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DECODING DESIGNS: THE LATE THIRD MILLENNIUM B.C. POTTERY FROM JEBEL QA'AQIR

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DECODING DESIGNS: THE LATE

THIRD MILLENNIUM B.C.

POTTERY FROM JEBEL QA^{c}AQIR

by

GLORIA ANNE LONDON

A Dissertation Submitted to the Faculty of the

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As members of the Final Examination Committee, we certify that we have read the dissertation prepared by Gloria Anne London

entitled Decoding Designs: The Late Third Millennium B.C. Pottery From Jebel Qa^{c}aqir

and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Philosophy.

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Final approval and acceptance of this dissertation is contingent upon the candidate's submission of the final copy of the dissertation to the Graduate College.

I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the dissertation requirement.

Dissertation Director

May 22, 1985
Date

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Signed: Gloria Anne London

DEDICATION

This study is dedicated to my mother whose dream to visit the Pyramids inspired me to study archaeology.

PREFACE

Many people have contributed to the work presented here. My interest in late third millennium B.C. studies began at the University of Leiden where, with H. J. Franken and J. Kalsbeek, I examined the Jericho material excavated by K. M. Kenyon. I later studied pottery from Lachish and Iskander at the Institute of Archaeology, London, thanks to the kindness of P. J. Parr. K. Prag kindly allowed me to examine the Iktenu pottery and D. Alon permitted me to see part of his Negev collection. These preliminary studies directed me to the Jebel Qa^{c}aqir repertoire excavated by W. G. Dever, who suggested that I study the assemblage in conjunction with my dissertation research. He most generously placed the entire collection, field notes and drawings at my disposal.

The Jebel Qa^{c}aqir project brought me to the University of Arizona where I have benefited from many new and exciting approaches to archaeological method and theory. In particular, I am indebted to W. A. Longacre for not only introducing me to ethnoarchaeology, but for enabling me to experience it for myself.

These words are hardly adequate to acknowledge the gratitude I wish to express to my many teachers who so willingly imparted their knowledge to me.

The help and support of many people contributed to this project and it is my pleasure to acknowledge their help. For financial support, it is with deep appreciation that I thank The American Schools of Oriental Research for awarding me the Kress Fellowship and a research grant from the Zion Research Foundation; the Lucius N. Littauer Foundation; the University of Arizona for awarding me a Summer Research Stipend and a Graduate Academic Scholarship; The Arizona State Museum; The Ministry of Education and Sciences of the Netherlands; the Maatschappij Tot Nut Der Israëlieten In Nederland; and the Hebrew Union College. The latter also provided work space at the Jerusalem School. In particular, I wish to thank Mr. Wm. Frost, Dr. M. Joukowsky, Mr. R. Scheurer, and Mr. H. Starr.

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ABSTRACT

The late third millennium B.C. in Israel until recently was known by funerary deposits only. At Jebel Qa^{c}aqir, the domestic and funerary remains provide an unprecedented assemblage and permit a reassessment of Early Bronze IV society and events culminating in the collapse of the Early Bronze III urban centers.

Historically, pottery studies have focused on chronological issues. After reviewing the history of ceramic analysis in Israel for the past one hundred years, the Jebel Qa^{c}aqir collection is presented. Variation in the manufacturing technique and incised patterns are described in detail for the purpose of identifying the work of individual potters. Ethnoarchaeological research of pottery production, especially the Filipino potters of Paradijon, provide the model for this analysis.

The nature of the late third millennium B.C. pastoral nomadic society is examined in terms of subsistence strategies and settlement distribution. Inferences regarding social organization drawn from mortuary practices, settlement types and organization of labor challenge the idea that an egalitarian society persisted.

Finally, these results provide a new perspective on the events following the collapse of the third millennium B.C. urban centers and the succeeding era of a non-sedentary lifestyle in Israel. The nomadic pastoralists are considered in their regional setting as an integral, indigenous part of Early Bronze Age society. Rather than viewing the pastoralists as a new phenomenon, they are considered as an ever-present characteric of the urban hinterland.

CHAPTER 1

INTRODUCTION

One of the outstanding features discovered by archaeologists in the ancient Near East is the repeated use of sites for millennia, resulting in the formation of tell deposits. Beginning perhaps as early as the Neolithic period, the great tells of ancient Israel were occupied with few interruptions for five thousand years.

The Early Bronze IV or Middle Bronze I period, dated to the end of the third millennium B.C., is one of the few exceptions to this settlement pattern.

Unlike the urban character of the EB II and III, settlements in the succeeding era shifted southward and eastward toward the hills, mountains, and more arid areas of today. This shift coincides with a changing political configuration in adjacent areas. In Egypt the Old Kingdom came to an end as did the Ur III dynasty of southern Mesopotamia, where the collapse was concomitant with the movement of the nomads identified as Amorites, as shown by textual evidence. While the collapse of the Third Dynasty of Ur cannot be ascribed to the Amorites or other outsiders, the demise in some way reflects internal struggles and instability throughout much of the Near East.

In the Levant, archaeological evidence pertaining to the end of the third millennium B.C. until recently was confined to funerary assemblages and the early survey work of Glueck (1934, 1935, 1939, 1951) in Transjordan. Settlement debris was sparsely attested and it is not surprising that the period was decreed a 'dark age' (Dever 1973b: 56).

The mystery of the period missing from the tells is slowly unraveling as a result of two recent developments. A shift in research strategy away from the lowland tells to the mountains and semi-arid zones has revealed the occupational remains of shallow one-period settlements as well as cemeteries.

The second major development results from the recent findings in Syria, specifically at the site of Tell Mardikh (Matthiae 1978; Mazzoni 1985) where the third millennium B.C. settlement continued to flourish into the second millennium B.C. without interruption. The discovery of the urban centers, in addition to the less permanent settlements of nomads, has changed the image of the late third millennium B.C. in Syria and, as such, alters any interpretation of historical events in Israel and Jordan. The presence of this viable community so close to Israel undoubtedly influenced events throughout the Levant and Jordan. This is not to imply Syrian domination or control, but rather a presence that could not be ignored. In this respect the relationship between Israel and Syria awaits further study as the Eblaite evidence unfolds.

For the region encompassed by Israel today, it was once assumed that the collapse of the Early Bronze (EB) III urban centers was the result of the nomadic incursions (Amiran 1969: 79; Kenyon 1966: 13-14), after which most of Israel was thought to have been abandoned. Because of the dearth of settlements in contrast with the vast funerary finds, Albright (1956: 83) and Kenyon (1966: 33) previously postulated a non-sedentary lifestyle. Our current state of knowledge challenges the notion that the country was void of population; instead we see that there was a shift of settlements to the present day marginal zones (Dever 1973b: 56) where village pastoral economies prevailed (Dever 1980c: 57).

That the nomads were responsible for the decline of EB III urban life has been recently questioned (Dever 1980c: 54; Kamp and Yoffee 1980: 85; Richard 1980: 8). Current theories on the collapse of ancient civilizations favor internal stress and failure to adapt to changes over external causes (Adams 1978; Culbert 1977; Yoffee 1979, 1982). This pattern might better explain the series of events culminating in the temporary demise of urban life in Israel, but this is not the subject of the present work.

The focus here is the nature of the succeeding EB IV or Middle Bronze (MB) I society as documented at the site of Jebel Qa^{c}aqir. This site, excavated by W.G. Dever (1972a) from 1967-1971, lies 12 km west of Hebron, where the Central Judaean Hills meet the rolling terrain of the Shephelah. This site includes a sprawling settlement and cemetery on the slopes above the valley, occupation/storage caves on the ridge with an enclosure wall, cairns, a kiln and many cup-marks carved into the outcropping bedrock.

The landscape of low mountains and gentle slopes supports the agricultural village Deir es-Samit. Local villagers discovered the site in 1967 when they brought deep ploughing equipment to the area to improve their fields. In the process, some of the tombs were robbed and the vessels appeared on the antiquities market; in this manner the site came to the attention of W. G. Dever, who subsequently conducted three salvage excavations under the auspices of Hebrew Union College.

Of the material culture, the pottery is by far the most abundant. Many of the vessels bear an incised decoration, well-known from other EB IV assemblages.

Various parts of the Jebel Qa^{c}aqir assemblage have been studied by Gitin (1975) and Dever (1981a). The present study deals with the pottery from the entire site and addresses several basic issues concerning the pottery and the people who made and used it, including:

1) the depositional history of the site;
2) a description of the ceramic manufacturing technique;
3) the significance of the variations in the incised designs;
4) the relationships among the vessels found in the different contexts and different caves;
5) the use of the site;
6) the nature of the society using the site.

A number of new techniques have been developed for this paper to approach these questions. Recent ethnoarchaeological research played a major role in formulating the research design. Unlike most archaeological excavations, at Jebel Qa^{c}aqir all sherds were saved. This complete evidence allows a quantitative analysis of the occurrence of vessel forms and designs which is necessary to test hypotheses concerning the manufacture, variability, use and deposition of the ceramics.

Before beginning the analysis of the Jebel Qa^{c}aqir material, it is important to place the study in context. For nearly one hundred years, ceramics have played a key role in archaeological research in Israel, where the emphasis has been on the significance of chronological changes detected in pottery forms and decoration. Ceramic chronologies are important for most ancient cultures and it was in

Israel that Petrie (1891) first devised this concept. In the Levant pottery was the sole means of establishing a relative chronology because of the absence of textual data. Accordingly, the emphasis of pottery studies has been on morphological and stylistic changes through time for the purpose of ordering and dating the material culture and associated remains.

In building this ceramic chronology, archaeologists such as Albright and Amiran among others have created a framework for tracing history and placing events, which serves as the basis for all subsequent pottery studies.

After a review of the history of ceramic analysis in Israel beginning over one hundred years ago, the Jebel Qa^{c}aqir assemblage is presented, along with an analysis of the variations detected in the ceramics. Finally, a re-assessment of the late third millennium B.C. in Israel concludes the study.

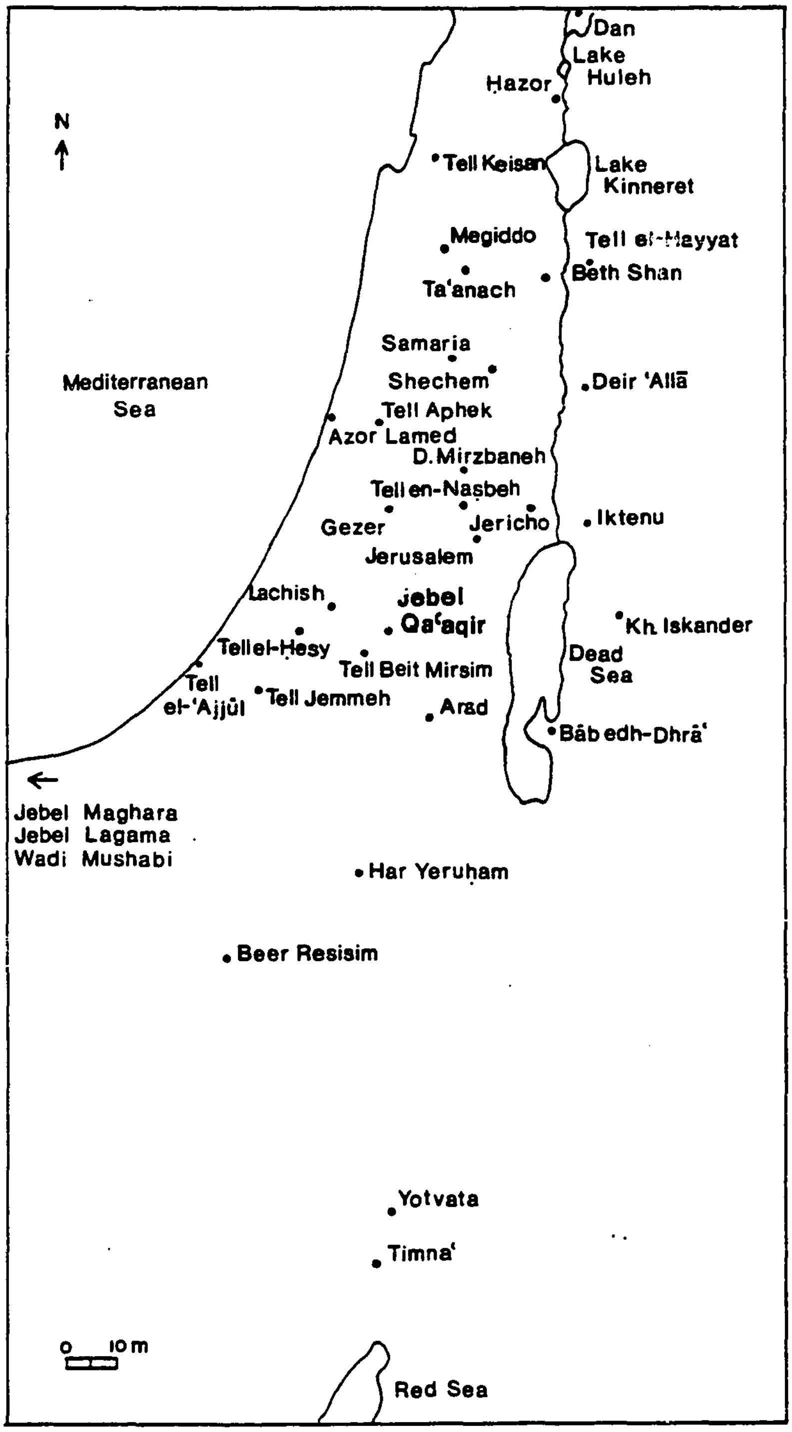


Fig. 1. Map of sites.

CHAPTER 2

A HISTORY OF CERAMIC ANALYSIS IN ISRAEL

> Since Petrie's publication of Tell el-Hesy in 1891, no apology for a study of ceramics has been necessary. (G. E. Wright 1937: 1)

Far from an apology for ceramic analysis, the purpose of this section is to present the history of the subject as practiced in Israel and some suggestions for new directions in its study. Wright opened his 1937 study of pottery with the above quotation and concluded it by declaring that not a single Early Bronze Age deposit remained undated and outside his typological sequence (Wright 1937: 81). The overriding concern with chronological problems dominated ceramic analysis from its inception at Tell el-Ḥesy (Petrie 1891) and remains the primary focus nearly a hundred years later. Emphasis on the finer, decorated wares, and a purely typological/chronological arrangement of utilitarian wares, has resulted in a negative connotation for pottery studies in general (Renfrew 1977: 3), although not among those working in Israel.

Within the past ten years, a few archaeologists have expanded their analyses of pottery to include inferences on non-chronological issues, and with that development has arisen an entirely new perspective on ceramics. Whereas the typological/chronological work stresses the commonality of pottery found throughout the country, the more recent approach attempts to identify and explain variability in the ceramic repertoire both within sites and among contemporaneous deposits on the regional level. Not only was homogeneity initially necessary for temporal synchronization, but it was commonly held that a country the size of Israel lacked the breadth for local variability (Macalister 1925: 63; Wright 1937: 15). This is no longer accepted, and archaeologists are defining with greater precision the nature of the local diversity. Thus far, however, no study has attempted to describe the variability exhibited in the contemporaneous pottery excavated at a single site, but the analysis of the late third millennium B.C. Jebel Qa^{c}aqir collection will serve as a test case for such an analysis. The research design for this project is presented following an assessment of the developments in ceramic studies in Israel over the past century.

Briefly, the history of ceramic analysis can be divided into five periods, paralleling more general trends in the growth of archaeological research. Initial investigations in the mid-nineteenth century involved survey work and the recognition that broken pottery fragments lay scattered throughout the country. The earliest phase ended with the brief, but inspirational appearance of W. M. Flinders

Petrie in 1890. His excavation at Tell el-Ḥesy demonstrated the chronological significance of stratified sherds. The Petrie era, sustained by "Petrie pups" once the master returned to Egypt, was superseded only by the demise of Turkish domination in the Levant and the start of the British Mandate period in 1920. It was also the year that W. F. Albright assumed the directorship of the American school of Oriental Research in Jerusalem.

The third phase of ceramic analysis, 1920-1955, is characterized by major archaeological excavations and the growth of American research and ceramic expertise. In 1948, with the establishment of the State of Israel, a local school developed alongside the American and European traditions. In the fifteen years following World War II, 1955-1970, the Israeli school matured, and with the greater number of excavations and the publications of earlier work delayed by the war, a change in course is detected. In addition to recognizing regional variability, the publication of the Samaria pottery stimulated a debate on excavation technique and ceramics.

Beginning in 1970, several pottery studies used methods not entirely unknown in earlier publications, but now oriented in part toward non-chronological issues. The study of the Deir ᶜAllā pottery provided a first glimpse of the potential of ceramic analysis by offering new techniques and solutions for well-worn problems. A major impact on general archaeological research strategies was the renewed work at the site of Gezer, which initiated a dialogue on excavation technique in Israel. The current methodological reappraisal of excavation strategies may eventually result in a new focus for pottery studies in exploring non-chronological aspects of ancient societies as suggested in the Jebel Qa^{c}aqir research design.

1840 - 1890

Exploration and Survey Work

Archaeological research in the Levant lagged behind in investigations of the antiquities of Egypt and Mesopotamia, where spectacular finds spurred nineteenth century exploration (G. Duncan 1928: 10; James 1965: 35). The Palestine Association in the UK, established in 1804 and disbanded in 1834, was later reconstituted in 1865 as the Palestine Exploration Fund (PEF) and represents the first society organized for the purpose of conducting exploration in the Levant (Bliss 1906: 255). Not until 1870 was the American Palestine Exploration Society organized, but it survived only seven years (*Ibid*.: 283). Unlike its American counterpart, the PEF was not a religious society (de Vaux 1970: 67). A major initial achievement of the PEF was *The Survey of Western Palestine, Jerusalem*, initiated by Charles W. Wilson (Palestine Exploration Quarterly 1979: 11) and completed by Charles W. Warren and Claude R. Conder (Warren and Conder 1884), and the Survey of Eastern Palestine (Conder 1889). This impressive project was accomplished despite poor funding, persistent disease, and fighting in the country (Palestine Exploration Quarterly 1979: 12). Conder, who at least had the companionship of his dog, suffered minimal funding, malaria, and wounds sustained in an attack by hostile natives (Elath 1965: 25).

Some have argued that the PEF might have developed more rapidly had excavations preceded the Survey (Bliss 1906: 231-2), but for their 100th anniversary, with the hindsight of too many poorly excavated tells, the Society was commended for conducting the general survey "though the temptation to begin to excavate at once was great" (James 1965: 35).

Early excavations

The first excavation of the modern era was in the Jerusalem area by Felicien de Saulcy in 1850-51 and 1863 for the primary purpose of collecting artifacts for the Louvre (Albright 1956: 26). Jerusalem presented an irresistable attraction, and the PEF was involved in excavations carried out by Warren beginning in 1867; and it is in the accounts of the Jerusalem tunnelling operation that drawings of sherds and pots were first presented (Warren and Conder 1884: 534). Warren (1869-70: 100) wrote: "It is desireable that instructions should be sent as to the style of pottery most worth keeping; at present all specimens are kept, whether Arabic, Christian, or otherwise."

Warren's popular work, Underground Jerusalem, refers to "ruins knee-deep in potsherds" (1876: 514), but he was not the first to notice this phenomenon. The survey work undertaken by Edward Robinson and Eli Smith and published in Biblical Researches in Palestine, Mount Sinai and Petraea (1841:314), includes an earlier reference to pottery and potsherds found on ancient sites in the Levant.

The report on the Jerusalem work includes an informative description of contemporary pottery manufacture in the city (Warren 1876: 514-518), and the excavated pottery was treated by Grenville Chester, who concentrated on the imported, decorated, and inscribed pieces. It was noted that the common wares were "undistinguishable for the different periods" (Chester 1884: 533). Homogeneity of domestic pottery is a theme not abandoned a century later.

The burgeoning study of ceramics in the Levant did not proceed without influence from events in Aegean archaeology. Troy was excavated in 1870, and later, in the publication of Myceneae, Schliemann (1878: 14) noted that superimposed deposits contained different wares and that similar 'Mycenaean' pottery was present at Troy, Attica, Egypt, and Cyprus (Ibid.: 65). In 1886 Furtwäengler and

Löeschcke produced their lavish study of decorated Aegean pottery and documented changes in design that bore chronological significance. Five years later, Sir Flinders Petrie realized the value of plain wares as a chronological indicator, based on his excavation at Tell el-Ḥesy.

The small number of nineteenth century archaeologists facilitated communication between Aegean and Near Eastern specialists, and the prompt publication of field work provided an ideal milieu for discussion and progress. The diversity of ceramic styles was understood to represent different ages, numerous centers of manufacture, and evidence of trade. For the purpose of chronologically linking material from widely separated sites, the commonality of decorated pieces was emphasized. In the Holy Land, chronology was reckoned according to the Old Testament, and early work centered on sites of Biblical interest such as Jerusalem (Bliss and Dickie 1898; Warren and Conder 1884). However, with the excavation of Tell el-Ḥesy, the first mound to be excavated in the Levant, a new chronometric gauge was created.

1890 - 1920

The Palestine Exploration Fund

W. M. Flinders Petrie was sent by the PEF to excavate Khirbet ᶜAjlan, thought to be biblical Eglon, but two reasons led him to concentrate his work elsewhere. Although his investigation of the surface at ᶜAjlan revealed no pre-Roman pottery, he was able to identify earlier wares at Tell el-Ḥesy, where a vertical section cut into the tell by stream action promised to quickly provide a full chronological sequence (Petrie 1890: 161; 163). By recognizing pottery similar to the pre-Roman wares of Egypt, Petrie at once could accommodate the Tell el-Ḥesy material in his system of sequence dating developed on the basis of Egyptian funerary ceramics and epigraphic data. Petrie devised this method for dating tomb material, the purpose of which was: "To express the time-range of each type of pottery and of other objects in the graves in terms of the scale of sequence of the tombs" (Petrie 1904: 129).

In the absence of epigraphic data, Petrie proposed that artifacts found in association in one grave be compared with those in other graves to establish a floating chronology (Ibid.: 128). Although Tell el-Ḥesy did not offer epigraphic verification of his scheme, it did provide a stratified sequence of plain and decorated wares enabling Petrie to develop fully the concept of the chronological value of domestic, undecorated pottery, which would come to serve as an alternative to the Old Testament dating system.

Petrie predicted that "in the future all tells and ruins of the country will reveal their age by the potsherds which cover them" (1890: 165), and in his survey of the country he was able to see the age of sites "without even dismounting" (Petrie 1904: 17). However, not everyone initially agreed that pottery was the "essential alphabet of archaeology in every land" (Ibid.: 16). Conder, who rarely recorded his own observations on pottery, and according to Bliss, seems not to have appreciated the differences between "ancient pottery" and Roman and Byzantine wares (Bliss 1906: 230 n. 1), questioned the pottery chronology (Conder 1890: 329). Renewed excavation at Tell el-Ḥesy, however, served to demonstrate that the sequence devised by Petrie was valid (Bliss 1898).

Petrie used pottery primarily as evidence of chronology, but his research was not restricted to a typological/chronological study and included investigations of trade and place of manufacture (Petrie 1918: 20). He considered the implications of similar pottery found at two contemporary sites versus dissimilar assemblages and the presence of traded wares and local production (Petrie 1904: 143-4). He criticized the dearth of information available on anything other than the decorated pottery of Egypt, Italy, and Greece (Ibid.: 17) and tried to correct this situation in his own publications.

Initially, Petrie's work required the recognition of features common to ceramics throughout the Levant, Egypt, and the Aegean, but he was sensitive to the local heterogeneity as best expressed by the undecorated wares. However, he advocated that for well-known periods only exceptional pottery should be published (1904: 49), and the recording system he devised, which was later completed by J. Garrow Duncan as the Corpus of Palestinian Pottery (1930), was designed to eliminate in future redundant publication of pottery types. The inadequacies in collecting all superficially similar vessels under one "type" are many, the most serious of which was the disregard for the heterogeneity and variability of vessel morphology, clay, and manufacture technique. Petrie and his contemporaries cannot be criticized for their methodology given the dearth of excavated sites and material. Pottery served as the only abundant artifact common to different sites and by concentrating on its homogeneity an outline of the temporal scheme was achieved, and material from various places could be placed accordingly. Less acceptable is the perpetuation of this method in later publications in which whole vessels from tombs were presented almost to the exclusion of stratified sherd material, as in the Lachish volumes (Tufnell et al. 1940, 1953, 1958).

Following Petrie's initiative, several other archaeologists worked prior to 1920 during Turkish rule, when "everything was prohibited, but everything was possible" (Macalister 1922: 85). Most noteworthy for their contribution to ceramic analysis are F. J. Bliss, R. A. S. Macalister, and G. E. Reisner.

Frederick Jones Bliss was selected by the PEF to continue the excavation at Tell el-Ḥesy, where Petrie had worked for a brief six weeks (Bliss 1898). The son of the president of the later American University of Beirut, Bliss suffered ill-health which "excused him from a regular profession" (Tufnell 1965: 112), rather than doing clerical work he started his archaeological career at the age of 31 under the tutelage of Petrie in Egypt (Ibid.:116). Surface pottery for Bliss served as a guide to determine which sites, if excavated, would reveal pre-Roman, i.e., Israelite remains. He hypothesized that a mound thirty feet high with pre-Roman pottery on top identified a pre-Israelite settlement, whereas a mound ten feet deep with such pottery would date exclusively to the Israelite period (Bliss 1906: 294). By examining surface pottery and accumulation depth, he developed an independent method of verifying the identification of ancient sites with Biblical places proposed in the mid-nineteenth century survey work of Robinson and Smith (Ibid.: 291-2).

In 1902, at the age of 21, R. A. S. Macalister began his excavation at Tell Gezer singlehandedly (Macalister 1912). For him pottery was: "primarily valued . . .as illustrations of life, manners, and customs of the inhabitants; in other words, the <u>anthropological</u> significance of the discoveries be kept in the foreground" (<u>Ibid</u>. II: 55).

In studying the ancient pottery, attention to manufacturing technique and raw materials influenced the resulting typological analysis (<u>Ibid</u>.: 129). Nor was Macalister oblivious to the contemporary use of ceramics. For example, in noting repair holes in the finer wares and larger vessels, but not in the common wares, he assumed that the latter would have been discarded if broken and that:

> the term of usefulness of an ordinary water-pot is very short, even if no accident happens to put an abrupt end to it. The vessel is serviceable only so long as it remains porous, as only thus . . . does the water contained remain cool. The impurities held in suspension by the water before long choke the interstices of the vessel, and in about two are three months' time it loses its porosity and a new pot has to be provided. (Macalister 1912,II: 145, note)

No source is provided for this note, but it is significant that in a more recent publication F.R. Matson stated that the life span of water jars is two months before they "soured" (1965a: 204).

Following Macalister, the PEF sent Duncan Mackenzie (1912-1913) to excavate at Beth-Shemesh in 1909. His knowledge of Aegean pottery helped him to recognize the importance of the similar looking "Philistine" ware (named by Hermann Thiersch in 1908) and to suggest a more realistic date for Iron Age pottery, thus correcting Macalister's relatively late dating scheme (Albright 1956: 32).

The Harvard Expedition to Samaria

The full contribution of George A. Reisner, an American Egyptologist, was not realized at the time. For the greater part of his career, he was involved with excavations in Egypt, yet like Petrie, he is noted for his brief, but distinguished work in Israel. His selection to lead the Harvard expedition to Samaria reflected the "scientific" rather than the theological nature of the project. Reisner's "object was not volume but scientific detail, and he attempted to wrest every particle of relevant data from the limited areas he chose to examine" (Silberman 1982: 172).

Meticulous recording of finds and restricted trenches contrasts sharply with the practices of Reisner's contemporaries, who sought monumental architecture by exposing vast areas with the use of enormous work gangs. Because of complications in Constantinople, the Samaria project was initiated in 1908 without Reisner's direct supervision. As a result of delays in acquisition of the excavation permit, he returned to Egypt and merely served as advisor to Gottlieb Schumacher, a Haifa resident who was selected to head the expedition. The German school of archaeology has been criticized for its attention to large buildings at the expense of the material culture (Dever 1973a: 1*), and Schumacher was no exception. The classical training of many European field workers resulted in a heavy reliance on the contributions of the site architect to understand the stratification. When Schumacher resigned his position after one year, Reisner returned and immediately reduced the work force from 450 to 62 (Silberman 1982: 174-6).

The method devised by Reisner with regard to ceramic analysis required the precise recording of all finds. His emphasis on complete and careful recording is perhaps his most important contribution to archaeological technique and as such influenced future work on ceramics, especially that undertaken by Clarence Stanley Fisher, the architect at Samaria (see below).

Unfortunately, the research strategies advocated by Reisner had little impact due to his return to Egypt and the fifteen year delay in publication of the Samaria reports following World War I (Reisner, Fisher, and Lyon 1924). Reisner, like Petrie, returned to Egypt disgusted by the difficulties created by the Ottoman Empire bureaucracy and the local populace regarding permission to excavate (Wright 1969: 121*). The following entry in Reisner's progress report reveals one frustrating episode and serves to remind us of the problems and challenges that archaeologists were forced to confront, which inevitably influenced the nature of their work.

> There was a small . . . field on the edge of the village in front of the mosque. Sheikh Kaid opened it to take out stones for an addition to his house and allowed us to excavate it without charge. The work was begun on August 1, . . . but was stopped before noon by the Turkish commissioner on the grounds that it was inside the village. He telephoned to Constantinople for instructions and on August 4 permitted us to resume work. (Reisner *et al*. 1924: 407)

Beyond the Levant and Egypt, Reisner was influential in the refinement of archaeological techniques, again following the example set by Petrie. In the case of Petrie, one may point to Max Uhle, born and trained in Germany and acclaimed the "father of Peruvian archaeology" (Willey and Sabloff 1980: 71-4), who shared a concern for seriation and stratigraphy and referred to the work of Petrie in his writing on excavation technique (Rowe 1954: 54-5).

A notable example of Reisner's influence was Alfred Vincent Kidder, who, while at Harvard, took a course in field methods with Reisner (Willey and Sabloff 1980: 89). Kidder was the first in the southwestern part of the United States to employ the stratigraphic method on a large scale, and by doing so at Pecos and concentrating on sherds rather than whole vessels created a comprehensive pottery sequence adopted for the Southwest (Kidder 1924). Furthermore, Kidder was one of the first archaeologists of his era to excavate according to natural instead of metric levels, again adhering to the technique espoused by Reisner (Reisner *et al*. 1924: 42). The attention to detail and the use of sherds found in stratified deposits characterize the work of Reisner and his students.

In any event, in the Levant during the period of 1890-1920, Petrie, Bliss, Macalister, and Reisner were active, major sites were excavated, and several schools of archaeological research were established. Simultaneously, the French Dominican Ecole Pratique d'Etudes Bibliques was inaugurated in 1890 in Jerusalem (Bliss 1906: 285). The American School of Oriental Studies, first proposed by J. H. Thayer, in 1895 was established in Jerusalem in 1900 at the instigation of the Society of Biblical Literature, which was itself formed in 1880 (Schmidt 1931: xviii). The School was organized jointly with the American Oriental Society and the Archaeological Institute of America. The German Evangelical Archaeological Institute, with which Gustaf Dalman was associated, was established in 1902 (Zobel 1981: 11). Following Gatt (1885 a,b), Dalman (1971) and Einsler (1914) studied the traditional life style and produced the only systematic record of local crafts and industries including ceramics (1971: 199). Albright, among others, advocated the study of folklore with an emphasis on oral traditions, linguistics, and social history (1922: 16), whereas Dalman furnished information on native crafts and the material culture. Dalman

(1902) occasionally drew conclusions regarding the implications of his work for archaeological problems, and he has supplied data otherwise neglected by his contemporaries.

1920 - 1955

Introduction

The third phase of ceramic analysis in Israel began in 1920, the year William Foxwell Albright assumed the acting directorship of the American School of Oriental Research in Jerusalem, and the beginning of the British-organized Department of Antiquities headed by John Garstang (Palestine Exploration Fund 1921: 3). This long span of thirty-five years might be divided at 1940 with the appearance of the innovative Lachish II volume, but because of the interruptions caused by World War II, the results and impact of this important publication were not immediately felt.

Many excavations were initiated in the first decade of this period, and others undertaken before World War I were finally published, most notably the Harvard excavation at Samaria (Reisner, Fisher, and Lyon 1924). Based on the accumulating data, Macalister (1925) wrote a synthesis of archaeological research in which several themes regarding pottery studies emerged. Foreshadowings of these themes, which determined much of the research undertaken between the World Wars, can be detected in earlier writings (Macalister 1922: 84; Perrot and Chipiez 1890: 355; and Phythian-Adams

1923: 71), but were now bolstered by the wealth of excavated finds.

First, in contrast with the spectacular funerary deposits of Egypt, Mesopotamia, and the Aegean, the material culture of the Levant was considered impoverished, and all finer wares were, correspondingly, designated as having been imported (Macalister 1925: 65, 241). The local wares were described as "derivative" of neighboring cultures (Ibid.: 210). Elsewhere Macalister (1921: 32) wrote: "from first to last there was not a native potter in Palestine who could so much as invent a new design to paint on his waterpots."

Homogeneity and monotony are two further characteristics attributed to the local pottery. In 1902 Ernest Sellin directed a German-Austrian expedition to Ta^{c}anakh, the first excavation of a northern site and to Macalister the work demonstrated the homogeneous nature of the material culture of the north and south (Macalister 1925: 63). In a country so small, it seemed unlikely that different cultural zones could have co-existed (Ibid.: 63, 68; Macalister 1922: 84).

Between 1920 and 1955 the majority of archaeologists concentrated their research on establishing the concept of cultural uniformity as evidenced in the pottery, in order to compare and cross-date assemblages from different sites. The emphasis on chronological problems eliminated the recognition, description, or explanation of variability within and among the wares found throughout the country. In particular, decorated pieces were the focus of attention and were used to establish a system of cross-dating within the Mediterranean basin.

Of singular importance was the work of Albright at Tell Beit Mirsim (1932, 1933, 1943) in which he demonstrated the value of a carefully controlled stratigraphic excavation to create a well-defined typological ceramic sequence. In addition to the gradual development of typological/ chronological sequences, several scholars presented ceramic analyses using new techniques designed to address non-chronological problems. Among those engaged in this endeavor were H. Frankfort (1924), J. L. Starkey (1933), O. Tufnell, C. H. Inge, and G. L. Harding (1940), W. F. Badè (1934), and the team of J. L. Kelso and J. P. Thorley (1943). Throughout the history of ceramic analysis, innovative strategies have been repeatedly devised to deal with various non-chronological problems. On the contrary, the use of ceramics to resolve dating questions has been restricted to typological and comparative analyses of vessel shapes and decoration.

The American "secular" and "biblical" traditions

The arrival of W.F. Albright in Jerusalem in 1919 signified a turning point in ceramic analysis and the division of American archaeological research into a "secular" stream in contrast with "biblical archaeology". Whereas the former was well financed and attempted the excavation of deeply stratified tell deposits, the results were disappointing. The University of Chicago Oriental Institute selected C. S. Fisher to direct their expedition to Megiddo beginning in 1925 (Fisher 1929). Catalogues of pots and other finds were produced, but without a synthetic analysis, in part because of the onset of World War II which forced too abrupt a conclusion to the publications. Another weakness was the large number of people involved with the reports, whose work could not be fully coordinated (Engberg and Shipton 1934; Guy and Engberg 1938; Lamon and Shipton 1939; Loud 1948; and Shipton 1939).

In a preliminary report on the excavation technique and recording procedures at Megiddo, Fisher advocated the uniform recording of vessel form, decoration, finish, manufacture, date, distribution, and "if possible, an analysis of the ware" (Fisher 1929: 75). The type of analysis was not mentioned; and although those who ultimately published the pottery attempted to present uniform pottery descriptions, their definition of tempering contradicts the sentiments expressed by Fisher, and reflects the more prevalent attitude:

> Tempering - To indicate this precisely a microscopic or analytical examination would be necessary, and

> that of course is out of the question. An attempt to describe the tempering material has been made by employing such terms as "many large light grits" or "few dark grits," but we find ourselves doubtful whether this will be of use. The normal is "some mixed grits." (Guy and Engberg 1938: 6)

Fisher also fostered the idea of the complete reconstruction of sherds, a practice well established today, but not fifty years ago. Restoration of all pottery would add to the corpus of known types (Fisher 1929: 35), so Fisher designed a major program to create a comprehensive pottery corpus by collecting information on ceramics found throughout the country. His intention with regard to excavation and ceramic analysis was not a "mere collection of portable antiquities" (Ibid.: 26), but the collection of data for the purpose of reconstructing the life of the people at the site. While he eventually finished the corpus (Fisher n.d.), it was never published; yet the underlying approach was used at several American secular and biblically oriented projects of which Fisher was a staff member.

A second "secular" project was the University of Pennsylvania expedition to Beth-Shan, which again involved C. S. Fisher, along with G. M. FitzGerald, and the Australian A. Rowe. Unfortunately, it resulted in an entirely unacceptable stratigraphic analysis, the misdating of contemporary finds, and the confusion of the pottery of the various periods. (FitzGerald 1930, 1931, 1935; Rowe 1939, 1940). Only recently has some order been introduced, with the partial restudy of the material by James (1966) and Oren (1973a, 1973b), who attempted to bring together pottery of comparable date.

In contrast with these "secular" undertakings, the "biblical archaeologists" were equipped with little money, but they were amply compensated by the leadership of W. F. Albright, who arrived in Jerusalem at age 29. His modest exposure at Tell Beit Mirsim produced a typological sequence that still serves as a standard for all comparative studies (Albright 1932, 1933, 1943). Unlike those of the secular school, Albright advocated the excavation of small sites (1922: 22-23), and his work at Tell Beit Mirsim resulted in the general advancement of archaeological field techniques and comparative ceramic analysis. The recent reanalysis of part of the material (Dever and Richard 1977) is a tribute to the careful recording system he developed.

In addition to the exhaustive typological and comparative analysis presented by Albright, to his credit, the Iron Age pottery was examined by J.L. Kelso, along with ceramicist J. Palin Thorley, resulting in an unparalleled account of ancient technology (Kelso and Thorley 1943). They lamented the lack of cooperation between archaeologists and ceramicists, but a similar joint endeavor was not to reoccur for twenty years, when potter Jan Kalsbeek joined H. J. Franken to study the Deir ᶜAllā Iron Age material

(Franken and Kalsbeek 1969). A considerably earlier study by Henri Frankfort (1924) represents an early interest in ancient Near Eastern ceramic technology and is an unusual attempt to treat pottery in terms of the broader anthropological issues. Pottery technology is there described with reference to ethnographic parallels from around the world with an emphasis on its applicability to the ancient wares. This unique and provocative work raised numerous issues regarding the implications of ceramic analysis that unfortunately went unnoticed by the majority of archaeologists.

Kelso and Thorley succinctly presented nearly all aspects of pottery technology, from raw materials to firing completed pots. They emphasized economic facets and the organization of the industry. Variability of Iron Age II vessel form and features was considered in terms of the effects of "quantity production" (Kelso and Thorley 1943: 97). The use of this term rather than the more common "mass-production" reflects their concern for correctly identifying the nature of the industry. The short-comings of Iron Age pottery were described and related to production techniques and demands, in contrast to the general tendency to equate unattractive wares with the lack of creative ability. Iron Age II pottery was characterized as "hastily" but not poorly made (Ibid.: 101) as a result of the market demands; however, the social and economic implications of their work were never incorporated into any synthetic study by Albright or anyone else. Their discussion of vessel standardization (*Ibid*.: 120) includes measurements of vessels, but remained inconclusive in the absence of sufficient material. Yet no one later attempted to assemble an adequate sample to test the hypotheses formulated on the basis of the Tell Beit Mirsim collection. Further work was undertaken by Kelso and Thorley (1935, 1945) and later Kelso wrote several reports specifically for archaeologists (1948, 1962). As H. J. Franken has stated: "had their work found the recognition it deserves, the face of archaeology would be different from what it is today" (1974: 38).

Also in the "biblical archaeology" tradition was the 1928-1933 Haverford College project at Beth-Shemesh, previously excavated by Duncan Mackenzie for the PEF (Mackenzie 1912-1913). C. S. Fisher served as a staff member in 1929 and influenced the ceramic analysis to the extent that lavish accommodations were provided for the "shelving, departmentalization, display and assembly of sherds" (Grant 1931: 5). In the discussion of field techniques written by Elihu Grant, the chief excavator, lengthy, nostalgic references to senior field workers and details of the gang labor hired to move the earth constitute the bulk of the methodological discussion. The daily trials and tribulations of the excavation are presented in three volumes

(Grant 1931, 1932, 1934). One page, entitled "Excursus on Pottery" (Grant 1931: 34), is devoted to the evidence of local manufacture of ceramics at the site. A brief yet concise discussion of manufacture is given along with references to the contemporary potters of Ramallah whose work is described as "very suggestive," but this observation was not incorporated into the presentation or interpretation of the ancient material. The definitive publication of the ceramics was written by Grant with the assistance of G. Ernest Wright (Grant and Wright 1938, 1939). Unable to work with the entire collection, Wright had at his disposal a large selection of sherds brought to the United States for "leisurely" study (Grant and Wright 1939: 3). The preselection of material for diagnostic and recognizable pieces resulted in a catalogue of artifacts without synethesis or historical reconstruction.

As co-author of the Beth-Shemesh pottery report, Wright was to follow Albright in the tradition of ceramic specialization. His doctoral thesis on Early Bronze Age pottery dealt primarily with chronological issues, yet Wright (1937:1) acknowledged that: "more exact studies in the future will perhaps allow the student of ethnology, commerce, and related subjects, to make far-reaching deductions from ceramic evidence."

Wright based his analysis on drawings and photographs rather than on actual material, and under these circumstances the emphasis naturally was on vessel form, not ware or technology. Shape, he reasoned, depended on vessel use and consequently was the most significant factor for typological analysis. The focus was on homogeneity of the material in a country too small for regional developments (Ibid.: 15, 69), although southern and northern traditions were separated in Wright's work (Ibid.: 45).

In concluding his study with the statement that "there is no longer a single EB deposit which does not fit" into one of his chronological phases (Ibid.: 81; Wright 1936: 21), Wright felt that he had achieved his goal. His emphasis on uniformity of shape with no consideration of ware or manufacture and their inherent variability, adhered to the traditional approach of Albright and others. Significantly, it contrasts sharply with the views of two of his contemporaries, W. F. Badè and J. C. Wampler, whose work on the Tell en-Naṣbeh pottery marks not so much a turning point in ceramic analysis, as an unacknowledged challenge.

To acquaint bible students with archaeology, William Frederic Badè organized the Palestine Institute of Pacific School of Religion, where he was professor of Old Testament Literature. At the suggestion of Albright, Badè began excavation in 1926 at Tell en-Naṣbeh, a site of easy access, whose biblical identification was in dispute (Albright 1956: 8; McCown 1947: 3). The formalities to acquire an excavation permit necessitated listing C. S. Fisher as organizer (McCown 1947: 3), and his influence is detected in the meticulous and comprehensive recording system and in the emphasis on ceramic analysis that transcended the traditional typological analysis. Badè developed a unique approach to pottery studies by initiating several interesting programs. His publication, A Manual of Excavation in the Near East (1934) is an unprecedented attempt since Petrie (1904) to state formally archaeological methodology and techniques. In this volume Badè noted that archaeologists generally failed to discuss their methods and aims, thereby preventing others from assessing their conclusions (Badè 1934: 5). A nature enthusiast and president of the Sierra Club, Badè gave his students field training in conjunction with the University of New Mexico field school at Jemez Canon, on the assumption that the southwestern part of the United States offered an environment comparable to the Levant (Ibid.: 13). In 1925 he visited A. V. Kidder to study his method of ceramic sequence dating (Ibid.) and so brought the methodological approach of Petrie via Reisner to Kidder to a complete circle.

Like Fisher, Badè devoted considerable attention to the pottery--too much, according to his critics (Wampler

1947: vii). He undertook pottery restoration to elaborate the known corpus of Iron Age types, which he described as "surprisingly large" (Badè 1934: 33), and he put forward the notion of local heterogeneity in opposition to the established view of cultural homogeneity throughout the country. Sadly, Badè did not live to complete this project. The publication of the pottery was the work of J. C. Wampler, who attempted to adhere to the principles espoused by Badè. The accepted procedure of drawing pottery "types" and then merely listing all other similar vessels was rejected by Wampler, on the grounds that this relied too heavily on subjective judgment while simultaneously destroying all evidence of variation. Only by providing a complete record of the finds would information on differential intra-site use be determined, and although several reasons for such variation are provided in the introductory section, this type of analysis was carried no further (Wampler 1947: vii-viii). It is unlikely that this approach received the support of the scholars who were called upon to verify vessel type identification, date, and distribution, such as Albright and Pere Vincent (Badè 1931: 7 n.9). Whereas the pottery experts who had devoted years to building a chronological sequence of pottery types depended on the homogeneity of ceramics throughout the country, Badè and Wampler sought to document local and regional heterogeneity.

The achievements of Albright cannot be overstated, and his contribution to establishing the chronological scheme on which all more recent studies have been constructed remains unique. His research was the direct result of an emphasis on comparative typological studies that required the recognition of features common to pottery assemblages from different sites, and his particular expertise in this field is acknowledged by all. Badè and Wampler, however, sought to define the heterogeneity of the wares excavated at a single site. The shallow deposits of the Iron II period provided a collection amenable to this endeavor, which itself elaborates on the typological/ chronological work of Albright and others. However, the manner in which the Tell en-Naṣbeh project differed from all other excavations was not understood by the "biblical archaeologists" whose primary interest was to verify the association of the site with a biblical place name. By finding Iron Age remains, Badè fulfilled their expectations, but his attempt to further understand the material culture was generally unappreciated, and thus in the final assessment the project was judged unsuccessful. One archaeologist who appears to have responded favorably to Badè's work, however, was J. L. Kelso, whose consultation provided cursory comments on ceramic technology (Wampler 1947: v, 5, 38), but the need for further studies was emphasized (Ibid.: 55).

As in other cases, the attempt to address non-chronological issues resulted in the use of unconventional techniques. One innovative procedure developed by Badè involved the study of the fingerprints impressed in the clay pots. The aim of this project was to identify vessels from various parts of the tell and tombs as the work of individual potters for the purpose of correlating contemporary vessels and assemblages (Badè 1934: 35). This study was designed in conjunction with a professor of police administration, but it was abandoned and received no mention in the final publication.

Rather than concentrating on the innovative and creative aspects of the work, reviewers of the Tell en-Naṣbeh publications severely criticized the excavation (Kenyon 1950: 198-99) and epitomized it as an example of poor fieldwork (Wheeler 1954: 53). The deposits at the site were thin, and to the inexperienced team directed by Badè there appeared to be no discernable stratification (McCown 1947: 10). Prior to excavating at Tell en-Naṣbeh, Badè had his sole field experience in New Mexico, and as a result of his confusion over the stratigraphy his highly original approach to ceramic studies never received approval with the result that the entire project was ultimately neglected.

The strategies adopted by Badè, Wampler, Kelso and Thorley, were not without parallels. The work of two other

Americans involved new techniques for studying the pottery of Syrian sites. In the Early Pottery of the Jebeleh Region Ann Ehrich (1939) dealt with material not without interest to archaeologists working in the Levant, and in a review published in the Palestine Exploration Quarterly the work was commended for its use of the new technique of petrographic analysis (Pal. Expl. Fund 1940: 171). Shortly afterwards there appeared one of the earliest contributions of Frederick R. Matson (1943) in which he described Medieval pottery in terms of ancient ceramic technology. Few archaeologists working in the Levant were concerned wtih Medieval pottery, since textual and numismatic evidence alleviated the necessity for developing pottery typologies for the later periods. A few early studies (Baramki 1942; Hamilton 1940; Iliffe 1936, 1939; Johns 1950; Kahane 1952, 1953; Reisner et al. 1924; and Saller 1952) have only recently been expanded by scholars interested in Persian through Medieval period pottery (Artzy 1980; Bar-Nathan 1981; Bennett 19782; Franken and Kalsbeek 1975; Gichon 1974; Hammond 1962, 1964; Landgraf and Glass 1980; Lapp 1961; London n.d.a; Lugenbeal and Sauer 1972; Mazar, Dothan, and Dunayevsky 1966; Meyers, Strange, and Meyers 1981; Riley 1975; Roller 1980; Schaefer 1979; Stern 1978; and Vitto 1981). Of these more recent publications, a considerable number include studies of ancient technology (Bar-Nathan

1981; Bennett 1978; Franken and Kalsbeek 1975; Hammond 1956, 1962, 1964; Landgraf and Glass 1980; London n.d.a; and Schaefer 1979) and provenience testing (Asaro 1981; Bennett 1972; Franken and Kalsbeek 1975; Gunneweg, Perlman, and Yellin 1983; Landgraf and Glass 1980; and Schaefer 1979). The lack of interest until recently in this "late" material, as well as the absence of well-established typologies, has perhaps precipitated the use of techniques not generally applied to earlier pottery. Research has therefore been directed towards non-chronological problems, especially trade and the organization of the ceramics industry. However, the majority of scholars working with the later periods are not involved with earlier materials, and archaeologists concentrating on Bronze and Iron Age pottery have not been influenced by these techniques and recent advances in ceramic analyses.

The British School

In the late 1920's Petrie returned from Egypt along with a team of distinguished archaeologists to obtain data missing in the Egyptian sequence (Petrie 1928: 1). New sites in the south were excavated, and a major achievement resulting from this was the completion of the Corpus of Palestinian Pottery by J. Garrow Duncan (1930), devised by Petrie to provide a system to identify well-known pottery types and alleviate repetitious drawings in future publications. In later excavation reports, pottery was listed according to the Corpus identification, but although the Corpus served its purpose for a limited period it was soon out-dated and became too cumbersome to use.

Petrie continued to provide new insights and techniques and in his Gerar volume (Petrie 1928) produced the first quantitative frequency chart of pottery. He compared the percentages of painted versus plain wares and inferred, from the relative abundance of decorated wares, the presence of Egyptian officials and traders at the site (Ibid.: 5). Few contemporary workers of more recent generations of archaeologists spanning the fifty years since Petrie have computed frequency charts or have realized the value of such analyses and it is both the type of information Petrie collected and the inferences he was able to draw that reveal his genius.

Also accompanying Petrie at Gerar were James Llewellyn Starkey and Olga Tufnell, whose subsequent work at Lachish reflects a well organized and well designed research project of tremendous scope, one which from its inception concentrated on problems other than chronological. Lachish was close to the northern border of Egypt, in a region previously explored (Bliss 1898; MacDonald, Starkey, and Harding 1932; Petrie 1891, 1928; Petrie and Duncan 1906; Petrie and Tufnell 1930). It was selected by Starkey, whose intention it was:

> to trace, if possible, the sources of the various foreign contacts which influenced the development of Palestinian culture. . .exemplified particularly by the potters' craft, where we often find wares which appear both in form and decoration not to be indigenous. (Starkey 1933: 190)

Upon completion of the work at this southern tell, a northern site was to have been excavated. However, Starkey was tragically killed while the project was still in its (lengthy) preliminary stage (Tufnell et al. 1953: 7). It fell to Olga Tufnell, herself a "Petrie pup" (Tufnell 1982: 81), to publish the excavations in four volumes that appeared just before and then after World War II. Her method, in contrast to that advocated by Fisher, Badè, and Wampler, coincided with the Petrie-Duncan system of drawing whole vessels and then treating the rest of the significant finds by noting to which type they belong. While the resulting drawing were useful, characteristically, little information was provided to determine the exact provenience of the vessels thus represented.

Tufnell's efforts to publish the material, however, are a tribute to her and to Starkey. In Lachish II the potential contribution of Starkey to ceramic analysis is apparent. Described here is a sample of fourteen Lachish sherds of Cypriote and local wares, in addition to three pieces from Cypriote excavations which was submitted for spectrographic analysis with the purpose of determining place of manufacture and of starting a comparative collection (Tufnell, Inge, and Harding 1940; 85-8). In turn, plates XXX and XXXI of the volume provide examples of the technological features, standards of temper size and frequency, and burnishing patterns to illustrate fully the terminology used with reference to manufacturing technique and pottery descriptions (Tufnell *et al*. 1940).

The use of compositional testing along with a concern for the technological features exemplfies the unconventional approach Starkey pursued and can be related to his interest in non-chronological issues, yet not until the publication of the Tell Beit Mirsim volume on the Iron Age ceramics with the work of Kelso and Thorley (1943) did anyone continue in this direction. Tufnell in fact incorporated their work into subsequent Lachish volumes and would have duplicated the Kelso-Thorley study had the project continued (Tufnell, Murray, and Diringer 1953: 260). Her own research concentrated on a comparative study of pottery types and presented, unlike most reports, distribution charts and frequencies of selected types (Tufnell 1958: 176). In the process she made many untested assumptions, some of which could have been easily investigated, such as estimating the firing time of Late Bronze Age pottery to be two hours (*Ibid*.: 138). Similarly, she inferred that once the potter's wheel was in common use "men largely replaced women in the making of pottery" (*Ibid*.: 140). Lapp (1966:

177 n.42), later quoted this not unreasonable, but undocumented statement which apparently was based on Tufnell's observations of contemporary potters (Tufnell 1961; Tufnell and Ward 1966: 170). More recent ethnographic research by Landgraf and Rye has recorded the sexual dichotomy of potters (Landgraf per.com. 1978). Men throw vessels on the wheel whereas women use the coil method. Broader ethnographic analysis suggests that if wheel-made wares coincide with specialized pottery production, both men and women use the wheel. While domestic pottery manufacture is frequently the domain of women, specialized production includes both sexes.

Tufnell was not the only British archaeologist to observe local pottery manufacture; Crowfoot (1932, 1940), and later Hankey (1968) made similar observations. The extent to which these studies influenced their work on ancient pottery, however, was never made explicit.

At the very least, the Lachish team was not constrained by typological/chronological pottery studies, and those participating in the project included scholars in numerous disciplines related to archaeology. Hans Helbaek, for example, was involved with an examination of the floral remains and was consulted regarding the identification of the organic material used as a tempering material for clay pots (Tufnell 1958: 137). There was also geologist F. E.

Zeuner, who arranged for the spectrographic analysis of selected sherds (Ibid.: 145). Lachish, then, marked a new start, but the promise came to an unfortunate, premature close with the early death of Starkey, who might well have altered the course of ceramic analysis in Israel.

Before leaving British research, it remains to mention the work of W. A. Heurtley (1938), who directed his attention to the decorated wares of the Middle Bronze II age. In an analysis typical of that undertaken for Greek vases (e.g., Richter 1924) in which stylistic nuances of individual pottery painters are identified, Heurtley recognized the "personality" of the "ᶜAjjûl painter" in the animals rendered on vessels found at the site of Tell el- ᶜAjjûl (Heurtley 1938: 24). This approach reflects the classical training of many Europeans who have worked in Israel. Such analysis has not been pursued, although the identification of individual potters, if not painters, is a viable endeavor. Part of the Jebel Qaᶜaqir study described below is designed to address this concept.

The beginning of the Israeli school

Locally, the Hebrew Palestine Exploration Society, organized in the years prior to World War I, was joined by the Jewish Archaeological Society in the early 1920's (Palestine Exploration Fund 1921: 4; 1922: 48). Nahum Slousch directed excavations at Tiberias and Jerusalem along with E. L. Sukenik and L. Mayer (Albright 1922: 21). In 1926, the newly founded Department of Archaeology at the Hebrew University undertook work at ^{c}Afula directed by Sukenik assisted later by Y. Yadin, R. Amiran, and N. Avigad (Sukenik 1948). S. Yeivin worked at Beth-Shan with the Pennsylvania expedition (Oren 1973b: 2 n.2), and I. Ben-Dor excavated with Albright at Bethel and with Garstang at Jericho (Albright 1937: 146). The impact of both the British and American traditions influenced the development of the later "Israeli school," which was able to benefit from the strengths of the "biblical archaeologists" typological work as well as the more anthropologically oriented approach of the British. Whereas the majority of Jewish archaeologists followed the American tradition, Sukenik, for example, delved into ethnographic parallels as a result of his association with the British excavation at Samaria. He visited the Jeba pottery workshops in Sebastiyeh where he identified the Old Testament "<u>sephel</u>" with the Arabic term for wash-basin, "<u>sifl</u>," and then proceeded to examine its meaning with reference to Old Testament usage (Sukenik 1940: 59). As will be discussed below, the next phase of ceramic analysis in Israel, which was dominated by the local school, represented to a great extent the perpetuation of the methodology and techniques of the pre-World War II generation of archaeologists.

In 1948, with the establishment of the State of Israel, the above-mentioned Israeli archaeologists and their students found themselves without a museum, comparative collections, libraries, or even an office. The Rockefeller Museum as well as the Hebrew University and its Department of Archaeology and Museum of Jewish Antiquities, were now controlled by Jordan or otherwise inaccessible. This included all foreign archaeological institutions except for the Pontifical Biblical Institute (Yeivin 1960: 1). Despite these difficulties, a new Department of Antiquities was established, libraries were recreated, and excavations continued.

Summary

To summarize ceramic analysis between 1920-1955, it should be remembered that this was a time of growth for archaeology with an increase in the number of field workers, sites excavated, and sherds collected. Pottery corpora created to present a type series for comparative chronological studies (Duncan 1930; Fisher n.d.) dominated the work of American, British, and Israeli scholars. Typological sequences of the pottery from earliest times through the Iron Age were designed to deal with a material culture for which no epigraphic or alternative dating methods, other than the Old Testament and an occasional radiocarbon reading, were available. In contrast, for the Persian Period and more recent times, for which textual and numismatic evidence furnish additional sources of information, pottery studies were virtually neglected, except for a few individual contributions. The emphasis of nearly all scholars centered on the biblical period, particularly the Old Testament, and only recently has an interest in the later periods been stimulated among archaeologists working in Israel.

Most typological studies have concentrated on superficial modifications of vessel morphology and decorations which are the most apparent alterations through time and are discernable in drawings and photographs. The tendency to rely solely on the latter, rather than on examination of the collections themselves, has evolved for a variety of reasons, such as inaccessibility to the material, lack of conservation and preservation of the entire assemblages, shipping costs, etc. Pottery descriptions of clay color and non-plastic size and color published to complement the drawings are rarely considered in comparative studies, or even as the typological sequences are constructed. Typological sequences were originally designed to facilitate comparative studies of assemblages from different parts of the country, and for this purpose, homogeneity of vessel form and surface finishing techniques have become an indispensable tool. As we have seen, the pioneering work of

Petrie, Vincent, Duncan, Albright, Fisher, and Wright facilitated the chronological synchronization of archaeological deposits throughout the country, as well as the formulation of an outline of the local culture history in Israel on which all more recent research has elaborated.

The emphasis of the "biblical archaeologists" on the biblical period, with the goal of identifying ancient sites with biblical place names, did not require the recognition of local heterogenity of pottery. The attempt of Badè, Kelso and Thorley to provide in greater detail evidence of the daily life and organization of the society via ceramic analysis was not considered pertinent to the study of biblical Israel. The problems these scholars were addressing and their methods were not well understood, and their innovative work did not stimulate similar studies for decades.

Much of the American archaeological work was unfortunately conducted by biblical scholars with little or no training in archaeological techniques and methods and little familiarity with ancient artifacts. In contrast, Albright was able to acquaint himself fully with the country, its inhabitants, and antiquities, unlike most Americans who visited Israel only during excavation seasons. Also unique was the innovative approach of Badè which reflects in part, his awareness of archaeological research in the United States. Only recently have the amateur archaeologists been replaced by professionally trained archaeologists as the study of archaeology emerges as a discipline distinct from bible studies (Dever 1980a, 1981b, 1985). Archaeology of the ancient Near East is finally becoming less parochial (Wiseman 1983). With the development of a separate field of archaeology, the simultaneous growth of a new methodological framework (Dever 1981b) will enable the appreciation of the pioneering work of those archaeologists who explored ceramic heterogeneity while their contemporaries dealt entirely with homogeneity. Whereas entire excavated pottery assemblages were considered to be the proper unit of analysis, a few, notably Badè, sought to examine the variability within individual pieces. Similarly, archaeology of the biblical period has been embedded in an historical reconstruction based almost exclusively on events described in the Old Testament, without an independent, objective analysis of the material culture. The newer methodology should be able to correct this discrepancy, while testing hypotheses derived from both Old Testament studies and archaeological research.

With regard to methodology, most excavators between 1920 and 1955 stated their methods and aims in one or two pages addressing camp conditions, gang labor (composition and salary), and meals, visitors, and local circumstances, such as the disappearance of railway equipment with Rommel's advance to Egypt (Tufnell <u>et al</u>. 1953: 32-3). In contrast was the discussion by Badè in his book on methodology and excavation techniques (1934).

It would appear that the British school, more than the American (with the exception of Badè), contemplated the non-chronologicl significance of pottery. Following Macalister (1912), they were eager to profit from the observations of contemporary pottery manufacture as practiced in the Near East (Crowfoot 1932, 1940). Crowfoot later incorporated her observation into studies of ancient ceramic technology (1957: 470-71), but it is unclear the extent to which this influenced her analysis of the pottery in comparative studies, if at all. Badè similarly collected photographic evidence of Palestinian pottery manufacture (1931: 5 n.5), but did not publish these data separately, nor were they introduced into the study of the Tell en-Naṣbeh pottery presented by Wampler (1947).

Simultaneously, the Americans were associating biblical works with unearthed ceramic vessels (Honeyman 1939; Kelso 1948). E. L. Sukenik, who was a member of the joint British and Israeli expedition to Samaria, incorporated his ethnographic observations with a study of Old Testament references (1940).

Chemical and mineralogical analyses of pottery were initiated in this era, and in a review of the Lachish work FitzGerald praised the laboratory analyses of the metal and ceramic artifacts (1941: 72). Whereas metal objects were submitted for compositional analyses beginning at the turn of the century (Bliss 1906: 188-90; Macdonald, Starkey, and Harding 1932: 16; etc.), pottery was in general treated in more cursory fashion. A recent study reveals that not all clay vessels were even recorded from tomb groups at Tell el-Far^{c}ah south (Williams 1977: 7), and it is reasonable to assume that this was commonly the case. The value of compositional analysis of pottery was not widely appreciated, especially given the orientation of all research toward resolving chronological questions.

In addition to serving as a temporal marker, pottery was understood to represent ethnic groups, and the appearance of a new ceramic style was indicative of a new people (Amiran 1957: 101; Engberg and Shipton 1934: 144; Phythian-Adams 1923: 77) or the diffusion of ideas (Engberg and Shipton 1934: 144). That invasions were characterized by the introduction of new pottery was accepted by all except Badè. He suggested that following the destruction levels of a conquest the older pottery tradition would persist along with the new, whereas abrupt innovations in pottery signaled a new people or trade (Badè 1931: 5-6). As usual, Badè alone was challenging the traditional views.

The British contribution has been emphasized. The 1933 Iraqi law prohibiting the exportation of antiquities prompted British interest (Hudson 1981: 94), and in addition to a generation of young archaeologists, Petrie returned. The British methodology clearly differed from that of the classically trained Americans who were theologically oriented. Stratigraphically controlled excavations characterize the British work in contrast to the French excavations in the Lebanon which was under the jurisdiction of France as a result of World War I. The French penchant for excavating according to metric levees, rather than natural stratigraphic units (Dunand 1939, among others), has contributed to an entirely confused presentation of the pottery based on an archaic excavation technique.

Finally, in Israel, with the creation of the State and the rise of the local school of archaeology, a new generation of archaeologists, trained in part by Albright, among others, appeared on the scene.

1955 - 1970

Introduction

The year 1955 is an almost arbitrary division, for in the years following World War II research was limited. In a tribute to G. Ernest Wright the fifteen years between 1955 and 1970 were treated as a unit (Dever 1980a: 1) and the ceramic studies of this period, described as the "'heyday of biblical archaeology'" (*Ibid*.: 2; Dever 1985), will be examined collectively. The years before and after

World War II provided a respite from field work and time to reconsider traditional aims and methods. The 1957 publication of the pottery excavated at Samaria before the War (Crowfoot, Crowfoot, and Kenyon 1957) prompted an unprecedented debate of excavation technique and methodology involving American, British, and Israeli archaeologists (Aharoni and Amiran 1958; Kenyon 1964; Tufnell 1959; Wright 1959, 1962; G.R.H. Wright 1966).

With the reassessment of excavation strategies, ceramic analysis entered a new phase characterized by several innovative approaches, but the fifteen years between 1955 and 1970 served more as an incubation period for the developments that appeared in print in the following decade. New personalities dominated pottery studies, and gradually the work of the two pioneers of the broader applications of ceramic analysis, Anna O. Shepard (1954) and Frederick R. Matson (1943, 1945, 1951, 1965a, 1965b), came to the attention of scholars working in Israel. Shepard visited the country in 1966 (Shepard 1971: 61), and Matson began his investigations of ancient Near Eastern pottery prior to World War II and more recently has concentrated on the study of contemporary potters throughout the region (Matson 1974). Nor did the typological approach based on geometric shape analysis, devised by Pinchas Delougaz for the Diyala material (Delougaz 1952), escape the attention of ceramic specialists in Israel (Amiran, Beck and Zevulon 1969: 13). Delouqaz worked briefly in the country, but he dealt with pottery of the later period (Delougaz and Haines 1960), and thus was of little interest to most archaeologists.

Mineralogical and compositional studies were undertaken with greater frequency, but in most instances pottery was used to refine the chronological sequence and the understanding of regional differences as in the previous decades. The debate on the correct use of pottery to date structures did not immediately evolve into a general methodological re-analysis of excavation technique or ceramic studies, but it did serve to stimulate discussion and thought that ultimately led to the newer approaches of the following decades.

The Debate

The antecedents of the debate on pottery to date structures go back to the pre-World War II period, particularly to the British-Israeli work at Samaria between 1931 and 1935. There, Kathleen M. Kenyon introduced: "fresh and revolutionary procedures in her stratigraphic sections... Yet this was not commonly known before the publication of <u>Samaria III. The Objects</u> in 1957..." (Wright 1969: 125). Kenyon earlier stated her views (1939), but the war and delayed publication of the Samaria report minimized the immediate impact of her work. In her presentation of the fragmentary stratified Iron Age pottery, buildings were dated by the latest pottery in the fill below the structures (Crowfoot, Crowfoot, and Kenyon 1957: 90). G. E. Wright (1959: 21), Yohanan Aharoni, and others preferred to use material on the floor to date the construction and use of the building (Aharoni and Amiran 1958: 180). Aharoni reasoned that material under the floor predated the construction (Ibid.) and as Wright (1959: 21) indicated, pottery found in fill below floors is not necessarily homogeneous and only in special circumstances can it be used to establish chronology.

The methods espoused in both systems relied heavily on the archaeologists' ceramic expertise in identifying diagnostic sherds to provide an appropriate date; rather than disagreement over the correct use of pottery to date structures, there was a basic misunderstanding of the phenomena to be described and dated. Whereas Kenyon used the latest sherds in the fill to date construction and initial use of structures, Aharoni and others used diagnostic sherds on the floor to date the initial use of the building. The confusion of building construction with the use and possible reuse of the building was interpreted as a fundamental difference in excavation technique. Kenyon never completed another final excavation report, and her Jericho volumes represent catalogues of tomb material

(Kenyon 1960, 1965). The most recent volume, Jericho III (Holland 1981), Jericho IV and V (Kenyon and Holland 1982, 1983) were published posthumously. Less concerned with issues related to the deposition of artifacts, their use as dating evidence and site formation processes than chronological problems, the Israelis continued to excavate and to produce catalogues of pottery found at many sites, such as Ḥazor (Yadin et al. 1958, 1960, 1961), Ramat Raḥel (Aharoni 1962, 1964), En-gedi (Mazar, Dothan, and Dunayevsky 1966), and numerous smaller sites.

The heterogeneity of pottery in Israel

Regional differences of pottery styles became apparent with the greater number of excavations and surveys, and local developments were increasingly described with more precision. Ruth Amiran separated three geographical zones for the Chalcolithic period (1955, 1957: 193) and described the local variability of Early Bronze Age wares (1957: 194, 1960). Aharoni and Amiran (1958: 183) distinguished a northern and southern Iron Age tradition and then subdivided the Iron Age chronologically according to the ceramic evidence (Ibid.: 184). In 1963 Amiran, along with Pirhiya Beck and Uza Zevulon, used tomb material to demonstrate temporal and regional pottery groups throughout the country from the Neolithic through the Iron Ages (1963, 1969). Despite the use of funerary wares, especially for certain periods, the overview they presented has helped to clarify the development of ceramics through the ages. Their work continues to serve as the primary tool in the field and as a basis for all comparative studies.

Whereas local heterogeneity was recognized, in contradistinction to the notion prevalent in the first half of this century, the primary emphasis of ceramic analysis centering on chronological issues did not alter substantially. Pottery restoration undertaken on the largest scale by the Israelis had as its aim four main purposes: (1) to obtain the full range of shapes; (2) to clarify major stratigraphical problems through typological studies; (3) to clarify situations within a stratum (using typological analysis); and (4) "to make statistics of typology more accurate" (Amiran and Eitan 1966: 19). The exclusive purpose of pottery typologies was to facilitate the chronological ordering of deposits, strata, and sites. Quantitative analyses, as stated above, were rarely attempted, and no further mention is found in the literature.

Although regional variations were well attested and acknowledged, the differences within contemporaneous site assemblages were not investigated except insofar as "local" wares were separated from "imported" decorated wares such as "Base Ring" wares (Stewart 1955), "Myceneaen" pottery (Hankey 1966, 1967), and the so-called "Palestinian bichrome ware" (Epstein 1961, 1965, 1966). The latter forms an interesting case. It is distributed along the Israeli littoral in sizable quantities, and recent neutron activation analysis reveals it to be of Cypriote origin (Artzy, Asaro, and Perlman 1973, 1975). Although the reports on Cypriote excavations remain few in number, the appearance of this ware on the island has not thus far been well documented. Nevertheless, the pottery could represent a trade ware manufactured primarily for export to the Levant. Its absence in large quantities on Cyprus consequently is not relevant for determining its origin, and despite the initial scepticism of some archaeologists, the evidence of the provenience testing cannot be disputed. Furthermore, later wares have been imported to Israel from Cyprus (Perlman, Asaro, and Frierman 1971) in a pattern that reflects the high quality of Cypriote clays and a long established trading relationship with the Levant.

One can only imagine, however, which of the utilitarian wares described as "local" have actually originated elsewhere. The term local generally refers to undecorated vessels considered unworthy of importation. This superficial, aesthetic judgment disregards the function of the common storejar or pitcher to serve as the container of some desired commodity. It is not unreasonable to speculate on the trade of basic items among the different regions of

Israel. To achieve any level of verification regarding the origin of clay pots, compositional analysis and provenience studies can provide a solution, and between 1955 and 1970 pottery was increasingly referred to laboratories for analysis to resolve questions concerning foreign trade wares.

Compositional and provenience testing

Gradually the value of compositional studies was realized following the early use of spectrographic analysis to investigate the provenience of the Lachish sherds (Tufnell et al. 1940: 85-88). In 1935 Kenyon had selected material from Samaria for petrographic and spectrographic analyses, but the results were published only twenty-five years later (Crowfoot, Crowfoot, and Kenyon 1957: 471). The study included fifty-nine sherds of Iron Age and Roman period dates from Samaria, Megiddo, Antioch, Hama, and Athens that were analyzed to learn their origin.

Ten years after the work of Kenyon and her associates appeared, the publication of the terracottas and statuettes from Tell Ṣippor by Ora Negbi (1966) incorporated the results of petrographic analysis (Shennav 1966) undertaken to distinguish between Eastern and Western Mediterranean art styles and the provenience of the artifacts.

In the Dhahr Mirzbâneh report, comments by F. R. Matson on manufacture and a microscopic inspection of the mineralogical components of the pottery were recorded (Lapp 1966: 77 n. 142; Figs. 19 and 40), but petrographic verification was not attempted (Ibid.: Fig. 19).

The most precise statement of the value of compositional testing was given by J. B. Hennessy, who used spectrographic analysis as a means to minimize the subjective element in comparative ceramic studies (Hennessy 1967: xx). To determine the disputed origin of the "Abydos ware" known from Egyptian tombs and sites in Israel, A. Millet analyzed pottery from seven Israeli sites and from Egyptian funerary deposits. Regardless of chronological problems related to the study, the results demonstrated the similarity between the material found in Israel and the "Abydos ware" thus suggesting a non-Egyptian origin. Although the small sample size prevented Hennessey from drawing conclusive results, but nevertheless a discussion of Early Bronze Age trade between Egypt and the Levant was presented with a new objectivity facilitated by the provenience testing.

Soon to follow were the mineralogical and spectrographic analyses of Crusader and Chinese ceramics found in Israel (Frierman 1967, 1969). Despite the numerous archaeological assumptions and interpretations based on the presence or absence of foreign pottery and the success of the projects mentioned above, compositional and provenience testing proceeded slowly. The work carried out was directed entirely toward distinguishing local versus foreign trade wares rather than local interregional trade.

Ancient ceramic technology

The subject of ceramic technology has received little attention since the work of Kelso and Thorley (1943) and Matson (1943), although cooperation between archaeologists and ceramic technologists can facilitate the retrieval of a wide variety of non-chronological data. In an effort to pursue this approach, Phillip C. Hammond studied the Nabatean wares (1956, 1962, 1964) to determine the nature of the potters' craft. Hammond conducted numerous laboratory tests to determine such features as firing temperatures, porosity, hardness, etc., and described in precise terms the degree of control displayed by the potters. Contrast this with a description of the ware as found at the 1930's British excavation at Nessana: "Whatever the method of manufacture, it must have been a difficult affair" (Baly 1962: 271).

Less precise was the report on the Chalcolithic pottery from Abu Matar (de Contenson 1956), which accompanied analyses of the fauna (Josien 1955), flora (Negbi 1955), and a study by Amiran (1955) of the "Cream ware." Amiran alluded to the white clay of the Beer Sheva region as the possible source of the raw material used for the "Cream ware," but this was not verified mineralogically. The entire nature of the French work at Abu Matar (Perrot 1955) differed from contemporary projects and reflects more of the methodologies employed at earlier prehistoric sites. Whereas prehistorians regularly collect floral and faunal evidence and study the geoarchaeological aspects of ancient sites, excavators dealing with later material tended to concentrate on the material culture. Studies of ancient technology in Israel have also characterized the work of prehistorians rather than historical archaeologists.

Ancient ceramic technology can provide important information and can influence the type of inferences the archaeologists are able to draw from the material culture. The nature of the research facilitated by a study of manufacturing techniques is exemplified by the collaboration of Paul Lapp and F. R. Matson. While all other work on EB IV pottery involved typological/chronological studies, based on the examination of the Dhahr Mirzbâneh pottery by Matson, Lapp was able to address the question of social organization and human behavior. Lapp tentatively identified vessels as those of household potters and attributed variability of the incised design to the work of individual potters (1966: 76). It is not by coincidence that both the use of mineralogical and compositional testing as well as the study of ancient ceramic technology, were not employed to resolve chronological issues, but were introduced in response to new types of questions being asked of the material. Usually the objective centered on problems related to social organization and human behavior.

The methodological framework

Chronological refinement of pottery types remained the dominant concern as reflected in the catalogue format of the excavation reports and the volumes attempting a systematic collection of pottery types (Amiran et al. 1963, 1969; Lapp 1961). With the intention of producing a complete corpus, several students of G. E. Wright at Harvard prepared dissertations on the pottery of various ages (Dever per. com. 1983): Early Bronze IV - Middle Bronze I (Dever 1966), Middle Bronze IIB (Cole 1984). Middle Bronze IIC (Seger 1965), Iron II (Holladay 1966), and Hellenistic (Lapp 1961) in part based on the excavation at Shechem (Wright 1965).

As in previous decades, pottery types were associated with ethnic groups, and new ceramic styles were attributed to the movement of people through the country (e.g., Amiran 1957: 197; Kenyon 1956: 197; Lapp 1966: 111). The designation "trade ware" was presumed only for decorated pottery, while commerce within Israel was not examined despite the topographic and climatic diversity of Israel. In a small country, situated on the edge of the desert, interregional exchange in commodities was inevitable, yet this has not been demonstrated by ceramic analysis.

Hammond and Hennessey were among the few to use laboratory studies and ancient ceramic technology to deal with non-chronological problems, specifically trade and the implications of the potters' skill. Others were beginning to regard the typological/chronological approach as inadequate. Strategies designed to answer new questions unrelated to dating problems were formulated between 1955 and 1970 by people who were trained in the earlier tradition but who brought the fresh perspective of newcomers who had not participated in field work prior to 1960. The single exception is H. J. Franken, whose first field experience at Jericho, with Kenyon in the 1950's, culminated in two unique reports (Franken 1974; Franken and Kalsbeek 1975). His subsequent work at Tell Deir ^{c}Allā led to a publication of the pottery there (Franken and Kalsbeek 1969) that has opened a still unresolved debate on ceramic analysis, regarding the inferences archaeologists can draw from pottery. The traditional typological work predominates current research, but gradually archaeologists are investigating non-chronological problems. These studies not only contribute to the refinement of the typological/chronological ordering of pottery, but also explore previously unexamined aspects of ancient society.

1970 - 1983

"The Tell Deir ᶜAllā Challenge"

The publication of the Iron Age pottery of Tell Deir ᶜAllā (Franken and Kalsbeek 1969) marked a turning point in ceramic analysis by providing archaeologists on both sides of the Jordan River with an alternative approach to pottery studies. The format and presentation of the material by potter Jan Kalsbeek and excavator H.J. Franken emphasized ancient ceramic technology and was designed to "help in the interpretation of the history of the inhabitants as well as the interpretation of the chronology" (Franken and Kalsbeek 1969: 70).

Kelso and Thorley (1943) had earlier dealt with various facets of ceramic technology, but their analyses were never incorporated into the reconstruction of ancient society. The skill and versatility of the Iron Age potter were described, but the broader organizational implications of the ceramic evidence were not drawn by Kelso and Thorley or Albright.

In comparison, Franken and Kalsbeek were concerned both with the chronological ordering of the material as well as how the ceramics industry represented a facet of ancient social organization. In the absence of a well-defined pottery typology for the upper Jordan Valley, a sequence was developed for the Tell Deir ᶜAllā material based on manufacturing technique rather than on superficial stylistic criteria alone. Franken and Kalsbeek defined the "tradition" of pottery manufacture according to analyses of the clay and its components, the mode of fabrication, decoration and/or surface finishing technique (1969: 75). The nature and significance of the modifications through time detected within the tradition were described and analyzed. In lieu of hundreds of sherd drawings accompanied by repetitive sherd descriptions as are commonly found in ceramic reports, Kalsbeek explained the method of pottery manufacture and the factors that contribute to variation of rim shape (Franken and Kalsbeek 1969: 81-83), fired clay color (Ibid.: 94-97), and to the selection of tempering material (Ibid.: 75). Vessel types were quantified (Ibid.: 242) to learn their relative frequency, rates of replacement, and the "production programme" (Ibid.: 243) of the potters which in turn would reveal evidence related to those who used the pots.

Unaccustomed to a synthetic analysis, and in the absence of the traditional catalogue format, the approach espoused by Franken has few supporters. Although pottery descriptions are provided in most reports, they are rarely considered in typological studies. Characterized as "one of the most problematic tasks faced by archaeologists" (Seger 1978: 118), the typical pottery descriptions include information on numerous superficial features, such as clay color, firing, inclusion size, color, and frequency, etc. Thus, the aim has been to describe the material "fully" but without necessarily attempting to understand the significance of the variability so described. Nevertheless, there is a growing dissatisfaction with the current presentation of pottery descriptions in excavation reports in which the pages of descriptive data account for nearly one half of the entire publication (Glock 1975: 12). Franken (1974: 13) later wrote ironically that pottery drawings and descriptions generally serve to illustrate graphically what the archaeologist does not know how to explain. Rather than repeatedly describing the inclusions, Kalsbeek explained the reasons for selecting a specific size and quantity of tempering material. Similarly an endless list of Munsell color readings was alleviated by refiring tests which determined and explained the nature of the variability seen in the color of the fired sherds.

Throughout the Tell Deir ᶜAllā report the emphasis is on hypothesis testing and explanation. Because Franken chose not to present the usual bewildering array of superficial information found elsewhere, his work has been severely critized. Also "missing" was an adequate comparative study of material from contemporary sites as accompanies most pottery studies. Franken did offer a comparative analysis, but a more detailed study, as commonly presented in other reports, contradicts the assumption that pottery styles did not appear simultaneously throughout Israel and Transjordan (Franken and Kalsbeek 1969: 247). Consequently ceramic typologies cannot be used to secure precise dating or the relative temporal position of widely dispersed sites. Whereas Franken and Kalsbeek were recording and explaining micro-changes within the tradition of a single site, their critics were preoccupied with typological and comparative studies without appreciating the aims and methods developed by Franken and Kalsbeek.

Not everyone dwelt on the "missing" elements. In a review by Lapp, "The Tell Deir ^{c}Allā Challenge to Palestinian Archaeology" (1970), various aspects of the new approach were highlighted. In a subsequent excavation directed by Lapp at the site of Idalion on Cyprus, the influence of the Franken-Kalsbeek approach is discernable. Ceramic technologist Robert H. Johnston was invited to join the staff (Johnston 1974a). Lapp advocated compositional analysis of pottery (Bieber 1974), but only inasmuch as such information would provide results pertinent to resolving chronological problems (Lapp 1975: 36). Lapp, along with virtually all other archaeologists, was concerned with the refinement of chronological sequences using pottery typologies as the primary tool. Without an understanding of the broader uses of pottery to examine non-chronological issues, such as trade, industry, social organization, and human behavior, the approach devised by Franken and Kalsbeek has been poorly understood and misinterpreted. The Deir ᶜAllā study was presented, not as a final report, but as an example of the type of information that can be retrieved from a comprehensive ceramic analysis. Although this study is in need of further testing and refining and elaboration, no one has attempted to replicate and carry on the work.

More serious is the virtual lack of discussion of general archaeological methodology among scholars working in the Levant (Dever 1980b, 1981b, 1985). In the renewed work at the site of Gezer, first excavated between 1902-1909 (Macalister 1912), an excavation strategy was designed to resolve specific issues (Dever, Lance, and Wright 1970), but again some reviewers and readers criticized the publication using older reports as models (e.g., Kempinski 1972, 1976). The aims and methods of the American team were not considered to be important in and of themselves. With regard to ceramic analysis, the new Gezer report included a purely descriptive presentation. Since then, however, geologist Reuben Bullard, who was a staff member, has undertaken compositional analyses of selected pottery (Bullard 1969, 1970, 1978). As noted earlier, several studies adopting newer techniques in the formative stage between 1960 and 1970 have finally begun to emerge.

The absence of a general methodological reassessment by archaeologists working in Israel has been contrasted with the developments in American anthropological archaeology (Dever 1981b, 1985). The new research trends which have characterized American archaeology since the 1950's involve hypotheses testing, the reconstruction of social organization (e.g., Longacre 1970b), and the demonstration of past human behavior (e.g., Longacre 1970a; Hill 1970). Only recently have these concerns come to the attention of a few archaeologists working in the Levant, where much of the current research revolves around a preoccupation for the chronological refinement of ceramic typologies. In America, the newer approaches have benefitted from a relatively well-defined chronological and typological sequence (Longacre 1970b: 10). With the introduction of anthropological archaeology in the Levant, future studies will similarly build on the decades of comparative typological work.

Dever (1980a, 1981b, 1985) has also emphasized the need to reconsider archaeological research in Israel as separate and distinct from Old Testament studies. "Biblical archaeology" as practiced in the past by Americans, most notably Albright and Wright, lost its appropriateness with the advent of the discipline of archaeology independent of Old Testament studies (Dever 1981b: 15; 1985). Until the two fields are disentangled and each develops its own approach, general archaeological method and theory and ceramic analysis will be slow to advance. For too long all historical reconstructions and excavation strategies have been devised based on a current understanding of Old Testament events rather than allowing the archaeological evidence to serve as an independent source of information.

With regard to ceramic analysis, in addition to events described in the Old Testament, political and historical developments have been used to explain the appearance of new styles. For example, in a review of the Medieval pottery from Abu Gourdan (Franken and Kalsbeek 1975), Sauer offered the following critique and reinterpretation: "instead of seeing two basic ceramic traditions which interact through Periods 1-3 at Tell Abu Gourdan, we would see a series of ceramic repertoires which attest differences that can often be attributed to changes in political and cultural domination" (Sauer 1976: 94).

The division of the ceramics into two traditions was considered "too simplistic" by Sauer based on political history and traditional typological analysis. Sauer has misunderstood the scope of the term "tradition" which "denotes a series of routine treatments repeatedly used by the same potters" (Franken and Kalsbeek 1975: 217). It is "a technique of pottery-making used by potters in one or more location" (_Ibid_.: 21), and can include wheel-thrown wares as well as hand-made containers (*Ibid*.: 217). Although the ceramic "repertoire" specifically refers to "all the sherds found together" (*Ibid*.: 21), Sauer, by focusing only on typological analysis, has used this term in a vague manner. The equation of ceramics with political history has been denounced elsewhere (Adams 1979; Kramer 1977). There is no reason to categorically assume that a change in political domination results in new ceramic styles as Sauer inferred. Nevertheless people continue to be identified by ceramic types (e.g., Dothan 1982) and new styles imply invasions by foreigners rather than changes in trade relations or other societal restructurings.

Continuing in the older tradition, pottery reports are usually presented in catalogue form (Aharoni 1973, 1975; Amiran *et al*. 1978; Beck 1975; Bikai 1978; Dothan 1982; Fargo 1979b; Gichon 1974; Mazar 1980; Rast 1978; Roller 1980; etc). Decorated wares receive disproportionate consideration and interest in utilitarian pottery remains minimally reported. The wealth of Tell Dan, excavated for over fifteen years, is represented in print by a Mycenaean charioteer vase (Biran 1970). Although scholars dealing with trade are rarely inspired to conduct provenience tests, there is a slow trend discernable in numerous recent publications that reflects more than the traditional typological studies.

New directions

The emergence of archaeological research as distinct from biblical studies has fostered a new type of professionalism to replace the part-time American archaeologist-Biblical scholar (Dever 1985). With this change, research strategies are increasingly formulated to address non-chronological issues. The new emphasis is directed more toward the integration of laboratory analyses with historical reconstruction. With more objective and thorough ceramic studies, information on social, political and economic history is beginning to evolve and crystalize in new and different configurations. For example, the neutron activation determination that the "Palestinian bichrome ware" was not of local origin, but was imported from Cyprus, has encouraged a reconsideration of the trade relations between the island and the Levant. The nature of the interaction between the Sinai sites and the northern Negev site of ᶜArad has not been fully explained, but were it not for the petrographic work on the ceramics (Amiran, Beit-Arieh, and Glass 1973; Rothenberg 1972b) the relationship may never have been realized. Studies of ancient ceramic technology invariably contribute to the appreciation of the potters' skill, which is understood to reflect the organization of the industry as well as society in general (Bennett 1972: 220; Hammond 1971: 11).

Neutron activation analysis has been employed to determine the origin of decorated wares and unusual pieces, such as the "Mycenaean" and "Philistine" wares from Ashdod (Asaro, Perlman, and M. Dothan 1971; Perlman and Asaro 1971; Perlman, Asaro, and Frierman 1971); anthropoid coffins from Deir el-Balah (Perlman, Asaro, and T. Dothan 1973), late Roman fine wares from Meiron (Asaro 1971), "Philistine" pottery from Tell ᶜEitun (Perlman, Asaro, and Frierman 1971), and Tell el-Yahudiyeh ware (Kaplan 1980), Eastern Terra Sigillata (Gunneweg, Perlman, and Yellin 1983), and decorated ware from Tell el-Heṣi (Fillieres, Harbottle, and Sayre 1983: 65).

Petrographic studies have been used to learn the components of ceramics excavated at ᶜArad (Amiran, Beit-Arieh, and Glass 1973; Glass 1978), Tell ᶜEitun (Edelstein and Glass 1973), Tell Keisan (Landgraf and Glass 1980), Timnaᶜ (Rothenberg 1972a; Rothenberg and Glass 1983; Slatkine 1974), and Yotvata (Kalsbeek and London 1978). The petrographic studies deal with provenience, but also serve to isolate and define the composition of the various clay matricies found within an assemblage of pottery. The purpose here is to differentiate wares which appear superficially similar. The thin sections prepared for petrographic study provide valuable information on the technology, such as the nature of the inclusions (sorted or unsorted; size variability; frequency; identification of the voids of decomposed organic material; etc.); clay preparation (well-mixed or poorly prepared); firing, etc. An analysis of the clay composition and the manufacturing technique together provide the necessary evidence for isolating ceramic traditions.

Ancient ceramic technology has been investigated on material from Ashdod (Long 1971), Bâb edh-Dhrâ[c] (Johnston and Schaub 1978), Herodium (Bar-Nathan 1981), Naḥf (London n.d.a), Tell Keisan (Landgraf and Glass 1980), Tell Ta[c]anakh (Rye 1981), and Yotvata (Kalsbeek and London 1978). Broadly based studies of ancient ceramic technology and provenience testing will supersede site specific typological sequences. In the future, material excavated at different sites will be placed within all encompassing ceramic traditions which will unite some typological sequences while separating others. Not until utilitarian wares are examined for their origin and manufacturing technique will regional traditions become apparent.

Variation within site assemblages is now increasingly described in terms of manufacturing tradition as suggested by Franken and Kalsbeek (1969; 1975). For example, the Byzantine storejars at Tell Keisan (Landgraf and Glass 1980) were treated according to clay type, porosity, and firing, in addition to the traditional color categories. The result was an explanation of the significance of red versus black jars and the suitability of each for holding oil or wine.

Renewed interest in the local contemporary pottery industry is attested in the work of Robert Johnston (1974b) and Owen Rye (1981). Several unpublished studies have more recently been conducted by John Landgraf, Alfred Krumholtz and Uza Zevulon. Unfortunately this work does not represent the mainstream of ceramic studies and few of these people are actively working on ancient pottery. Nevertheless, a greater understanding of the pottery industry will foster a better appreciation of the ancient wares and the significance of the variability and nuances of the different manufacturing techniques.

Archaeologists are beginning to realize the value of studying a ceramic repertoire in its entirety, not only the "diagnostic" rims and decorated pieces. Following the quantification of the Tell Deir ᶜAllā material based on sherd counts (Franken and Kalsbeek 1969: 240) all sherds found at Tell Jemmeh have been saved to test:

> a new method of dealing with artifacts.... Theoretically, this procedure should yield considerably more data on which to base chronological and functional interpretations than that provided by the prevailing practice of retaining only representative collections of artifacts and discarding the remainder. (Van Beek 1983: 14)

Jerome Schaefer (1979) has examined the Byzantine material from Tell Jemmeh and from kiln remains in the vicinity of the site to investigate the distribution of storejars in relation to their place of manufacture. A discussion of trade based on the quantification of the wares provided important evidence of both domestic and foreign exchange patterns.

All of the Byzantine ceramics from Tell Keisan (Landgraf and Glass 1980) was saved and studied. Relative vessel frequencies were computed for the Byzantine material, but not for pottery of the earlier periods for which diagnostic sherds alone were examined.

At the Naḥf Byzantine kiln site (Vitto 1981) all sherds were counted and weighed to test the utility of each method and to quantitatively define the assemblage (London n.d.a). Among the numerous computations, the preservation ratio of various vessel parts was determined along with the number of gray versus red sherds, among other calculations. A study of the technology and the tradition of manufacture of these jars, in addition to petrographic analysis, will isolate them from other superficially similar storejars. The type of information collected facilitated a reconstruction of certain aspects of the organization of the workshop. For example, the presence of an apprentice or unskilled worker was inferred from the variation detected from the form and method of handle application in contrast with the more uniform bodies. The bimodal distribution of rim diameters implied the work of two potters.

Quantification of partial assemblages defeats the purpose of the exercise. Part of the Byzantine wares from Caesarea were quantified by Riley (1975) who stressed the importance of working with entire assemblages whenever possible. A study based on a count of published Iron Age pottery (McClellan 1975) assumes that archaeologists have been publishing a representative sample of the ceramics excavated at various sites, but this is doubtless not a valid assumption. Emphasis on decorated wares, whole vessels, and unusual forms has created a bias in the literature. Only by collecting all sherds at the time of excavation can quantification provide meaningful results.

In preparation for a comprehensive analysis of the Jebel Qa^{c}aqir material, all sherds from most archaeological units and all whole vessels were saved (Dever per. com. 1978). This will enable us not only to study the collection in its entirety and to determine vessel frequencies, but the precise nature of the variation of vessel form and decoration will be systematically recorded without the bias of a preselection of diagnostic and unusual pieces. It is not always necessary to save all sherds from a site to assure an unbiased sample if a rigorous sampling strategy is devised that facilitates a random sample of different types of deposits. Sampling problems can arise even if all sherds are saved from some archaeological units if certain types of deposits are neglected, e.g. areas outside structures or pits. As always, the goals determine the method of collection. Preferably, all deposit types should be sampled for comparative purposes and all sherds from selected deposits should be saved for analysis.

The study of the manufacture requires a large body of material from which the nuances in the local tradition can be discerned. A detailed research design for this project is presented below and benefits from the impact of anthropological archaeology with its emphases on hypothesis testing, the reconstruction of social organization from patterns in material residues, and the interpretation of social change based on observations of changing material patterns. The study draws on recent American research pertaining to social organization as expressed in the ceramic variability of individual assemblages (Deetz 1965; Hardin 1977, 1979; Hill 1970; Longacre 1970a). Although several of these earlier studies have been criticized for using untested assumptions regarding learning frameworks and the sources of ceramic variation, they nevertheless served as a stimulus for redefining and enhancing ceramic studies. One research endeavor that developed in part as a result of those studies is the field of ethnoarchaeology as discussed below.

Several of the problems to be examined here, however, have been previously defined and grew out of the past one hundred years of ceramic analysis in Israel. The current Qa^{c}aqir project, which arose within the context of a well-defined typological and chronological framework, which was constructed by the comparative analyses of ceramics during the past decades, is designed to investigate the ceramic assemblage by conducting tests as described in this chapter and below.

A study of micro-tradition: The late third millennium B.C.pottery of Jebel Qa^{c}aqir

Theoretical framework

For over one hundred years, pottery has served as a temporal guide, but ceramic studies dealing with non-chronological concerns are beginning to explore evidence of social organization and human behavior. It is assumed that pottery manufacture and decoration are not random, and that variation within ceramic micro-traditions, or the manufacturing technique of individual potters, reflects more than artistic whim. The pioneer studies in American anthropological archaeology to address this facet of ceramic analysis, demonstrated that patterns can be detected in the micro-tradition from which one can draw inferences regarding the people who made and used the wares (Cronin 1962; Deetz 1965; Hill 1970; and Longacre 1970a).

More recent research has begun to define with greater clarity the relationship between variation within ceramic assemblages and the human factor (Braithwaite 1981; Friedrich 1970; Graves 1981; Hardin 1979; London 1982; Longacre 1981). Observations of contemporary potters working according to traditional methods have repeatedly shown that the work of individuals can be identified based on morphological and decorative features (*Ibid.*). These ethnoarchaeological studies are designed to focus on aspects of the material culture of interest to archaeologists often neglected by the ethnographer concerned generally with less tangible aspects of society. For millennia potters have worked with the same raw materials for the primary purpose of shaping containers. The traditional methods still practiced in some parts of the world enable the archaeologist to observe pottery manufacture and to interview potters to learn about the organization of the industry.

An important value of ethnoarchaeology is the fresh perspective it affords on the analysis of ancient pottery and the opportunity it presents for developing new hypotheses to be tested on archaeological material. The Jebel Qa^{c}aqir collection, from a late third millennium B.C. site in southern Israel, is amenable for examining hypotheses drawn from ethnoarchaeology, such as those related to the variation of the work of individual potters, micro-traditions, and the community as a whole. Ceramics from four caves and over eighty tombs will be carefully recorded and analyzed to determine the precise nature of the morphological and stylistic nuances in the work of the Jebel Qa^{c}aqir potters and to detect patterns in the spatial distribution of the various wares.

Additional hypotheses to be examined are derived from my experimental archaeology dealing with ceramic technology. Here the focus is on the nature of the clay, its composition, and the pyrotechnology to learn about the technology.

Also under investigation are questions generated by recent studies of the cultural formation processes responsible for the acccumulation of the artifacts and debris at ancient sites (Schiffer 1976, 1977, 1983). One aim is to reconstruct the depositional history of the ceramics found at Jebel Qa^{c}aqir and to examine the various uses of the four caves. The excavator has suggested that not all were used as habitational or storage facilities at the time of site abandonment (Dever 1971: 232). A quantitative study of the sherds will determine the correlation between the use of each cave and the nature of the sherd deposits, and facilitate the recognition of such debris at other sites.

CHAPTER 3

THE JEBEL QA^{C}AQIR ASSEMBLAGE

Jebel Qa^{c}aqir - Site description

Jebel Qa^{c}aqir lies 12 kilometers west of Hebron, at an altitude of 900 meters, where the Central Judaean Hills meet the rolling hills of the Shephelah (Fig. 1). The terrain of low hills and gentle slopes is suitable for farming.

Springs are known in the area, but not immediately at the ancient site. The natural occurrence of caves in the Cenomanian-Turonian limestone perhaps encouraged ancient settlers to use the area.

Local villagers discovered the site in 1967 after bringing deep ploughing equipment to the area to improve their agricultural fields. When they turned over the earth, they discovered tombs and caves. Despite an exhaustive archaeological surface survey since then, researchers have been unable to ascertain the full extent of the site, much of which lies below cultivated fields.

The settlement and cemetery sprawl over an area of hilltops and slopes. Cut into the slopes above the valleys are rows of tomb chambers (Dever 1972a: 232). On the crest of the hill are caves used for occupation and/or storage and many cupmarks are artificially carved in the outcropping bedrock. In all, five caves and 79 burial chambers were identified. Twelve tumuli or cairns were found high on the ridge as was a dolmen construction. Fragments of an enclosure wall encircle the site and also separate the domestic area from some of the tombs. Outside the enclosure wall, in a slight depression, was a kiln. The wall, cairns, and kiln cannot be dated absolutely to the late third millennium B.C. use of the site, although there is considerable reason to associate them with Early Bronze IV period.

In addition to the late third millennium B.C. material, the excavation unearthed a small collection of 4th millennium B.C. Chalcolithic debris and some Hellenistic and Byzantine material. Iron Age II tombs excavated in the vicinity of Jebel Qa^{c}aqir and at nearby Khirbet el-Kôm attest to yet another later brief use of the area.

In contrast to the wealth of late third millennium B.C. funerary remains, domestic debris is poorly represented throughout Israel. Among the few sites in the Negev with habitation remains are Har Yeruḥam (Kochavi 1967, 1969), Beer Resisim, and nearby sites identified in survey work (Cohen and Dever 1979, 1980, 1981). Beer Resisim provided valuable data, but its location in a military zone imposed limitations common to salvage work. In North Sinai, Clamer and Sass (1977) have reported on domestic sites in the Jebel Lagana and Wadi Mushabi area. In the Jerusalem area, G.

Edelstein (1982) has exposed a domestic structure below later agricultural terraces. At Jericho, Kenyon (1966; Holland 1981) found a limited exposure of habitational debris on the tell. Other tell sites lack stratified debris but produced caves containing non-funerary material, as at Tell Beit Mirsim (Albright 1932: 15), Lachish (Tufnell 1958: 256-58), and Megiddo (Guy and Engberg 1938: 26-27, 146-149). Caves in the Wâdi ed-Dâliyeh (Dever 1974) and at Khirbet Rabûd (Kochavi 1974: 19) also provide domestic material. Seasonally occupied camp sites in the southwestern Sharon area (Gofna and Bonimovitz 1980) and Sha^{c}ar Ha-Golan in the north (S. Rosen per. com. 1985) are the only other known domestic sites in Israel.

In Transjordan, late third millennium B.C. settlements are better represented: current excavations include Tell el-Hayyat (Falconer and Magness-Gardiner 1984); Khirbet Iskander (Richard and Borass 1984), following earlier work at the site by Parr (1960); Bâb edh-Dhrâ^{c} (Rast and Schaub 1974, 1978, 1980) and Numeira (Coogan 1984). Other settlements have been identified at Iktenu (Prag 1974), Aro^{c}er (Olavárri 1965; 1969), Ader (Cleveland 1960), and Tell Umm-Hamad (Prag 1974: 96). The dearth of occupational deposits throughout the region highlights the importance of Jebel Qa^{c}aqir, where both funerary and domestic debris were preserved.

Excavation techniques at Jebel Qa^{c}aqir

Ceramic vessels appearing on the antiquities market brought the site to the attention of W. G. Dever, then Director of the Nelson Glueck School of Biblical Archaeology of the Hebrew Union College in Jerusalem. Under the auspices of the College and with the generous support of Mr. R. Scheuer, three short seasons of salvage work were carried out at Jebel Qa^{c}aqir in 1967, 1968, and 1971.

The work involved complete excavation of tombs and caves and partial excavation of the cairns. A team of archaeologists and local workmen systematically collected ceramic vessels and sherds, metal artifacts, human and animal bones, and miscellaneous stone artifacts. As the excavation proceeded, so did illicit tomb robbing, but often the villagers destroyed or discarded the skeletal material. A third collection of pottery was purchased from the villagers, but it is impossible to attribute each artifact to an individual tomb.

In 1971 Dever and his team returned to the site fully equipped with sieving apparatus, but found few caves. Among those found were H27 and G21, which contained little EB IV material.

Previous study of the Jebel Qa^{c}aqir material

Pottery outnumbers all other funerary and domestic artifacts. All sherds were saved from most excavation units. Gitin (1975) and Dever (1981) have studied some of the Jebel Qa^{c}aqir pottery and have identified the collection's chronological and regional setting based on stylistic considerations. Many of these vessels bear an incised decoration well-known from other late third millennium B.C. assemblages found in the Central Hills and the Negev.

In dealing with the Jebel Qa^{c}aqir assemblage as a whole, my purpose is to investigate style variations among the vessels. The material clearly belongs to the southern style of flat-bottomed wares with incised decoration, but how does it differ from contemporaneous material from the south? Petrographic (Glass n.d.) and neutron activation analyses (Gunneweg n.d.) confirm that most of the pottery was locally manufactured. Subtle variations within the collection therefore reflect the work of different potters at the site. By assessing the morphological and decorative variation, it should be possible to learn about the people who made and used the pottery. One can then make inferences concerning social organization and the nature of late third millennium B.C. society.

<u>The funerary remains; excavations and acquisition</u>

At Jebel Qa^{c}aqir, 79 tomb chambers were identified, of which less than a quarter were found undisturbed; the local villagers who had discovered the site were selling the tomb contents, and even during the excavation illicit activity was unpreventable. The tombs were hewn into the bedrock and range in size from .3 to over 3 square meters in area and buried under two meters of earth.

The various slopes around the settlement were designated as Cemeteries A - E (Fig. 2). Cemetery A, southwest of the occupation area, was entirely robbed. The main excavation concentrated on Cemetery B, located on a ridge south of the site; 59 tombs were recorded, but almost 40 had been robbed.

Cemeteries C, D, and E lie southeast of the site. Most of the Cemetery C tomb contents were acquired during and immediately after they had been collected by the villagers from each tomb. No significant skeletal material was retrieved, but tomb plans were recorded.

The single tomb of Cemetery D was robbed, and the contents were purchased. Cemetery E was partially robbed, but broken sherds were collected, along with a few bones.

In the wadi adjacent to the north slope, 12 tombs were emptied by the villagers. The contents of Agagir 1, 3, and 5 were purchased immediately following the illicit digging and Agagir tombs 2 and 4 were systematically excavated. Two kilometers northwest of Jebel Qa^{c}aqir at the site of Khirbet el-Kôm, 3 burial chambers were excavated in addition to the Iron Age tomb well-known for its inscription (Dever 1971).

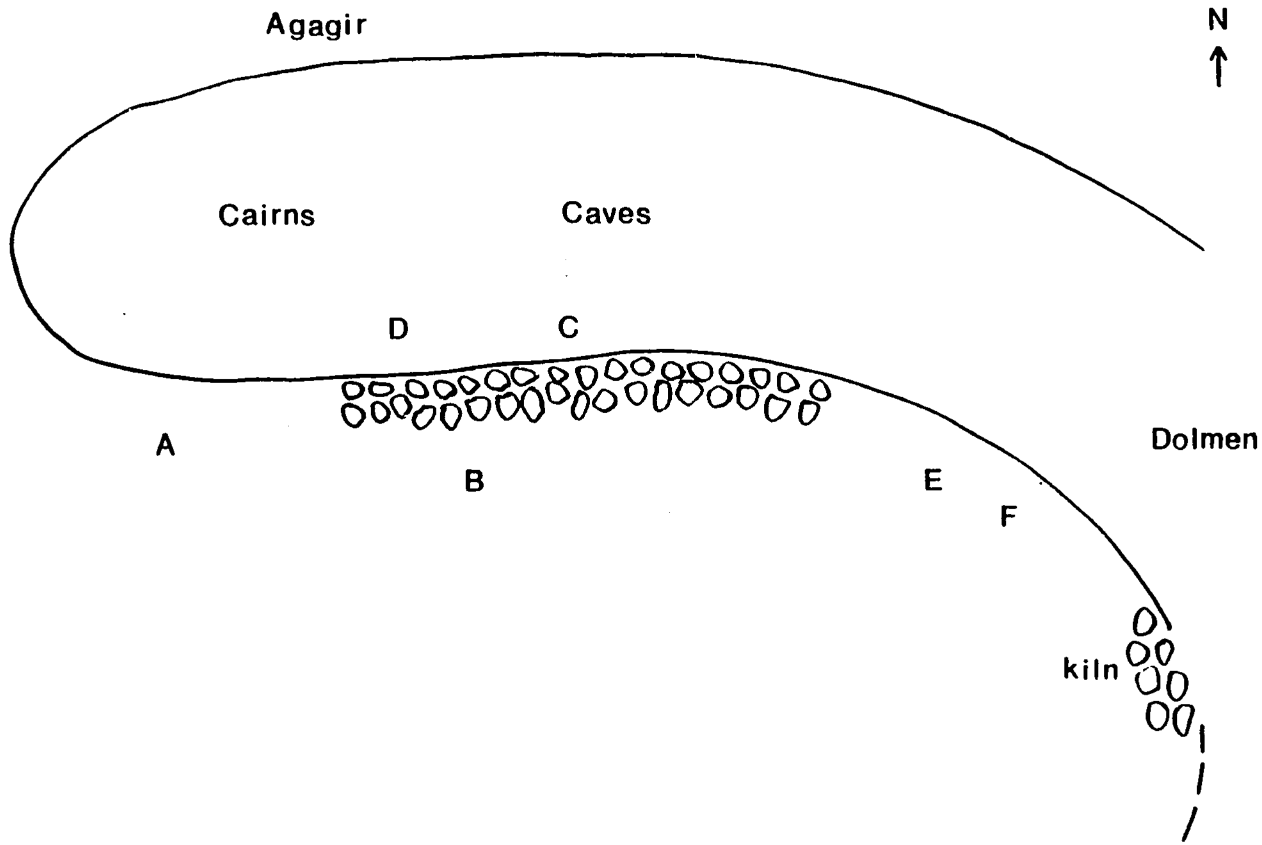


Fig. 2. Sketch map of Jebel Qa^{c}aqir cemeteries A - F and Agagir, caves, cairns, dolmen, wall, and kiln.

Many more tombs may lie undetected below the agricultural fields surrounding the area, and the full extent of the cemeteries remains undetermined.

Tomb contents

Ideally it would be instructive to compare the contents, size, subsurface depth, and architectural features of all tombs, but this is difficult. The full range of human and animal skeletal material is available only from the systematically excavated tombs in Cemetery B, and these tombs had few funerary offerings in comparison to the assemblages recovered from the villagers from the robbed tombs (Table 1).

Bone fragments were collected from the recently disturbed tombs of Cemeteries C and E, and there is no reason to assume that human bones were not regularly included in each burial. Of 79 tombs, a total of 46 human individuals (Smith 1982 and n.d.) from Cemetery B tombs was retrieved (Table 2). To complicate matters nine of the 16 undisturbed Cemetery B tombs contained multiple burials, and it is impossible to associate grave goods with the individual interments. Of the single burials, five of seven contained only an undecorated lamp and/or animal remains.

Table 1. Tomb Contents.

Abbreviations:

A	Amphoriskos	L	Lamp
Btk	Bowl-thick	M	Mini-bottle
Btn	Bowl-thin	S	Spouted vessel
C	Cup	.	No data
F	Funnel		

Tomb No.	Decor. facade	Steps	Depression "body niche"	Lamp niche	Pottery	Animals	Human
B1					empty	empty	empty
B2					.	.	.
B3			x		.	.	.
B4			x	x	.	.	.
B5					.	.	.
B6					.	.	.
B7					.	.	.
B8			x		.	.	.
B9					.	.	.
B10			x		.	.	.
B11			x	?	.	.	.
B12			x		.	.	.
B13			x		.	.	.
B14		x	x		.	.	.
B15		x	x		.	.	.
B16A,B			x		.	.	.
B17			x		.	.	.
B18			x		.	.	.
B19					.	.	.
B20			x		.	.	.
B21					.	.	.
B22		x	x		.	.	.
B23					.	.	.
B24		x	x		.	.	.
B25					.	.	.
B26	x		x		.	.	.
B27	x			?	.	.	.
B28					.	.	.
B29					.	.	.
B30	?				.	.	.
B31					.	.	.
B32					.	.	.
B33	x				.	.	.
B34		x		?	.	.	.
B35		x			.		2

Table 1. (<u>Continued</u>)

Tomb No.	Decor. facade	Steps	Depression "body niche"	Lamp niche	Pottery	Animal	Human
B36				x	empty	empty	empty
B37	x	x			.	.	.
B38		x			.	.	.
B39		x			.	.	.
B40					.	.	.
B41			x			?	bones
B42							1
B43	?				A	2	4
B44							1
B45	?				A,J		3
B46					A		1
B47						1	1
B48	x					2	1
B49			x		sherds	?	bones
B50					A,Btk		5
B51			x		A,J,3L	3	4
B52					sherds		1
B53	wall				L	3	1
B54A	?			?	L	1	1
B54B				?	2A,2J,Btk C,4L	2	8
B54						1	
B55	?					3	
B56	wall					bones	bones
B57						2	4
B58A	?						
B58B	?				L	1	1
B59					L	1	2
C1			x		2J	.	.
C2						.	.
C3A					A,2J,C,L	.	.
C3B			x		2A,Btk	.	.
C4			x		A,J,C, 2S,L	.	.
C5			x		A,Btk,2C, L,M	.	.
C6					A,F	.	.
C7					empty	.	.
C8					empty	.	.
C9					A,J,C,S,L	.	.

Table 1. (Continued)

Tomb No.	Decor. facade	Steps	Depression "body niche"	Lamp niche	Pottery	Animal	Human
C10					empty	.	.
C11					sherds	.	.
C12					empty	.	.
C13					A,L	.	.
D1					A		skull
E1					J	.	skull
E2					J,2S,L	frags.	bones
E3A						.	.
E3B					2A,B,L	.	.
E4A					2J,C	.	.
E4B					J,Btn,L	frags.	.
Agagir 1					2A,Btk,L	.	.
2					A		
3					2A,J,Btn	.	.
4					4A,2B	.	.
5				x	2A,B,L	.	.
El Kom 1			x	x	J,2L	.	.
2					A,2J,L	.	.
Ali x					A,2Btk,L	.	.

Tombs B57 and B59 contained stones with holes in the center; Tomb D1 held a stone spindle whorl. No beads were found; metal objects are presented below as are sex and age data for human skeletons and animals.

Table 2. Inventory of human and animal skeletal remains from Jebel Qa^{c}aqir.

Tomb No.	No.Individuals	Homo No.	Age	Sex	Animal Bones
B35	2	H21	50-60	M	
		H22	9-10	?	
B42	1	H39	1 1/2 yrs	?	
B43	4	-	2	?	1 young goat
		-	12	?	1 immature caprine
		H7	25	M	
		H8	50	F	
B44	1	H16	3	?	
B45	3	H9	7-8	?	
		H10	15-16	?	
		H11	50+	F	
B46	1	H41	30-35	F	
B47	1	H15	40-50	M	1 young adult goat
		H40	40-50	F	1 young adult sheep (f)
B48	1	H14	50-60	F	1 young caprine
B50	5	H2	2-3	?	
		H1	12-13	?	
		H4	15-17	?	
		H0	30-40	M	
		H3	40-50	F	
B51	4	H28	40-50	F	2 young caprines
		H29	40-50	M	1 adult goat
		H26	50-60	F	1 immature bovid
		H27	60+	F	(1 bone)
B52	1	H13	30+		

Table 2. (Continued)

Tomb No.	No. Individuals	Homo No.	Age	Sex	Animal Bones
B53	1	H30	30+	?	1 young adult sheep
B54	9	H25	16-18	F	(54) 1 adult sheep (m)
		H24	16-18	M	(54a) 1 young caprine
		H17	25-35	F	
		H18	40-50	F	
		H19	40-50	F	(54b) 1 young caprine (m?)
		H5	40-50	M	1 young adult caprine
		H6	40-50	M	1 adult goat (f)
		H20	40-50	M	
		H42	50-60	F	
B55					1 adult sheep (m?) 1 young goat 1 immature caprine
B57	4	H36	8-9	?	
		H35	30-35	M	1 young adult sheep
		H34	45-55	M	1 young caprine
		H33	50-60	F	
B58	1	H31	50-60	M	1 young adult goat (f)
B59	2	H37	16-18	M	1 young sheep (f)
		H38	50-60	F	
E2					Miscellaneous fragments
E5					Fragments fallow deer antler

Grave goods are meager in the excavated tombs, especially in light of the large number of individuals buried together. The largest tomb held nine human skeletons, eight ceramic pieces, three metal objects, and four animals. Other burials contained few if any non-perishable offerings. Where pottery is present, rarely are two examples of the same type found together. Analysis of the variability of associated ceramics is thereby limited.

Some pottery from Jebel Qa^{c}aqir given to the Archaeological Officer for Judaea and Samaria was subsequently misplaced, further restricting the study of the internal variation of the collection. All other vessels are housed at Hebrew Union College in Jerusalem.

The ceramic finds. As a group, the tomb wares, both excavated and purchased, form a homogeneous assemblage that complements the domestic pottery found in the caves (see Appendix, Fig. A.1-13). The funerary wares comprise small and medium-sized amphoriskoi, teapots, and jars whose average height is just under 20 cm. This contrasts sharply with the predominance of large, tall jars (average height 60 cm) found in the domestic debris of Caves G19 and G26.

Non-ceramic artifacts. Unlike tombs found at other sites, the Jebel Qa^{c}aqir burials are sparsely equipped with non-ceramic artifacts. Beads, as found at Jericho (Kenyon 1960b: 182), el-Jib (Pritchard 1963) and Dhahr Mirzbâneh (Lapp 1966) were entirely absent.

However, several deposits contained metal artifacts. Eleven metal artifacts come from Tombs B54, C1, C4 and Caves C11 and C13. The caves, not necessarily burial facilities, each contained a dagger, as did each of the tombs. In addition, in B54A were found a pin and awl, and a second awl in B54B; there were two javelins in Tomb C1 and one in C4.

The metal artifacts cannot be associated with individual skeletons because of the multiple burial in Tomb B54. All other metals come from the tombs opened by the villagers who destroyed all skeletal material.

Each tomb containing a metal artifact also held ceramic materials (Table 3); no tomb contained only metal artifacts.

Animal bones. The remains of caprines (sheep and/or goats) were found in ten of the 16 excavated tombs (Horwitz n.d.). Most of the animals are immature or young adults; all goats are female (Table 2).

Signs of butchering and cutting indicate that the animals were slaughtered for inclusion in the tombs. Skulls are always missing, as are tail vertebrae and phalanx bones. This further confirms that the animals were purposely dismembered in order to bury parts of them. One bone of an immature bovid was also found.

Table 3. Tomb contents: metal and ceramic artifacts.

Tomb	Metals	Ceramics
B 54 A	pin	1 lamp
	awl	
	dagger	
B 54 B	awl	2 lamps
		1 cup
		2 amphoriskoi
		1 bowl
		2 ovoid jars
C 1	javelin	2 ovoid jars
	javelin	
	dagger	
C 4	javelin	2 spouted jars
	dagger	1 lamp
		1 cup
		1 amphoriskos
		1 broken jar
C 11	dagger	sherds
C 13	dagger	1 lamp
		sherds

The non-funerary deposits

At least five natural caves on the hill crest contained no human skeleton remains, but rather evidence of domestic use.

Cave C12

This natural cave, only partially excavated, contained 351 identifiable rim sherds (Table 4). Sherds of all sizes were found, but body sherds were not saved, and no attempt was made to reconstruct the pieces. Incised designs vary and jars with plastic rope moulding are limited to this cave and Cave G23.

Also unique to this deposit is a small cylindrical jar reminiscent of the funerary jar found so often in the region of Jericho. This is an important link between the two regions, but the Jebel Qa^{c}aqir specimen is considerably smaller than the norm.

Cave G19

Several periods of use and abandonment can be discerned in Cave G19, an irregularly shaped natural cave measuring 8 by 2 meters and varying in width between 3 and 4 meters (Fig. 3).

The earliest use dates to the Chalcolithic period, which is followed by a hiatus followed by an Early Bronze Age use, and finally a later stage of deposition and accumulation.

Table 4. Cave C 12 contents.

	Number of sherds
Cooking pot rims	77
Jar rims	107
Amphoriskos rims	5
Teapot rims	7
Cylindrical bottle	1
Thin-walled bowl rims	53
Thick-walled bowl rims	61
Funnels	7
Lamp	12
Small jar rims	1
Deep bowl rims	5
Pitcher rim	1
Small-medium jar rims	5
Wide mouth jar rims	3
Chalice (Iron Age?)	1
Holemouth rims	5

The uppermost deposit consists primarily of donkey bones found in larger proportions here than elsewhere at the site. Three sherds of the Iron II age and Hellenistic or Roman/Byzantine period were found in baskets 4, 7, and 12, (Table 5).

Artifacts post-dating the Chalcolithic deposit include two flint or chert fragments and a considerable quantity of pottery. No heavy grinding equipment or pounding implements were found, but cupmarks possibly used for grinding, characterize the exterior area of the cave. No human skeleton remains were encountered, although animal bones were distributed throughout the deposit (Hakker n.d.b). Evidence of hearths was found as well. The EB IV (baskets 12-31) material is discussed below;the ceramics are illustrated in Fig. A.9.

The Chalcolithic Assemblage. The 4th millennium B.C. pottery and stone implements were associated with loci 19011 and 19012; a few sherds with red slip and a loop handle were found in the late third millennium B.C. deposit, along with a reworked lug handle.

Predominant in the assemblages are thick- and thin-walled open forms tempered with large quantities of stones and medium-sized fiber fragments. Some cores preserve the carbonized fibers intact. Small quantities of red-slipped

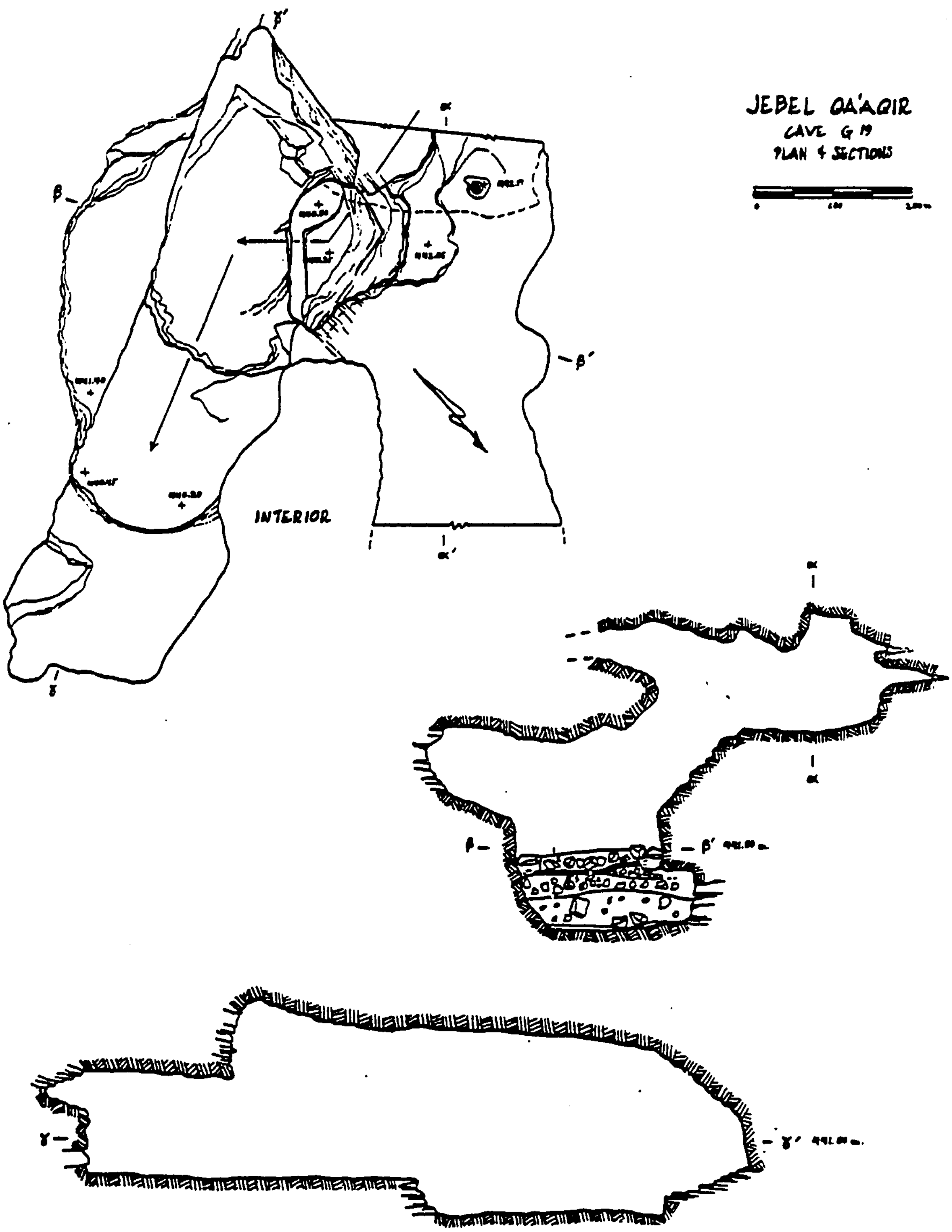


Fig. 3. Cave G19.

Table 5. Cave G19: Locust list and corresponding basket numbers.

Locus No.	Description	Baskets
L. 19000	Probe, surface cleaning of cave entrance; rubble	1-3
L. 19001	As L. 19000; bones found; fill of soft soil Basket 19.12: flint, large sherds, from lower cave; Basket 19.15: bones	3-12; 14-19
L. 19002	EB IV flagstone surface	-
L. 19003	Mixed locus below 19002 surface: subsoil below flagstone surface; soil with humar specks and chips	13, 20-25
L. 19004	Rubble in back of lower cave chamber	26
L. 19005	Above 19004 rubble in rear, lower chamber	27,28,30,31
L. 19006	Shelf in lower cave; loose fill	29
L. 19007	Steps leading down to lower cave	-
L. 19008	Shelf in upper cave	-
L. 19009	Upper cave work area and entrance	-
L. 19010	Upper cave cup mark at cave entrance	-
L. 19011	Lower cave Chalcolithic material	-
L. 19012	Fill below L. 19011	32-34

bowl sherds and burnished unslipped 'V'-shaped bowl fragments were found. The foot of a chalice (?) and a ledge-handled, large burnished bowl comprise the remainder of the identifiable pieces. Examples of finer wares are limited to two sherds fabricated from a cream-colored compact ware with red-slipped exterior surfaces. These fragments of a single vessel lack the voids of the organic tempering material so characteristic of the assemblage as a whole. Some of the thin-walled, fiber-tempered bowls display the marks of a flint scraper used to thin the walls. This technique was detected in Neolithic wares deposited at Jericho (Franken 1974: 182).

Both a flat and a disc base show evidence of a double layer of clay for the base. The disc base has been burnished as was the outer wall.

One of the loop handles shows the method of attachment: one end was applied head on, while the second was applied sideways and secured by a fillet of clay. This was a common practice throughout antiquity (Franken and Kalsbeek 1969: 171; Glock 1975: 14).

A basalt fragment and a chert pounding tool were found in the Chalcolithic deposit. The basalt was brought from the northern part of Israel during the Chalcolithic period, and any basalt finds from the late third millennium

B.C. context could represent the later reuse of an older object rather than evidence of EB IV ties with the north.

Cave G21

As Cave H27, this natural cave contained fragmentary late third millennium B.C., Iron II, and Hellenistic material. The small quantity of worn sherds included a low-necked jar with slashes around the neck.

Cave G23

One of the excavated natural caves, Cave G23, has been designated as the dumping site (Dever 1972a: 232). It contained 198 buckets or 797 kilograms of pottery (estimated to be 25,000 sherds) and little else in a dark yellow brown fill with ashy deposits. All sherds were saved. Cave length measures 9.85 meters; the width is 8.25 meters and the maximum height is 2.8 meters (Fig. 4).

No discrete stratigraphic units were discerned during the excavation, but it was noted that debris had been thrown into the cave from two directions "from its southern entrance and from the northern roof-hole in four successive layers, as evidence by the top lines of its centre-east west section" (Gitin 1975: 46*).

The cave roof collapsed at an undetermined time. Little reference to limestone fragments appears in the field notes, suggesting that the collapse occurred before the cave

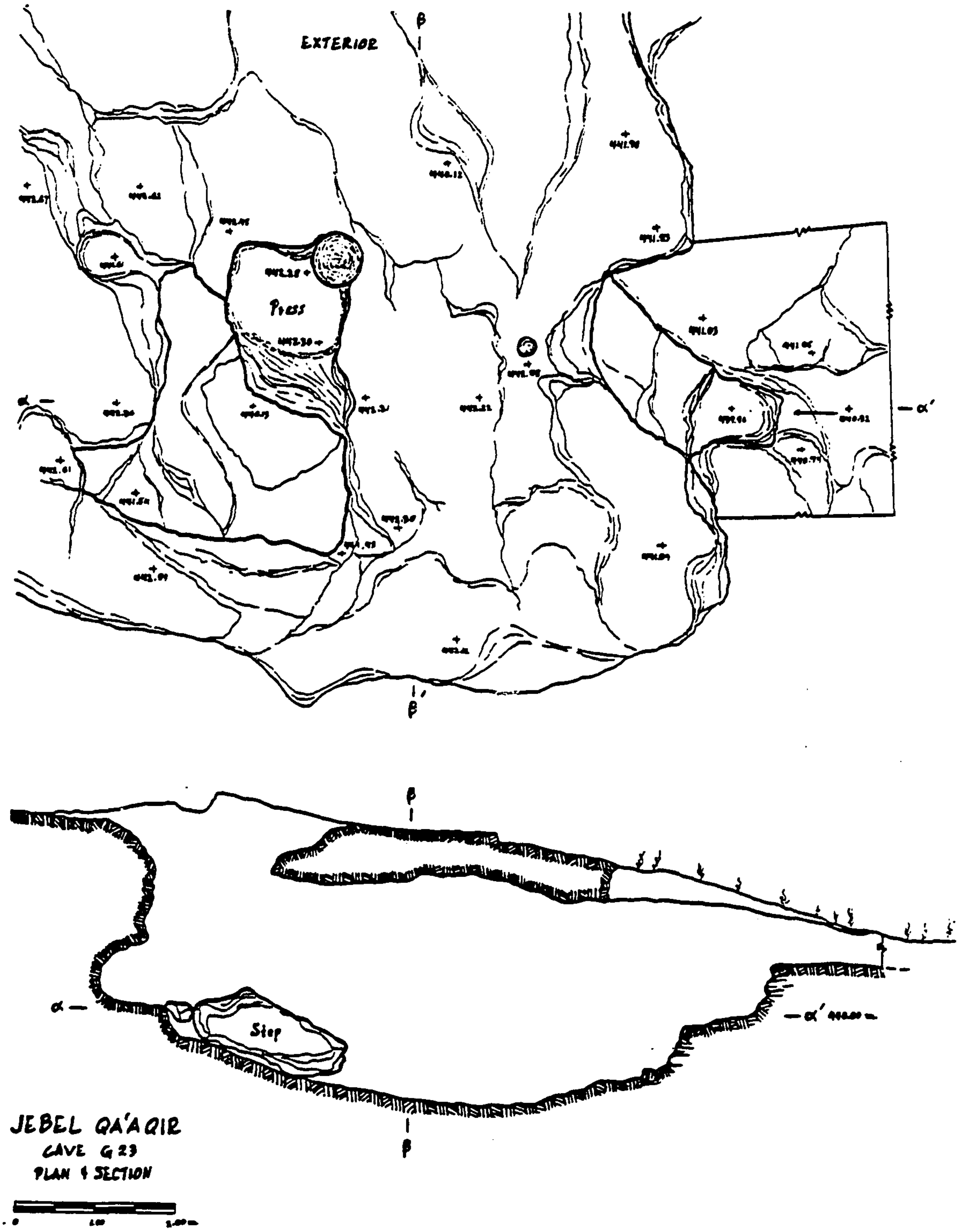


Fig. 4. Cave G23.

was filled with sherds. Once the roof collapsed, debris was thrown in through the holes in the roof and the cave became a repository for broken pottery.

Twelve locus numbers (Table 6) were arbitrarily assigned. In reconstructing the decorated pieces, it became clear that sherds from all parts of the dump joined with each other (Table 7).

Gitin, who examined the majority of the decorated pieces and cooking pot rims determined that the dump potentially held 1898 restorable domestic vessels, but did not attempt the enormous task of reconstruction (Gitin 1975: 60*). Stylistic parallels for the Jebel Qa^{c}aqir finds also were presented by Gitin, who attributed the dump to periodic cleaning of the habitational/storage caves (G19, 26) when the site was reused in the Iron II period (Ibid.: 46* n. 3). Iron II tombs are known in the vicinity of Jebel Qa^{c}aqir especially at Kh. el Kôm, which lies one kilometer from the site (Dever 1970a). Some Iron Age pottery was found in and near the dump. A very small proportion of the cave contents (4 kg) are non-EB IV sherds, including Chalcolithic, Hellenistic, Roman/Byzantine, and Islamic wares.

A cobbled substructure with a loom weight was found 7-10 cm above bedrock. This feature, as well as the steps cut into the bedrock, suggest that prior to filling with sherds, the cave served other functions, perhaps as a storage facility similar to Caves G19 and 26.

Table 6. Cave G 23: locus list and corresponding basket numbers.

Locus No.	Description	Baskets
23000	Silt fill dug from both cave entrances; probe	1-51,58,59,67-71,74, 76,78,80-93,100,163
23001	Dark yellow brown fill	94-98,101-117,119-121, 123-140-151-153-155, 155B, 165,167, 170,171, 173,174,176,177,181,188, 190-193
23002	Bottom part of L23000; probe into dark brown fill	52-57,60-65,67
23003	Fill	66,68,72,73,75,77, 80,81,156-8,160-162, 164,166,168,167,172
23004	Brown fill, continuation of L23003	79
23005	Surface; dark brown fill	182,184-7,189
23005P	Surface; black soil	175,178
23005.1	Cobbled sub-structure 7-10 cm above bedrock	179,180
23006	Bedrock, sterile	-
23007	Sterile soil immediately above bedrock	159,183
23008	Stairwell steps cut into bedrock	-
23009	Fill, dark brown	118,99,122
23010	Decomposed limestone 2 cm. above Saḥir	-
23011	Shelf cut into right side of cave wall	-

Table 7. Distribution of joining sherds in Cave G23.

Locus #	23000	23001	23002	23003	23004	23005	23005.1	23005P	23007	23009
23000	jkn	jkn	j	jk	-	-	-	-	-	-
23001		jkn	jn	jk	-	j	j	-	j	-
23002		jk	kn	-	-	-	j	-	-	-
23003				j	-	n	n	-	j	j
23004					-	-	-	-	-	-
23005						-	n	-	-	-
23005.1							-	k	-	-
23005.P								-	-	-
23007									-	-
23009										-

j = closed vessels, especially jars;
k = thick-walled bowls;
n = thin-walled bowls and teapots,

This cave contained the full range of EB IV pottery found elsewhere at the site: jars with high, out-flaring necks and rounded or flattened rims, all have flat bases and none have handles. Most jars have incised designs or rope moulding on the shoulders (Fig. A.10).

Amphoriskoi are smaller than jars and have two lug handles from neck to shoulder. It was often difficult to differentiate between jar and amphoriskos rims and shoulders unless a handle was present. The rim diameters of complete jars tend to be wider (over 100 mm) than amphoriskoi (Table 8), but this feature could not be measured on many sherds. Neck height and diameter of the two forms vary minimally.

Table 8. Comparison of jar and amphoriskos rim diameters based on 68 purchased and excavated vessels from Jebel Qa^{c}aqir, Khirbet el-Kirmil and Khirbet el-Kôm.

	Rim diameters (mm)					
Vessel type	under 100	100-110	111-120	121-140	41+	Total
jars	3	6	10	7	4	30
amphoriskoi	30	4	4	0	0	38

Three categories of "teapots" or spouted vessels were identified according to neck height: high, low, or no neck (holemouth rim). It was difficult to separate incurving bowls from the holemouths unless a spout was present.

Bowls were initially divided into two groups based on wall thickness. Thin-walled bowls (3-5 mm) are incurving, out-flaring, straight or slightly corrugated. The thick-walled bowls tend to be carinated or rounded (Fig. A.11).

The majority of lamp spouts (77%) were of fine ware and nearly 50% of all preserved soot around the spout.

No system to differentiate coarse ware store jar rims from cooking pot rims was devised owing to the fragmentary nature of the vessels. No complete forms were found at the site. All coarse ware sherds were treated as a unit.

Funnels were few in number. A fragment of a crucible to which metal still adhered completes the assemblage.

To determine vessel frequencies, open and closed rim sherds were compared (Table 9). Closed vessels predominate. For the entire collection of containers (as well as lamps and coarse ware rims), open forms (including teapots that could not be differentiated from the incurving bowl forms) account for 27.3%, closed vessels 45%, lamps 4.4% and 23.3% coarse ware rims. In all, the fine ware rims (and lamps) account for 77% of the assemblage versus 23% coarse ware rims. A similar ratio for all fine ware body sherds (N=57 boxes or 593.6 kg) versus all coarse ware body sherds (N=14 boxes or 202.9 kg) was obtained: fine ware body sherds represent 80.3% countwise and 74.5% weightwise versus 19.7% and 25.5% for coarse wares.

Table 9. Cave G23: Vessel and ware frequencies.

Identifiable sherds	Kilograms	%
Closed vessels*	55.45	45.02
Bowls and spouted vessels	33.64	27.31
Coarse ware rims	28.64	23.25
Lamps	5.45	4.42
Total	123.18	100.00

Body sherds	Kilograms	%	Boxes	%
Fine ware	593.6	74.5	57	80.3
Coarse ware	20.3	25.5	14	19.7
Total	613.9	100.0	71	100.0

* Closed vessels include rims, combed sherds, amphoriskos handles, knobs and ledge handles.

Cave G26

This natural cave contains a rare assemblage of late third millennium B.C. domestic debris. Unlike the burial deposits, human bones are absent although small quantities of animal bones were found (Hakker n.d.b).

Cave contents include sherds and whole pots, chert and flint blades, chert pounders, two serrated flint blades, and animal bones.

Dever (1981a) noted stylistic similarities with contemporaneous collections of sherds. He distinguished three depositional phases. One large broken, but restorable bowl and sherds of small bowls (Fig. A.12) belong to Phase A and were found stratigraphically 25-30 cm above the reconstructed vessels and small chipped stone debris of Phase B (Figs. A.12,13). A third occupation, Phase C, is represented only by sherds.

The cave measures 1.75 meters in height, 6 meters at most in depth and varies in width from 2 to 4 meters (Fig. 5). In front of the cave are many cupmarks hewn into the exposed bedrock. Inside are bins, a stone wall and evidence of hearths.

Cave H27

Cave H27 is a natural cave measuring 6 by 6 meters and 2 meters in height with a long overhanging roof (Fig. 6). Three steps lead into the chamber, which contained a stone wall near the entrance, two perpendicular walls, a fire pit, a shelf in the wall, and a fill of earth and sherds. Cupmarks in the bedrock surround the cave entrance.

No discrete archaeological deposits were isolated; reuse during the Hellenistic period disturbed earlier debris. Chalcolithic, Early Bronze, Iron II, and Hellenistic sherds were found. Those of the late third millennium B.C. have incised designs (individual slashes or stippling above two horizontal combed bands).

Table 10 presents a list of the deposits.

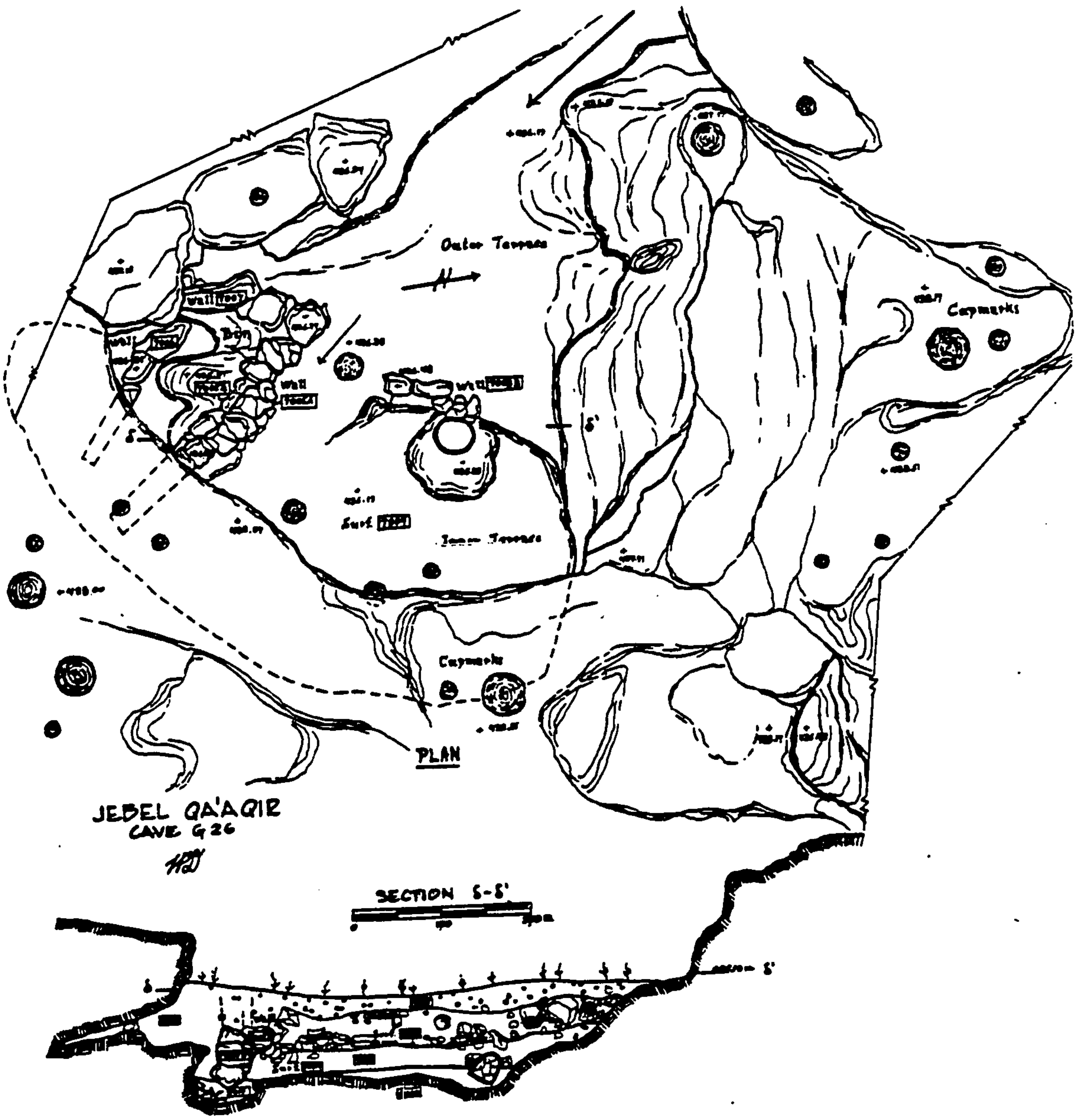


Fig. 5. Cave G26.

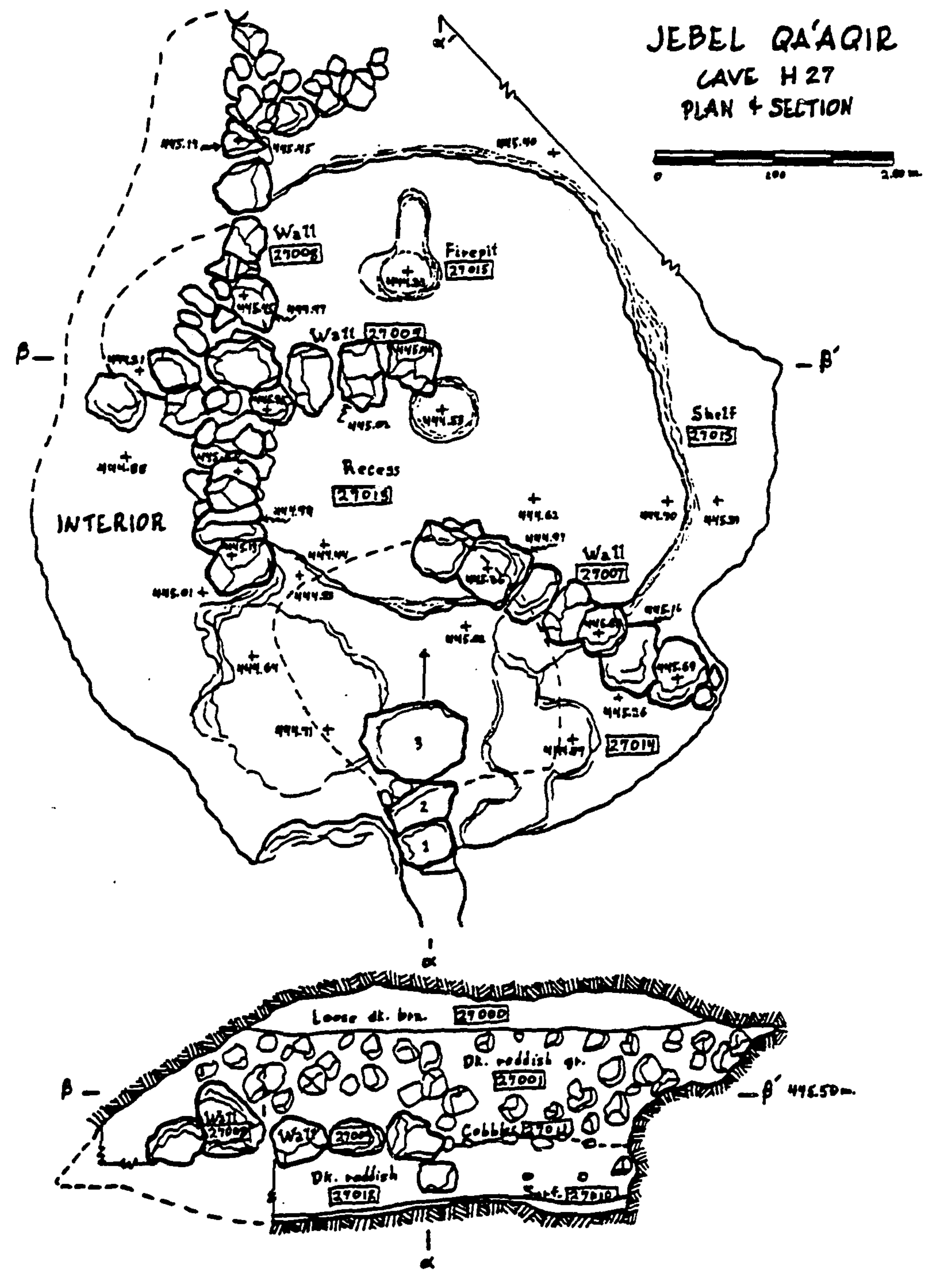


Fig. 6. Cave H27.

Table 10. Cave H27: Locus list and corresponding basket numbers

Locus #	Description	Baskets	Pottery
27000	Loose fill; top level	1,5	-
27001	Fill throughout cave; dark reddish gray	2,15	Hellenistic
		3,6,10	-
		7,11,12,13A	EB IV, Hell.
		14A	
		8	EB IV
27002	Sterile soil above bedrock as L. 27010 + L.27014	-	
27003	Six steps leading down to cave entrance		
27004	Eliminated		
27005	Bedrock		
27006	Eliminated		
27007	Wall (possibly cobbles)		
27008	Wall (possibly cobbles)	27	Iron II,EB IV Hell.
27009	Wall (possibly cobbles)		-
27010	Sterile earth	16;19	Hell.
		24	-
27011	Cobbles	17	EB IV, Hell.
27012	Fill, dark reddish, below wall	13	Iron II
		14,22	MB I, Iron II
		18	EB IV, Hell.
		23	Chalcolithic? EB IV, Hell.
27013	Shelf in cave wall	-	-
		4	Chalcolithic EB IV,Iron II
27014	As L.27010 + L.27002	21	
		20	EB IV,Iron II
27015	Depression in bedrock	25	Hell.
27016	Depression cut into bedrock in cave center	-	
27017	Bottom course of wall L.27008 and wall foundation	28	EB IV
		29	

Cairns

Twelve stone-heaps stand on the hill crest. Two were partially excavated, and identifiable pottery, mostly small sherds, were saved. The date of the cairns remains problematic; there is no absolutely certain indication of a third millennium B.C. date.

Cairn 1

Below the heap of small and medium-sized stones, were sherds of Early Bronze Age date and ten later ribbed sherds (Roman/Byzantine; Fig. 7).

Cairn 4

Below Cairn 4 are a round structure described by the excavator as a "tower" and part of a rectangular building. In the ceramic assemblage, thick-walled bowls are common, and several varieties of thumb-indented rims were collected. Many of the closed vessels bearing a variety of incised designs had knobs. The designs are highly varied and include the full range recorded from other parts of the site.

A bowl fragment, red-slipped and burnished on both sides, and an Iron Age ring base were found among the debris.

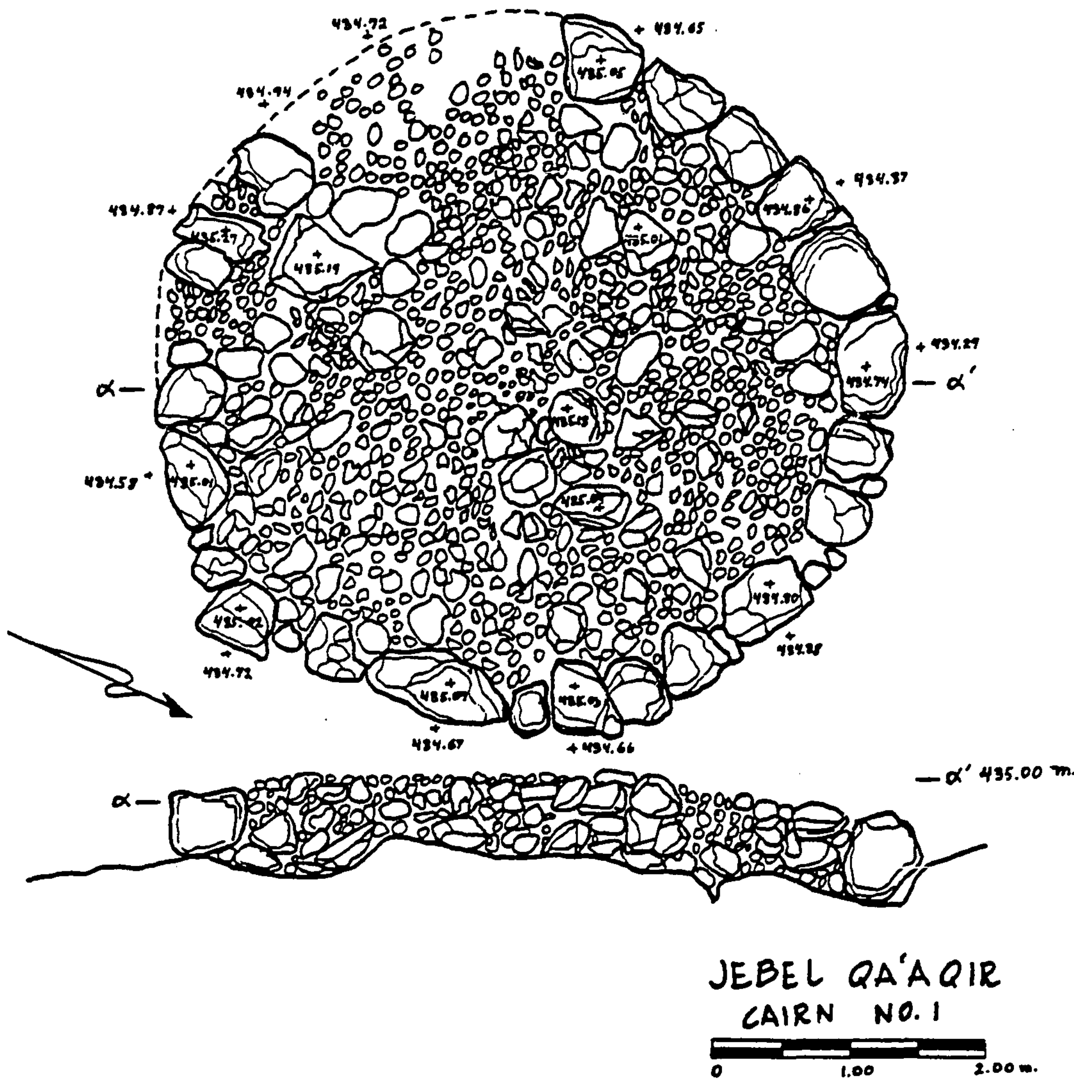


Fig. 7. Cairn 1.

CHAPTER 4

ANALYSIS OF THE LATE THIRD MILLENNIUM B.C. MATERIAL CULTURE

One of the goals of the Jebel Qa^{c}aqir study is to examine and characterize variation detected in the pottery found within each deposit and then to compare material found in different parts of the site. In order to establish a basis for comparison, it was necessary to first examine the cultural formation processes responsible for the deposits.

Physical appearance of the collection, site formation processes and depositional history

Archaeologists have come to explore in greater detail the cultural circumstances contributing to the formation of archaeological deposits (Schiffer 1977, 1978, 1983). The study of those site formation processes induced by cultural causes requires creative approaches given the complexity of the problem, the fragmentary state of the archaeological remains, and the variety of factors culminating in artifact deposition.

Schiffer (1977: 16) describes four types of cultural formation processes, i.e. how objects come to be where they are found.

(1) Cultural deposition of artifacts by which they are moved from systemic context (use) to archaeological con-

text (non-use) is not uniform. Worn-out objects deposited as refuse wherever they were used constitute primary refuse, whereas objects removed from the work areas to a trash heap constitute secondary refuse. Abandonment of still usable artifacts is considered de facto refuse (Schiffer 1977: 19).

(2) Transforms of material from archaeological context back into use or systemic context result from scavenging or collecting.

(3) Transforms of material from state to state within the archaeological context as a result of digging or trampling and the upward migration of objects through layers of debris (Ibid.: 27).

(4) Finally, transforms of material within systemic states, such as recycling artifacts to different uses with or without modification of the object and the curation of artifacts (Ibid.: 29).

As a result of these transformations, "the archaeologist cannot read behavior and organization directly from patterns discovered in the archaeological record" (Schiffer 1983: 677). To make inferences about past behavior, the first task is to identify the processes contributing toward the deposition of archaeological remains. Precise descriptions are usually impossible, but analyses of certain aspects of the artifacts can show some of the circumstances of their deposition.

Among those properties of artifacts and deposits that may have information regarding depositional history, Schiffer (1983: 679) lists several that are appropriate for the Jebel Qa^{c}aqir assemblage: sherd size, reconstructability, artifact diversity, and sherd wear damage. These properties were examined for the sherds and vessels from the tombs and Caves G19, G23, G26 and H27. (All sherds were saved from these deposits, thereby eliminating selection biases).

Sherd size

Although rarely discussed in archaeological literature, artifact size reflects numerous pre- and post-depositional factors. For ceramics, sherd size is affected by ware composition, wall-thickness, vessel shape and size, manner of fabrication, precise manner of breakage, post-depositional environment, and archaeological retrieval processes. These factors have been discussed in part by Schiffer (1983).

The precise manner of breakage is too complex to consider here and more testing is needed to study ceramic breakage. From inspection of large quantities of archaeological ceramics, we can make certain generalizations, but these would be more fully understood with rigorous testing. For example, it is known that egg shell wares break into more and smaller pieces than thick, coarse wares. Large inclusions can influence fracture pattern and sherd size, as might breakage along coil joins or mould seams. The flat, wide bases of the collection under study break into large pieces because they were formed from a single lump of clay rather than coil manufacture. The base of the round-bottomed cooking pot of the collection breaks into fairly small sherds along coil joins. Wheel-thrown wares, by contrast, often break into triangular pieces (Franken and Kalsbeek 1969: 79).

Schiffer (1983) enumerates many post-depositional events effecting sherd size including archaeological recovery techniques. For example, small pieces are often neglected at the time of excavation or later.

At Jebel Qa^{c}aqir, the debris was not sieved, and the smallest sherds were not always collected, but all others from Cave G19, 23, 26 and H21 and 27 were saved and analyzed.

To study the body sherds, all were first divided by ware (coarse cooking pot and store jar ware versus all other finer wares). Fine wares were then sized: small (under 3 cm at the longest point), medium (3-10 cm) and large (over 10 cm). These values are appropriate for the dense, coil-built wares, of which most are no more than 6 mm thick at all points, except the shoulder of jars and some bowl fragments. The base/wall juncture is unusual in that it is thin. Unlike the finer wares, the coarse ware varies considerably in thickness.

After sizing, all body sherds were boxed, then weighed and counted by box. The boxes were weighed on a bathroom scale, which was the most convenient tool. Later, five boxes were reweighed on a balance scale to confirm the accuracy of the first measures (Table 11).

Table 11. Comparison of the weight values obtained with a balance scale versus a bathroom scale.

	Balance scale	Dial scale
large sherds	99.21 lb. (45.55k)	100 lb.
rim sherds no decoration preserved	38.61 lb. (17.55k)	38 lb.
combed body sherds		
wide toothed comb	9.13 lb. (4.15k)	8 lb.
narrow " "	10.29 lb. (4.68k)	10 lb.

Cave G19. Three groups of material were differentiated in this cave: baskets 1-11, the uppermost deposit; baskets 12-31, the middle deposit; and baskets 32-34, the lowermost deposit. Only the latter comprises Chalcolithic material.

For the two Early Bronze IV period deposits, medium-sized sherds account for 71.8% and 66.4% of the total (Table 12). The middle deposit with 66.4% medium-sized sherds contained pottery that might be fully reconstructable.

Small and large-sized sherds differed greatly in the two deposits: the upper collection has more smaller sherds (18.9%) than the lower (3.2%) and fewer large sherds (9.4%) than the lower deposit (30.4%).

Table 12. Cave G19: Sherd size frequencies.

Body sherds were not included, nor were thick-walled bowls (N=25 sherds, all medium-sized) or coarse ware (N=31).

	basket	small	medium	large	N		Total
Early Bronze	1-11	18.8	71.8	9.4	85	sherds	100%
" "	12-31	8.2	66.4	30.4	280	"	100%
Chalcolithic	32-34	9.0	56.4	34.6	78	"	100%

For the Early Bronze Age deposits, medium-sized sherds do not vary significantly, but there are discrepancies between small and large sherds for each deposit. For the Chalcolithic material, a relatively high percentage of large sherds is attributed to the predominance of thick-walled containers (maximum 2 cm thick). The size categories are appropriate for the Early Bronze Age collection alone.

Cave G23. Both the count of the boxes (N=40) and weight value (N=594 kilograms) present similar results (Table 13); in each instance, medium-sized sherds account for 75% and 75.5% of the total assemblage. The similarity of the figures suggests that for this pottery, weight and count values are interchangeable.

The different values obtained for the small (12.5% versus 13%) countwise and large-sized (12.5% versus 10.4% weightwise) sherds result from packing problems. For each group, five boxes were counted, but the less efficient packing of the large sherds created larger spaces between them. As a consequence, each box with small-sized sherds weigh slightly more than a box with large-sized sherds. Nevertheless, the differences are minimal.

Table 13. Cave G23: Sherd size frequencies.

Percentages of sherds according to size from Cave G23, comparing values obtained by counting boxes (upper row) and weight values (lower row). The percentage of medium-sized sherds hardly differs and suggests for this collection, sherd count and weight values are interchangeable.

Cave	% small	% medium	% large	Total	N
G 23	12.5	75.0	12.5	100%	40 boxes
G 23	13.9	75.5	10.4	100%	594 kg

Cave G26. Since the vessels from Cave G26 Phase B were either complete or reconstructed, it was not possible to weigh sherds. Instead, I counted the number of sherds according to size (Table 14). The percentage of medium-sized sherds falls within the range for other deposits. For the non-reconstructable sherds of Phase B, proportions of sherds in each size category are similar to those of Phase A.

To summarize, medium-sized sherds predominate all deposits. The most prominent differences appear in the relative percentages of small versus large sherds: for Cave G23, there are identical values for each; for Cave G26 Phase B reconstructable pieces, large sherds represent 28.9% versus 13.1% for sherds; for Cave G19 Baskets 12-31, large sherds account for 30.4% versus 3.2% small sherds. These figures suggest: (1) the sherds of Cave G26 Phase B represent a different depositional history than the whole/ reconstructable pots; (2) Cave G19 Baskets 12-31 were not heavily trampled nor disturbed.

Table 14. Cave G26: Sherd size frequencies.

Percentages of sherds sorted according to size; Phase B* refers to reconstructed vessels in contrast with the unreconstructed fragments (Phase B**). For Phase B** and Phase C sherds, the percentage of large-sized sherds approximates that found for Cave G23. The percentage of large-sized sherds for Phase B* approximates that of Cave G19, large-sized sherds, baskets 12-31.

		small	medium	large	Total
Cave G 26	Phase B*	0	71.05	28.9	99.95%
	Phase B**	14.3	72.60	13.1	100.00%
	Phase C	6.45	80.64	12.9	99.99%

Index of reconstructability

Archaeological reports and drawings of pottery rarely reveal the percentage of a vessel present, or sherd size, although occasionally drawings of small fragments include sherd size. However, Bradley and Fulford (1980: 85) and Schiffer (1983: 686) report that information concerning depositional history can be retrieved from analysis of vessel reconstructability.

A comparison of the deposits from Caves G21, G23 and G26 show different degrees of reconstructability for decorated and/or rim sherds of other vessel parts that could be joined together.

Cave G23. For the decorated sherds of Cave G23, more than one sherd was found for each of 52 closed vessels (or 145 sherds) and 96 open vessels (or 242 sherds; see Table 15). Rims of open vessels tend to be larger and break into a larger number of sherds than closed vessels with narrower necks and rims. This difference may account for almost double the number of open versus closed vessels. Of the total, 57.77% of closed vessels were reconstructable from two sherds and 68.85% of open vessels were represented by two sherds. For both open and closed pieces, the reconstructable segment rarely constituted more than a fourth of a jar shoulder or bowl rim.

Three sherds were present for 22% of open vessels and 27% of closed pieces. Over 75% of all reconstructable pieces from Cave G23 are represented by two or three sherds only. Table 15 shows that over three sherds were found for only 12.2% of all forms.

Table 15. Cave G23: index of reconstructability for open and closed vessels.

Sherds adjoining	2	3	4	5	6	7	total
# of joins or pots	96	34	9	3	3	3	148
percentage	64.87	22.97	6.08	2.03	2.03	2.03	100%
Cum. per. freq.	64.87	87.84	93.92	95.94	97.97	100	
No. sherds	192	102	36	15	18	21	384
percentage	50	26.56	9.37	3.91	4.69	5.47	100%
Cum. per. freq.	50	76.56	85.93	89.84	94.53	100.0	

Cave G19. For Cave G19, two phases of the EB IV material were differentiated. The sherds of Baskets 1-11 did not join with material found deeper in the cave, and almost each sherd represents an individual pot, resulting in very low index of reconstructability; two sherds fit together for each of two pots (Table 16).

In contrast, for Baskets 12-31, 46% of closed and open shapes were represented by two sherds, and 23% were represented by three sherds. Therefore, two or three sherds were present for 53.9% of the deposit in comparison with 75% of the sherds from Cave G23 that fall into this bracket. In contrast, over three sherds were present for 46.1% of all vessels, versus 12.2% for Cave G23 (Fig. 8).

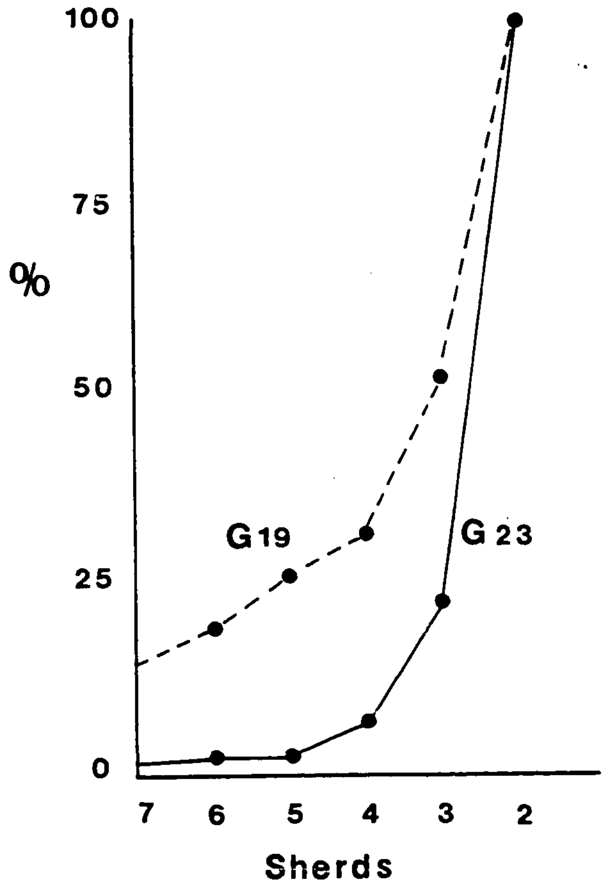


Fig. 8. Cumulative frequency polygon of vessel reconstructability, Caves G19 and G23. G19 = 26 pots or 90 sherds; G23 = 148 pots or 384 sherds.

Table 16. Cave G19: Index of reconstructability.

Baskets	2	3	4	5	6	7plus	Total
		Number of sherds adjoining					
1-11	2	-	-	-	-	-	2 pots
12-31	12	6	1	2	1	4	26 pots
1-11	100%						100%
12-31	46.15	23.08	3.85	7.69	3.85	15.38	100%
No. of sherds							
12-31	24	18	4	10	6	28	90 sherds
	26.66	20	4.44	11.11	6.66	31.11	100%
Cumulative frequency distribution							
12-31	24	42	46	56	62	90	90 sherds
	26.66	46.66	51.11	62.22	68.66	100	100%
Cumulative frequency distribution							no. of pots
12-31	12	6	1	2	1	4	26
	46.15	69.23	78.08	80.77	84.62	100	

Cave G26. All vessels of Phase B that were reconstructable were represented by over seven sherds a piece.

Comparison of the index of reconstructability for three units. It is clear that different levels of reconstructability characterize the three cave deposits. One bias results from the reconstruction of the G26 vessels and not from the other caves. Nevertheless, the comparison between Cave G19 and G23 contents is striking: a substantially larger number of sherds is present for a larger number of pots in Cave G19 than G23.

Artifact diversity

One criterion Schiffer (1983: 685) lists as indicative of cultural formation processes is the variety of artifacts present. Artifact diversity corresponds with site use, length of occupation, and all of the factors associated with discard behavior (Schiffer 1983: 685; Yellen 1977). The range of artifacts found in the Jebel Qa^{c}aqir deposits is useful to distinguish tombs from non-funerary deposits and abandoned de facto refuse from intentionally discarded, broken pottery. Artifact diversity will vary within and between sites, but analysis of variation within a site eliminates some of the constraints imposed by differential site use.

Cave G23 contains the widest variety of artifacts (Tables 17-19). Unlike all other deposits, the fill was ashy and suggest there were repeated firings.

In addition to diversity of artifact material, there is the range of types within each category, especially ceramics. Cave G23, unlike all other deposits, contained the full range of open and closed forms, as well as a crucible fragment with a bit of copper adhering. Caves G19 and G26 contained no spouted vessels or small jars, although amphoriskoi were marginally represented. In contrast with the domestic debris, the tombs held few large jars. Lamps were most common in the Cave G23. Metal artifacts were limited to the tombs and a fragment in Cave G23.

Table 17. Artifact diversity of non-ceramics.

T = Tombs C4 = Cairn 4

Artifact	Context										
	G19			G21	G23	G26			H27	T	C4
	1-11	12-31	32-34			A	B	C			
Humans										x	?
Animals	x	x			x		x			x	?
Grinding stones			x		x		x				x
Spindle whorl										x	
Basalt			x			x					
Granite											x
Figurine					x						
Crucible					x						
Metal					x					x	
Hearths		x					x				
Walls		x					x				
Shells					x						
Chipped stone					x			x	x		x
Cobbled area					x						

Table 18. Artifact diversity of ceramics.

T = Tombs C12 = Cave 12 H27 = Sherds only

Vessels	Context									
	C12	G19 1-11	G19 12-31	G19 32-34	G21	G23	G26 A	G26 B	G26 C	H27	T
Amph.	x	x	x		x	x	x	x			x
Bowl thick	x	x	x			x	x				x
Bowl thin	x	x	x			x	x	x			x
Cooking pot	x	x	x		x	x	x	x			
Crucible						x					
Funnel	x					x					x
Jar	x	x	x			x		x			x
Lamp	x		x			x					x
Spouted vessel	x					x					x
Chalco-lithic			x	x		x			x		
Iron II	?					x					
Later	?	x			x	x	x			x	

Table 19. Artifact diversity of surface treatment.

T = Tombs C4 = Cairn 4 C12 = Cave 12
Stipple stance: ne-sw = northeast-southwest
nw-se = northwest-southeast

Surface treatment	Context									
	C12	G19			G21	G23	G26			H27	T
		1-11	12-31	32-34			A	B	C		
Hor. bands											
1		x				x					x
2	x	x	x			x	x	x			x
3	x	x	x			x					
Multi-direc.	x	x	x			x		x			
Wavy	x	x	x			x	x				x
Stipples											
(ne-sw)	x		x			x	x	x			x
(nw-se)			x			x	x			x	x
Lines			x			x					x
Slashes	x	x	x		x	x	x			x	x
Rope	x					x					
No decor.						x		x			x

Wear, damage, and surface alteration

Surface alteration resulting from vessel use can provide wear patterns that differ from the effects of artifact reuse and subsequent post-depositional events. Baker (1978: 177) notes that systematic examination of sherd damage contributes to understanding depositional history. Use-wear studies of surface alterations by Bray (1982), Halley (1983), and Griffiths (1979) demonstrate that we can learn how vessels were used. This work often requires microscopic analysis to detect surface wear and a clean, unencrusted surface. Use-wear analysis was not undertaken for the Jebel Qa^{c}aqir material, although when visible to the unaided eye, surface alteration was recorded. Few tomb vessels appear ever to have been used: nine of the ten of lamps lack soot accumulation.

Most surface alteration and damage noted pertains to sherd recycling and post-depositional effects. A small number of pieces found in Cave G23 had rounded reworked sherd edges often with striations on the edges as if they had been used for type of scraping work.

A second form of edge treatment lacked the striations. These sherds had been shaped into oval or round pieces classified as jar lids. They were found in Caves G23 and G19. Microscopic analysis is needed to determine whether they were used as jar covers or for other purposes, such as games. A purposely reworked Chalcolithic lug handle and neck fragment was found with the late third millennium B.C. debris of Cave G19.

Rounded sherds of small and medium sizes were found in most deposits, but they were never numerous except in Caves H27 and G21 where almost all 4th, 3rd, and 1st millennium B.C. sherds were small or medium-sized with worn, rounded edges except the ribbed cooking pot which broke into the large-sized sherds with sharp edges.

Post-depositional damage resulted in irregularly shaped sherds with very rounded, smooth edges, ranging in size between small and medium; none were large. These sherds were found in most cave deposits, especially H27 and G19, though there were few of each.

Darkened sherds with ash deposited on both sides and edges were common in Cave G23, but not elsewhere. Quantitative data were not collected, but the majority of the G23 sherds do not exhibit signs of post-depositional trauma in contrast with the Early Bronze Age material retrieved from Caves G21 and H27.

Assessment of the cultural processes responsible for the assemblages

Sherd size, vessel reconstructability, wear, damage, and design diversity (Table 20) provide independent evidence in the complex depositional history of Jebel Qa^{c}aqir.

The relatively high percentage of large-sized sherds with no evidence of rounding or wear, and the high percentage of adjoining sherds found in Cave G19 (baskets 12-31) and Cave G26 Phase B, suggests that these are intentional primary deposits of <u>de facto</u> refuse. The non-reconstructable sherds of each deposit often bear different incised designs from the pots and represent a residual deposit, i.e., sherds that were manufactured, used, and discarded prior to the reconstructable pieces (Baker 1978: 176-77), that fell into the cave at a later date. Cave G19 contents were subjected to greater disturbance than Cave G26, but the high degree of reconstructability and the high percentage of large-sized sherds imply minimal disturbance, and as such the assemblages represent primary, intentional deposits. Both are associated with hearths and stone walls inside the cave.

Table 20. Comparison of sherd size and reconstructability for sherds in Caves G19, 23, and 26.

	Sherd size %				Reconstructability	
Caves	Sm	Med	Lg	Total	2-3 sherds join	7+sherds
G19						
1-11	18.8	71.8	9.4	100	100%	-
12-31	3.2	66.4	30.4	100	69.2%	15.35%
G23	13.9	75.5	10.4	99.8	87%	2.03%
G26						
Phase B						
reconstr.	-	71.1	28.9	100		99%
orphan sherds	14.3	72.6	13.1	100		
Phase C	6.45	80.64	12.9	99.9		

In Cave G23, the low degree of reconstructability, the large percentage of small-sized sherds, and the wide variety of incised designs and vessel types tell a different story. The contents imply that the deposit includes material from many parts of the site. The mere presence of medium-sized sherds indicates little because they are common in all deposits. Thus the relative percentages of small and large-sized sherds are a more sensitive indicator of depositional history.

Large sherds when thrown into the cave might have been reduced in size, but the drop to cave bottom is at most 2.8 meters, and as the cave filled, the drop decreased. Some sherds show post-depositional firing; others have worn rounded edges from intentional reuse and as a result of rolling, trampling or other effects of exposure. Trampling and scavenging are not impossible, but the cave configuration mitigated against such post-depositional disturbances. Repeated fires in the cave might have contributed to sherd size and appearance, although other than fire-darkened fragments nothing else was detected.

Several sources of evidence suggest a late third millennium B.C. deposition of the bulk of the 600 kilograms of sherds. The low percentage of large sherds, the low degree of reconstructability for Cave G23, and the dearth of orphan sherds and unreconstructable pieces found in Cave G19 and G26, imply either periodic cleaning of broken pottery from the cave while in use, or a one-time use of Caves G19 and G26. The latter seems unlikely, given the large number of tombs (at least 79) at the site. During a later reuse, in the Iron II period or later, additional material may have been dumped into Cave G23, along with a few later sherds. This would account for the 4 kilograms of non-Early Bronze Age material. Sherds found in Cave G19 and on the slopes above Cemetery B unquestionably can be associated with Cave G23 contents based on stylistic criteria. Although Gitin (1975: 60*) estimated that the dump contained 1898 restorable vessels, his own calculations show that for most pots one herd was present, and only 230 vessels were represented by more than one sherd (compare 2129 sherds to 1898 vessels).

Further evidence that the vast majority of vessels were not present in toto derives from the overall weight of the dump debris. If 1450 vessels (excluding cooking pots) were present, according to the breakdown by type presented by Gitin (1975: Tables 1-12), the deposit should weigh 2210.5 kilograms based on weights of selected pieces (Table 21). The combined weight of all fine ware sherds amounts to 594 kilograms, less than one fifth of the estimated overall weight, suggesting that the assemblage is far from complete.

Table 21. Weight of selected vessels from Jebel Qa^{c}aqir and estimated number of pots based on Gitin (1975).

Vessel type	Wt.		Est. Vessel #	Est. Weight
Large jar	5	kg	500	2500
Small jar	2.5	"	58	145
Teapot	2.5	"	32	80
Lamp	500	grams	100	50
Thin-walled bowl	500	"	429	214.5
Thick-walled bowl	1	kg	331	331.0
			1450 pots	3320.5 kg

On the contrary, the small fraction of non-Early Bronze Age material (4 kilograms) cannot serve as evidence of a depositional date for the dump as a whole.

If broken pots had been discarded immediately, one might expect a higher degree of reconstructability. Broken pots not discarded immediately would be subject to loss and recycling of sherds selected for their size, decoration, or the presence of knobs, handles, or spouts. Scavenging perhaps accounts for the dearth of spouts, handles, and knobs in the dump.

The slopes of Jebel Qa^{c}aqir undoubtedly contributed to the loss of sherds broken in the area outside of the caves.

In addition to collecting sherds for their decoration, sherds were saved for use as grog tempering material. Stanislawski (1969) provides a long list of potential sherd reuse based on work among extant Hopi communities of the American southwest.

In Caves G21 and H27, are sherds showing the most rounding, the greatest proportion of small sherds and the least reconstructability. These two caves experienced pronounced post-late third millennium B.C. disturbance.

For the tombs there is no question that the whole pots found on tomb floors were intentionally deposited. Few if any were cracked. Sherds found in and above the tomb shaft were not treated as intentional grave goods, but sherds found on the tomb floors present a problem. Although rare at Jebel Qa^{c}aqir, sherds were also noted in the Dhahr Mirzbâneh tombs (Lapp 1966: Fig. 12, 18 and 27) and include a large jar base, perhaps serving as a tray, found along with cooking pot rims and other fragments. At both Jebel Qa^{c}aqir and Dhahr Mirzbâneh, the excavators rule out the possibility of worker contamination or tomb robbing as contributing to the presence of the sherds.

With this assessment of the depositional history complete, the next question to be addressed involves the nature of the material culture found in each deposit. Pottery which represents the bulk of the artifacts is the subject of the following section. First the raw material and manufacturing tradition will be discussed, and then variations in vessel form, size, and incised patterns will be examined.

CHAPTER 5

THE MANUFACTURING TRADITION

This section includes studies of the raw material, manufacturing techniques, an ethnoarchaeological study of pottery production and an analysis of variation of the wares.

The raw material

Microscopically, a fresh break of the fine wares reveals an abundance of white inclusions, a variety of darker rocks, minerals, grog (crushed pottery), and rectangular voids of burned out organic material. A drop of hydrochloric acid (10% solution) produced profuse effervescent action, confirming the presence of carbonates in the clay and/or non-plastics. The coarse wares appear to contain at least 40% white and gray crystals of all sizes.

It is difficult to determine if the non-plastics were intentionally added or if some were present in the clay as dug. But most clays contain naturally occurring non-plastic inclusions. Clay alteration is attested by the purposeful crushing of sherds for grog tempering material. The wide range of the other non-plastic sizes implies that other than removing very large pieces, sieving of the clay or non-plastics was not carried out to achieve a more even size distribution.

Methods to describe non-plastic size usually rely on arbitrary size criteria (March 1934; Shepard 1954: 228), rather than relating non-plastic size to vessel wall thickness. Potters refine clay, or use it in its natural form, depending on the desired thickness of the vessels; the size of the largest inclusion limits wall thinness more than any other factor. The method used to describe non-plastics throughout this analysis emphasizes their relationship to wall thickness:

fine	-	powder
small	-	less than 1/4 wall thickness
medium	-	up to 1/2 wall thickness
large	-	equal to wall thickness
very large	-	exceeds wall thickness

Mineralogical and neutron activation analyses

Ten sherds each from Jebel Qa^{c}aqir and Beer Resisim were submitted to the Hebrew University for neutron activation analysis. The Jebel Qa^{c}aqir sample included open and closed forms, a lamp, and a round bottomed cooking pot. An Iron Age II red-slipped and burnished bowl from Khirbet el-Kôm was also submitted. The Iron Age II bowl and eight of the earlier Jebel Qa^{c}aqir samples contained similar trace elements, but they differed distinctly from the round bottomed cooking pot (Gunneweg n.d.). One of the Beer Resisim sherds differed from all others and the entire reference collection of the Hebrew University. It was a fragment of a "gray burnished teapot" attributed stylistically to a Syrian provenience (Cohen and Dever 1981: 63).

A total of 114 thin sections of Jebel Qa^{c}aqir pottery were subjected to petrographic analysis by J. Glass (n.d.). The selected pieces belong to jars, amphoriskoi, lamps, thin- and thick-walled bowls, spouted vessels, and cooking ware. The full range of incised designs was included in the sample. B. Rothenberg had the samples made in conjunction with his study of contemporaneous Negev and Sinai pottery.

Mineralogically, six ware groups have been differentiated by Glass. Five include vessels of all forms and decoration; the sixth includes all cooking pots. Five sherds could not be classified with the others and differ from each other. Two sherds have basalt non-plastics, in common with the round bottomed cooking pots.

The most abundant ware, characterized by rounded, fine-grained chalky and silty carbonate rocks, variegated silt (silty quartz), shell fragments, and other minor components, is highly micro-fossiliferous and highly calcareous. Microfossil analysis might enable identification of the clay source. Tentatively, Glass proposes the Taqia^c

marl formation in the vicinity of Jebel Qa^{c}aqir. Among the sherds in this group (N=32) are thick-walled bowls (all but one of the 7 bowls sampled), jars (with all types of decoration), and a lamp.

Unlike most cooking pot wares, those of Jebel Qa^{c}aqir are not calcite tempered, but contain coarse sand, dolomite and chert. There is some resemblance between this ware and the previous group, but the clay matrix is poorer in carbonates and contains a large percentage of silt composed of quartz, plagioclase→hornblende→epidote, and other minerals. Cooking pot sherds (N=17) from all parts of the site belong to this group.

A grog-tempered ware represents a third group (N=25). Jars and bowls from all parts of the site belong to this group.

A fourth group (N=8), characterized by abundant, medium-sized rhombohedral carbonates, includes six sherds, one bowl and five closed vessels, from various parts of the site. Sherds fired to a relatively low temperature show the original, unaltered rhombs with cloudy cores and fresh edges, suggesting to Glass that these were not intentionally crushed along cleavage lines, and constitute a non-plastic native to the clay.

Quartz sand, at times cemented with calcite, characterize the fifth group of four sherds, of which one also contains basalt.

Three samples, with coarse shale fragments in a clay poor in iron and carbonates, constitute a minor group.

Glass concludes that the common ware (group 1) and cooking pot ware are probably of local manufacture. Carbonaceous flinty sand is common in the Taqia^{c} marl formation; variegated silt could have come from the loessy deposits near the site. Jebel Qa^{c}aqir lays on the border of two geographic regions, each built on a different geological sub-structure.

All vessel forms overlap with all clay types. The thick-walled bowls were usually fashioned from the most common ware type, but this is the only clear association between vessel form and clay type, other than cooking pots fashioned from the coarse quartz ware. Sherds containing basalt perhaps reveal a limited amount of non-local wares, but basalt fragments from the Chalcolithic debris might have been the source for the tempering material.

The manufacturing tradition

An estimated 25,000 sherds and 155 whole pots comprise the Jebel Qa^{c}aqir assemblage of domestic and funerary deposits excavated and purchased. Less than 10 whole pots come from domestic contexts.

In contrast with other archaeological periods, the repertoire of forms is limited. Open forms include flat-bottomed bowls, cups, and hemispherical funnels. Closed forms include flat-bottomed jars, amphoriskoi, teapots, and lamps. Cooking pots, store jars, and lamps, fabricated from a coarser ware than used for most other forms, complete the assemblage.

A detailed study of the manufacturing tradition benefits from the large sherd collection; sherds often provide information about the manufacture process that is difficult to obtain from whole pots.

Along with the Jebel Qa^{c}aqir material, contemporaneous sherds and whole pots from Lachish, Khirbet el-Kirmil, and Jericho were examined. The Jericho material, housed at the University of Leiden, was studied with the help and guidance of H. J. Franken and J. Kalsbeek.

Previous studies of manufacture

Various archaeologists discuss the fabrication of the late third millennium B.C. flat-bottomed jars found throughout Israel, especially in the southern region. Most agree that vessel bodies were coil-made and rim/neck pieces were wheel-made and then added to the bodies (Amiran 1960: 207; Amiran, Beck and Zevulon 1969: 45; Olavárri 1969: 232; and Pritchard 1963: 20). Tufnell (Tufnell and Ward 1966: 171; Hankey 1968) suggested this reconstruction based on her observations of Lebanese potters in the village of Beit Chebab, where vessel parts were separately fashioned and then joined together. Tufnell, one of the first archaeologists working in the region to record the work of contemporary potters who use traditional techniques, applied this to her study of the archaeological material of Lachish (Tufnell 1958).

The reconstruction outlined above suited the transitional nature of the late third millennium B.C. as a whole; the pottery technology represented the end of the EB coil work and the beginning of the MB II wheel-made potter. Also implied in the reconstruction was the appearance of a new, foreign tradition of pottery-making brought by newcomers who destroyed the EB III urban centers and life-style.

F. R. Matson examined the Dhahr Mirzbâneh collection of pottery excavated by Lapp (1966). The assemblage comprises mainly small, low-necked jars for which Matson noted that basketry or a mat served as the work surface. He also suggested that "an incipient tournette [was] used while finishing the necks... The sharp angle between the neck and body suggests that the pots were rotated as the rim was finished and everted" (Lapp 1966: Fig. 40). Matson indicates no evidence of separate body and neck fabrication, but suggests rotation was important for finishing rims and necks.

The manufacture of the Jebel Qa^{c}aqir flat-bottomed pots: Closed forms

All jars, teapots, and amphoriskoi were constructed by the coil technique. After fashioning the flat base, a coil was applied, followed by an interruption in the work to allow the clay to dry slightly before another wet coil was added. Uneven-ness and irregularities of the walls, and slight depressions at regular intervals up the walls, imply coil manufacture. A spiraling coil, rather than individual coil rings, caused the forms to grow asymmetrically as evidenced by the faint oblique linear depressions discernable on some pieces. Usually these irregularities were smoothed away as part of the final surface finishing work. Elsewhere ledge handles half way up the bodies of large jars are often slightly oblique and follow the line of the spiraling coil.

Some pieces reveal the addition of a small coil at the neck/shoulder juncture to even the wall before applying the final coil to form the neck and rim. The neck appears not to have been made separately and applied to the body, but by adding a coil, which was thinned and shaped as the pot rotated on a turntable; one hand pushed the table while the other worked the clay. The fine concentric striations on the neck, often presented as evidence of separate wheel manufacture, resulted from the piece of cloth, leather, or bare hand used to smooth the surface.

My experimental work enabled me to replicate large flat-bottomed jars without resorting to separate manufacture of neck and body. In contrast with the contemporary

Lebanese potters, who use a fast, heavy wheel capable of momentum and well-suited for shaping individual vessel parts used in composite manufacture, the ancient potters lacked such equipment. There is no reason to use composite manufacture if the desired effect can be achieved by less complex means.

From the beginning, each vessel stood on a turntable or "tournette" that functioned differently during the various stages of manufacture. While the body was shaped, pressure was applied to the clay coils, thereby causing the turntable to move slowly. To fashion the neck and rim, however, one hand applied pressure directly to the turntable while the other squeezed the clay between the thumb and fingers. To form the neck, faster rotation was achieved and maintained due to constant pressure applied to the turntable. Momentum was never maintained.

The force of the revolutions and the pressure of the fingers caused most of the clay of the neck coil to move upward, but some clay invariably moved downward to create a slight protrusion at the interior neck/shoulder join. This mark has been interpreted as evidence of the separate manufacture of the neck, but it need not be. Composite manufacture coincides with the use of a fast, heavy wheel or mould-shaped pieces. My experimental work using a lightweight turntable resulted in identical evidence as preserved in the study collection. Some potters systematically smoothed away the neck/shoulder protrusion, whereas others were less particular. For some pieces, neck height and rim diameter determined whether the potter had the option of reaching down to remove the irregularity or not.

Neck height rarely exceeds hand size, implying that one hand rotated the turntable while the other was folded over the clay to shape and thin it. With two hands free to the shape the neck, there would have been no limitation on neck height. One exceptionally large jar in Cave G26 has a high, wide neck exceeding hand height. The unevenness and irregularities of the neck indicate that a turntable rather than a heavy wheel was used.

The manufacture of open forms

This category of flat-bottomed pots includes thin- and thick-walled bowls and cups made by coiling.

Thin-walled bowls and cups. The majority of the small, thin-walled bowls and cups are three and four coils high with plain and narrowing rims. Bodies are cyma-shaped, or less often in the form of a barrel with an incurving rim; occasionally they are 'V' shaped with an out-flaring upper body. The barrel forms tend to be slightly thicker and are sometimes warped. Unlike the closed vessels, the bowls were smoothed and thinned on the interior and exterior, thereby obliterating most traces of manufacture.

Bases are the thickest part of the vessel (1 mm thicker than the body). The area above the base and below the point of carination frequently shows drag marks and signs of scraping. Some lower bodies are irregularly faceted from a knife used to remove excess clay in thinning the lower body; this results in slightly oval or hexagonal bases with pointed edges. The irregularity of the short strokes implies that thinning took place not by replacing the bowl upside-down on the turntable, but by holding it in the hand. This feature again negates the use of a sophisticated wheel.

Small solid or pierced knobs and lug handles were occasionally placed at various points on the body, but never at the rim.

Thick-walled bowls. Contrasting with the thin and delicate bowls are the larger thick-walled coil-made bowls. Above the point of carination, the upper bodies are straight, slightly concave or out-flaring. The upper body was sometimes decorated with combing or incised bands.

Rims range from plain, rounded and squared to quite elaborate forms folded on the interior. Owing to the coarseness of the clay and the thickness of the wall, it would have been easier to fold an uneven rim than to cut off the excess clay using a sharp tool. Coil-made pieces are often uneven at the rim and a common solution is the folded rim. This applies for the coarse holemouth jars and cooking pots as well.

Thumb-indented or "pie crust" rims of various patterns were found on 5% of the thick-walled bowls measuring over 18 cm in diameter.

As a whole, the thick-walled bowls are heavy, particularly the bases, which are full of indentations and pit marks. The lower bodies immediately above the base sometimes show signs of faceting. Warped forms were occasionally encountered.

The base

In the discussion of the manufacturing tradition, little mention was made of the base, yet the most outstanding feature of the EB IV pottery is the wide, thin, flat base of the closed vessels -- large and small.

Difficulties are encountered in every stage of work involved with the manufacture of a wide flat base. First, it is difficult to create a large, perfectly circular, thin, and even clay slab. An irregular form results in a lopsided pot, an uneven thickness creates problems during drying and firing and using the pot. To remove a large flat base intact from the work surface is itself a problem that must be overcome if the base is to dry thoroughly at a rate even with the rest of the pot; unless free circulating air reaches both sides of the base, it will crack, especially if the base/wall juncture is angular as with the EB IV pots. To fire a wide base evenly and completely is also difficult, as is transporting the finished product. Pointed or narrowing bases are easier to transport with less risk of bumping and damaging the small base than is the case for wide, flat bases.

The thin base of wide diameter is an achievement skillfully mastered by the late third millennium B.C. potters in a tradition that could have originated in the Early Bronze II or III eras.

To form the EB IV flat base, the potters squeezed, stretched, and pulled a circular slab from a single lump of clay held between the hands and worked in the air. None was coil made; there is no evidence of coils in the breakage pattern, and the slightly thickening at the center of the base is one indication of its manufacture from a single clay slab.

Accessory pieces-spouts, knobs and handles

Spouts on "teapots" were formed from a separate piece of clay rolled thin, folded and joined together. They tend to be longer on the lower side and were added by forcing a hole in the teapot wall either before or after decorating the shoulder.

Opposite the spouts are handles or knobs, but the EB IV tradition at Jebel Qa^{c}aqir and elsewhere is noted for the absence of handles. Ledged handles are known from other assemblages but are represented by a few fragments at Jebel Qa^{c}aqir. Loop or lug handles, either angular or rounded in cross section, were not encountered other than on amphoriskoi. Strap handles do not form part of the repertoire, but are known from other sites e.g., Lachish, and Tell Beit Mirsim.

Most common are the round or flattened knobs and protuberances on open and closed forms which were applied either before or after the decoration.

The dearth of handles contrasts with the previous EB III tradition, in which ledge handles abound (Amiran, Beck and Zevulon 1969 :35-40; London n.d.b). Dever (1973b: 61, Dever 1974: 45) noted their absence to differentiate regional and chronological grouping within late third millennium B.C. materials. Finally, the lack of handles has implications for the firing and stacking of pottery (see below).

The work surface, turntable, and the direction of rotation

The work surface. All potters use some type of work surface or batt placed on the ground on a stationary surface, on a turntable, or on a wheel. Pieces of wood, basketry, textile, leaves, ceramics, grouds, and mats are suitable material for a work surface. None have been found at Jebel Qa^{c}aqir, but for the Dhahr Mirzbâneh small jars, Matson (Lapp 1966: B20 F 40) detected basketry or mat impressions on the bases. None have been observed on the Jebel Qa^{c}aqir pots, but something similar was undoubtedly used. At Tell es-Sa^{c}diyeh el-Tahta in the Wadi Kufrinji in Jordan a "twilled mat impression" was noted on the flat base (16 cm diameter) of a store jar (Pritchard 1964: Fig. 31).

Ideally, the base of a pot should be secure on the work surface without sticking to it so as to prevent easy removal. After fashioning the base slab in the air, it was fixed to the work surface, perhaps a mat, which was covered with a thin layer of sand or organic material which served to prevent sticking. The sand allowed the potter to hold the base in place, but the unfinished vessel could be removed easily if necessary, for example, to expose the base to free circulating air to dry. Most of the jar and bowl base exteriors are covered with impressions and indentations of the substance used to dust the turntable.

Dusted work surfaces are common features in antiquity and are still used today (Leach 1976: 64). Ancient Near Eastern wares exhibit this same feature, such as the Bronze Age wares from Selenkhiye in Northern Syria at the bend of the Euphrates, which were excavated by van Loon (1977) of the University of Amsterdam. North of this site, at Ta^{c}as, Bronze Age flat-bottomed bowls of all sizes excavated by H. J. Franken exhibit bases still covered with fine sand (Franken per. com. 1976). At Tepe Nush-i-jan, "The larger forms were invariably constructed on a bed of grits, a layer of grits always adheres to the base (Pl. VII d)" (Stronach 1978: 13). Finally, the flat bases of the Chalcolithic material from Teleilāt Ghassū bear a variety of mat impressions, as well as pock-marked bases (Koeppel 1940: Pl. 84, 13).

<u>The turntable</u>. No turntables have been found at Jebel Qa^{c}aqir, but they could well have been made of a perishable material light in weight and not much larger than the size of the widest base diameter (22 cm.)

The indirect evidence suggests that the turntable was easily rotated in either direction, which implies a light-weight material. It was probably worked close to the ground, with the potter sitting or squatting on a low stool or directly on the ground. The irregular finish of the base/wall juncture implies that it was out of the potter's vision and consequently close to the ground rather than raised on a table.

Light weight turntables allow rotation in both directions because, unlike a heavy wheel, it is mechanically easy to push in either direction; heavy wheels are easier to push counterclock-wise. Although light turntables lack momentum, they can be rotated either by direct or indirect force. With direct force one hand applies pressure to the turntable, which can result in a considerable number of revolutions per minute. This was the technique used to form the neck and rims of jars, amphoriskoi, and bowls. To build the bodies, the coils were pressed together between the fingers of both hands and, without being touched, the turntable rotated in a slow, jerky motion. Accordingly, the necks and rims alone were shaped with the aid of the turntable capable of a reasonable speed if continuous pressure was maintained.

A final source of evidence hinting at a slow or relatively slow rotation, and therefore a light-weight turntable, is seen on the large jars of Jericho bearing an incised wavy pattern rendered by a comb. On the shoulder, there is clear indication that the comb was replaced as many as five times, rather than having a design completed in one revolution. This was the result of a lightweight turntable lacking momentum.

Rotation direction. Several independent sources suggest dual rotation direction for the Jebel Qa^{c}aqir and Jericho material. Individual pieces occasionally illustrate clockwise and counterclockwise rotation, but more often the evidence is limited to one rotation direction per vessel. Many pieces do not display this type of information at all.

One method to determine rotation direction is the "lift-off" mark preserved on the interior of rim (Fig. 9).

This mark represents the final contact point between the clay and the cloth, leather, or bare hand used to finish and smooth the rim. It points in the opposite direction of the rotation. Lift-off marks were preserved if the clay was relatively moist when worked; usually these marks are shallow and difficult to discern. For 21 pieces, counter-clockwise and clockwise rotation were each represented by 50% of the sherds with this mark.

A further source of rotation direction is the nature of the neck/rim fractures and the resulting "rim tails" (Fig. 10). Rim tails generally point in the direction of the rotation, but for the Jebel Qa^{c}aqir and Jericho sherds, the rim tails are indecisive: they point in both directions -- even on individual pots. This implies the absence of a fast-moving heavy turntable capable of orienting the clay in a single direction. Had the turntable been sufficiently powerful, a large percentage of the rim tails should point in one direction because of the correlation between rotation speed and fracture pattern. Wheel-made wares of the Middle and Late Bronze Ages show far less variability of rim tail direction, both on individual pieces and in general, based on my observation of restored vessels, especially store jars.

No attempt was made to remove manufacturing traces from the interior walls of jars. A regular pattern of the

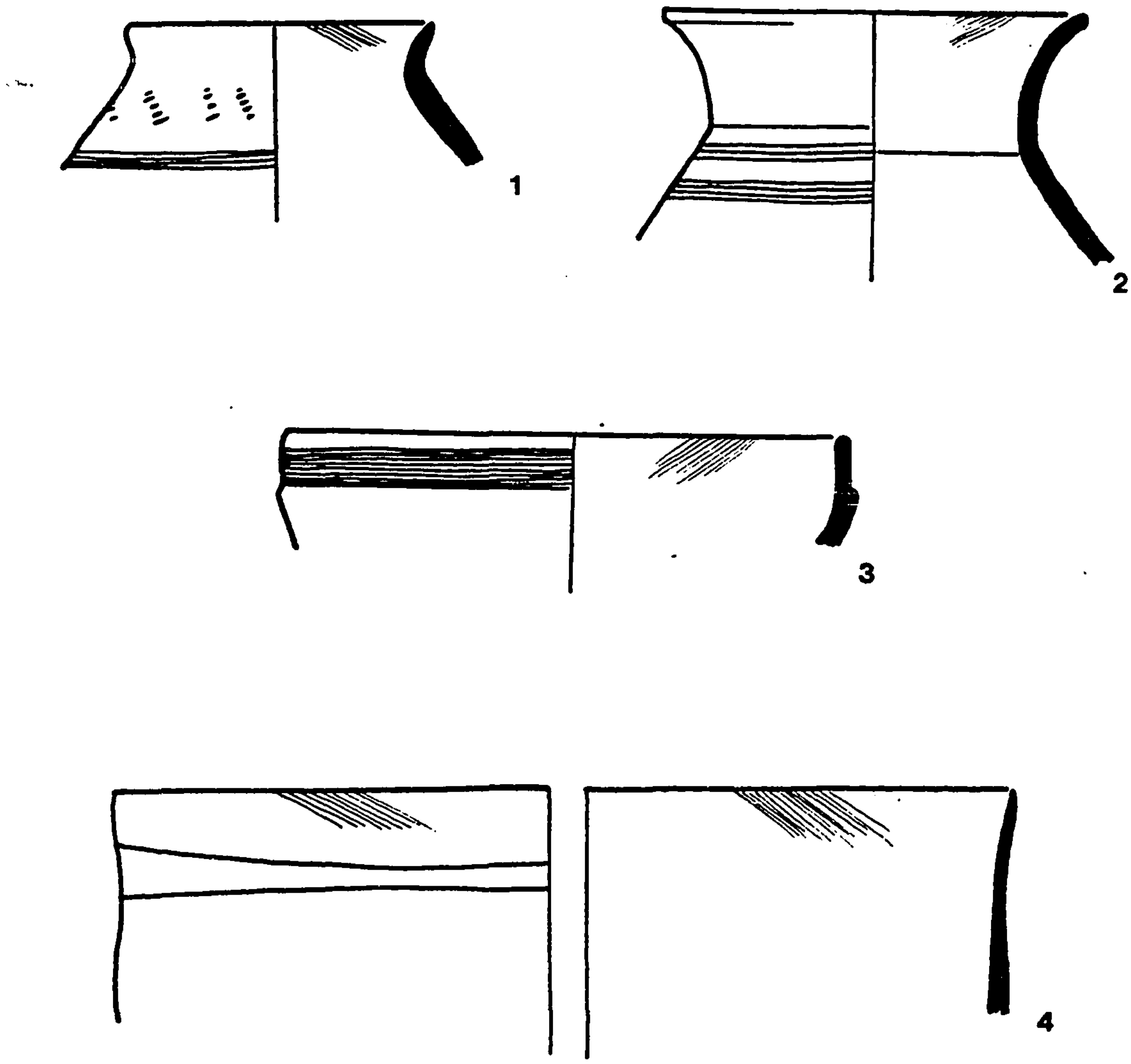


Fig. 9. "Lift-off" marks indicative of rotation direction. (1) and (4) clockwise, (2) and (3) counterclockwise rotation.

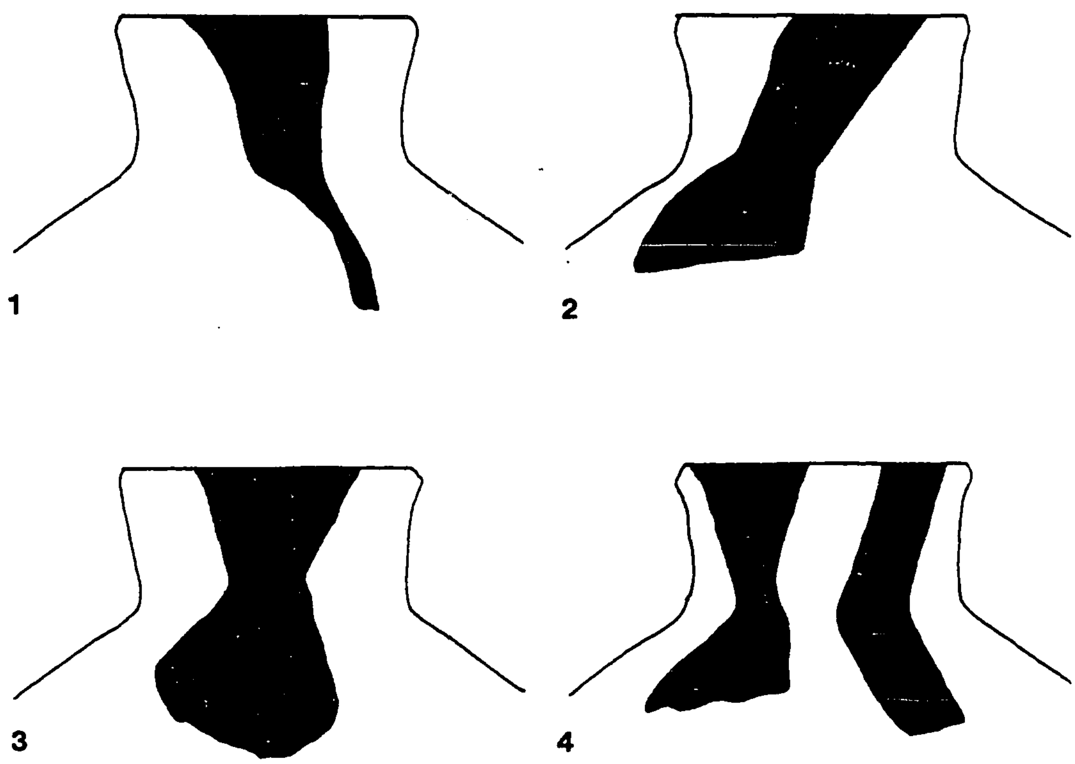


Fig. 10. "Rim tails" indicative of rotation direction. (1) counterclockwise, (2) clockwise, (3) indecisive, and (4) either direction.

full first finger covers the lower bodies and demonstrates that the left hand was consistently held inside the jars, implying counter-clockwise movement. The pattern impressed in the wall is in the form of crescents arranged in rows. As the coil was squeezed in place, the potter pushed the pot counterclockwise rather than pulling it clockwise.

It is not surprising that both rotation directions are in evidence. Potters may have intentionally rotated each pot in two directions to help strengthen coil joins and to smooth the clay. Based on my observations of Filipino potters in Paradijon (see below), this same practice occurs for coil-built forms rotated on a turntable.

A final source of rotation direction is decoration. Occasionally, the overlap of combed bands or stipples (Fig. A.9:5; A.10:5,6) placed one on top of another reveals which was rendered first and also shows the rotation direction.

When the design was applied after the handles or spout and if it cuts into the accessory pieces, a third source of rotation direction is obtained. For example, a jar from Cave G19, (see Fig. A.9:5). demonstrates two rotation directions; the interior lift-off mark points to clockwise rotation, while the overlap of the combed band reveals counterclockwise movement.

To conclude, the primary forming stage of the flat-bottomed open and closed vessels was accomplished as the turntable was rotated counterclockwise. To finish and smooth the surface and to strengthen the coil joins, clockwise and counterclockwise directions were used indiscriminantly (Table 22).

Table 22. Occurrence of rotation direction ascertained from the surface finishing work and decoration for open and closed vessels.

	Clockwise	Counterclockwise	Tot.	# of Pots
Closed vessels				
Surface finish	42.0%	58.0%	100%	12
Decoration	12.5%	87.5%	100%	8
Open vessels				
Surface finish	44.5%	55.5%	100%	9
Decoration	0	100 %	100%	2

Decoration

Three types of incised designs characterize the Jebel Qa^{c}aqir wares: (1) individually incised lines rendered with a pointed instrument; (2) stippling rendered with a comb; and (3) combed patterns. At first glance, the designs appear repetitive, but closer inspection reveals considerable variety of designs and patterns.

<u>Individual incised lines and slashes</u>. For the individually incised lines and slashes rendered with a pointed tool, variation is detected in the number of lines, their width, depth, and distance apart. Too few complete vessels

were found to determine whether the horizontal lines were a continuous spiral or closed circles.

Individual incised lines were sometimes accompanied by slashed or a punctate pattern. Slashes, slanted in either direction with a preference for northeast-southwest stance, vary in size, shape (straight, rounded or crescentic), distance apart, and precise location (on the shoulder or closer to the neck/shoulder joint).

Incised lines are found on bowls; slashes are restricted to closed vessels, usually amphoriskoi. Of the Jebel Qa^{c}aqir funerary wares (N=33), individually incised lines and slashes each represent 6.06% of the funerary wares. For the 12 Agagir cemetery pieces, 33.33% have slashes; none have individually incised lines. None of the five Khirbet el-Kôm funerary wares have this pattern.

<u>Stippling</u>. In this category are oblique, but occasionally vertical, stipples of varying width and length made with the teeth of a comb. The number of the teeth and size vary, as do length, distance between each stipple, stance, and number of stipple rows. One row is the norm.

Stippling was rendered as the closed vessels were rotated on the turntable. At times the comb was dragged slightly, resulting in a pulled or dragged stipple.

Stipple patterns tend to face northwest-southwest with a minority in the opposite direction. Fine-toothed combs predominate for the latter. Stipples occur alone, above, or between bands of horizontal combing and sometimes in more elaborate patterns.

Of the tomb pieces from Jebel Qa^{c}aqir (N=33 pots), stippling represents 33.33% as at Agagir (N=12). For Khirbet el-Kôm (N=5 pots), 40% are stippled.

Combing. Combing can be horizontal, multi-directional, or zigzag (wavy) and is found on open and closed vessels alike. The number of horizontal bands vary. Multi-directional patterns comprise oblique combed slashes between horizontal bands of varying number.

Variation in the combed designs include distance between bands, position on the neck (at the neck join or below), size, number of grooves, thickness (fine, medium or coarse) and depth of the combing, (shallow, medium or deep) and the number of teeth in the comb (3-9).

Combing (without stippling) appears on 36.4% of the Jebel Qa^{c}aqir funerary wares (N=33), 25% of the Agagir pots (N=12) and 60% of the Khirbet el-Kôm assemblage (N=5).

Rope decoration. The raised rope moulding is confined to the shoulders and bodies of large jars represented by a small number of sherds (2.3 kilograms or less than 50 sherds). The moulding varies in thickness and evenness of the slashes. The rope effect was achieved by applying a clay coil that was cut or slashed at intervals with a blunt instrument.

Origin of the decoration

Decorations on pottery often develop from the manufacture or surface finishing techniques, and this is probably true of the incised and plastic decoration on the EB IV pottery.

Amiran suggested that the separate manufacture of the neck and body parts resulted in the need to cover the join with decoration to mask the irregularities: "The decoration is always placed at the base of the neck and may have been intended to cover the join between the separately made body and neck" (Amiran, Beck, and Zevulon 1969: 80).

Although it has been suggested above that the necks were not made separately and added to the bodies, there is evidence to associate the incised and slashed decorations with the techniques of manufacture and surface finish.

To begin with the individual slashes found around jar necks, the complete low-necked jars (Fig. 11) from Jericho best illustrate the transition of a surface finishing technique into a decoration. These jars were coil-made and then smoothed by drawing a blunt instrument (2-3 cm wide) pulled from the base up to the neck (Fig. 12). Short oblique strokes encircle the neck of some jars, but on most these irregularly placed strokes or scars are faintly visible. More often, the potter smoothed them away and replaced them with regularly spaced, deeper oblique slashes on the shoulder.

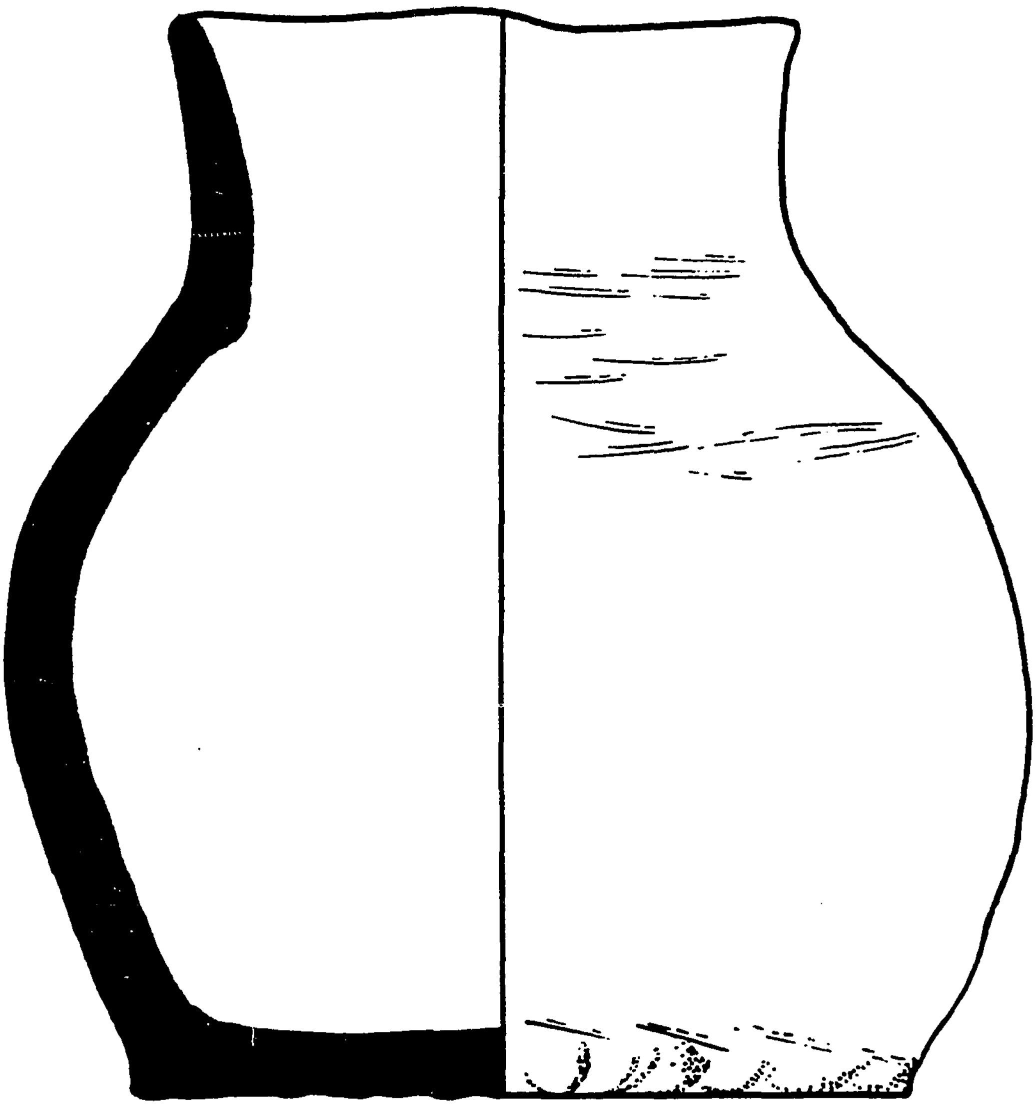


Fig. 11. Jericho small jar (Tomb D5 [3]).

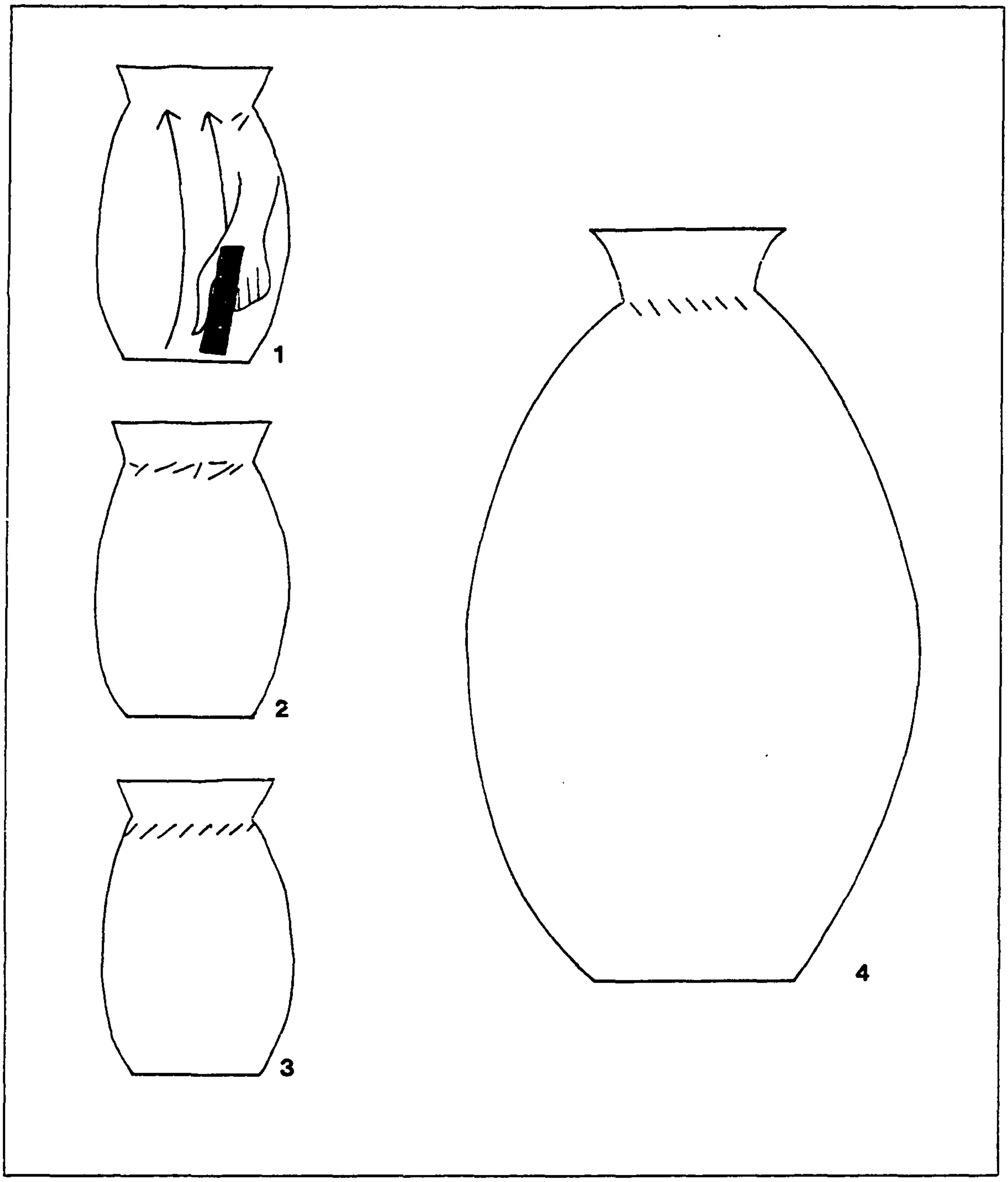


Fig. 12. Surface finishing of small jar.
(1) tool used to smooth surface from base to neck with (2) resulting irregular slashes; (3) translation of slashes into a regularized pattern on a small and (4) large jar.

The same instrument used to render the slashes could have been used for the individually incised lines, and in a later or simultaneous development, a comb was used in addition to the pointed instrument.

Just as the incised decoration developed from a surface finishing technique, the use of raised band on the shoulders and bodies of the largest jars originated in the use of ropes during the primary forming work. To this day potters wind ropes around the bellies of large jars to prevent the clay from spreading outward. Cypriote potters (Hampe and Winter 1962: 65), among others, preserve this technique.

Once the clay has dried sufficiently to stand without collapsing outward, the rope is removed, leaving an indentation in its place. To obliterate the impression there are two alternatives: to smooth clay over the indentation; or to fill it by applying a clay coil that is then decorated with slashes to create a rope affect. Often the second choice is preferable, especially if the clay has become too dry to smooth with a tool.

It would have been sensible to use a rope at the point of widest diameter or immediately below it during the manufacture of large jars, but not on the shoulder. The application of the shoulder band is not the translation of an indentation into decoration, but a device to balance the jar and the number of raised bands.

The jars from Wâdi ed-Dâliyeh (Dever 1974) emphasize placement of the raised bands at regular intervals to create an overall balanced effect.

Drying

The main goal in drying pottery is to achieve even, uniform drying of the entire pot by exposing all surfaces to freely circulating air. Unless the pot dries at an even rate, differential drying of various vessel parts results in pre-fire cracks, especially at the juncture areas. If the interior remains damp, the pot will explode or flake during the firing. If the thin center of the base dries before the thicker base/wall juncture, the shrinkage of the base will cause it to crack.

To alleviate drying mishaps, several measures were taken by the EB IV potters; a relatively dry and lean, heavily-tempered clay was selected, and a carefully controlled drying process was maintained. A clay worked in a relatively dry state dries faster and with fewer complications than a wetter clay. A leaner clay rather than a fatty clay is best suited for coiling: two lumps of a wet stick clay tend to slip and slide along each other, rather than sticking together as would two lumps of a lean clay. Lean clays also tend to shrink less than fat clays, which results in fewer risks during the drying stage. Finally, lean clays demonstrate less tendency to break along coil joins (Franken and Kalsbeek 1969: 75).

The abundance of non-plastics in the clay helped to open the walls of the pots for easier and faster drying and firing. As clay dries, it shrinks away from the non-plastics which do not shrink and are not plastic, hence the term "non-plastics." The pores around the non-plastics become escape routes for the evaporating water and later serve as entry points for the heat of the fire.

Another device to facilitate drying, especially of the interior walls, involves interruptions in the manufacture of each vessel. Once the base was shaped, and perhaps only after it was set aside to dry slightly on each side, the first spiraling coil was added. This was followed by an interruption in the work to permit the lower body to dry a little before the next coil was added. Ropes may have been tied around the lower body of large vessels at this stage to prevent unwanted spreading of the clay.

The absence of rope impressions in the clay does not imply that ropes were not used; rather it may indicate a lean, dry clay in which impressions are less likely to be preserved. The indentations would have been deeper in a fat, wet clay.

Despite the use of a lean, dry clay, there still remained problems in drying both sides of the wide, flat base. Bowls were easily turned upside-down to dry, and there is no doubt that this was done: round-bottomed funnels made in the pinch-pot technique were dried while resting on their rims, as evidenced by the white scum deposit adhering to their exterior surfaces. The outer surfaces are noticeably whiter than the interiors due to the position of the funnel during the drying stage. As clay dried, the evaporating water and salt migrated to the exterior surfaces, and although the water disappeared, the salts formed a layer on the surface exposed to free circulating air.

Closed vessels with their small and narrow rims, in contrast to the large bodies, could less easily be inverted. An alternative means for drying the bases involved placing the jars upside-down in a stand or laying them on their sides directly on the ground. The latter is suggested in part by the slight depressions on slightly flattened jar sides. However, this is not to be confused with the flat dents associated with color spots, the result of vessels touching each other in the firing pile.

It is not without reason that wide flat-bottomed pots are usually characterized by a very coarse textured clay such as that used for the EB holemouth jars and the Iron Age Negev ware. To eliminate part of the problem of drying Negev ware bases, rim diameters almost equal that of the bases which would have permitted the rims to better support the weight of the inverted pot. The exceptionally thin wide bases of the EB IV southern pottery tradition signify excellent craftsmanship. It cannot be overemphasized that the base is the single most important part of the pot--unless it is stable and even, the pot fails.

Firing and stacking

The firing regime of the Jebel Qa^{c}aqir pottery can be ascertained in part from the surface color of the ceramics, the zonation, width and color of the core, the reaction of the tempering material to the heat and the presence of dents and color spots on the surface.

The kiln at Jebel Qa^{c}aqir. Although a kiln (Fig. 13) was found on the site, there is no absolutely conclusive evidence that it is of EB IV date rather than Iron II or Byzantine. Trace element analysis of the kiln lining described it as similar to an EB IV spouted vessel (see Gitin 1975: 60*, Fig. 4:19).

Kilns are rarely discovered, and it is impossible to compare the Jebel Qa^{c}aqir find with contemporaneous or other kilns for dating purposes. The kiln is fairly elaborate in that there is a separate fuel box on the slope below the upper firing chamber. Even more important is the sophisticated piping system through which the heat was transferred from the fire box to the upper chamber in which the pots were stacked. This implies an indirect transfer of heat,

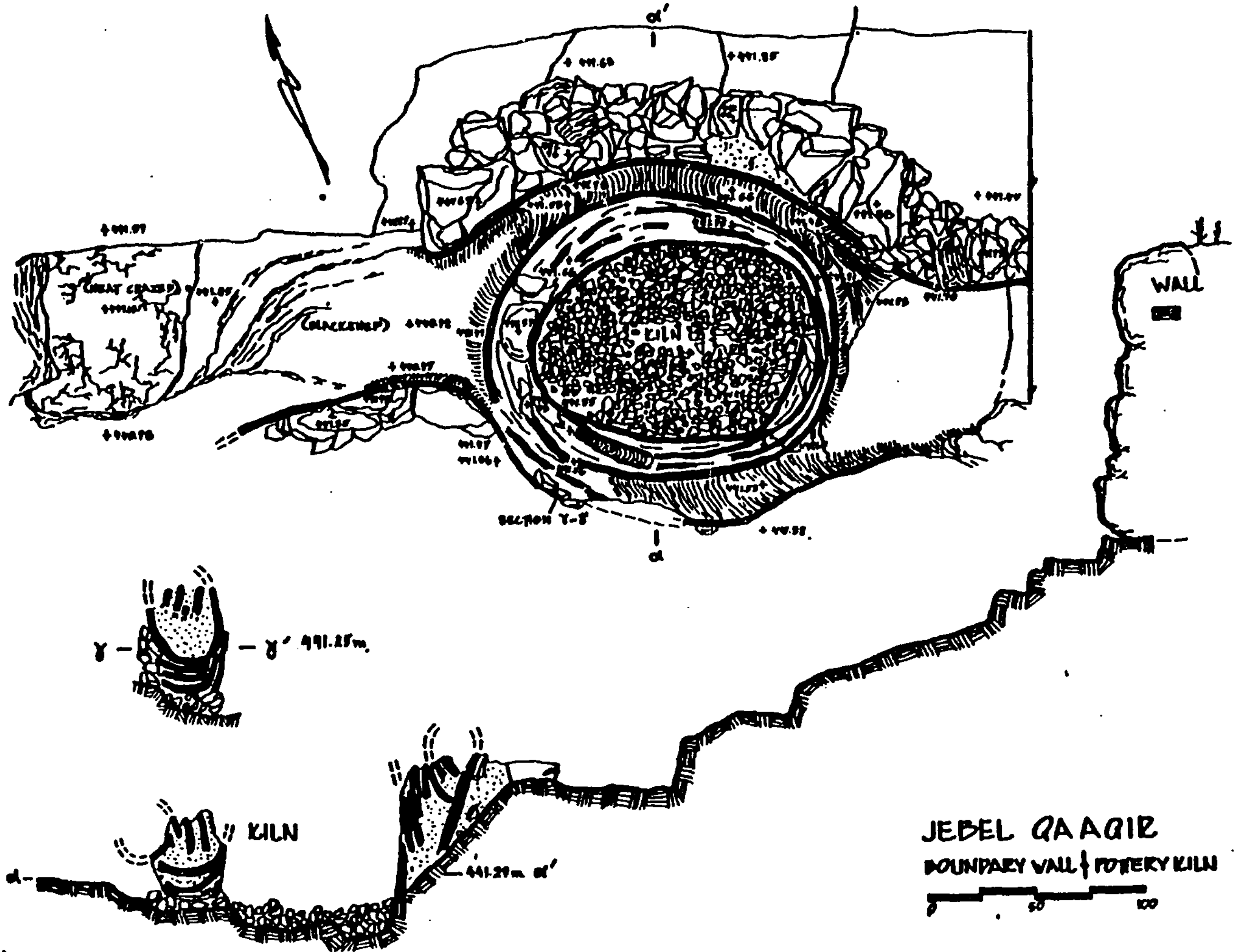

WALL
KILN
SECTION γ-γ'
γ — γ' 441.25m.
KILN
441.29m. α'
JEBEL QAAQIR
BOUNDARY WALL & POTTERY KILN
0
50
100

Fig. 13. Kiln.

characteristic of a carefully controlled pyro-technology that is not unknown elsewhere in Early Bronze Age societies, for example, in Iran at the site of Djaffarabad (Dollfus 1978: 149).

The roof of the kiln appears to have been destroyed and was perhaps rebuilt prior to each firing. It perhaps consisted of organic material or potsherds piled above the pots. The relining of the pipes suggests multiple use of the kiln, perhaps as many as ten times. Inside the kiln were some EB IV sherds, but no pile of waste of any type was identified in the vicinity of the site.

Firing temperature. From the sherds and the whole pots of the flat-bottomed tradition, we can estimate the firing temperature to have been between 700 degrees and 900 degrees C, and probably around 850 degrees C. At Jebel Qa^{c}aqir, the majority of the wares fired orange, tan or brown; individual pots vary considerably in color. White sherds and green colored pieces were rare, but not unknown. Most of the wares appear to have been locally made (according to neutron activation analysis and petrographic work; see above) and differ drastically from the bright orange-red firing wares of nearby sites at Efrat (Gonen per. com. 1984) and Khirbet el-Kirmil.

Surface color and scum deposit. The surface colors of individual pots vary, probably as a result of their position in the kiln, access to the fire and their relationship with other pots stacked around them.

Many sherds and complete pots were covered with either a thick encrustation of limestone or calcite or they have a thin "scum" deposit of salts like many EB IV wares found throughout southern Israel.

The thin film of salt contributes to the pale faces typical of many EB IV assemblages. Immediately below the surface are bright clear hues in contrast with the subdued hue of the surface resulting from the salt mask. As clay dries, moisture migrates to the surface where it evaporates, but the salts are deposited in a thin layer of "scum" or "bloom." Often the interior surfaces are brighter than the exterior because the salts and water migrated to outer surfaces exposed to the air; this is best illustrated by the small cups and funnels that were dried upside-down.

Scum deposits characterize other wares and on occasion potters create white surfaces by intentionally adding salt as on the contemporary pottery made in Hebron (Edelstein and Glass 1973: 127).

In Papua, Rye (1976) observed the use of salt water by potters making cooking pots tempered with calcite and limestone inclusions. Rye explained that the chemical reaction between the saline water and the calcareous inclusions prevented the later from exploding during the firing.

Alternatively, it would have been necessary to limit the firing temperature to 750-800 degrees C (Rye 1981: 107) or to grind the inclusions down to powder. In contrast the use of salty sea water allowed the Papuan potters to fire cooking pots made with calcareous inclusions, which often have properties favorable for use in cooking ware.

There is perhaps a similar relationship between the calcareous tempering material used at Jebel Qa^{c}aqir, the presence of salt in the water or clay, and the resultant pale surfaces.

To further test the effect of salt on firing color, experiments were conducted using table salt added to a red-firing clay. Two grams of salt were added to 55 grams of clay, which were formed into slabs and then fired, along with a control sample, to 700-900 degrees C at 50 degrees C intervals in an electric kiln. The overall effect was the formation of a white surface or simply a surface color lighter than the section in contrast with the bright-colored control sample lacking salt. All samples containing salt fired to a subdued hue regardless of the precise temperature.

Stacking. Three features related to stacking pottery during the firing stage have been discerned from the Jebel Qa^{c}aqir pottery: (1) the absence of handles; (2) the presence of color spots; and (3) the coincidence of color spots with circular large dents on jar walls.

By the absence of handles, it is inferred that pots could be stacked on top of each other without breakage of accessory pieces in the event that the pile shifted during the firing. This indirect evidence of stacking is supported by the presence of color spots and dents on medium and large sized jars, but rarely on the small pieces.

Often there are bright color spots that appear to be the result of contact with the fuel, or more likely with another pot. Color spots sometimes coincide with the circular dents (approximately 10 cm in diameter), especially on the upper jar shoulders, and indicate the point of contact between two pots stacked one on top of the other. If subjected to a relatively high temperature, the clay buckled slight under the weight of the vessel above.

Alternatively, the dents could have resulted during the drying stage as each jar was turned on its side to allow the base to dry, but the coincidence of the dents and the color spots favors the former explanation.

Pottery stacking implies that more than one pot was fired together - either the work of one or more potters.

Assessment of the pyrotechnology. Few complete pots display cracks, warping, or overfiring. All evidence, including the behavior of the non-plastics, firing color, and core pattern suggest a carefully controlled firing characterized by a relatively high firing temperature of over 700 degrees C and possible 850 degrees C. To fire pots is one of the most difficult aspects of pottery production, and the EB IV wares of Jebel Qa^{c}aqir attest to the skill of the potters. If the kiln found at the site can be associated with the EB IV period, it presents further testimony regarding the high achievements of th EB IV potters especially in the sophisticated transferal of heat via tubes from the fire box to the upper chamber.

The other pottery forms

Lamps. Four spouted lamps were the norm. Tomb B54B (Q147) and Tomb B51 each contained one single spouted lamp.

Both fine and coarse textured clays were used for the lamps. Some seem to have been created by pulling a circular slab at four points to the spouts. These lamps have rounded bases, which contrast with the flatter bases of the lamps fashioned from bowl-like forms. Approximately 50% of the spouts show soot deposits (Table 23).

Table 23. Occurrence of soot accumulation on lamp sherds found in Cave G23 (140 spouts) and in the tombs (N=10).

Context	Ware	Soot	None	Total
Tombs	Fine	10%	80%	90%
	Coarse	0	10%	10%
				100%
Cave 23	Fine	42.8%	34.3%	77.1%
	Coarse	9.3%	13.8%	22.9%
				100.0%

Pinch pots. Most pottery traditions include more than one way of making pottery. At Jebel Qa^{c}aqir, in addition to the coil work, there are small hemispherical forms made in the pinch-pot technique; those with a small hole in the base are described as funnels and can fit into the mouths of the amphoriskoi and small jars.

To create these forms, a small amount of clay was worked into a ball. The thumb was inserted to open the clay, and gradually the opening was expanded by pressing and pinching the clay as it was held and rotated on the palm of one hand.

Rims are simple and narrowing. Rounded bases predominate, and all have a small hole made while the clay was relatively wet. Flat bases lacking a hole are best described as cups, but they differ from the flat-bottomed cups made on the dusted work surface. These cups often have an incised line or combed band, whereas the pinch pots are never decorated. This implies a correlation between manufacture technique and decoration: the hand-held pinch-pots lack decoration, whereas the small cups made on the turntable were sometimes decorated.

Coarse wares: the Jebel Qa^{c}aqir cooking pots and store jars. A coarse textured brown and gray firing ware containing abundant unsorted, small, medium and large-sized inclusions, especially quartz, characterize cooking pot and store jars rim. Both forms were made of coils in some instances measuring 2 cm in width (e.g., Gitin 1975: Pl. 2, Cave G23.142.4). The rims are thickened, folded holemouth forms. The distinction between cooking pots and store jars made of the coarse ware is unclear; it is assumed that the cooking pots were smaller than the jars and more open, but no complete forms of either type were excavated, thus limiting the study of these shapes.

Rims are folded and thickened on the interior; folding is the best device to even the edge of a vessel made of coils. Usually, a short, thin coil was added to straighten the rim, but folding was inevitable. Thick folded rims are also better shock absorbers than thin rims, and this would be a desirable feature for cooking pots. Rim forms can be classified as triangular, flattened, or rounded. Some rims have a slight concavity, and others have a heavy overlap of clay on the interior. Of 80 pieces, rim thickness ranges from 9-14 mm.

Round-bottomed cooking pots. Although no complete cooking pots were excavated, a round-bottomed cooking pot (Q97) with two loop handles at the rim/shoulder was acquired along with the purchased pieces and is of considerable interest. This rounded form characterizes northern assemblages, but is rare in the south where the flat-bottomed tradition prevails.

To determine the origin of the round-bottomed cooking pot, neutron activation and petrographic analyses were undertaken. Each test independently determined that the vessel was unrelated to the bulk of the Jebel Qa^{c}aqir assemblage. The petrographic study of J. Glass revealed the presence of basalt in the matrix, implying a northern origin. Basalt, a volcanic rock, is restricted to the northern part of Israel.

Not only are the form of the base and the mineralogical composition distinctive, but the manufacture technique of the base differs substantially from that of the flat-bottomed tradition. To shape either a wide flat or round bottomed base there are two common procedures: (1) wind a coil in a circular fashion either on a flat surface or in a rounded mould; and (2) fashion a flat slab of clay by squeezing a lump of clay flat and then place it on a flat surface or into a rounded mould. Both methods are equally feasible for each type of base, yet all of the flat bases at Jebel Qa^{c}aqir were made from a slab, whereas the round-bottomed cooking pot base was coil-made as discerned in the fracture pattern.

The presence of the round-bottomed basalt-tempered cooking pot can be explained in several ways: (1) it might have been imported to the site during the EB IV period; (2) it might be a recent import to the site, which was then sold along with the material taken by the villagers from Jebel Qa^{c}aqir caves; or (3) it could have been made at the site using basalt brought at any time to Jebel Qa^{c}aqir. It has been noted that there is evidence of a Chalcolithic use of the site, and associated with this earlier deposit are a few pieces of basalt. The Chalcolithic period was one of considerable movement of artifacts throughout the country.

No rims, base sherds or handles of this type of cooking pot were found in the occupational debris or in the excavated tombs. The identification of a manufacturing technique that differs drastically from the bulk of the Jebel Qa^{c}aqir wares suggests that the cooking pot was imported to the site rather than made locally.

A round-bottomed cooking pot in the collection of Hebrew Union College is attributed to the southern site of ^{c}Ain Sâmiya (Dever 1972b). Also in the southern region of Israel, the site of Dhahr Mirzbâneh yielded a round-bottomed cooking pot that was examined by Matson. Lapp (1966: Fig. 19) noted comments made by Matson to the effect that the inclusions may have been basalt and that there was evidence of the paddle and anvil technique on the interior walls.

These two finds lend credence to the local villagers' account of the round-bottomed pot found at Jebel Qa^{c}aqir and imply the movement of pottery from the northern parts of Israel down to the central hilly regions and possibly beyond. This is of particular interest, considering that the vessel under discussion is not an exotic decorated form, but the common cooking pot.

Potters´ marks

A total of 2 complete and fragmentary potters marks incised in wet clay were found on coarse ware sherds immediately below the rim on the upper shoulders (Fig. 14). The meager assemblage prevents comment on their shape and frequency, but two points are of interest.

The paucity of potters´ marks either indicates that the coarse ware pots broke in such a manner as to obscure many of the marks, or that the potters rarely incised marks into the walls of cooking pots. A third possibility involves the differential preservation of potters´ marks; someone might have collected all sherds with incised signs at any time throughout history. Evidence of the occurrence of potters´ marks from contemporary EB IV assemblages is not helpful because coarse wares are poorly attested for this period at other sites. The Jebel Qa^{c}aqir finds represent the largest collection of EB IV cooking pots.

Contrasting with the Jebel Qa^{c}aqir finds, in the EB III period potters´ marks on cooking wares are far more common. At Tell Yarmut, 10% of cooking pot rims exhibit a

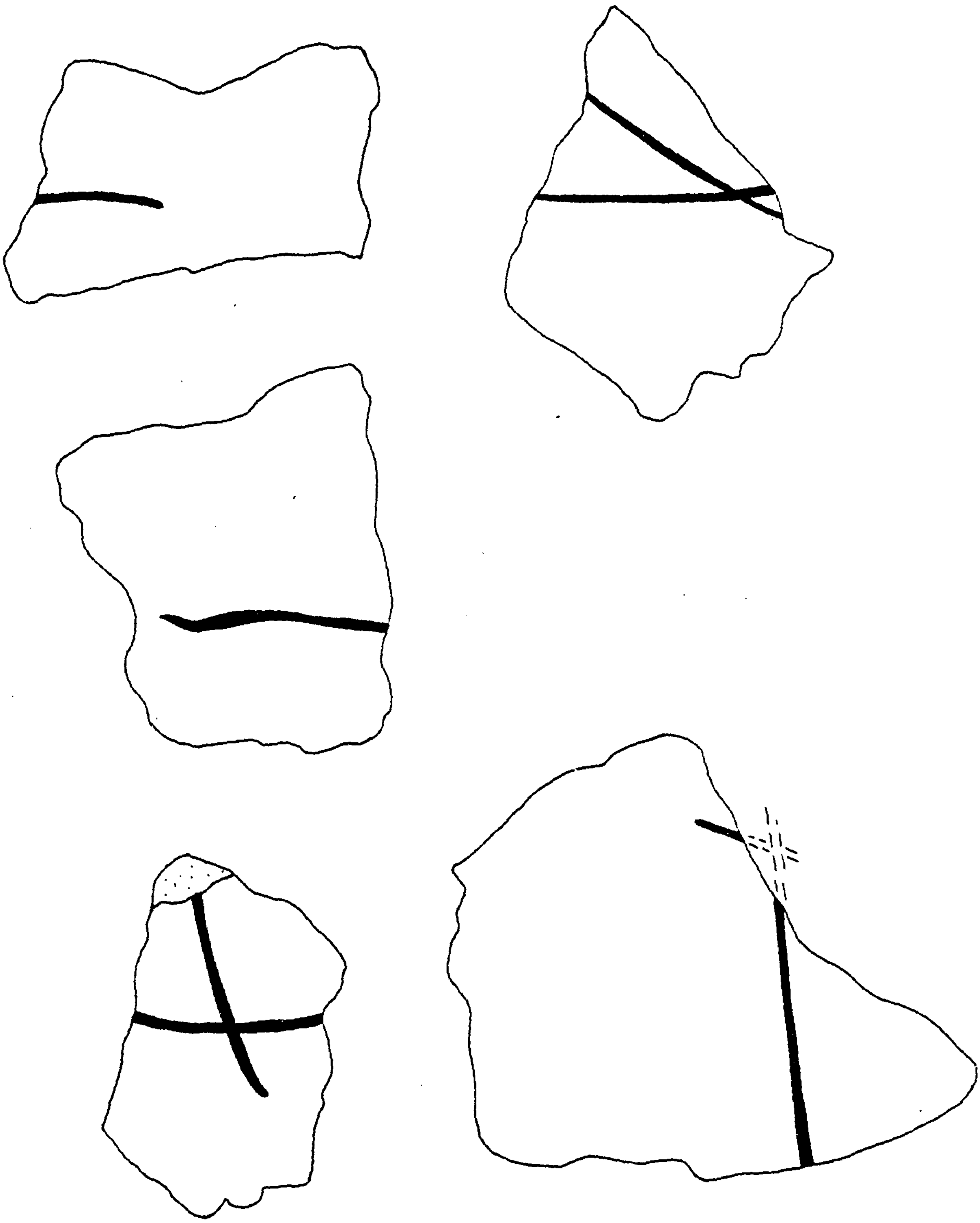


Fig. 14. Potters' marks.

potters' mark in which there is considerable variation (Nodet per. com. 1984).

Whatever contributed to the EB III use of potters' marks to differentiate pottery no longer existed in the subsequent era. This change is attributable in part to the reorganization of the pottery industry and mirrors the shift from craft specialization to domestic production (London n.d.b). The EB III potters' marks characterized commercially produced pottery in contrast to the later system of home production and use in EB IV.

The second interesting aspect of the Jebel Qa^{c}aqir potters' marks is the double occurrence of an oblique row of six short slashes found both on a coarse ware sherd found in the dump site Cave G23 (Fig. A.10:20) and on a jar shoulder found in Cave G19 (Fig. A.9:7). These finds reveal an affinity between the maker of each form; it is noteworthy that the jar shoulder does not bear an incised design of lines or combing and instead has the mark found on the cooking pot.

Morphological, decorative, and technological variation of the pottery

Although pottery studies have traditionally focused on chronological problems, once a general time framework exists the stress can shift from an emphasis on temporal and regional homogeneity to more localized variation, i.e., within and between contemporaneous sites.

Coupled with this trend are analyses of the sources of stylistic variation. It is assumed that pottery manufacture and decoration are not random, and that variation within ceramic traditions reflects more than artistic whim. The pioneer studies in American anthropological archaeology to address this facet of ceramic analysis (Cronin 1962; Deetz 1965; Hill 1970; and Longacre 1970a) demonstrated that patterns can be detected in the micro-tradition, from which one can draw inferences regarding the people who made and used the wares. As mentioned above, although these studies have been criticzed for their use of certain assumptions regarding variations in ceramics and social organization, their basic premise, that human behavior can be inferred from ceramic variability, remains a viable endeavor.

More recent research has begun to define with greater clarity the relationship between variation within ceramic assemblages and the human factor (Braithwaite 1981; Friedrich 1970; Graves 1981; Hardin 1979; London 1981; and Longacre 1981). Observations of contemporary potters working according to traditional methods have repeatedly shown that the work of individuals can be identified by observing variations in morphological and decorative features (_Ibid._). These ethnoarchaeological studies were designed to focus on those aspects of the material culture and human behavior of interest to archaeologists that often are neglected by the ethnographer. For millennia, potters have worked with the same raw materials for the primary purposes of shaping containers. The traditional methods still practiced in some parts of the world enable the archaeologist to observe pottery manufacture and to interview potters to learn about the organization of the industry.

An ethnoarchaeological study of traditional potters

My own work among a community of craft specialists of the town of Gubat of southeastern Luzon Island provides interesting results pertinent to the study of archaeological pottery. After describing the community, several sources of variation in the work of individual potters are presented.

One purpose of the ethnoarchaeological project was to measure the degree of standardization in the work of craft specialists. It has been suggested that the work of craft specialists, in contrast with that of domestic producers, can be identified by measuring the degree of standardization in the shapes and sizes of archaeological ceramics (Johnson 1973: 129). There is a tendency to equate standardization with craft specialization (Adams 1979: 729; Balfet 1965: 170; Connor and Rathje 1973: 6, 10: Rathje 1975: 430; Rice 1977: 230, Rice 1981: 222; and Stark and Hepworth 1982: 4).

It is assumed that full-time potters, producing market-oriented wares, become routinized in their movements, resulting in standardized shapes and sizes. Under these circumstances, the work of full-time craft specialists will be recognized archaeologically by a degree of standardization that contrasts with the more variable work of non-specialist, domestic producers.

To test this assumption, I examined the wares of craft specialists in the town of Gubat, Sorsogon Province, in the Philippines. The University of Arizona Summer Research Support Program provided partial funding for this two-month project carried out in the summer of 1981.

My objectives were to observe and record the manufacturing tradition and the organization of the industry; to measure the degree of standardization of the Gubat potters as a group and the variation in the wares of each potter; and to learn to identify the work of individual potters.

<u>The selection of Paradijon, Gubat, Sorsogon</u>. The Filipino community of Paradijon, identified by Longacre in 1976, provides an appropriate locale to test hypotheses concerning craft specialists. In many parts of the Philippines, traditional industries persist alongside more modern enterprises and tourist businesses. Thirty years ago, Scheans (1977) recorded 45 market-oriented traditional production centers throughout the Philippines, to which the small community of Paradijon can be added.

Approximately half of the 57 potters interviewed work full-time all year. Although production decreases during the winter months because of rain and cooler temperatures, the potters obtain most, if not all, of their income by selling pottery. Of the 57 potters present during the two-month study period, half were women with young children who consequently are part-time potters. Additional income for some families is earned by men who engage in temporary and seasonal jobs.

In an industry predominantly female, five men work as part-time potters in addition to the more usual male activities of digging and preparing the clay and later firing the finished pieces. Four of the men are brothers and nephews; the fifth is a former _baringo_ (_barrio_) captain. The repertoire of each man varies, but besides flower pots, stoves and cooking pots, they make unusual pieces, such as animal figures and miniature vessels for children. The _baringo_ captain is the only Paradijon potter to decorate flower pots with a relief pattern.

The potters are specialists in the sense that they comprise a small percentage of the Gubat population, they are not involved in subsistence work on a regular basis, and they supply a large non-pottery producing clientele.

All wares are destined for local distribution rather than the tourist trade. Potters sell their work in bulk to shopkeepers in Gubat, Bulusan, and especially in the provincial capital, Sorsogon, Sorsogon; traveling merchants and retail sales account for a fraction of the market. The Paradijon wares reach maximum distance estimated to be 160 km from Gubat.

The community of Paradijon. Paradijon, a small neighborhood in the town of Gubat (pop. 15,000) lies near the southeastern tip of the Bikol district of Sorsogon Province (Fig. 15). The term Bikol refers to a cultural linguistic group distinct from central Luzon Island with which contact has always been restricted. The Bikol area comprises the peninsula of southern Luzon Island, which is dissected by innumerable bays and gulfs for the length of its coasts.

The high volcanic cones protruding on the horizon include the active Mayon volcano (7943 ft.) in Albay and Bulusan volcano (5115 ft.) south of Gubat. Soil suitable for agriculture abounds and annual precipitation exceeds 200 cm (Wernstedt and Spencer 1967: 412). Hot and humid summer weather contrasts with the drier months of February through April and the cold, rainy winter months.

The recent history of pottery making in Paradijon began in the Spanish era; many terms associated with pottery production are borrowed from Spanish. According to the oral history, potters from nearby Albay came to Paradijon

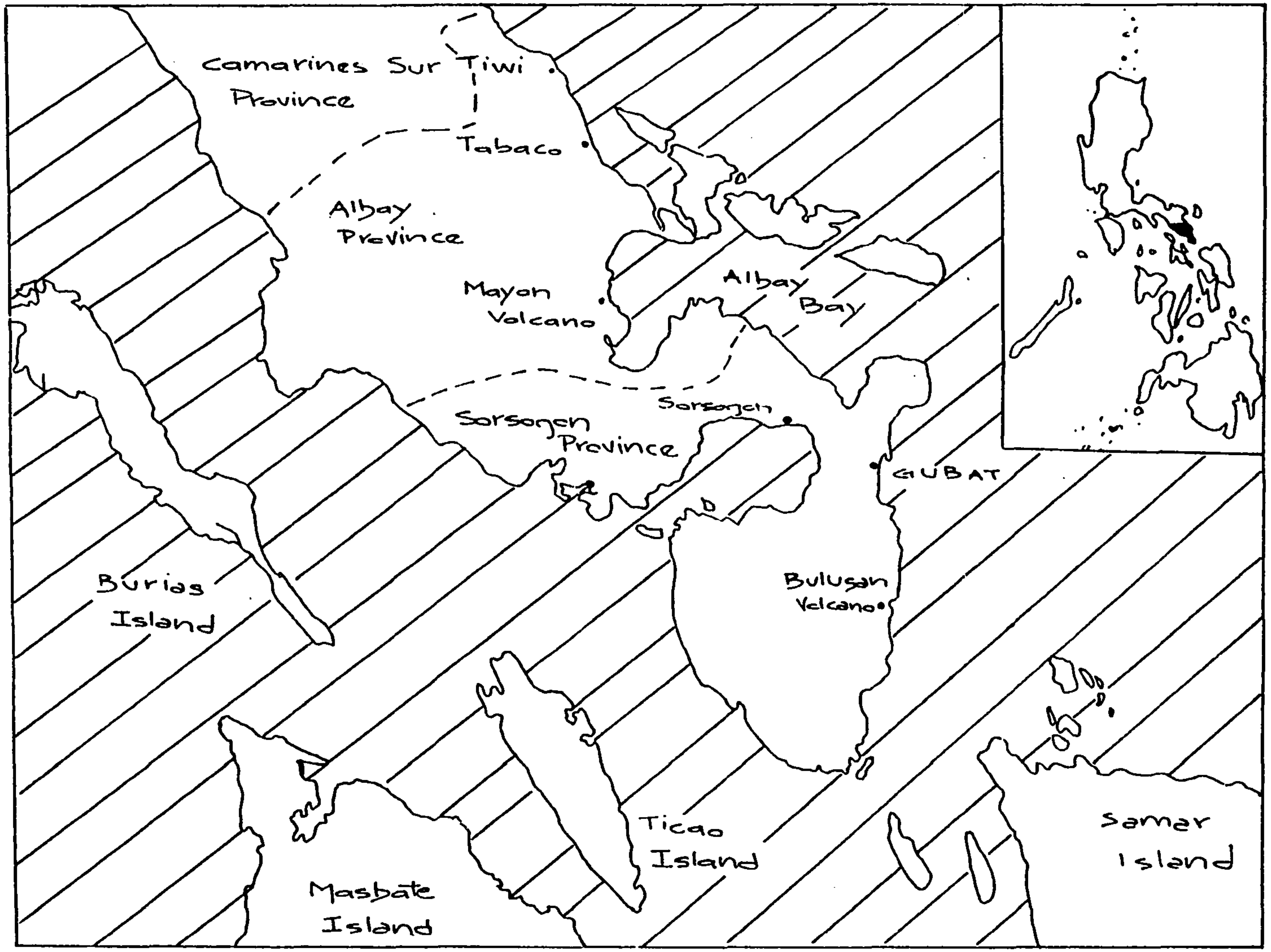


Fig. 15. Southern Luzon Island, The Philippines.

following a devastating eruption of Mayon volcano, perhaps in 1814. In the Gubat cemetery, tombstones of the grandparents of current Paradijon residents bear mid-nineteenth century dates. Church records of the same era list potters among the local population.

In Gubat, the small neighborhood of Paradijon is unique in that it is the sole concentration of craft workers; all potters reside in Paradijon whereas bamboo cottage industries are dispersed throughout Gubat. Paradijon, nicknamed "Paradise," is one of the poorest neighborhoods of Gubat along with the fishing community on the coast. In 1981, a manually-operated bellows for working iron was in use in a foundry located on one of the two roads leading to Paradijon and perhaps hints at the former industrial base of the area.

The sampling strategy. To address the questions of standardization in the work of craft specialists and the identification of the work of individuals, potters and their wares were selected according to four criteria: age, experience, familial relationships, and the location of their work areas.

Rigorous testing requires accurate measurements of adequate numbers of each pottery type made by a well-selected sample of potters. The sample of Paradijon potters includes individuals ranging in age (22-67 years old), experience (less than one year to 50 years of making pottery), and familial relations (spouses and mother-and-daughter sets). Of the 16 individuals selected, the sample comprises two elderly sisters, two sets of mother-and-daughter potters, a potter, who after a lapse of 30 years, has begun to make pottery recently, the husband of the latter, and eight other female potters (Table 24). Nearly half of the women are not native to Paradijon but originated in nearby districts.

With the help of interpreters, I interviewed 60 people, but most of the time was spent observing the potters and measuring the pots. The ability to observe patterns of behavior and work habits, supplemented by interviews, is one of the primary strengths of ethnoarchaeology (Schiffer 1978: 236).

Potters usually work outside in a small clearing or on a path adjacent to their homes, which are clustered behind two main roads (Fig. 16). I watched the work without physically interfering, and everyone saw what I was doing. More difficult to observe was the work carried out inside the homes. As a result, cooking pots were measured in fewer numbers than other vessel types, because much of the paddle-and-anvil work was done inside where the clay could dry slowly and at a more controlled rate.

Table 24. People included in the quantitative analysis of variation.

Potter	Age	Years potting
1	46	7
2	22	Under one year; daughter of potter 1
3	50	30
4	53	15
5	40-45	?
6	56	42; sister of potter 14
7	31	Under one year; daughter of potter 9
8	30-35	7
9	55	30
10	50	20 plus
11	65	50
12	48	31
13	50	Started under one year ago after a 30-year pause before which she made pots 6-7 years
14	65	51
15	67	15
16	52	Husband of potter 13; engages in secondary forming and finishing work

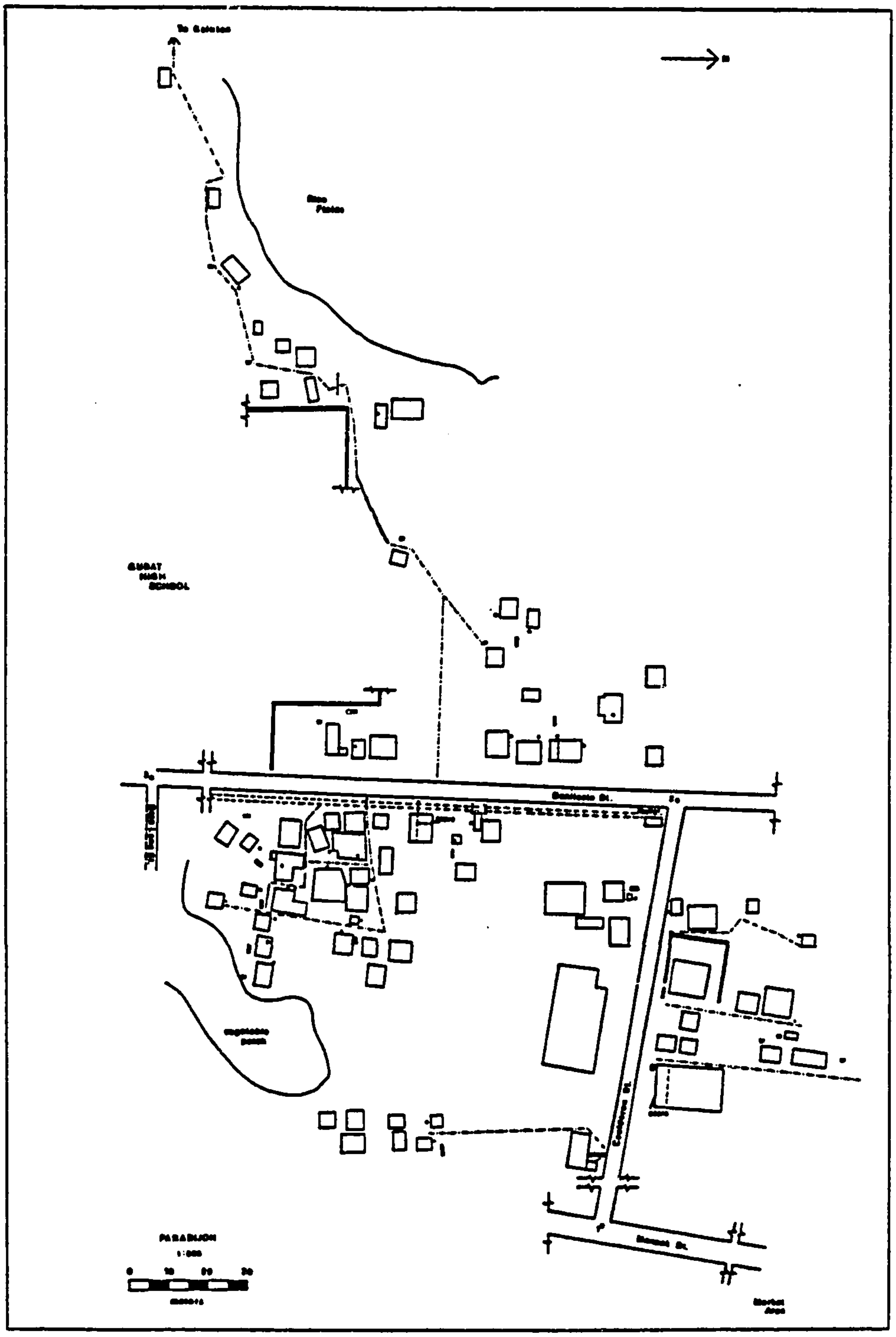


Fig. 16. Paradijon.

To avoid disruption in the work cycle, nearly all measurements are of unfired wares. After the late Friday afternoon firings, the pots, while still hot, were stacked and wrapped in banana shoots for pre-dawn transportation by car to the regional market in Sorsogon each Saturday morning. In 1981, finished pieces were sold within two weeks, but in 1983 Longacre (per.com. 1983) found that the potters had organized a cooperative and now stockpile finished wares in a new system of marketing and sales.

Another reason for working with the fragile, unfired wares, was in response to the common practice of firing the work of as many as five potters together. A single load of between 70 - 150 pieces might comprise the work of the potter responsible for the firing; pieces commissioned from any number of potters too poor to buy their own clay; work purchased in the dry, unfired state from potters in need of immediate cash; and, finally a few of the neighbor's pieces.

To avoid misidentification of the fired wares of each potter, I measured the dried, unfired pots whose manufacture I had observed from start to finish. Close observation required spending a great deal of time with each potter. Pots were rarely completed during the course of a single day, especially when rainy weather prevailed. To observe each stage of manufacture of individual pots usually required three to seven days. This contributed to an unbalanced sample of pots and potters but resulted in an accurate assessment of the organization of the industry and the variation detected throughout the community and in the work of individuals.

Sources of variation in the work of craft specialists. Variation in the work of full-time potters appears in all stages of pottery production, from clay selection and method of manufacture to surface finishing techniques and decoration.

The clays. In 1981, 22 men dug (kalot) clays from a fallowed rice field, one and a half kilometers from Paradijon. The clay field owner offers seasonal employment in his rice mills. The potters and those who fire the wares pay for the clay, rather than the diggers. The owner of the field receives one of every ten pots fired.

Five or six men work together in a group in one of the many holes in a section of the rice field used since 1972. The first task on many mornings involves bailing out the evening rain water--a job requiring more than one person.

Suitable clay lies 15-30 cm below the surface soil (ing´ode); sticky red and white firing clays (hemolot) rest above the leaner, gray clay (baras) containing a large fraction of non-plastics. A third category of clay is a mixture (salado) of the two; all three types are dug separately.

Clay (lapok) for shaping pottery is formed by combining and pounding (dusang) the different clays that individually are unusable. To pound the clay, a light-weight tree trunk, under two meters in length, is repeatedly dropped on the clay as the pounder walks around the pounding board (dusangan) eight times. The pounding process requires approximately four hours tc lay the clays on the wooden board and pound the different clays together. The men sprinkle water on the pile during the process but add no tempering materials. Throughout the pounding process, the men extract large stones and organic inclusions indigenous to the clay. A pounder prepares clay for approximately 100 pots at least once a week or more often.

Most pounders (parakalot) and potters (parakoron) work with all three clay types, although the sticky white hemolot was said to be buried deeper, difficult to dig, and rarely used. Some potters preferred it for cooking pots which are made exclusively in the paddle-and-anvil technique. Sticky, fat clays are more amenable to paddle work than to coiling; whereas two lumps of a fat clay will slide over each other, two pieces of lean clay adhere to each other and are better suited for coil work. This would suggest a correlation between clay selection, vessel type, and mode of manufacture if the white clay is usually reserved for cooking pots, which are never coil made. The infrequent use of white _hemolot_ prevented the collection of quantitative data to support this correlation.

Manufacturing techniques. Most pottery-making traditions include more than one technique, and in Paradijon pots (_koron_) are made both by paddle-and-anvil and/or by coiling. Cooking pots (_koron_) are always paddled (_pok pok_) with wooden tools (_bikal_, _henag_, and _limos_) and a rounded stone (_bato_) anvil (Fig. 17). All stoves (_kalan_) are coil built, but flower pots (_masetera_) and jars (_biso_) are made by either technique.

One method of shaping _masetera_ begins by centering several handfuls of clay on the turntable (_bayangan_), consisting of a removable wooden disc that rotates above a block of wood fitted with ball bearings from an old bicycle. With one hand at all items on the _bayangan_, the potter rotates it while the other hand opens and stretches the clay to form a thick-based, low, open shape (_binayang_). The clay is removed and set to dry on a wooden plank, banana leaf, or piece of plastic until it dries enough for the first paddling stage. The drying period lasts from less than one hour to overnight, depending on the weather and the work load. Potters who cannot work on the _binayang_ immediately pile them up under plastic covers for several days. Normally, potters shape a series of 12-30 _binayang_ at one sitting as they wait for the first ones to dry before beginning the paddle work.

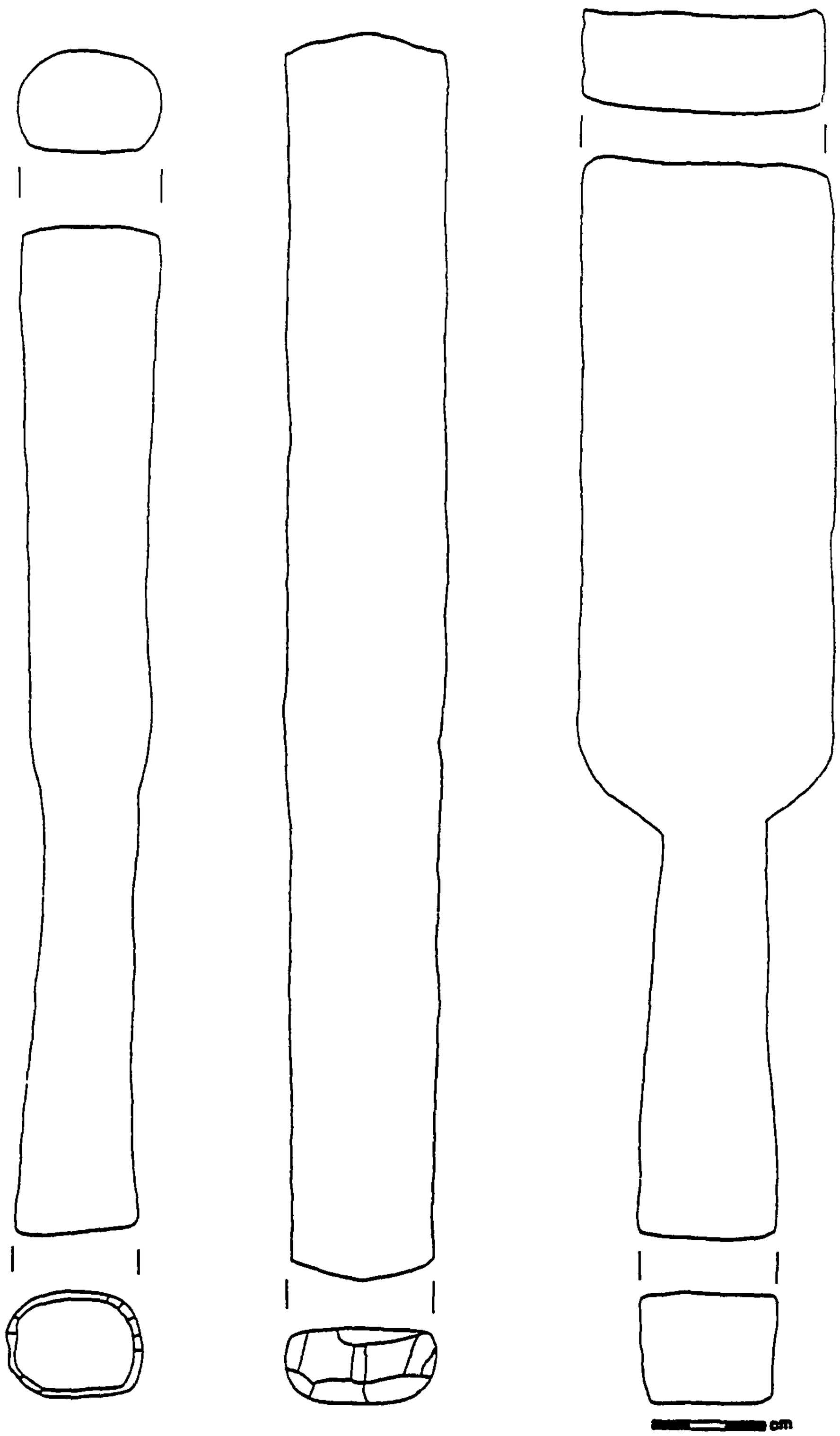


Fig. 17. Potters' tools.
Bikal, henag, and limos.

Over the course of a day, or as long as one week, the potter works on each piece and stretches out the clay by using the different paddles and the stone anvil. Following the use of each paddle (the unfinished form acquires the name of the paddle (binikal, heninag, and liminos).

To form masetera by coiling,the potter rotates a small lump of clay on the turntable to create a low-walled, open form (binayang), whose base thickness equals wall thickness. After a drying period of under one hour or as long as overnight, the form is recentered on the turntable to receive the first of three to five coils, depending on the desired size. Before and after each coil (sinangkann), the vessel dries slightly to enable it to support the weight of the next wet coil. The potter pushes the final coil in at several places to create a scalloped (gerittinggetting) finish. Paddled flower pots invariably have a flattened, belt-like (depaja) rim.

All large flower pots (palmera) are coil-built, whereas smaller versions (saday saday, natural, and media) are made either by coiling or paddling. Variation of rim finish corresponds consistently with method of manufacture: paddled masetera have flattened belt-like (depaja) rims and coiled masetera have scalloped rims. The older and more experienced potters tend to use the paddle-and-anvil technique more so than the younger women. Consequently masetera rim types reflect the manufacturing techniques as well as the ability and experience of the potter.

Surface finishing techniques and decoration. Following the primary coiling and paddling work there come various secondary forming and surface finishing techniques, such as cutting holes into stove and flower pot walls, applying red slip (porog) to flower pots, and burnishing (bolalohon) cooking pots. Surface finishing techniques and decoration coincide closely with vessel type.

By mid-week, most potters have many pots in various stages of drying. Invariably, there are times at which too many pots require immediate attention; clay that becomes too dry cannot be paddled, coils and accessories will not adhere, and surfaces cannot be burnished.

To solve this dilemma, potters enlist the help of their spouses and children to assist with the secondary forming and finishing work. For example, family members might cut holes into masetera and kalan, as well as burnish cooking pots or apply red slip to masetera. On one occasion, the husband of a potter shaped the binayang for his wife to paddle later, although this was the only instance of the involvement of a non-professional in the primary forming work.

Craft specialists elsewhere are assisted by family members who render the decoration and secondary forming work

(Agogino and Bennett 1980: 86; Lackey 1978: 111; Papousek 1981: 18). The participation of non-potters in the manufacturing process creates a significant source of variation in the work of the Paradijon potters. Although the primary forming work is normally carried out by skilled potters, the market demands result in the use of non-professionals to perform secondary tasks requiring less skill and experience.

A quantitative analysis of the secondary forming and finishing work, especially the burnish pattern on cooking pots and the pattern and number of holes cut into stove walls and bases, illustrates the variation introduced by the non-specialists.

For example, after the charcoal-burning stoves (kalan sa oring or onogan) dry several hours or overnight, holes are cut into the upper base, through which ashes escape to the lower base. The onogan made by one potter, whose husband sometimes uses the knife to cut the holes, reveals the work of two different people, the potter and her husband consistently cut a different number of holes arranged in two distinct patterns. The potter cut an average of 13 holes into 13 onogan (SD 1.22), and her husband carved 11 holes into all 14 onogan observed.

Although cooking pots are usually made by the most skilled potters, they too must cope with the vagaries of the weather and the market schedule. Once the pots reach the leatherhard stage, the exteriors and rims are burnished using the eye of a tiger cowrie shell, a metal spoon, or an empty bottle. According to several informants, shells were formerly more common and came from the island of Samar, southeast of Luzon Island. Pottery and vegetables were formerly traded between the islands.

Anyone can easily burnish the body in an open or tight zigzag pattern (Fig. 18). The combined efforts of two people on a single pot result in variation of significant consequence: the burnish pattern, or distance between strokes, is one criterion used to differentiate the work of individual potters. When asked to identify the potters responsible for several cooking pots I purchased, those who correctly identified the maker used a variety of vessel features: rim thickness, overall vessel proportions, rim angle, symmetry and evenness of the orifice, smoothness of the exterior, thinness and roundness of the rim, rim form (concave or flat, rounded or slightly angular), steepness of the shoulder, interior rim/neck join (sharp or rounded), curvature or flatness of the base, presence/absence of anvil marks on the interior, proximity of burnish strokes, and the occasional use of paint.

The domestic Kalinga potters identified many of the same features as important for differentiating the wares of individual potters (Longacre 1981: 62). Each person

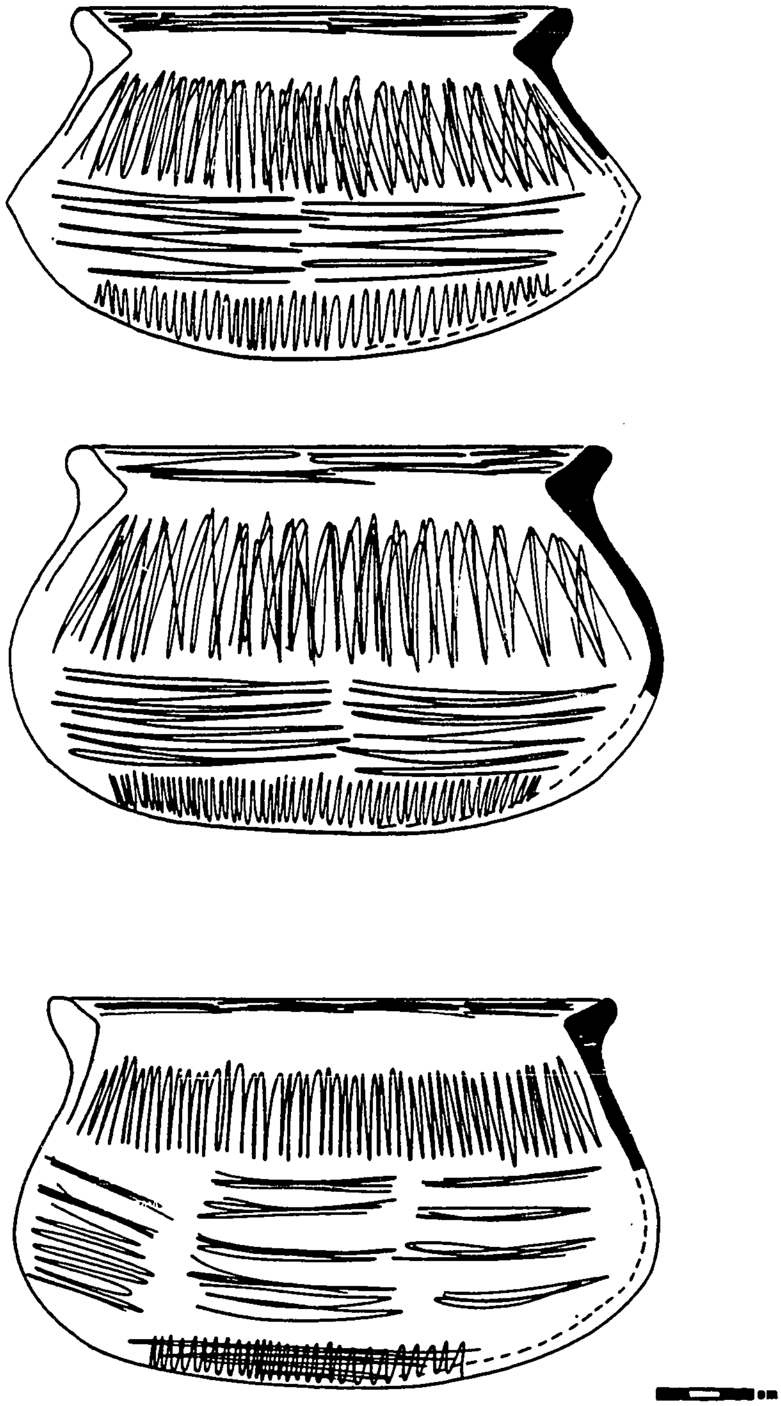


Fig. 18. Cooking pots with different burnished patterns.

interviewed by Longacre (Ibid: 62) was able to identify the potter responsible for each cooking pot. I posed the same question to ten Paradijon residents. Although they claimed to be able to recognize the work of each potter, only 50% (at best) correctly attributed one of the four cooking pots to its maker. This contrasts sharply with the Kalinga experiment involving a larger sample of pots and 100% correct identifications. In Paradijon, of the 28 full-time potters, only 16 make cooking pots, yet their work was not readily identified. In part this results from the contradictory information presented by the primary features rendered by the potter, versus the secondary finishing work of the non-professional.

Variation of the burnish pattern serves not only to differentiate among the Paradijon potters, but also to distinguish Gubat wares from those of contemporary nearby pottery making communities. A striped burnish pattern, designated "carabasa" after the striped squash, and horizontal burnish strokes characterize cooking pots from the two closest pottery-making communities that are less than 100 kilometers from Gubat.

On the level of individual stylistic preference within a community, or the "assertive style" (Wiessner 1983: 256), the thumb-indented pattern (samberi) found on stoves (kalan) serves as a good example. Non-potters contribute to all aspects of the surface finishing work and decoration, except for the _samberi_ on the four types of _kalan_, of which two burn wood, one burns charcoal, and the least common type burns sawdust. Thumb-indented patterns, grouped or continuous (Fig. 19), are rendered by the potter while the clay is wet and plastic and positioned on the turntable. This process contrasts with all other surface finishing work that requires drier clay.

Variation of the pattern and number of thumb-indentations cannot be attributed to the non-professionals but coincides with an individual or "assertive style" (Wiessner 1983: 256) and allows us to separate the work of each potter.

Of the 10 Paradijon potters observed, each adhered to either the continuous or grouped pattern of thumb-indentations. The continuous pattern appears on the _kalan sa oring_ of two sisters who use this same pattern on the _kalan sa kahoy_. Two other potters create a continuous pattern. All four women are over 50 years of age. Perhaps the continuous pattern represents as older style, while the grouped pattern, used by all potters under 50, is a more recent development and represents variation resulting from changes through time. The two elderly sisters average 18 indentations on _kalan sa oring_ (n = 6 and 11), while a third potter averages 48 (n = 12). For the _kalan sa kahoy_ of each

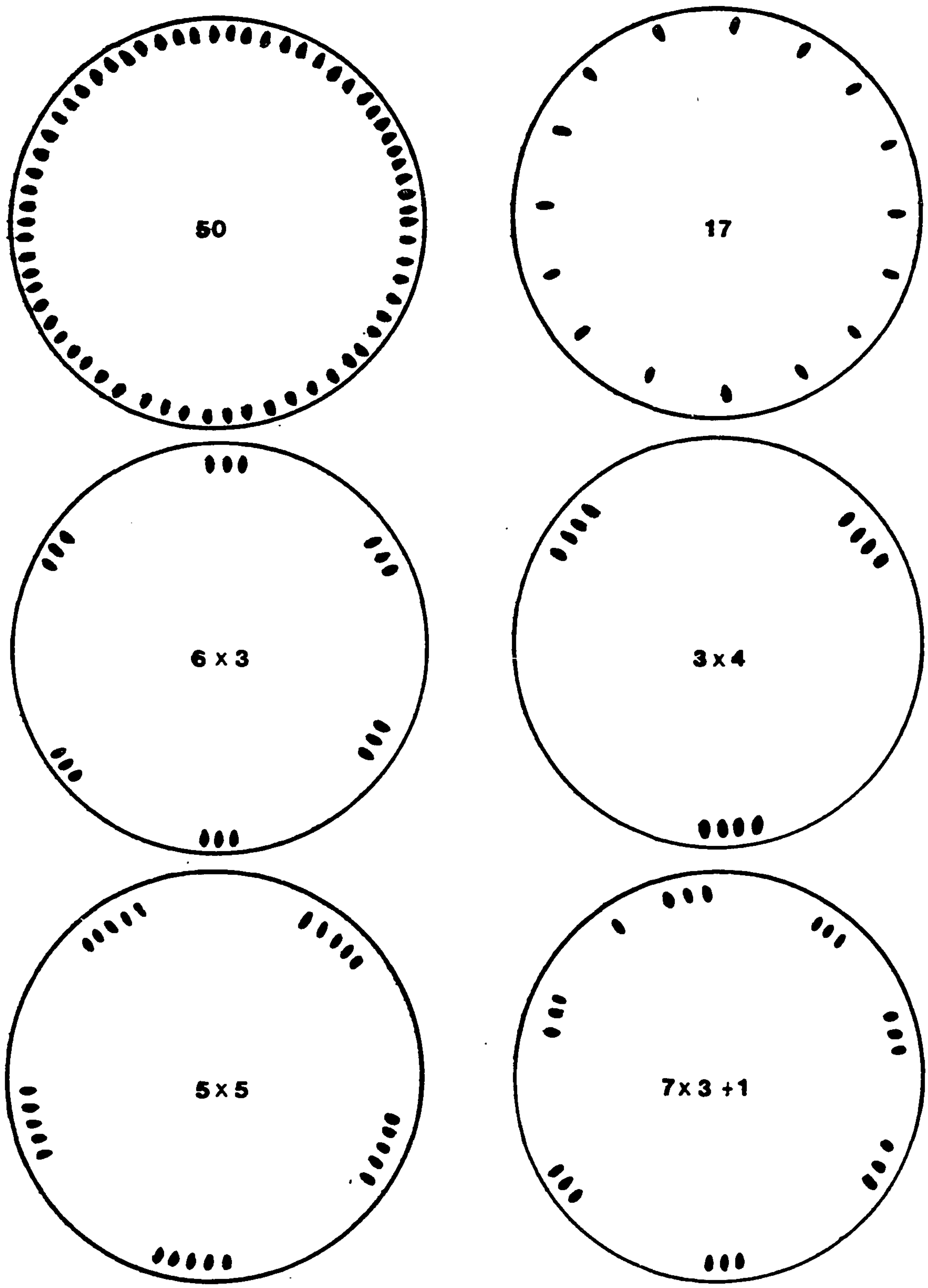


Fig. 19. Thumb-indentations on stoves.

potter, the average number of indentations is 19, 19, and 48 (n = 6, 26, and 21). This grouped pattern varies from potter to potter although duplicated patterns occur (Table 25).

Table 25. Rim indentations on <u>kalan sa oring</u>.

Potter	Years potting	Sample	Mode
Grouped patterns			
1	7	23	3x4
2	Beginner	5	3x5
3	30	6	7x3 or 6x3
4	15	2	7x3
5	?	2	6x3
7	Beginner	11	7x3 plus 1
9	30	26	6x3
14	51	2	5x5
Continuous pattern			
6	42	11	17
13	See table 24	12	48

This might obscure identifying the wares of individual potters, but this problem is resolved by considering other features e.g, the number of holes cut into the upper body, lower body, and base. With these combined data, the work of potters 3,5, and 9 can be distinguished although each uses six sets of three indentations on the rim (Table 26).

Table 26. Holes carved into the walls and base of <u>kalan sa oring.</u>

Potter	Years potting	Upper body	Lower body	Base	Sample
1	7	3	3	12	4
2	Under 1	3	?	-	5
3	30	3 or 6	3	-	2
5	?	3	2	13/14	2
6	42	3	5	-	11
7	Under 1	-	-	11	11
8	7	6	5	15	8
9	3	6	5	11	24
13	See table 24	3	3	13	13
16	See table 24	3	3	11	14

Data are unavailable that would provide a similar solution for the potters who create seven sets of three indentations.

Another feature of the <u>kalan sa oring</u> specific to each potter is the number of indentations in the raised band placed at the join of the upper and lower halves of the stove. Continuous patterns characterize this band, but the number of indentations varies (Table 27) and aids in separating the work of each potter.

Finally, the work of mother-and-daughter pairs reveals interesting similarities and differences: in one instance, the mother's pattern of <u>kalan</u> rim indentations is

Table 27. Indentations on the bodies of kalan sa oring.

Potter	Year's potting	Sample	x	SD	Coef.of var.	Mode
1	7	13	26.8	1.59	5.93	26
6	42	11	16.7	1.38	8.17	18
9	30	26	22.7	1.52	6.70	23
13	See table 24	12	42.5	2.58	6.10	44

three sets of four versus the daughter's pattern of three sets of five (potters 1 and 2). In another pair, (potters 9 and 7), the mother uses six sets of three, while the daughter uses seven sets of three plus one extra indentation (Table 26). In each situation, the potters worked independently; the daughters were once taught by their mothers to make pottery, and the similarity as well as the individuality of the offspring are obvious.

Data on vessel dimensions and overall proportions are not available for the kalan. The ethnoarchaeological work on Kalinga pottery (Graves 1981; Longacre 1981: 62) emphasizes the importance of overall vessel proportions, in addition to decoration and surface finishing techniques, for differentiating the work of individual potters. These data would further facilitate identification of the work of each potter. The identification of individuals in the ethnographic record (Graves 1981; Hardin 1977; Hill and Gunn 1977; Longacre 1981; Wiessner 1983) demonstrates that a combination of morphological and decorative features allows us to separate the work of people who produce and co-exist within the same communities. These same criteria can serve to identify the potters of antiquity and provide information on social organization.

Conclusion. In Paradijon, variation in the work of craft specialists results from the different clays, manufacturing techniques, potters' ages and experiences, market demands, and collective and self-expression. Each stage of the work contributes to subtle differences in every succeeding manipulation of the clay. The choice of clay and the desired vessel form influence the manufacture technique, which in turn influences the surface finish and decoration. Variation in the thumb-indented pattern on stoves reflect potters' age differences, as well as the number of years potting and the individuality of each potter. Market pressure creates a role for non-professionals who account for a large measure of the nuances detected in the surface finish.

The question of standardization requires further testing, but an important point to emerge from the Paradijon study is organizational complexity, especially the division of labor. This appears to be a significant distinction between domestic potters and craft specialists. To differentiate between these two production levels, the first step involves an examination of the manufacturing technique to determine the order of work and to distinguish among the primary and secondary forming stages and the surface finishing work. Processes rendered on dry or drying clay, rather than in its wet, plastic state, might signal non-professionals involved in the final stage of manufacture. Variation in the primary and secondary work could then be measured and compared to assess standardization in bulk-produced wares.

Individuality in the work of full-time potters results in subtle variation in all stages of manufacture. Despite the distance between potter and client, each potter asserts an element of individuality that tends to limit standardization on the community level. On the individual level, nuances in morphological and decorative attributes permit identification of the work of each potter, but often the information is obscured by non-professional participation, especially for the surface finishing work.

Variation of the Jebel Qa^{c}aqir pottery

An analysis of the same vessel features as recorded for the ethnographic pottery can provide new insights regarding variation of ancient wares. Of particular interest are the sources of variation attributable to individual preference or other factors. Despite the seeming homogeneity of the EB IV flat-bottomed wares, the cross-tabulation of morphological, technological, and decorative features reveals variation resulting from several sources.

1) Vessel type as a source of variation. Incised designs characterize all forms except cooking pots, but certain factors affect the use of each design. Individually incised elements such as stippling and slashes are rarely found on open forms and are most common on amphoriskoi. Stippling is found primarily on spouted vessels, jars, and amphoriskoi, but never on bowls. Combed patterns are found on open and closed vessels, but wavy patterns are most common on open forms, both bowls and spouted vessels.

Although any design might be found on closed vessels, stippling and slashes tend to predominate on vessels with handles and spouts, i.e., spouted vessels and amphoriskoi (Table 28). This may be because accessory pieces (handles and spouts) hindered execution of a continuous combed pattern. Stippling and slashes can be

Table 28. Incised designs according to vessel type. excavated and purchased closed vessels N = 73.

Vessel type	N	Combing	Stippling	Lines	Slashes	None	Total
Jars	25	56.0%	33.0%	0	0	8.0%	100
Amphor.	36	41.7%	22.2%	8.3%	5.5%	5.5%	99.9
Spouted vessels	12	25.0%	58.3%	8.3%	0	8.3	99.9

rendered regardless of accessory pieces. Occasionally, the stipples and slashes cut into the handle indicating the order of work. On other pieces, irregular and uneven combed bands reveal the problems created by handles, which interrupted any design rendered after handle application. Since accessory pieces hindered continuous patterns, individual slashes or stipples are better suited for amphoriskoi and spouted vessels.

2) Vessel size as a source of variation. Larger vessels, especially jars, tend to have as many rows of decoration as smaller vessels, or more (Fig. 20). Designs on large forms also tend to be more widely spaced and longer than on smaller forms. Multi-directional combing is restricted to large vessels; this design can extend 10 cm in length, whereas other combing patterns rarely exceed 5 cm.

3) Time as a source of variation. Time as a factor of stylistic change cannot be overlooked, but we lack the means to evaluate chronological distinctions among the deposits at Jebel Qa^{c}aqir or contemporaneous sites.

4) Provenience as a source of variation. Smaller vessels are among the most common in the tombs; only one large jar at Jebel Qa^{c}aqir was found in a tomb. On the whole, it is best to treat wares from domestic and funerary contexts separately.

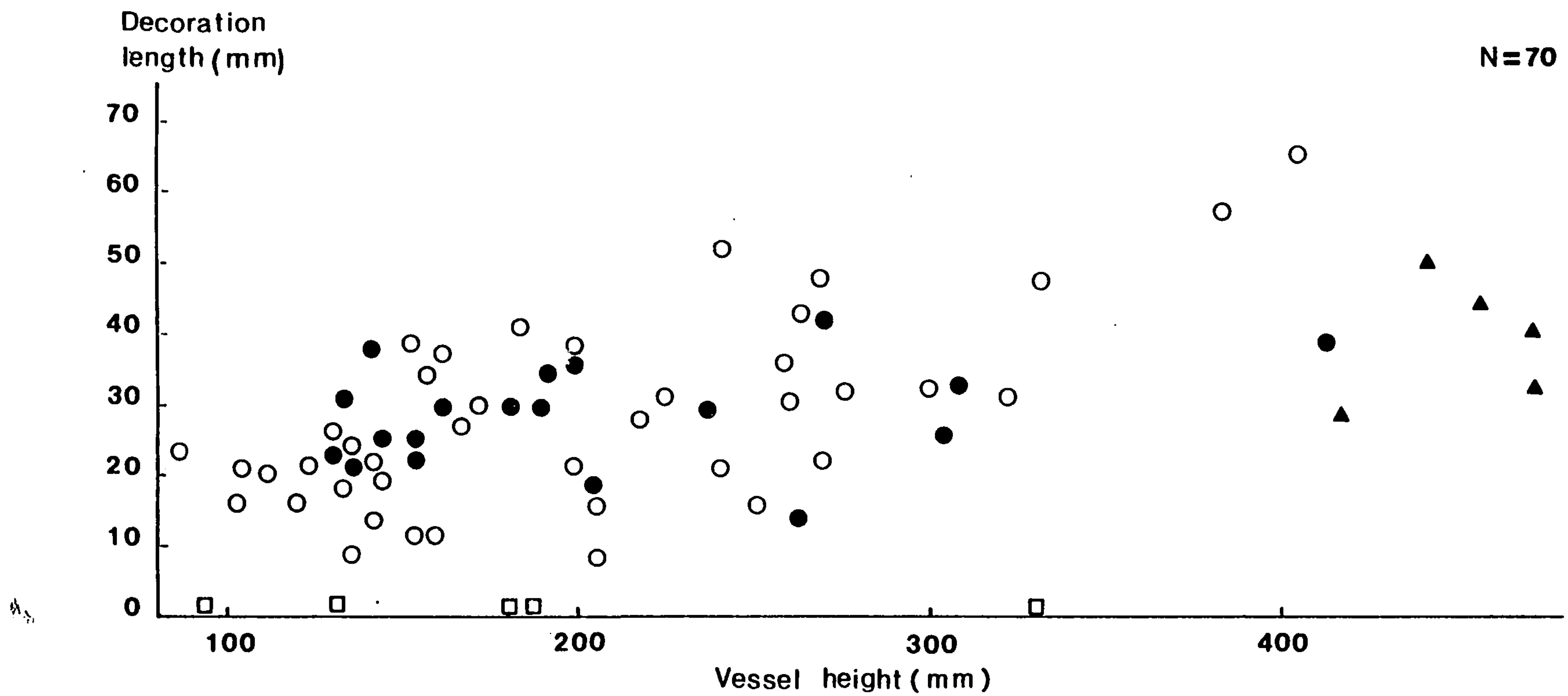


Fig. 20. Correlation between vessel height and decoration length. Jebel Qa^{c}aqir pots: O = tomb wares; ▲ = domestic wares; □ = no decoration; and ● = non-Jebel Qa^{c}aqir pots.

5) <u>Individual or "assertive" style as a source of variation</u>. Once design variations resulting from vessel form and size are recognized, individual stylistic differences can be identified by comparing vessels of similar size and form, e.g., all tall jars, versus amphoriskoi. If morphological, technological, decorative features co-vary on vessels of similar size and form, the work of individual potters or the "assertive style" can be isolated.

The best example of a single assertive style comes from the complete or reconstructed jars and amphoriskoi found in Cave G26. Two horizontal comb bands characterize six of the jars (Fig. A.12:5,6; A.13:4,5,7) though combed size varies (9-12 cm.), as does the number of teeth (5-8). The seventh jar has almost vertical combed bands between two horizontals (Fig. A.12:4).

For the six jars, various size dimensions are also matched closely (Table 29). Although two jars (Q195 and Q0000) are very tall (over 60 cm), heights of the maximum circumference measure 301 and 300 mm respectively. Maximum circumferences are 100 and 110 mm, rim diameters are 150 and 155 mm, base diameters are 204 and 208 mm, interior neck rims are 84 and 85 mm, and the rims thicknesses are 6 mm.

Two other jars bearing a close resemblance are Q248 and Q250. The former is missing the rim so maximum height, neck height and rim diameter cannot be obtained, but other

Table 29. Cave G26: Vessel measurements.

All jars but Q246 have two horizontal combed bands.
Both amphoriskoi have stippling above a horizontal band.
Measurements are in millimeters.

A.

Pot	Width of band	Grooves	Base dia.	Ht.	Neck ht. Int.	Neck ht. Ext.	Neck diam. Int.	Neck diam. Ext.	Rim diam.	Max. cir.	Max. diam.ht.
Jars											
Q195	10	6	204	602	76	65	84*	99*	150	100	301
Q247	9	6	-	-	64	51	90	103	152	-	-
Q0000	8.5	8	208	667	110	90	85*	102*	155	110	300
Q246	10	8	-	-	73	66	90	106	158	-	-
Q248	12	8	184	450+	-	-	87	100	-	91	220
Q250	10	8	202	480	63	54	90	96	142	99	222
Q249	9	6	172	425	54	51	80	95	130	85.5	177

B.

Pot	Length of decoration	Width of band	Length of stipple	Grooves/cm	Distance between stipples	Grooves
Amph.						
Q ?	24	8.5	10.1	6	17	5
Q237	24	9	19	6	18	5

measurements reveal similar dimensions to those of Q250. Heights of the two maximum diameters are 220 and 222 mm, maximum circumferences are 91 and 99 mm and base diameters are 184 and 202 mm. Jar Q248 has a slight dent in the wall, which might have influenced the maximum circumference measurement.

Jar Q249 is smaller than the other jars in all respects and cannot be directly compared. However, the ratio between interior neck diameter and rim fits with the ratio on the other jars.

The seventh jar (Fig. A.12:4) differs from the others in decoration as well as overall proportions. Because the jar is incomplete, certain measurements have been estimated. This relatively short jar has a ratio of 1:1.6 for maximum circumference to maximum circumference height, in contrast with the 1:2 ratio for the other jars.

All of the jars have out-flaring rims which is not unusual, but their consistency is noteworthy. The neck/ shoulder joins were not smoothed, except for the small jar. Knobs on four of the jars further unite the group and differentiate these vessels from other jars. Except for this group, knobs were rarely encountered among the sherds found at the site, which might reflect scavenging of a form that otherwise would be expected to have been preserved due to its thickness. The jar with the non-conforming decoration does not have a knob placed on the shoulder like the other four jars but has a lump of clay pressed into the neck/ shoulder juncture, as found on the G19 large jars with multi-directional combing.

In addition to the large jars, two amphoriskoi, one high-necked and one low-necked, were found. Neither was complete, but the decoration on the two was identical: stippling above a combed horizontal band (Fig. A.13:3,6). The northeast-southwest stipple stance on these two vessels is unusual; such an orientation represents less than 7% of all stipple designs found in the dump G23.

The distance between stipple strokes is virtually identical for each of the two amphoriskoi (Table 29), as is the distance between the stippling and the horizontal band. Decoration length is also similar.

There can be no question that both vessels were made by the same potter. On both pieces, the design was deeply incised with a pale orange-firing clay; a fine-toothed comb measuring 10 mm in length was used. In each instance, the decoration was rendered after handle application and, if stipple stance is an indication of rotation direction, both vessels were turned in the same direction. The interior neck/shoulder joins are smooth and rounded. Finally, angular rather than round handles were found on both amphoriskoi. All of this is strong evidence of a single micro-tradition.

A comparison of the width of the combed bands and the number of teeth per centimeter suggests a close relationship between the amphoriskoi and large jars Q195 and Q0000. The difference in decoration pattern can be attributed to vessel form rather than the work of different potters.

The analysis of the incised designs, vessel size, and proportions and the nuances of manufacture point to a large measure of internal consistency of the Phase B jars and amphoriskoi in Cave G26. The limited number of design patterns, supported by a similarity of vessel measurements, permits one to attribute various vessels to an individual potter or a small group of potters who shared the same tradition.

A second group of large jars comes from Cave G19 (Fig. A.9). No complete vessels were found, but several upper bodies were reconstructed, which suggests that most if not all of the pieces of the pots were present in the cave. The less complete jars with multi-directional combing are perhaps curated pieces saved for their decoration.

Of the 11 closed jars, two major groups can be discerned, each of which displays decisive differences in manufacture, selection of tempering materials, presence/absence of knobs, vessel size, distance between the horizontal combed bands, and in the decoration itself (Table 30). The nature of these differences, which cross-cut each stage of vessel manufacture, can be understood to reflect conscious decisions made by different potters working according to two micro-traditions.

Table 30. Cave G19: Features of the reconstructed jars.

Design incised	Multi-directional (and stippling) (N=4)	Two horizontal bands (N=5)
Tempering material		
Very fine, white	0	5
Medium sized white	4	0
Knobs, present/absent	present on 3	none present
Neck/shoulder join		
Rounded join	1	1
Overhanging join	? (no data)	5
Neck diameter	103-110 mm	80-97 mm
Distance between horizontal bands	23-39 mm	8-15 mm

The deposits of Caves G19 and G26 reveal a consistent pattern: despite the presence of other combed designs at the site, large jars with two horizontal combed bands dominate the domestic debris. Some jars from each cave have similar rim and neck dimensions as well as identical treatment of the interior neck. Had the G19 jars been fully reconstructed, one could determine the relationship between the two deposits with greater certainty.

The minor discrepancies in jars bearing the same morphological and decorative features suggest that either the work of an individual potter or a specific micro-tradition has been identified. Micro-tradition here reflects the work of an individual or a small group of people with the same ideas of how a pot should look. Rather than ascribe work to an individual potter, the emphasis here is on the "analytical individual" as defined by Redman (1977). In this sense, pots are attributed to an individual potter and/or the smallest interaction group -- a pair of sisters or mother-and-daughter sets (Redman 1977:44).

The study of individuals in prehistory was stimulated by the emphasis on anthropological archaeology (see Hill and Gunn 1977), but this is not entirely a new subject. Classical archaeologists in particular have attempted to identify individual potters, painters and ʹschools.ʹ The work of Heurtley (1938) on the 18th century B.C. ᶜAjjūl potter is characteristic of this work. In contrast, the new archaeology sought to identify individuals for the purpose of learning about human behavior and social organization rather than simply identifying stylistic nuances in art forms. Ethnoarchaeological research offers new insights into sources of ceramic variation among extant potters who continue to work according to traditional methods. By using the models derived from ethnoarchaeology, we can better understand and decode the variation within ancient wares.

No attempt to identify the work of individual potters or micro-traditions for the Cave G23 material was undertaken, but an analysis of the design patterns is instructive. A wider range of incised patterns was found in the dump than in the other caves. According to sherd weights (Table 31), horizontal band combing predominates (34.5%) followed by stippling with or without horizontal bands (29.1%), oblique slashes (10.9%), individually incised lines (7.3%), multi-directional combing (8.2%), and undecorated vessels (10%). Similar percentages were obtained by

Table 31. Cave G23: Percentage frequencies of incised designs.

The first column includes all 25 kilograms of incised sherds and the second represents closed vessles (N=50) for which two or more sherds were present.

Incised patterns	N=25 kilograms	N=50 closed vessels	%
Horizontal combing	34.5	22	44
Stipples	29.1	11	22
Oblique slashes	10.9	4	8
Multi-directional	8.2	3	6
Individual lines	7.3	5	10
No decoration	10.0	5	10
Total	100 %	50	100 %

calculating the percentages of vessels for which two or more sherds were found.

Within the horizontal band combing (Tables 32 & 33) two horizontal bands predominate (41%), stippled patterns (Table 34) usually were placed above a row of horizontal combing (65.6%), and less often (9.4%) were placed between two horizontal bands. Stippling alone was present on 6.3% of the sherds, and two rows of stippling were extremely rare (less than ten pieces). The majority of the stipples (Table 34) face northwest-southeast, but 6.3% are inclined in the opposite direction, as were those on the two amphoriskoi found in Cave G26. For 12.4% of the sherds with a stippled pattern, not enough of the shoulder below the stippling was preserved to determine whether or not it was the only design.

Table 32. Cave G23: Percentage frequency of combed patterns.

N=8.8 kilograms of decorated closed vessel sherds.

	%	N (Kilograms)
One horizontal bands	7.7	.68
Two horizontal bands	41.0	3.6
Three or four horizontal bands	28.2	2.5
Multi-directional combing	32.1	2.94
Total	100	8.82

Table 33. Cave G23: Percentage frequencies of horizontal combed patterns.

N=8.6 kilograms of closed vessel sherds (multi-directional combing not included).

Incised horizontal combed band designs	%
One wide band (probably an overlapping of two bands at times)	5.3
One band preserved at neck (fragmentary shoulder perhaps with additional bands(s) below)	15.8
Two horizontal bands separated by a narrow space	26.3
Two horizontal bands separated by a wide space	5.3
Three horizontal bands	26.3
Two coarse-toothed horizontal bands	10.5
One horizontal band (with sufficient area below to determine that it was the only decoration)	5.3
One horizontal band as above, but not placed immediately at the neck	2.6
Four or more horizontal bands	2.6
	100%

Table 34. Cave G23: Percentage frequencies of stipple patterns.

Stipple patterns	N (kilogram)	%
One row	.68	6.3
One row above horizontal band	4.54	65.6
One row between two horizontal bands	.68	9.4
One row (northeast-southwest stance) with or without horizontal band	.45	6.3
One row, but area below is broken	.91	12.4
	7.26	100%

Pots have from two to nine individually incised lines thick or thin, deep or shallow. These are occasionally grouped into 2 or 3 sets of 4 lines. The number of lines measured varies on many sherds and the complete vessels because the lines often appear to be a continuous spiral rather than individual closed circles. The slash or punctate patterns vary as listed in Table 35.

Table 35. Cave G23: Percentage frequencies of slash and punctate patterns.

Pattern	N (kilograms)	%
Oblique slashes (ne-sw)	1.3	50.0
Oblique slashes (nw-se)	.68	25.0
Circular incisions	.23	8.3
Slashes plus lines	.23	8.3
Unusual pieces	.23	8.3
Total	2.67	99.9%

Closed vessels lacking decoration were identified only if the shoulder was preserved in sufficient length to determine with certainty that the jars or amphoriskoi were never incised, as are 9.1% of the shoulder sherds.

Few of the thick-walled bowls were decorated, although some have a combed band above the point of carination. "Pie crust" or thumb-indented rims, although rare, are found in a variety of patterns - both continuous or grouped indentations.

Another category of undecorated bowls is the ridged and/or corrugated upper bodies of thin-walled bowls. Ribbing is occasionally encountered on some of the thick-walled bowls.

Both thick and thin-walled bowls show a minimal variety of incised designs in comparison to closed vessels (Table 36). Individual incised lines (49.1%) and combing (40.7%) predominate, with a few wavy band patterns (10.2%) on bowls and spouted vessels. One wide horizontal combed band is twice as abundant as pattern combing (2 or 3 bands) because the form of the bowls prevented the potter from exercising control over the combing. The proximity of the turntable to the ground, the small vessel diameter, and the straight walls reduced the potter's ability to see the surface to be decorated.

Table 36. Cave G23: Percentage frequencies of incised patterns on open vessels.

N=13.4 kilograms of thin-walled bowls.

Pattern	%
Wavy combing	10.2
Individual incised lines	49.1
One horizontal band	27.1
Two or more horizontal bands	13.6
Total	100.0

The wavy band at Jebel Qacaqir is reserved for bowls and spouted vessels exclusively.

Variation among the funerary wares can be described in terms of morphological and decorative differences. Several vessel features selected as indicative of overall vessel proportions and manufacturing technique were plotted to compare the tomb pieces. The features include: base diameter, the ratio of interior to exterior neck height (reveals the presence/absence of the interior neck/shoulder protrusion), the ratio of maximum diameter to maximum diameter height, and decoration. The ratios were used in addition to the individual measurements as a means of combining or collapsing different vessel features.

When 37 vessels from 19 tombs were plotted for these features, four patterns emerged: (1) all or (2) some pots found in tombs cluster together; (3) pots from different tombs form clusters; or (4) pots found in a tomb are very dispersed. Tombs in which vessels cluster together include A1, C1, C3A, and C9. Tombs containing pots that cluster in one or more groups are A4, C5, C4, and B54B. Two of the three vessels with individually incised lines cluster, but each was found in a different tomb (D1 and A4). Most vessels with individually incised slashes cluster in the center of the graph and were excavated in tombs A1, A2, A4, and B46 (Fig. 21).

Agagir		Pots
1	△	2
2	W	1
4	▲	4
5	○	3

Qa^{c}aqir		Pots			
B 43	◓	1	C 1	□	2
B 46	▽	1	C 3	■	3
B 50	◆	1	C 3	◊	1
B 51	⊗	2	C 4	●	4
B 54B	✚	4	C 5	*	1
E 1	◆	1	C 9	◉	2
E 2	∅	2	C 13	□	1
Misc.	X	2	D 1	♦	1

Fig. 21. Three dimensional plot of funerary wares.

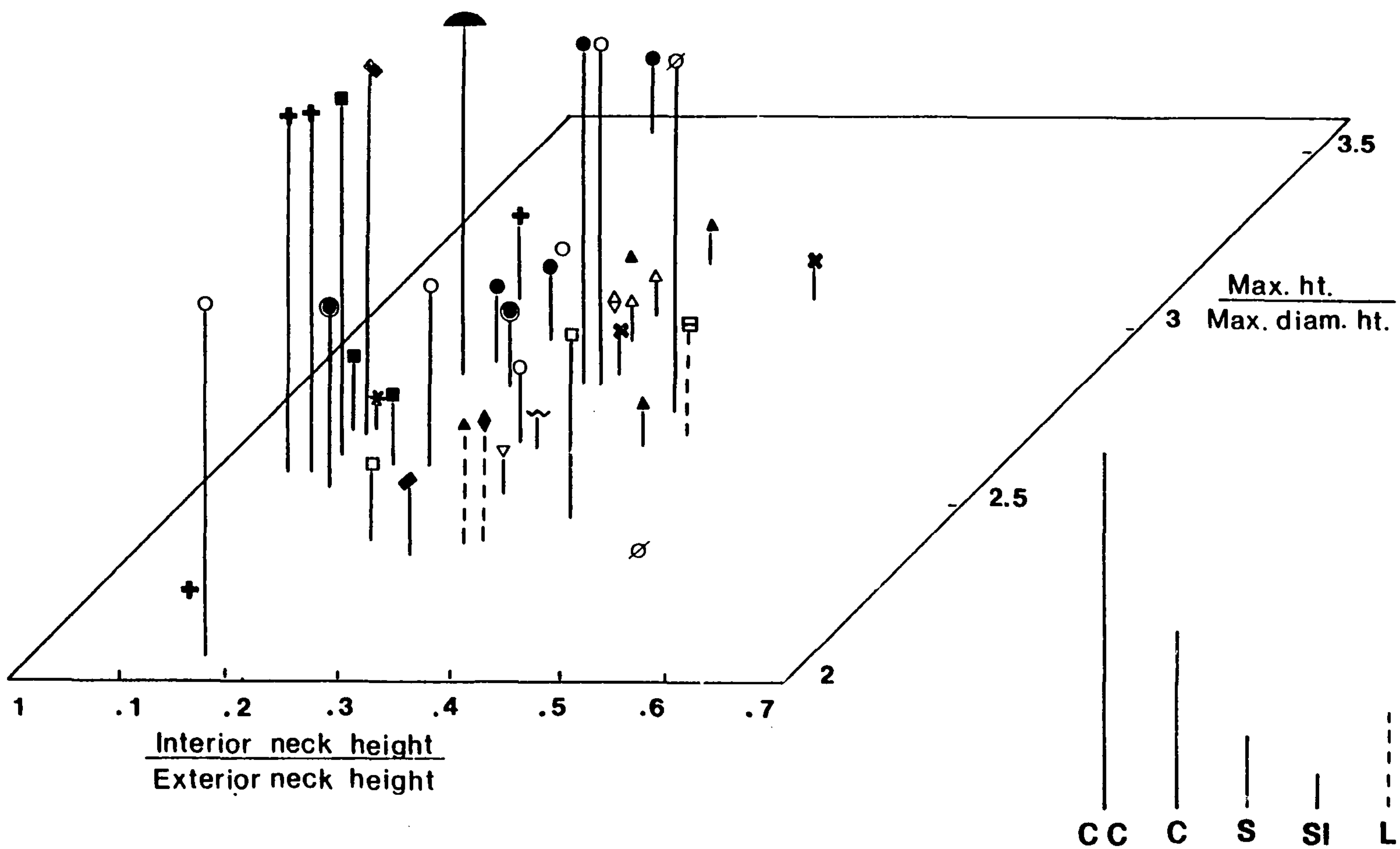


Fig. 21. Three dimensional plot of funerary wares.
Horizontal dimension is decoration: CC = two combed bands; C = one combed band; S = stippling; Sl = slashes or punctates; L = individual lines; and no line = no decoration.

The overlap of morphological and decorative features implies the work of an individual potter, or a small number of potters who work according to a single micro-tradition (i.e. the analytical individual). In some instances, different vessel forms e.g., the spouted vessel and jar found in Tomb C4, have similar morphological and decorative attributes. Tombs containing highly dissimilar pots, evidently the work of different potters, are common, such as B51, B54B, C9, and E2. This is not surprising, given the practice of multiple burials.

Pots of similar morphological and decorative dimensions are found in different tombs (A1, A2, A4 and B46; A1 and A4; A5 and C4; A5 and B54B; C4 and C9; B50, B54B and C3A; B54B and C9; D1 and A4) probably because the work of individual potters was deposited in more than one tomb. This, along with the practice of placing pots made by two or three potters in each tomb, might imply that the tombs are not necessarily family tombs reopened periodically. There is no evidence that the shaft entrances were reopened once they were sealed closed with plaster. If the tombs held close family members and pottery made by a limited number of people, one might expect to find greater homogeneity of the pottery, as at Jericho where individual burials are the norm. At Jericho, there is little doubt that all wares were deposited at one time, and their homogeneity suggests that they represent the work of one potter or a small group who worked according to the identical micro-tradition.

Various aspects of the Jericho cemetery are discussed in detail below. Many tombs there held pottery and permit an analysis of variation of the wares within each tomb and within the cemetery as a whole.

Pottery from four of the large "Outsize" tombs and 13 smaller tombs was plotted and reveals certain similarities and differences with the Jebel Qa^{c}aqir findings.

The vessels from four Outsize tombs (04, P12, P22, and P24), when plotted on a three dimensional graph showing decoration, maximum diameter height and base diameter (Fig. 22) reveal two different patterns. Vessels cluster according to each tomb, but there are differences within each tomb. For Tomb 04, there are three clusters and two outliers (one not shown). All jars (N=4) but one bear an incised pattern of individual slashes above two incised lines, and all but one have ledge handles. Throughout the Jericho tombs (N=356), this same design is limited to only one pot in Tomb P24 and another in Tomb G1.

The co-occurrence of ledge handles, the incised designs, and the vessel dimensions distinguish this tomb group from others. Size differences among and within the three clusters of pots are minimal and suggest that the work of three potters who worked according to a single

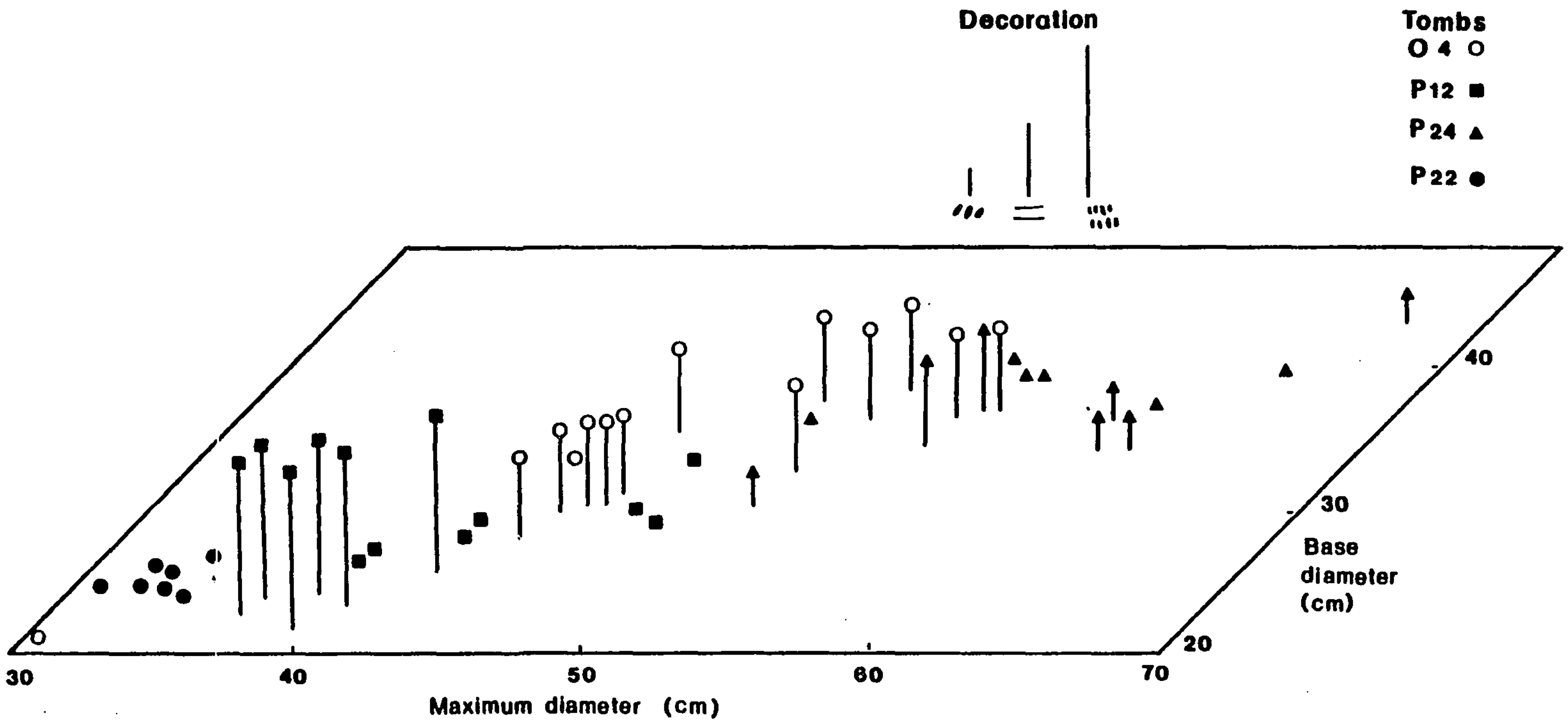


Fig. 22. Three dimensional plot of Jericho pottery from four Outsize tombs. Horizontal dimension is decoration as illustrated; no line indicates no decoration.

micro-tradition has been separated. There is no reason to infer size gradation as a factor, since the size differences among the three groups are minimal. Consequently, it is inferred that several people contributed the vessels found in this tomb, but all pieces were made according to a single micro-tradition.

The eight spouted vessels and four small jars of Tomb P12 show a distribution similar to Tomb 04. Two clusters for the spouted vessels, which differ minimally in size, are understood to represent the work of two potters who worked according to a common micro-tradition. One cluster of five vessels, each with individual slashes around the neck, further unifies the group.

One small jar found in Tomb P12 overlaps morphologically with one cluster of spouted vessels, but three of the smaller jars form a separate cluster. Nevertheless, all have ledge handles, as do the spouted vessels. It is significant that the small jars differ from others of this category at Jericho. These small jars are noteworthy for their apparent lack of variation -- all look alike. Handles (or decoration) are rarely found on these jars, and their consistent presence in Tomb P 12 -- also containing spouted vessels with ledge handles -- cannot be a random occurrence.

For Outsize Tomb P22, the clustering of small undecorated jars in a group distinct from all others suggests manufacture by one potter.

The final Outsize tomb whose contents were plotted is P24, in which ten jars, five spouted vessels, and two jugs were found. The distribution is scattered, but some patterning is discernable, especially according to vessel type. The two jugs cluster, as do two spouted vessels, and the two jars with individually incised slashes (facing ne-sw). One decorated jar constitutes an outlier but matches the pieces found in Tomb 04. The three jars with individually incised slashes form a tight cluster.

The wide variety of incised patterns and the lack of morphological homogeneity imply that a larger number of potters contributed wares for this tomb assemblage than for the other tombs.

This tomb also held the largest minimal number of animals (ten), a metal knife, and a disarticulated male skeleton showing symptoms of arthritis. All evidence suggests that many people were involved in contributing the ceramics and non-ceramic artifacts, yet despite a less clear clustering of the pottery the tomb group as a whole is distinct from the others in terms of those responsible for the pottery.

For the small jars found in 13 tombs, two patterns emerge (Figs. 23 and 24): (1) the clustering of vessels found in a single tomb, implying their manufacture by a single potter or a single micro-tradition; (2) vessels found

Tombs			Pots	Skeletons
D	10	□	2	1
G	23	▲	3	1
G	28	∅	4	1
H	2	△	4	1
H	4	✱	3	1
H	9	⊙	4	2
H	14	☆	4	1
H	16	●	3	1
H	17	■	4	1
H	20	✚	5	1
M	1	◆	4	2
O	4	○	14	1
P	12	♦	13	1
P	22	◠	8	1
P	24	⟠	12	1

Fig. 23. Pots from Jericho tombs (Outsize and others).

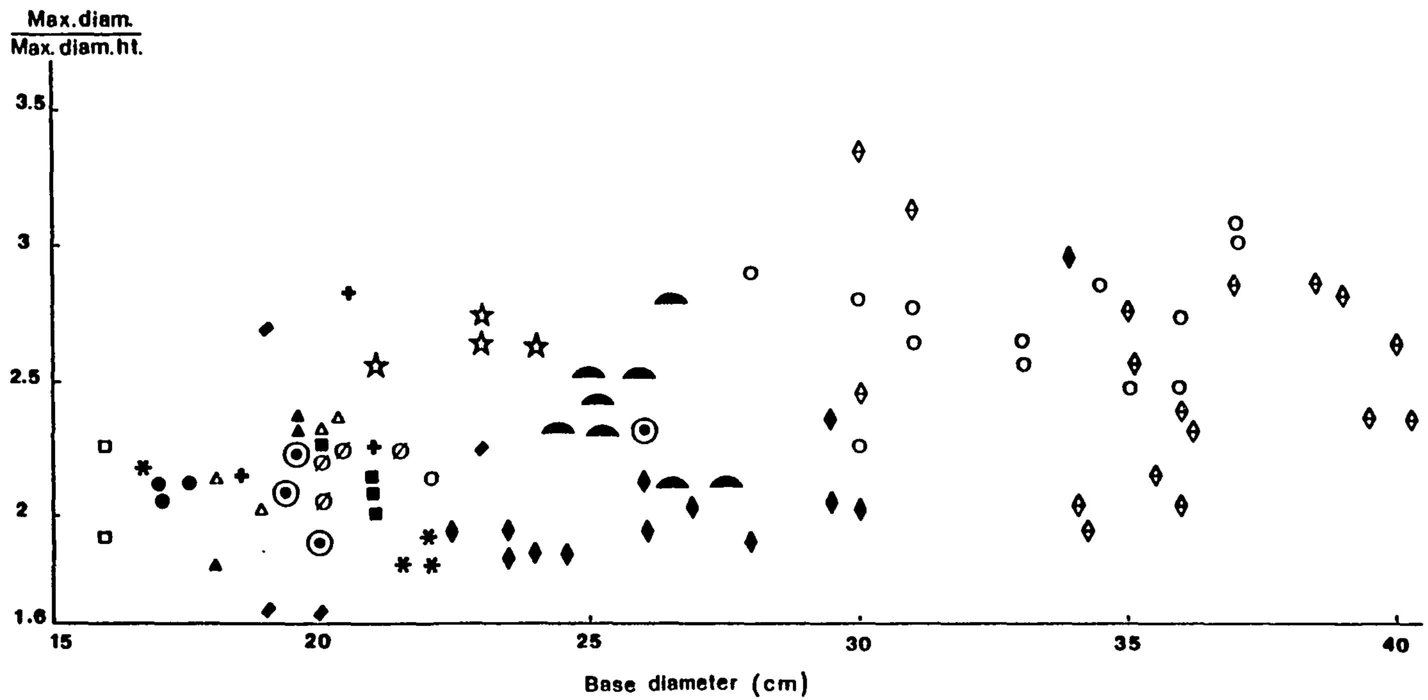


Fig. 23. Pots from Jericho tombs (Outsize and others).

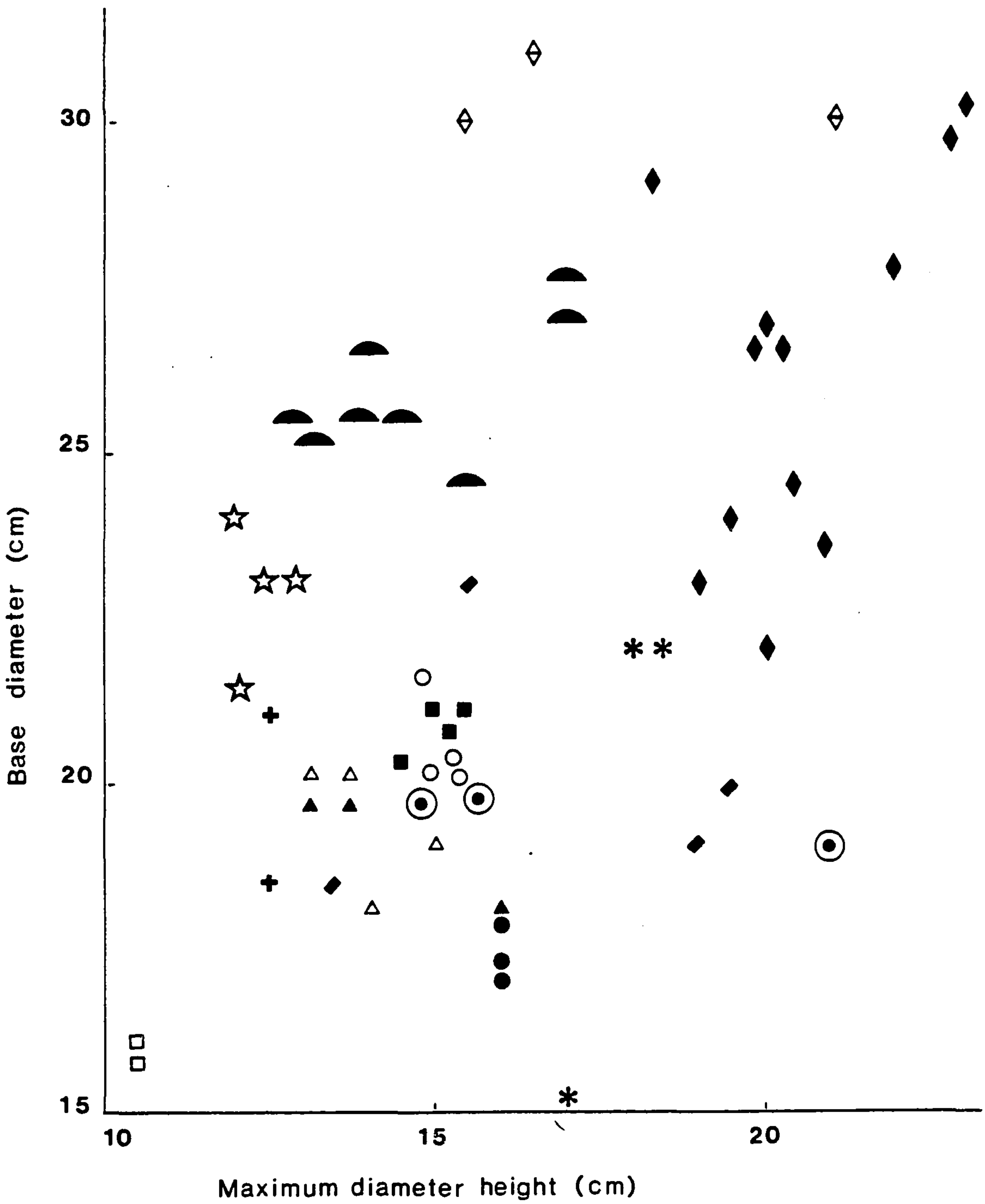


Fig. 24. Pots from Jericho tombs.

together in a tomb appear to be dissimilar, implying more than one micro-tradition. The latter is the situation for Tombs M1 and H9, each containing two skeletons, and Tombs H14 and H17. Any clustering according to tomb group can only be understood in terms of the work of individual potters. These small jars vary minimally in volume, and all appear to be identical and indistinguishable. Few are decorated; the two in Tomb D10 each have incised slashes and cluster together at one end of the graph.

These jars, apparently special funerary pieces (Kenyon 1960b: 203; Pritchard 1963: 67), are not found in the Jebel Qa^{c}aqir region, but are most common in the Central Hills area of Jericho. For the Dhahr Mirzbâneh assemblage of over 80 small jars, "frequently several small jars in a tomb have the same ware and form and may be attributed to a single potter or even a single firing. The implications of this for a family potter theory are obvious...the variations may be attributed to the woman of the household" (Lapp 1966: 76-77).

At the site of el-Jib, Pritchard (1963) excavated a cemetery in which the skeletal material was poorly preserved; subsequent reuse of the tomb chambers prevented association between the skeletal material (human or animal) and other artifacts.

In the 13 tombs containing EB IV pottery, there were found 23 jars, one amphoriskos, and one bowl. On the jars, there is a propensity for three horizontal combed bands, which is found on 30% of all jars. The three jars in Tomb 50 have this decoration in addition to two undecorated medium sized jars and a third with individual incisions around the neck. This was the only tomb with an articulated skeleton (in addition to a disarticulated skeleton); a metal javelin was also found.

Tomb 52 contained three jars, each with circular incisions, and two smaller jars, globular in form, each with remnant ledge handles. The medium-sized jar has ledge handles, and in addition to circular incisions, it has a more elaborate decoration below. A metal javelin was also found in this tomb.

The homogeneity of the vessels found together in each tomb induced Pritchard (1963: 67) to suggest that: "In general the jars within a single tomb are fairly uniform in shape and size.... This apparent consistency in the type of vessel within a single tomb could be interpreted as evidence that the jars were made specially for the particular burial and by the same potters."

Tomb 32 contained three small jars, each with an unusual incised pattern; one has ledge handles. Either these pieces represent the work of three different potters or a very imaginative individual. This tomb contained a vessel with an incised pattern of animals (ibex?) between two horizontal combed bands. Also outstanding about this tomb is the large number of 165 beads (Pritchard 1963: 44).

Only three of the 27 EB IV excavated tombs at el-Jib held metal artifacts. Of course metal might have been removed during the later reuse of the tombs, but it is perhaps significant that the tombs containing the largest number of pots are those with the metal javelins.

Seven tombs contained one pot each, in contrast to the other tombs. Might these tombs have contained individual interments? In any event, the larger number of pots from the other tombs permits comparison with the Jebel Qa^{c}aqir and Jericho findings.

At all three sites the evidence suggests that: (1) more than one vessel in a tomb appears to have been made by the same potter or in the same micro-tradition; and (2) that other pots found in the tombs were made by different potters who worked according to a different micro-tradition. Perhaps these tombs contained multiple burials or members of the older segment of the population.

To conclude, the pots found together in the Jericho individual burials usually show morphological and decorative homogeneity, but the two tombs with two skeletons show greater variation. At Jebel Qa^{c}aqir, the pattern is similar, but the preponderance of multiple burials blurs the picture. Certain of the Outsize tombs at Jericho show internal consistency, while others show greater variation. The tomb containing the largest number of animals and pottery shows the greatest variation in ceramic morphology and decoration, suggesting that a larger number of people contributed to the grave goods.

Unlike the small undecorated funerary jars of the Jericho region, the amphoriskoi, spouted vessels and jars from the Jebel Qa^{c}aqir cemetery present greater variety both in form and decoration. This permits the identification of the work of different micro-traditions or analytical individuals and allows speculation on the number of potters whose wares were deposited in the tombs. By grouping wares according to morphological and decorative features, the work of 20 potters, "analytical individuals," or micro-traditions can be separated.

If two potters worked together an any give time, and if each produced pots for 20 years, 20 potters could account for a 200-year use of the site. Rarely was the work of more than two potters identified in a tomb, which might support the suggestion that at any one time two potters were at work on the site.

Implications of the variation in the Jebel Qa^{c}aqir ceramics

Variation of the Jebel Qa^{c}aqir pottery has been attributed to vessel form, size, context (funerary versus domestic), and the work of individual potters. One implication of these findings is the inappropriateness of comparing tomb with *tell* or domestic materials. Although Kenyon (1966: 47) inferred an earlier date for the Jericho cemetery than for the occupational debris, she based herself on a comparison of the pottery forms and decoration. The Jebel Qa^{c}aqir finds invalidate these conclusions. Oren (1973b: 57) concurred with Kenyon's analysis and further dated the Beit-Shan, Megiddo, and Tell Beit Mirsim domestic debris to a slightly later date than the cemeteries. Oren (*Ibid*.) noted the occurrence of the wavy combed pattern in the domestic debris as additional evidence of its later date. However, wavy combing is most often associated with bowls (e.g., Sellin and Watzinger 1913: 110; Kenyon and Holland 1983) which were rarely placed in tombs. Consequently, neither vessel form nor the incised pattern can date the cemetery versus the domestic material. In any event, it is far more reasonable to suggest the contemporaneity of the funerary and domestic use of these sites.

Co-variation, or grouping of vessels by morphological and decorative features, is attributed to distinct micro-traditions or individual potters. In contrast with the EB III wares of craft specialists, often bearing potters' marks, the work of individual EB IV domestic potters can be distinguished by vessel dimensions and decoration.

Why might it have been necessary to differentiate wares? What information is revealed by the material culture, and why? Pastoral nomads are known to harvest grain, straw, acorns, and sorgum for storage (Dyson-Huson and Smith 1978: 34-5; Hole 1978: 152). Among the Baharavand of Iran "since grain ripens in the winter pasture about the same time the nomads must leave, and it does the same in the summer pasture, it is stored until the people return" (Hole 1978: 152). Perhaps the pots were used as storage containers whose ownership was expressed by nuances of the vessel dimensions and decoration. The high-fired wares would have been suitable to store grains and seeds.

Pastoral nomads are known to use pottery for various purposes (Birmingham 1974: 47-8; Hammond 1976: 34; Jacobsen 1984: 29). By decorative and morphological features ownership of the pots and their contents, perhaps organic material, could have been identified when the nomads returned to the site. The evidence of a pastoral nomadic life-style is presented in the next section. Variation of vessel form and decoration would thus imply individual ownership, but there is no single authoritative meaning to be associated with the nuances of design. On one level, it may symbolize the wares of individual potters and ownership of the contents by a small number of people. On the next level, the variation may symbolize the work of people who shared the site. Finally, the incised patterns and vessel forms may serve to differentiate regional groups. Hodder notes (1982: 213) that material symbols mean different things to different people, and the meanings are always changing.

The incised patterns on vessels found in cemeteries near Jebel Qa^{c}aqir differ not so much in design pattern, but rather in the frequencies of each pattern (Table 37). Although the sample sizes are uneven, sites with the small funerary jars (Jericho and Dhahr Mirzbâneh) each have over 150 pots. For the other sites, the range is between 24-43 vessels. Despite these inconsistencies, five striking differences are discernable:

(1) The predominance of individually incised lines on the Khirbet el-Kirmil pieces versus all other collections;

(2) The dearth of individually incised slashes at Khirbet el-Kirmil and Dhahr Mirzbâneh;

(3) The predominance of three horizontal combed bands at el-Jib;

(4) The abundance of undecorated (usually small jars) at Jericho, Dhahr Mirzbâneh and less so at el-Jib;

Table 37. Comparison of incised patterns on vessels from Jebel Qa^{c}aqir, el-Jib, Jericho, Khirbet el-Kirmil and Dhahr Mirzbâneh.

C = combing
CC = two combed bands
CCC+ = three or more bands
L = incised lines
St = stipples
Multi = multi-directional combing
Sl = slashes
All numbers are in percentages; k refers to kilograms rather than number of pots.

Site	Decoration									Vessels
	None	C	CC	CCC+	L	St	Multi	Sl	Rope	
J. Qa^{c}aqir Tombs	13.95	11.6	25.6	0	4.65	30.2	2.3	11.6	0	43
G23	9.2	9.2	13.3	9.2	6.7	26.6	7.5	10	8.3	27.3k
G26 (Ph.B)	-	-	66	-	-	33	?	-	0	9
G19 (12-31)	8	8	50	-	-	8	25	-	0	12
el-Jib	20.8	4.2	12.5	29.2	0	4.2	4.2	24.9	0	24
Jericho	71.78	0	1.98	0	2.97	1.98	0	13.36	0	202
Kh.el-Kirmil	12.1	12.1	21.2	3.03	15.2	36.3	-	0	0	33
D. Mirzb.	95.4	0	0	.65	0	1.31	-	1.31	Misc. 1.31	153

(5) The presence of stippling at Jebel Qa^{c}aqir and Khirbet el-Kirmil.

The funerary and domestic material at Jebel Qa^{c}aqir shows a predominance of two horizontal combed bands; at Jericho, the *tell* material shows a preference for wavy bands on both closed and open pieces.

Within the small region no more than 50 kilometers in any direction, distinct design frequencies are detectable. Regional diversity of the EB IV ceramics was first demonstrated by Amiran (1960), who distinguished three ceramic "Families" -- A-C -- based on vessel forms, decoration, and the geographic location of the sites. A fourth, "Family D," was added (Amiran 1974) to correct the growing disparity between the original tripartite division and the accumulating finds from new excavations. Despite this addition, not all of the material was accommodated and geographic anomalies increased.

A more elaborate classification devised by Dever (1971, 1973b, 1974) divided the country into five smaller "geographic-cultural" zones, and subsequently two more regions have been discerned (Dever 1974: 48; Dever 1980c: 45-48).

Jebel Qa^{c}aqir belongs to the southern (A) of Amiran and Family S according to Dever's scheme. Jericho also fits into the southern family of Amiran, but Dever places it in his Central Hills group. In separating the two sites, Dever acknowledges significant differences in the ceramic traditions and burial practices, which are further delineated by the quantitative data presented here. More subtle differences in the wares found at each sites can also be discerned and allow one to identify individual micro-traditions.

CHAPTER 6

CHARACTERIZATION OF THE LATE THIRD MILLENNIUM B.C. IN ISRAEL

Terminology

Uncertainty regarding events of the late third millennium B.C. contributes to the debate over designating the period "Early Bronze IV," "Middle Bronze I," or otherwise. The first term stresses continuity with Early Bronze Age traditions, while "MB I" denotes discontinuity. An alternative name, "Intermediate Early Bronze-Middle Bronze," was proposed by Illife in the 1930's as he arranged the newly created Palestine Archaeological Museum in Jerusalem (Kenyon 1966: 8). His purpose was to highlight the break with the Early Bronze Age, and numerous authorities have favored this term (de Vaux 1971; Kenyon 1966; Kochavi 1969; Lapp 1966). The name "Middle Bronze I," suggested by Albright (1932: 8), emphasizes more emphatically the break with the EB culture. In objection to this term, Kenyon (1966: 53), Franken (1978: 67), and Gerstenblith (1980: 76) emphasize rather the cultural break between MB I and MB II.

G. E. Wright (1937: 3) introduced the name Early Bronze IV. The composite term "Early Bronze IV-Middle Bronze I" suggested by Dever (1966) focuses on the EB II, III, and IV continuities, especially in ceramic forms.

Later Dever (1973b) presented strong arguments for using the "EB IV" terminology, which is currently used by many archaeologists, such as Rast and Schaub (1980:32) and Richard (1980: 20).

Despite similarities with the EB II and III ceramic traditions, the 200-300 year EB IV period differs markedly in settlement pattern. Heavily fortified cities of EB III date, such as Tell el-Far[c]ah (N) (de Vaux 1971), Tell Yarmut (Ben-Tor 1975; Miroschedji 1980), [c]Ai (Calloway 1972, Marquet-Krause 1949), Numeira (Rast and Schaub 1980: 45), and Bâb edh-Dhrâ[c] (Rast and Schaub 1980: 25), contrast with the non-urban EB IV sites. Following the EB IV (or MB I) period, cities again predominate in MB II (Kochavi 1975; Kochavi, Beck, and Gophna 1979).

Any reconstruction of the EB IV period must consider a serious sampling problem before comparing it with preceding and succeeding deposits. The long-term policy of excavating large tells, rather than small one-period sites outside traditionally occupied zones, results in a dearth of EB IV as well as EB III and MB II rural settlements. Non-urban communities are difficult to identify archaeologically, and few of any period have been excavated in Israel or Jordan, although a recent shift in excavation strategy has changed the picture significantly.

The excavation of one- or two-period sites, especially in the marginal areas of today, has produced a number of EB III, EB IV, and MB II non-urban sites, such as Har Yeruḥam (Kochavi 1966), Jebel Qa^{c}aqir (Dever 1972a), Beer Resisim (Cohen and Dever 1978, 1980, 1981), Efrat (Gonen per. com. 1984), Er Ras (Edelstein 1982) and Jebel Maghara (Clamer and Sass 1977) of EB IV date. At Kh. Iskander (Richard and Borass 1984), EB III platters were found with other forms more characteristic of EB IV. This permanently occupied site could represent one of the EB III rural settlements that continued into the EB IV period as did Bâb edh-Dhrâ^{c}. At Tell el-Hayyat (Falconer and Magness-Gardiner 1984) an MB II non-urban settlement has been uncovered above late third millennium B.C. remains.

Unless more rural communities are excavated, any comparison of EB III, EB IV, and MB culture reflects the unbalanced data available. Before assigning a name to the late third millennium B.C. and comparing it with the EB III and MB II material culture, it is vital to identify and excavate non-urban settlements of each period. For the present, however, the name "EB IV" is as appropriate as any other.

Previous studies of the EB IV period

Few scholars have attempted to synthesize the elusive EB IV evidence. For Albright (1956: 82) and Kenyon

(1966: 33), the absence of permanent settlements, in contrast to the large cemeteries, inspired the idea of a non-sedentary life-style characteristic of nomads. Since nomads leave minimal traces of buildings or other material culture, the lack of late third millennium B.C. material on the tell sites fits the culture exemplified by the Bedouin of Sinai. Kenyon (1957: 200) also inferred a pastoral nomadic society from the disarticulated burials found at Jericho. She assumed that nomadic peoples carry the bones of their deceased back to family burial grounds, resulting in disarticulated and fragmentary skeletons.

Albright's astute sense of events based on the scant, mostly unpublished evidence of 40 years ago is a tribute to his genius. Kenyon similarly deserves our respect for not only excavating and publishing the Jericho cemetery, but for her assessment of funerary variability that helped to pioneer more recent concerns of an archaeology concerned with people rather than artifacts.

Just fifteen years ago, it was commonly held that the region once known for its impressive urban centers was overrun by nomads who ruled the mostly vacant territories of the late third millennium B.C. landscape. As noted by Kenyon: "From at least the twenty-fourth to the twentieth centuries B.C., Syria and Palestine were overrun by nomads amongst whom the Amorites predominated, with a culminating period of complete nomadic control in the two centuries 2182-1991 B.C." (Kenyon, Bottero, and Posner 1971: 594).

These ideas have been challenged as a result of recent changes in excavation strategies and more recent interpretations of Mesopotamian epigraphic data. Dever (1980c) recently presented a synthesis of the accumulating archaeological data and challenged traditional ideas regarding the nomadic invasion argument as responsible for the demise of the EB III urban sites and the predominance of non-sedentary communities. In part this reassessment relies on textual evidence, especially the early second millennium B.C. Mari tablets dealing with the interaction of nomads and sedentary people (Luke 1965; Mathews 1978; Rowton 1972, 1973). This perspective differs sharply with the view that nomads constituted a self-contained society in constant opposition to the urban population.

Current research strategies

Already in the early 1970's Dever (1973b) and Prag (1974) questioned the theoretical perspective and historical reconstruction then accepted. Dever (1973b: 62) emphasized the cultural continuity from the third to the second millennium B.C. Richard (1980) and Falconer and Magness-Gardiner (1984) have more recently presented their reservations about the older reconstruction of events and are among those currently carrying out excavations designed to reassess late third millennium B.C. history. Prior to their field work in Jordan, Cohen and Dever (1978, 1980, 1981) had already adopted new excavations strategies at Beer Resisim, designed to address the issues derived from the new theoretical perspective.

Rather than dealing with chronological issues, we need to reconsider the archaeological evidence. The very nature of the EB IV period remains in despite, and in her review of the debate on the designation most appropriate for this phase, Richard presents the various prevailing views over the past forty years (1980: 6). Not emphasized in her work is that the struggle to find a suitable name reflects the uncertainty of what is being described. People working in different parts of the country are not describing identical phenomena. Events of the late third millennium B.C. did not occur uniformly throughout the country.

In reassessing late third millennium B.C. events, Richard has collected the scanty evidence of a modification in the environment without fully considering the spectrum of geomorphological processes affected (1980: 25). In the north, Horowitz (1977: 18*) detected evidence of extensive marshes and changes in the size of Lake Hula at the end of the third millennium B.C. At the coastal site of Tell Abu Hawam, "prolonged swamps or flooding by rivers" was recorded for pre-late Bronze Age sediments (Avimelech 1959: 104).

There is also evidence of late third millennium B.C. swamp deposits along the coast north of Tel Aviv in the Azor Lamed region (Itzhaki per. com. 1973). Finally Zeuner diagnosed a lowering of the water table based on his analysis of the Jericho EB - MB tombs (Kenyon 1957: 185).

Evidence of an environmental change in the south is still meager and the full ramifications cannot be estimated until sufficient data are collected relating to water table level, run-off, the height of the Mediterranean Sea and inland water bodies, temperature ranges, and vegetation. Excavations can be designed to retrieve this type of environmental data as in the multi-disciplinary projects including climatological and geobotanical research at Beer Resisim (Cohen and Dever 1978, 1980) in the Negev and at Tell el-Hayyat in Transjordan (Falconer and Magness-Gardiner 1984). Pollen, for example, collected at these sites can furnish information on the vegetation and proximity of forests. In rejecting the "Amorite invasion/ destruction hypothesis" first proposed by Albright (1935: 218), Richard relies perhaps too heavily on environmental deterioration as the primary cause of the collapse of EB III society as does Fargo (1979a). As Richard stated, although an array of events precipitated the the demise of the EB III society:

> accumulating environmental data imply that probably the major factor was a shift in climate to drier conditions. This ecologically significant shift either caused or, combined with an already weakened

> economy, hastened an abandonment of sites. Presumably, the climatic shift was substantial, for otherwise one would expect cultural adaptation to the new conditions rather than total abandonment of site. (Richard 1980: 25)

While overemphasizing the inconclusive environmental factors, Richard has similarly overestimated the potential impact and magnitude of changes in the environment. Although there is sufficient evidence of climatic fluctuations, it was not necessarily devastating in scale, and it may be equally likely that it was rather the inability of the EB III society to deal with the resultant changes in the environment that ultimately led to the collapse. The massive EB III cities may have grown too large and over-specialized to subsist on their own hinterland. Inaccessibility to established lines of communication, compounded by an unpredictable or uncertain climate, may have induced internal crises more destructive than nomadic intruders.

Conclusive evidence of internal problems is not apparent, but the mass burials of the EB III period, some with over one hundred interments, might reflect internal fighting, or the effects of disease and malnutrition. An analysis of a small sample of skeletal material from the Jericho tombs reported that: "In such a small sample of individuals there is a remarkable amount of pathology..." (Brothwell 1965: 692).

A more systematic analysis of the skeletal material at Jericho might have revealed the reason for the mass burials, but this has not been undertaken. In an analysis of the Jebel Qa^{c}aqir EB IV human skeletal remains, Smith (1982) found no evidence of disease or malnutrition in the forty-six specimens, implying a healthy population in comparison with Jericho.

Current theories on the collapse of ancient civilizations favor internal stress rather than external causes (Adams 1978; Culbert 1977; Yoffee 1979, 1982, n.d.), and this pattern appears applicable for the Early Bronze civilization as well. The Amorite invasion explanation further lacks credibility in the absence of destruction levels at EB III sites (Richard 1980: 12). It is therefore posited that due to the inability of the EB III society to cope with new conditions, internal organizational struggle resulted in collapse. In contrast, the smaller communities that followed represented a more flexible, resilient lifestyle. It was their mobility and diversified subsistence pattern, involving limited agriculture and an emphasis on herding that assured their survival. This is a hypothesis in need of testing, and with the retrieval of floral and faunal material from sites, such as Beer Resisim and Tell el-Hayyat, evidence to support this idea may emerge.

Thus in the past decade, an interdisciplinary approach has emerged that aims at collecting information to address many of the EB IV ambiguities. The new approach conforms with a general trend to extract more information from the archaeological record than ever before. This includes the retrieval of organic, human, and animal skeletal material, as well as a greater concern for the physical environment. Newer excavations designed with these issues in mind are: Tell el-Hayyat (Falconer and Magness-Gardiner 1984), and Khirbet Iskander (Richard and Borass 1984).

The next endeavor is to formulate a research strategy designed to test the hypothesis that a pastoral nomadic lifestyle prevailed. This can be accomplished by first defining the material correlates of pastoral nomadic societies. A hypothetical framework can be derived from studies of extant comparable communities wherever they exist.

There is little justification in using 20th century Bedouin to reconstruct late third millennium B.C. pastoral nomadic societies or other phases in Near Eastern archaeology. This "direct historical approach," i.e., the Bedouin who inhabit the region today provide the best model because of their current geographic affiliation, is inappropriate; both the use of camels by the Bedouin and their circumspection by modern states prohibits their serving as a model for ancient non-sedentary people.

<u>Pastoral nomadic societies: ethnographic evidence</u>

It is legitimate to question the relevancy of examining extant pastoral nomads, and those of the recent past, to reconstruct earlier societies. Can generalizations be drawn from such societies, and are they useful for learning about ancient societies?

In both instances, the response is affirmative; generalities can be drawn from ethnographic data, without stereotyping pastoral nomadic communities. Based on a wide body of ethnographic literature, hypotheses can be formulated and tested archaeologically.

Several generalizations emerge form the ethnographic data of numerous field workers, of whom Barth (1956, 1961) represents a pioneering figure. Among the reoccurring features of pastoral nomadic societies are:

(1) the concentration on migratory ruminants;

(2) the use of natural grass for fodder;

(3) the exploitation of sparsely occupied zones.

The wide variety of landscapes and environments contributes to a diversity of patterns, yet these three characteristics form the basis of nearly all pastoral nomadic societies (Goldschmidt 1979: 15; Lefébure 1979: 1). Differences result from the type of migratory animal (small versus large); the distances travelled along the migratory route; and the nature of the relationship between the pastoral nomadic society and the sedentary population.

Interaction with sedentary peoples and social organization

Many authors agree that the study of pastoral nomads in isolation of the larger social milieu in which they function results in an inaccurate assessment of the nomadic societies (Asad 1979: 421; Bates and Lees 1977; Irons 1979; Goldschmidt 1979: 16; and Salzman 1979, among others). Most nomadic societies maintain some form of direct or indirect relationship with sedentary agriculturalists, although there are exceptions (Dyson-Hudson and Dyson-Hudson 1980: 18). Fluidity of the two groups is well documented: people move from one subsistence strategy to the other for various reasons (Bates and Lees 1977: 832).

Closely related to the interaction between sedentary communities and nomadic pastoralists is the issue of social organization. The current debate (Pastoral Production and Society 1979) on defining social organization among extant pastoral nomads reflects the difficulty in working with a typological order derived form evolutionist models. Ethnographers have tried to work within the rigid and mutually exclusive categories of bands, tribes, chiefdoms, etc., devised by Service (1962, 1971, 1975), Fried (1967), and Sahlins (1968). Many authorities continue to use this scheme despite modifications and retractions by the originators (e.g., Service 1971: 156-157).

Similarly, the concepts of _egalitarian_ versus _stratified_ are not only too static, they are unrealistic (McGuire 1983). Recent research among societies once considered "egalitarian" reveals that equality of all members is virtually impossible and unrealistic for hunter-gatherers (Lee 1981) or peasant communities (McGuire and Netting 1982).

In nomadic societies, once characterized as egalitarian segmentary lineage systems (Sahlins 1968: 15), inequalities as well as their causes have been identified (Bates 1973: 162; Bonte 1979; Dahl 1979: 264; Goldschmidt 1979: 310). The resulting social organization is not easily defined without considering the nature of interaction between the nomads and the sedentary population.

Interaction between nomads and agriculturalists is well attested ethnographically (Barth 1956; Bates and Lees 1977; Beck 1980; Pastner 1978; Spooner 1969). In Turkey, Bates (1973: 26) noted that most Yoruk nomads have relatives, especially merchants, living in towns. For the Yoruk, there is no social discontinuity separating nomadic from sedentary households (_Ibid_.: 27). Irons (1979: 31) writes that extant pastoral nomads often share social and cultural features with settled people within their contact zone, more so than with other pastoralists. This is especially true of pastoral nomads who travel short distances enclosed by sedentary communities. Thus the social structure of pastoral nomads, villagers, and in some cases city dwellers is interwoven.

Although a high degree of mobility and the low population density typical of nomadic societies might mitigate against political and social hierarchies, the political and social pressure of the sedentary society imposes a complex order on the nomads (Burnham 1979). Consequently, the concept of "egalitarian" pastoral nomadic societies is invalidated both by recent studies of inequalities among extant comparable societies and by virtue of their involvement with sedentary populations.

Regional analyses, as emphasized by Salzman (1978) and by Dyson-Hudson and Dyson-Hudson (1980: 36) are preferable to particularistic case studies of nomads in isolation from the social, cultural, and physical environments of which they constitute one part. This approach applies to the study of ancient pastoral nomads and their settled neighbors as well.

Given these generalities pertaining to pastoral nomads and the difficulties of defining and identifying complex societies, what archaeological evidence might one expect to find? Most ethnographic studies do not present the material correlates of the nomadic lifestyle. This may not be within the realm of ethnographic research of cultural anthropology, but it does fall into realm of the re-emerging field of ethnoarchaeology. As Longacre (1984) states, this discipline differs from ethnography in that it is carried out by archaeologists who work among extant communities selected for study due to their suitability for addressing problems posed by archaeological material. A main concern of ethnoarchaeology focuses on variability within material culture and its relationship to human behavior and social organization. Unlike ethnographic work, the emphasis is on the material correlates of human behavior.

Archaeological evidence of an EB IV pastoral nomadic society

A non-sedentary society can be identified if the three basic characteristics of extant pastoral nomads are present. The hypothesis states that non-sedentary societies can be identified by a subsistence strategy emphasizing herds of migratory animals who graze on natural vegetation while migrating through sparsely occupied areas. Archaeologically, this would result in:

(1) a settlement pattern emphasizing marginal environments;

(2) temporary dwellings rather than permanent buildings;

(3) a large number of animal bones and a high percentage of migratory versus non-migratory animals;

(4) minimal agricultural implements for use in the field, for processing and storing foods.

Each of these correlates can be tested against the EB IV material.

Settlement pattern

Over the past century, most research has concentrated on the <u>tell</u> sites in the low-laying plains and gentle rolling hills of Israel. More recent projects, however, focus on exploration of the hilly and semi-desertic zones. This shift in research strategy results in the identification of several one-period sites dated to the late third millennium B.C. Permanent urban centers at the major <u>tells</u> or elsewhere are rare in Israel for the EB IV period. Cemeteries are found at some <u>tells</u>, such as Lachish (Tufnell 1958), Megiddo (Guy and Engberg 1938), and Beit-Shan (Oren 1973a,b), but occupational debris is attested mostly in the Central Hills and the Negev and Sinai deserts.

These zones constitute marginal areas today, but were they such in antiquity? Information about the physical environment and changes in precipitation, run-off, soil development, etc. is largely unavailable, and settlement pattern studies are the chief means of evaluating the potential use of these areas. The dearth of settlements over the millennia implies that ancient technologies normally could not render these regions suitable to support a permanent population under normal circumstances. They were amenable, however, to nomadic societies; indeed most EB IV remains are confined to these regions. The archaeological evidence of settlement patterns appears to fit the situation of marginal land use typical of extant pastoral nomadic societies.

Dwellings

Permanent structures at the small number of domestic sites are rare, except at Beer Resisim, where round or elliptical one-room buildings, 2.5-5 meters in diameter, number at least 80 (Cohen and Dever 1981: 58). Several rooms cluster around open courtyards. Chalk slabs, plaster, and wooden beams roofed stone-walled buildings with one or two central stone slab pillars. One complex of several rooms clustered around a central courtyard was located on the highest point of the ridge.

Near Beer Resisim were 32 small round buildings, some 800 meters away, and at a third site, seven similar structures were identified (Cohen and Dever 1981: 69). It is estimated that 400 or more such sites may dot the Negev desert (Dever 1980c: 43); in northern Sinai, Clamer and Sass (1977) surveyed several sties with round stone structures similar to those of Beer Resisim.

In Israel, EB-style <u>Breithaus</u> structures are attested. In Jordan, at Kh. Iskander (Richard and Borass 1984), fragments of rectangular buildings date to the EB IV period, according to the excavators. The remains of a rectangular structure was found at Jebel Qa[c]aqir, and also at Bâb edh-Dhrâ[c] (Rast and Schaub 1978: 17), where eroded mudbrick wall of several buildings survive (*Ibid*).

The use of caves for either storage and/or habitation is attested at Lachish, el-Husn, Tell Beit Mirsim, Jebel Qa[c]aqir, Megiddo, and Wâdi ed-Dâliyeh (Dever 1974: 47). At el-Husn, Khirbet Rabûd (Kochavi 1974: 19) and Megiddo (Tomb 1101-02B Lower), EB III caves were reused in the EB IV period. The two large Tell Beit Mirsim caves in SW13 and 22/23 contained rough stone walls as found at Jebel Qa[c]aqir (Dever 1974: 47). Three caves at Jebel Qa[c]aqir held EB IV material, two being virtually undisturbed. These could have been used in addition to temporary dwellings of tents or lean-tos. Similar collapsable housing could have been erected at various points along the migratory route.

The archaeological evidence suggests that permanent structures were rare, but not unknown in EB IV times. Both the locale and the nature of each site will determine the type of structure used and their preservation. The dearth of permanent housing concurs with the practices of contemporary pastoral nomads. The presence of some stone buildings and the use of caves, however, imply differential site use, perhaps by different groups of the nomadic society.

Concentration on migratory animals

An analysis of the faunal remains involves an assessment of the types and frequencies of each species. Sheep, goats, pigs, and cattle are known from 4th and 3rd millennia B.C. sites (Clutton-Brock 1971, 1979). The faunal remains at two EB IV sites, Beer Resisim (Hakker n.d.a) and Jebel Qa^{c}aqir (Hakker n.d.b and Horwitz n.d.) reveal an emphasis on caprines over all other animals. Of the Jebel Qa^{c}aqir tomb bones, Horwitz identified one cattle (*Bos taurus*) bone among the caprines. Seven sheep, five goats, and eight sheep/goats account for the 20 caprines, of which 30% were under one year, 45% were aged 1 1/2-2 1/2 years, and 25% between 2 1/2-3 1/2 years. Horwitz associates the high percentage of young animals with a slaughter pattern typical of meat exploitation. Metzger's (1984) preliminary analysis of the faunal evidence from Tell el-Hayyat suggests a high percentage of caprines. The large sample of animal bones from the site of Efrat awaits analysis (Gonen per. com. 1984).

In general, the emphasis on sheep and goats implies a relatively short migration route; the cattle might suggest permanent residence at Jebel Qa^{c}aqir.

Use of natural grasses for fodder

Archaeologically this can be identified only by indirect evidence--primarily by the dearth of agricultural material correlates. The myriad of stone implements, ground stone artifacts, and containers needed to hold large and small quantities of grains are poorly attested at the EB IV sites. This shortage in part reflects the predominance of funerary sites at which agricultural equipment would be sparse or non-existant. Grinding equipment was found in small quantities at Jebel Qa^{c}aqir as well.

At Bâb edh-Dhrâ^{c} mortars and querns were found at a site thought to contain a sedentary EB IV group (Rast and Schaub 1978: 21). EB III and IV organic material comprised a variety of plants (McCreery 1980). For EB IV, barley appears to have predominated over other grains, but the small sample size precludes drawing final results.

The limited EB IV ceramic repertoire at domestic sites contrasts with the wide variety of containers known for other archaeological periods. Pastoral nomads usually store and carry food in skins and basketry rather than in ceramic vessels, but the small ceramic repertoire is indicative of the minimal need for storage -- this, even though containers are ideal for storing grains and preventing access to rodents.

The paucity of grinding implements and agricultural equipment does not imply that farming was not practiced by the pastoral nomads, but rather that large surpluses did not accumulate. Agriculture was only a small part of the economy, and the ceramic jars found at the EB IV sites would have been adequate to store grains or other commodities.

At Jebel Qa^{c}aqir, cupmarks in the exposed bedrock all around the site hint at some type of processing of animal or vegetable goods. Rarely does any extant nomadic community subsist on meat products alone (Monod 1975: 134). Normally, the sedentary population in contact with the nomads provides agricultural goods in exchange for the animal products provided by nomads, or the nomads are themselves involved with farming. In the latter situation, part of the group would remain at permanently occupied settlements, while the rest of the group migrates with the herds (Dyson-Hudson and Smith 1978: 34). For the EB IV period, the lack of permanent settlements in Israel implies either that the pastoral nomads conducted transactions with the sedentary agricultural settlements, as at Bâb edh-Dhrâ^{c} or Kh. Iskander, or that they themselves engaged in small scale farming, or perhaps both.

The material correlates of pastoral nomads are well-attested archaeologically, and it can be concluded that the EB IV society comprised a non-sedentary population in the marginal areas where they raised migratory caprines who grazed on natural grasses.

In an assessment of ethnographic sources and ancient Mesopotamian texts of the UR III period (ca. 2100-2000 B.C.), Rowton (1973: 249) described two forms of interaction between nomadic groups and sedentary peoples as "enclosed" versus "free-ranging nomadism." While the latter involves groups who cross large territories and maintain their independence, enclosed nomads use pastures partly or entirely surrounded by sedentary people who, to a certain extent, control their movements. Kamp and Yoffee (1980: 91) have modified Rowton's terminology to "enclosed pastoralism" as more appropriate, emphasizing the interaction mentioned in the Mesopotamian texts of "integrated tribes, part of which were pastoralists, part villagers" (Ibid.).

The same texts reveal contact between herders and agriculturalists who bear the same group name (Rowton 1973: 257). On the next level of integration, Kamp and Yoffee (1980: 93) cite numerous ethnographic cases of interaction between state and hinterland.

The Ur III cuneiform texts also describe non-sedentary people bearing "Martu" surnames as living also in the mountains, steppes, and desert zones throughout the Near East. The urbanites view the nomads as not knowing towns, houses, or grains, but maintaining a tent-life and neglecting to bury their dead (Edzard 1981: 40). No references allude to their social organization, but later texts from

Mari, of the Old Babylonian Kingdom ca. 1850-1600 B.C., refer to the tribal hierarchical structure of non-sedentary populations (*Ibid*.: 43). This same situation might well apply to the late third millennium B.C. in Israel. If so, the EB IV pastoral nomads there can be described as part of a complex society comprising sedentary and non-sedentary groups. This view contrasts with a recent assessment of Shay (1983) suggesting that the EB IV period witnessed a revival of an egalitarian society.

Social Organization

The difficulty of defining social organization among extant pastoral nomads emerges in the current debate in the ethnographic literature noted above. For ancient societies, the more difficult situation results from the incompleteness and uncertain depositional history of the archaeological record and is also reflected in the lack of consensus regarding identification and measurement of social organization and its complexity. Studies devoted to the rise of complex societies (Carneiro 1970; Flannery 1972; Jones and Kautz 1981; Sanders and Price 1968; Wright and Johnson 1975; Yoffee 1979) note various factors contributing to changes in social organization. Studies of the archaeological identification of complex societies have suggested several ways to measure complexity. Decision-making hierarchies as derived from systems theory and information theory (Flannery 1972;

Pebbles and Kus 1977; Wright and Johnson 1975) use the number of decision-making levels as discerned from settlement hierarchies to measure social complexity. Alternately Tainter (1978: 131) differentiates between "vertical" and "horizontal" dimensions of social structure. Vertical dimensions or "rank grading" in a society are manifest in differential levels of energy expenditure and refer to wealth differences. Horizontal dimensions refer to age, sex, kin-related affiliations (descent groups, post-marital residence, and non-kin-based groups such as secret societies or work groups). For Tainter (Ibid.), social complexity increases as the vertical dimensions increase, i.e., as manifestations of kin-related affiliations diminish.

More recently, McGuire (1984: 101) proposed that social complexity can be measured by examining two features expounded by Blau (1977) -- heterogeneity and inequality. McGuire (Ibid.: 101) defines heterogeneity as "the distribution of peoples between social groups," while inequality refers to "the differential access to material and social resources within a society." Whereas heterogeneity indicates how many individuals have comparable access to resources, inequality measures how much difference there is between comparable levels of access" (Ibid.: 102).

This attempt to define complexity in measurable quantities is applicable to the archaeological record if adequate means to measure heterogeneity and inequality can be devised that compensate for the incompleteness and often unknown depositional history of the artifacts. In such a scheme, the least complex societies would demonstrate the lowest degree of heterogeneity and inequality.

As Tainter notes (1978: 116), the measure of complexity is best achieved by examining as many parameters as are available. Toward this goal, Pebbles and Kus (1977) list correlates they associate with "chiefdom" societies and then test each using material drawn from prehistoric societies. They note that inequalities of such a society are archaeologically discernable in mortuary practices and settlement types as well as the ability to organize labor, to support part-time craft specialization, and to maintain international trade. Large-scale economic redistribution is excluded from their list; this is not a function noted among the Hawaiian chiefdoms of their study.

The inadequacies of the cultural evolutionary approach of dividing societies into clearly delineated stages and simple versus complex societies have been noted (Cordy 1981: 25; McGuire 1983: 93; Pearson 1984: 62; Yoffee 1979: 5). The term "chiefdom" is thus inappropriate, but the emphasis of Peebles and Kus (1977) on examining multiple aspects of a society to determine social complexity is useful. Social inferences can be drawn from archaeological data once the limitations are stipulated. Mortuary practices, settlement hierarchy, the organization of labor, and long distance trade are appropriate indicators of social structure and its complexity.

Mortuary practices

Archaeologists have long dealt with funerary remains as indicative of social organization by assuming that mortuary practice, beginning with treatment of the corpse, the ensuing ceremonies, and final disposition, all reflect the social status of the deceased. Saxe (1970) and Binford (1971) devised a much-used framework for interpreting funerary remains. Their work relied on ethnographic case studies for testing hypotheses concerning the mortuary practices accorded people of different statuses within different societies.

Several recent studies challenge the idea that social organization can be inferred from mortuary practice. O'Shea (1984: 20; 161; and 249) notes the uneven reliability of ethnographic reports; rarely do they portray the full range of mortuary variation. Despite a relatively small sample of ethnographic and ethnohistorical case studies, O'Shea's criticism of incompleteness of ethnographic data is justified. Furthermore such reports tend not to furnish the type of data most readily retrieved archaeologically.

Inconsistencies with the ethnographic record can therefore be expected.

O´Shea (1984: 161) notes that ethnographic reports often fail to provide information on horizontal differentiation other than treatment accorded individuals of different age and sex. Descent groups, post-marital residence, secret societies, and a variety of kin-affiliated distinctions are poorly documented ethnographically.

Although horizontal distinctions are less well-defined in the ethnographic literature, it can be argued that the need to display overt group identity varies through time. Hodder (1979) points to crisis periods as requiring obvious material correlates of group affiliation and group solidarity. At other times, kin and other group-related distinctions are less blatant.

Representations of both horizontal and vertical (especially wealth) differentiations in mortuary practices also reflect changing ideologies. For Pearson (1984: 60) "ideology is not the spiritual as opposed to the materialistic reality, but is present in all material practice.... Each artifact embodies an ideological perspective." At times, ideologies erase, equalize or emphasize social distinctions (Kristiansen 1984: 77; Pearson 1982: 110; 1984: 64). For example, in a study of 17-19th century early American gravemarkers from the New York area, Baugher and

Winter (1983: 53) found no differentiation along religious affiliation nor original nationality. Most conformed to the new "American" idea, rather than emphasizing cultural origins.

Further complicating the situation is that not all social dimensions are equally preserved, and rarely are there overlaps of symbolic representation in burial treatment and grave goods; the former might signify horizontal distinctions, while funerary offerings might represent vertical distinctions (O´Shea 1984: 250). Tainter (1978: 127-128) and Goldstein (1981) emphasize that treatment of the corpse, construction of the burial facility, and the extent and duration of the burial ceremonies are all indicative of social differentiation in addition to the more obvious funerary inclusions and each deserves careful consideration. For O´Shea:

> The specific treatment accorded an individual will be consistent with that individuals´ social position in life.... Although the premise asserts that observed differences will be consistent with actual social differences in life, it does not imply that all differences recognized in life will be given symbolic recognition through mortuary differentiation, nor that any particular living distinction need necessarily be symbolized in an archaeologically observed form. (1984: 36)

Another important factor contributing to mortuary practice is the social relationships it expresses for the living (Goldstein 1982: 54; Peebles 1971: 68; Whittlesey 1978: 143). Mortuary practice, while perhaps representing the social position of the individual, can serve as an outlet to display group affiliation, position, and ideology of those performing the ceremony for whom the event represents social, political, and economic statements. The event might involve the transfer of property, power, and redistribution of wealth and surplus (Pearson 1984: 64).

Additional evidence that mortuary variation within a society cannot automatically be used to infer social organization comes from an important study of skeletal material retrieved from the Grasshopper site in north central Arizona. Whittlesey (1978) evaluated 655 burials and her results demonstrate that prior to attributing variability in mortuary practice, status, and/or wealth, the two dimensions of age and sex must be considered.

Whittlesey (1978: 43) first devised a set of correlate hypotheses to relate variables in the archaeological record to past behavior and then presented ethnographic evidence for most correlates. They include:

(1) The roles or <u>social</u> <u>persona</u> of the deceased structure the form and character of the mortuary practice. <u>Social</u> <u>persona</u>, as defined by Goodenough (1965: 7) and later Binford (1971), reflect an individual's age, sex, marital status, status as a parent, occupation, residence, and membership in groups, kin-based or otherwise (work groups or ceremonial).

(2) There is a prescribed minimum or standard burial ritual.

(3) Composition of the group mourning the deceased includes kin-affiliated and other people. Burials are "integrative rites" with emphasis on those mourning rather than the deceased.

(4) Situation and circumstances surrounding the death of an individual, such as time, place, and cause of death, influence mortuary practice.

(5) Prestige of the deceased influences the treatment of an individual and is related to the personal prestige attained during life.

(6) Material wealth of the deceased or of the mourning family influences the mortuary practice.

(7) The esteem in which the individual was held reflects the personal qualities of the deceased and influence mortuary practice.

(8) Personal achievements, such as craftsmanship or storytelling influence mortuary practice.

(9) Idiosyncrasies not accounted for above might also influence mortuary practices.

Whittlesey then presents ethnographic examples from pueblo communities of the American Southwest for many of the correlates.

For the late third millennium B.C., the common practice of secondary, disarticulated burials requires a correlate hypothesis to relate this procedure to past behavior. Kenyon (1965: 556) suggested that among nomadic societies, the bones of those who die on the trail are carried back to family burial grounds.

Non-sedentary societies are known to transport bodies or bones from the place of death to the family burial grounds immediately upon death (Howitt 1904: 471), or several months or even years later (Fordes and Jones 1950: 27). Several procedures for drying bodies are recorded: corpses are placed on a stage under which a low fire is built to hasten the process (Howitt 1904: 468), or corpses are hung from a tree to dry (Ibid.). The Adaman Islanders were recorded as burying a corpse until the soft tissue decayed and later retrieving the bones (Hays 1963: 29). Beals (1965: 118) records a similar practice in South America as witnessed by a Jesuit traveller. It should be noted that ethnographic evidence of mortuary practices is limited in scope, given the difficulty of the subject.

Secondary burials are sometimes reserved for the chief or elderly, "to assert or enhance the prestige of the dead person's kin" (Fordes and Jones 1950: 78). Among southeastern Australian communities the bodies of young men were dried and carried around because they had died before their time and were considered too young for a grave (Howitt 1904: 468).

Interaction between sedentary and non-sedentary communities is important for understanding social organization as well as burial practices. Several writers note the multiplicity of mortuary practices of nomads. Procedures vary depending on location. Nomads in the vicinity of a village or town carry out different burial practices than when on the migratory route (Burchardt 1967: 102; Burchardt 1968: 100; Musil 1928: 670-1). The different burial practices coincide with seasonal migrations; as a consequence, burial practices reflect both season and location.

Cairn burials have been recorded for nomads on the trail, especially the Rwala Bedouin camel herders of Saudi Arabia (Musil 1928: 671-3), the Aenezes of northern Syria (Burchardt 1967: 101), the Fejir Bedouin (Doughty 1923: 432), and the Basseri of Iran (Barth 1961: 143). When near a village, these same people are reported to accord their dead a burial like that of a villager (Burchardt 1967: 102-3; Musil 1928: 670-1). More evidence is needed, especially concerning non-camel herding nomads, but the available data suggest the correlation between nomadic groups and secondary disarticulated burials. The practice of secondary burials might reflect the needs of the living more so than the deceased.

Before examining the archaeological evidence, Whittlesey (1978: 152-4) stressed the transformation operations; burials do not reflect the mortuary practices in their entirety. She notes that items associated with a burial and treatment of the grave and individual represent the final burial stage plus any other stage that leaves physical or material evidence. Burial items are intentional offerings, including the personal artifacts of the deceased or contributed goods.

Before evaluating the EB IV burial tradition, it is important to note that the archaeological record imposes restrictions as does the method of excavation. Several factors contributing to distortion of the archaeological remains, such as environment, human interference, and the aims and resources of each excavator deserve mention.

Rodent and water action plagued the Jericho burials, resulting in the disarray of tomb contents. Rodent interference is also reported at Jebel Qa^{c}aqir (Dever per. com. 1983).

The decay of organic material (vegetal and animal) in many tombs contrasts with preservation in some Jericho tombs. Skeletal material was not always well preserved, and in the absence of physical anthropologists and paleozoologists, much information perhaps retrievable at the time of excavation is lacking. The presence of animal bones might have been ascertained had the specialists participated in the excavations.

Sampling biases plague all known cemetery collections. Of the 356 EB IV Jericho tombs, 46 human skeletons were submitted for analysis (Hughes 1965), and one-third of this sample came from the largest, most elaborately equipped "Outsize" tombs. Age and sex data for the human remains were lumped together with later material and information on the age and sex is lacking. More recent excavations will provide such information, but none involve a cemetery as large as Jericho.

The sample of 46 Jebel Qa aqir skeletons of subadults, men and women of all ages (Table 38) appears not to be a representative population. Infants and subadults are under-represented, especially if infant and child mortality rates were high. Over half (53.9%) of the individuals are aged 40 years or more; adults between 20-39 account for only 12.8% of the total number of skeletons whose age was possible to determine (n=39).

Table 38. Age distribution of human skeletal material.

			Years					Total
1-3	4-11	12-19	20-29	30-39	40-49	50-59	60+	
4	3	6	2	3	11	9	1	39
10.2	7.7	15.4	5.1	7.7	28.2	23.1	2.6	100%

A further bias of the Jebel Qa^{c}aqir sample reflects tomb location. The area of the site is under current cultivation, and many tombs may remain buried below the surface. At Jericho, the largest, best equipped "Outsize" tombs are grouped together in an area away from other tombs. Six separate burial areas at Jebel Qa^{c}aqir were identified, but additional groups might remain undetected.

To complicate the natural disturbance and the incomplete recording and analyses, tomb reuse and multiple interments confuse an already fragmentary assemblage making it often impossible to associate funerary offerings with individual skeletons. Multiple burials are known at Jericho (Kenyon 1960b, 1965), Dhahr Mirzbâneh (Lapp 1966), el-Jib (Pritchard 1963), Efrat (Gonen 1981), and Jebel Qa^{c}aqir (Smith 1982). Recent tomb-robbing, if not in antiquity, further distorts the situation. Sherds found tombs at Dhahr Mirzbâneh (Lapp 1966: Fig. 18) and Jebel Qa^{c}aqir either suggest their inclusion at the time of burial or later entry. The sherds do not belong to complete vessels. Both Lapp (1966) and Dever (per.com. 1984) refute any dislodging of the large limestone slab or smaller stones that sealed and cemented the entrance.

Occasionally, shaft tombs were (unintentionally?) re-entered through holes dug into the tomb walls, perhaps while other burial chambers were under construction.

Mortuary practices at Jebel Qacaqir

Variation of the Jebel Qacaqir and contemporaneous burials is discernable in construction and location of the burial facility, treatment of the corpse, funerary inclusions, and offerings buried with the deceased.

Tomb construction. For the area included in Israel of today, Dever (n.d.) discerns three types of burial facilities: "dolmens," cairns or tumuli, and shaft tombs. The dolmens, confined to northern Israel, especially the Hauran and Golan Heights, are above-ground roofed chamber tombs constructed of megalithic stones. An EB IV use, if not construction, for these structures is suggested by Epstein (1975) who found late third millennium B.C. metals and pottery associated with a dolmen. The cairns or tumuli are either slab-built rectangular above-ground chambers or platforms covered with a pile of small stones or simply stone heaps. They characterize southern Israel, essentially the Negev, Sinai, and Transjordan, where limestone rather than basalt predominates. The EB IV date attributed to the cairns is ascertained from the pottery sherds associated with them. Few dolmen or cairns have been systematically excavated; often no datable artifacts are associated with them. However, at Beer Resisim (Cohen and Dever 1980: 52) EB IV sherds and a metal artifact were found in a cairn.

Shaft tombs form the majority of burials and are unrestricted in their geographic distribution. Usually, they are found in southern Syria, central Israel and in Transjordan. They comprise a narrow shaft that enters into a chamber (occasionally more than one) of various sizes.

Steps sometimes separate the shaft and chamber. Geologist P. Goldberg has suggested (per. com. 1982) that the soft Cenomanian and Senonian limestone formations of central Israel are well-suited for cutting out burial chambers. It is interesting that the shaft tombs do not overlap with the dolmen and cairns; each burial facility coincides with a geographic zone and reflects the geological formation.

Variation in the shaft tombs provide evidence of different levels of energy expenditure, yet each chamber represents a considerable amount of labor investment. Steps when present might reflect difficulties encountered in the tomb construction, rather than a deliberate architectural feature. Platforms, low walls of stone, and wall niches (occasionally with a lamp) occur in some of the tombs found at numerous sites. Two Jebel Qa^{c}aqir tombs had stone slab walls around the shaft entrance. Indications of chisel marks well-preserved in the Jebel Qa^{c}aqir chambers provide evidence of the use of a copper/bronze implement for the final finishing work, if not for the actual cutting of the chamber.

Shaft depth below the surface varies and in some instances co-varies with chamber size (Fig. 25). For the individual burials, there is a correlation between tomb depth and age of the deceased. The shallowest and smallest tombs (T. B42, 44) contain the bones of children, and the deeper tombs hold the older segment of the population.

The third smallest tomb chamber and shallowest shaft (Tomb B45) contained two juveniles and an elderly female; it is the only tomb with an individual over the age of fifty that lacks animal bones. It contained a single jar. All of the other 76 tombs are at least twice the size of these three tombs, although 9 tombs have shallow shafts measuring 50 cm in depth below the surface. Larger tomb chambers with deeper shafts are isomorphic with a large number of skeletons.

Placement of the tombs at Jebel Qa^{c}aqir reveals a carefully designed, orderly pattern of rows of shafts carefully placed along a ridge. This very regular patterning hints at well-defined and accepted areas suitable for burying.

Tomb chambers vary in size, regularity of form, and interior surface finish. Occasionally large tomb chambers are isomorphic with regularity of shape and interior surface finish. At the most, eight tombs entrances have decorated facades; various incised patterns surround the shaft

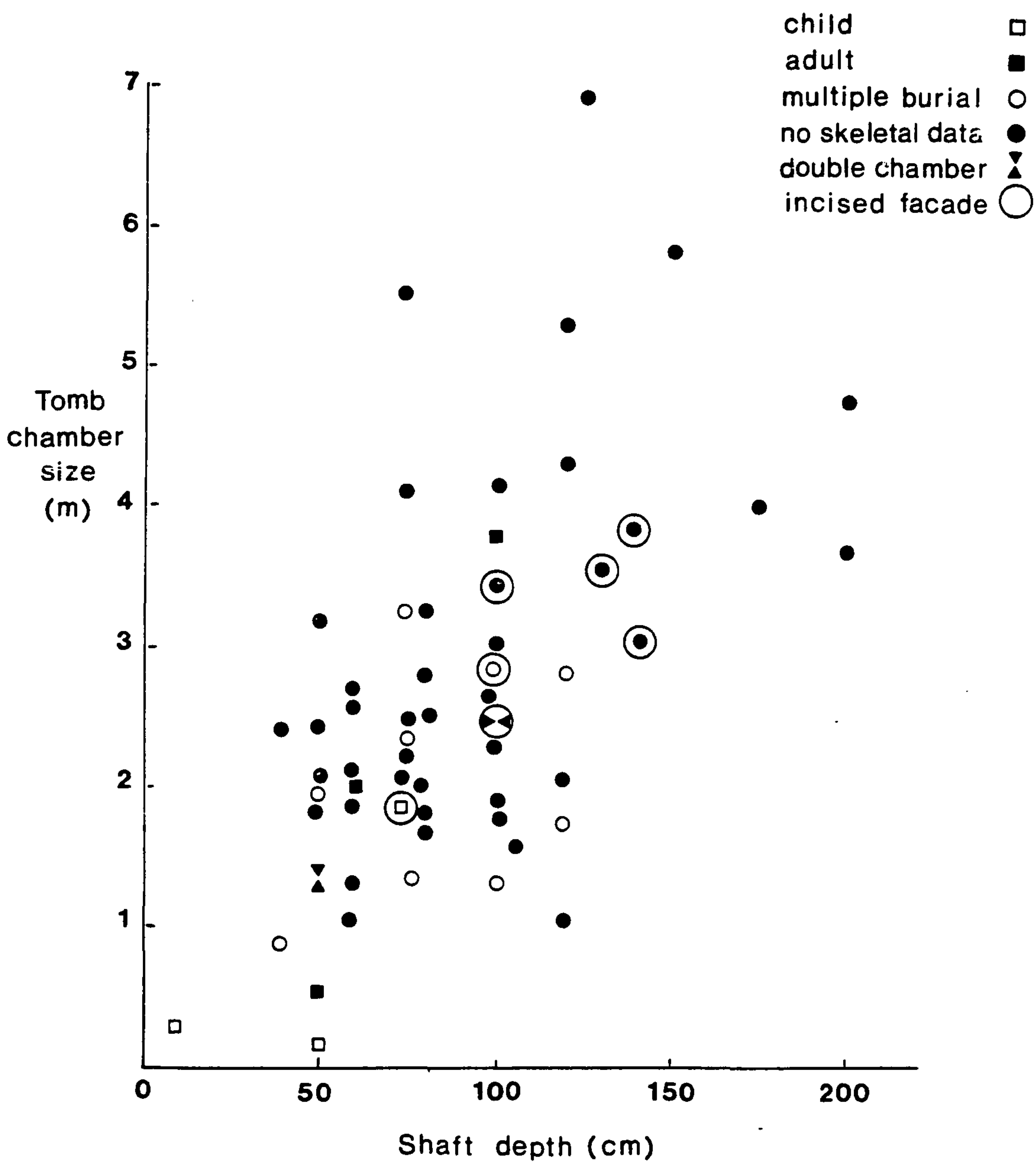


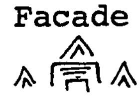
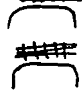
Fig. 25. Correlation between shaft depth and tomb chamber size.

entrance. Several are perhaps not intentional markings, but possibly represent flaking of the area above the entrances to allow a better fit between the blocking stone and shaft.

The decorated tomb entrances usually belong to the larger tomb chambers (Table 39). Tomb B26, with three areas of triangles (above and alongside the entrance), is almost a perfect circle in form, as is Tomb B38. The latter has an area of checkerboard incision right above the entrance.

Table 39. Jebel Qa^c^aqir tombs with decorated or smoothed facades.

No. of Tombs = 58 tombs. 33.3% of all tombs over 3 m have decorated facades.

Tomb	Size	Facade
B26	3.44	
B27	2	
B30	3.84	
B33	3.04	
B38	3.6	
B48	1.8	
B53	3.75	Smoothed
B54	2.8+1.3=4.1	
B56	3.25	Smoothed
B58	2.45+2.45=4.9	

For Tomb B33, the crosshatching was incised above the door entrance. Tomb B48 has two areas of crosshatching, on either side of the entrance. This tomb is fairly small, but it contained the remains of an individual female skeleton over the age of 50 and the remains of an animal.

Tomb B30 is large in size, but the concentric half-circles or scalloped pattern above the entrance constitute a dubious decoration or intentional marker. Above and below Tomb B27, the incised horizontal lines present the same problem.

No association between human and animal bones or grave goods can be drawn for the above-mentioned tombs, other than Tomb B48; all other decorated tomb chambers were robbed.

Above the entrances to the two bilobate tombs, B54 and B58, are chipped areas, perhaps intentional marks or possibly flaking of the bedrock. The chambers are not large, but these tombs are distinguished by their double chambers; only two other examples were located at Jebel Qa^{c}aqir out of 79 tombs. Animal bones were found in each as were individuals over the age of 50.

Finally Tomb B53 deserves mention. It is a large tomb, with a curb wall of stone slabs surrounding the shaft, in which animals and an adult age 30+ (very fragmentary preservation) were found. Rather than a decorated facade, the area around the entrance was carefully smoothed. The other tomb with a stone circle surrounding the shaft is Tomb B56. This large tomb, emptied by the villagers, was nicely smoothed around the shaft entrance and interior chamber walls.

Treatment of the bodies. At Jebel Qa^{c}aqir all skeletons are disarticulated, with different parts of each skeleton missing (Smith 1982), as is the case at the Efrat cemetery (Gonen per. com. 1984), where one tomb purportedly contains five bones belonging to five individuals.

Concerning placement of the bones in each chamber, there appears to be no single pattern (e.g., Fig. 26). In Tomb B54B, bones were found in a lamp, and the pieces belonging to a human skull were found in one inside another. Stones (not the result of roof collapse) were among and above the bones. Animal bones were interspersed with the human remains.

In Tomb B45, the bones rest on a layer of stone chips. Bones and artifacts were sometimes piled in the center of the chamber, but in Tomb B50, they were piled in the rear of the chamber, and two pots stood at the chamber entrance. Often bones and artifacts were interspersed.

Below it will be suggested that the initial burial might have involved use of the cairns, and it is interesting that some of the tombs contain a pile or bed of stone chips

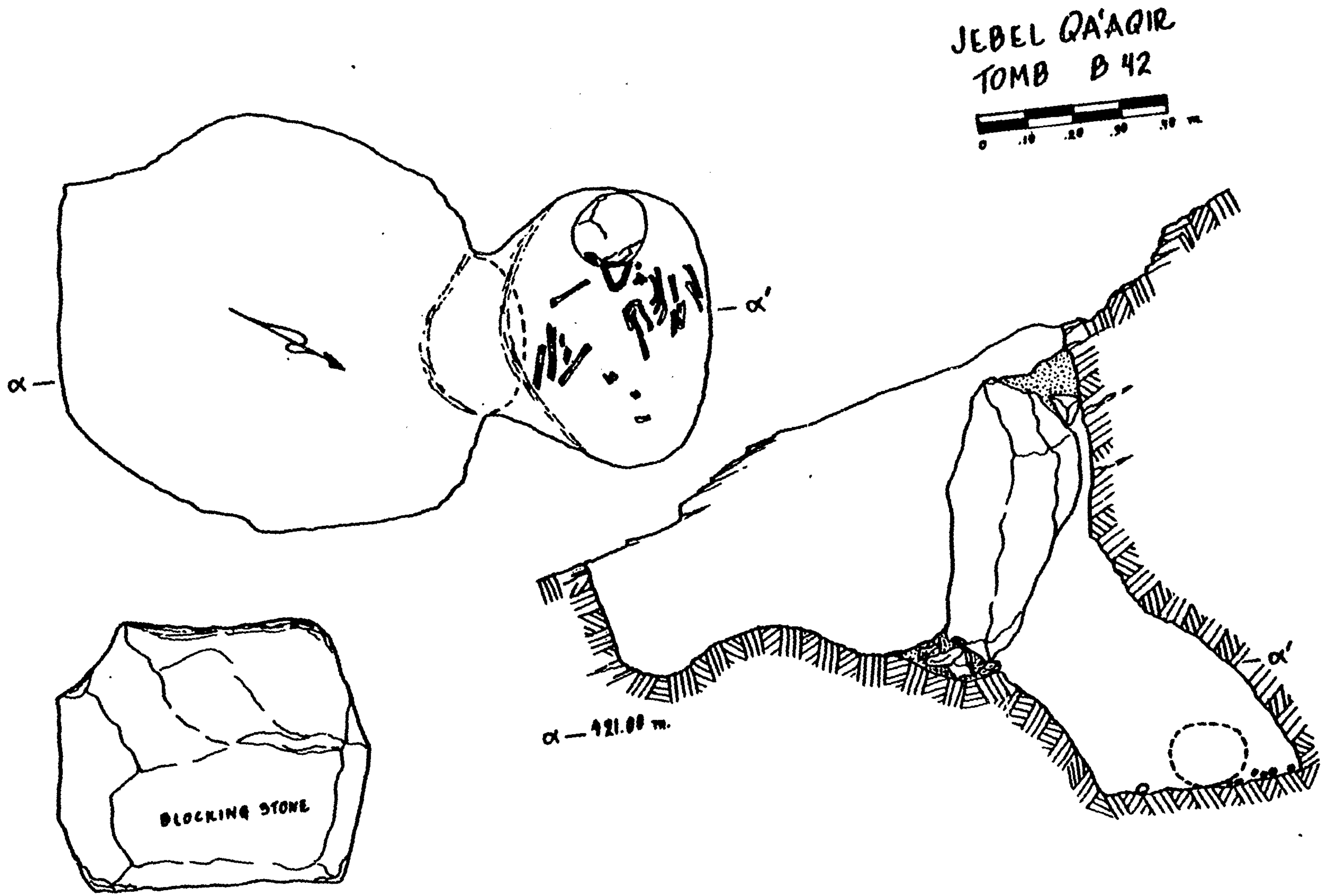


Fig. 26. Tomb B42.

on which the bones rest. This feature is perhaps reminiscent of the first stage of the burial treatment.

Grave goods. At Jebel Qa^{c}aqir, metals, ceramics, and animal bones represent the only funerary articles. Often, female animals were found with human females, but the association is weakened by the presence of multiple burials. There appears to be an association between human skeletal remains, grave goods and animal bones (sheep and/or goat) found in tombs containing individuals over the age of 50. Each of the individual burials with individuals over 50 years of age has animal bones (T48 and 58). On this basis animal bones may have been associated with the older segment of the population, although in all other instances the burials contain multiple human interments. Twenty-three percent of the population submitted for analysis had attained 50 years of age (Smith 1982), and in all but one tomb containing an individual of 50 years or more animal bones were found. The single exception, Tomb B45, held an elderly woman and two juveniles interred in a shallow small tomb.

Horwitz (n.d.) noted signs of cutting and butchering on the animal bones. Cranial remains, tail vertebrae and phalanx bones were not recovered in any of the tombs, but most numerous were the upper leg bones of both the hind and forequarter, i.e., bones containing large quantities of meat. Horwitz concludes that parts of each animal were included in the tombs, but the rest were reserved for the mourners.

The most common grave good was pottery. Analysis of the morphological and decorative features above reveal that pots made by more than one potter were at times buried together (especially in the multiple burials), but at other times two pots made by one potter were found together. Further, the work of individual potters has been associated with different tombs at the site.

Mortuary ritual. Is there a prescribed mortuary ritual as illustrated by the homogeneity of corpse treatment, burial chamber, and grave offerings? At Jebel Qa^{c}aqir, the standard mortuary practice involved disarticulated secondary burials in rock-cut chambers. Pottery is the most abundant artifact; animal bones and metal artifacts are less common.

Variation in burial treatment is evident in artifact type and quality, tomb chamber size, shape, and decoration. Age of the deceased is the only dimension to account for some of the variation. Energy expenditure in tomb construction and the presence of animal bones co-vary with adults over the age of 50, male and female, based on the small sample of excavated tomb chambers.

The burial tradition of disarticulated, incomplete skeletons represents the final act of a multi-staged process. No direct evidence of the initial stages exists, unless one considers the cairns. At Beer Resisim, a cairn was found to cover an EB IV amphoriskos and a metal dagger, but nothing else. Could the cairn have served as the initial burial place until the skin and soft tissue decayed? The stone pile would allow disintegration while preventing animals from dragging off the bones. Following decomposition of the soft tissues the bones could be collected, and transported to the family burial area elsewhere at the site or farther away.

An exposed body might decay in six to ten weeks (W. Birkby per. com. 1985). Flies, rodents and insects would be responsible for the disintegration and removal of the flesh and soft tissue almost immediately after the body was placed in a cairn.

Cairns have been excavated at several sites and the finds vary. In northern Sinai, cairns were found to contain human bones, but no artifacts (Clamer and Sass 1977: 249). At Beer Resisim one cairn yielded the remains of five individuals and another cairn contained a metal dagger and an amphoriskos of EB IV date, but despite sieving, no human bones were found (Cohen and Dever 1980: 52-3). At Bâb edh-Dhrâc, Lapp (1966: 95) reported cairn burials in the form of shallow cysts covered by stones; the artifacts date the burials to the EB IV period.

At Jebel Qa^{c}aqir, the excavated cairns produced no human bones, but animal bones were recovered. This would accommodate their use in the initial mortuary ritual after which most bones and any artifacts were collected and re-buried in a tomb chamber. Some bones would probably have been left in the stone pile, but might not have survived to the present. As noted above, stone chips were found in some tombs below and among the bones; this bed of stones might represent the initial cairn burial ceremony.

In the North, Epstein (1975) excavated a dolmen containing no skeletal material, but EB IV pottery and metal artifacts were present. Both the dolmens and the cairns might have served a similar purpose: as primary burials sites after which the contents were collected and redeposited.

Not all individuals may have been accorded the secondary interment. There is some evidence to suggest that individuals over 40 were more often reburied than younger people. Further data are needed to support this idea given the small sample of 46 individuals found at Jebel Qa^{c}aqir. Brown (1981: 37) notes the danger of confusing different stages of a burial process with different social statuses. At the Spiro site, in eastern United States, Brown (1981) demonstrates that energy expenditure related to the treatment of the corpse varies in such a way that the least handled, most complete skeletons constitute the burials of the lowest rank. The most curated, least articulate and smallest number of bones corresponds with the highest ranking burials and contain grave goods distinctive in type and quantity. One motive for the secondary burial derived from the ethnographic sources is the desire to bury family members in a common burial ground, but a second motive might involve a display of authority or leadership on the part of the chief mourners. Secondary burials could well be a process more common for community elders and leaders than for the rest of the population.

At Jebel Qa^{c}aqir, the considerable investment of energy in tomb construction, the slaughter of animals and the high percentage of individuals over 50 suggests that percentage of secondary burials were important events, perhaps when community and/or family leadership was asserted.

Contemporaneous cemeteries

The largest collection of contemporary burials are those of Jericho (Kenyon 1960b, 1965) where 356 tomb chambers (usually with individual interments) were excavated. Occupational debris was also found at the site (Holland 1981; Kenyon and Holland 1982, 1983). My research on the unpublished wares stored at the University of Leiden and the

Institute of Archaeology in London permit a reassessment of variation in the tombs.

Smaller assemblages from Dhahr Mirzbâneh (Lapp 1966), Khirbet el-Kirmil (Dever 1975), Kufin (Smith 1962) el-Jib (Pritchard 1963) and Lachish (Tufnell 1958) offer less evidence, but their southerly location allows comparison with the Jebel Qa^{c}aqir tradition. For Lachish, an abbreviated type series was published rather than each vessel, therefore making it impossible to compare forms found together. The Khirbet el-Kirmil collection at Hebrew Union College in Jerusalem and some of the Lachish vessels at the Institute of Archaeology, University of London, were examined; notes on the other assemblages are based on the published reports.

Jericho. Although the Jericho material provides a large collection of tombs, the differential preservation of vegetal and skeletal remains and a sampling bias regarding the skeletal material submitted for analysis contribute to an uneven representation. Of over 300 human skeletons recovered from the site, only 46 were identified to age and sex; this resulted in a population of 16 children, 16 males, and 6 females (Hughes 1965) -- hardly a representative sample. The information on sex is presented for each tomb, but the age data were pooled together with the Middle Bronze II Age skeletons (Ibid.).

Another selection bias characterizes the report on the animal bones. Animal remains were recorded for over 30 tombs, of which no more than 13 were submitted for analysis (Cornwall 1965; Grosvenor-Ellis and Westley 1965). Animal bones could well have been present in the additional tombs as well.

Kenyon (1960b: 182) discerned five categories of tombs:

(1) Dagger type tombs, with articulated skeletons, usually with a metal (copper and/or bronze) dagger, associated with initial thrust of the nomads into the area;

(2) The Pottery type tombs, with disarticulated burials and pottery, associated with the nomads only once they had settled down and developed the domestic arts;

(3) Tombs of the Bead type, with disarticulated skeletons were attributed to the "poorer members of the group otherwise buried in the Pottery type tombs" (Kenyon 1960b: 182);

(4) The Square-shaft; and

(5) The Outsize tombs, each representing a mingling of the attributes found in the Dagger and Pottery type tombs. Due to the mixture of pottery, metal daggers, beads, and other artifacts found with disarticulated burials, these tomb categories were considered later than the other groups.

Kenyon concluded that "none of the arguments as to chronological priority of one group or the other is convincing" (Kenyon 1960b: 182) and in the end, preferred to interpret the variation as reflecting "loose tribal organization, which included elements with differing tribal burial customs" (Ibid.). Her emphasis on understanding tomb variation in terms of social groups is unique. Perhaps, with the benefit of detailed analyses of the skeletal material, the beads, metals and pottery, she might have had the evidence to support her interpretation. Unfortunately, these data are unavailable and hamper any reassessment.

A reanalysis of the Jericho data by Shay (1983) led her to infer an egalitarian social structure (Ibid.: 38) characterized by three social levels: "the lowest positions were held by children and the highest by adult males, the intervening positions being divided more or less equally between adults of both sexes" (Ibid.).

The present study of Jericho and Jebel Qa^{c}aqir burial data leads me to draw different conclusions and to question the basic assumptions of Shay's study. As noted above, sex and partial age data are available for only 13% of the 356 skeletons. A further bias was introduced by the overwhelming selection of the human skeletons from the Outsize tombs for study. The contents and size of these tombs differ substantially from the majority of the tombs and cannot be considered representative of the population as a whole.

Although Shay (1983: 26) assumed that most of the Jericho tombs had been located and excavated, Kenyon noted that further investigation was hampered by the presence of houses and soil accumulation (1965: 87). H.J. Franken has informed me that certain areas surrounding the site remain unexplored suggesting that more tombs are undetected. At Khirbet el-Kirmil, 900 tombs chambers are reported (Dever 1975) and the cemetery at Jericho could have been as large if not larger.

Shay's own analysis seems to contradict her inference of an egalitarian society if as she suggests in such societies children would have been buried in the smallest tombs and without grave goods. Although Shay concluded that child burials "contained little or no goods at all" (1983: 32), 3 of the 11 individual child burials contained an assortment of offerings including pottery and fairly exotic goods such as beads, a shell and a pierced stone (Tombs A92, B52 and M12).

According to Shay's own calculations, two of the Jericho child burials (Tombs H9 and M1) are of medium rather than small size, but each held an adult skeleton. As such, the tomb size and variety of grave goods do not fully support Shay's inference that an egalitarian society characterizes the Jericho population. Given the small number of sub-adults at Jebel Qa^{c}aqir in relation to the rest of the population, Smith (1982: 67) suggested that perhaps children were treated differently and were not always placed in a tomb; this might be true at Jericho as well.

At both sites, the small number of sub-adults prevents generalization regarding burial treatment as well as inferences concerning social organization. Furthermore, in stating that adult males held the highest social position, Shay disregards the three females in addition to the nine males buried in the Outsize tombs.

For Shay, burial furniture was the single most important criterion in determining the social standing of the deceased. She placed great importance on metals, beads, and shells without acknowledging the possible significance of animal remains. The imported items and metals are obviously significant, but the presence of animal bones in the tombs of pastoralists represents an equally prestigious offering that appears to have been restricted to the tombs of community elders.

That animal bones represent a particularly high value grave offering is inferred from the subsistence strategy of pastoral nomads which relies on animal herding. Additional evidence comes from the depiction of animals on the wall of Jericho Tomb P3 (Kenyon 1965: 138) and on an el-Jib pot found in Tomb 32 (Pritchard 1963: Fig. 35). The repeated occurrence of animals, in the tombs as offerings, in graffiti on the walls and incised into pottery, imply the importance of animals and the high value of such an offering.

On the walls of Tomb P3, one animal is facing a double triangle reminiscent of the "desert kites" thought to have functioned as animal pens for herding or hunting purposes. This occurrence suggests that some desert kites might have been used, if not constructed in the late third millennium B.C. These low stone wall constructions are confined to the Negev, Sinai and Transjordan (Meshel 1974).

To further identify levels of social differentiation, at Jericho, Shay (1983: 33) studied the nature of the corpse and concluded that there is no correlation between primary (N=27) versus secondary burials and grave goods. Contrary to Shay's interpretation, the association between crouched primary burials with daggers rather than pottery or other containers implies a burial ceremony quite different than that represented by the disarticulated burials accompanied by pottery and vegetal offerings.

Shay's reanalysis of the Jericho material to learn about social organization can be questioned on several levels. The excavated tombs do not necessarily constitute a representative sample; and the limited data are inadequate to determine variation in the tombs attributed to sex before assigning different levels of social status.

These two points cast doubt on any assessment of the Jericho collection. Finally, there is the inappropriateness of describing prehistoric societies in terms of rigid evolution models (e.g. egalitarian) as noted above in the discussion of social organization.

Within the Jericho mortuary practices, Kenyon and Shay observed that variation is most obvious in treatment of the skeletons, tomb size and grave goods. Is there sufficient data to determine the factors responsible for these differences?

In all, 27 articulated primary interments, associated with average-sized tombs and a metal dagger were found; two skeletons with daggers were disarticulated. Only one articulated skeleton was submitted for analysis; it belongs possibly to a male. The disarticulated skeleton found in the same tomb is that of a female (Hughes 1965: 665). Unfortunately, the tomb did not contain a dagger and the findings do not comment on the sex of the articulated skeletons in general. Tomb L2, however, held two daggers and an older individual crouched and intact of undetermined sex.

There is little doubt that the articulated burials represent a different mortuary practice than the disarticulated burials. The former appear to result from a short, immediate burial ritual, usually associated with a metal dagger. The absence of containers implies a different ceremony than associated with the disarticulated skeletons which are often found with ceramic vessels and wooden trays. The sole exception is Tomb O4, in which an articulated crouched skeleton was found along with 18 vessels, 521 beads, and several metal objects. Of course, the Dagger type tombs might have held skin containers or basketry that have not been preserved. However, at Jericho, organic materials were often preserved and there is no evidence of their presence in these tombs. Instead, time, location and cause of death might have contributed to the distinction between articulated and disarticulated, primary and secondary burials.

Even if the primary burials belong to a group of males, the dagger need not be indicative of warriors; they could simply be the outward material attribute of a group distinguished by age and/or sex and as such, be more ceremonial or represent a status symbol that have been actually used to do battle. This is the situation encountered by Hodder (1982: 67) among the Baringo society in which the young males throughout the region carry two spears specifically as symbolic indications of their status in contrast with the older males who own cattle and women.

Alternative reasons for the variation in the disposition of the corpse and the grave goods could be the cause and location or season of death. Perhaps the articulated burials represent people who died near the site, whereas the disarticulated burials accompanied by a variety of grave goods, probably indicative of a funeral meal, could represent individuals who perished far away form the site at a different time of the year. The occasion of the secondary burial could have involved a special ceremony not in evidence for the primary burial.

In addition to the difference in treatment of the corpse, differences in tomb size and grave goods are obvious. For one group of tombs, the Outsize type, noted for their large size, abundant and varied contents and separate location, most of the human skeletons were submitted for examination of sex and paleopathological condition. In all, 18 Outsize tombs were excavated; each held one skeleton. Nine of the skeletons submitted for analysis demonstrate evidence of arthritis (Brothwell 1965: 687), in some cases, severe conditions. The association between this condition and old age is a common feature, although arthritis is not confined to people over any age. Minimal evidence of this condition was discovered in the Jebel Qa^{c}aqir population of 46 individuals, of whom 21% were over 50 years of age (Smith n.d.).

I would infer, not entirely without reservation, that the Jericho skeletons showing signs of arthritis belonged to the older segment of the population, especially where the symptoms were severe.

Inside the Outsize tomb chambers, the grave goods exceed anything found elsewhere in the cemetery. Many pots were placed in most of the tombs along with objects of wood and leather, beads, spindle whorls, animal bones, and a wide variety of metal artifacts including pins, awls, knives, bands, rivets, and plate metal. Metal objects were found in each of the 18 Outsize tombs and, while not unknown in other Jericho tombs, the overall abundance and wealth of the Outsize tombs is striking.

The distribution of animal bones in the Jericho cemetery is probably not fully presented in the publication; animal bones are recorded for 34 of the Jericho 356 tombs, of which 14 (41.2%) belong to the Outsize category. All bones belong to ruminants probably mainly the sheep/goat group (Grosvenor-Ellis and Westley 1965: 694). The high percentage of animal bones, the presence of metal objects in each Outsize tomb, and the large chamber size all imply a burial practices differing from the majority of the tombs.

Tombs not belonging to the Outsize category -- which are similarly well equipped with grave goods, are Tombs L2 and G88. The repeated occurrence of animal bones in the

Outsize tombs -- which apparently held the remains of the older segment of the population -- concurs with the Jebel Qa^{c}aqir findings. Variation in the Jericho tombs, then, as at Jebel Qa^{c}aqir can in part be attributed to age. Sex was not a determining factor at either site. One other instance in which animal bones were buried along with an older person at Jericho is Tomb G83A, which held an individual whose sacroiliac had fused (Brothwell 1965: 687), a condition again indicative of advanced years. Unfortunately, the estimated age of the deceased was not published.

Unlike at Jebel Qa^{c}aqir, where multiple burials are the rule, individual burials predominate at Jericho. This practice allows one to assume that the grave goods found in association were contributed at the same time for a single skeleton.

To determine the number of potters whose wares were placed together in each tomb, measurements of overall vessel proportions and the nature of the decoration were compared and contrasted for vessels from 15 tombs.

The Jericho ceramics discussed above reveal two patterns:

(1) Vessels cluster first according to size (small versus large) and then according to tomb context. Within Tombs O4, P12, and P22, the vessels show consistency of incised decoration and morphology, but for Tomb P24, there

is greater variation possibly attributed to the work of different potters.

(2) The smaller vessels cluster according to tomb, but some variation in this pattern was discerned for the tombs containing multiple interments.

Often, tombs containing small jars (rarely over four), held a lamp, a metal "pin," occasionally beads, but no animals were recorded. The evidence suggests that unless two individuals were present, the pots were usually made by one potter. For the Outsize tombs containing over four pots, in addition to animal bones, beads, metals and organic material, the evidence suggests that all pots were not made by the same potter, but either by potters working according to a specific micro-tradition or by potters working according to different work patterns. The abundance and variety of the tomb contents, the large tomb chamber, the animal bones, and the variation of the pottery imply the involvement of a large number of people in the mourning party for those buried in the Outsize tombs in contrast with all others. Tentatively, these individuals have been associated with the older segment of the population. The varying internal consistency of the pottery found in the tombs implies that the donor group was not random, but in part constituted a group of people who worked according to a similar micro-tradition in addition to potters who worked according to a different micro-tradition. This might imply that those buried in the Outsize tombs represent family or community leaders. It is not possible, however, to determine who contributed the other artifacts -- close kin members or not. Perhaps the immediate family was responsible for the ceramic containers and their contents whereas other offerings, the animals, metals, beads, etc., were provided by other community members.

Analysis of the metals and beads from the tombs contributes to an assessment of trade and interaction between the pastoral nomads and other communities, but for the present more questions than answers are available. Of the 35 metal artifacts analyzed, 83% were made of arsenical copper and 25% of a tin alloy (Khalil 1983: 777). The source of Near Eastern tin is an intriguing but unanswered problem (Muhly 1973, 1976). Studies of arsenical copper (Berthoud et al. 1980, 1982) are divided between those who write that arsenic was added to the copper or that it was native to the copper. Too little is known of the sources of each to make inferences about trade patterns.

As for the beads, Talbot (1983: 799) lists agates, chacedony, quartz, carnelian, calcite, frit, alabaster, clay and natrolite, but she does not comment on their possible origins. Most frit is associated with an Egyptian source, but these beads might have been brought to the site at an earlier period.

To conclude, both the Jericho and Jebel Qa^{c}aqir mortuary practices suggest differential treatment for the older segment of the population. Variation in tomb contents and construction within sites cannot be associated with any dimensions other than age. The work of individual potters was found in tomb chambers containing multiple burials at Jericho and Jebel Qa^{c}aqir. Tombs of individuals contain pots made by one potter or a small group of people working according to a single micro-tradition.

Between sites, differences in the ceramic assemblages, especially the small undecorated funerary jars found at Jericho and nearby sites but not at Jebel Qa^{c}aqir, suggest slightly different burial traditions for the two areas. Differences in the incised patterns on the ceramics serve to separate the two groups further. These differences in pottery types and decoration, and the preferential treatment accorded adults of advanced years, can be viewed as two dimensions of horizontal differentiation within the EB IV society.

It is suggested here that the disarticulated secondary burials of the community elders were designed to commemorate the deceased as well as to enhance the status of the mourners. The very practice of reinterments is understood to reflect the needs of the living more so than the dead.

Although Shay's analysis of the Jericho mortuary practices led her to infer an egalitarian social structure, the above study reveals that age alone accounts for the variation in tomb contents and construction. There is no available data on wealth distribution among the burial remains. Before inferences can be drawn regarding social structure, properly excavated tombs and complete analysis of the skeletal material is a necessity. In any event, mortuary practices alone are insufficient for examining the complexity of social organization. Additional dimensions are presented next.

Settlement pattern

A second indicator of social complexity is the nature of settlement types. A settlement hierarchy is discernable for the EB IV period, despite the small number of excavated sites. Six types of sites have been identified:

(1) Limited activity areas. These sites have not been identified archaeologically, but they probably existed along the migration routes. Animal kill and butchering sites, activities associated with hunting and gathering wild plants and animals, would be included in this category, for which the archaeological material correlates are extremely difficult to locate. Desert "kites" as depicted in the Jericho tombs, could well belong to this category.

(2) Cemetery sites. Tomb groups predominate over all other EB IV remains. In addition to the large number of tombs often found in groups, temporary housing might have once existed at these sites, where funerary rites and other social functions probably occurred.

The presence of animal bones among the grave goods might imply the congregation of a large number of people who participated in the funeral ceremony and fulfilled various social obligations.

At Dhahr Mirzbâneh and Efrat, sheep/goat remains were encountered in the tombs, although no settlement debris was found in the vicinity. At Efrat, large, thick-walled bowls rarely found with tomb wares hint at domestic occupation.

Both large cemeteries and isolated tomb groups are known, but it is premature to use tomb counts as a criterion for sub-dividing burial sites. Most of the single tomb sites were found as a result of construction work, and larger burial grounds may have been neglected or overlooked.

(3) Multi-purpose sites. In addition to the isolated tombs and large cemetery sites, other burial grounds belonged to multi-purpose sites. At Jebel Qa^{c}aqir, Tell Beit Mirsim, Lachish, and Wâdi ed-Dâliyeh caves containing domestic debris imply seasonal use of the site for habitation and/or storage. Except for Wâdi ed-Dâliyeh, tombs have been identified and excavated at each site.

Part of the population may have used the caves year round, while the others migrated with the animals. Temporary dwellings may have been erected to accommodate the full group at seasonal meetings.

Other activities at Jebel Qa^{c}aqir include food and/or skin processing, as attested by the innumerable cupmarks hewn into the exposed bedrock throughout the site. These artificially carved depressions hint at a substantial operation.

The kiln at Jebel Qa^{c}aqir, if datable to the EB IV period, reveals another activity, as does the crucible found in the dump site, Cave G23. While no other evidence of copper working was identified, we cannot exclude the possibility that the metal was in part processed locally. Whether or not the metal artifacts found in the tombs were locally made requires further testing.

The cairns or tumuli represent another aspect of Jebel Qa^{c}aqir's multi-purpose use. A slab-built, rectangular construction covered with a pile of stones could belong to the funerary apparatus, as has been suggested. Also for the cairn found at Beer Resisim (Cohen and Dever 1980: 52). In the northern Sinai sites of Jebel Lagama and Wadi Mushabi, several large occupational sites were surveyed by Clamer and Sass (1977). In addition to circular structures of stone, there were cairns or tumuli and several tumuli were associated with a rectangular platform below (Ibid.: 248).

At Beer Resisim, round stone structures surrounded by open work spaces imply summer residence in addition to the cairns on an adjacent hilltop. No cemeteries were identified in the survey of the region. More recently, R. Cohen (1984: 78) found an EB IV settlement near the southern bank of Nahal Nissana. Round rooms, cairns, and animal pens were recorded in the preliminary report. Also in the Negev, west of Mitspe Ramon, M. Heiman (1984: 82) recorded round structures and EB IV pottery at three separate sites.

(4) Permanently occupied sites. This category includes Jericho in the south, and perhaps Megiddo and Tell el-Hayyat in the north. At Jericho and Megiddo, permanent water sources provide the basic requirement for permanent settlements. Domestic debris at Jericho and Tell el-Hayyat reveals long-term and perhaps permanent settlement. Habitation debris was not identified at Megiddo when the site was excavated some 50 years ago, but it is quite possible that the Megiddo excavators overlooked the ephemeral EB IV habitational settlement. The elaborate tombs at Megiddo containing pottery associated with a Syrian origin imply strong northern connections. The site could well have maintained a strong relationship with the Syrian centers, given the strategic position of Megiddo.

(5) Agricultural communities. In addition to the urban centers, the Syrian hinterland probably included rural agricultural communities with whom the pastoral nomads exchanged goods. Evidence that the people of southern Israel reached the Syrian agricultural communities is lacking, apart from a few sherds of Syrian type, but this level of the settlement hierarchy cannot be overlooked. Mazzoni (1985: 15) views the area of Israel as part of the Syrian hinterland. From her northern perspective, she adopts a position similar to that expressed here.

(6) Syrian cities. At the highest level in the settlement hierarchy stand the Syrian cities such as Tell Mardikh. These permanently occupied centers belong to the social and cultural milieu of the pastoral nomads perhaps as much as the agrarian centers listed above. Ultimately, the tribal nomads reacted and responded to events and pressures exerted by the urban core.

Ability to organize labor

Another characteristic that reflects social complexity is the ability to organize labor. The only manifestations in EB IV might be the construction of dolmens, cairns and perhaps the desert kites. The two large rectangular structures at Beer Resisim (23 by 6.7 meters and another 14 by 6.5 meters) might also attest to communal work projects.

Craft specialization

Part-time craft specialization is another feature of complex societies (Peebles and Kus 1977: 438). The EB IV metal work provides a possible example of craft specialization, in contrast with the household production of pottery. The requirements of metal working are more elaborate than pottery making and involve the identification of sources and the procurement of raw materials of limited distribution. The nature of the products (weapons and ornaments) and their similarities over long distances from southern Israel to northern Syria argues for an industry controlled and maintained by a small number of people. It is pertinent that metal working is a trade associated with nomadic peoples such as those we have postulated for EB IV Palestine.

Irons (1979: 365) and Lefebure (1979: 2) note that household production is the norm for pastoral nomads. During the EB IV period, this level of production appears to have characterized the pottery, but not the metal. There is no reason to assume that all crafts would have involved specialists. Another part-time craft occupation may have been tomb-digging, which involved a considerable energy expenditure.

Long distance trade

This is difficult to document, in the absence of provenience testing of metals, ceramics, and other objects.

One "gray teapot" sherd found at Beer Resisim identified as a Syrian import (Cohen and Dever 1981: 63) proved to be mineralogically distinct from all other Beer Resisim sherds. Neutron activation analysis conducted at the Hebrew University by J. Gunneweg (n.d.) separated this sherd from all ceramics known to have been made locally in Israel or Cyprus.

The presence of sea shells in the Jericho tombs is clear evidence of a Mediterranean or Red Sea origin. Red Sea shells were also found at the Negev site of Beer Resisim (Cohen and Dever 1981: 63). This represents an important area for future investigation, as does the source of metals (copper and tin) and the beads.

Late third millennium B.C. social complexity

The difficulties in measuring social complexity are many; yet independent sources may reveal dimensions of social structure when considered together. The aim here has been to examine data on mortuary practices, settlement patterns, and labor organization. Settlement patterns prove the most useful. A landscape of villages and temporary sites, in addition to the towns and cities further north, has been recognized only in the past decade of archaeological excavations.

Modern ethnographic and ancient epigraphic sources provide ample evidence of interaction among pastoral nomads, agriculturalists, and urbanites. These findings imply that any assessment of social structure profits by considering all people of the region as part of a single entity, comprised of many parts, which together constitute a complex society.

In addition to taking a regional perspective, the period as a whole must be dealt with in historical context. The EB III urban centers are characterized by their massive defense systems, mass burials, and homogeneous material culture produced by craft specialists and meager foreign trade contacts (Weinstein 1984). Few EB III sites have been excavated, but at Tel Yarmut P. de Miroschedji (per. com. 1984) has found evidence pointing at collapse. In one area, immediately inside the gate, the uppermost EB IIIB levels reveal a reorganization of space: above a well-built construction of finely-built hewn stone (perhaps a temple or public building) smaller rooms were constructed of rough stones. This may suggest a breakdown of urban institutions.

The collapse of the EB III urban centers and the shift of population to the marginal zones is well documented. The question here is not the cause of the collapse, but rather the resulting social configuration. Although the geographical distribution of the population and land use differ drastically for the EB III and EB IV periods, this does not imply an entirely new social structure.

In our need to classify and categorize, the differences between sedentary and non-sedentary lifestyles have been emphasized, yet often we are describing two aspects of one society, or even one family. Ancient texts and ethnographic data imply a close association between settled and migratory people. Each group not only relies on the other, but the two belong to the same ethnic or kin groups. Fluidity between the two seemingly divergent groups is well-attested ethnographically and epigraphically.

Little is known about EB III non-urban settlements. Our archaeological bias focuses attention on urban environments, to the neglect of their hinterlands. EB III villages and non-sedentary communities must have existed; at Beer Resisim, red burnished EB III sherds (Cohen and Dever 1980: 58) and at Arô^{c}er in Transjordan (Olavárri 1969: 232) imply EB III or EB IV site use. In Transjordan, Bâb edh-Dhrâ^{c} and Khirbet Iskander are only two examples of EB IV rural settlements. Transit stations of pastoral nomads remain undetected.

Rather than viewing the pastoral nomads of the EB IV period as a new phenomenon, we can understand them in terms of the reemergence of kin-based groups whose identities were masked but never eliminated by the urban material uniformity.

With the collapse of the urban centers the society "decomposed" into its many parts, of which the pastoral nomads and their sedentary kin represent an indivisible entity. In an exhaustive study of the collapse of ancient Mesopotamian civilization, Yoffee (n.d.: 40) notes that the Mesopotamian empire of the late third millennium B.C. consisted of:

> subassemblies of city-states put together into larger subassemblies which could then constitute an empire. In the collapse of such systems, the products of dissolution would not fall to zero, but into one or the other layer of subassemblies that constituted the larger whole - depending on the specific reasons and the magnitude of the collapse.

On a smaller scale, this same scheme is appropriate for the late third millennium B.C. in Israel. Here, however, we are dealing with the decomposition of city-states rather than empires. We do not know the cause of the collapse, but its magnitude was immense and coincides with the reemergence of village and non-sedentary lifestyles. Neither village agriculturalists nor pastoral nomads represent a new phenomenon -- merely the breakdown of a system into its original components.

Coincident with a breakdown of this magnitude and major political change, the need for group affiliation and identification emerged (Uchendu 1982). For the EB IV period, group affiliation is expressed in the regional differences of pottery forms, surface finish, and incised patterns. The geographical distribution of each ceramic style coincides with new political and/or economic boundaries, or the "emblemic style" as defined by Weissner (1983: 6). Within each site, variation of incised patterns not attributable to vessel size or form reflects individual work ownership and/or the "assertive style" described by Weissner (Ibid.).

There is no evidence to suggest that the boundaries defined by the pottery were static or that people and products did not cross. Seasonal encampments described in ethnographic accounts are known to involve groups of people who might ordinarily follow different migration routes (Salzman 1982: 50-1). Furthermore, the metals, exotic beads, and pottery reveal evidence of the movement of goods, if not people as well.

The need to assert group affiliation through material culture at this juncture between urban societies differs greatly from the EB III and MB IIA periods, during which craft specialists throughout Palestine produced a more or less homogeneous ceramic repertoire. To differentiate their wares, potter's markers (as at Tell Yarmut) were used, whereas the incised patterns and vessel morphology served this same purpose for the domestically produced EB IV wares.

This is not to imply that kin affiliations were erased in the urban environment and its hinterland, but they were less visible. The relative prominence of horizontal distinctions, especially kin-related groups serves as one measure of social complexity and contrasts with the EB III.

Just as EB III society decomposed into its constituent parts, these same entities provided the building blocks to recreate the MB IIA urban landscape of cities, as at Aphek (Kochavi, Beck, and Gophna 1979), Gezer (Dever per. com. 1985), Megiddo (Loud 1948), Tell Beit Mirsim (Albright 1956), and Jericho (Kenyon 1966), as well as villages (Falconer and Magness-Gardiner 1984; Gophna and Beck 1981).

For the MB IIA period, unlike the EB III age, settlements of various types are known and illustrate the complexity of society. This very complexity contributed to the flexibility and resilience of a society bordered by the sea, the desert and two ancient empires. Adams (1978: 334) describes resilience as a strategy for survival in periods of instability. The objective is to avoid over-concentration on any one subsistence strategy, a pattern of behavior best accommodated by the tribally organized pastoral nomads and their sedentary kin. While not achieving the grandeur of the neighboring Egyptian and Mesopotamian empires, the diversity assured continuity and survival.

CHAPTER 7

CONCLUSION

In tracing the history of ceramic analysis in Israel through the five periods defined above, it becomes clear that research of the 1980's owes much to the typological/ chronological studies of the past hundred years. The comparative ceramic analyses have enabled archaeologists to place sites throughout the country into a single chronological sequence, thereby providing an initial ordering of the material culture on which all further work advances.

The two major problems confronting scholars for decades involved the identification of ancient sites with biblical place names and the description of the local culture history. The historical framework for the archaeological evidence was constructed from events described in the Old Testament. The typological, descriptive pottery studies provided a workable ceramic chronology, the refinement of which can be a never-ending task. Interesting and provocative questions were raised regarding the material culture and the sites, but the typological work proved insufficient for addressing non-temporal issues.

Archaeologists are increasingly searching for information about ancient societies and past human behavior for which new types of data collection and analyses are required. The investigation of various aspects of social organization has characterized American archaeology for over thirty years (Martin and Rinaldo 1950; Tshopik 1950; Willey and Sabloff 1980) and these same issues are gradually coming to the attention of archaeologists working in Israel. The gap between anthropological-oriented archaeology and classical and Near Eastern archaeology noted earlier by Taylor (1967: 9), is currently a topic much debated (Dever 1980a, 1981b, 1983; Dyson 1981, 1982; Renfrew 1980; Sabloff 1981; Wiseman 1980, 1983). Most would agree that the schism must be bridged for mutual benefit.

With the emergence of Israeli archaeology as an entity distinct from Old Testament studies, the reconstruction of the past can be approached from a new perspective, based on material culture studies and the potential wealth of non-chronological information retrieved from ceramics can facilitate an entirely new interpretation and understanding of events depicted in the Old Testament.

Theoretically, the juxtaposition of archaeology and Old Testament studies should allow the archaeologist to reconcile and mitigate the biases for each discipline. This can only be achieved once archaeologists begin to design excavation projects to clarify issues other than those of chronology and local culture history in the narrowest sense.

Anthropologically-oriented archaeology differs from archaeology as culture history not only in its concern for reconstructing ancient societies and human behavior, but by its concern for developing new methodologies and techniques of retrieving information to investigate problems of social organization and social change. As noted above, to resolve problems related to trade, the organization of the ceramics industry, and its broader implications, laboratory studies were sporadically used alongside traditional typological analysis since the 1930's. In Israel, these studies, which have been the exception rather than the rule, involved analyses of fingerprints (Badè 1934), ancient ceramic technology (Kelso and Thorley 1943; Matson 1965a, 1965b; Hammond 1964; Franken 1971, 1973, 1974; Franken and Kalsbeek 1969, 1975; etc.), and provenience testing (Hennessy 1967; Perlman, Asaro, and Frierman 1971; Slatkine 1974; Tufnell et al. 1940; among others).

The type of ceramic analysis undertaken, be it typological, provenience or technological, is determined by the nature of the questions to be addressed. A typological ordering of sherds suitable for the chronological ordering of assemblages and sites, cannot resolve the questions of inter- and intra-site variation, trade, or the organization of the ceramics industry. New strategies are needed to deal with such topics. The collection of artifacts from a site requires more than accumulating selected remains. Information on the material culture must be collected with the intention of answering specific questions raised prior to the excavation.

As with any new methodology, a test case is needed to demonstrate its utility, and the Jebel Qa^{c}aqir collection provides such an opportunity. A systematic study of the pottery, in addition to human and animal skeletal remains, can furnish evidence of social organization and past human behavior useful for reconstructing ancient society.

Historically, pottery studies have concentrated on homogeneity of contemporaneous material. The present study differs from traditional ceramic analyses in three ways: (1) the emphasis is on non-chronological issues; (2) rather than searching for uniformity and homogeneity between the assemblage and contemporaneous sites, variation is stressed both within the assemblage and among nearby sites; and (3) it is assumed that the collection results from a variety of cultural formation processes producing a complex depositional history which itself warrants examination before any other work is considered.

The purpose is not to neglect chronological issues, but to build on the research of the past century devoted to this endeavor. One result of the study in fact concerns the relative date of the domestic and funerary material. Since no one questions the late third millennium B.C. date of the material and no one questions that the morphological and decorative features of the pottery belong to the EB IV style, the primary question here is how does the assemblage <u>differ</u> from contemporaneous material? Rather than attempt to demonstrate similarities with other collections, what distinguishes the site from nearby Jericho, el-Jib, Dhahr Mirzbâneh and Khirbet el-Kirmil? What differentiates the tomb material from the domestic debris within the site? What differences are detected in pots found in each tomb and throughout the cemetery? Finally, how do these findings contribute to our understanding of EB IV society? These are not questions easily answered, but only by raising them can we collect the data needed to address them.

Material from Jebel Qa^{c}aqir, unlike most EB IV assemblages, includes domestic as well as funerary wares, thereby providing an unprecedented cameo of EB IV society. Before examining variation within the ceramics, the first task of assessing the depositional history of each deposit proved essential.

There is no question that the tomb wares were deliberately placed in the burial chambers; some pieces appear never to have been used. But to determine the depositional circumstances of the whole or reconstructable pots and sherds from the caves requires creative strategies due to the nature of the material and its complex history. Vessel reconstructability, sherd size, artifact diversity, wear, and abrasion were examined for each deposit.

The complete and reconstructable pots in Cave G26 evidently represent the deliberate deposit of usable containers, but the sherds could have entered the cave before, during, or after placement of the complete jars. The size, wear, and design patterns of the sherds differ from the jars; accordingly, they deserve separate consideration in any analysis of the cave contents.

The unreconstructed, but apparently complete jars of Cave G19, constitute another deliberate assemblage based on sherd size, degree of reconstructability (or the number of sherds per jar), and wear. Consequently, the material within each of the two caves can be compared for internal consistency and then compared against each other. If all jars differ in overall vessel proportions and decoration, or if they are similar to each other, but different from others at the site, we can draw various inferences.

For the sherds from dump site Cave G23, which in part if not entirely resulted from repeated cleaning of the area in EB IV times, there is a correlation between sherd weight and count. Both measures produced almost identical results, suggesting that either measure is suitable for quantifying wares of virtually uniform thickness. In this deposit, as in Caves G19 and G26, sherd size frequency co-varied with the degree of vessel reconstrucability, implying that both values help to differentiate and define depositional events. Large sherds characterize nearly one-third of the reconstructable vessels of Caves G19 and G26, whereas medium-sized sherds represent 3/4 of the dump debris. These findings allow one to make more precise inferences regarding the depositional process which is a first step before analyzing any assemblage.

Until we can determine with some measure of certainty events culminating in the deposit of artifacts, we make the assumption that everything found together represents a deliberate, contemporaneous collection. Traditionally, a sherd might be described as "intrusive" if its appearance in a deposit poses chronological problems. Otherwise, all pieces found together are dealt with as a single entity, yet this is a vexing issue that deserves attention. Minimally, archaeological reports could indicate which vessels were found whole, reconstructable, fragmented, or as sherds to provide some indication of the depositional history. Often it is difficult to retrieve such information from the descriptions of the fill or the artifacts.

For the present study, sherd size, degree of reconstructability, wear, abrasion, and artifact diversity (see above) were recorded to ascertain which deposits were intentional assemblages. One deposit each in Caves G19 and G26 represent deliberate deposits, but the sherds of G23 do not constitute reconstructable vessels - merely the remains of discarded pots.

Since the pottery in Cave G19 and G26 are purposeful collections, it is legitimate to compare the two groups. Ideally, it would then be instructive to contrast domestic and funerary material to determine the contemporaneity of the two assemblages and to infer use of the entire site by the same people. Although it might seem most reasonable for both to be contemporaneous, this is a critical question for several EB IV sites where it is assumed that the domestic material post-dates the cemeteries, as at Jericho, Beth-Shan, and Megiddo.

How then do the funerary and domestic material compare? Tomb wares tend to be small closed jars and amphoriskoi in addition to lamps, whereas large jars, cooking pots, bowls, and lamps characterize the domestic wares. Therefore, the two contexts contain complementary assemblages making it inappropriate to determine their relative chronology by comparing vessel forms. Further, it appears that small closed vessels tend to have individually incised elements (stipples, slashes, and punctates) more often than large jars, on which continuous patterns (horizontal and multi-directional combing, as well as individual horizontal lines) predominate.

Here we have one of the best examples of a special category of funerary pieces distinct from pots in daily use. None of the funerary pieces are of inferior quality, but were either used pots selected for their small size and form, or were made specifically for inclusion in the tombs. At Jericho and Dhahr Mirzbâneh, special funerary wares apparently made for each interment reveal the common practice of creating pots for specific funerary use as well.

At Jericho, Kenyon not only dated the cemetery earlier than the tell debris based on differences between the assemblages, but she also inferred that the relatively late date of the domestic material was a result of the nomadic life-style of the invaders who destroyed the EB III urban centers for which they had no need. The Jebel Qa^{c}aqir findings invalidate any comparison between domestic and funerary wares for chronological purposes and similarly invalidate Kenyon's reconstruction of events.

Here we see a limitation of ceramics for resolving chronological problems because the comparison involved pottery from two different contexts - domestic and funerary. This would suggest both the benefits of comparing similar deposit types as well as first determining their depositional history.

Consequently, it is appropriate to compare and contrast pots found in: (1) the various tombs; and (2) the caves used for occupation and/or storage. How do the domestic jars from Cave G19 and G26 compare with each other? How do pots from different tombs compare and how similar or different are pots found in one tomb?

To address these and other questions, one method involved identifying the work of individual potters. Ethnoarchaeological and experimental work formed the basis of this analysis. The work of individual potters and/or microtraditions has been differentiated in recent ethnoarchaeological research by measuring morphological and decorative features. Furthermore, my experiments to make the EB IV repertoire allowed me to identify potential sources of variation emanating from the choices presented to the potter throughout all stages of manufacture and decoration. A combination of various vessel measurements, nuances of manufacture and decoration would ideally allow differentiation of the work of "analytical individuals."

Prior to assigning pots to different potters, I considered all possible sources of variation of the finished product. As noted above, within each vessel form, different rules apply regarding decoration. Therefore, large jars of one potter might bear a different decoration than amphoriskoi of the same potter. Second, not all variation of the incised patterns can be attributed to chronological differences, but are in response to vessel form and size. Third, by comparing vessels of similar form, co-variation of decorative and morphological features should reveal the work of distinct micro-traditions or the "analytical individual."

As a result of the quantitative analysis, several of the large jars in Cave G26 proved to be almost identical in size and all but one have two horizontal combed bands. Overall vessel proportions are remarkably uniform, as if all but one were made according to one micro-tradition. For the jars of Cave G19, a correspondence between vessel shape, size, clay, and decoration allowed the differentiation of two distinct micro-traditions or "analytical individuals." Finally, the consistency of the pottery made by these domestic potters contradicts the idea that the work of craft specialists will always demonstrate a higher degree of standardization.

To turn to the funerary wares, two important findings emerge:

(1) the work of more than one potter was deposited in tombs containing multiple interments; and

(2) vessels formed by one micro-tradition were found in tombs throughout the cemetery.

What can we infer from this evidence regarding use of the cemetery? Who were buried together in the multiple tombs? Do the mutiple burials contain members of a nuclear family who were buried over a long period of time? Or were there seasonal burials of all members of the extended family who used or visited the site? Or were they unrelated people?

The relative homogeneity of the ceramic objects rules out the last possibility and implies the non-random character of those interred at the site. It is assumed that the site was used seasonally by pastoral nomads. All evidence suggests that the same people returned to the site. Perhaps part of the population remained year round, but the evidence is meager.

Reopening of the shaft entrance once the limestone slab doors were in place has been rejected by all archaeologists, thus mitigating against the possibility that the burial chambers were family tombs unsealed each time a member of the nuclear family died. Instead, it is more plausible that members of the extended family were deposited in the tomb following an initial ceremony at the site or elsewhere.

At Jebel Qa^{c}aqir and other late third millennium B.C. sites, cairns holding a variety of EB IV metal and ceramic objects in addition to animal bones (sheep and goats) and human bones could represent the initial stage of the mortuary practice. First the corpse was placed under a pile of stones along with artifacts to allow disintegration of the flesh and soft tissue (one or two months at the most). Eventually the disarticulated skeletons, pottery, metals, and animal bones were collected and redeposited in a burial chamber. All those who died along the migratory route and at the site were first deposited in the cairn and perhaps toward the end of the season, all were buried together in a single tomb containing pots and other artifacts presented by the various mourners. In some tombs, the skeletons lay on a bed of stone chips, perhaps reminiscent of the cairn ceremony.

Individual burials are not unknown at Jebel Qa^{c}aqir, although they are the norm at Jericho. Two individual burials at Jebel Qa^{c}aqir belong to skeletons aged 50 plus. People over 50 years of age represent over 25% of those buried in the cemetery suggesting that secondary burials were either more often reserved for the older segment of the population, or that the sample is skewed, or both. The low percentage of infants and children implies that they did not receive the same treatment as adults. The low percentage of adults aged 20-39 (12.8%) might reveal a pattern of preferential treatment for those over 50. Perhaps only the older people who died along the migratory route were returned to the family burial ground and the younger people in the cemetery are those who died at the site. If part of the group lived year round at the site, and if secondary burials represent those who died at the site, it is most feasible that the older people comprised the permanent inhabitants of the site.

The death of a community elder could have involved inheritance of wealth, status, and power and thereby would have been of considerable significance to the mourners and other survivors. To mark the occasion and to assert new leadership, animals were slaughtered. In both individual burials of a male and female over 50, animal bones were found, suggesting that men and women received similar burial treatment.

To test some of these findings, the Jericho cemetery was selected due to its large size, wide variety of tomb types, and abundance of funerary artifacts. Similarities and differences between the two sites serve as a useful comparison. At Jericho individual interments characterize over 350 tombs and multiple burials are rare. One tomb type, the "Outsize" category, contained a wealth of artifacts unlike anything found at Jebel Qa^{c}aqir. Site use might account for these differences: Jericho may have been permanently occupied by a sizable number of people, whereas Jebel Qa^{c}aqir was seasonally used or at most, was inhabited year round by a small number of people. Individual burials might coincide with a permanent settlement.

As for tomb contents, two issues were examined for the Jericho material: (1) preferential treatment of the older segment of the population; and (2) identification of the work of individual potters. Specific age data are unavailable for many Jericho skeletons and all published results are totals of all third and second millennium B.C. data. However, the pathological study reported symptoms of arthritis present among many skeletons exhumed from the Outsize tombs, possibly signalling that these well-equipped large tombs were reserved for the aged. This inference is tentative, but perhaps implies preferential treatment for a small segment of community elders, both male and female. The relatively small number of elders so honored suggests that age alone might not warrant special burial practices and that other achievements, such as economic and/or political power, appear to have been considered as well.

The high incidence of animal bones in the Outsize tombs likewise concurs with the Jebel Qa^{c}aqir findings. Animal bones constitute a grave good of considerable value given the pastoral economy in which animal herds represent a substantial source of wealth. Additional evidence of their importance is inferred from their repeated depiction on pottery (at el-Jib) and in tomb graffito (at Jericho). In this sense, animal bones can be considered as valuable as the metal artifacts of copper and bronze buried in the tombs.

Ceramics found in the Jericho tombs reveal four patterns based on an analysis of vessel measurement, decoration and the appearance of handles:

(1) pots in small tombs with one skeleton cluster implying manufacture by one micro-tradition;

(2) pots in small tombs with two skeletons form two clusters implying manufacture by two micro-traditions or analytical individuals;

(3) pots in different tombs (small or Outsize) cluster together implying that the work of one analytical individual is dispersed throughout the cemetery; and

(4) pots in the Outsize tombs (individual burials) either all cluster together or form distinct clusters, implying that some contain the work of one micro-tradition while others have additional sources.

These findings confirm the pattern discerned at Jebel Qa^{c}aqir and further demonstrate the cross-cultural value of ethnoarchaeological research. The work of individual potters can be distinguished in both ancient and modern pottery using the same criteria.

More specifically, the results provide a diverse, yet consistent picture of EB IV mourning practices. Usually a small number of people contributed ceramic goods. Following an initial cairn ceremony, the disarticulated skeletons and artifacts were collected and redeposited in a tomb chamber. Secondary burials appear to have been more common for the older segment of the population who occasionally received preferential treatment with regard to grave goods and tomb size.

How do these and other findings reflect on late third millennium B.C. society as a whole? Studies of site assemblages are most valuable if they can contribute to the overall reconstruction of ancient societies, both locally and regionally.

Locally, the Jebel Qa^{c}aqir assemblage differs from nearby sites in the relative frequencies of the incised patterns found on closed vessels. Horizontal band combing and various combed patterns characterize incised southern wares, but each site can be differentiated by the percentage of specific patterns. These quantitative data suggest the close relationship among the people at each site who nevertheless differentiated themselves from each other.

At present, we lack the means to determine the precise contemporaneity of each site and we do not know which overlapped chronologically. There is no basis to assume that none were contemporaneous. On the contrary, the subtle differences of vessel proportions and the incised patterns suggest that these variables signified ownership of land and property among contemporaries. Each pot embodied a code decipherable on several levels: as the work of an individual; as the property of a family; as the territory of an extended faily or larger group. Messages encoded in the pottery and perhaps other artifacts (clothing, basketry, skins, and bone) relayed different information to different people.

Regionally, an emphasis on migratory animals (caprines), the lack of agricultural material correlates, and the predominance of sites in the marginal zones of Israel characterize a pastoral nomadic society. Yet the pastoral nomads did not exist in a vacuum. Mesopotamian texts and modern ethnographic studies repeatedly reveal interaction between sedentary and non-sedentary communities throughout history. Often members of the same family belonged to each community.

Archaeologically, little evidence of trade or interaction between sedentary and nomads exists other than a hint of trade in beads, metal, pottery and basalt. Indirect indication of exchange is suggested by the lack of agricultural material correlates at EB IV sites in southern Israel. What was the source of their grains? Few if any nomads rely on animal products alone; most barter with agriculturalists or part of the nomadic population practices agriculture.

If agricultural produce was obtained in part from sedentary people, the dearth of evidence is not unusual. Archaeologists tend to ignore local exchange, i.e. between different geographic zones within Israel, and emphasize long distance trade and foreign contacts. This is understandable since the foreign objects often serve as important chronological markers, but to stress foreign trade to the exclusion of local trade is unrealistic, especially if non-chronological issues are to be addressed. Exchange among the diverse geographic regions of Israel was inevitable and merits our attention. We can now redirect our interest away from purely chronological problems and exotic imported artifacts to focus on the more mundane objects of daily life. The results will provide a new perspective on ancient societies as well as new chronological insights.

I would propose that the pastoral nomads are not a new phenomenon of the EB IV period, but despite the dearth of archaeological evidence, pastoral nomads were always a part of the urban hinterland and rural landscape. Our urban bias results in a research strategy guaranteed to minimize rural settlements. Continuity between EB III and EB IV, and later the second millennium B.C. rural communities cannot be underestimated until such sites have been excavated.

Social inferences can be drawn by relying on independent factors. The complex nature of EB IV society, as demonstrated by the settlement hierarchy, interaction between non-sedentary and settled people, craft specialization, and trade, is best understood in its regional and historical contexts. With the collapse of EB III urban centers, the country was not emptied of its inhabitants, nor was it populated by outsiders. The heterogeneity of the physical and social landscapes assured continuity of the non-urban communities. The close proximity of the mountains, plains, coast, and semi-arid zones induced a highly divergent pattern of subsistence strategies throughout history. At times, urban centers served as focal points, but at crisis periods, villages and a non-sedentary life-style reappeared as the most viable means of survival. The stability, versatility, and resilience of the ever-present non-urban society assured cultural and social continuity. Accordingly, the society of pastoral nomads and villagers is a well-established tradition often camouflaged by the urban facade.

Any attempt to place Jebel Qa^{c}aqir in its regional setting requires consideration of events throughout the Near East. New excavations in Jordan have begun to reveal more than seasonal sites and in Syria, urban life persisted uninterrupted from the EB III. Recent discoveries of the Eblaite culture reveal an unexpected wealth of late third millennium city-life. Settlements of a permanent nature may once have existed at Jericho, Megiddo, Beth-Shan, and other _tell_ sites in Israel, but most were either excavated too long ago or in too limited of an exposure (or both) to discern the EB IV strata. New hope comes from the excavation of the urban and rural settlements of Jordan and Syria as well as renewed exploration of the marginal regions of Israel.

The traditional role of ceramics for chronology has its limitations, yet the past century of research has laid the foundation for all current studies. The new directions proposed here offer an exciting potential to learn about people. One of the new tools is ethnoarchaeology whose contribution toward decoding the material culture throughout history has only just begun.

APPENDIX A

POTTERY DRAWINGS

Fig. A.1. Tombs B43 (1); B45 (2); B46 (3); B50 (4,5); B51 (6-9,11); and B53 (10).

Fig. A.2. Tomb B54 (1-14).

Fig. A.3. Tombs C3A (1-5) and C3B (6-8).

Fig. A.4. Tombs C4 (1-6); C1 (7, 8); and C13 (9, 10).

Fig. A.5. Tombs C5 (1-6); C6 (7, 8); C9 (11-15); and D1 (9, 10).

Fig. A.6. Tombs E1 (1); E2 (2, 3, 5, 6); and E4B (7-9).

Fig. A.7. Agagir tombs 1 (1-4); 2 (3, 6); and 3 (7-10).

Fig. A.8. Agagir tombs 4 (1-7) and 5 (8-12).

Fig. A.9. Cave G19.

Fig. A.10. Cave G23: closed forms.

Fig. A.11. Cave G23: open forms.

Fig. A.12. Cave G26: Phase A (1-3) and Phase B (4-10).

Fig. A.13. Cave G26: Phase B.

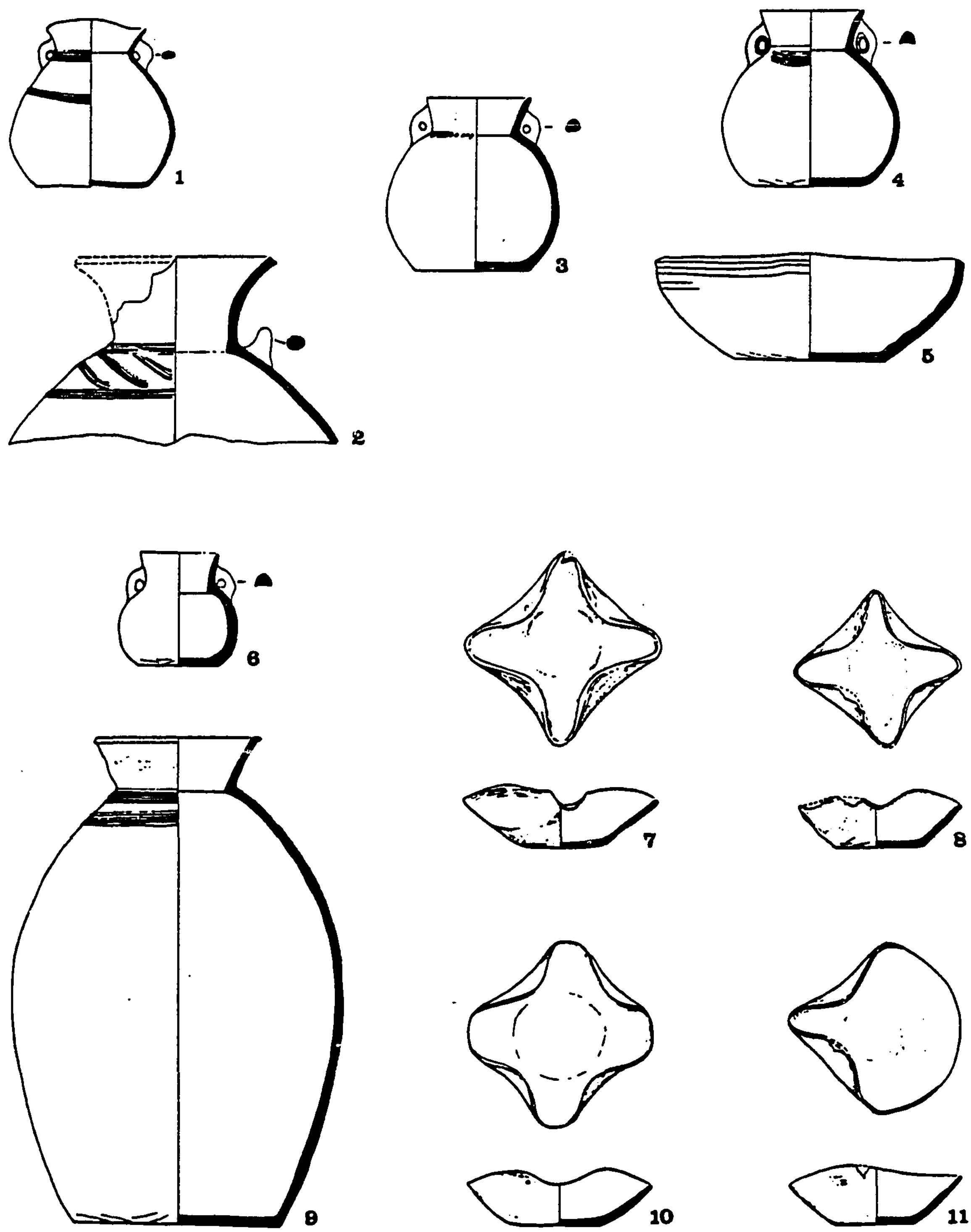


Fig. A.1. Tombs B43 (1); B45 (2); B46 (3); B50 (4,5); B51 (6-9,11); and B53 (10).

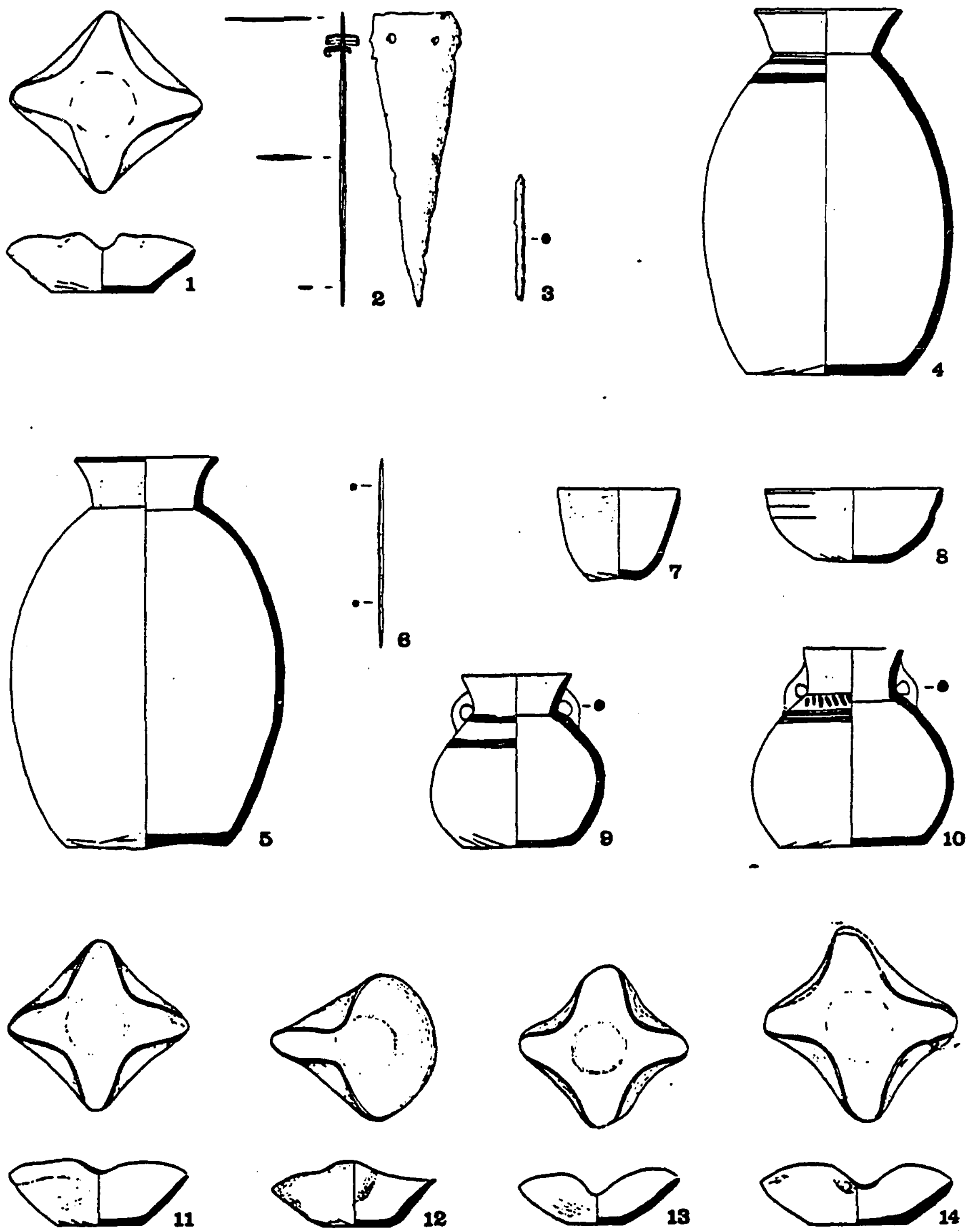


Fig. A.2. Tomb B54 (1-14).

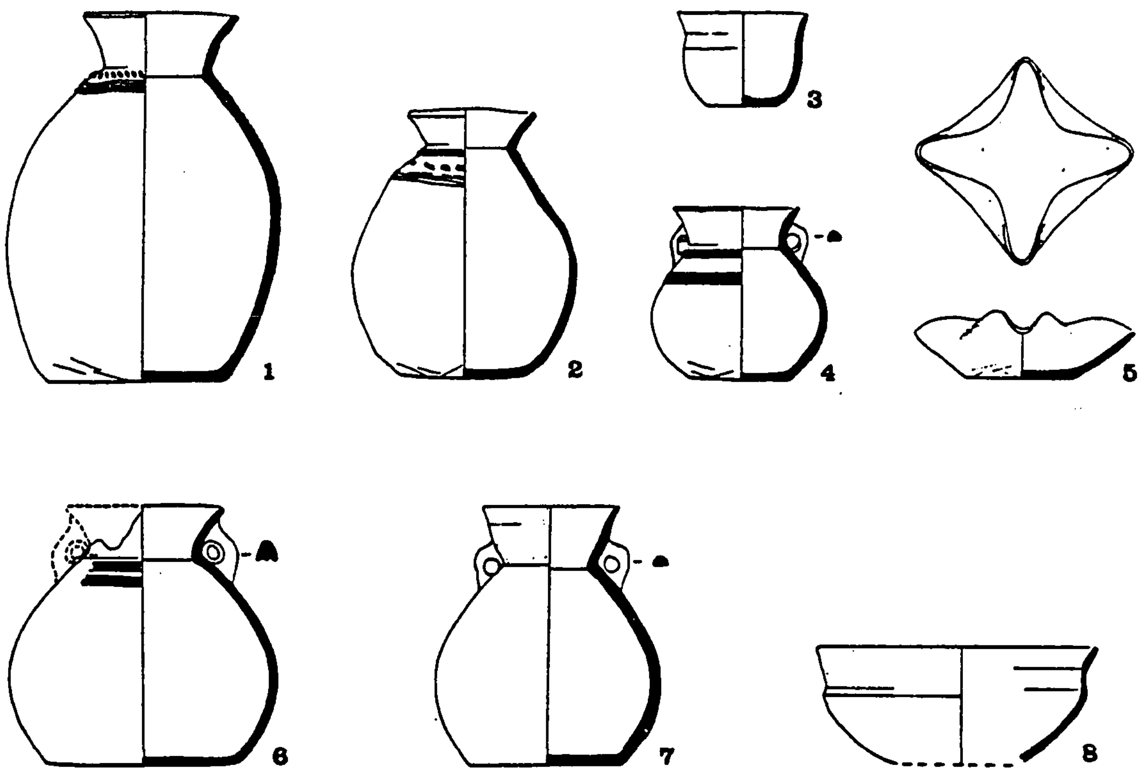


Fig. A.3. Tombs C3A (1-5) and C3B (6-8).

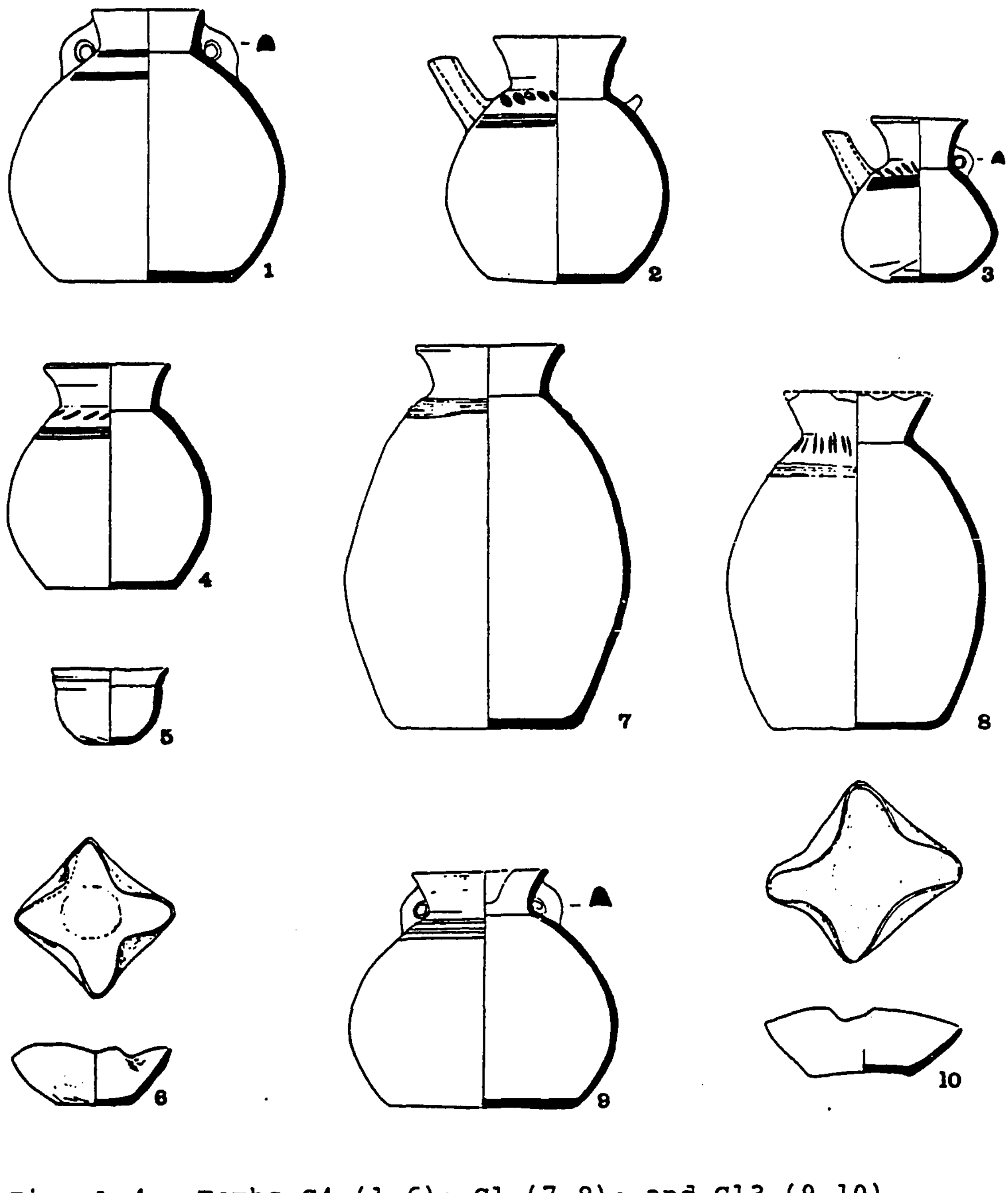


Fig. A.4. Tombs C4 (1-6); C1 (7,8); and C13 (9,10).

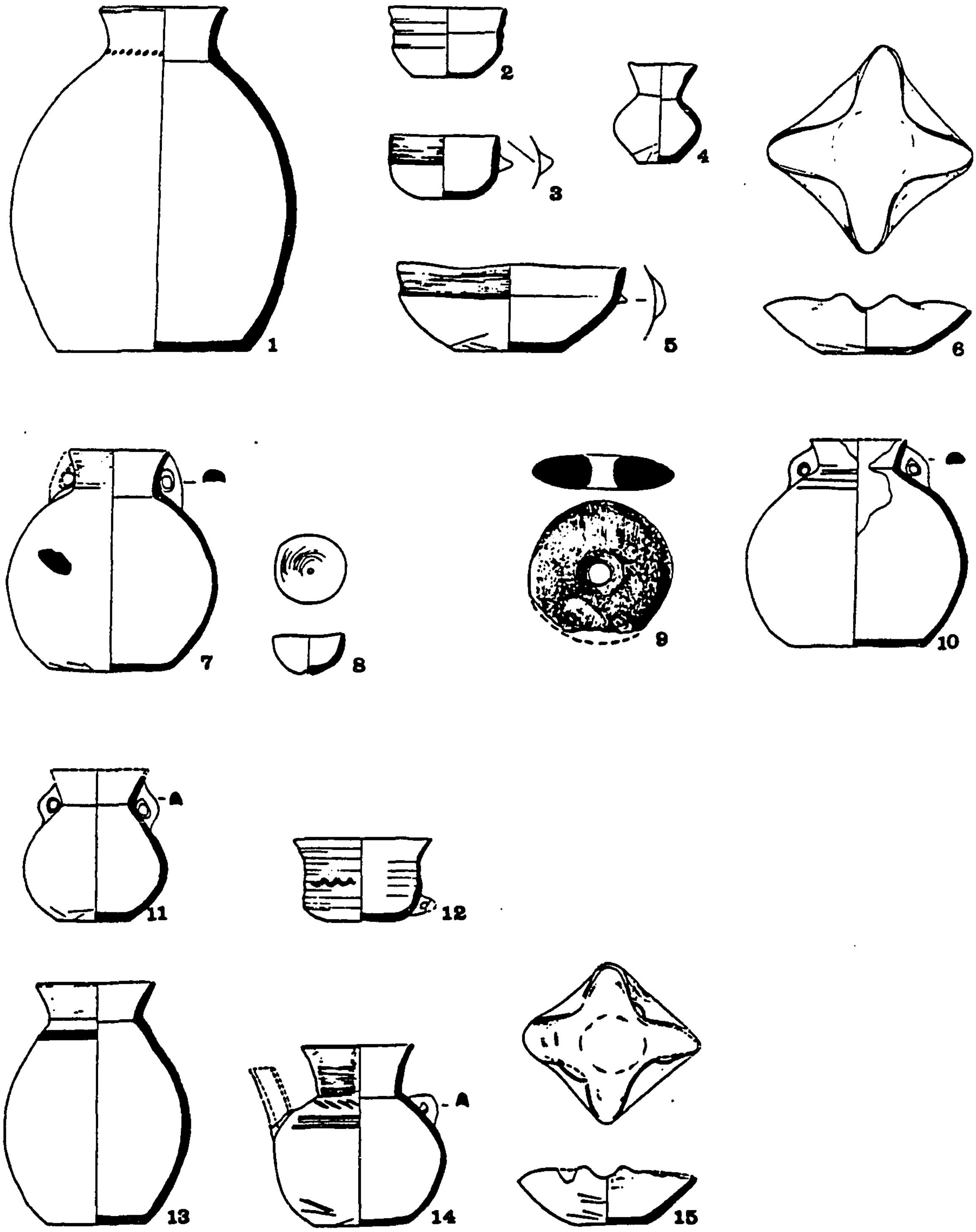


Fig. A.5. Tombs C5 (1-6); C6 (7,8); C9 (11-15); and D1 (9,10).

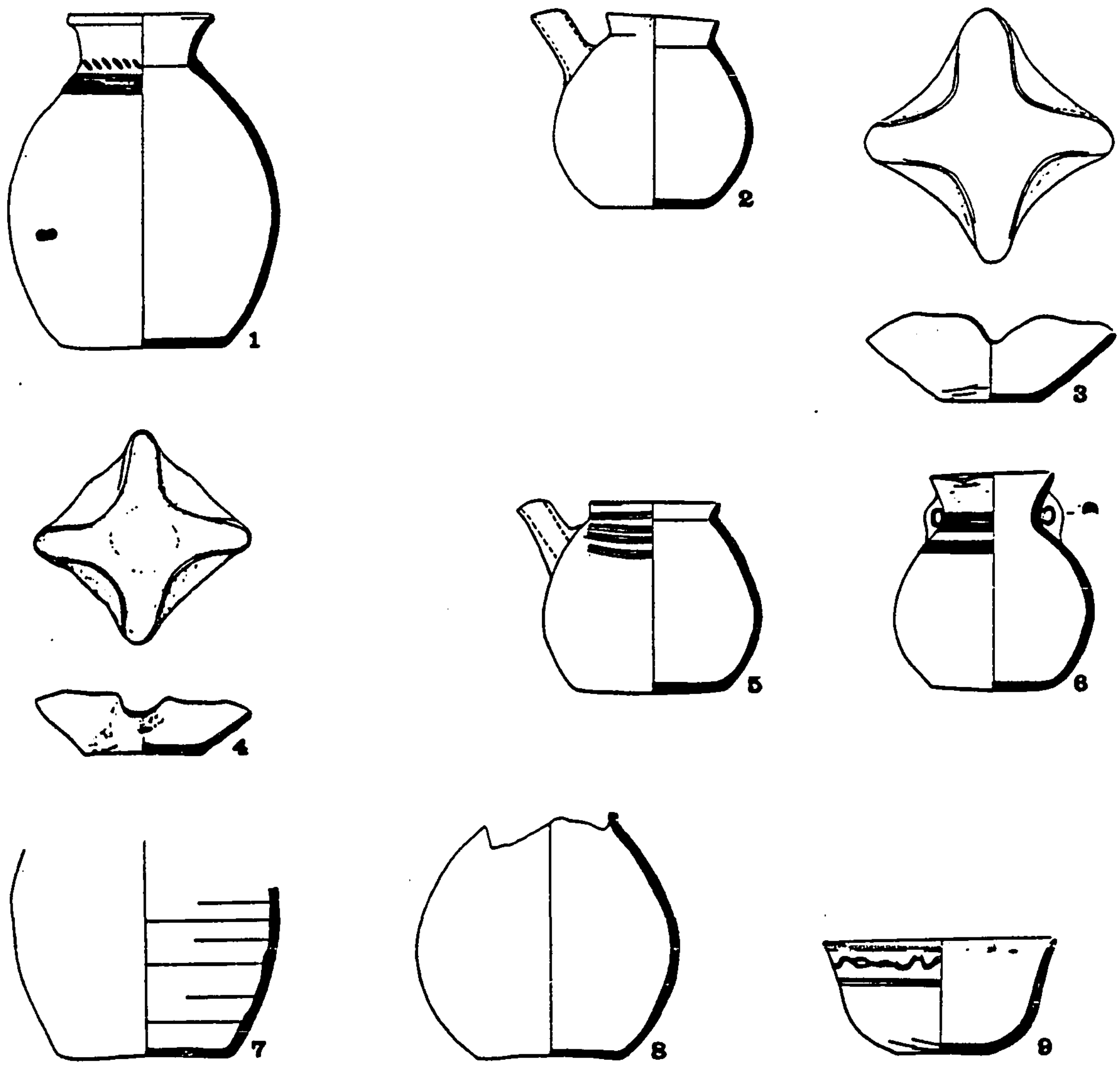


Fig. A.6. Tombs E1 (1); E2 (2, 3, 5, 6); and E4B (7-9).

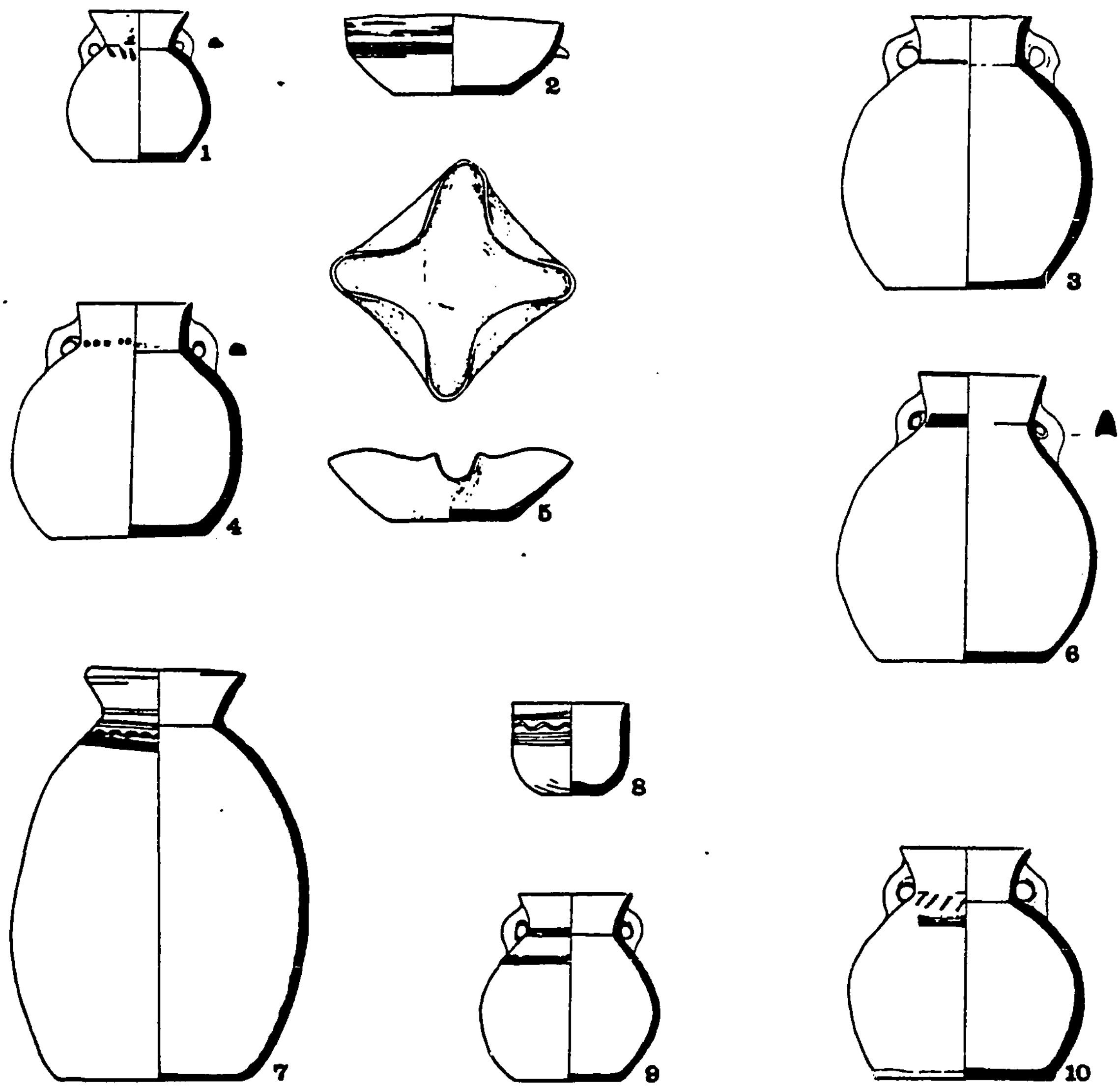


Fig. A.7. Agagir tombs 1 (1-4); 2 (3,6); and 3 (7-10).

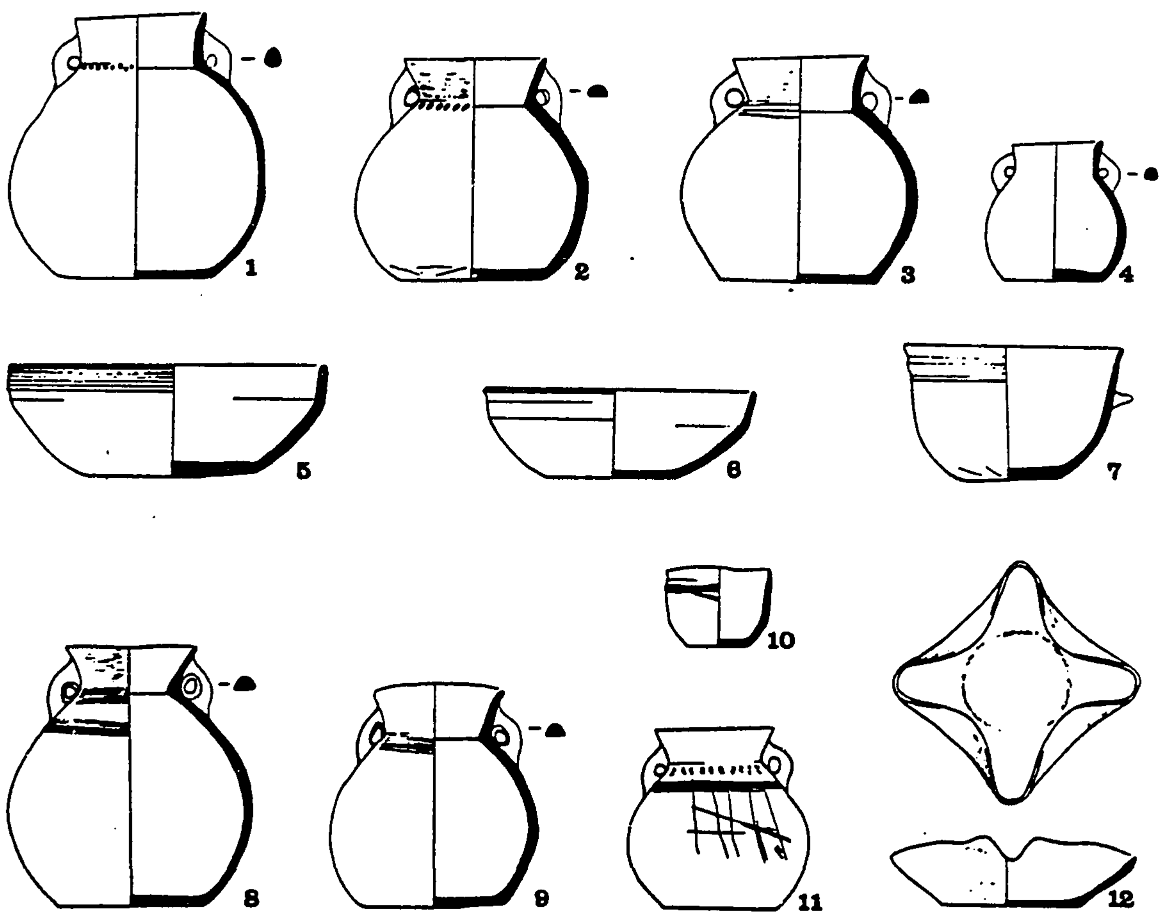


Fig. A.8. Agagir tombs 4 (1-7) and 5 (8-12).

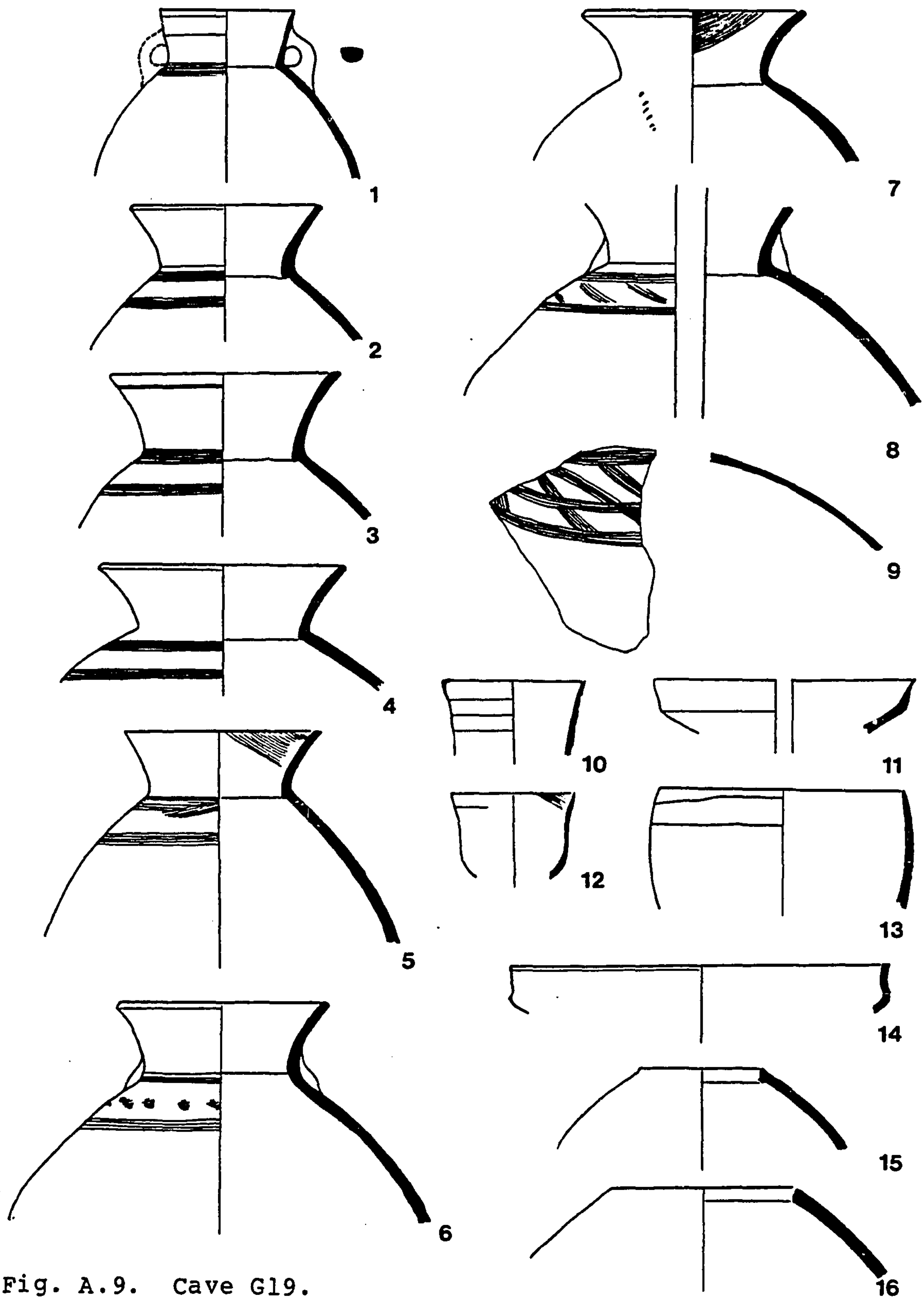


Fig. A.9. Cave G19.

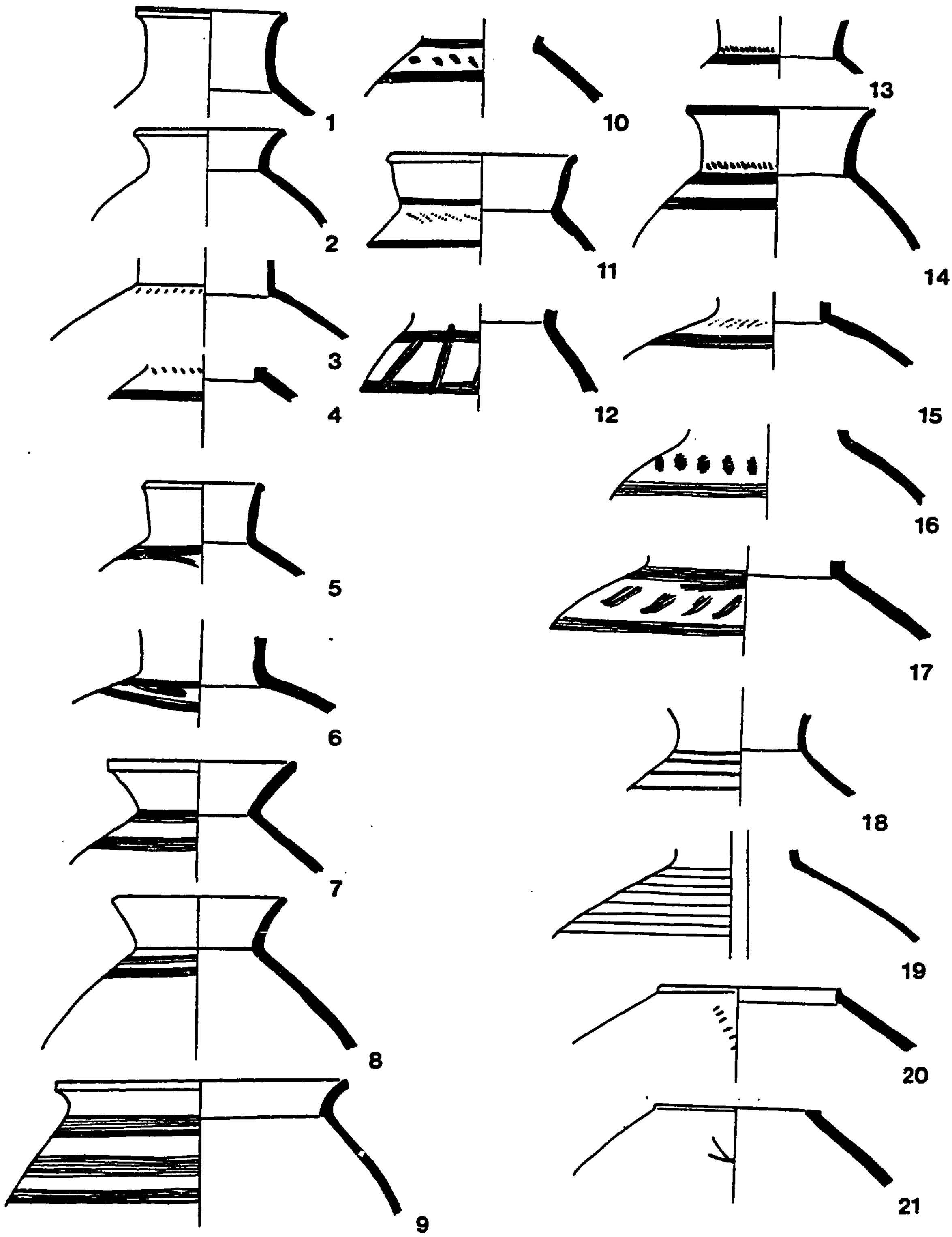


Fig. A.10. Cave G23: closed forms.

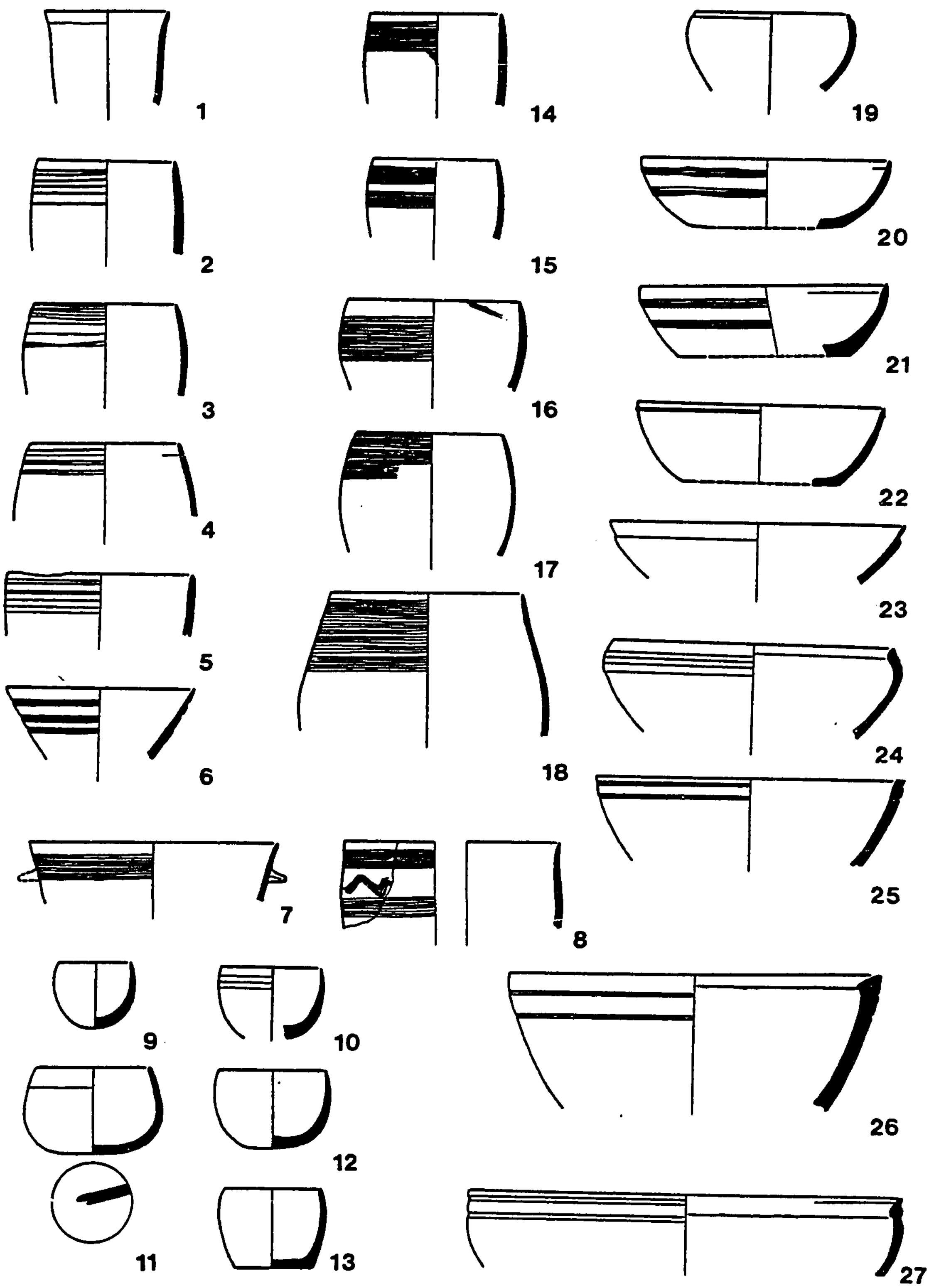


Fig. A.11. Cave G23: open forms.

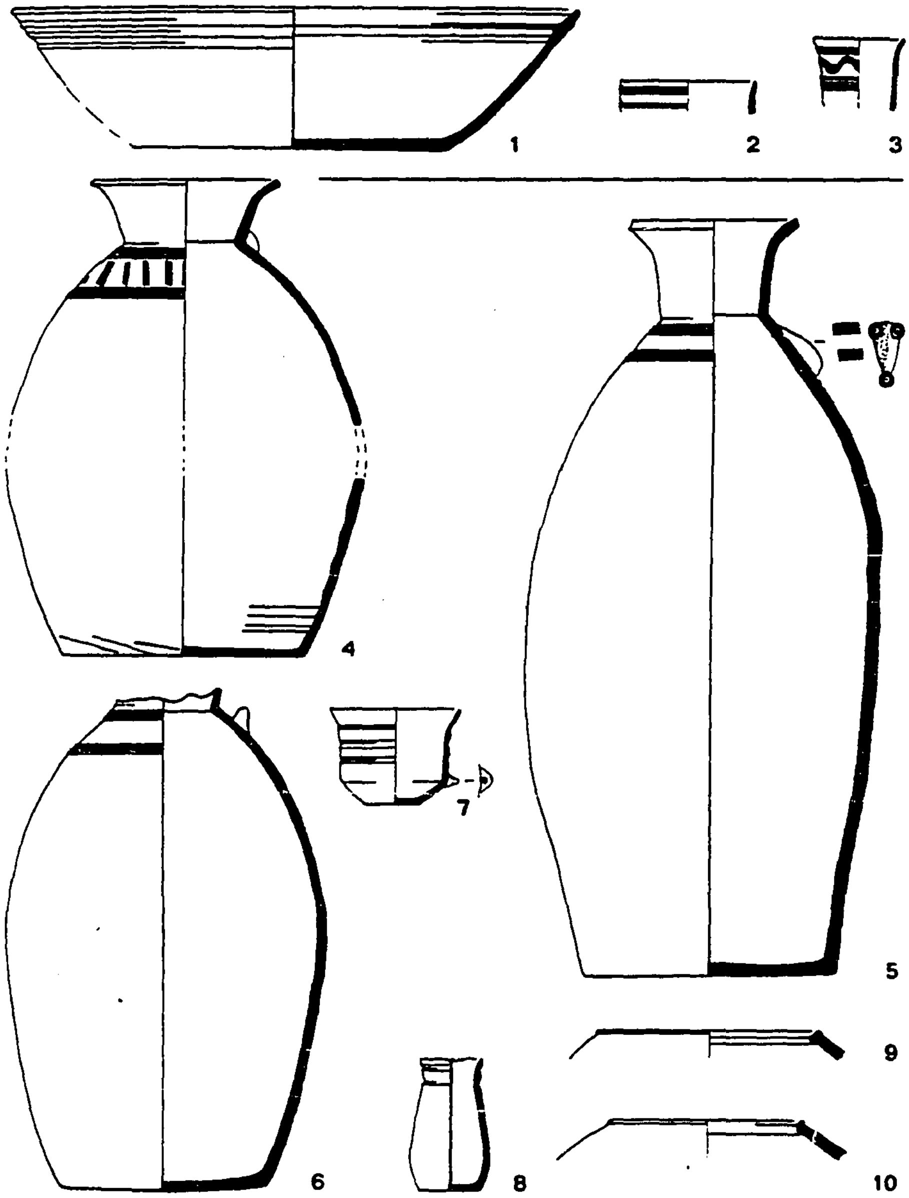


Fig. A.12. Cave G26: Phase A (1-3) and Phase B (4-10).

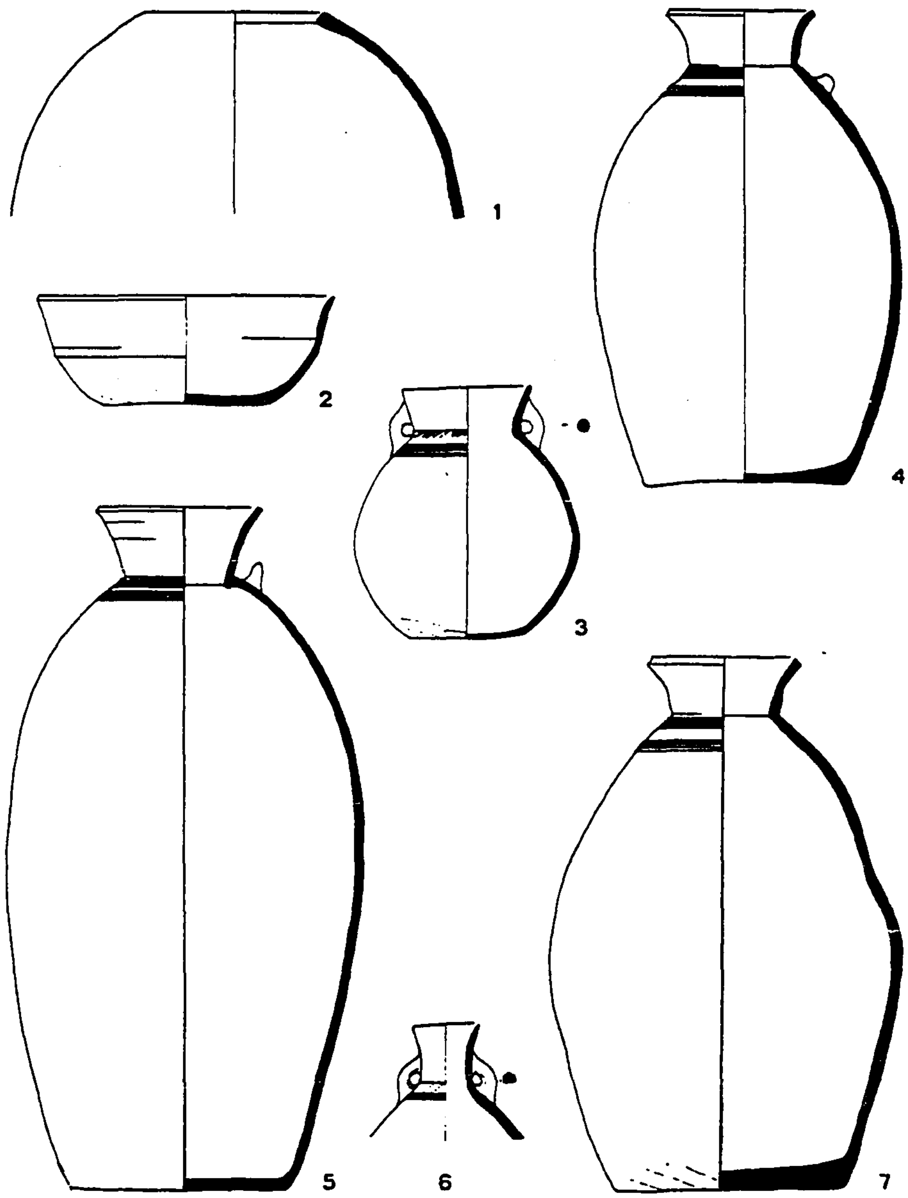


Fig. A.13. Cave G26: Phase B.

LIST OF ABBREVIATIONS

AASOR	Annual of the American Schools of Oriental Research
AHUCBASJ	Annual of Hebrew Union College Biblical and Archaeological School of Jerusalem
AJA	American Journal of Archaeology
ASOR	American Schools of Oriental Research
BASOR	Bulletin of the American Schools of Oriental Research
CNRS	Centre National de la Recherche Scientifiques
IEJ	Israel Exploration Journal
JBL	Journal of Biblical Literature
PEQ	Palestine Exploration Quarterly
PEFQST	Palestine Exploration Fund Quarterly Statement
QDAP	Quarterly of the Department of Antiquities in Palestine
ZDPV	Zeitschrift des Deutschen Palästina-vereins

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