	rodent hole	poor	18mmL 6mmNHD spherical head
intrusive pit	unshpd pit	soft,loose	poor	18mmL 13mmW 4mmTH even wall TH
near room	fill ex rm	indetermin	good	12mmL 12mmW 4mmTH even wall TH
virgin soil	virgn soil	virgin soil	poor	

Appendix C

Context List

Context	*Period*	*Context/ Feature Description*
A.69.A2.T2.1	I	fill ex room
A.75.T8.13	VII	fill ex room
B.71.15	VA–IVC	fill ex room
B.71.15.1	VA.1	outside surface
B.71.17	VA.1	fill ex room
B.71.17.1	VA.1	outside surface
B.71.18	VA.1	fill ex room
B.71.19	VA.1	fill ex room
B.71.20	VA.1	fill ex room
B.71.20A	VA.1	fill ex room
B.71.20B	VA.1	fill ex room
B.71.21	VA.1	fill ex room
B.71.22	VA.2	fill ex room
B.71.22.1	VA.2	outside surface
B.71.23	VB	courtyard fill
B.71.24	VB	courtyard fill
B.71.25	VB	courtyard fill
B.71.25.1	VB	courtyard surface
B.71.26	VB	courtyard fill
B.71.27	VB	courtyard fill
B.71.27.1	VB	courtyard surface
B.71.27.2	VB	courtyard surface
B.71.27.3	VB	courtyard surface
B.71.27.4	VB	courtyard surface
B.71.27.5	VB	courtyard surface
B.71.28	VC	fill ex room
B.71.29	VC	fill ex room
B.71.29.2	VC	outside surface
B.73.2	VA.1	fill ex room
B.73.2.1	VA.1	human burial
B.73.2.2	VA.1	outside surface
B.73.2.4	VA.1	outside hearth
B.73.2.5	IVB.2	intrusive pit
B.73.2.6	IVB.2	intrusive pit
B.73.2.8	after VA.1	intrusive pit
B.73.2A	VA	fill ex room
B.73.3	VA.1	fill ex room
B.73.3.1	VA.1	outside surface
B.73.3.2	VA.1	outside hearth
B.73.3.4	VA.1	rubble fill
B.73.3.5	VA.1	outside surface
B.73.4	VA.2	fill ex room
B.73.4.1	VA.2	rubble fill
B.73.4.2	VA.2	outside surface
B.73.4.4	VB	wall
B.73.4.5	VB	human burial
B.73.4.6	VA.2	wall
B.73.4.7	VA.2	wall
B.73.5	VB	courtyard fill
B.73.5.1	VB	courtyard surface
B.73.5.2	VB	partial room
B.73.5.3	VB	human burial
B.73.5.4	VB	courtyard fill
B.73.5.5	VB	wall
B.73.6	VB	courtyard fill
B.73.6.1	VB	courtyard fill
B.73.6.2	VB	courtyard surface
B.73.6.3	VB	courtyard depression
B.73.6.4	VB	courtyard surface
B.73.T1.1	VB	courtyard surface
B.73.T1.1.1	VB	courtyard surface
B.73.T1.1.2	VB	brick paving
B.73.T1.2	VC	fill ex room
B.73.T1.2.1	VC	outside surface
B.73.T1.3	VC	fill ex room
B.73.T1.3.1	VIIA	fill ex room
B.73.T1.3.2	VC	outside hearth
B.73.T1.3.5	VIIA	fill ex room
B.73.T1.3.6	VIIA	partial room
B.73.T1.3.7	VC	outside surface
B.73.T1.3.8	VIIA	concentration of bricks
B.73.T1.3.9	VIIB.2–1	wall
B.73.T1.3.10	VIIA	outside surface
B.73.T1.6.2	VB	courtyard surface
BI.67	V	fill ex room
BW.69.4	IVA	fill ex room
BW.69.T5.7A	VI–IVC	fill ex room
BW.69.T5.10	VC–IVC	fill ex room
BW.69.T6.4	VC–IVC	fill ex room
BW.71.10	VC–IVC	fill ex room
BW.71.12.2	VIA	wall
BW.71.12.8	VIA	rubble fill
BW.71.12.9	VIA	rubble fill
BW.71.12.10	VIA	rubble fill
BW.71.12.14	VIA	rubble fill
BW.71.T1.6	VC–IVC	fill ex room
BW.73.surf	indeterminable	mound surface wash
BW.73.1	VA.1–IVC	fill ex room
BW.73.2	VIA	rubble fill

Context	*Period*	*Context/Feature Description*
BW.73.2.1	VIA	wall
BW.73.T1.1	VC–IVC	fill ex room
BW.73.T1.2	VIA	rubble fill
BW.73.T1.2.1	VIA	wall
BW.73.T1.3	VIB.1	fill ex room
BW.73.T2.3	VIB.1	fill ex room
BW.73.T2.3.1	VIB.2	wall
BW.73.T2.3.2	VIB.2	wall
BW.73.T2.3.3	VIB.2	wall
BW.73.T2.3.4	VIB.2	wall
BW.73.T2.4	VIIA	fill ex room
BW.73.T2.4.1	VIIA	wall
BW/CW.71.12.1	VII–VC	fill ex room
C.68.surf	indeterminable	mound surface wash
C.68.1	indeterminable	mound surface wash
C.68.2	IV	fill ex room
C.68.3	IVB	fill ex room
C.68.4	IVC	fill ex room
C.68.5-7	IVB	fill ex room
C.68.T1-2.4	indeterminable	mound surface wash
C.68.T1-2.5	IV	fill ex room
C.68.T1-2.6	IV	fill ex room
C.68.T1-2.7	IVB	fill ex room
C.68.T1-2.8	VA.1–IVC	fill ex room
C.68.T1-2.8A	IVC	fill ex room
C.68.T1-2.8B	VB–VA	fill ex room
C.68.T1-3.1	VA	fill ex room
C.68.T1-3.2	VB	fill ex room
C.68.T1-3.3	VC	fill ex room
C.68.T1-3.4	VC	brick paving
C.68.T1-3.5	VC	fill ex room
C.68.T1-3.5.1	VC	wall
C.68.T1-3.5.3	VC	wall
C.68.T1-3.5.4	VC	wall
C.68.T1-3.5.5	VC	wall
C.68.T1-3.5.6	VC	wall
C.68.T1-3.5.7	VC	wall
C.68.T1-3.5.8	VC	wall
C.68.T1-3.5.9	VC	wall
C.68.T1-3.5.10	VC	wall
C.68.T1-3.5.11	VC	wall
C.68.T2	VA	fill ex room
C.68.T2.1	VA	fill ex room
C.68.T3.2	VA.1	fill ex room
C.68.T3.2.3	VA.1	wall
C.68.T3.3	VB	fill ex room
C.68.T3.4	VC	fill ex room
C.68.T3.5	VC	fill ex room
C.68.T4.1	V	fill ex room
C.68.T5.1	IVC	fill ex room
C.68.T5.2	VA.1	fill ex room
C.68.T5.3	VA.1	fill ex room
C.68.T6.9	VA.1–IVC	fill ex room
C.68.T6.9.3	VA.1	room without door
C.68.T6.9.4	VA.1	room without door
C.68.T6.9.5	VA.1	room without door
C.68.T6.9.6	VA.1	fill ex room
C.68.T7.1	VA.1	fill ex room
C.68.T7.1.1	VA.1	wall
C.68.T7.1.2	VA.1	wall
C.68.T7.1.3	VA.1	wall
C.68.T7.1.4	VA.1	wall
C.68.T7.1.5	VA.1	wall
C.68.T7.2	VA.2	fill ex room
C.69.surf	indeterminable	mound surface wash
C.69.surf.1	after VA.1	intrusive pit
C.69.surf.2	IVC	wall
C.69.surf.5	after VA.1	intrusive pit
C.69.surf.6	IVC	foundation trench
C.69.surf.7	VB	wall
C.69.surf.8	V	rubble fill
C.69.1	VB–VA	fill ex room
C.69.1.2-3	VB	room with feature
C.69.1.4	VIA	rubble fill
C.69.1.5	VB	interior hearth
C.69.1.6	VB	courtyard surface
C.69.1.7	VB	room with hearth
C.69.1.8	VC	brick paving
C.69.1.9	VIA	rubble fill
C.69.1.10	VIA	wall
C.69.1.11	VIA	wall
C.69.1.12	VIA	wall
C.69.1.12A	VIA	wall
C.69.1.12B	VIA	wall
C.69.1.12C	VIA	wall
C.69.1.14	VIB.1	outside surface
C.69.1.15	VC	brick paving
C.69.1.16	VIA	wall
C.69.1.17	VB	partial room
C.69.1.18	VB	outside surface
C.69.1.9	VIB	outside hearth
C.69.2	VIA	rubble fill
C.69.3	VC	brick paving
C.69.3.1	VC	outside surface
C.69.5	VC	fill ex room
C.69.6	VIA	rubble fill
C.69.6.1	VIB.1	mud plaster floor
C.69.7	VIB.1–VC	fill ex room
C.69.7.1	VC	room with feature
C.69.7.2	VC	room with door
C.69.7.3	VC	room with door
C.69.7.4	VC	partial room
C.69.7.5	VC	room with hearth

Context	Period	Context/Feature Description
C.69.7.6	VC	room with door
C.69.7.7	VC	room without door
C.69.7.8	VC	room with door
C.69.7.9	VC	room with hearth
C.69.7.9-10	VC	room with hearth
C.69.7.10	VC	room with hearth
C.69.7.11	VC	fill ex room
C.69.7.12	VC	interior hearth
C.69.7.13	VC	room with door
C.69.7.14	VC	room with door
C.69.7.16	VC	room with door
C.69.7.17	VC	fill ex room
C.69.7.18	VC	fill ex room
C.69.7.19	VC	interior hearth
C.69.7.20	VIB.2–1	rubble fill
C.69.7.21	VIB.2–1	wall
C.69.7.22	VIB.2–1	wall
C.69.7.23	VIB.2	outside fill
C.69.7A	VIB.1	fill ex room
C.69.T1.1	VB–VA	fill ex room
C.69.T1.1.5	VB	interior hearth
C.69.7.15	VC	room with hearth
C.69.T1.2.4	VIA	rubble fill
C.69.T1.3	VC	fill ex room
C.69.T2.surf.8	VC–VA	rubble fill
C.69.T2.1	VC	fill ex room
C.69.T2.3	VC	fill ex room
C.69.T3.1	VIA	leveling fill
C.69.T3.1.1	VIA	rubble fill
C.69.T3.1.2	VIA	outside surface
C.69.T3.1.3	VIA	wall
C.69.T3.1.4	after VA.1	intrusive pit
C.69.T3.1.5	VIB.1	mud plaster floor
C.69.T3.1.6	VIA	rubble fill
C.69.T3.1.7	VIA	wall
C.69.T3.1.8	VIA	wall
C.69.T3.1.9	VIA	wall
C.69.T3.1.10	VIA	wall
C.69.T3.1.11	VIB.1–VIA	outside surface
C.70.surf	indeterminable	mound surface wash
C.70.surf.1	after VA.1	intrusive pit
C.70.surf.2	VC	room with door
C.70.1	VIIA–VIA	fill ex room
C.70.1.1	VIA	rubble fill
C.70.1.2	VIA	rubble fill
C.70.1.3	VIA	outside surface
C.70.1.4	VIA	outside surface
C.70.1.5	VIA	mud plaster floor
C.70.1.6	VIB.1	wall
C.70.1.7	VIB.1	wall
C.70.1.8	VIB.1	wall
C.70.1.9	VIA	wall
C.70.1.10	VIA	wall
C.70.1.11	VIA	wall
C.70.1.12	VIA	wall
C.70.1.12A	VIB.2–1	wall
C.70.1.13	VIA	wall
C.70.1.14	VIB.1	ash concentration
C.70.1.15	VIA	outside hearth
C.70.1.16	VIB.2	brick paving
C.70.1.17	VIA	wall
C.70.1.18	VIB.1	wall
C.70.1.18A	VIA	wall
C.70.1.18B	VIB.1	wall
C.70.1.19	VIA	rubble fill
C.70.1.19A	VIB.1	rubble fill
C.70.1.20	VIB.1	outside surface
C.70.1.21	VIB.2	outside surface
C.70.1.22	VIB.2	wall
C.70.1.23	VIB.1	stepped outside surface
C.70.1.24	VIB.1	sloping outside surface
C.70.1A	VIIA	fill ex room
C.70.2	VIA	leveling fill
C.70.2.1	VIB.1	outside surface
C.70.3.1	VIB.1	rubble fill
C.70.3.2	VIB.1	wall
C.70.T1.1	VIIA	fill ex room
C.70.T2.1	VIB.1–VIA	fill ex room
C.70.T2.1.1	VIA	rubble fill
C.70.T3.1	VIIA	fill ex room
C.70.T4.1	VIIA	fill ex room
C.70.T5.1	VIIA	fill ex room
C.70.T5.1.1	VIIA	rock concentration
C.70.T5.1.2	VIIA	courtyard surface
C.70.T5.1.3	VIIA	wall
C.70.T5.1.4	VIIA	wall
C.70.T5.2	VIIB.6–1	fill ex room
C.70.T5.2.1	VIIB.6	clay lens
C.70.T5.2.2	VIIB.6–2	wall
C.70.T5.2.3	VIIB.6	outside surface
C.70.T5.3	VIB.2	fill ex room
C.70.T5.3.1	VIB.2	wall
C.70.T5.3.2	VIB.2	outside surface
C.70.T5.4	VIIC.1	fill
C.70.T5.4.1	VIIC.1	ash lens
C.70.T5.5	VIIA	fill ex room
C.70.T5.5.1	VIIA	green clay floor
C.70.T5.5.2	VIIA	wall
C.70.T5.6	VIIC.2–1	fill
C.70.T5.6.1	VIIC.2	outside hearth
C.70.T5.6.2	VIIC.2	wall
C.70.T5.7	VIID	fill
C.70.T5.7.1	VIID	burned earth lens
C.70.T5.7.2	VIID	human burial
C.70.T5.8	before VIID	virgin soil

Context	*Period*	*Context/Feature Description*
C.70.T6.1	VIIB.6–1	fill ex room
C.70.T6.1.1	VIIB.6–2	wall
C.70.T6.2	VIIC.1	fill
C.70.T6.2.1	VIIC.1	human burial
C.70.T6.2.2	VIIC.1	human burial
C.70.T6.3	VIIC.2–1	fill
C.70.T6.4	VIID–VIIC	fill
C.70.T6.5	VIB.2	fill ex room
C.70.T6.5.1	VIB.2	rubble fill
C.70.T6.5.2	VIB.2	wall
C.70.T6.5.3	VIB.2	wall
C.70.T6.5.4	VIB.2	wall
C.70.T6.5.5	VIB.2	wall
C.70.T6.5.6	VIB.2	wall
C.70.T6.6	VIIA	fill ex room
C.70.T6.6.1	VIIA	room without door
C.70.T6.6.2	VIB.2	brick paving
C.70.T6.6.3	VIIA	partial room with hearth
C.70.T6.6.4	VIIA	green clay floor
C.70.T6.6.5	VIIA	interior hearth
C.70.T6.7	VIIB.2	ash fill
C.70.T7.1	VIIA	fill ex room
C.70.T7.2	VIB.2	fill ex room
C.70.T7.2.1	VIB.2	brick paving
C.70.T7.2.2	VIB.2	outside surface
C.70.T7.3	VIIA	fill ex room
C.70.T7.3.1	VIIA	outside surface
C.70.T7.4	VIIA	fill ex room
C.70.T7.4.1	VIIA	room without door
C.70.T7.4.2	VIIA	wall
C.70.T7.5	VIIA	fill ex room
C.70.T7.5.1	VIIA	green clay floor
C.70.T7.5.1A	VIIA	sloping plaster surface
C.70.T7.6	VIIB.1	leveling fill
C.70.T7.6.1	VIIB.2	courtyard surface
C.70.T7.6.2	VIIB.1	leveling fill
C.70.T7.6.3	VIIB.2	room
C.71.1	VIIC	fill ex room
C.71.1.1	VIIC	fill ex room
C.71.T1.1	VIID	fill
C.71.T1.1.1	VIID	wall
C.71.T1.1.2	VIID	outside hearth
C.71.T1.1.3	VIID	brick concentration
C.71.T1.1.4	VIID	outside hearth
C.71.T1.2	before VIID	virgin soil
C.71.T1.2.1	before VIID	charcoal concentration
C.71.T2.1	VIIA	fill ex room
C.71.T2.1.1	VIIA	wall
C.71.T2.1.2	VIIA	courtyard surface
C.71.T2.1.3	VIIB.6–2	wall
C.71.T3.1	VIIA	room fill
C.71.T3.1.1	VIIA	partial room
C.71.T3.1.2	VIIA	partial room
C.71.T3.1.3	VIIA	room without door
C.71.T3.1.4	VIIA	room without door
C.71.T3.1.5	VIIA	room with hearth
C.71.T3.1.6	VIIA	room with door
C.71.T3.2	VIB.2–1	ash-filled depression
C.71.T3.2.1	VIB.2	outside surface
C.71.T3.2A	VIB.2–1	fill ex room
C.71.T3.3	VIIA	room fill
C.71.T3.3.1	VIIA	room without door
C.71.T3.3.2	VIIA	room wtihout door
C.71.T3.3.3	VIIA	fill ex room
C.71.T3.3.4	VIIA	room without door
C.71.T4.1	VIB.1	fill ex room
C.71.T4.1.1	VIB.1	outside surface
C.71.T4.1.2	VIB.1	wall
C.71.T4.1.3	VIB.1	wall
C.71.T4.2	VIB.2	fill ex room
C.71.T4.2.1	VIB.2	outside surface
C.71.T4.3	VIB.2–1	ash-filled depression
C.71.T4.3.1	VIIA	room without door
C.71.T4.3.2	VIB.2–1	rubble fill
C.71.T4.3.3	VIIA	mud plaster floor
C.71.T4.3.4	VIB.2	brick paving
C.71.T4.3A	VIIA	fill ex room
C.71.T4.3B	VIIA	fill ex room
C.71.T4.4	VIIA	room fill
C.71.T4.4.1	VIIA	room without door
C.71.T4.4.2	VIIA	room without door
C.71.T4.4.3	VIIA	fill ex room
C.71.T4.4.4	VIIA	green clay floor
C.71.T4.4.4A	VIIA	green clay floor
C.71.T4.4.4B	VIIA	green clay floor
C.71.T5.1	VIIA	fill ex room
C.71.T5.1.1	VIIA	wall
C.71.T5.1.2	VIIA	courtyard surface
C.71.T6.1	VIIB.2–1	fill ex room
C.71.T6.1.1	VIIB.2	room with door
C.71.T6.1.2	VIIB.2	alley fill
C.71.T6.1.3	VIIB.2	room with door
C.71.T6.1.4	VIIB.2	room with door
C.71.T6.1.5	VIIB.2	partial room
C.71.T6.1.6	VIIB.2	courtyard surface
C.71.T6.1.6A	VIIB.1	fill
C.71.T6.1.7	VIIB.2	room with door
C.71.T6.1.8	VIIB.2	outside surface
C.71.T6.1.9	VIIB.2	room with door
C.71.T6.1.10	VIIB.2	outside hearth
C.71.T6.1.11	VIIB.2	wall
C.71.T6.1A	VIIB.1	leveling fill
C.71.T6.1A.1	VIIB.1	outside surface
C.71.T6.1A.2	VIIB.1	brick platform

Context	Period	Context/Feature Description
C.71.T7.1	VIIB.1	leveling fill
C.71.T7.1.1	VIIB.1	courtyard surface
C.71.T7.1A	VIIB.1	leveling fill
C.71.T7.1A.1	VIIB.1	outside surface
C.71.T7.1A.2	VIIB.1	brick platform
C.71.T7.2	VIIB.2	ashy fill
C.71.T7.2.1	VIIB.2	wall
C.71.T7.2.2	VIIB.2	wall
C.73.1	VIIB.2	walls, room fill
C.73.1.1	VIIB.2	outside surface
C.73.1.2	VIIB.2	outside surface
C.73.6	VIIB.6–3	ashy fill
C.73.6-9	VIIC.2–VIIB.3	fill ex room
C.73.7	VIIC.1	fill
C.73.7.1	VIIC.1	human burial
C.73.7.2	VIIC.1	human burial
C.73.8	VIIB.6–4	fill ex room
C.73.9	VIIC.2	fill ex room
C.73.9.1	VIIC.2	wall
C.73.9.3	VIIC.2	wall
C.73.9.4	VIIC.2	wall
C.73.9.5	VIIC.2	wall
C.73.9A	VIIC.2	fill ex room
C.73.9-1	VIIC.2	fill ex room
C.73.10	VIIC.2	fill ex room
C.73.10.1	VIIC.2	wall
C.73.10.2	VIIC.2	wall
C.73.10.3	VIIC.2	room without door
C.73.T1.1	VIIB.2	courtyard surface
C.73.T1.2	VIIB.3	fill
C.73.T1.3	VIIB.3	fill
C.73.T1.3.1	VIIB.3	outside surface
C.73.T1.3.2	VIIB.3	wall
C.73.T1.4	VIIB.3	fill
C.73.T1.4.1	VIIB.3	wall
C.73.T1.4.2	VIIB.3	wall
C.73.T1.5	VIIB.3	fill
C.73.T1.6	VIIB.6–3	ashy fill
C.73.T1.6.1	VIIB.3	wall
C.73.T1.6.2	VIIB.6–4	wall
C.73.T1.6-9	VIIC.2–VIIB.3	fill ex room
C.73.T1.7	VIIC.1	fill
C.73.T1.7.1	VIIB.3	wall
C.73.T1.8	VIIB.6–4	fill ex room
C.73.T1.9	VIIC.2	fill ex room
C.73.T2.9	VIIC.2	fill ex room
CDE.73.surf	indeterminable	mound surface wash
CDE.73.surf.1	VA.1	kiln
CDE.73.surf.2	VA.1	wall
CDE.73.surf.2-3	VA.1	fill between walls
CDE.73.surf.3	VA.1	wall
CDE.73.surf.4	VA.1	wall
CDE.73.surf.7	after VA.1	intrusive pit
CDE.73.1	VC	fill ex room
CDE.73.1.5	VC	wall
CDE.73.1.6	VC	wall
CDE.73.1.8	VC	room with feature
CDE.73.1.9	VC	fill ex room
CDE.73.2	VIA	rubble fill
CDE.73.2.10	VIA	rubble fill
CDE.73.2.11	VIA	wall
CDE.73.2.12	VIA	wall
CDE.73.2.13	VIA	rubble fill
CDE.73.2.15	VIB.2–1	wall
CDE.73.2.17	VIB.2–1	wall
CDE.73.2.18	VIB.2–1	rubble fill
CDE.73.2.19	VIB.2–1	wall
CDE.73.2.20	VIB.2–1	wall
CDE.73.3	VIB.1	fill ex room
CDE.73.3.10	VIB.2–1	room with door
CDE.73.3.13	VIB.2–1	wall
CDE.73.3.14	VIB.1	wall
CDE.73.3.16	VIB.1	wall
CDE.73.3.18	VIB.2	rubble fill
CDE.73.3.19	VIB.2	outside surface
CDE.73.4	VIIB.2–VIIA	fill ex room
CDE.73.4.21	VIIB.2	wall
CDE.73.4.22	VIIB.1	wall
CDE.73.4.23	VIIB.2	wall
CDE.73.4.24	VIIB.2	wall
CDE.73.4.26	VIIB.2	outside surface
CDE.73.4.27	VIIB.2	outside surface
CDE.73.5	VIIB.4	fill ex room
CDE.73.5.28	VIIB.5–4	wall
CDE.73.5.29	VIIB.5–4	wall
CDE.73.5.30	VIIB.5–4	wall
CDE.73.5.31	VIIB.5–4	wall
CDE.73.T1.3.5	VIIA	fill ex room
CDE.73.T2.5	VIIB.4	room fill
CW.70.T1.6	VC	brick paving
CW.71.12	indeterminable	mound surface wash
CW.71.12.1	after VA.1	intrusive pit
CW.73.surf.1	after VA.1	intrusive pit
CW.73.5	VC	brick paving
CW.73.6	VIA	rubble fill
CW.73.7.1	VIA	wall
CW.73.7.3	VIA	walls and rubble fill
CW.73.7.4	VIA	walls
CW.73.T1.5.2	VB–IVC	ashy fill
CW.73.T1.6	VC	brick paving
CW.73.T1.7	VIA	rubble fill
CW.73.T1.8	IVC	fill ex room
CW.73.T1.8.1	VIA	wall
CW.73.T1.8.2	VIA	wall
CW.73.T3.1	VIA	rubble fill
CW.73.T3.2	VIB.1	fill ex room
CW.73.T3.2A	VIB.2	fill ex room

Context	Period	Context/Feature Description
CW.73.T3.2A.1	VIB.2	wall
CW.73.T3.2A.2	VIB.2	wall
CW.73.T3.3	VIIA	fill ex room
CW.73.T3.3.1	VIIA	wall
D.68.1	indeterminable	mound surface wash
D.68.2	VC	room fill
D.68.2.1	VC	wall
D.68.2.2	VC	wall
D.68.2.3	VC	wall
D.68.2.4	VC	wall
D.68.2.5	VC	room with door
D.68.2.6	VC	room with hearth
D.68.2.7	VC	fill ex room
D.68.2.9	VC	wall
D.68.2.11	VC	room with door
D.68.2.12	VC	partial room
D.68.2.13	VC	wall
D.68.2.14	VC	room with door
D.68.2.15	VC	partial room
D.68.2.16	VC	wall
D.68.3	VIA	rubble fill
D.68.4.1	VIA	rubble fill
D.68.4.2	VIA	rubble fill
D.68.4.34A	VIB.1	wall
D.68.4.34B	VIB.1	wall
D.68.5	VIB.2	brick paving
D.68.5.1	VIB.2	rubble fill
D.68.5.3	VIB.2	rubble fill
D.68.5A	VIIB.4	fill ex room
D.68.5B	VIIB.5	fill ex room
D.68.6	VIIA	fill ex room
D.68.6.7	VIIB.4	room without door
D.68.6.8	VIIB.5–3	fill ex room
D.68.6.11	VIIB.2	room without door
D.68.6.19	VIIB.6	fill ex room
D.68.t1	indeterminable	mound surface wash
D.68.t2	VC	fill ex room
D.68.t2.5	VC	room with door
D.68.t3	VIB.1	fill ex room
D.68.t3.1	VIA	rubble fill
D.68.t4	VIB.2	fill ex room
D.68.t5	VIIA	fill ex room
D.68.t6	VIIB.2–1	fill ex room
D.68.t6.1-2	VIIB.2	room fill
D.68.T1.3	VIA–VC	fill ex room
D.68.T1.4	VIA	leveling fill
D.68.T1.4.1	after VA.1	intrusive pit
D.68.T1.5	VIB.1	mud plaster floor
D.68.T1.6	VIB.1	fill ex room
D.68.T1.7	VIB.2	brick paving
D.68.T1.8	VIIA–VIB.2	fill ex room
D.68.T1.9	VIIB.5–1	ashy fill
D.68.T1.10	VIIB.6	ashy fill
D.68.T1.11	VIIC.1	fill
D.68.T2.5	VIB.1	fill ex room
D.68.T2.6	VIB.1	ashy fill
D.68.T2.7	VIB.1	ashy fill
D.68.T2.8	VIB.2	ashy fill
D.68.T2.9.1	VIIA	mud plaster floor
D.68.T2.9.2	VIIB.2–1	outside surfaces
D.68.T2.10.1	VIIB.3	outside surface
D.68.T2.10.2	VIIB.3	laminated fill
D.68.T2.11	VIIB.5–4	fill ex room
D.68.T2.12	VIIB.6	fill ex room
D.68.T2.13	VIIC.1	fill
D.68.T2.14	VIIC.1	fill
D.69.surf	indeterminable	mound surface wash
D.69.2.6	VC	room with hearth
D.69.2.23	VIA	foundation trench
D.69.3	VIA	leveling fill
D.69.3.1	VIA	rubble fill
D.69.3.2	VIA	rubble fill
D.69.3.3	VIA	rubble fill
D.69.3.4	VIA	brick facing
D.69.3.5	VIA	leveling fill
D.69.3.6	VIA	rubble fill
D.69.3.7	VIA	rubble fill
D.69.3.8	after VA.1	intrusive pit
D.69.3.10	VIA	wall
D.69.3.10	VIA	wall
D.69.3.11	VIA	wall
D.69.3.12	VIA	wall
D.69.3.14	VIA	wall
D.69.3.15	VIA	wall
D.69.3.19	VIA	wall
D.69.3.20	VIA	wall
D.69.3.21	VIA	wall
D.69.3.22	VIA	wall
D.69.3.23	VIA	wall
D.69.3.24	VIA	wall
D.69.3.25	VIA	wall
D.69.3.26	VIA	wall
D.69.3.30	VIA	outside surface
D.69.3.35	VIA	wall
D.69.4	VIB.1	fill ex room
D.69.4.1	VIA	rubble fill
D.69.4.13	VIB.2–1	wall
D.69.4.16	VIB.2–1	wall
D.69.4.17	VIB.2–1	brick buttress
D.69.4.18	VIB.2–1	wall
D.69.4.27	VIB.1	wall
D.69.4.27D	VIB.1	wall
D.69.4.28	VIB.2–1	wall
D.69.4.29	VIB.2–1	wall
D.69.4.31	VIB.2–1	partial room hearth
D.69.4.32	VIB.2–1	wall
D.69.4.33	VIB.2–1	wall
D.69.4.34A	VIB.1	wall

Context	Period	Context/Feature Description
D.69.4.34B	VIB.1	wall
D.69.5	VIB.2	fill ex room
D.69.5.1	VIB.2	rubble fill
D.69.5.2	VIB.2	rubble fill
D.69.5.3	VIB.2	rubble fill
D.69.5.4	VIB.2	rubble fill
D.69.6	VIIA	fill ex room
D.69.6.28	VIIB.1	brick platform
D.69.6.29	VIIB.1	brick platform
D.69.6.30	VIIB.1	brick platform
D.69.6.31	VIIB.1	brick platform
D.69.7	VIIB.2	fill ex room
D.69.7.1	VIIB.2	possible room
D.69.7.2	VIIB.2	possible room
D.69.7.3	VIIB.2	possible room
D.69.7.5	VIIB.2	room without door
D.69.7.6	VIIB.2	room without door
D.69.7.7	VIIB.2	room without door
D.69.7.9	VIIB.2	room without door
D.69.7.10	VIIB.2	room without door
D.69.7.11	VIIB.2	room without door
D.69.7.12	VIIB.2	room without door
D.69.7.13	VIIB.2	fill ex room
D.69.7.14	VIIB.2	room without door
D.69.7.15	VIIB.2	room without door
D.69.7.16	VIIB.2	room without door
D.69.7.17	VIIB.2	room without door
D.69.7.20	VIIB.2	possible room
D.69.7.22	VIIB.2	room without door
D.69.7.23	VIIB.2	possible room
D.69.7.24	VIIB.2	room without door
D.69.7.25	VIIB.2	room with door
D.69.7.26	VIIB.2	room without door
D.69.7.27	VIIB.2	room with door
D.69.7.32	VIIB.2	wall
D.69.7.33	VIIB.2	wall
D.69.7.34	VIIB.2	wall
D.69.7.35	VIIB.2	wall
D.69.7.36	VIIB.2	wall
D.69.7.37	VIIB.2	wall
D.69.7.38	VIIB.2	wall
D.69.7.39	VIIB.2	wall
D.69.7.40	VIIB.2	wall
D.69.7.41	VIIB.2	brick platform
D.69.8	VIIB.5–4	fill ex room
D.69.8.1	VIIB.5–4	room without door
D.69.8.2	VIIB.5–4	partial room
D.69.8.3	VIIB.5–4	partial room
D.69.8.4	VIIB.5	possible room
D.69.8.5	VIIB.5	room without door
D.69.8.5A	VIIB.4	room without door
D.69.8.6	VIIB.5	room with door
D.69.8.6A	VIIB.4	room without door
D.69.8.7	VIIB.5	room with door
D.69.8.7A	VIIB.4	room without door
D.69.8.8	VIIB.5	fill ex room
D.69.8.9	VIIB.5	room without door
D.69.8.9A	VIIB.4	room without door
D.69.8.10	VIIB.5	room without door
D.69.8.10A	VIIB.4	room without door
D.69.8.11	VIIB.5	room with door
D.69.8.11A	VIIB.4	room without door
D.69.8.12	VIIB.5	room with door
D.69.8.12A	VIIB.4	room without door
D.69.8.13	VIIB.5	possible room
D.69.8.13A	VIIB.4	possible room
D.69.8.14	VIIB.5	room without door
D.69.8.14A	VIIB.4	room without door
D.69.8.15	VIIB.5	room without door
D.69.8.15A	VIIB.4	room without door
D.69.8.16	VIIB.5	room with door
D.69.8.16A	VIIB.4	room without door
D.69.8.17	VIIB.5	partial room
D.69.8.17A	VIIB.4	room without door
D.69.8.18	VIIB.5–4	room without door
D.69.8.20	VIIB.5–4	room without door
D.69.8.20A	VIIB.5	wall
D.69.8.21	VIIB.4	clay basin
D.69.9	VIIB.6	fill ex room
D.69.9.1	VIIB.6	room with door
D.69.9.2	VIIB.6	partial room
D.69.9.3	VIIB.6	partial room
D.69.9.4	VIIB.6	possible room
D.69.9.5	VIIB.6	room without door
D.69.9.6	VIIB.6	room with door
D.69.9.7	VIIB.6	room with door
D.69.9.8	VIIB.6	fill ex room
D.69.9.9	VIIB.6	room without door
D.69.9.10	VIIB.6	room without door
D.69.9.11	VIIB.6	room with door
D.69.9.12	VIIB.6	room with door
D.69.9.13	VIIB.6	possible room
D.69.9.14	VIIB.6	room without door
D.69.9.15	VIIB.6	room without door
D.69.9.16	VIIB.6	room with door
D.69.9.17	VIIB.6	fill ex room
D.69.9.18	VIIB.6	room with door
D.69.9.19	VIIB.6	courtyard fill
D.69.T1.6	VIB.1	fill ex room
D.69.T1.7	VIB.2–1	brick paving
D.69.T1.8	VIB.2	fill ex room
D.69.T1.8.1	after VA.1	intrusive pit
D.69.T1.9	VIIB	fill ex room
D.69.T1.10	VIIB.6	ashy fill
D.69.T1.11	VIIC.1	fill
D.69.T2.3	VIA	rubble fill
D.69.T2.4	VIA	leveling fill
D.69.T2.5	VIB	fill ex room
D.69.T2.6	VIB.1	fill ex room
D.69.T2.8	VIB.2	fill ex room
D.69.T2.9.1	VIIA	mud plaster floor
D.69.T2.9.2	VIIB.2–1	outside surfaces

Context	*Period*	*Context/Feature Description*	*Context*	*Period*	*Context/Feature Description*
D.69.T2.10.1	VIIB.3	outside surface	E.69.T3.14	before VIID	virgin soil
D.69.T2.10.2	VIIB.3	laminated fill	E.69.T7.1	VIIB.6–1	fill ex room
D.69.T2.11	VIIB.5–4	fill ex room	E.69.T7.3	VIIB.6	outside surface
D.69.T2.12	VIIB.6	fill ex room	E.69.T7.3.1	VIIB.6	wall
D.69.T2.13	VIIC.1	fill	E.69.T7.4	VIIB.5	fill ex room
D.69.T2.14	VIIC.1	fill	E.69.T7.4.1	VIIB.6–5	room with door
D.73.6.27	VIIB.2	room with door	E.69.T7.4.2	VIIB.6–5	room with door
D.73.6.31	VIIB.2	fill ex room	XB.71.T1.9C	N-IV	fill ex room
D.73.6.41	VIIB.2	brick platform	XB.73.T2.13	N-VA.1	fill ex room
D.73.7.37	VIIB.5–3	fill ex room	XBE.73.9	N-IVC	fill ex room
D.73.7.42	VIIB.5–3	ashy fill	XBE.73.9A	N-VA.1–IVC	fill ex room
D.73.7.43	VIIB.2	fill ex room	XBE.73.14	N-VA.1	fill ex room
D.73.7.44	VIIB.4	fill ex room	XBE.73.T1.1	IVB	fill ex room
D.73.8.43	VIIB.4	fill ex room	XBE.73.T1.13	N-VA.1	fill ex room
E.68.T1.3.1	VIIB.6	wall	XBE.73.T2.13	N-VA.1	fill ex room
E.68.T1.3.3	VIIB.6	fill ex room	XBE.73.T5.1	N-VA.1	fill ex room
E.68.T1.6.1	VIIB.6	wall	XBE.73.T5.3	N-VA.1	fill ex room
E.68.T2.3	before VIID	virgin soil	XBE.73.T5.4	N-VA.1	fill ex room
E.68.T2.3.1	VIIB.2	outside surface	XC.70.7	N-IVC	fill ex room
E.69.T2.3	before VIID	virgin soil	XC.70.7-1	N-VA.2	fill ex room
E.69.T2.3.1	VIIB.2	outside surface	XC.70.8	N-VA.2–1	fill ex room
E.69.T2.3.2	VIIB.2	outside surface	XC.70.8-1	N-VA.2	fill ex room
E.69.T2.4.1	VIIB.5–4	possible room	XC.70.T1.7	N-IVC	fill ex room
E.69.T2.4.2	VIIB.5–4	wall	XC.70.T1.7-1	N-VA.2	fill ex room
E.68.T2.4.3	VIIB.5–4	wall	XC.70.T2.2D/2D-1	N-VA.2–IVC	fill ex room
E.69.T2.4.4	VIIB.5–4	wall	XC.70.T2.6-1	N-IVC	fill ex room
E.69.T2.4.5	VIIB.6	partial room	XC.70.T2.7	N-IVC	fill ex room
E.69.T2.4.5A	VIIB.5–4	partial room	XC.70.T2.7-1	N-VA.2	fill ex room
E.69.T2.4.6	VIIB.5–4	possible room	XC.71.1.45	after N-VA.1	intrusive pit
E.69.T2.4.7	VIIB.5–4	wall	XC.71.2	N-IVC	fill ex room
E.69.T2.5	VIIB.6	fill ex room	XC.71.3	N-VA.2–1	fill ex room
E.69.T2.6	before VIID	virgin soil	XC.71.3.4	N-VA.2	wall
E.69.T2.6.1	before VIID	virgin soil	XC.71.3.5	N-VA.2	wall
E.69.T2.8	VIIB.6	fill ex room	XC.71.3.8	N-VA.2	wall buttress
E.69.T2.8.1	VIIB.6	outside surface	XC.71.3.9	N-VA.2	wall
E.69.T2.8.2	VIIB.5–4	wall	XC.71.3.10	N-VA.2	wall
E.69.T2.8.3	VIIB.6	outside surface	XC.71.3.11	N-VA.2	outside hearth
E.69.T2.8.4	VIIB.6	outside surface	XC.71.4	N-VA.2	fill ex room
E.69.T2.8.5	VIIB.6	outside surface	XC.71.4.1	N-VA.2	wall
E.69.T2.9	VIIB.6	fill ex room	XC.71.4.2	N-VA.2	wall
E.69.T3.2	VIIB.5	fill ex room	XC.71.4.3	N-VA.2	wall
E.69.T3.2.1	VIIB.6–5	room without door	XC.71.5	N-VA.3	fill ex room
E.69.T3.2.2	VIIB.6–5	room without door	XC.71.5.12	N-VA.3	wall
E.69.T3.10	VIIB.6	fill ex room	XC.71.5.13	N-VA.3	plastered pit
E.69.T3.10.1	VIIB.6	outside surface	XC.71.5.14	N-VA.3	wall
E.69.T3.10.2	VIIB.6	wall	XC.71.5.15	N-VA.3	wall
E.69.T3.11	VIIB.6	fill ex room	XC.71.5A	N-VA.4	fill ex room
E.69.T3.11.1	VIIB.6	outside surface	XC.71.5A.18	N-VA.4	brick podium
E.69.T3.11.2	VIIB.6	outside surface	XC.71.5A.19	N-VA.4	wall
E.69.T3.12	VIIB.6	fill ex room	XC.71.6	N-VA.4	fill ex room
E.69.T3.12.1	VIIB.6	outside surface	XC.71.7	N-VB	fill ex room
E.69.T3.12.2	VIIB.6	outside surface	XC.71.7.20	N-VB	wall
E.69.T3.12.3	VIIB.6	outside surface	XC.71.7.21	N-VB	wall
E.69.T3.12.4	VIIB.6	outside surface	XC.71.7.22	N-VB	partial room
E.69.T3.12.5	VIIB.6	outside surface	XC.71.7A	N-VB	outside surface
E.69.T3.13	VIIB.6	fill ex room			

Context	Period	Context/Feature Description
XC.71.7B	N-VB	outside surface
XC.71.7C	N-VII, VB	fill ex room
XC.71.7C.24	indeterminable	human burial
XC.71.7C.27	N-VII, VB	wall
XC.71.7C.28	N-VII, VB	wall
XC.71.8	N-VII, VB	fill ex room
XC.71.8.25	N-VII	wall
XC.71.8-9	N-VII	fill ex room
XC.71.8A	N-VII, VB	fill ex room
XC.71.8A.32	N-VII, VB	room fill
XC.71.8B	N-VII	fill ex room
XC.71.8B-9	N-VII	fill ex room
XC.71.8B.35	N-VII	alley
XC.71.8B.40	N-VII, VB	room fill
XC.71.8N	N-VII, VB	fill ex room
XC.71.9.23	N-VII	tholos with door
XC.71.9.26	N-VII	wall
XC.71.9.27	N-VII	wall
XC.71.9.28	N-VII	wall
XC.71.9.29	N-VII	wall
XC.71.9.30	N-VII	room without door
XC.71.9.31	N-VII	wall
XC.71.9.32	N-VII	courtyard
XC.71.9.33	N-VII	circular platform
XC.71.9.34	N-VII	possible room
XC.71.9.34A	N-VII	partial room
XC.71.9.36	N-VII	room with door
XC.71.9.37	N-VII	room without door
XC.71.38	N-VII	room without door
XC.71.9.39	N-VII	courtyard
XC.71.9.40	N-VII	room without door
XC.71.9.41	N-VII	partial room
XC.71.9.42	N-VII	partial room
XC.71.9N.39	N-VII	courtyard
XC.71.T1.3	N-VA.2	fill ex room
XC.71.T1.5	N-VA.3	fill ex room
XC.71.T1.5A	N-VA.4	fill ex room
XC.71.T1.5B	N-VA.4	outside surface
XC.71.T1.5C	N-VA.4	outside surface
XC.71.T1.5C.16	N-VA.3	hole-mouth jar
XC.71.T1.5C.17	N-VA.3	necked jar
XC.71.T1.6	N-VA.4	fill ex room
XC.71.T1.6A	N-VB	outside surface
XC.71.T1.7	N-VB	fill ex room
XC.71.T1.7A	N-VB	outside surface
XC.71.T1.7B	N-VB	fill ex room
XC.71.T1.7B.23	N-VB	tholos fill
XC.71.T1.9.41	N-VII	partial room
XC.71.T1-2.5	N.VA.3	fill ex room
XC.71.T2.2.2.5	N-IVC	fill ex room
XC.71.T2.2B	N-VA.1	outside surface
XC.71.T2.5	N-VA.3	fill ex room
XC.71.T2.6	N-VA.4	fill ex room
XC.71.T2.6A	N-VB	outside surface
XC.71.T2.6B	N-VB	fill ex room
XC.71.T2.7	N-VB	fill ex room

Context	Period	Context/Feature Description
XC.71.T2.7A	N-VB	outside surface
XC.71.T2.7C	N-VII, VB	fill ex room
XC.71.T2.8C.34A	N-VII, VB	partial room
XC.71.T2.8N.28	N-VB	near wall
XC.73.1	N-VII	fill ex room
XC.73.2	N-VII	fill ex room
XC.73.3	N-VII	fill ex room
XC.73.3.36	N-VII	room with door
XC.73.3A	N-VII	outside surface
XC.73.3B	N-VII	outside surface
XCE.71.13C	N-VA.1–IVC	fill ex room
XCE.71.14	N-VA.1	fill ex room
XCE.71.14.30	N-VA.1	room with hearth
XCE.71.14.31	N-VA.1	fill ex room
XCE.71.14.32	N-VA.1	wall
XCE.71.14.33	N-VA.1	fill ex room
XCE.71.14.34	N-VA.1	room with door
XCE.71.14.34A	N-VA.1	room without door
XCE.71.14.35	N-VA.1	fill ex room
XCE.71.14.36	N-VA.1	fill ex room
XCE.71.14.37	after N-VA.1	intrusive pit
XCE.71.14.38	N-VA.1	fill ex room
XCE.71.14A	N-VA.1	outside surface
XCE.71.14A.30	N-VA.1	room with hearth
XCE.71.14A.38	N-VA.1	fill ex room
XCE.71.14B	N-VA.1	outside surface
XCE.71.14B.39	N-VA.1	fill ex room
XCE.71.14B.40	N-VA.1	fill ex room
XCE.71.14B.41	N-VA.1	fill ex room
XCE.71.14C	N-VA.1	fill ex room
XCE.71.14C.39	N-VA.1	fill ex room
XCE.71.14C.41	N-VA.1	fill ex room
XCE.71.14C.42	N-VA.1	fill ex room
XCE.71.15	N-VA.2	fill ex room
XCE.71.15.39	N-VA.2	wall
XCE.71.15.40	N-VA.2	wall
XCE.71.15.41	N-VA.2	wall
XCE.71.15.42	N-VA.2	room with door
XCE.71.15.43	N-VA.2	room with door
XCE.71.15.44	N-VA.2	room with door
XCE.71.15.45	N-VA.2	fill ex room
XCE.71.15.46	N-VA.2	fill ex room
XCE.71.15.47	N-VA.2	fill ex room
XCE.71.T1.14.35	N-VA.1	fill ex room
XCE.71.T2.14	N-VA.1	fill ex room
XCE.71.T2.14.30	N-VA.1	room with hearth
XCE.71.T2.14.35	N-VA.1	fill ex room
XCE.71.T2.14.36	N-VA.1	fill ex room
XCE.71.T2.14B	N-VA.1	outside surface
XCE.71.T2.15.45	N-VA.2	fill ex room
XCE.73.surf	N-VA.2	fill ex room
XCE.73.surf.1	N-VA.2	room with door
XCE.73.surf.2	N-VA.2	room with door
XCE.73.surf.4	N-VA.2	room with door
XCE.73.surf.6	N-VA.2	wall
XCE.73.1.6	N-VA.2	room with door

Context	*Period*	*Context/Feature Description*
XCE.73.4A.23	indeterminable	intrusive pit
XCE.73.5	N-VA.4	fill ex room
XCE.73.5.26	N-VA.4	brick podium
XCE.73.5.27	N-VA.4	brick podium
XCE.73.5.28	N-VA.4	wall
XCE.73.5.29	N-VA.4	room with door
XCE.73.5.30	N-VA.4	possible wall
XCE.73.9.35	N-VII	outside hearth
XCE.73.9.37	N-VII	burned earth
XCE.73.9.40	N-VII	wall
XCE.73.10.38	N-VII	room without door
XCE.73.T1.1	N-VA.2	fill ex room
XCE.73.T1.1.1	N-VA.2	room with door
XCE.73.T1.1.2	N-VA.2	room with door
XCE.73.T1.1.8	N-VA.2	rubble foundation
XCE.73.T1.1.9	N-VA.2	fill ex room
XCE.73.T1.2	N-VA.2	foundation fill
XCE.73.T1.2.1	N-VA.2	rubble foundation
XCE.73.T1.2.17	N-VA.2	wall
XCE.73.T1.2A	N-VA.2	rubble foundation
XCE.73.T1.4	N-VA.3	fill ex room
XCE.73.T1.4.18	N-VA.3	brick podium
XCE.73.T1.4.19	N-VA.3	brick podium
XCE.73.T1.4A	N-VA.4–3	fill ex room
XCE.73.T1.4A.21	N-VA.4	possible wall
XCE.73.T1.4A.22	N-VA.4	wall
XCE.73.T1.4B	N-VA.4	fill ex room
XCE.73.T1.5	N-VA.4	fill ex room
XCE.73.T1.5.26	N-VA.4	brick podium
XCE.73.T1.5.27	N-VA.4	brick platform
XCE.73.T1.5.28	N-VA.4	wall
XCE.73.T1.5.29	N-VA.4	room with door
XCE.73.T1.5.30	N-VA.4	possible wall
XCE.73.T1.6	N-VA.4	foundation fill
XCE.73.T1.6.28	N-VA.4	wall
XCE.73.T1.6.29	N-VA.4	room with door
XCE.73.T1.7	N-VA	fill ex room
XCE.73.T1.8	N-VA	fill ex room
XCE.73.T1.9	N-VII, VB	fill ex room
XCE.73.T1.9.32	N-VII, VB	room without door
XCE.73.T1.9A	N-VII, VB	fill ex room
XCE.73.T1.10	N-VII, VB	fill ex room
XCE.73.T1.10.32A	N-VII	room without door
XCE.73.T1.10.33A	N-VII	room without door
XCE.73.T1.10.34A	N-VII	room without door
XCE.73.T1.10.38	N-VII	room without door
XCE.73.T1.10.39A	N-VII	room without door
XCE.73.T1.11	N-VII	courtyard
XCE.73.T1.11.32B	N-VII	room without door, floor
XCE.73.T1.11.32C	N-VII	room without door, floor
XCE.73.T1.11.33B	N-VII	room without door, floor
XCE.73.T1.11.34B	N-VII	room without door, floor
XCE.73.T1.11A	N-VII, VB	fill ex room
XCE.73.T1.12	N-VII	courtyard
XCE.73.T1.12.32C	N-VII	room without door, floor
XCE.73.T2.1	N-VA.2	fill ex room
XCE.73.T2.1.2	N-VA.2	fill ex room
XCE.73.T2.2	N-VA.2	fill ex room
XCE.73.T2.3	N-VA	outside surface
XCE.73.T2.3A	N-VA	fill ex room
XCE.73.T2.4	N-VA	fill ex room
XCE.73.T2.4A	N-VA	fill ex room
XCE.73.T2.4A.23	indeterminable	intrusive pit
XCE.73.T2.4B	N-VA	fill ex room
XCE.73.T2.4B.25	N-VA.4	outside hearth
XCE.73.T2.4C	N-VA	fill ex room
XCE.73.T2.5	N-VA	fill ex room
XCE.73.T2.6	N-VA	fill ex room
XCE.73.T2.7	N-VA	fill ex room
XCE.73.T2.8	N-VA	fill ex room
XCE.73.T2.9	N-VB–VA	fill ex room
XCE.73.T2.10	N-VB–VA	fill ex room
XCE.73.T2.11	N-VB–VA	fill ex room
XCE.73.T2.12	N-VII, VB	rubble fill
XCE.73.T2.13	N-VII, VB	rubble fill
XCE.73.T2.14	N-VII	fill ex room
XCE.73.T3.1	N-VA.3	fill ex room
XCE.73.T3.1.20	N-VA.4	outside hearth
XCE.73.T4.1	N-VII, VB	fill ex room
XCE.73.T4.2	N-VII, VB	fill ex room
XCE.73.T4.3	N-VII	fill ex room
XCE.73.T5.3	N-VA	fill ex room
XD.70.1	indeterminable	mound surface wash
XD.70.2	indeterminable	mound surface wash
XD.70.T1.2	indeterminable	mound surface wash
XD.70.T1.2.1	N-VII	human burial
XD.70.T1.2-1	indeterminable	unsealed fill
XD.70.T1.2-2	indeterminable	unsealed fill
XD.70.T1.2-3	indeterminable	unsealed fill
XD.70.T1.2-4	N-VII, VB	fill ex room
XD.70.T1.3	indeterminable	unsealed fill
XD.70.T1.3.1	N-VII	fill ex room
XD.70.T2.2	indeterminable	mound surface wash
XD.70.T2.3	N-VII, VB	fill ex room
XD.70.T2.3.1	N-VII, VB	fill ex room
XD.70.T2.3.2	after N-VA.1	intrusive pit
XD.71.1.43	N-VII, VB	courtyard
XD.71.1.44	N-VII, VB	fill ex room
XD.71.1.45	after N-VA.1	intrusive pit
surf.68	indeterminable	mound surface wash

Bibliography

Adams, R. McC.
1981 *Heartland of Cities: Surveys of Ancient Settlement and Land Use on the Central Floodplain of the Euphrates*. Chicago: University of Chicago Press.

Adams, R. McC., and H. J. Nissen
1972 *The Uruk Countryside*. Chicago: University of Chicago Press.

Amiran, R.
1973 "A Note on the Tepe Yahya Statuette." *Iran* 11:184
1976 "More About the Chalcolithic Culture of Palestine and Tepe Yahya." *Israel Exploration Journal* 26(4):157–162.

Anderson, S. C.
1968 "Zoogeographic Analysis of the Lizard Fauna of Iran." In *The Land of Iran. The Cambridge History of Iran*, ed. W. B. Fisher, 305–371. Cambridge: The University Press.
1974 "Preliminary Key to the Turtles, Lizards, and Amphisbaenians of Iran." *Fieldiana: Zoology* 65(4):27–44.

Beale, T. W.
1971 "The Fifth and Fourth Millennia B.C. at Tepe Yahya: A Study of Prehistoric Trade and Cultural Contact in Southern Iran." B.A. honors thesis, Department of Anthropology, Harvard University.
1973 "Early Trade in Highland Iran: A View from a Source Area." *World Archaeology* 5(2):133–148.
1976 "Tepe Yahya Project: Soghun Valley Survey." *Iran* 14:174–175.
1978 "Tepe Yahya: The Early Periods." Ph.D. dissertation, Department of Anthropology, Harvard University.

Berthoud, T., R. Besenal, F. Cesbron, S. Cleuziou, M. Pechoux, J. Françaix, and J. Liszak-Hours
1978 "The Early Iranian Metallurgy: Analytical Study of Copper Ores from Iran." *Archaeophysika*, Proceedings of the 18th International Symposium on Archaeology and Archaeological Prospection 10.

Berthoud, T., and J. Françaix
1980 "Contribution à l'étude de la metallurgie de Suse aux IVième et IIIième millenaires." Division de Chimie, Centre d'Études Nucleaires de Fontenay-aux-Roses.

Bobek, H.
1955 "Klima und Landschaft Irans in vor- und frühgeschichtlicher Zeit." *Geographischer Jahresbericht aus Österreich* 25(1953–1954):1–42.

Bonine, M. E.
1982 "From *Qanat* to *Kort*, Traditional Irrigation Terminology and Practices in Central Iran." *Iran* 20:145–159.

Bottema, S.
1975 "The Interpretation of Pollen Spectra from Prehistoric Settlements (with special attention to Liguliflorae)." *Palaeohistoria* 17:18–35.

Bowen-Jones, H.
1968 "Agriculture." In *The Land of Iran. The Cambridge History of Iran*, ed. W. B. Fisher, 565–598. Cambridge: The University Press.

Burton-Brown, T.
1951 *Excavations in Azerbaijan, 1948*. London: John Murray.

Busche, D., J. Grunert, W. Haars, H. Hagedorn
1977 "The Pleistocene Glaciation of the Shir-Kuh Mountains (Central Iran)." Paper presented at the 10th INQUA Congress, Birmingham, Great Britain.

Caldwell, J. R.
1967 *Investigations at Tal-i-Iblis*. Illinois State Museum Preliminary Reports 9. Springfield: Illinois State Museum Society.
1968 "Tal-i-Iblis and the Beginning of Copper Metallurgy in the Fifth Millennium." *Archaeologia Viva* 1:145–150.

Cardi, B. de
1970 *Excavations at Bampur. A Third Millennium Settlement in Persian Baluchistan*. Anthropological Papers of the American Museum of Natural History 51 (3). New York.

Casal, J.-M.
1961 *Fouilles de Mundigak*. Mémoires de la Délégation Archéologique Française en Afghanistan 17. Paris.

Chase, D. W., G. Fehérvári, and J. R. Caldwell
1967 "Reconnaissances in the Bard Sir Valley." In *Investigations at Tal-i Iblis*, ed. J. R. Caldwell. Illinois State Museum Preliminary Reports 9:73–107. Springfield.

Clarke, D. L.
1968 *Analytical Archaeology*. London: Methuen.

Coghlan, H. H.
1942 "Some Fresh Aspects of the Prehistoric Metallurgy of Copper." *The Antiquities Journal* 22(1):22–38.

1962 "A Note on Native Copper: Its Occurrences and Properties." *Proceedings of the Prehistoric Society* 28:55–67.

Contenau, G., and R. Ghirshman
1935 *Fouilles du Tepe-Giyan*. Paris: Paul Geuthner.

Corbet, G. B.
1978 *The Mammals of the Palaearctic Region: A Taxonomic Review*. London: British Museum.

Costantini, L.
1984a "The Beginning of Agriculture in the Kachi Plain: the Evidence of Mehrgarh." In *South Asian Archaeology 1981*, ed. B. Allchin. Cambridge: The University Press.
1984b "The Study of Palaeoethnobotanical Remains from Settlements in the Soghun and Dolatabad Valleys, Iran." Preliminary manuscript prepared for C. C. Lamberg-Karlovsky, Department of Anthropology, Harvard University.

Cowgill, G. L.
1975 "On Causes and Consequences of Ancient and Modern Population Changes." *American Anthropologist* 68:177–181.

Deetz, J.
1960 "An Archaeological Approach to Kinship Change in Arikara Culture." Ph.D. dissertation, Department of Anthropology, Harvard University.

Dittman, R.
1984 *Eine Randebene des Zagros in der Frühzeit*. Berlin: Dietrich Reimer Verlag.

Dollfus, Geneviève
1971 "Les fouilles à Djaffarabad de 1969 à 1971." *Cahiers de la Délégation Archéologique Française en Iran* 1:17–162.
1975 "Les fouilles à Djaffarabad de 1972 à 1974, Djaffarabad, périodes I & II." *Cahiers de la Délégation Archéologique Française en Iran* 5:11–220.
1978 "Djaffarabad, Djowi, Bendebal: Contribution à l'étude de la Susiane au Vè. Millénaire et au début du IVè. Millénaire." *Paléorient* 4:141–167.
1983a "Tépé Djowi: contrôle stratigraphique, 1975." *Cahiers de la Délégation Archéologique Française en Iran* 13:17–131.
1983b "Tépé Bendebal, travaux 1977, 1978." *Cahiers de la Délégation Archéologique Française en Iran* 13:133–275.

Durante, S.
1979 "Marine Shells from Bala Kot, Shahr-i Sokhta and Tepe Yahya. Their Significance for Trade and Technology in Indo-Iran." In *South Asian Archaeology*, 275–316. Naples: Istituto Universario Orientale.

Durkheim, E.
1933 *The Division of Labor in Society*. Glencoe: The Free Press.

Dyson, R. H.
1966 "Problems in the Relative Chronology of Iran, 6,000–2,000 B.C." In *Chronologies in Old World Archaeology*, ed. R. W. Ehrich, 215–256. Chicago: University of Chicago Press.

Egami, N., and S. Masuda
1962 "The Excavations of Tall-i-Bakun, 1956." *Marv Dasht I*. Tokyo: Yamakawa Publishing Co.

Egami, N., and T. Sono
1962 "The Excavations at Tall-i-Gap, 1959." *Marv Dasht II*. Tokyo: Yamakawa Publishing Co.

Fairbridge, R., and C. Hillaire-Marcel
1977 "An 8,000-yr Palaeoclimatic Record of the 'Double-Hale' 45-yr Solar Cycle." *Nature* 268:413–416.

Fairservis, W. A., Jr.
1956 *Excavations in the Quetta Valley, West Pakistan*. New York: Anthropological Papers of the American Museum of Natural History 45.

Finley, M. I.
1973 *The Ancient Economy*. Berkeley: University of California Press.

Fitz, William
1971 "A Report on Recently Discovered Cairns, Cave Graves, Rock Art, and a Possible Dakmeh from Southeastern Iran." B.A. honors thesis, Department of Anthropology, Harvard University.

Flannery, K. V.
1972 "The Origins of the Village as a Settlement Type in Mesoamerica and the Near East: a Comparative Study." In *Man, Settlement, and Urbanism*, ed. P. J. Ucko, R. Tringham, and G. W. Dimbleby, 23–53. London: Duckworth.

Fukai, S., K. Horiuchi, and T. Matsutani
1973 *The Excavation at Tall-i Mushki*. Tokyo: University of Tokyo Institute of Oriental Culture.

Ganji, M. H.
1968 "Climate." In *The Land of Iran. The Cambridge History of Iran*, ed. W. B. Fisher, 212–249. Cambridge: The University Press.

Ghirshman, R.
1938 *Fouilles de Sialk*. Paris: Paul Geuthner.

Glanzman, W. D.
1983 "Xeroradiographic Examination of Pottery Manufacturing Techniques: A Test Case from the Baq' ah Valley, Jordan." *MASCA Journal* 2(6):163–169.

Glanzman, W. D., and S. J. Fleming
1985 "Ceramic Technology at Prehistoric Ban Chiang,

Thailand: Fabrication Methods." *MASCA Journal* 3(4):114–121.

Goff, C.
1964 "Excavations at Tall-i-Nokhodi, 1963." *Iran* 2:41–52.

Gould, S. J.
1982 *The Panda's Thumb*. New York: W. W. Norton.

Gremliza, F. G. L.
1962 *Ecology of Endemic Diseases in the Dez Irrigation Pilot Area: A Report to the Khuzestan Water and Power Authority and Plan Organization, Government of Iran*. New York: Development and Resources Corp.

Hakemi, A.
1970 "Shahdad." *Iran* 8:187–188.
1976 "Découverte d'une civilisation préhistorique à Šahdad au bord ouest du Lut, Kerman." In *Memorial Volume of the 6th International Congress of Iranian Art & Archaeology, Oxford, September 11–16th, 1972*, ed. M. Y. Kiani, 131–149. Teheran: Iranian Centre for Archaeological Research.

Hauptmann, A.
1980 "Zur frühbronzezeitlichen Metallurgie von Shahr-i-Sokhta (Iran)." *Der Anschnitt Zeitschrift für Kunst und Kultur im Bergbau* 2–3:55–61.

Hedrick, U. P., ed.
1919 "Sturtevant's Notes on Edible Plants." *Report of the New York Agricultural Experiment Station for the Year 1919*, vol. 2. Albany: J. B. Lyon Company.

Herrmann, G.
1968 "Lapis Lazuli: the Early Phases of its Trade." *Iraq* 30(1):21–57.

Heskel, D.
1981 "The Development of Pyrotechnology in Iran during the Fourth and Third Millennia B.C." Ph.D. dissertation, Department of Anthropology, Harvard University.

Heskel, D., and C. C. Lamberg-Karlovsky
1980 "An Alternative Sequence for the Development of Metallurgy: Tepe Yahya, Iran." In *The Coming of the Age of Iron*, eds. T. A. Wertime and J. D. Muhly, 229–266. New Haven: Yale University Press.

Hole, F.
1977 *Studies in the Archaeological History of the Deh Luran Plains: The Excavations of Chogha Sefid*. Memoirs of the Museum of Anthropology 9. Ann Arbor: University of Michigan Press.

Hole, F., K. V. Flannery, and J. A. Neely
1969 *Prehistory and Human Ecology of the Deh Luran Plain: An Early Village Sequence from Khuzistan, Iran*. Memoirs of the Museum of Anthropology 1. Ann Arbor: University of Michigan Press.

Huckreide, V. R.
1961 "Jüng-Quartar und End-Mesolithikum in der Provinz Kerman (Iran)." *Eiszeitalter und Gegenwart* 12:26–42.

Hüe, F., and R. D. Étchécopar
1970 *Les Oiseaux du Proche et du Moyen Orient*. Paris: Éditions N. Boubée.

Iran Ministry of Mining and Transportation
1969 *Geological Survey of Iran*. Teheran.

Jacobs, L.
1979 "Tell-i Nun: Archaeological Implications of a Village in Transition." In *Ethnoarchaeology*, ed. C. Kramer, 175–191. New York: Columbia University Press.

Jarrige, J.-F.
In press "The Beginning of Pottery in Baluchistan." In Beatrice di Cardi Felicitation volume, ed. E. C. L. During-Caspers.

Jarrige, J.-F., and M. Lechevallier
1980 "Les Fouilles de Mehrgarh, Pakistan: Problèmes Chronologique." *Paléorient* 6:253–258.

Johnston, R. H., and R. E. Alexander
1982 "Xeroradiography of Ancient Objects: A New Imaging Modality." In *Archaeological Ceramics*, ed. J. Olin and A. D. Franklin, 145–154. Washington, D.C.: Smithsonian Institution Press.

Kamilli, D., and C. C. Lamberg-Karlovsky
1979 "Petrographic and Electron Microprobe Analysis of Ceramics from Tepe Yahya, Iran." *Archaeometry* 21(1):47–59.

Kantor, H.
1985 "Chogha Mish." *The Oriental Institute 1983–84 Annual Report*, 25–30. Chicago: Oriental Institute.

Kehl, G. L.
1943 *The Principles of Metallographic Laboratory Practice*. New York: McGraw-Hill.

Kenyon, K.
1960 *Archaeology in the Holy Land*. 2nd ed. New York: Praeger.

Klein, J., J. C. Lerman, P. E. Damon, and E. K. Ralph
1982 "Calibration of Radiocarbon Dates: The Tables Based on the Consensus Data of the Workshop on Calibrating the Radiocarbon Time Scale." *Radiocarbon* 124(2):103–150.

Kohl, P. L.
1974 "Seeds of Upheaval: The Production of Chlorite at Tepe Yahya and an Analysis of Commodity Production and Trade in Southwest Asia in the

Mid-Third Millennium." Ph.D. dissertation, Department of Anthropology, Harvard University.

1975 "Carved Chlorite Vessels: A Trade in Finished Commodities in the Mid-Third Millennium." *Expedition* 18(1):18–31.

1978 "The Balance of Trade in Southwestern Asia in the Mid-Third Millennium B.C." *Current Anthropology* 19(3):463–492.

Kohl, P. L., G. Harbottle, and E. V Sayre

1980 "Physical and Chemical Analyses of Soft Stone Vessels from Southwest Asia." *Archaeometry* 21(2):131–159.

Kramer, C.

1976 "Ethnoarchaeology in a Kurdish Village." Paper presented at the annual meeting of the American Anthropological Association, Washington, D.C.

1979 "An Archaeological View of a Contemporary Kurdish Village: Domestic Architecture, Household Size, and Wealth." In *Ethnoarchaeology*, ed. C. Kramer, 139–163. New York: Columbia University Press.

1982 *Village Ethnoarchaeology: Rural Iran in Archaeological Perspective*. New York: Academic Press.

Krinsley, D. B.

1970 *A Geomorphological and Paleoclimatological Study of the Playas of Iran*. 2 parts. AFCRL-70-0503. Washington, D.C.: U.S. Government Printing Office.

Kuhle, M.

1976 "Beiträge zur Quartärmorphologie SE-Iranischer Hochgebirge: die quartäre Vergletscherung des Kuh-i-Jupar." *Göttinger Geographische Abhandlung* 67.

Ladjevardi, Y.

1976 "Baghun Village Survey, Tepe Yahya, August 1975." Paper on file with C. C. Lamberg-Karlovsky, Peabody Museum, Harvard University.

Lamberg-Karlovsky, C. C.

1968 "Survey and Excavations in the Kerman Area." *Iran* 6:167–168.

1969a "Further Notes on the Shaft-Hole Pick-Axe from Khurab Makrän." *Iran* 7:163–168.

1969b "Excavations at Tepe Yahya." *Iran* 7:184–186.

1970a "Excavations at Tepe Yahya: 1969." *Iran* 8:197–199.

1970b *Excavations at Tepe Yahya, Iran, 1967–1969*. American School of Prehistoric Research, Bulletin 27. Cambridge: Peabody Museum, Harvard University. Asia Institute, Monograph 1. Shiraz, Iran: Pahlavi University.

1971a "The Yahya Project." *Iran* 9:182–183.

1971b "The Proto-Elamite Settlement at Tepe Yahya." *Iran* 9:87–96.

1972 "Tepe Yahya, 1971. Mesopotamia and the Indo-Iranian Borderlands." *Iran* 10:89–100.

1973 "Urban Interactions on the Iranian Plateau: Excavations at Tepe Yahya, 1967–1973." Albert Reckitt Archaeological Lecture 1973, *Proceedings of the British Academy* 59:282–319. London: Oxford University Press.

1974 "Tepe Yahya Project." *Iran* 12:228–231.

1976 "The Tepe Yahya Project: 1975." *Iran* 14.

Lamberg-Karlovsky, C. C., and J. Humphries

1968 "The Cairn Burials of Southeastern Iran." *East and West* (n.s.) 18(3–4):269–276.

Lamberg-Karlovsky, C. C., and M. Lamberg-Karlovsky

1971 "An Early City in Iran." *Scientific American* 224(6):102–111.

Lamberg-Karlovsky, C. C., and R. H. Meadow

1970 "The Neolithic at Tepe Yahya: A Unique Female Figurine." *Archaeology* 23(1):12–17.

Lamberg-Karlovsky, C. C., and D. Schmandt-Besserat

1977 "An Evaluation of the Bampur, Khurab, and Chah Hussein Collections in the Peabody Museum; Relations with Tepe Yahya." In *Mountains and Lowlands: Essays in the Archaeology of Greater Mesopotamia*, eds. L. Levine and T. C. Young, Jr. *Bibliotheca Mesopotamica* 7:113–134. Malibu: Undena Publications.

Lamberg-Karlovsky, C. C., and M. Tosi

1973 "Tracks on the Earliest History of the Iranian Plateau: Shahr-i Sokhta and Tepe Yahya." *East and West* 23(1–2):21–57.

Langsdorff, A., and D. McCown

1942 *Tall-i-Bakun A*. Oriental Institute Publications 59. Chicago: University of Chicago Press.

Lay, D. M.

1967 "A Study of the Mammals of Iran." *Fieldiana: Zoology* 54:1–282.

LeBlanc, S.

1971 "An Addition to Naroll's Suggested Floor Area and Settlement Population Relationship." *American Antiquity* 36(2):210–211.

Lloyd, S.

1982 "Archaeological Retrospect 4." *Antiquity* 56 (218):181–188.

Lloyd, S., and F. Safar

1948 "Eridu. A Preliminary Communication on the Second Season's Excavations, 1948–49." *Sumer* 6:115–127.

Longacre, W. A.

1970 *Archaeology as Anthropology: A Case Study*. Anthropological Papers of the University of Arizona 17. Tucson: University of Arizona Press.

1974 "Models of Cultural Process. Testing Hypotheses: Suggestions from Southwestern Archaeology." In *Reconstructing Complex Societies*, ed. C. B. Moore. Supplement to the Bulletin of the American Schools of Oriental Research 20:29–40.

MacDonald, M. M. A.
1979 "An Examination of Mid-Holocene Settlement and Patterns in the Central Zagros Regions of Western Iran," Ph.D. dissertation, University of Toronto.

Marechal, J. R.
1958 "Étude sur les proprietés mécaniques de cuivres à l'arsenic." *Metaux: Corrosion-Industries* 33(397):377–383.

Meadow, R. H.
1968 "Survey, 1967. The 1967 Harvard University Archaeological Expedition to Southeastern Iran and a General Consideration of Iranian Prehistory." B.A. honors thesis, Department of Anthropology, Harvard University.
1973 "A Chronology for the Indo-Iranian Borderlands and Southern Baluchistan, 4,000–2,000 B.C." In *Radiocarbon and Indian Archaeology*, ed. D. P. Agrawal and A. Ghosh. Bombay: Tata Institute.
1981 "Faunal Remains from Mehrgarh: Early Cattle Domestication in South Asia." In *South Asian Archaeology 1979*, ed. H. Hartel, 143–179. Berlin: Dietrich Reimer Verlag.
In press "Faunal Exploitation Patterns in Eastern Iran and Baluchistan: A Review of Recent Investigations." In *Orientalia Iosephi Tucci Memoriae Dictata*, ed. G. Gnoli. Rome: Instituto Italiano per il Medio ed Estremo Oriente.

Michael, H., and E. K. Ralph, eds.
1971 *Dating Techniques for the Archaeologist*. Cambridge: MIT Press.

Miroschedji, P. de
1973 "Prospections archéologiques dans les vallées de Fasa et de Darab (Rapport Preliminaire)." *Proceedings of the 1st Annual Symposium of Archaeological Research in Iran* (November 1972). Teheran: Ministry of Culture and Arts, National Research Centre for History of Art and Archaeology.

Misonne, X.
1959 *Analyse Zoogéographique des Mammifères de l'Iran*. Mémoires, deuxième série, fasc. 59. Bruxelles: Institut Royal des Sciences Naturelles de Belgique.

Mortensen, P.
1974 "A Survey of Prehistoric Settlements in Northern Luristan." *Acta Archaeologica* 45:20–48.

Munsell, A. H.
1961 *A Color Notation. An Illustrated System Defining All Colors and Their Relations by Measured Scales of Hue, Value, and Chroma*. 11th ed. Baltimore: Munsell Color Co.

Naroll, R.
1962 "Floor Area and Settlement Population." *American Antiquity* 27(4):587–589.

Neghaban, E.
1977 "Preliminary Report of Qazvin Expedition: Excavation of Zaghe, Qabristan, Sagzabad, 1971–73." *Marlik* 2:26–44.

Nyerges, A. E.
1977 "Traditional Pastoralism in the Middle East: The Ecology of Domesticated Sheep and Goats in the Turan Biosphere Reserve, Iran." M.A. thesis, Department of Anthropology, University of Pennsylvania.

Oates, J.
1973 "Early Farming Communities in Mesopotamia." *Proceedings of the Prehistoric Society* 39:147–181.

Oates, J., T. E. Davidson, D. Kamilli, and H. McKerrell
1977 "Seafaring Merchants of Ur?" *Antiquity* 51:221–234.

Odum, E. P.
1971 *Fundamentals of Ecology*. 3rd ed. Philadelphia: W. B. Saunders.

Perrot, J.
1971 "Les Recherches à Djaffarabad et dans les Couches Profondes de l'Acropole de Suse," *Délégation Archéologique Française en Iran* 1.

Piggott, S.
1965 *Ancient Europe*. Edinburgh: Edinburgh University Press.

Piperno, M.
1973 "The Lithic Industry of Tepe Yahya. A Preliminary Typological Analysis." *East and West* 23(1–2):59–74.

Potts, D. T.
1980 "Tradition and Transformation: Tepe Yahya and the Iranian Plateau During the Third Millennium B.C." Ph.D. dissertation, Department of Anthropology, Harvard University.

Prickett, M.
1972 "Archaeological Evidence for Settlement in Southeastern Iran." Paper presented at the 6th International Congress of Iranian Art and Archaeology. Oxford, England, September 1972.
1976 "Tepe Yahya Project: Upper Rud-i Gushk Survey." *Iran* 14:175–176.
1979 "Settlement and the Development of Agriculture in the Rud-i Gushk Drainage, Southeastern

Iran." In *Akten des VII. Internationalen Kongresses für Iranische Kunst und Archäologie, Archäologische Mitteilungen aus Iran* 6:47–56. Berlin.
1985 "Man, Land and Water: Settlement Distribution and the Development of Irrigation Agriculture in the Upper Rud-i Gushk Drainage, Southeastern Iran." Ph.D. dissertation, Department of Anthropology, Harvard University.

Raikes, R. L.
1965a "The Ancient Gabarbands of Baluchistan," *East and West* (n.s.) 15(1–2):26–35.
1965b "Physical Environment and Human Settlement in Prehistoric Times in the Near and Middle East." *East and West* (n.s.) 15(3–4):179–193.
1968 "Archaeological Explorations in Southern Jhalawan and Las Bela, Pakistan." *Origini* 2:103–171.

Renfrew, C.
1972 *The Emergence of Civilization*. London: Methuen.

Renfrew, J. M.
1973 *Palaeoethnobotany: The Prehistoric Food Plants of the Near East and Europe*. London: Methuen.

Rodgers, B.
1964 *The Nature of Metals*. Cambridge: MIT Press.

Russell, J. C.
1958 *Late Ancient and Medieval Population*. Transactions, American Philosophical Society (n.s.) 48(3). Philadelphia.

Rye, O.
1971 *Pottery Technology: Principles and Reconstruction*. Washington, D.C.: Taraxacun.

Sabzehei, M.
n.d. "Structural Environment of Coloured Mèlange —Northeast Dowlatabad Area." Map, Geological Survey of Iran (ca. 1972). Adapted in P. L. Kohl 1974, p. 102.

Sadjjadi, M., and H. T. Wright
1976 "Archaeological Survey in the Qobaira Area, Province of Kerman." Manuscript, Iranian Center for Archaeological Research, 1976–2535.

Sahlins, M.
1972 *Stone Age Economics*. Chicago: Aldine-Atherton.

Sajjadi, S. M. S.
1979 "Prehistoric Settlements in the Bardsir Plain, Southeastern Iran." Paper presented for the *Laurea in Lingua e Civiltà Orientali* degree, Istituto Universitario Orientale, Naples.

Salvatori, S., and M. Vidale
1982 "A Brief Surface Survey of the Protohistoric Site of Shahdad (Kerman, Iran): Preliminary Report." *Revista di Archeologia* 6:5–10.

Sarraf, M. R.
1981 *Die Keramik von Tell-i Iblis*. Berlin: Dietrich Reimer Verlag.

Schacht, R. M.
1984 "The Contemporaneity Problem." *American Antiquity* 49(4):678–695.

Schmandt-Besserat, D.
1977 "An Archaic Recording System and the Origin of Writing." *Syro-Mesopotamian Studies* 1 (2). Malibu: Undena Publications.

Schoenwetter, J., and A. E. Dittert, Jr.
1968 "An Ecological Interpretation of Anasazi Settlement Patterns." In *Anthropological Archeology in the Americas*, ed. B. J. Meggars. Washington: Anthropological Society of Washington.

Schurenberg, H.
1963 "Über Iranische Kupfererzvorkommen mit Komplexen Kobald-Nickelerzen." *Jahrbuch Mineralische Abhandlung* 99(2):200–230.

Selimkhanov, I. R.
1962 "Spectral Analysis of Metal Articles from Archaeological Monuments of the Caucasus." *Proceedings of the Prehistoric Society* 28:68–79.

Sherratt, A.
1980 "Water, Soil and Seasonality in Early Cereal Cultivation." *World Archaeology 11:313–330.*

Skinner, B., and F. Luce
1971 "Stabilities and Compositions of Alpha-Domeykite and Algodonite." *Economic Geology* 27:117–129.

Smith, C. S.
1965 "Metallographic Study of Early Artifacts Made From Native Copper." *Actes du XIe Congres International d'Histoires des Sciences* 6:237–243. Warsaw.

Snead, R. E., and P. Durgin
1975 "The Physical Geography of the Soghun Valley, Southeastern Iran." Report on file with C. C. Lamberg-Karlovsky, Department of Anthropology, Harvard University.

Solomon, A. M.
1975 "Pollen Analysis of Samples from Southern Iran." Report on file with C. C. Lamberg-Karlovsky, Department of Anthropology, Harvard University.

Stein, M. A.
1937 *Archaeological Reconnaissances in North-Western India and South-Eastern Iran*. London: Macmillan.

Sumner, W. M.
1972 "Cultural Development in the Kur River Basin, Iran. An Archaeological Analysis of Settlement

Patterns." Ph.D. dissertation, Department of Anthropology, University of Pennsylvania.

1979 "Early Settlements in Fars Province, Iran." In *Mountains and Lowlands: Essays in the Archaeology of Greater Mesopotamia*, ed. L. Levine and T. C. Young, Jr. *Bibliotheca Mesopotamica* 7:291–305. Malibu: Undena Publications.

1977 "Estimating Population by Analogy: An Example." In *Ethnoarchaeology*, ed. C. Kramer, 164–174. New York: Columbia University Press.

Tosi, M.

1976 "Tepe Yahya Project: Palaeobotanical Survey." *Iran* 14:173–174.

UNESCO/FAO

1969 "Vegetation Map of the Mediterranean Zone" (2 Maps and Explanatory Notes). Paris: UNESCO/FAO.

Vandiver, P.

1985 "Sequential Slab Construction: A Near Eastern Pottery Production Technology, 8000–3000 B.C." Ph.D. dissertation, Department of Materials Science and Engineering, Massachusetts Institute of Technology.

Vidali, M. L., E. Vidali, and C. C. Lamberg-Karlovsky

1976 "Prehistoric Settlement Patterns Around Tepe Yahya: A Quantitative Analysis." *Journal of Near Eastern Studies* 35(4):237–250.

Vidali, M. L., and M. Tosi

1973 "Shahr-i Sokhta and Tepe Yahya: Tracks on the Earliest History of the Iranian Plateau." *East and West* 23(1–2):21–53.

Voigt, Mary M.

1976 "Hajji Firuz Tepe: An Economic Reconstruction of a Sixth Millennium Community in Western Iran." Ph.D. dissertation, University of Pennsylvania.

Watson, P. J.

1979 *Archaeological Ethnography in Western Iran*. Tucson: University of Arizona Press.

Weiss, H.

1977 "Periodization, Population and Early State Formation in Khuzistan." In *Mountains and Lowlands: Essays in the Archaeology of Greater Mesopotamia*, ed. L. Levine and T. C. Young, Jr. *Bibliotheca Mesopotamica* 7:347–369. Malibu: Undena Publications.

Whitehouse, D., and A. Williamson

1973 "Sasanian Maritime Trade." *Iran* 11:29–49.

Williamson, A.

1970 "Islamic Trade Routes in Southern Iran." *Iran* 8:206–207.

1971 "Tepe Dasht-i Deh." *Iran* 9:182–183.

1972a "Persian Gulf Commerce in the Sasanian Period and the First Two Centuries of Islam." *Bastan Chenassi va Honar-e Iran* 9–10:97–109, 142–151.

1972b "Regional Diversities in Mediaeval Persian Pottery in the Light of Recent Investigations." Paper presented at the 6th International Congress of Iranian Art and Archaeology. Oxford, England, September 1972.

1972c "Sirjan-i-Kuhna and Tepe Dasht-i-Deh." In *Excavations in Iran: The British Contribution*, ed. P. R. S. Moorey, 26–28. Oxford: Organizing Committee of the Sixth International Congress of Iranian Art and Archaeology (Oxford 1972).

1972d "The Yahya Project: Tepe Dasht-i Deh." *Iran* 10:177–178.

Woosley, A. I., and F. Hole

1978 "Pollen Evidence of Subsistence and Environment in Ancient Iran." *Paléorient* 4:59–70.

Wright, H. E., Jr., J. H. McAndrews, and W. van Zeist

1967 "Modern Pollen Rain in Western Iran and its Relation to Plant Geography and Quaternary Vegetational History." *Journal of Ecology* 55:415–443.

Wright, H. T.

1981 *An Early Town on the Deh Luran Plain. Excavations at Tepe Farukhabad*. Memoirs of the Museum of Anthropology, 13. Ann Arbor: University of Michigan Press.

Wright, H. T., and G. A. Johnson

1975 "Population, Exchange and Early State Formation in Southwestern Iran." *American Anthropologist* 77:269–289.

Wright, H. T., J. A. Neely, G. A. Johnson, and J. Speth

1975 "Early Fourth Millennium Developments in Southwestern Iran." *Iran* 13:129–148.

Wright, R. P.

1977 "Paleoethnobotany at Tepe Yahya—1973 Season." Term Paper for Anthropology 213. Manuscript on file with C. C. Lamberg-Karlovsky, Department of Anthropology, Harvard University.

Wulff, H. E.

1966 *The Traditional Crafts of Persia*. Cambridge: MIT Press.

Zeist, W. van

1967 "Late Quaternary Vegetation History of Western Iran." *Review of Palaeobotany and Palynology* 2:301–311.

1969 "Reflections on Prehistoric Environments in the Near East." In *The Domestication and Exploitation of Plants and Animals*, ed. P. J. Ucko and G. W. Dimbleby, 35–36. London: Duckworth.

Zeist, W. van, and S. Bottema

1982 "Vegetational History of the Eastern Mediterranean and the Near East during the Last 20,000 Years." In *Palaeoclimates, Palaeoenvironments and Human Communities in the Eastern Mediterranean Region in Later Prehistory*, ed. J. L. Bintliff and W. van Zeist. *British Archaeological Reports International Series* 133:277–321.

Zeist, W. van, R. W. Timmers, and S. Bottema
1968 "Studies of Modern and Holocene Pollen Precipitation in Southeastern Turkey." *Palaeohistoria* 14:19–39.

Zeist, W. van, H. Woldring, and D. Stapert
1975 "Late Quaternary Vegetation and Climate of Southeastern Turkey." *Palaeohistoria* 17:53–143.

Zohary, M.
1969 "The Progenitors of Wheat and Barley in Relation to Domestication and Agricultural Dispersal in the Old World." In *The Domestication and Exploitation of Plants and Animals*, ed. P. J. Ucko and G. W. Dimbleby, 47–66. London: Duckworth.
1973 *Geobotanical Foundations of the Middle East*. Stuttgart: Gustav Fischer Verlag.