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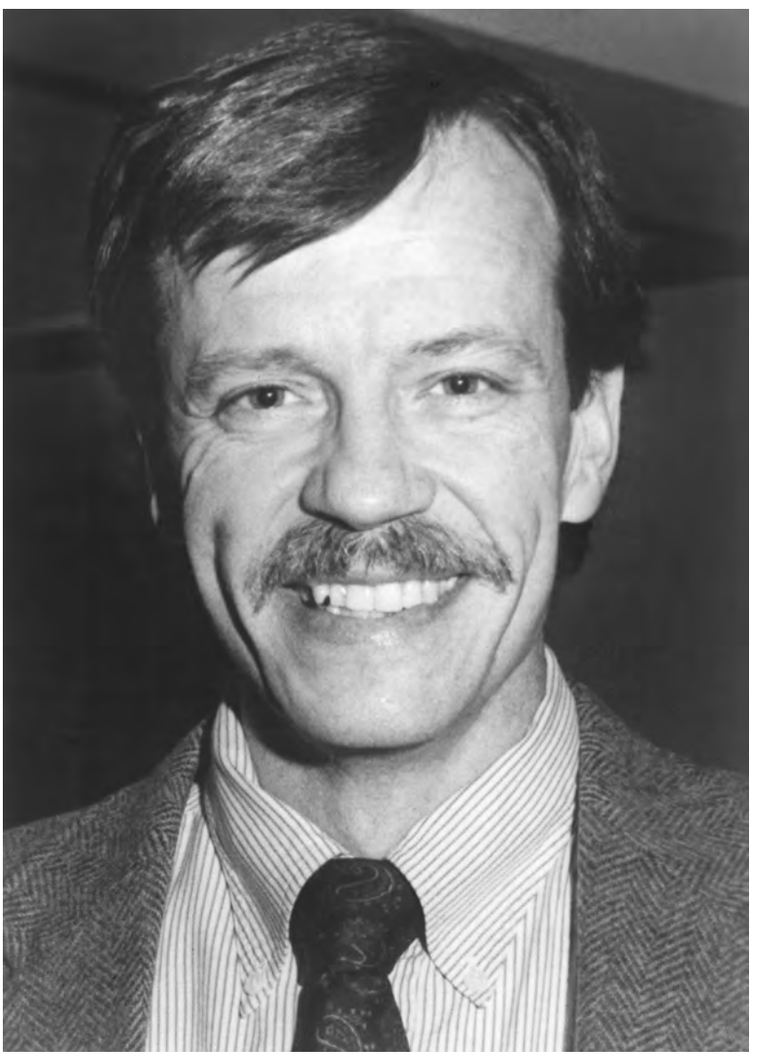

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Studies in the Archaeology of Israel and Neighboring Lands

in Memory of Douglas L. Esse

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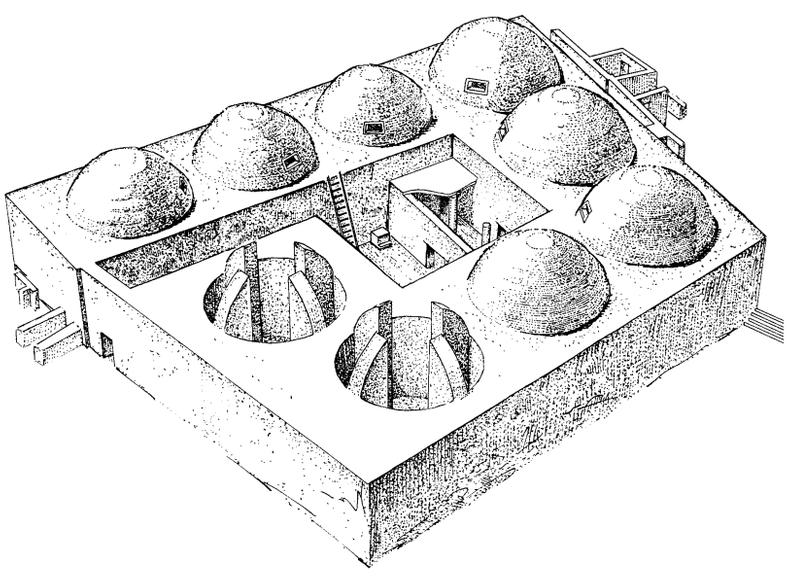

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PREFACE

The Early Bronze Age was Douglas Esse's special passion, so it is fitting that the majority of the articles published here concern that era. Indeed, the contributions to this volume could have been limited to the EB period in ancient Israel, but I decided not to do so for two reasons. First, although most of Esse's published articles and his monograph dealt with this period, he was much more than "an EB man." Doug was equally capable of dealing with all periods, from prehistory through Persian. Second, confining the essays to the Early Bronze Age, or to ancient Israel, would have meant excluding certain authors from this volume. It was important to me—and to them—that they be given the honor of participating in this tribute. Thus, the glue that holds together this "heap of broken images" (to quote from T. S. Eliot, cited in L. Stager's eulogy below) is that all the contributors were colleagues or students of Doug.

In the tradition of "family-style archaeology," as practiced by Esse in his excavations at Tel Yaqush (Esse 1989, "Notes from an Early Bronze Age Village." *Oriental Institute News and Notes* 121:1–3), several of his professional "families" are represented in the volume. There is the Tel Yaqush family: J. P. Dessel, Alex Joffe, Brian Hesse, Egon Lass, and Paula Wapnish; the Chicago family: Guillermo Algaze, Ron Gorny, Rachel Hallote, Tim Harrison, Larry Stager, and myself; the American Schools of Oriental Research family: Bill Dever, Larry Herr, Tom Levy, Walter Rast, and Jeff Zorn; and the Israel family: Ruth Amiran, Amnon Ben-Tor, Eliot Braun, Edwin van den Brink, Anat Cohen-Weinberger, Zvi Gal, Yossi Garfinkel, Ayelet Gilboa, Ram Gophna, Rafi Greenberg Ann Killebrew, Liora Kolska–Horowitz, Ami Mazar, Ianir Milevski, Pierre de Miroschedji, Avner Raban, Daniella Saltz, Ilan Sharon, Neil Silberman, and Yuval Yekutieli. In the same vein, four husband and wife teams are represented among the contributors: Brian Hesse and Paula Wapnish, Alex Joffe and Rachel Hallote, Steve and Arlene Miller Rosen, and David and Ornit Ilan.

It is fitting that this volume is a joint production of the Oriental Institute Publications Department and the American Schools of Oriental Research, since these two institutions played such an important role in Esse's professional career. I wish to thank the following people for their contributions: from the Oriental Institute: William Sumner, Director (1980–89); Robert Biggs, Chair, Publications Committee; and Thomas Holland and Thomas Urban, Publications Office; from the American Schools of Oriental Research: Albert Leonard, Jr., Chair, Committee on Publications; Victor Matthews, Book Series Editor; and Billie Jean Collins, Director of Publications. In addition, I express my gratitude to Hershel Shanks, editor of *Biblical Archaeology Review*, for permission to reprint Lawrence E. Stager, "In Memoriam: Douglas L. Esse," *Biblical Archaology Review* 19 (1993), pp. 20–21.

Finally, I wish to acknowledge the generous subvention provided by Mr. Leon Levy and Ms. Shelby White, which helped make possible the publication of this volume.

The majority of the contributions were submitted in 1996; some arrived as late as 1998. The authors were permitted to update their articles in 1999 and to make minor corrections and additions in the proof stage.

Samuel R. Wolff

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TRIBUTES

REMEMBERING DOUG ESSE*

LAWRENCE E. STAGER
Harvard University

Douglas L. Esse, archaeologist, assistant professor, and foremost authority on the Early Bronze Age Levant, died October 13, 1992 at home with his family in Hyde Park, Chicago, after a long battle with stomach cancer. He was forty-two years old.

I knew Doug for more than a decade and a half: first as a student at the Oriental Institute of the University of Chicago, then as a colleague in the field and in the classroom, and throughout as a very best friend. He began his fieldwork in 1975 at Tel Dan and Tel Qiri in Israel and continued to develop as a stratigrapher and strategist in the following year, when he joined our staff at Carthage. By the time we launched the Ashkelon project a decade later, where Doug served as associate director and as director of the lab in Jerusalem (now in Ashkelon), he had become one of the very best excavators I have ever known. Few archaeologists could excavate the backfill of robber trenches the way he could and retrieve in negative form so many coherent building plans. With his sharp eye for stratigraphy and attention to relevant details (duly recorded), Doug was able to trace room after room of a warehouse, where not a single foundation stone remained, only the "ghost walls" and the backfill left by stone robbers. Today we recognize this as one of several seaside warehouses destroyed by Ptolemy I shortly after 300 B.C. Their stone foundations stood still visible above ground until they were robbed out and recycled some fifteen hundred years later.

Through his meticulous excavation and recording, he was able to recover dozens of unbaked clay cylinders at Ashkelon, which, when found in rows, indicated they had fallen from a vertical loom in a weaving factory. Since this type of loom weight is totally alien to the Canaanite culture, these homely artifacts have become valuable documents for tracing the Philistines back to their Aegean homeland, where these mud cylinders are found in abundance at Minoan and Mycenaean sites (see my "The Impact of the Sea Peoples in Canaan [1185–1050 B.C.E.]," in *The Archaeology of Society in the Holy Land* [1995], ed. T. E. Levy, New York and *Ashkelon Discovered* [1991]).

Before Ashkelon, in the early 1980s, we traveled as two companions searching for tells to excavate, first in Syria, then in Turkey. Doug was a wonderful traveling companion, generous, quick-witted and endowed with a wonderful sense of humor—the latter was always very much needed in the situations we often found ourselves. On our way to Harran where we hoped to launch a major Oriental Institute project but had our hopes dashed at the last minute, we

* This remembrance is based on a tribute I gave to honor Douglas Esse at a memorial service held in Hyde Park (Chicago) on 26 October 1992, and on another, "In Memoriam: Douglas L. Esse," *Biblical Archaeology Review* 19 (1993): 20–21. I am grateful to Hershel Shanks, editor of *Biblical Archaeology Review*, for permission to reprint portions from the latter.

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stopped in Urfa and there decided to visit a grotto which, according to Muslim tradition, had been visited by the Patriarch Abraham (or Ibrahim). Inside the dark, dank cave was a pool filled with sacred fish. From out of the shadows appeared the keeper holding a ladle. Doug and I looked at each other somewhat uneasily. (Together we might have had a vocabulary of perhaps a dozen words in Turkish.) The keeper dipped the ladle in the pool and in a friendly gesture offered a drink to Doug and me. We automatically asked in English, "What is it?" We thought he responded by saying "sewage." With pained expressions we knew that we had no choice but to receive his hospitality and take a drink. We then ran back to the hotel wondering when disaster would strike. The hotel manager asked us what was the matter, we told him the episode and he burst out laughing and then told us not to worry—"sewage" was not English but Turkish; su iç means "water—drink it!"

Doug received his M.A. in 1977 and his Ph.D. in 1982 "with distinction" from the University of Chicago, Department of Near Eastern Languages and Civilizations. I had the privilege of serving as primary reader of his doctoral dissertation, which he revised as a book, *Subsistence, Trade, and Social Change in Early Bronze Age Palestine* (SAOC 50, Oriental Institute Press, 1991). It is a tour de force, a grand synthesis that analyzes the rise and fall of civilization in Palestine from about 3500 to 2200 B.C. Using the material from Beth Yerah excavated by Professors P. Delougaz and Helene Kantor in 1963 and 1964, Doug shows us how to move from the particular to the general, from potsherds to international trading networks, as he turns "heaps of broken images" into patterns that give us glimpses of the unbroken reality behind the sherds and scraps of evidence. The renowned archaeologist William Dever graciously sent Doug an advance copy of his review of the book, now published in the *Journal of the American Oriental Society* (vol. 112 [1992]: 495–96). Dever proclaimed Doug's book a masterpiece of archaeological analysis and exposition—a model for us all.

His most succinct and theoretically sophisticated statement of the problem appears in "Secondary State Formation and Collapse in Early Bronze Age Palestine" published in *L'urbanisation de la Palestine de l'âge du Bronze ancien* (ed. P. de Miroschedji, Oxford: Biblical Archaeology Review International Series 527 [1989]: 81–96). There Doug explains how Egypt catapulted Canaan into its First Urban Age through economic and cultural stimulus. Commenting on the proceedings, the distinguished prehistorian Jean Perrot considered this piece the highlight of the conference.

In 1987 Doug was well on his way toward the summit of academic success: he was appointed Assistant Professor of Syro-Palestinian Archaeology at the Oriental Institute. Just two years later he was diagnosed with cancer. Nevertheless in 1989 he launched the Oriental Institute expedition to Tel Yaqush in the Jordan Valley, where for three seasons he and his students investigated Early Bronze Age lifeways. At the same time he continued to teach, do research, and publish. He was an excellent teacher, regarded with affection and esteem by students and colleagues alike. And there is little doubt that given a couple more years, Doug would have attained tenure at Chicago.

Whether digging in the field, or through old explorers' accounts of the Holy Land, or Ottoman tax records, Doug was a virtuoso in seeing how bits and pieces fit together to provide fresh insights. By digging into the Museum Archives of the Oriental Institute, Doug discovered a prosperous Canaanite city at Megiddo (Stratum VI), built at the beginning of the eleventh century B.C. and destroyed at the end of that century. The original excavators from the Oriental

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Institute had published only a small portion of this stratum in Megiddo II. The confusion resulted in part from major staff changes made in 1934 by the inimitable founder and director of the Institute, James Henry Breasted. From the original plans and unpublished photographs of the excavations, Doug was able to recover streets and pillared buildings, along with dozens of crushed collared-rim jars and the skeletons of numerous individuals who had perished in the fiery destruction. From this startling evidence he was able to reconstruct the plan of the city and recover some of its history. It appears that Megiddo continued to prosper as a Canaanite city well into the Iron Age, including among its ruins some presumed hallmarks (such as pillared houses and collared-rim pithoi) of the early Israelites. Doug began to explore the meaning of these discoveries in an article published just before his death as "Collared Pithoi at Megiddo: Ceramic Distribution and Ethnicity" (*Journal of Near Eastern Studies* 51 [1992]: 81–103). All future studies dealing with the emergence of Early Israel and its relation with Canaan must take these new discoveries into account.

During the last three years, when the cancer was wracking his body, Doug somehow managed to continue his Early Bronze research at Tel Yaqush in northern Israel. During the last exciting season at the site, Doug's father Vernon (now deceased), Doug's wife Ann, son Joey (then age 9) and daughter Allison (then age 6) participated in the excavations. Throughout the long ordeal, his priorities and passions never changed: family, friends, and archaeology, in that order.

During the last months of his life, embattled but not embittered by the cancer, he told me about the articles he was writing, and, alas, never finished, and the classes he would be teaching the next quarter at the Oriental Institute. Highest on his list of priorities was further research toward publication of his new discoveries about Iron Age I Megiddo (now being completed for publication by his former student and now Ph.D., Timothy Harrison), and a volume dealing with tombs excavated by Kantor and Delougaz (to be issued as an Oriental Institute Publications, with the title *Naḥal Tabor: An Early Bronze Cemetery in the Northern Jordan Valley, Israel*). His spirit and courage were indomitable right up to the end.

Ann, his wonderful wife of twenty-one years, put beside him in the coffin a Marshalltown trowel and three Early Bronze Age potsherds—the tool of his trade and the artifacts that he was able to transform into documents by which he read the past. In *The Waste Land*, a scathing critique of modernity, T. S. Eliot asks us:

> What are the roots that clutch, what branches grow out of this stony rubbish? Son of man, you cannot say, or guess, for you know only a heap of broken images, where the sun beats, and the dead tree gives no shelter, the cricket no relief, and the dry stone no sound of water.

Doug loved the ancient mounds of ruin with their "stony rubbish" and "heaps of broken images," and the challenge they posed to piece together a past more coherent than the present. In both his profession and his life (they were inseparable) Doug knew that the truth of existence, the truth of reality, is not some absolute proposition about truth, nor ultimate despair, but something in between, a quest (whether in archaeology or in life) for something beyond the broken images of past and present, a quest for the unbroken reality behind the broken images.

We sorely miss Doug Esse, the best and brightest of his generation of archaeologists, the kindest and most gentle person of any generation.

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A PERSONAL NOTE*

AMNON BEN-TOR
Hebrew University

It is customary on occasions such as this for friends of the deceased to meet and say good things about him—nothing negative. But show me someone who had anything bad to say about Doug when he was still alive. He had, really, a wonderful gift of getting along with people. Everybody liked Doug—Israelis, Americans and Druze! Let me say a word about the Druze: We all know that they are a very tough people, especially the Druze men. They never show their feelings. It is difficult for men like Husein Hason from the village of Buq'ata, who got to know Doug at Yaqush; even he couldn't help but get emotional when the news about Doug arrived in Israel.

Doug was my first student. I was amazed—I couldn't get over it—that somebody could get excited, like me, about Early Bronze Age (EB) platters, about the typology of carinated bowls, and about metallic ware. It was the first time that I met somebody else here who was interested. And I am talking about something that happened twenty years ago or more—and I am still amazed. Let's admit it, there is a certain degree of suspicion between American archaeologists and Israeli archaeologists, especially when it comes to fieldwork. Americans just don't do things the way we do them, and we don't do things or we don't see things the way they do. Yet Doug, an American, was "one of us." He excavated with me at Tel Qiri, and already in 1979, he was an area supervisor at Tel Qashish. Without any preliminaries, we trusted him, and as we look at his locus cards today, as we work on the final report, his locus cards are excellent, as though written by any one of us, not by any one of "them." Look at his mastery of Hebrew. Show me another American archaeologist working in this country whose Hebrew was like Doug's. And all those differences of approach make you wonder, how is it possible that at the same time that he was "one of us," he was also "one of them" at Ashkelon.

And it's not like we didn't have our differences about archaeological issues. We argued about typology, we argued about cylinder seal impressions, we were still arguing about his last article on cylinder seal impressions from Beit Yerah (*Eretz-Israel* 21 [1990]: 27*–34*). I would like to quote one or two sentences from a letter that he wrote me on January 14, 1982: "Work on the thesis is progressing, but it seems as if I spend incredible amounts of time doing things like registering, drawing, xeroxing, and moving pieces of paper from one pile to another. Is all this truly Wissenschaft? I feel more like a bureaucrat than a scholar. I have labeled the plates in the upper right-hand corner with EB II or EB III [he sent me a whole bunch of plates of pottery]. If you will note very carefully, the material which appeared in your *Israel Exploration Journal* publication, figures 16 and 17, seems to be very similar to that from my EB II phases. I noticed that you are dating your Qashish material mainly to EB III." As you can see, in spite of all, there was *Wissenschaft.* We were arguing about EB II, EBIII. . . .

I would like to end with one last sentence from his letter in which we can see how much he was "one of us." There is no Israeli who ever spent a certain amount of time in the United States—a week, two weeks, three weeks—who couldn't or didn't write the following in his diary: "Ann is fine. She is spending a relaxing summer working in the garden. We have got to grow our own tomatoes—the commercial tomatoes in this country are terrible."

We shall miss him.

* Delivered at a memorial service held at the Israel Museum on March 17, 1993, lightly edited.

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DOUG ESSE, MY FRIEND*

DANIELLA SALTZ

The time was nearly eighteen years ago, in the winter of 1974/1975. The place was Mt. Scopus in Jerusalem, which then had almost no buildings except for the Institute of Archaeology. I had just left class at the Institute and went down to the bus stop. The area was barren and deserted. I stood under a street light waiting for the bus. Suddenly, I heard an American male voice, coming from somewhere in the dark, calling my name. I turned but could see no one. The bus came. He came out of the shadows. We boarded the bus. He introduced himself as Doug Esse, and thus began one of the most important friendships of my life. Very shortly afterwards I met Ann, Doug's perfect other half in every way.

I would like to share with you a few random memories of some of those eighteen years together. I know we all have our own memories, and many of our individual memories are intertwined with those of others. I know many of my memories are also shared by Larry Stager, Carol Hoffman, Terry Benninga, and others of you who are here and not here today. Indeed, I think it is our love of Doug and Ann that has been a part of what has made many of us friends these many years.

I remember a freakishly cold day in April 1975. Doug and Ann, Carol and I and a few others were hiking through Wadi Kelt towards Jericho. The other members of the group scampered like goats along the edge of the very steep precipice. Doug and I rather sheepishly slogged through the freezing water of a channel instead, which is how we discovered a shared fear of high places or, rather, steep drop-offs. I had always thought I had acrophobia and, having labeled it, never gave it much thought. But Doug expounded a theory that remains the best explanation I have ever heard. Doug said that it wasn't really a fear of heights, but the fear of an overpowering desire to jump, to soar, to experience some kind of total free fall. So now I think of Doug and his perceptive observation whenever I look over a sharp edge and get that dizzy-queasy feeling. This is just one example of the really fascinating intelligence Doug had. He wasn't just smart and brilliant in the academic sense, he had an unusual mind and conversations with Doug were always both delightful and challenging.

Also in April 1975, Doug learned that he had been accepted at the University of Chicago to study with Larry. Of course he pumped me for details about Larry, whom I knew from Harvard, and of course, I told him all the wonderful things he could look forward to.

Thus Doug came to Chicago, and in December of that year I had occasion to visit Chicago from Israel to do some research or attend a convention, or both. Doug and Ann, who had just moved to Chicago, invited me to stay with them. That was when our friendship really took root on a personal, as opposed to just professional, level. And I think that is the reason why there was no question that it would survive when I left archaeology for law, and why it still flourishes all these years and all these places later.

Doug went out of his way to help me navigate through the labyrinthine basement and storage rooms of the Oriental Institute. Ann taught me that you don't have to refrigerate butter. I soon realized that with these two people, I had formed three friendships: The friendship with

* This eulogy was delivered on October 26, 1992, at the memorial service for Doug held in Hyde Park, Chicago. I thank Ann Esse for transcribing the tape of the memorial service, which I have very lightly edited for the sake of coherence and to bridge breaks in the tape.

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Doug, the friendship with Ann, and the friendship with Doug-and-Ann. Each different, but all marked by the same qualities of supreme goodness and kindness. Doug was indeed the genuinely nicest person I have ever met. Nice as he was, though, he knew how to be critical in scholarship and otherwise. Yet he was never gratuitously mean or unkind. It was remarkable. And Doug was deservedly loved and admired even by those he disagreed with.

I knew that Doug was going to be digging with Larry at Carthage in the spring of 1976, so I asked Larry to assign Doug to be my assistant. It was my favorite digging experience of all time. Doug had the most marvelous understated sense of humor, and it got us through many rough moments of cold, drenching rain and the peculiarities of our workmen. Even the workmen loved Doug because he was so kind and so fair. Needless to say, Doug was an extremely rapid learner, and his rise from assistant area supervisor in Tunisia to the head of his own excavations and surveys in Israel and Turkey was meteoric. Fortunately, he had no fear of the heights of academic success.

Then I met my husband-to-be, Dani Katsir, and Dani met Doug and Ann and in no time, Dani adored Doug and Ann as much as I did. We all got together whenever and wherever possible, in Israel, in the United States—we somehow managed. Our lives became entwined, even if our meetings were never frequent enough or long enough.

I remember an incident in the fall of 1979. Doug and Ann were spending a year in Jerusalem. My daughter Karen, who is here today and is thirteen years old, was then about nine days old. Dani had gone back to work that morning, leaving me alone, for the first time, with a tiny new infant. I was nervous. Just as Karen was about to wake up from her nap hungry, I went to the front door to bring in the newspaper. The door slammed shut behind me and locked automatically. It was a classic sitcom setup. Very funny on television, but not at all in real life. What did I do? The first thing I could think of was to run to a neighbor's apartment and call Doug and Ann at the Albright. They dropped everything to race across town through rush hour traffic with their spare key to our apartment. They literally rescued me and calmed me down.

Doug and Ann were also Karen's first babysitters. Five years later, they became godparents to our son Carmi. We agonized with them in their yearning for children. Their reaction was not to resent us for having Karen, but to shower her with love. So characteristic. Finally, they were rewarded with Joey and Allie. They were the family that Doug and Ann had always dreamed about.

At long last, it was all coming together, personally and professionally. Doug and Ann's dreams were happening. Joey and Allie, the Ph.D., tenure track at the University of Chicago. Their own home to decorate and fix up, the island. Everything was going so well, and all of us were so genuinely happy because Doug and Ann deserved every bit of it.

Then came the diagnosis that nobody deserved. Especially not Doug. We all burned the phone lines. It can't be true. It was. What can we do? Sadly, nothing. Hope. And pray. But nothing could erase the inexorable fact of Doug's cancer. It was so unfair, unfair, unfair! Doug fought so hard and endured so much pain without complaint, without bitterness. Just to hold onto life and the family he loved so much, just a little bit longer.

And Doug held on, tenaciously, long beyond anyone's expectation or anyone else's endurance. After one of his numerous operations, Doug was reminiscing with me about his previous operation in Israel in 1985. At that time, he suddenly had to have knee surgery. His leg was in a cast, and he stayed with us in Jerusalem during his convalescence. It was such a great time—

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that convalescence. We spent so many wonderful hours laughing and talking and playing with the kids. Bert and Ernie's "Sesame Street Sing Along" album made permanent grooves in his brain. It was such a good feeling to be able to do something for Doug that time and to watch him get better and stronger.

But this time, all we could do was hope and pray, and watch him get thinner and weaker.

I have so any more Doug stories, and know all of you have your own favorites. Doug had so many facets, and each of us knew and shared different ones. I am aware that Doug had his banjo side, his fishing side, and his church side. Sides that I knew about but did not share with him. Others of you did. Doug was like a diamond in that respect. Facets shining in every direction, with a special sparkle for each of us.

As a factual matter, the course of our lives was permanently affected by our friendship with Doug and Ann. So many of the roads we took were taken because of them. My husband's present career, for example, was a direct result of the light streaming through the stained glass windows of their Victorian home in Morgan Park during our visit to Chicago in 1983.

But it is emotionally that we are the most affected by our love for Doug and Ann. And because we loved Doug so much, his death is so unbearable.

For Doug's fortieth birthday, I bought him one of those cynical cards. On the outside, it read, "40 isn't the end of the world," and on the inside it continued, "but you can see it from there." Days after, Doug learned that he had stomach cancer. The card was no longer funny or cynical. I felt awful. Doug was typically reassuring, making light of the matter, masking his own fear with a determination to fight. He tried to keep our spirits up. To him, the statistic that only one in five stomach cancer victims will survive five years meant—or so he told us—that someone had to be in that 20%, and he intended to be the one in five. He should have been.

He loved his work and he loved us all so much. He had so much to live for, so much to give. He always gave and we all needed him so much. He held on tenaciously, miraculously enduring the agony of bad days and bad weeks, just to be able to be with us a little longer. To try to accustom us to what we'll never be accustomed to—life without Doug.

Doug, I love you more than these words can convey. I can never give back all you've given me, but I promise that I—that we—will keep your memory alive. We will tell Joey and Allie our stories about you over the years, to make sure they know how much you loved and were loved. We have lost our friends Doug, and Doug-and-Ann, but we still have Ann, thank goodness. Ann who has been through her own hell these past three years and for whom rough days are ahead. But Ann, you were always there for us and we'll always be there for you and support you in your, and our, grief.

Now when I hear that familiar well-loved voice calling my name in my memories, no beloved figure will step out of the shadows like he did eighteen years ago on Mt. Scopus. Doug, you are now resident in our hearts. We love you, we miss you, we thank you for touching our lives.

Postscript (October 1995)

Is it already three years since I spoke those words? I still miss Doug very much, but the passage of time has enabled me to think of and talk about Doug without crying. Ann and I talk by phone and we see them whenever we can, which is harder than it used to be since they moved to South Dakota. Dani, Karen (now sixteen), Carmi (eleven), and I just returned from

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a wonderful vacation in South Dakota with the Esses, where we often spoke about Doug. I am grateful for the opportunity to participate in this Festschrift/Memorial for Doug, even though no longer as an archaeologist. It means we are all keeping the promise to remember.

Post-Postscript (November 1997)

Just days before his death, Doug characteristically was still making plans to travel from Chicago to suburban Detroit, oxygen tank in tow, to attend Karen's Bar Mitzvah. Doug died ten days before that ceremony, and Ann delayed the memorial service in Chicago to enable us to be there. Ann and I had occasion to remember this recently, when Ann "finally made it" and celebrated Carmi's Bar Mitzvah with us. Tempus fugit, pain is tempered, friendship abides, and love survives.

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2

A RECONSIDERATION OF THE ORIGINS OF HUMAN SETTLEMENT AND SOCIAL DIFFERENTIATION

GUILLERMO ALGAZE AND DANIEL FESSLER

SOCIAL EVOLUTION

Evolutionary biologists tell us that increasing complexity is not predetermined and that the observable order of life is largely a product of chance (Gould 1989). There are, however, significant differences between biological evolution and the evolution of human social forms (Geiger 1990). The most important is that human social evolution depends heavily on the transmission of acquired cultural traits and, therefore, operates through Lamarckian as well as Darwinian mechanisms (Cavalli-Sforza and Feldman 1981; Gould 1987; Rosenberg 1994). Thus, when considered in the aggregate, the evolution of human societies exhibits a trend toward increasing complexity and hierarchical differentiation through time. This trend has become particularly accentuated since the end of the Pleistocene period and the beginning of the Holocene era, starting some 12,000 years ago with the appearance, first, of permanent settlements possessing some degree of internal socio-economic differentiation—a phenomenon that took place over many areas of the world—and, second, with the emergence of a small number of early pristine urban civilizations—a later phenomenon that took root only in a more limited number of locations. This paper focuses on the earlier of these two transformations, and, in particular, on the role that conditions of resource abundance resulting from Holocene environmental changes may have had in creating a set of conditions promoting rapid social evolution in specific localities around the world.

For the four to five million years prior to the Holocene, human societies were based on the exploitation of seasonally shifting plant and animal resources. These hunter-gatherer groups must have had complex belief systems and rituals, as demonstrated by artistic representations of Ice Age cultures of western Europe of the Upper Paleolithic period (ca. 40,000 to 14/12,000 B.P.) (Bahn and Vertut 1988). Nevertheless, when the available archaeological evidence is weighed as a whole, we are still left with small bands of blood-related individuals organized largely along egalitarian lines (Conkey 1980) and characterized by more or less mobile lifestyles determined entirely by the productivity and seasonality of the individual ecological niches they exploited.[1]

1. To be sure, truly egalitarian societies have never existed. Every human group, no matter how simple, has natural elites that aspire to, and commonly achieve, some measure of power, wealth, and status in their lifetimes. By an "egalitarian" society we mean a society in which status and leadership are ephemeral, are based on personal achievement, and are shaped by individual factors such as intelligence, ambition, charisma, and luck. In short, an egalitarian society is one in which status is not inheritable and is not legitimized and reproduced through formal political or religious institutions.

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By all accounts, the hunting and gathering way of life has been the most enduring form of social organization throughout the human career (Lee and DeVore 1968). It allowed human societies to colonize every continent on the planet, save Antarctica. However, this long-lived and uniquely successful subsistence strategy began to be radically transformed (though at sharply varying rates and times in different areas of the world) with the onset of the Holocene. At this time, we see the initial emergence of permanent human settlements and societies with varying degrees of internal differentiation above and beyond sex- and age-related roles. Throughout the world, this is closely followed by the institutionalization of differences in access to resources and control over labor, the beginnings of hereditary leadership, and the emergence of inherently asymmetrical economies based on the accumulation and redistribution of deployable wealth by elite groups (Service 1975; Flannery 1994).

EARLY SEDENTISM, CLIMATE, STORAGE, AND AGRICULTURE

To what degree were the fundamental transformations described above set into motion, in part, by environmental changes taking place across the world at the transition to the Holocene era? As the economist Joel Mokyr (1990) reminds us, there are two competing schools of thought regarding the connection between natural resources and the evolution of technological progress and social complexity. One school holds that abundant resources encourage complementary innovations. In contrast, the other school argues that it is the scarcity of natural resources that stimulates the search for substitutes.

In general, until recently it has been the latter position, scarcity, that has dominated research. Those who adhere to this position see the advent of agriculture as the key factor triggering the transition from egalitarian foraging societies to settled ranked communities. Agriculture is conceptualized as an attempt to correct for perceived deficiencies in the environment by achieving greater control over it. Agriculture is thus viewed as a social response to some sort of stress, such as climatic change (Childe 1951), environmental unpredictability (Flannery 1986), or population pressure (Cohen 1977).

Whatever the initial triggering stress or stresses, the arguments in support of the scarcity position generally run as follows: The domestication of plants and animals allowed for the creation of reliable food surpluses for the first time. Surpluses, in turn, have a variety of multiplier effects on social evolution. First, because of the reduction in mobility it necessitates, the need to store bulky agricultural produce increases territoriality and, eventually, makes fully sedentary occupations inevitable. Second, following Malthusian principles, storable surpluses are seen as the crucial variable allowing for substantially higher population levels than those practicable under less-productive technological regimes. Third, the managerial requirements associated with agricultural regimes are commonly thought to favor the growth and institutionalization of power in the hand of social elites (Wittfogel 1957). And, finally, because they are fungible, surpluses are seen as crucial in spurring intensified cross-cultural contacts and exchange on the one hand, and warfare on the other—spin-off effects which, in turn, also have a powerful impact on social development.

While the sequence of mutually reinforcing effects just outlined is certainly valid in many locations where early sedentary and ranked societies emerged, data from new excavations

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around the world suggest that initial resource abundance, and not merely resource scarcity, can also trigger the chain of interdependent transformations leading to the creation of both sedentary and hierarchically organized societies. This is not a new idea. Over forty years ago Carl Sauer argued against conceptions current in his time and suggested that early agriculture was the consequence of sedentism rather than its cause (1969: 22). Unfortunately, Sauer's insight went largely unnoticed, possibly because of his insistence—now discredited—on Southeast Asia as the first and only location where agriculture emerged. It was not until the publication of two influential articles by Kent Flannery (1972, 1973) in the early 1970s that Sauer's insistence on the preeminence of sedentism over agriculture gained some currency.

In his 1972 article, Flannery reviewed the advent of early sedentary communities in the Near East and Mesoamerica and concluded that (1) localized areas of concentrated strategic (wild) resources could act as a powerful magnet for the growth of nucleated communities in their environs, and (2) this growth was instrumental in the development of territoriality and the establishment and maintenance of unequal rights to limited areas of high resource potential (1972: 28–29). While many scholars now accept Flannery's arguments with respect to the development of social complexity in sedentary hunting and gathering populations exploiting rich maritime resources (Yesner 1980), with a few exceptions (e.g., Bender 1978; Gebauer and Price 1992) Flannery's position is not generally seen as widely applicable to the development of complex societies exploiting more fragile, non-maritime environments. However, recent data from excavations around the world suggest that Flannery's insights apply to both coastal and terrestrial environments. In the pages that follow, we argue that more often than not cases of initial sedentism and social complexity in disparate areas of the world were triggered, in part, by resource abundance—an abundance that commonly was the result of environmental shifts at the onset of the Holocene era.

Two constraints help explain why the initial transformations toward sedentism and inherently unequal societies are more likely to occur in a context of abundant rather than scarce resources. The first is one of logistics. This constraint was explained by Sauer, who argued that "People living in the shadow of famine do not have the means or time to undertake the slow and leisurely steps out of which a better and different food supply is to develop in a somewhat distant future" (1969: 20–21). The second constraint is implicit in the nature of social relations in mobile foraging egalitarian societies. In such societies, the social costs to rank-striving individuals who try to circumvent cultural leveling mechanisms are commonly too steep in marginal environments, where risk-leveling behaviors such as generalized reciprocity are a necessary precondition for individual and communal survival (Kelly 1995: 164–81; Sahlins 1972: 191–221; Winterhalder 1986). Would-be elites engaging in self-aggrandizing activities against the grain of the communal egalitarian ethos would hardly dare to do so unless the environment offered enough resources to guarantee their survival, and that of their families and faction members, should the community reject their advances.

We turn now to a discussion of a small number of case studies drawn from some of the earliest sedentary societies around the world in order to illustrate the contention that resource abundance is a universally valid destabilizing force that helped drive the transition from egalitarian, mobile hunting and gathering groups to sedentary communities possessing some degree of internal social differentiation.

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CASE STUDY: THE NATUFIAN/PPNA SEQUENCE OF THE LEVANT

Our first example is drawn from the earliest sedentary societies of the Old World: the Natufian and Pre-pottery Neolithic A (PPNA) cultures that developed in areas of the Levantine coast that today comprise most of Israel and the western portions of Jordan. These cultures arose between ca. 12,500–10,200 and 10,200–9,300 B.P., respectively (radiocarbon years). What makes them unique is the presence, for the first time in history, of permanent settlements (Tchernov 1991) comprised of closely packed semi-subterranean circular or oval houses, commonly containing hearths, mortars, pounding and grinding stones, and flint sickles. Initially, in the Natufian period, houses had superstructures made of perishable materials, but by the end of the sequence, in the PPNA period, more permanent superstructures built of mudbrick had been developed. Throughout the sequence, houses were surrounded by numerous pits, sometimes lined with slabs, which appear to have been used to store surplus food (Valla 1995; Bar-Yosef 1995).

What was the nature of social relations within Natufian/PPNA societies, the earliest sedentary communities in the world? We can address this question by drawing inferences from analyses of (1) the spatial distribution of Natufian and PPNA period sites across the Levantine landscape, (2) the degree of internal differentiation characteristic of sites from both periods, and (3) mortuary data from Natufian and PPNA sites.

Spatial Distribution

The settlement pattern of Natufian/PPNA sites became increasingly differentiated over time. Permanent base camps of the Natufian period are restricted to areas of the Levantine highlands squarely within the Mediterranean climatic zone. These camps do not exhibit evidence of regional site-size hierarchies. However, by the later part of the sequence, significant changes are evident. While some PPNA sites are found in the highlands, many sites of the period, including most of the larger and more complex ones, are found in lowland alluvial terraces in more arid areas of the Levant, such as the Jordan River valley, commonly at the transition between the Mediterranean and the Irano-Turanian vegetational zones (Bar-Yosef and Belfer-Cohen 1992). Furthermore, unlike their Natufian predecessors, PPNA sites exhibit a clear regional settlement hierarchy. This latter point is highlighted in a recent synthesis of available data by I. Kuijt (1994). He notes that PPNA sites in the fertile alluvial terraces of the Jordan Valley (e.g., Jericho, Netiv Hagdud, and Gilgal I) are larger (and presumably more complex) by several orders of magnitude than contemporary sedentary sites in the highlands. The patterned settlement distribution that emerged by the end of the Natufian/PPNA cultural sequence is highly relevant for understanding the transformation of social relations taking place at the time. Geographers have consistently found that clearly definable site-size hierarchies tend to correlate closely with patterned ideology (ritual), power, and economic differentials, both between communities and among individuals within a single community (Smith 1976a, 1976b).

Internal Differentiation

The emerging complexity of the earliest sedentary societies in the Levant is also demonstrated by the increasing internal differentiation within sites of the Natufian/PPNA periods. While Natufian sites are characterized by more or less homogeneous distributions of domestic

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structures and associated features, by the PPNA period some of the largest sites have, in addition, specialized structures that are clearly not domestic in nature. This is most evident at the PPNA site of Jericho, one of the larger (2.5 ha) PPNA sites identified thus far.

The site is situated near a substantial spring in the west bank of the Jordan River. Kenyon's excavations revealed only a minute portion of the PPNA levels of the settlement, but the well-known monumental round stone tower and nearby wall, identified in Trench I, contrast dramatically in both scale and function with the more modest houses typical for the PPNA period at the site. It is clear that these massive features must have required community-wide efforts for their construction, irrespective of whether they represent part of an elaborate fortification system, as Kenyon originally claimed, or protection against flooding and an unrelated ritual construction, as Bar-Yosef (1986) has recently argued.

Further evidence for the emergence of socioeconomic differentiation within the early sedentary societies of the Levant is provided by the incidence of nonlocal, imported materials within PPNA sites. Though comparisons of the relative incidence of imports at different sites are difficult because of varying excavation and recording standards and differences in the extent of exposures in the various sites, it is clear that, on the whole, exotic nonlocal resources are found more frequently in the large PPNA sites in the Jordan Valley area than in smaller PPNA sites elsewhere. Among the imported materials found in these sites are obsidian from several sources in Anatolia, various semiprecious stones brought in from a number of locations within the Levant itself or the Sinai, various types of shell from the Mediterranean or Red seas, and asphalt from Dead Sea seepages (Kuijt 1994: 181).

Mortuary Data

Although more equivocal in its meaning, the corpus of available mortuary data for the Natufian/PPNA periods can also be interpreted as reflecting the beginnings of unequal access to restricted resources within these early sedentary societies. Over 400 burials are known from several sites of the Natufian period (Byrd and Monahan 1995), and about 300 are attested for the succeeding PPNA period (Kuijt 1994: 181–82; but the greater majority of the PPNA burials come from a single site, Jericho). Natufian burial practices show significant variability, both spatially (between sites) and chronologically. For the Early Natufian period, both single primary interments and communal burials are attested, the latter including both primary and secondary interments. Burial gifts are common and are found in association with both types of burials, though they tend to be more common in single interments of young adults of both sexes (Byrd and Monahan 1995). An important innovation at this time was the appearance of formal segregated burial areas where only a portion of the population was interred. This is clearest at the site of Ein Mallaha, near Lake Hula in northern Israel, where two contemporary but separate burial grounds at the periphery of the site were continually reused for centuries (Perrot and Ladiray 1988: 84, fig. 8). Important differences in mortuary practice appeared by the end of the Natufian period: offerings virtually disappeared from burials, individual interments became the norm, and some individuals were buried with their skulls missing (Byrd 1994: 236). These characteristics also typify PPNA burial practices. Only some adults (of both sexes) had their crania removed in that period. The missing skulls are often found cached inside houses (Bar-Yosef 1989). Significantly, this practice appears highly correlated only with some of the larger PPNA sites in the Jordan Valley (Kuijt 1994: 183, table 3).

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In an initial review of the corpus of Natufian mortuary practices, Gary Wright (1978) argued that differences in types of Natufian burials (primary vs. secondary and group vs. single interments) and in associated burial offerings reflected entrenched rank differences. Though initially widely accepted (e.g., Henry 1989: 206), Wright's conclusions are now disputed by Byrd and Monahan (1995) who review a larger corpus of data than was available at the time of Wright's analysis. They conclude that burial gifts, when they occur, appear in association with both single and multiple interments, and that these gifts are not often found with older individuals, as would be expected if they were to mark clearly defined social classes, as Wright had argued.

While Byrd and Monahan (1995) are correct in pointing to the lack of conclusive proof for systematic social ranking within Natufian burials, there are nevertheless indications of the emergence of patterned asymmetries in access to crucial resources by different lineages within Natufian/PPNA societies. Evidence for this is provided by (1) the appearance of spatially segregated burial areas within some Natufian sites, and (2) the Late/Natufian/PPNA practice of skull-caching within houses. These practices are simply variant expressions of the establishment of clearly bounded areas for the disposal of the dead (intramural burial being the ultimate form of boundedness). The significance of this becomes clear in light of ethnographic studies correlating various patterned aspects of mortuary behavior and social structure. For example, building on the earlier work of Arthur Saxe (1970: 119), Lynn Goldstein (1981) reviewed thirty ethnographic examples bearing on the relationship between levels of asymmetry in access to crucial resources within societies, and the degree of boundedness which those societies practice in the disposal of their dead. She found that while not all corporate groups with exclusive control of crucial resources have distinct burial areas, all groups with formal segregated areas for the disposal of their dead share rights over the use or control of crucial but restricted resources. This correlation is very significant given that formal segregated extramural cemeteries are already present by the beginning of the Natufian period. Furthermore, Goldstein found that such asymmetrical rights are transmitted by means of a system of lineal descent from the dead. This finding helps to explain the Late Natufian/PPNA practice of secondary decapitation and skull caching noted earlier, which is commonly interpreted as evidence for ancestor worship (Cauvin 1994). The connection between this practice and the development of unequal access to resources by corporate groups within early sedentary societies is explicitly made by Flannery (1972: 29), who argues that "In a world without written deeds, the presence of the ancestors serves as a group's best evidence that the land had been theirs since time began."

Discussion

At first glance, the evidence outlined above for the earliest sedentary cultures of the Levant appears to be consistent with the model of transformations triggered by scarcity, namely, agriculture leading to sedentism, followed by the emergence of social inequality and trade. However, available data fail to support such a developmental sequence: studies of plant and animal remains found in Natufian contexts show that they are invariably morphologically wild (Henry 1989; Valla 1995). Agriculture does not come into play until late in the Natufian/PPNA developmental sequence. The earliest (morphologically) domesticated grains and legumes, for instance, do not appear until the PPNA period (Bar-Yosef and Belfer-Cohen

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1992; Zohary and Hopf 1994). This explains the observed differences in the settlement patterns of Natufian and PPNA sites: whereas Natufian base camps are only found in areas within the natural habitat of wild grain and legumes in the Levantine highlands, large PPNA sites actually concentrate in the alluvial terraces of the Jordan valley, an area hundreds of meters below sea level and well outside the natural area of distribution of the wild progenitors.

Agriculture is thus a late development in the Natufian/PPNA developmental sequence. Resource abundance rather than resource scarcity appears to be the context within which the social transformations that manifest themselves in the Levant by the PPNA period take place. A series of recent pollen cores from lakes in northern Israel shows that the first Natufian villages flourished at a time of substantial environmental change—the Continental-type climate characteristic of the Near East at the end of the Pleistocene changed to a Mediterranean-type climate, such as still prevails in the area today (Baruch and Bottema 1991; H. E. Wright 1993). As McCorriston and Hole (1991) note, Mediterranean climates are characterized by sharply seasonal precipitation patterns which would have promoted the expansion of plant communities able to thrive in the shortened growing seasons typical for the Holocene, including the wild grasses that formed the core of the earliest domestic plants in the Near East. What this meant for early Holocene communities of the Levant was that, in comparison with the previous period, high and reliable yields of wild grains and legumes (and of the ungulates dependent on them) could be obtained during the growing season, thus favoring the creation of difficult-to-transport surpluses requiring long-term storage. In a now famous experiment, Jack Harlan (1967), a botanist, harvested one of the few remaining stands of wild wheat in southeastern Turkey using a crude sickle made with flint blades like those available to the early village communities of the Near East. With this tool, Harlan was able to harvest just over six pounds per hour, on average. After processing in a mortar, this was converted to about two pounds of clean wheat. From this, Harlan concluded that a small nuclear family could have easily gathered a year's supply of protein—about a ton of protein-rich wild grain—in about four weeks.

Harlan's findings help us understand the processes of change taking place in Natufian/PPNA societies. As discussed below in greater detail, ethnographic studies show that long-term food storage is often a deeply destabilizing factor for egalitarian societies because it (1) reduces mobility and promotes sedentism, and (2) provides rank-striving individuals within the newly sedentary societies with the opportunity to manipulate surpluses in order to consolidate and extend their power. Agriculture is one way of creating manipulable surpluses in preindustrial societies, but it is by no means the only way. In the Natufian case, surpluses were made possible, and investments in long-term storage were made necessary, by the shift to a Mediterranean climatic regime, a regime that provided abundant, easily exploited, and storable resources in the spring, but few resources in the long dry months that followed.

CASE STUDY: AŞIKLI HÖYÜK IN CENTRAL ANATOLIA

The Natufian/PPNA case showing a correlation between abundant resources, sedentism, and initial social complexity is far from unique. Various other sedentary communities exploiting particularly rich environmental niches in the Near East were also able to achieve substantial social complexity in the Early Holocene largely on the basis of hunting and gathering.

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This point has recently been reiterated by Mehmet Özdoğan (1995), who notes that, in fact, most known cases of early sedentism in Anatolia, such as Hallan Çemi (Rosenberg 1995), Suberde (Perkins and Daly 1968), and the basal layers of Çayonu (A. Özdoğan 1995: 83–84) are based principally on intensive hunting of wild animals.

No site demonstrates Özdoğan's point more strikingly than Aşıklı Höyük, a remarkably large (minimum of 8 ha) and fully sedentary site near the modern town of Aksaray in Central Turkey. Excavated since 1989 by a team from Istanbul University under the direction of Ufuk Esin, Aşıklı is situated along the banks of the Melendiz Su River. The river has carved a narrow green valley within an otherwise relatively barren volcanic tufa landscape, acting as a magnet for plant and animal life in the region. Moreover, the site is not far from the then forested bottom slopes of Hasan Dağ and is also situated near important obsidian sources (Esin et al. 1991; Esin 1994). Available radiocarbon dates suggest that Aşıklı was occupied for about 400–500 years sometime around the transition from the tenth to the ninth millennium B.P. (Esin 1995: fig. 11). The site is thus only slightly later than the Levantine PPNA sequence discussed earlier.

The horizontal exposures that have already been achieved at Aşıklı are unique in their extent (over 35,000 m^2), and excavations are still ongoing. These exposures give us a much clearer view of the structure of the community than is available for any comparable site elsewhere in the Near East. Although only preliminary reports are available, even a cursory examination of the available plan of the area exposed thus far reveals that the settlement was divided into two clearly distinct quarters or neighborhoods separated by a pebble-paved road (Esin 1995: fig. 5). The largest quarter is north of the road and is comprised of many small two- or three-roomed rectangular houses, often with associated burials under house floors, and built entirely in mudbrick. In contrast, the area south of the road is characterized by larger structures of more elaborate plan, which sometimes have substantial stone foundations. Some of the rooms within the structures in this area of the site had carefully plastered walls and floors, often decorated in colors.[2]

Only preliminary studies of the paleobotanical and faunal data from the site are available thus far, but these indicate that this astonishing level of social differentiation was based largely on intense hunting and gathering of the abundant wild resources available in the Melendiz Su area. The hunting of wild sheep, goats, pigs, cattle, onager, hare, and deer was particularly important and may have been the most economically significant subsistence activity at the site. Various types of fruits and nuts were also collected. Cereals appear to have been only a small part of the diet. Full animal and plant domestication were not present at the site, although the relative frequencies of young sheep and goat individuals in the samples analyzed thus far suggest that those species were being intensively manipulated (Esin et al. 1991).

A full assessment of the significance of Aşıklı must await the end of the excavations and the completion of the pertinent artifactual and ecofactual analyses. However, it is already clear from the patterned spatial differences observable within the exposed plan that the site illus-

2. These comments are based on the available published reports for Aşıklı (Esin 1994, 1995; Esin et al. 1991) and on observations by Algaze during a visit to the Aşıklı in August 1994. We are grateful to Professor Esin for her kindness in showing Algaze some of the pertinent materials at that time.

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trates a more advanced stage of the processes of internal social differentiation than that observed in the Natufian/PPNA sequence discussed earlier. Aşıklı shows, once again, that sedentism and the initial emergence of social complexity in the ancient Near East need not be directly connected with agriculture (M. Özdoğan 1995).

CASE STUDY: THE ANDEAN COASTAL PRECERAMIC

The connection between abundant resources, sedentism, and social complexity illuminated by the Near Eastern case studies discussed above is also apparent at a variety of other locations around the world. In recent years, as archaeologists have started to focus more on coastal adaptations of human populations, it has become increasingly apparent that in many cases early complex societies developed in connection with the exploitation of abundant marine resources, commonly on or near estuary and marsh areas that have a high biomass of varied and easily exploitable resources and a high potential for self-regeneration (Yesner 1980).

All around the Pacific Rim we see a strong correlation between initial sedentism, early social complexity, and the exploitation of estuarine or marine resources (Aikens and Rhee 1992). This is the case with the development of the earliest sedentary societies in places as disparate as eastern coastal Japan (Middle Jomon period; Akazawa and Aikens 1986) and Korea (Chulmun period; Barnes 1993), the Gulf of Siam in modern-day Thailand (Khok Phanom-Di; Higham 1994), the Pacific coastal lowlands of Chiapas in Mesoamerica (Early Formative period: Blake 1991), and the Andean coastal fringe in South America (below). The emergence of early complex societies in the latter area is of particular interest with regard to the issue of the connection between resource abundance and social complexity. This initial process of evolution did not take place in well-watered highland valleys where later Andean civilizations such as the Inca were to develop, but rather on the Andean coast, one of the driest deserts in the world, an area where few potential domesticates of dietary significance existed (Moseley 1975).

Andean Preceramic Complexity

Unless pertinent data have been destroyed by Holocene increases in sea level affecting the western coast of South America, it would appear that the earliest fully or semisedentary villages in the Andean coast date to the late fifth and fourth millennia B.C. Early villages in the area were largely undifferentiated and comprised of round, semisubterranean houses (e.g., Chilca, La Paloma). The inhabitants exploited marine resources along the coast and seasonally available plants in fog-shrouded Lomas environments slightly inland (Moseley 1975, 1992; Quilter 1989). Starting sometime around 5,000 B.P., at the onset of the so-called Preceramic period, population levels rose exponentially along the Andean coast (Moseley 1992: 107) and numerous large settlements were established in the area. These settlements were commonly located at the point where rivers draining the nearby mountains meet the ocean and were centered around massive architectural complexes that appear to be of a ceremonial nature (i.e., characterized by platforms and sunken courts).

At one of the earliest of these sites, Aspero, Robert Feldman (1985) and his coworkers have uncovered a series of small habitation mounds and middens surrounding larger ceremonial structures. Several of these have been excavated, and in each case they consisted of a

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large pyramidal masonry platform accessible by means of steep stairs and capped by a structure. These constructions are clearly distinct in both scale and organization from the much more ephemeral domestic structures of the period. The buildings on the top of the platforms generally lack domestic refuse, and the objects found in association with them come mainly from cached dedicatory offerings, commonly including a variety of imported exotic items. At least one of the structures (Huaca de los Sacrificios) had several associated sacrificial burials incorporated into its construction and also contained the burial of a high-status child accompanied by numerous offerings. Similar sacrificial and high-status burials are normally found within ceremonial architecture in a variety of later well-documented Andean civilizations (Verano 1995).

More impressive still is the largest known Preceramic site in the Andean coast, El Paraiso. Radiocarbon dating indicates that El Paraiso was occupied toward the end of the Preceramic period (ca. 3,800 B.P.). The site is four or five times larger than Aspero, about 58 hectares in extent, and it is estimated that about 100,000 tons of quarried stone make up its ruins. Nine large mounds suggest as many platforms and massive buildings. These form a U-shaped architectural complex surrounding a central plaza, an arrangement that marks the beginning of an architectural form that will remain typical for Andean ceremonial complexes for millennia (Williams 1985). Only one of the nine mounds has been exposed by archaeologists. This was a building complex rebuilt in a number of distinct stages over a long period of time (Moseley 1975; Quilter 1985).

The sizable extent common to the coastal Preceramic settlements just described, the magnitude of their ruins, and the organized nature of the initial construction and subsequent rebuildings (using standardized bundles of fill, a practice well attested much later in the Andes in association with the use of compulsory state labor [M'ita]) are interpreted by some scholars (e.g., Moseley 1975; Feldman 1985) as an indication that institutions able to command substantial labor resources on a regional scale were already common to the earliest sedentary coastal societies in the Andes.

Preceramic Subsistence

What was the economic base that supported the impressive scale and organizational complexity of the larger Andean Preceramic coastal settlements? When archaeologists first noted the large and obviously complex coastal Preceramic settlements earlier in this century, they automatically presumed that their subsistence base was agricultural, in part because of their location near rivers. More recently, however, new controlled excavations at some of these sites (e.g., El Paraiso) have yielded direct paleoeconomic data for the subsistence strategies of their inhabitants. These data show that agriculture was largely limited to industrial purpose crops such as cotton. Domesticated plants of dietary value represent only a small and economically unimportant component of the overall nutritional intake of the Preceramic populations along the coast (Pearsall 1992: table 9.2). In fact, agriculture did not become an important component of the subsistence economy of societies on the Andean coast until canal irrigation was developed in the second and first millennia B.C., well after the Preceramic period. Instead, as Michael Moseley (1975) and various other scholars (Moseley and Feldman 1988; Quilter and Stocker 1983) have noted, the early complex societies of the Preceramic period in the Andean desert coast were overwhelmingly based on the exploitation of fish (mainly ancho-

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vies) from the Humboldt Current (but for a contrary view, see Wilson 1981). This plankton-rich current supports one of the densest marine biomasses found anywhere in the world (Schrader 1992), and its abundant and renewable resources were exploitable with simple technologies available to Preceramic societies, such as reed boats, fishhooks, and cotton nets floated on gourds (Quilter and Stocker 1983). To be sure, the bounty of the sea that formed the basis for early social complexity on the Andean coast would have been severely disrupted, sometimes for many months at a time, by recurring El Niño events (Parsons 1970). However, while this adds an important element of risk that must be taken into account in trying to explain the development of complex societies in the Andean area (Isbell 1978), the difficult-to-predict El Niño phenomena present less of a threat to the long-term continuity of Andean coastal societies than doubters of Moseley's Maritime Hypothesis (e.g., Wilson 1981) would have us believe. Problems introduced by the unpredictability of the Andean maritime environment could have been surmounted by the accumulation and management of surpluses. One well-documented case showing how unpredictable but recurring climatic catastrophes can be surmounted is that of the Trobiand islanders, who developed a cultural emphasis on the production of surpluses in order to overcome the risk of catastrophic drought through overproduction and storage (Malinowsky 1935). Similar surpluses were easily achievable in the Andean case. As Moseley and Feldman note (1988), fishmeal stores just as well as threshed grain (or yams). Moreover, as discussed in greater detail below, surpluses constitute a means whereby rank-striving individuals can manipulate social relationships so as to rise in power and prestige.

NECESSARY AND SUFFICIENT CONDITIONS: CROSS-CULTURAL PERSPECTIVES

Years ago, Robert Braidwood (1975: 94) criticized V. Gordon Childe's (1951) insistence on climatic change as the crucial trigger unleashing the social transformations of the Near Eastern Neolithic by pointing out that environmental changes roughly comparable to those taking place at the Pleistocene-Holocene transition had taken place in the same area in earlier interglacial periods without leading to similar social consequences. The same principle also holds true elsewhere. For instance, the marine resources that supported the earliest sedentary societies on the Andean coastal fringe had existed well before the Holocene. Moreover, recent sedimentological studies off the coast of Peru suggest that, if anything, the Humboldt Current was less productive on average in the Holocene than it had been in earlier peak glacial periods (Schrader 1992). Braidwood's comment thus forcefully reminds us that any attempt to explain the origins of human settlement and social differentiation in the Holocene era must go beyond specific single "prime movers" and must focus instead on conjunctures of mutually reinforcing factors present in the Holocene but not before, at least not as a package.

One contributing factor must have been that in many cases the climatic changes at the onset of the Holocene increased the spatial concentration of exploitable resources available to human societies, thus helping reduce their mobility. One aspect of this phenomenon was noted years ago by both Kent Flannery (1969) and Lewis Binford (1968), who argued that the extinction of megafauna at the end of the Pleistocene decreased the availability of large, seasonally migrating animals exploitable by humans (Bell and Walker 1992: 148–54) and helped

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focus human attention on the utilization of new, more localized subsistence resources, such as smaller game (with shorter migratory patterns), marine and lacustrine resources, invertebrates, and various plant resources, including grasses, nuts, and fruits (the "Broad Spectrum Revolution"). A further example of how climatic changes after the end of the Pleistocene promoted the creation of spatially concentrated resources is provided by the environmental impact of the slow sea-level transgressions that characterized the Early and Middle Holocene. In many coastal areas of the world, these transgressions contributed to the creation of new estuary and marsh areas, and to the expansion of preexisting ones, as low-lying alluvial plains, shallow river valleys, and creeks were flooded (Roberts 1989: 65, 125). As noted, such estuary/marsh areas commonly provide varied, rich, stable, and easily exploitable resources for human populations and were commonly the foci around which early sedentary and socially differentiated societies first developed in many parts of the world (particularly in middle latitude tropical and monsoonal environments).

A second contributing factor was worldwide population levels that, though difficult to measure, must have been higher in the Holocene than those prevalent in earlier interglacials. As noted earlier, some scholars of the scarcity camp see population pressure as the crucial trigger toward sedentism and eventual agriculture. This is problematic because arguments based on population pressure commonly disregard the possibility of cultural controls on population growth, a factor that is prominent in the ethnographic record (Kelly 1995: 205–59). Nevertheless, higher regional population densities, while not a trigger in and of themselves, are still significant for a number of reasons. First, they increase intergroup competition for available resources, which normally leads to reduced group mobility and increased territoriality. Second, higher population levels would increase the potential for conflict between Holocene communities above levels characteristic for earlier groups. The social impact of this increased competition is discussed by both Carneiro (1970) and Webster (1975). Both emphasize the important role of conflict in providing opportunities for early forms of social stratification to emerge, as successful military leaders manipulate wealth acquired from outside their own traditional social system (plunder) to dampen dissension and attract supporters. Third, on the domestic side, higher population levels would increase intragroup competition over available resources, thus favoring (1) the creation of formal modes of resource management if the tragedy of the commons (Hardin 1968) is to be avoided, and (2) the adoption of new, more productive, technologies, or (3) more efficient modes of control over available labor (Johnson and Earle 1987).

A third factor affecting societies in the Holocene is that of variability in the year-round availability of resources. In some cases this variability was the direct result of climatic changes brought in by the Holocene that promoted the expansion of high seasonality resources, such as the wild grains and legumes of the Near Eastern highlands. In other cases, such as the Peruvian coast, the variability was the result of the intrinsic unpredictability of the environmental framework because recurring El Niño events were inherently irregular in their timing, intensity, and effect.

Irrespective of whether resource variability was the result of predictable (i.e., seasonal) or stochastic processes, it would have necessitated substantial investments in storage in order to assure that resources be available at all times. This is very relevant indeed, because, as both Flannery (1972) and Testart (1982) have noted, cross-culturally the establishment of perma-

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nent storage facilities correlates with the emergence of territoriality, sedentism, and, ultimately, with the establishment and maintenance of hereditary ownership of limited areas of high resource potential. Of these aspects, we want to focus here on the social impact of sedentism. Coming on the heels of earlier decreases in human mobility caused by natural increases in human population densities and by the increased localization of exploitable resources typical of the Holocene, investments in permanent storage facilities and housing would have further (and, possibly, decisively) reduced the ability of commoners to escape the demands of rank-striving individuals. The social evolutionary impact of this can hardly be underestimated. Ethnographic studies consistently show that social fissioning is one of the most important mechanisms by which self-aggrandizing individuals are thwarted in mobile foraging societies (Boehm 1993; Carneiro 1968). Equally important, decreased mobility also normally leads to environmental degradation of areas surrounding human settlements, thus reducing the overall carrying capacity of the easily exploitable environment. At the same time, however, sedentism often leads to significant increases in population density. Demographic studies consistently show that, cross-culturally, sedentism commonly results in a significant shortening of the spacing between live births (Armelagos, Goodman, and Jacobs 1991; Bentley, Goldberg, and Jasienska 1993). Under such diametrically opposed but mutually reinforcing environmental and demographic stresses put into play by sedentism, subsistence agriculture, with its promise of increased and consistent yields of exploitable plants and animals, provides a logical way out. This is why agriculture is often a secondary development in areas that initially possessed abundant exploitable resources: it does not appear in the Near East until the PPNA period, 2,000 years or so after the initial sedentism of the Natufians, and it was not an important factor in Andean coast until the so-called Initial period, a thousand years or so after the exponential increases in population that accompanied the first emergence of complex societies in the area (Moseley 1992).

A fourth factor is one recently discussed by Joy McCorriston and Frank Hole (1991). This is the pre-development of the technologies that would eventually become necessary to take full advantage of the new opportunities made available by Holocene environmental changes promoting abundance—technologies with consequences surely unforeseen at the time of their initial introduction. In the Near East, for instance, while the climatic conditions occurring at the onset of the Holocene had existed several times before, the technology to produce the blades and the grinding and pounding stones necessary to cut and process the new seasonal (and highly nutritious) wild grasses that flourished under Early Holocene conditions did not exist before the Upper Palaeolithic period (ca. 40,000–12,000 B.P.) (Gilead 1991). Similarly, the achievements on the Andean coast would have been impossible without, first, the domestication of cotton and gourds, crops that had nothing to do with diet, and, second, the emergence of weaving technologies. These technological breakthroughs had already occurred by the end of the Archaic period, a thousand years or so before the emergence of Preceramic social complexity (Engel 1976: 95; Pearsall 1992: table 9.2). Both were necessary preconditions for making the nets and floats that made possible the large fish catches supporting Preceramic period centers along the coast.

We can thus understand the uniqueness of the Holocene as opposed to earlier interglacials as a result of the conjuncture of the various necessary conditions just discussed: (1) the increased localization of exploitable resources, (2) increased population levels, (3) the social

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impact of large-scale storage systems necessitated by either high seasonality or unpredictably variable environments, and (4) the pre-development of necessary processing and exploitation technologies. However, in and of itself, this conjuncture of factors is not a sufficient explanation for the observed transformations. No doubt, many other societies around the world failed to respond in ways that promoted differentiation and social complexity when confronted by conjunctures of similar necessary preconditions in the Holocene. Furthermore, there is no shortage of well-attested cases of fully sedentary groups of hunters and gatherers who managed, in spite of sedentism, to keep their population levels below the natural regenerative capacity of the environmental niche(s) they exploited, societies which did not go on to develop agriculture—at least not within the time-frame of the observations (e.g., the Calusa chiefdom, which developed on the southwest coastal lowlands of Florida between the 9th and sixteenth centuries A.D. [Widmer 1988] or the various tribal groups of relatively recent times along the northwestern coast of the U.S. and Canada [Druker 1965]). And, finally, cases of mobile hunting and gathering societies which practice some form of seasonal high-yield agriculture but refuse to become sedentary are also common (e.g., the Raramuri of northern Mexico, see Graham 1994).

The final factor, therefore, and possibly the only sufficient condition in the conjuncture, must be the culturally determined element of individual and communal perceptions of opportunities and threats (i.e., assessments of the social benefits and costs of behaviors such as self-aggrandizement, risk taking, and innovation). The details of this cultural framework must necessarily remain elusive in the case of the prehistoric societies that have been the focus of this paper. However, in trying to understand why different societies responded differently to similar conjunctures of demographic, ecologic, and technologic determinants, we would do well to remember Maurice Godelier's (1970: 120) suggestion as to the central role that social competition has in driving social evolution: ". . . social competition in primitive societies, as in class societies, provides the major incentive for the production of surplus. . . ." Surpluses, in turn, are important not only because they necessitate the construction of permanent storage facilities but also, and more importantly, because stored surpluses are deployable surpluses—and such surpluses are a crucial factor in the eventual institutionalization of rank hierarchies. The reason for this is simple: surpluses allow aspiring elites to attract, reward, and maintain followers by bestowing material, social, or even spiritual benefits (asymmetrical reciprocity), thus creating at the same time social obligations and political legitimacy (Bailey 1988; Orenstein 1980). In so doing, surpluses create a situation in which the masses perceive their interests to be coterminous with those of emerging elites and help them to consolidate, extend, and, ultimately, institutionalize their power, both within their own group and vis-à-vis local rivals (Hayden 1990; Clark and Blake 1993).

CONCLUSIONS

In the final analysis, when considering the origins of human settlement and social differentiation we must envision a complex scenario in which varying paths and multiple co-occurring factors led, in otherwise disparate areas, toward convergent social forms (fig. 2.1). Within this scenario, one of the disequilibrating factors that until now has not received the attention it deserves as a cross-cultural trigger for early instances of surplus formation, sedentism, and

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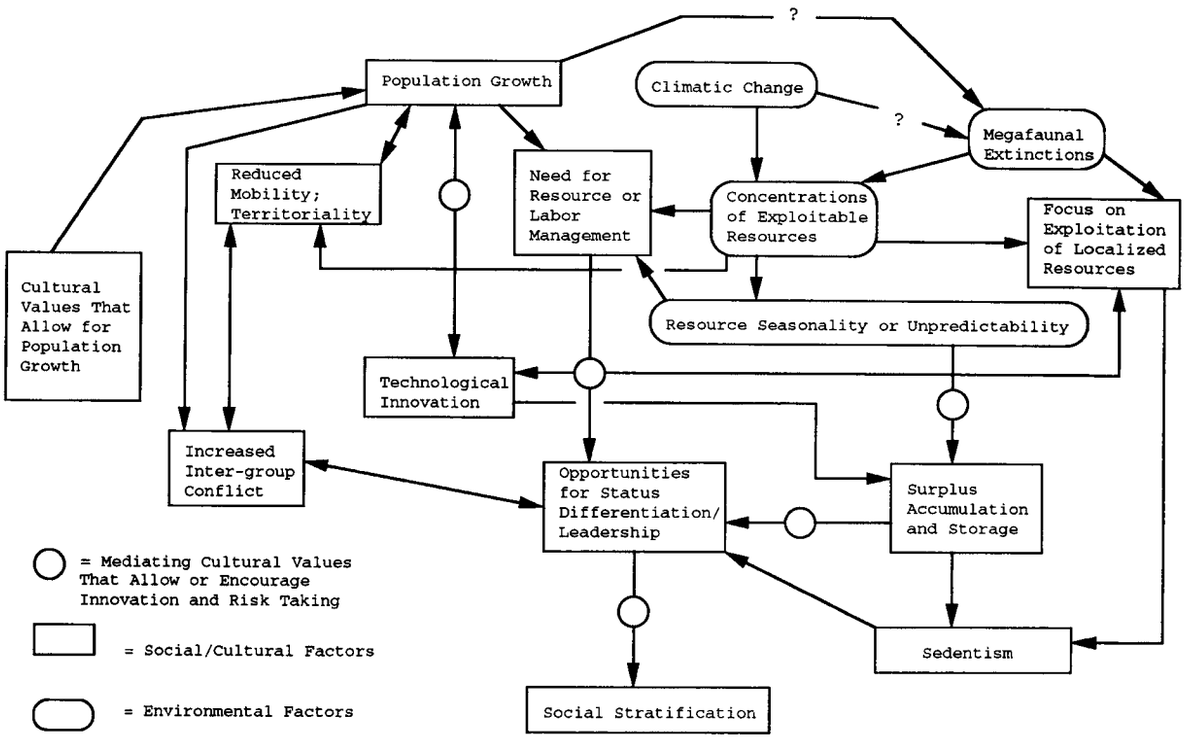

FIGURE 2.1. Factors promoting sedentism and initial social stratification.

social differentiation is resource abundance—an abundance which constituted a type of circumscription in the sense described by Carneiro (1970). However, resource abundance served as a trigger only in the presence of the necessary ecological, demographic, technological, and cultural preconditions discussed above. In some cases, the enabling abundance was the result of environmental shifts triggered by the onset of the Holocene. However, in and of themselves, these environmental changes did not determine social evolution. Rather, they merely provided a context within which the sort of individual risk taking and factional competition (Brumfiel 1994) that ultimately drive social evolution could thrive.

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3

A COMPARATIVE STUDY OF THE EGYPTIAN POTTERY FROM TEL MAʾAḤAZ, STRATUM I

RUTH AMIRAN AND EDWIN C. M. VAN DEN BRINK

INTRODUCTION

Over the past decade many new and important discoveries have been made at numerous Early Bronze Age I (EB I) sites in central but especially southern Israel which have direct bearing on the earliest Egyptian-Canaanite interconnections attested thus far (cf., e.g., Brandl 1992; Gophna 1992; Kempinski 1992; Kempinski and Gilead 1991; Oren 1989; Oren and Yekutieli 1992; Porat 1989, 1992; Braun et al., chap. 4, this volume; Levy et al. 1995; Levy et al., chap. 22, this volume).

Porat's recent study of Egyptian materials from these sites (1989, 1992), both locally produced and imported from Egypt, has prompted us to return here in more detail to the Egyptian materials found some twenty years ago by the Ophir expedition at Tel Maʾaḥaz.

DESCRIPTION OF THE SITE

Tel Maʾaḥaz, which covers an area of at least 5 dunams (Gophna 1987: 17), is situated in the southern part of the Lower Shephelah (map ref. 1314 1028), about 10 km south of Tel Erani (fig. 3.1) with its contemporary and culturally related occupations. The site is located on the top of a spur (pl. 3.1a) overlooking the confluence of Naḥal Kelekh and Naḥal Adorayim, 235 m above sea level. A nearby, perennial well, located in the wadi bed, guaranteed the inhabitants of Tel Maʾaḥaz a steady supply of water.

HISTORY OF RESEARCH

The site was discovered in 1961 by Mr. Y. Divon, a resident of the region. In 1969 R. Gophna, accompanied by M. Broshi and E. Yeivin, carried out a reconnaissance and sherding of the site which yielded a quantity of potsherds. Included was a sherd of an Egyptian storage jar, incised before firing with an incompletely preserved *serekh*, apparently "of either King Scorpion or Narmer" (pl. 3.6b [left]; see also below, nn. 7–8).

In two short seasons during the years 1975 and 1976, three small areas in the center of the tel (pl. 3.1b) were probed by members of the Ophir expedition (namely, D. Alon, R. Amiran, I. Beit-Arieh, R. Cohen, and R. Gophna) on behalf of the Institute of Archaeology of the Tel Aviv University and the Israel Museum (Cohen et al. 1975: 162; Amiran 1977; Amiran and Gophna 1993).

These excavations indicated that about 20 cm below the present surface are deposits—between 0.75 and 1.0 m deep—of two archaeological strata. The lower stratum (Stratum II) is

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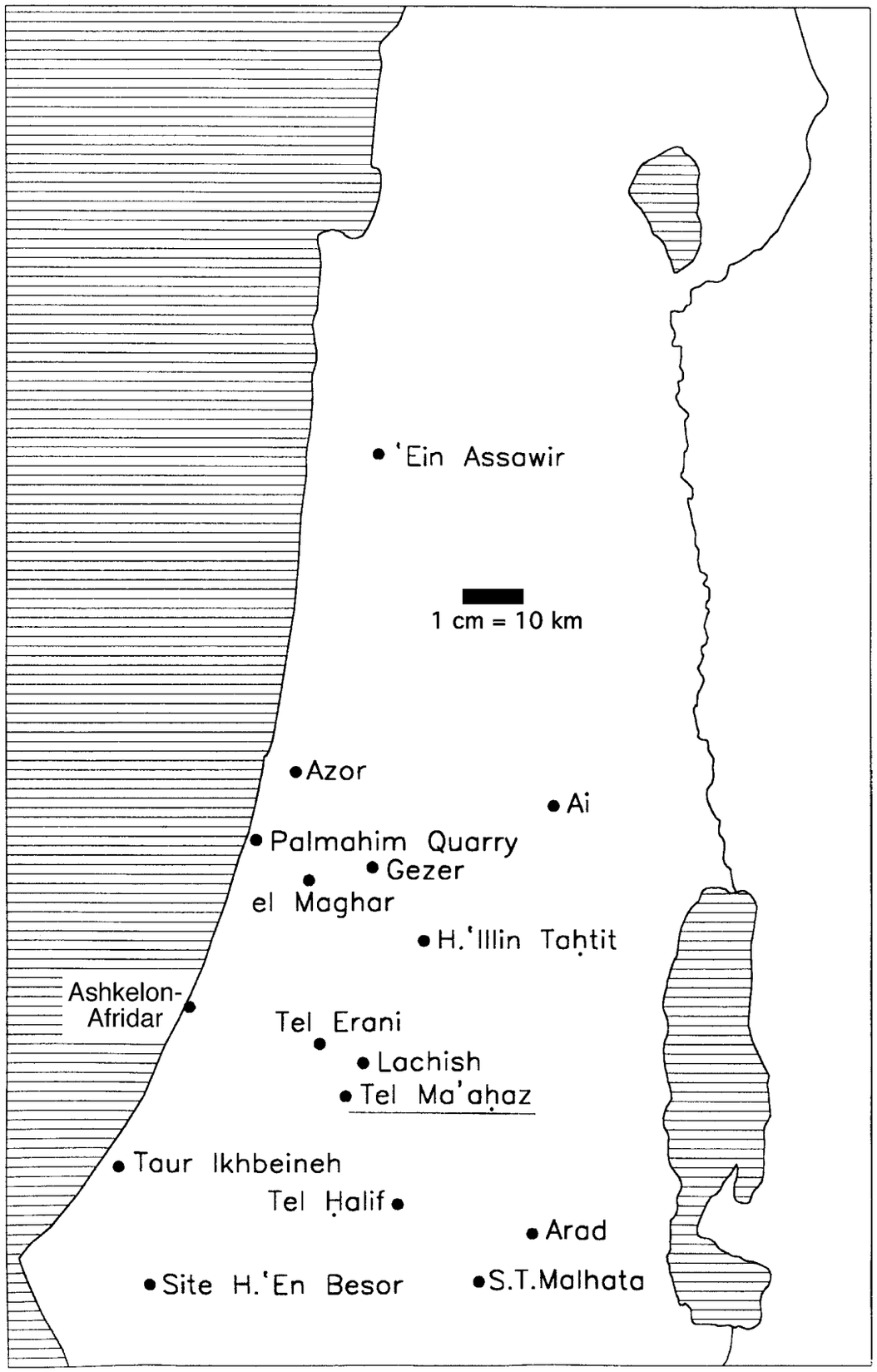

FIGURE 3.1. Map of Tel Maʾaḥaz and contemporary EB I sites mentioned in the text.

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represented by pits dug in virgin soil, filled with ashes and pottery fragments dating from the EB I period (Cohen et al. 1975: 162). Excavation of Stratum I revealed partial remains of walls and floors, most of which are composed of a single line of stones. A very thick wall (about 2 m wide), built of small stones, was found in one part of the excavation. It is not clear whether the wall is part of a structure, a segment of a fortification, or part of a stone-built platform of the type found at Arad (Amiran et al. 1978: 17e). Various installations, with an abundance of pottery in and around them (pl. 3.2a), were also found in Stratum I. This stratum is assigned to the EB IB (Amiran and Gophna 1993: 919).

The Pottery

The Egyptian ceramics under discussion[1] all derive from Stratum I buildings. They form part of a domestic assemblage; features in this level include various built installations, numerous grinding stones, flint tools, and a ceramic assemblage that supports this description.[2]

Although the material has not yet been statistically quantified (but see Amiran and van den Brink, in press), one may safely subscribe to the general statement that "the majority of the ceramic finds are of Egyptian type, and a smaller quantity of local types" (Cohen et al. 1975: 162), a situation comparable to that of contemporary ʿEn Besor, Stratum III (see below).

Petrography

Porat (1989, 1992) analyzed petrographically and chemically about 300 Egyptian vessels found at various EB I–II sites in Israel, including nineteen specimens from Tel Maʾaḥaz. The results of this examination of the composition of pottery fabrics was subsequently compared with data concerning typical local Canaanite pottery from the very same sites. The research was further complemented with analyses of typical Egyptian pottery found at contemporary Proto-Dynastic/Early Dynastic sites in Egypt, with emphasis on the Nile Delta.

Examination of the composition of the Egyptian component in the ceramic assemblages of various EB I sites indicated that they fell into three distinct petrographic groups:

Group 1. A calcareous-silty group of so-called local (i.e., produced in Israel) Egyptian pottery, made of local loessy clays, which "on the base of their carbonate contents and mineralogy of the silt-size fraction" (Porat 1992: 433) can be distinguished from Nile silts.
Group 2. Egyptian Nile silt ware.
Group 3. Egyptian Marl clay ware.

For further subdivisions in the import wares, Groups 2 and 3, which do not require further elaboration here, the reader is referred to Bourriau 1981: 14–15. Comparing the local Egyptian pottery of Group 1—quantitatively the largest of the three groups within the Egyptian ceramic assemblage of Tel Maʾaḥaz, Stratum I—with typical local Canaanite pottery from the same sites, Porat (1992: 434, tables 6–7) notes that a *technological* difference between them is

1. The local Canaanite pottery of Tel Maʾaḥaz, Strata I and II, will be presented in the final report of the site (cf. Amiran and van den Brink, in press).
2. In contrast, for example, to another contemporary site with a strong Egyptian component (namely, the Silo site, Stratum IIb at Tel Ḥalif Terrace) where "For the most part, the . . . architecture . . . is non-domestic in character" (Levy et al. 1995: 29).

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clearly apparent. The choice of clays, the kind of temper added, the firing temperature, and the use of the wheel distinguish between the Egyptian and Canaanite pottery.

Thirty-six thin sections from pottery found at Tel Maʾaḥaz were studied by Porat (1989: appendix 5). Nineteen, as mentioned above, were prepared from Egyptian vessels (Porat 1989: table 9.4, appendix 2a; Porat 1992: table 4) and seventeen from local, Canaanite vessels. These last include bowls, holemouth jars, and a pithos (Porat 1989: appendix 2a continued). It was found that the petrographic composition of the Egyptian pottery is almost identical with Egyptian wares of Tel Erani.[3]

All three petrographic groups mentioned above were identified within the Egyptian assemblage of Tel Maʾaḥaz, Stratum I and "no consistent differences were found between the two sites [i.e., Tel Erani and Tel Maʾaḥaz, Stratum I]" (Porat 1989: 56, 9.1.9). Unfortunately none of the pottery shapes, analyzed by Porat (1989), has been reproduced in drawing or in photograph, a shortcoming only partially obviated by the present paper.

The distribution of the nineteen analyzed Egyptian vessels into the three petrographic groups (see above) can be summarized as follows: nine vessels (bowls, bread molds, and storage jars) fall in Group 1; six storage jars belong to Group 2, and four jars fall in Group 3 (Porat 1989: table 9.4).[4] To the latter group (Egyptian marl clay ware) we can add here two *serekh*-incised sherds from Egyptian storage jars found at Tel Maʾaḥaz (see below).

The discussion below includes those vessels of Egyptian origin or inspiration previously noted[5] at this site. The pottery is presented according to shape (open vessels, closed vessels). Each type is compared to related material found both in Israel and Egypt.

Open Vessels (Table 3.1)

The types of open vessels represented in the Tel Maʾaḥaz Stratum I assemblage are:

(1) Medium-sized, flat-based bowls. These handmade bowls with flaring rims proved to have been made both of Nile clays (fig. 3.2:1–3; pls. 3.2a-b, and 3.3a [center]) and local loessy clays mixed with various kinds and sizes of temper (fig. 3.2:4; pl. 3.3b; cf. Porat 1989, 1992; Y. Goren pers. comm.). The interior and exterior surfaces of these bowls are left untreated (no slip applied, not polished).

A plausible explanation for the rather unexpected presence of imported bowls among the ceramic assemblage, also valid for the smaller version of the same type made of Nile silt, mentioned below, would be that they originally served as lids on storage jars imported from Egypt.

3. More than half of all vessels studied by Porat (162 out of an odd 300) derive from Tel Erani, which therefore is her main reference site. Of these, seventy-five were Egyptian(ized) vessels, and eighty-eight were local, Canaanite vessels. From ʿEn Besor, Stratum III, another site to which the Maʾaḥaz assemblage is well comparable, a total of fifty-nine vessels were studied by Porat. Of these thirty-nine were Egyptian(ized) vessels and twenty were local, Canaanite vessels.

4. As for the seventy-five Egyptian vessels from Tel Erani, the distribution over these three groups is: fifty-six in Group 1, seven in Group 2, and sixteen in Group 3. For ʿEn Besor, Stratum III: 27 in Group 1, six in Group 2, six in Group 3 (Porat 1989: table 9.4).

5. These include Cohen et al. 1975: pl. 16C (= pl. 3.3a in this article), Gophna 1976: fig. 3:1 (= fig. 3.3:21 in this article), Amiran 1977: figs. 2a-b (= pls. 3.2b, 3.4a in this article), Schulman and Gophna 1981: 28A (= pl. 3.6b [left] in this article), Amiran and Gophna 1993: 920 (= pls. 3.2b, 3.4a, and 3.6b in this article).

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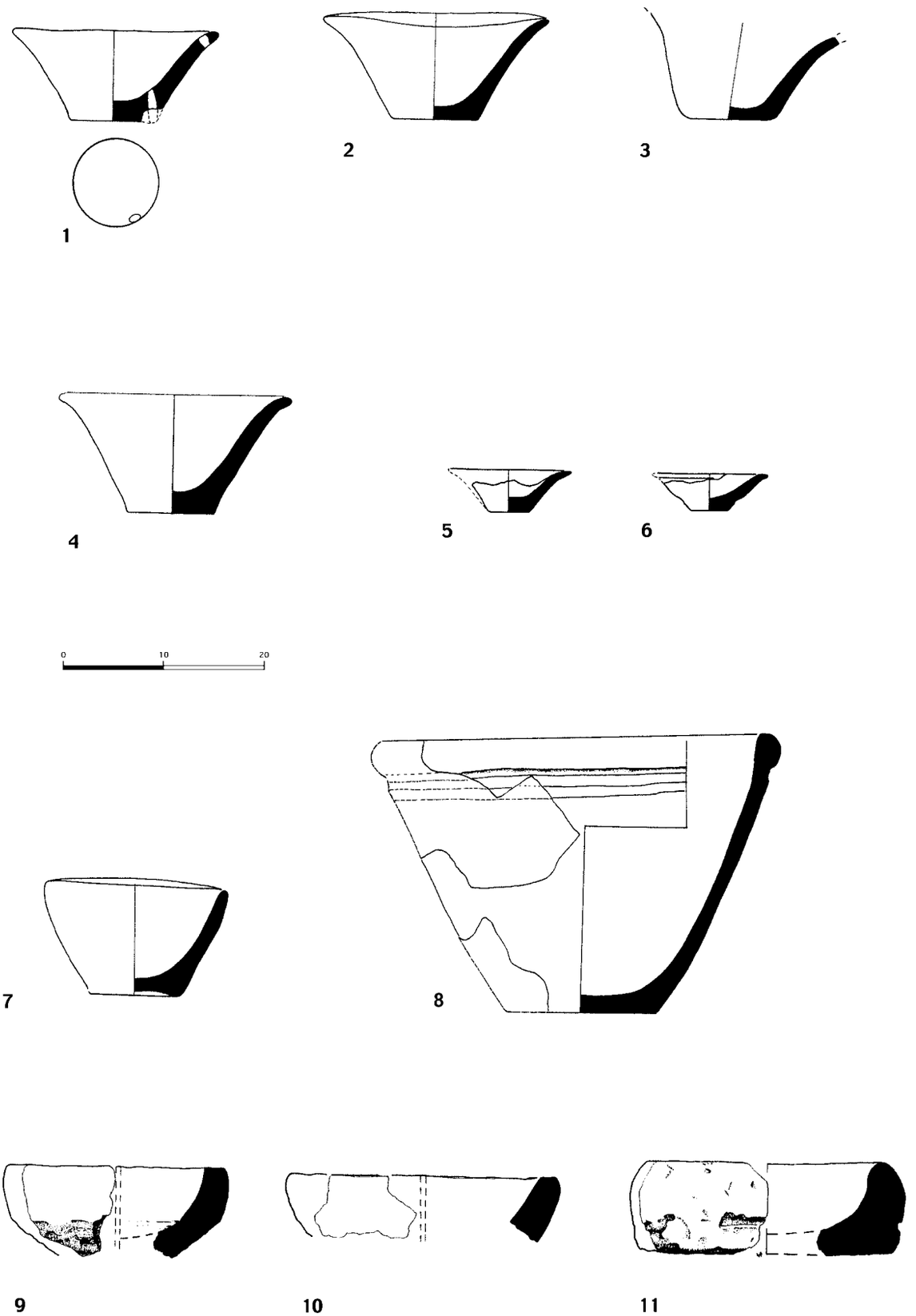

FIGURE 3.2. Tel Maʾaḥaz, Stratum I, Egyptian pottery, open vessels (see table 3.1).

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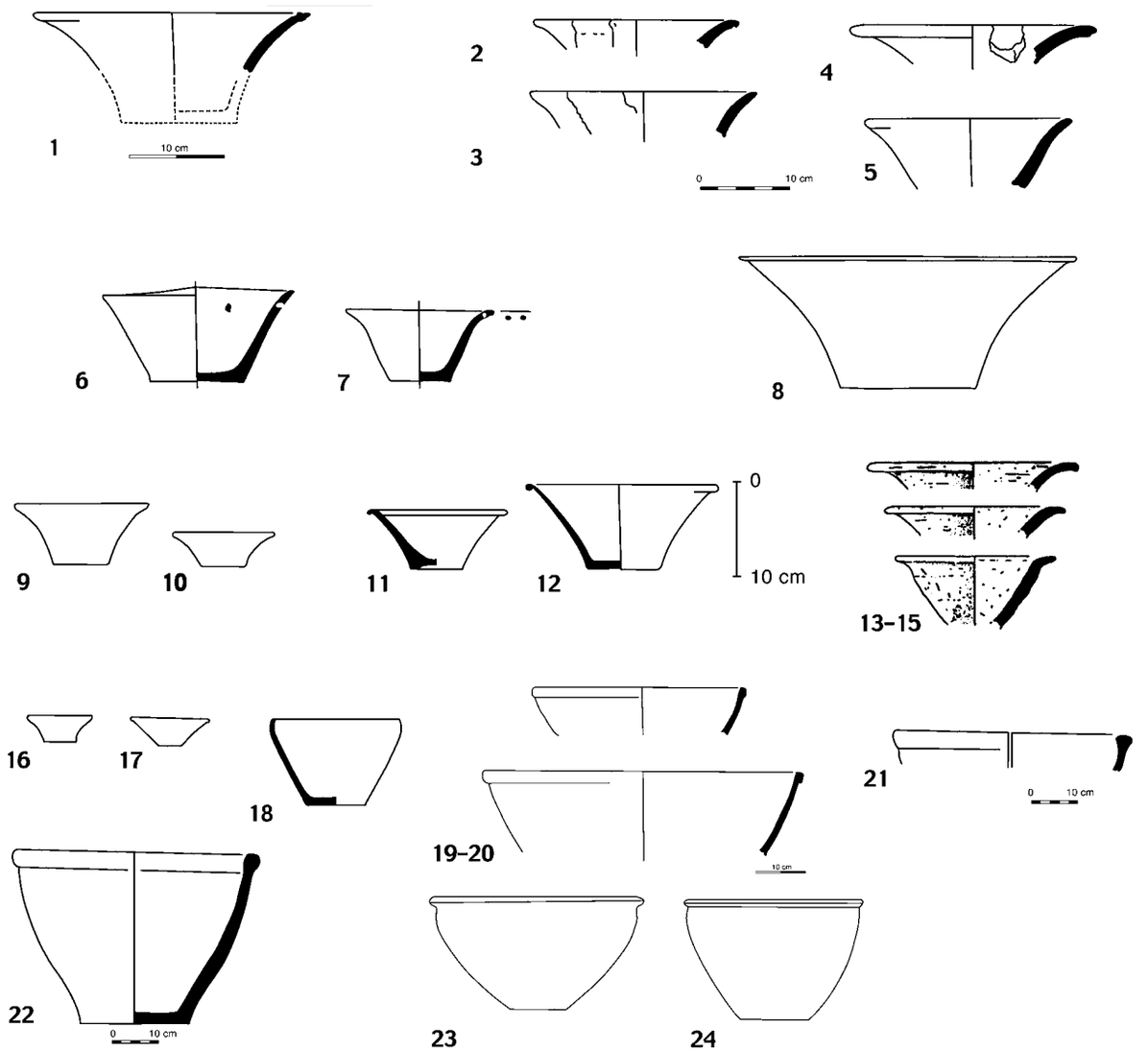

FIGURE 3.3. Open vessels, comparable material. *(1):* Brandl 1989: 373, fig. 12:12. *(2–5):* Gophna 1990: fig. 1:1, 3, 4. *(6–7):* After Brandl 1992: fig. 2:9–10. *(8):* After Brandl 1992: fig. 3:10. *(9–10):* Petrie 1953: pl. I:3, g, d. *(11–12):* Kroeper 1988: figs. 105–06. *(13–15):* Köhler 1992: fig. 1. *(16–17):* Petrie 1953: pl. I:3, k, l. *(18):* Kroeper 1988: fig. 111. *(19–20):* Brandl 1989: fig. 13:3–4. *(21–22):* Gophna 1990: fig. 6:5, 10. *(23–24):* Petrie 1953: pl. 33, l, n.

Similar bowls, made of local loessy clays only, are found in Tel Erani (fig. 3.3:1), ʿEn Besor, Stratum III (fig. 3.3:2–5), et-Tell (Ai) (two bowls with similar perforated walls, found in Tomb C; fig. 3.3:6–7) and Gezer (fig. 3.3:8).

They are comparable to certain late types of Petrie's R(ough)-ware found in Egypt (cf., e.g., fig. 3.2:1–4 with fig. 3.3:9–10). In the Early Dynastic cemetery at Minshat Abu Omar, eastern Nile delta, they appear in graves belonging to Grave Group 3b (fig. 3.3:11–12). They are also present in, e.g., Tell el-Faraʾin/Buto, Stratum IVc (fig. 3.3:13–15).

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Table 3.1. Tel Maʾaḥaz, Stratum I. Egyptian pottery, Open Vessels

No.	*Reg. no.*	*Fabric*	*Type*	*Fig./Pl.*
1	533 00 70 1	Nile silt C	Bowl with perforations	Fig. 3.2:1; pl. 3.2b
2	533 75 25 1	Nile silt C	Bowl[a]	Fig. 3.2:2; pl. 3.3a
3	533 00 59 2	Nile silt C	Bowl, incomplete	Fig. 3.2:3
4	533 00 58 1	Loessy clay	Bowl	Fig. 3.2:4; pl. 3.3b
5	533 00 59 1	Nile silt C	Small bowl	Fig. 3.2:5
6	533 00 42 1	Loessy clay	Small bowl	Fig. 3.2:6
7	533 75 09 1	Marl clay	Bowl	Fig. 3.2:7; pl. 3.3a (right)
8	533 75 15 1	Loessy clay	Deep bowl	Fig 3.2:8; pl. 3.4a
9	533 00 38 2	Loessy clay	Bread mold	Fig. 3.2:9
10	533 00 40 1	Loessy clay	Bread mold	Fig. 3.2:10
11	533 00 56 1	Loessy clay	Tray	Fig. 3.2:11

[a] Identifiable with Porat (1989: appendix 5: 345).

Smaller versions of the same type are represented by fig. 3.2:5, 6, made of Nile silt C and loessy clay respectively. They are similar to fig. 3.3:16–17, deriving from Egypt.

A different type of medium-sized bowl is represented by fig. 3.2:7; pl. 3.3a (right), made of marl clay. It compares well with fig. 3.3:18, deriving, once again, from graves belonging to Minshat Abu Omar Grave Group 3b. In contrast to the latter, however, no traces of slip or polish have been found on our example.

(2) Deep bowls, made of loessy clay (fig. 3.2:8; pl. 3.4a). Similar locally produced examples are found at Tel Erani (fig. 3.3:19–20), ʿEn Besor, Stratum III (fig. 3.3:21–22) and Ashkelon–Afridar (Brandl and Gophna 1993: 89, fig. 102). At ʿEn Besor a very large example was found "sunken into the floor of building A" (Gophna 1990: 150).

They are comparable in form to, e.g., fig. 3.3:23–24, deriving from Egypt.

(3) Thick-walled bread molds (fig. 3.2:9–10) and flat-bottomed trays invariably made of loessy clay (fig. 3.2:11). The interior and the upper portions of the exterior surface of the bread molds are carefully smoothed. The lower portions of the exterior were wholly untreated; not even excess clay was scraped off. The loessy clay is usually mixed with coarse temper, perhaps in order to imitate their Egyptian counterparts made of equally coarse-tempered Nile silt (C) fabric.

Similar bread molds have been found in Israel at ʿEn Besor, Stratum III (fig. 3.4:1–6; many of them with prefiring applied marks on the inside, a feature they share with their Egyptian counterparts) and Tel Ḥalif Terrace, Site 101 (fig. 3.4:7; Dessel 1991: fig. 43:1–4), and Silo Site, Stratum II (Levy et al. chap. 22, this volume: table 22.2).

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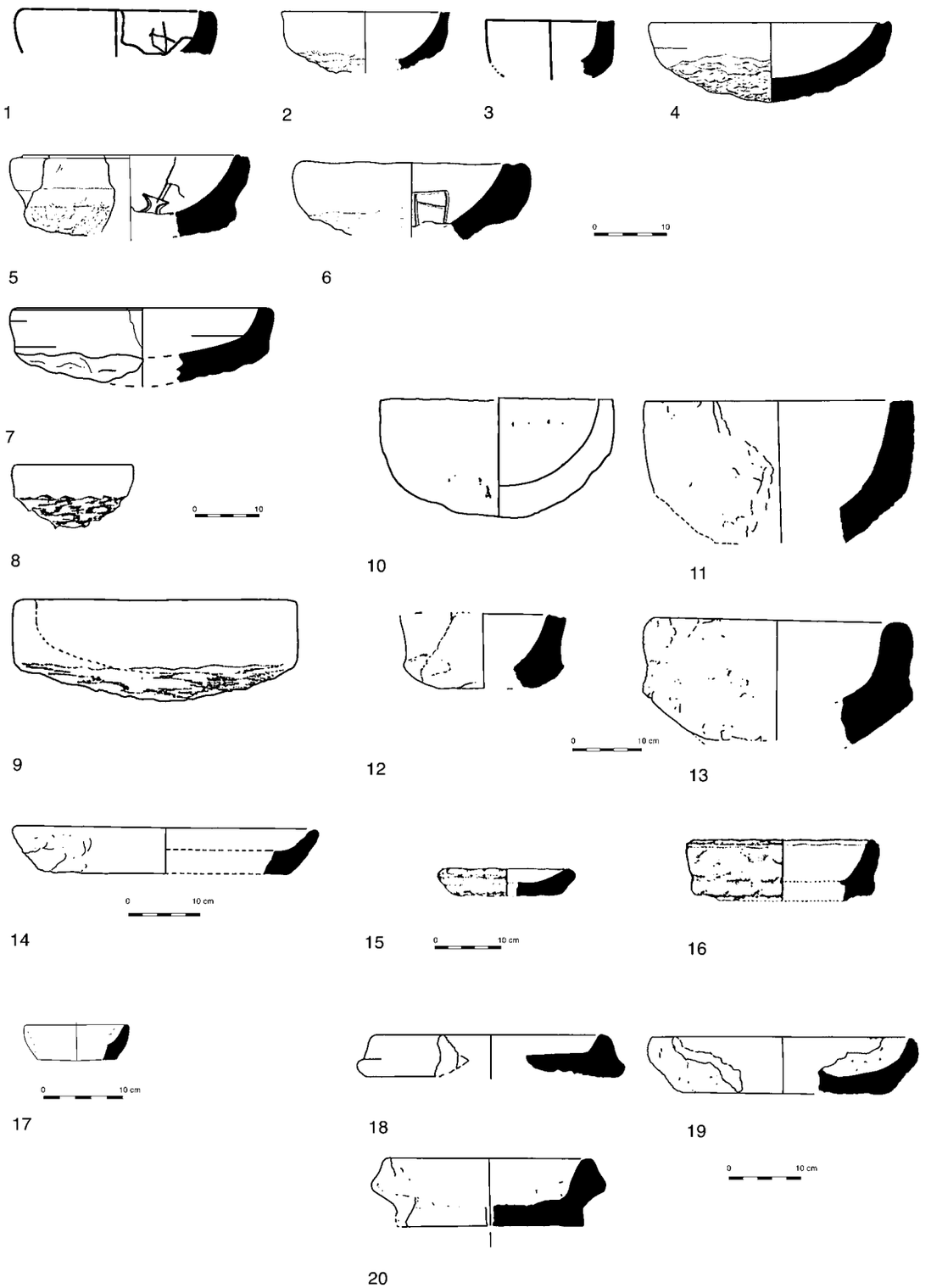

FIGURE 3.4. Bread molds, comparable materials. *(1–6):* Gophna 1990: fig. 2:1, 2, 4–6. *(7):* Gophna 1972: fig. 2:6. *(8–9):* Petrie 1953: pl. II:8e, h. *(10):* van den Brink 1992: fig. 7:3. *(11–13):* van den Brink 1989: fig. 13:4–6. Trays, comparable materials. *(14):* Kempinksi and Gilead 1991: fig. 12:10. *(15–16):* Oren 1989: fig. 6:21–22. *(17):* Friedman 1992: 203, fig. 4h. *(18–20):* van den Brink 1989: fig. 13:1–3.

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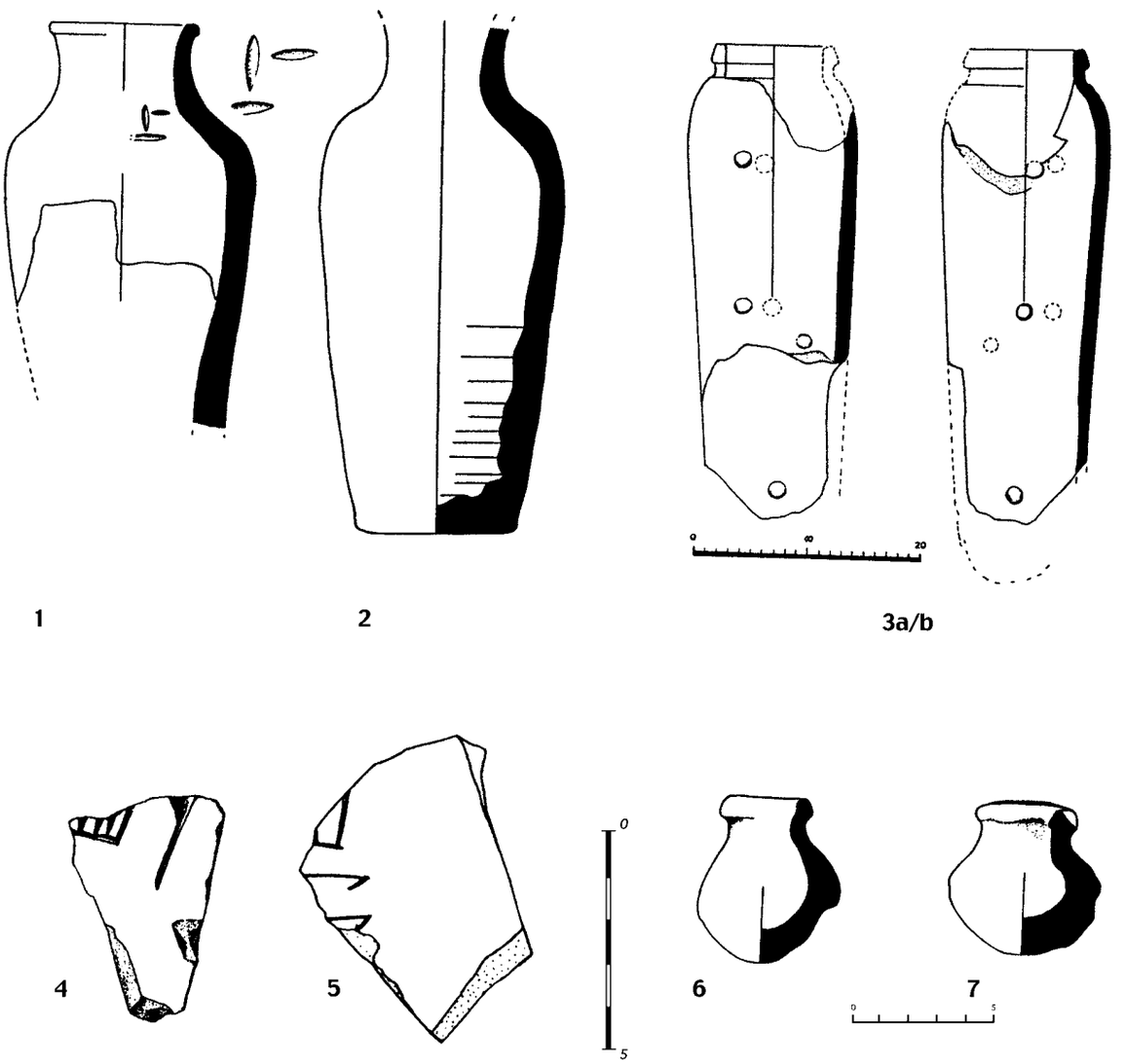

FIGURE 3.5. Tel Maʾaḥaz, Stratum I, closed vessels (see table 3.2).

They are almost indistinguishable from their Egyptian counterparts (cf. fig. 3.2:9–10 with fig. 3.4:8–13; see also Jacquet-Gordon 1981: fig. 1:1–4).

Examples of the flat-bottomed tray, reproduced here in fig. 3.2: 11, have been found also in Tel Erani (fig. 3.4:14), in northern Sinai (fig. 3.4:15–16), and in southern Sinai, namely, in Sheikh Muhsen (Beit-Arieh 1986: fig. 11: 7; there erroneously called a "crucible").

They can be compared with late Proto-Dynastic examples found in Egypt, for instance deriving from Mendes/Tell el-Rubʾa (fig. 3.4:17), Area B, Unit 3, and el-Tell el-Iswid (S), Phase B (fig. 3.4:18–20), both located in the Nile Delta.

Closed Vessels (Table 3.2)

The types of closed vessels represented in the Tel Maʾaḥaz Stratum I assemblage are:

(1) Flat-based storage jars (fig. 3.5:1–2; pls. 3.2a, 3.4b-c, 3.5a) of loessy clay, roughly handmade, with very thick walls. The fabric is very similar to the coarse-tempered ware used

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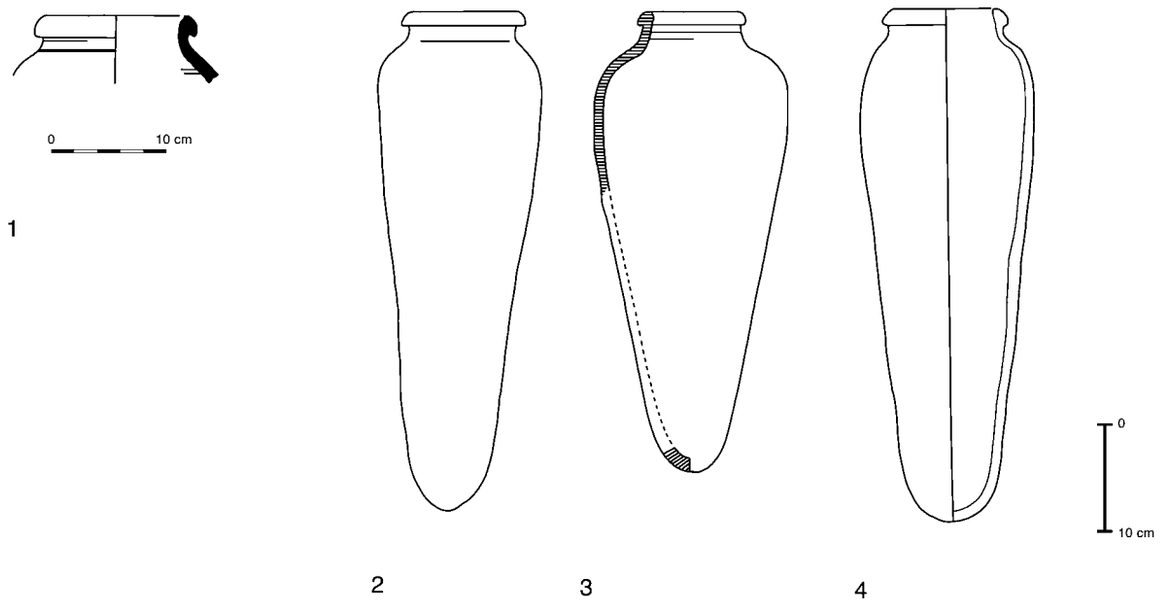

FIGURE 3.6. Storage jars, marl clay, comparable materials. *(1):* Gophna 1990: fig. 8:5. *(2):* Petrie 1953: pl. XIV:60T [SD 78]. *(3):* Kroeper 1988: fig. 90. *(4):* Hendrickx 1994: pl. xiv [H339]; cf. also pl. 3.6a, this chapter).

for bread molds. With the latter they also share the low firing temperature at which the vessels were fired: charred straw is still visibly present in the fabric of some of these jars.

Comparable jars are apparently absent at other late EB I sites in Israel. Also in Egypt close parallels are absent, pointing to a very local production of this type at Tel Maʾaḥaz.

(2) A handmade, shouldered jar, made of marl clay (fig. 3.5:3a-b; pl. 3.5b-c), paralleled in Israel by a single specimen from ʿEn Besor, Stratum III (fig. 3.6:1).

This type of storage jar is frequently found in the Proto-Dynastic/Naqada III cemeteries all over Egypt, from Minshat Abu Omar in the north (fig. 3.6:3; once more found in graves belonging to Grave Group 3b) to the Naqada III cemeteries in Abydos (cf. fig. 3.6:2) and el-Kab in the south (fig. 3.6:4; pl. 3.6a).

Our example is, however, unusual because of the perforations found on opposite sides of the vessel wall at three different heights (see fig. 3.5:3a-b; pl. 3.5b-c). The holes were drilled after firing and indicate a reuse of this jar. Its function is not known, but we suggest that since the perforations are at opposite sides, sticks may have been meant to be inserted in them.

(3) Two fragments of handmade storage jars, made of marl clay, each incised before firing with a *serekh*-sign (fig. 3.5:4–5). One sherd was encountered during the excavations (fig. 3.5:4; pl. 3.6b [left]; briefly mentioned in Amiran 1983: n. 21 [end]), while the other one was a surface find (fig. 3.5:5; pl. 3.6b [right]), picked up by R. Gophna during his initial survey of the site.[6]

6. Reg. no. 81 129. A reexamination of the sherd, with kind permission of R. Gophna, showed that in order to obtain the right position, the sherd should in reference to Schulman and Gophna 1981: fig. 1, be turned 90 degrees to the left, (cf. also van den Brink in prep.). That is to say, that what is preserved of this *serekh* is its right lower corner. Although the present authors are of equal opinion that what has been preserved is part of a *serekh*, it is not possible to attribute it to any specific king, due to its incomplete state of preservation.

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Table 3.2. Tel Maʾaḥaz, Stratum I. Egyptian pottery, Closed Vessels

No.	*Reg. no.*	*Fabric*	*Description*	*Fig./Pl.*
1	533 00 38 1	Loessy clay	Storage jar, with potmark	Fig. 3.5:1; pl. 3.5a
2	533 00 53 1	Loessy clay	Storage jar	Fig. 3.5:2; pl. 3.4b
3	533 00 70 1	Loessy clay	Storage jar	Pl. 3.4c
4	533 75 13 1	Marl clay	Storage jar[a]	Fig 3.5:3; pl. 3.5b–c
5	IAA 94 3328	Marl clay	Incised *serekh*-sign	Fig. 3.5:4; pl. 3.6b (right)
6	IAA 81 129	Marl clay	Incised *serekh*-sign	Fig. 3.5:5; pl. 3.6b (left)
7	533 75 20 1	Nile silt B	Miniature vessel	Fig. 3.5:6; pl. 3.3a (foreground, left)
8	533 75 23 1	Nile silt B	Miniature vessel	Fig. 3.5:7; pl. 3.3a (foreground, left)

[a] Identifiable with Porat (1989: appendix 5: 362).

The former *serekh* fragment (fig. 3.5:4; pl. 3.6b [left]) is preserved on a single sherd (IAA 94 3328), measuring 5.1 × 3.5 cm; it is a maximum of 10 mm thick. Handmade and carefully smoothed, it obviously belongs to a growing corpus of tall, Egyptian storage jars with tapering bodies, sometimes known in the literature as "wine jars," occasionally bearing *serekh*-signs and usually incised before firing (for a typo-chronological discussion of these jars, see van den Brink 1996). Examples with pottery-incised *serekh*-signs date mainly to Dynasty 0.

Petrographic examination of our sherd by Y. Goren[7] shows that it is made of Egyptian marl clay, thus confirming its origin. The color of its exterior surface is pinkish-buff. It has been evenly and thoroughly fired, without oxidation zones being visible in section. Only the lower right corner of the *serekh*, carefully executed before firing of the vessel, has been preserved.[8] Incised *serekh*-signs are quite often accompanied by additional incised marks, as illustrated once again by our example, which also bears an additional sign.

The fragmentary state of the *serekh* excludes any possible attribution to a specific king. We should content ourselves with the observation that on the basis of the thickness of the sherd (not exceeding 10 mm), it is most likely to be attributed to the general group of Type III storage jars (cf. van den Brink 1996), dated to the latter part of Dynasty 0. For a complete listing of the seventeen pottery (fragments) incised with *serekh*-signs, found to date in Israel, including a recently found *serekh*-sign of (Horus) Narmer, found at Tel Ḥalif Terrace, Silo site, Stratum IIb (Levy et al. 1995; see Levy et al., chap. 22, this volume: fig. 22.14).

Clearly identifiable fragments of the same type of tall storage jars (van den Brink Type III), although without incised *serekh*-signs, have been found at Tel Erani (fig. 3.7:1–2), ʿEn Besor,

7. The necessity to petrographically check pottery with incised *serekhs* found in Israel and north Sinai—taken until now on face value to have been imported from Egypt—was proven by the recent finding of two Egyptian *serekh*-signs appearing on local, Canaanite pottery (cf. Braun et al., chap. 4, this volume). Also sherd IAA 81 129, mentioned above, was examined petrographically and proved to be made of Egyptian marl clay (Y. Goren pers. comm.).

8. The *serekh* fragment measures maximum 1.2 × 1.1 cm; the individual grooves that make up the *serekh* are not deeper than 1.5 mm.

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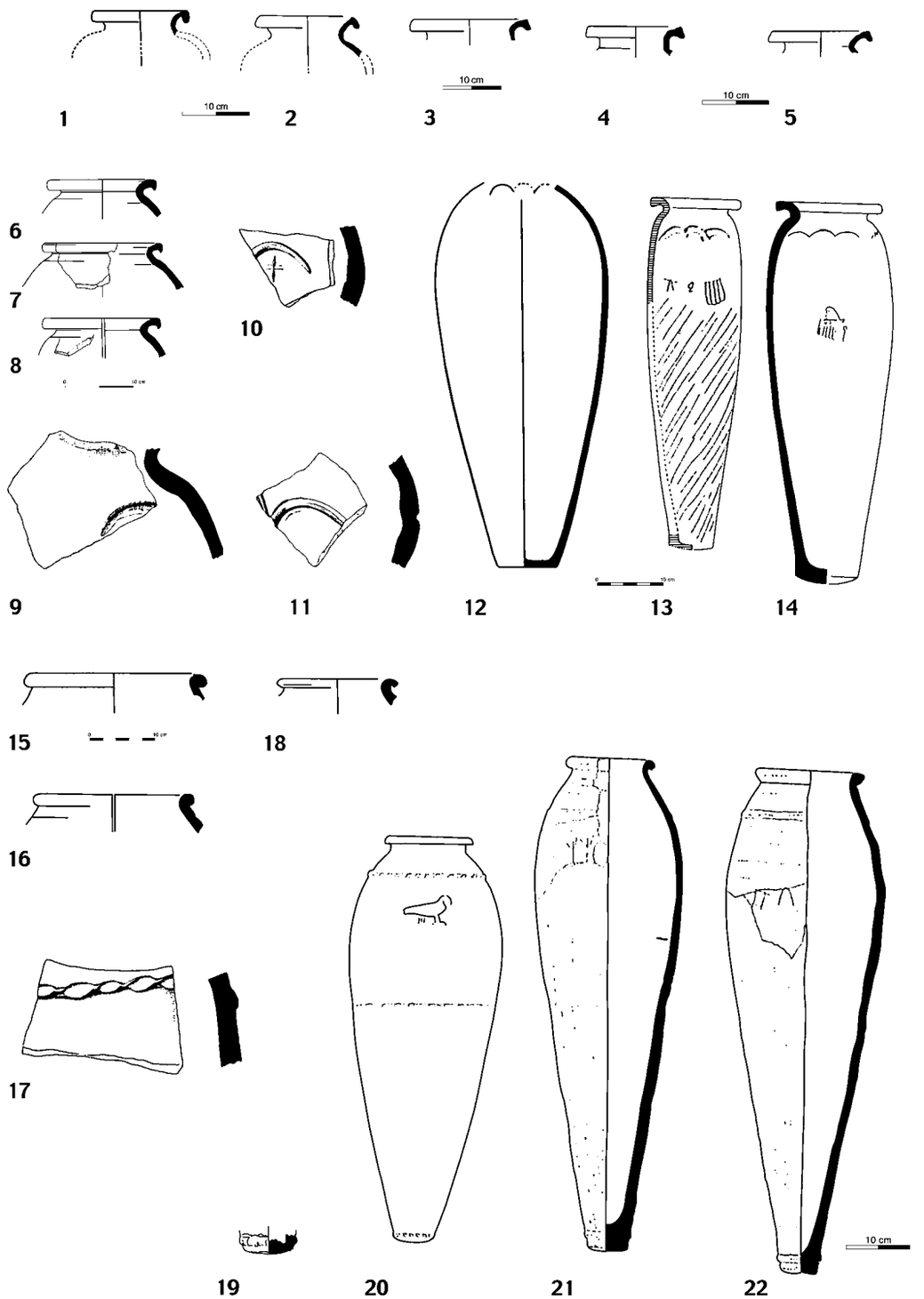

FIGURE 3.7. Storage jars (wine jars), marl clay and Nile silt. Nos. *1–14:* Type 3; nos. *15–22:* Type IV. *(1–2):* Brandl 1989: figs. 9:5; 10:5. *(3):* Gophna 1990: fig. 8:3. *(4–5):* Oren 1989: fig. 7:13, 16. *(6–8):* Beit-Arieh 1986: nos. 20–22. *(9–11):* Gophna 1990: fig. 10:5, 8, 11. *(12):* Amiran 1974: fig. 2:12. *(13–14):* Kroeper 1988: figs. 94–95. *(15):* Gophna 1990: fig 8:1. *(16):* Braun et al., chap. 4, this volume, fig. 4.2:4. *(17):* Braun et al. chap. 4, this volume, fig. 4.5:2. *(18–19):* Oren 1989: fig. 7:5, 17. *(20):* Petrie 1953: pl. XXII: 76a. *(21–22):* van den Brink 1988: fig. 15:70–72.

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Stratum III (fig. 3.7:3, 9–11), Tel Arad, Stratum II (fig. 3.7:12), in north Sinai (fig. 3.7:4–5) as well as in south Sinai, namely, in Sheikh Muhsen (fig. 3.7:6–8).

Rim and bottom fragments of related, but taller and more robust storage jars, with applied bands imitating ropes (van den Brink [1996] Type IV), have been found in ʿEn Besor, Stratum III (fig. 3.7:15), el Maghar (fig. 3.7:16), Ḥorvat ʿIllin Taḥtit (fig. 3.7:17), Tel Erani (Israel Antiquities Authority excavations 1995: Braun and van den Brink pers. comm.), north Sinai (fig. 3.7:18–19), and in south Sinai, at Sheikh Muhsen (Beit-Arieh 1986: fig. 11:6).

For comparison we reproduce here two Type III jars from Minshat Abu Omar, Grave Group 3b (fig. 3.7:13–14), and three Type IV jars, two of which derive from a First Dynasty burial at Tell Ibrahim Awad (fig. 3.7:21–22), and the third one from Tomb B1, Abydos (fig. 3.7:20).

(4) Cylindrical jars of marl clay, not reproduced here (cf. Porat 1989: table 9.4, Maʾaḥaz; see also Amiran and van den Brink, in press).

Similar jars have been found at Tel Erani (Yeivin 1960: pl. 23c–d; fig. 3.8:1–4), ʿEn Besor, Stratum III (fig. 3.8:5–11), at Tel Ḥalif Terrace (fig. 3.8:12; cf. also Dessel 1991: 136–37, fig. 45:4–5 [Site 101] and Levy et al., chap. 22, this volume: table 22.1 [Silo Site, Stratum II]), Tel Arad, Stratum IV (fig. 3.8:13), Afridar (fig. 3.8:14–16), and north Sinai (fig. 3.8:17–24).

For comparison we reproduce here several cylindrical jars from Minshat Abu Omar Grave Groups 3a (fig. 3.8:25) and 3b (fig. 3.8:26–29), and one from Tell Ibrahim Awad, Phase 6 (fig. 3.8:30).

(5) Miniature vessels (fig. 3.5:6–7, and fig. 3.9:1–2; pl. 3.3a [left]) made of Nile silt B. These intact examples are handmade. The lower parts are very rough, while the neck and rim have been carefully wet-smoothed.

No parallels are known from other late EB I sites in Israel, and even in Egypt, until recently, this type went virtually unnoticed. Yet one such vessel, deriving from Egypt (fig. 3.9:3) was published already by Petrie. Two more examples were recently found during the German excavations at Elephantine (C. Köhler pers. comm.). Recent excavations in the Nile delta have brought many more to light. At Tell el-Faraʾin/Buto this type has been found in large quantities (more than 100 miniature vessels; fig. 3.9:5–6). They first appear in Stratum IIIa, are most numerous in IIIb–c, and continue into Stratum IV. The size of these slightly enigmatic vessels apparently diminish through time (cf. Köhler 1992: fig. 1). At Tell Ibrahim Awad several examples of the same type were found in layers belonging to Phase 6 (Proto-Dynastic period; van den Brink 1992: 53, pl. 21). Another specimen of the same type was found as far south as at Locality 29A in Hierakonpolis, Upper Egypt,[9] in the fill of a pit also dating to the Proto-Dynastic period (fig. 3.9:4).

(6) Although not encountered at Tel Maʾaḥaz, we list here for the sake of completeness those Egyptian(ized) drop- and bag-shaped vessels—with a broad chronological range—found at (near) contemporary EB IB sites in Israel. They include examples from Azor (fig. 3.10:1–4), Kibbutz Palmaḥim (fig. 3.10:5), Tel Erani (fig. 3.10:6–10), Lachish (fig. 3.10:11–13), Taur Ikhbeineh (fig. 3.10:14–16), Wadi Gazzeh/Site H (fig. 3.10:17–21), Tel Ḥalif Terrace (fig. 3.10:22; another one was recently found at the same site by Levy and Alon [Levy et al. 1995]), ʿEn Besor, Stratum III (fig. 3.10:23–28), north Sinai (fig. 3.10:29), and as far north as Ein Assawir (fig. 3.11:30).

9. And not, as was erroneously stated in van den Brink (1992: 53), from Tell el-Rubʾa-Mendes.

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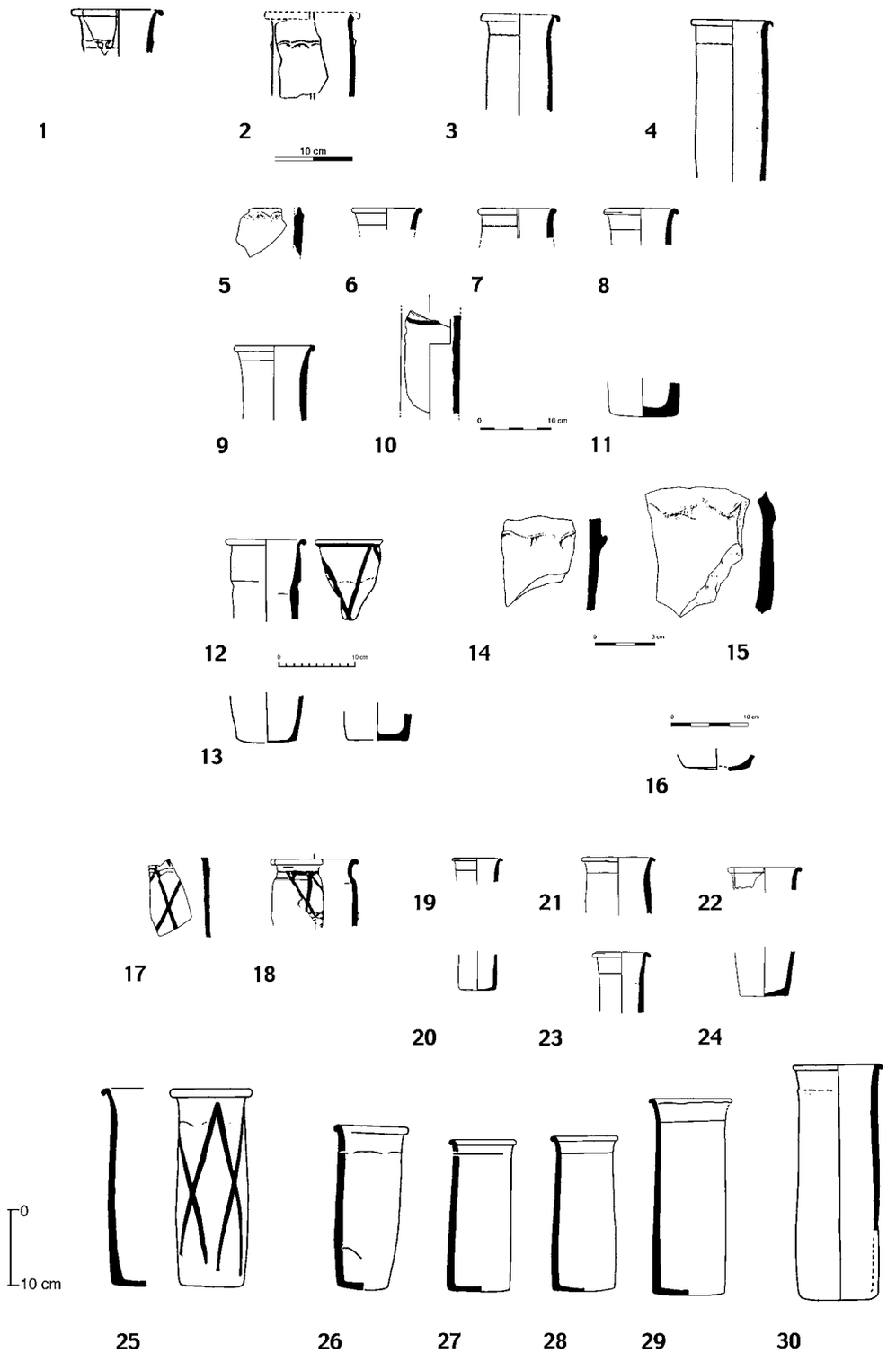

FIGURE 3.8. Cylindrical jars. *(1–4):* Brandl 1989: figs. 9:2, 10:3–4. *(5–11)*: Gophna 1990: fig. 7:1–7. *(12):* Gophna 1972: fig. 2. *(13):* Amiran 1974: fig. 2:10. *(14–16):* Gophna 1974: pl. 15:2–4. *(17–24):* Oren 1989: fig. 4:2–9. *(25):* Kroeper 1988: fig. 78. *(26–29):* Kroeper 1988: figs. 85–88. *(30):* van den Brink 1992:51, fig. 7:4 (= van den Brink 1992:66, pl. 19).

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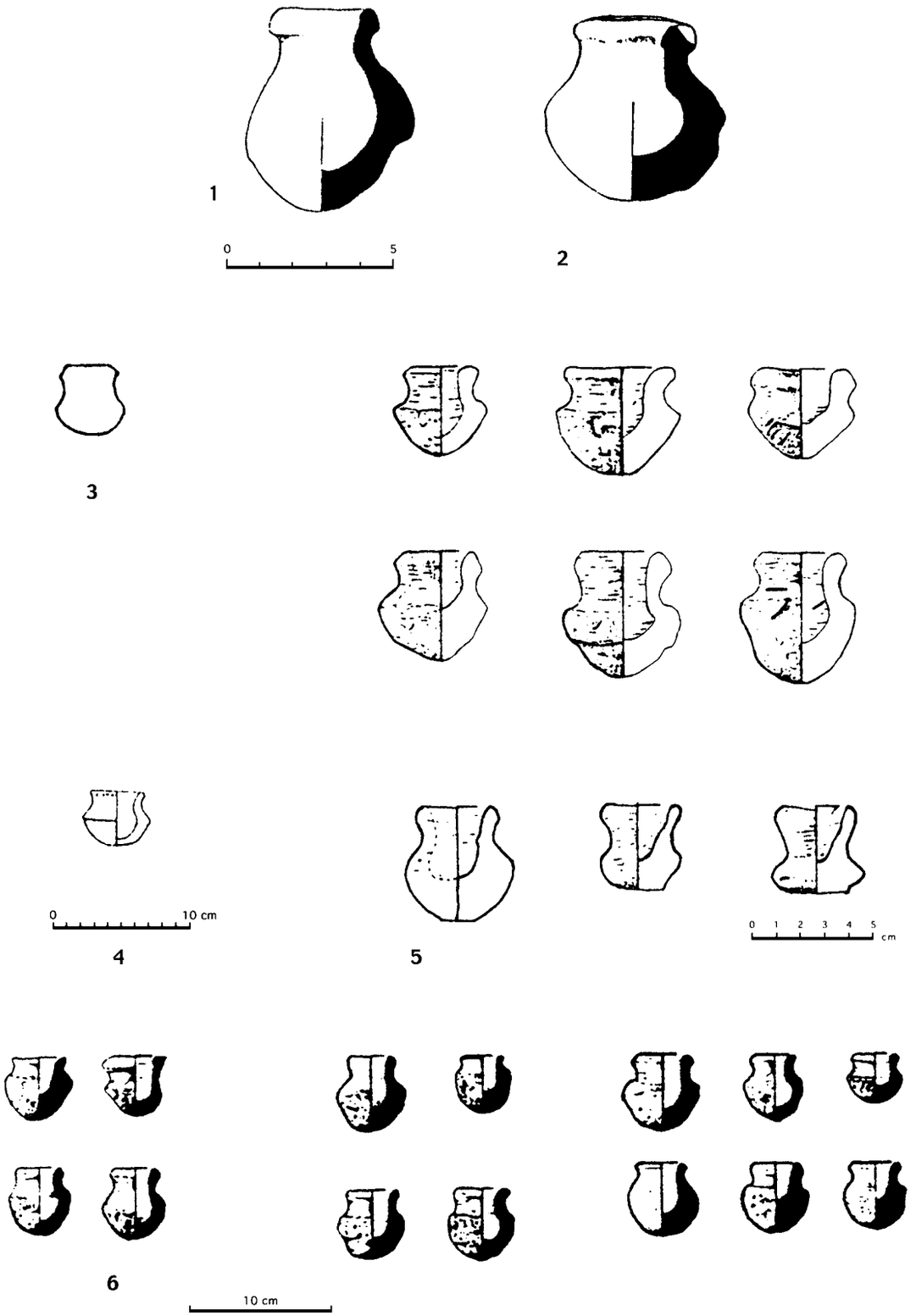

FIGURE 3.9. Miniature vessels, comparable materials. *(1–2):* This chapter, fig. 3.5:6–7. *(3):* Petrie 1953: pl. 6:36p [SD 80]. *(4):* Adams and Friedman 1992: fig. 8e. (*5–6):* Köhler 1990; 1992: 20, fig. 7.

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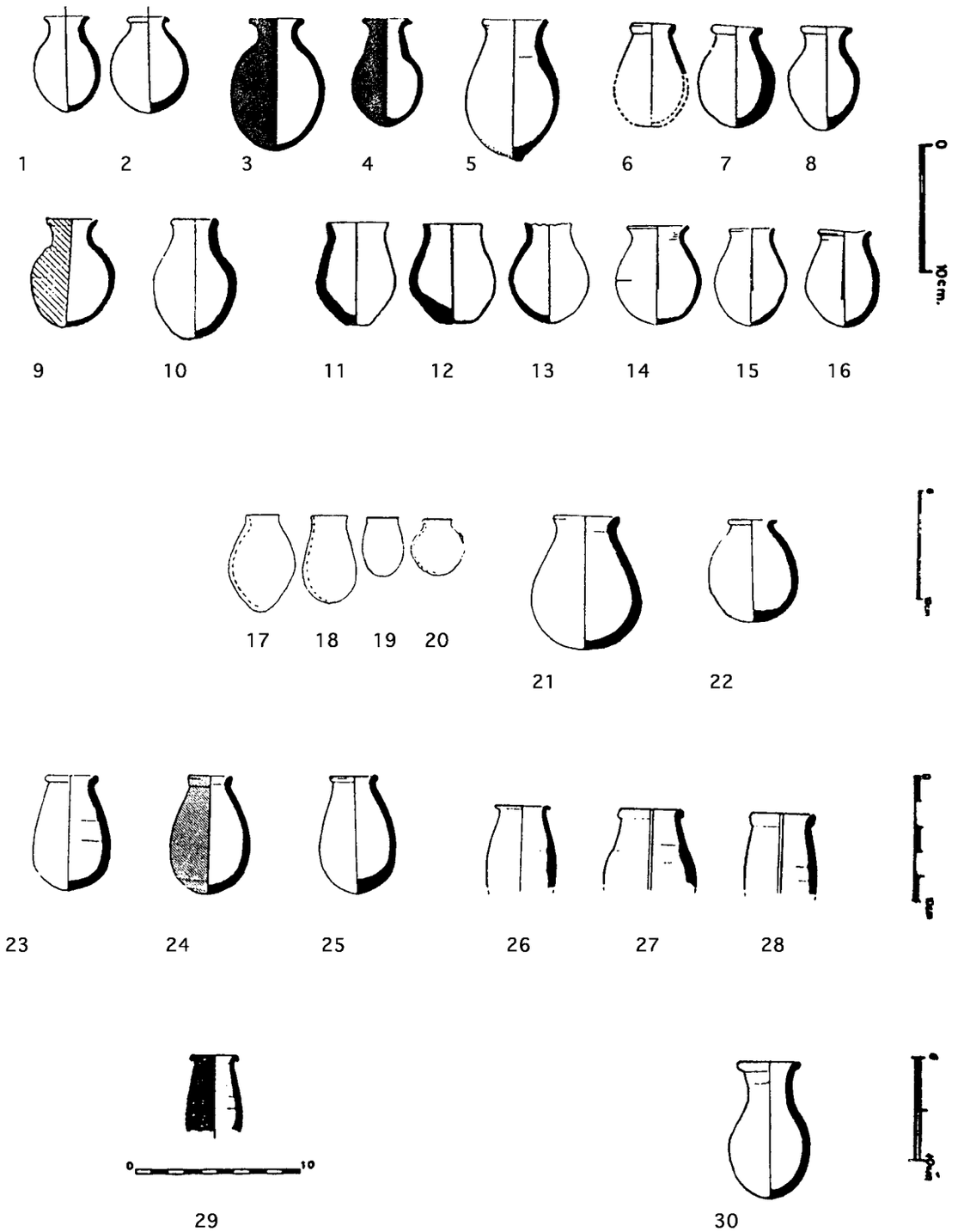

FIGURE 3.10. Bag- and drop-shaped vessels. *(1–2):* Perrot 1961: fig. 40:14–15. *(3–4):* Ben-Tor 1975: fig. 10: 6–7. *(5):* Braun et al., chap. 4, this volume: fig. 4.3:1, pl. 4.5c. *(6–8):* Brandl 1989: figs. 10:1, 14:2–3. *(9–10):* Kempinski and Gilead 1991: fig. 12:11–12. *(11–13):* Tufnell et al. 1958: pls. 56:19–20, 57:47. *(14–16):* Amiran 1976: fig. 1. *(17–20):* MacDonald, Starkey, and Harding 1932: pl. 40:40–46, 49. *(21):* Gophna 1992: fig. 4:7. *(22);* Dessel 1991: fig. 44:2; Levy et al. 1995. *(23–28):* Gophna 1990: fig. 8:18–23. *(29):* Oren 1989: fig. 4:11. *(30):* Unpublished, Ein Assawir (# 2235), Tomb 3; field reg. no. 80497; made of loessy clay; traces of red slip (by courtesy of E. Yannai).

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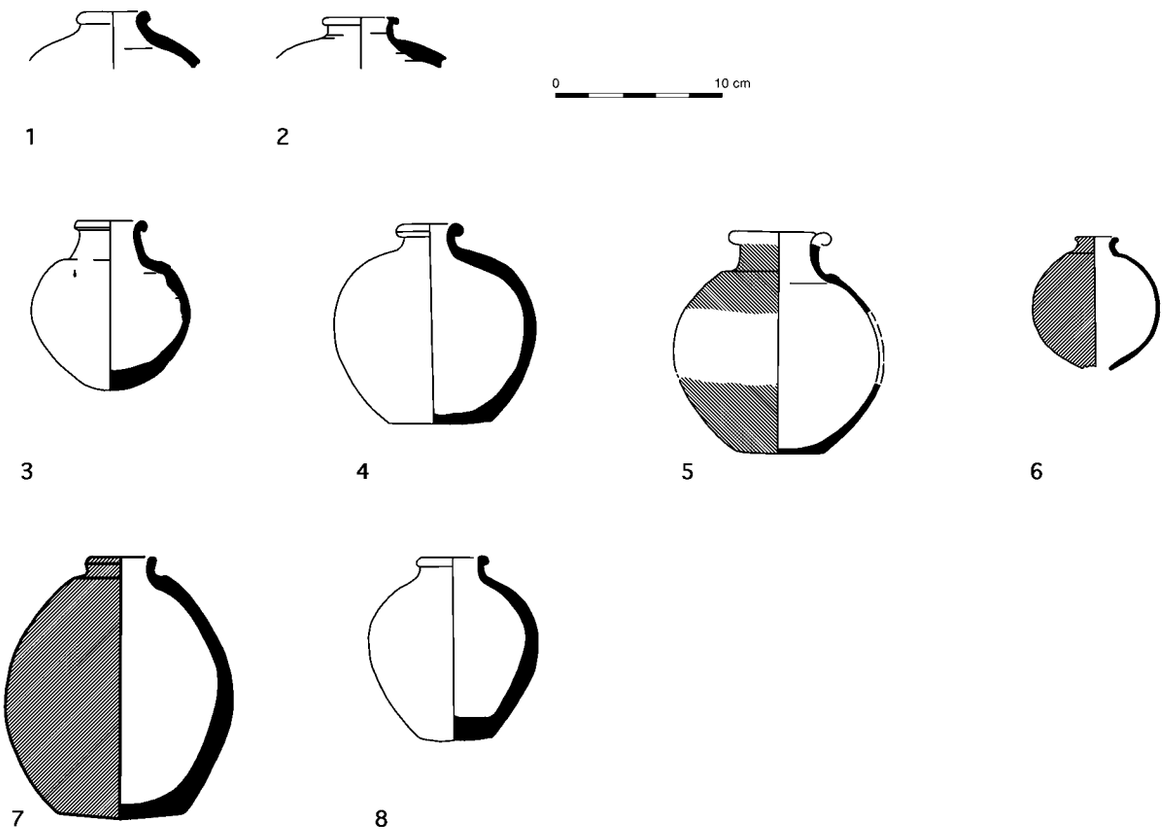

FIGURE 3.11. Small, "squat" vessels found in Israel. *(1–2):* Gophna 1990: fig. 8:24–25. *(3)*: Unpublished Ein Assawir (# 2235), Tomb 3; field reg. no. 80531. Made of Nile silt; plain surface. *(4):* Unpublished Ein Assawir (# 2235), Tomb 20; field reg. no. 200 408; made of Nile silt; plain surface. *(5–6):* Oren 1989: fig. 5:18, 15. *(7):* Braun et al., chap. 4, this volume: fig. 4.5:5. *(8):* Ben-Tor 1975: fig. 10:8, pl. 19:3.

For comparable material from Egypt see, for instance, Petrie 1953: pl. XXV:86c–g, with sequence dates varying between S.D. 78 and S.D. 80 and van den Brink 1992: 65, pl. 18:1–3.

(7) Finally we should mention a number of small, flat-based jars or bottles with rather constricted orifices, some of them with sharply carinated shoulders, with and without slip, not encountered thus far in Tel Maʾaḥaz (see, however, Amiran and van den Brink, in press), but uncovered in ʿEn Besor, Stratum III (fig. 3.11:1–2), Ein Assawir (fig. 3.11:3–4), north Sinai (fig. 3.11:5–6), Ḥorvat ʿIllin Taḥtit, Stratum IV (fig. 3.11:7), Azor (fig. 3.11:8), Tel Ḥalif Terrace (Levy et al. 1995: 29), and Tel Erani (Yeivin 1960, pl. 23A).

The examples from Ein Assawir, Ḥorvat ʿIllin Taḥtit, Azor, and the Silo site at Tel Ḥalif Terrace have been petrographically analyzed, and all proved to be made of Nile silt. Since they seem to form a rather homogeneous group, it would be worthwhile to cross-compare the results of these analyses with the objective to find out whether these vessels were possibly produced in a single workshop in Egypt.

They belong to Petrie's obsolete L(ate) class (Petrie 1953: pl. XXVI:87, 88), which has since been revised by Federn (cf. Needler 1981). They can now more accurately be ascribed to his "P 1" ware, that is, light-red polished pottery vessels (Needler 1984: 218).

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It is perhaps of interest to note that the occurrence of a drop-shaped vessel together with a jar or bottle-like vessel at issue is encountered in a single context in Tomb 4 at Azor (figs. 3.10: 4, 3.11:8)[10] as well as in Tomb 3 at Ein Assawir (figs. 3.10:30, 3.11: 3).[11]

The apparent absence of both types in the Tel Maʾaḥaz Stratum I assemblage perhaps has some chronological significance; in Egypt examples of the two vessel types appearing in a single context derive from, e.g., the early dynastic cemetery at el-Maʾmariya (Needler 1984: fig. 15:105–7, 103–4). None of the tombs in this cemetery can be dated earlier than to the second half of Dynasty I (Needler 1984: 103).

SUMMARY

This study presents the major components of the ceramic assemblage of Egyptian and Egyptian associated (Egyptianized) pottery from Stratum I at Tel Maʾaḥaz.

We have related it to contemporary, similar late EB I assemblages from a number of sites in the south of Israel, especially Tel Erani Strata VI–V, ʿEn Besor Stratum III, and Tel Ḥalif Terrace, Site 101, and Silo Site Stratum II.

Finally, we have compared this material with contemporary, Proto-Dynastic sites in Egypt, especially Tell el-Faraʾin/Buto Stratum IV, Minshat Abu Omar Grave Group IIIb, and Tell Ibrahim Awad, Phase 6.

CONCLUSIONS

All major components of the Tel Maʾaḥaz Egyptian and Egyptianized ceramic assemblage are paralleled in the late EB I (EB IB) repertoires of such sites as Tel Erani (Strata VI–V [Yeivin 1961]), ʿEn Besor (Stratum III [Gophna 1990]) and Tel Ḥalif Terrace, Site 101, and Silo Site (Stratum II [Dessel 1991; Levy et al., chap. 22, this volume]).[12]

It is this material which indicates that Tel Maʾaḥaz is part of the phenomenon of Egyptian presence in Canaan in EB I, that is, Tel Maʾaḥaz is one of a series of late EB I (EB IB) sites in the south of Israel showing important evidence of mixed Egyptian-Canaanean material culture.

Although so far only very few of these assemblages have been subjected to rigorous statistical counts, it would seem that—based on the ratio of local Canaanite pottery/ Egyptian(ized) pottery within each of them—these ceramic assemblages can be subdivided into three categories:

(1) Ceramic assemblages in which the Egyptian(ized) component is the dominating element, like in those of ʿEn Besor, Stratum III (Gophna 1990) and Tel Maʾaḥaz, Stratum I (see above). The size of these habitation sites is rather modest.

10. It should be noted, however, that each of the two vessels derive from a different level in this tomb (cf. Ben-Tor 1975: 40, fig. 10:7–8).
11. Most interestingly the same tomb also yielded ceramic evidence for interconnections with Anatolia (E. Yannai pers. comm.).
12. Missing at Tel Maʾaḥaz Stratum I are the so-called bag-shaped vessels associated with other sites of this period with an Egyptian element.

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(2) Ceramic assemblages in which the local, Canaanite component by far outnumbers the Egyptian(ized) one, like in those of Tel Erani, Stratum C and Tel Ḥalif Terrace.[13] The size of these settlements is considerably larger than those in Category 1.

(3) Ceramic assemblages in which the Egyptian(ized) component is, in terms of percentages, almost negligible, as in those of Tel Arad, Strata II–IV (cf. Amiran et al. 1978), Small Tel Malhata (Amiran, Ilan, and Arnon 1983), and more to the north, e.g., Palmaḥim Quarry, Stratum 2, and Ḥorvat ʿIllin Taḥtit, Stratum IV (Braun et al., chap. 4, this volume). Settlement size varies considerably.

This tentative, threefold differentiation between contemporary late EB I sites notwithstanding, there are other parameters which seem to bind them together.

(1) In the Egyptian(ized) ceramic assemblages Categories 1 and 2, the locally produced Egyptian pottery by far outnumbers true Egyptian imports (e.g., Porat 1989; Gophna 1990: 159; see also above, n. 4). In other words, it would seem that the access to imported, Egyptian commodities was more or less equal in both categories.

(2) *Serekh*-signs, incised in pottery, are occasionally found on some of the Egyptian storage vessels in all three settlement groups. They are applied to both vessels imported directly from Egypt (as attested in Tel Maʾaḥaz, Tel Erani, Tel Arad, Tel Ḥalif Terrace, and Small Tel Malhata) as well as to vessels produced locally (as at ʿEn Besor Stratum III, Palmaḥim Quarry Stratum 2, and Ḥorvat ʿIllin Taḥtit, Stratum; cf. Levy et al., chap. 22, this volume: fig. 22.14).

(3) Egyptian administrative tokens, namely, cylinder seals and cylinder seal impressions, were found at various sites mentioned in Categories 1 and 2 (e.g., ʿEn Besor Stratum III, Tel Erani Strata C-D, and Tel Ḥalif Terrace, Silo Site, Stratum IIa [cf. van den Brink 1998]).

(4) The lithic tool kit (like the ceramic assemblages) contains both Egyptian and Canaanite components at sites such as Tel Erani (Rosen 1988) and ʿEn Besor Stratum III (Gophna and Gazit 1985).

(5) The presence of Egyptian mudbrick architecture (and/or application of ancient Egyptian mudbrick building techniques) is attested at ʿEn Besor, Stratum III (Gophna and Gazit 1985), Tel Erani, Strata V–VI (Yeivin 1961) and Stratum C (Kempinski and Gilead 1991: 175–76), and Ashkelon–Afridar, Stratum 2 (Gophna 1974: pl. 15; Brandl and Gophna 1993: 89).

These sites are all located near major watercourses, and Tel Maʾaḥaz, as does ʿEn Besor, further enjoys the benefits of a bountiful, perennial, spring nearby, possibly one of the factors accounting for Egyptian presence there (cf. Gophna and Gazit 1985: 15).

A comparative study with artifacts from contemporary sites in Egypt indicates that the best parallels to the Egyptian assemblage at Tel Maʾaḥaz Stratum I are presently found in the late Proto-Dynastic–early First Dynasty ceramic repertoires of such sites as Minshat Abu Omar, Grave Group 3b, Tell el-Faraʾin/Buto Stratum IV, and Tell Ibrahim Awad, Phase 6 (see also Amiran and Gophna 1992; Gophna 1995: 279, table 1; Braun et al., chap. 4, this volume: table 4.3; van den Brink 1996: table 5).

13. In Tel Erani Stratum C, the Egyptian ceramic component amounts to about 21% of the total ceramic assemblage (Kempinski and Gilead 1991: 179). At Tel Ḥalif Terrace, Silo Site, Strata I and II, the Egyptian component varies from about 24% to 36% among the total ceramic assemblage (Levy et al., Chap. 22, this volume: fig. 22.1).

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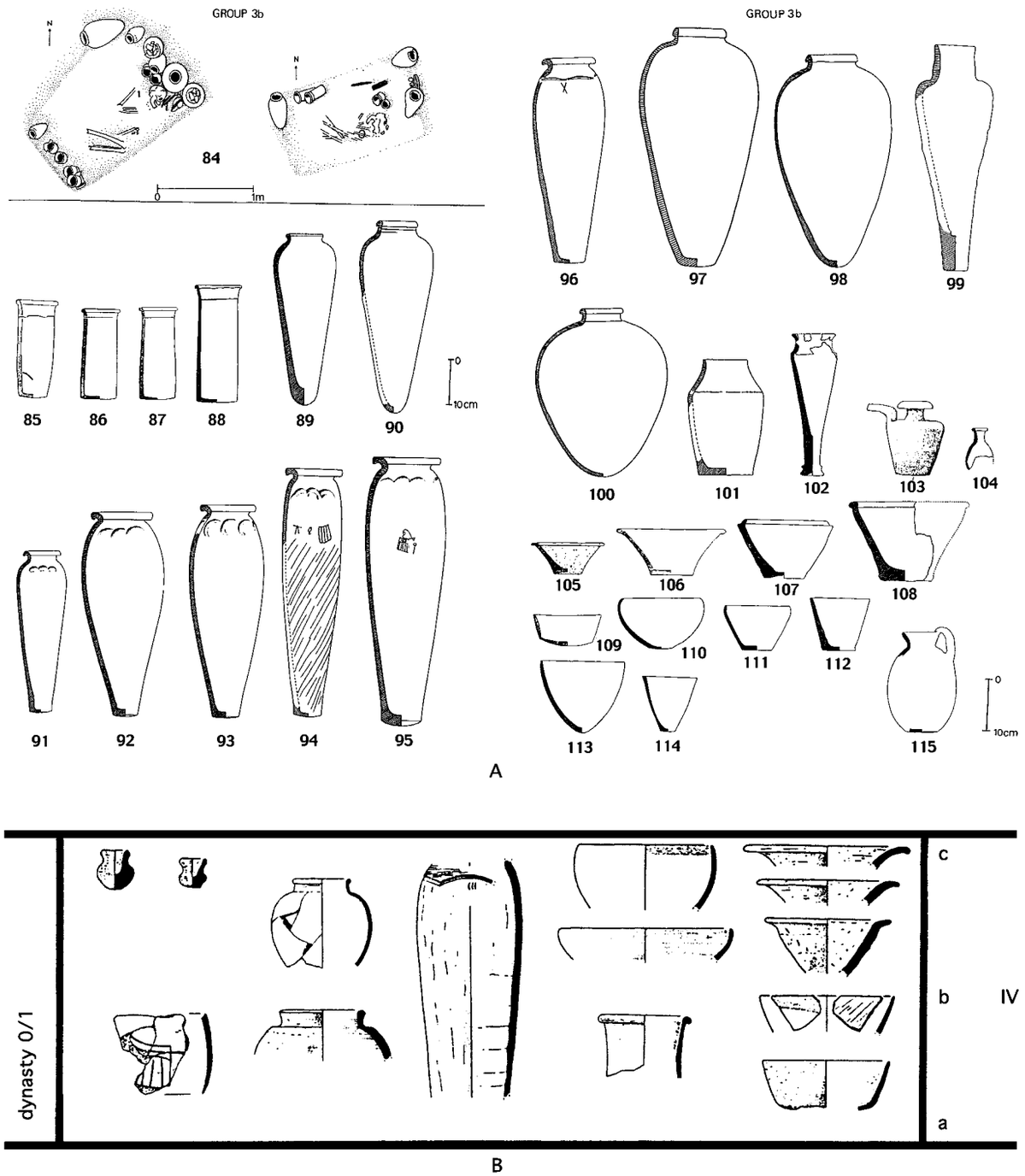

FIGURE 3.12. (A) Ceramic assemblage of Minshat Abu Omar, Grave Group 3b (Kropper 1988: 26–27, figs. 84–115); (B) Ceramic assemblage of Tell el-Faraʾin/Buto, Stratum IVa–c.

With Minshat Abu Omar, Grave Group 3b, Tel Maʾaḥaz Stratum I shares the presence of medium-sized, flat-based bowls both with flaring rims (fig. 3.12A:105–06) as well as slightly inverted rims (fig. 3.12A:111), deep bowls (fig. 3.12A:108), marl clay storage jars (fig. 3.12A:90), cylindrical jars (fig. 3.12A:85–88), and Type III storage jars, occasionally

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incised with a *serekh*-sign (fig. 3.12A:91–95). This assemblage further includes bag- and drop-shaped vessels (fig. 3.12A:104), discussed above, but apparently absent at Tel Maʾaḥaz.

With the ceramic repertoire of Tell el-Farаʾin/Buto, Stratum IV (fig. 3.12B), the Tel Maʾaḥaz Stratum I assemblage shares inter alia the medium-sized bowls with flaring rim, the miniature vessels, and Type III storage jars, occasionally incised with a *serekh*-sign.

Although the Maʾaḥaz materials discussed here derive from three small probes only, their potential for further historical inferences has been clearly indicated, underlining the desirability of returning to this site once more for probing on a larger scale than has been done in the past.

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PLATE 3.1a. Tel Maʾaḥaz, located on top of spur, and immediate surroundings.

PLATE 3.1b. Tel Maʾaḥaz: Exposure of Stratum I remains in one of three small probes.

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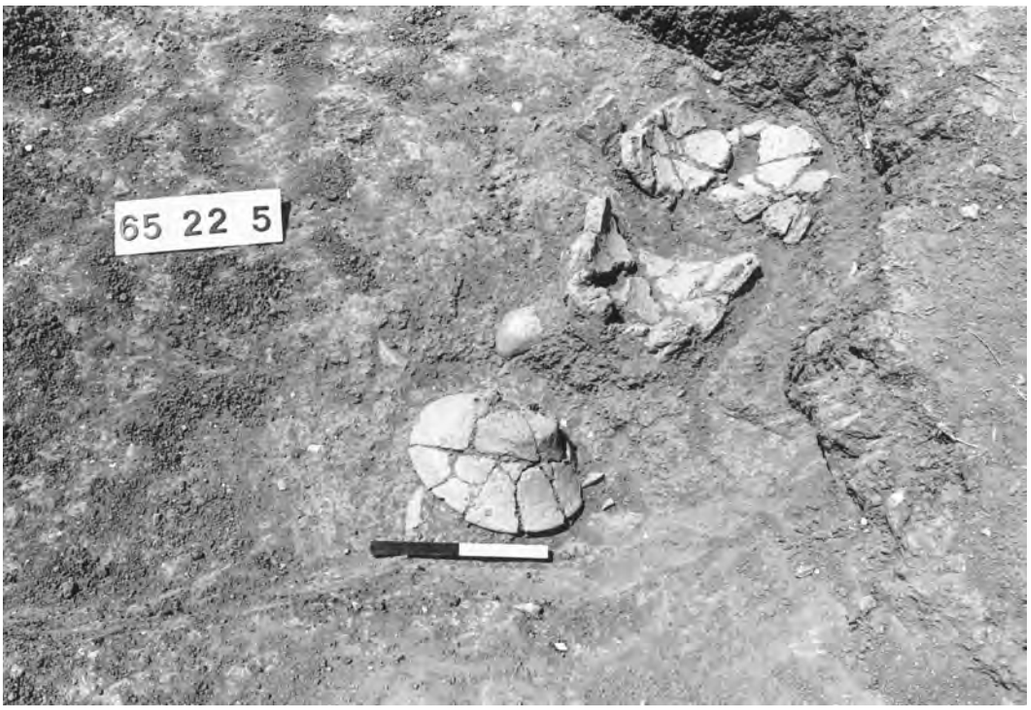

PLATE 3.2a. Tel Maʾaḥaz, Stratum I: Bowl (533 00 70 1) and jar (533 00 53 0) in situ.

PLATE 3.2b. Tel Maʾaḥaz, Strutum I: Bowl (533 00 70 1) after restoration, Nile silt.

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PLATE 3.3a. Tel Maʾaḥaz, Stratum I *(Left to right):* Two miniature vessels of Nile silt (533 75 20 1 and 533 75 23 1); bowl of Nile silt (533 75 25 1), and bowl of marl clay (533 75 09 1).

PLATE 3.3b. Tel Maʾaḥaz, Statum I: Bowl (533 00 58 1), loessy clay.

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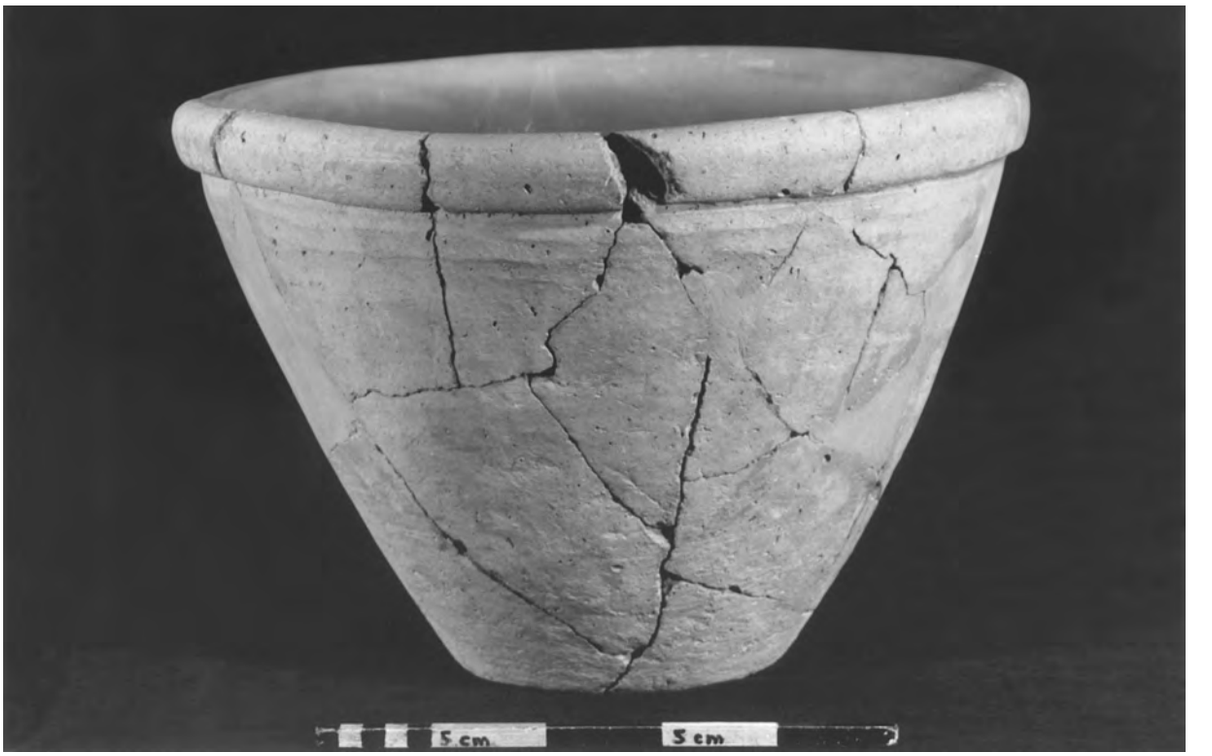

PLATE 3.4a. Tel Maʾaḥaz, Stratum I: Large bowl (533 75 15 1), loessy clay.

PLATE 3.4b. Tel Maʾaḥaz, Stratum I: Storage jar (533 00 53 1), loessy clay.

PLATE 3.4c. Tel Maʾaḥaz, Stratum I: Storage jar (533 00 70 1), loessy clay.

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PLATE 3.5a. Tel Maʾaḥaz, Stratum I: Storage jar fragment (533 00 38 1), loessy clay.

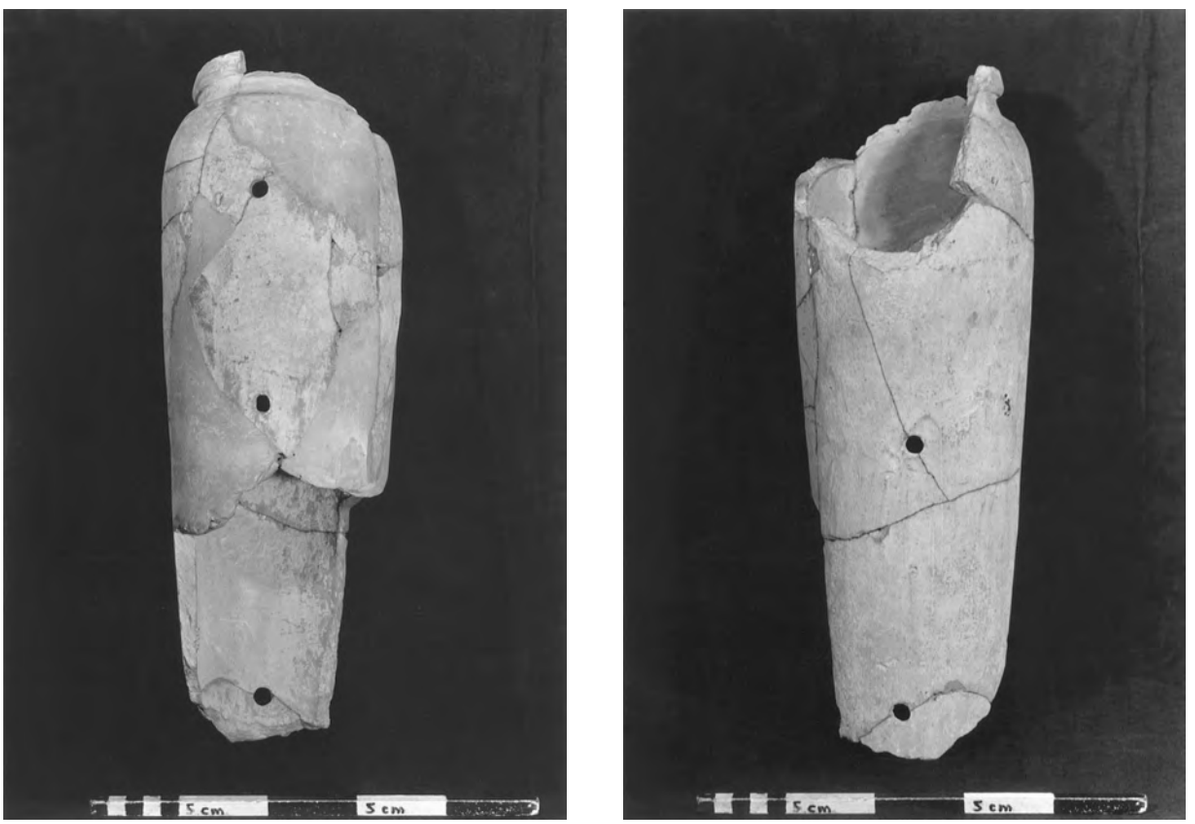

PLATE 3.5b-c. Tel Maʾaḥaz, Stratum I: Two views of a storage jar with perforations (533 75 13 1), marl clay.

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PLATE 3.6a. Elkab, Upper Egypt: Storage jar (H0872), marl clay.

PLATE 3.6b. Tel Maʾaḥaz, Stratum I: Two sherds with *serekh*-signs, marl clay. *(Left):* Israel Antiquities Authority 94 3328; *(Right):* Israel Antiquities Authority 81 129.

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4

NEW EVIDENCE FOR EGYPTIAN CONNECTIONS DURING A LATE PHASE OF EARLY BRONZE I FROM THE SOREQ BASIN IN SOUTH-CENTRAL ISRAEL

Eliot Braun, Edwin C. M. van den Brink, Ram Gophna, and Yuval Goren

INTRODUCTION

Naḥal Soreq, a major, natural conduit in the watershed of the highlands of Judaea, wends a circuitous way westward from the environs of Jerusalem through precipitous hills, spilling into the highland plain, known as the Shephelah[1] just to the north of biblical Beth Shemesh (Tell Rumeileh). There it broadens out into a wide valley that extends westward and to the north through the Coastal Plain. There, following a long, crescentic path, this streambed debouches into the sea near Kibbutz Palmaḥim.

The valley through which the lower part of Naḥal[2] Soreq flows is a natural thoroughfare, providing easy communication from west to east (Gophna 1993). Fertile soils, a well-watered climate, and perhaps even an annual, seasonal flow of water, attracted in ancient times a number of important settlements to the environs of this natural conduit (Gophna 1974: passim; Eisenberg 1993; Gibson, Kloner, and Ibbs 1991).[3] In Early Bronze I (EB I) the Soreq basin and its environs sustained a number of settlements, two of which have been extensively excavated. From them we have abundant evidence of the indigenous material culture. In addition, minor and differing degrees of Egyptian influence have also been found at several of these sites. The present paper deals with important new data on Egyptian influence in the Soreq basin in EB I and perhaps slightly later.

THE SITES

Sites germane to this discussion (fig. 4.1), from east to west, include Ḥorvat ʿIllin Taḥtit (henceforth HIT; Israel map ref. 1507/1282), Hartuv (Israel map ref. 1502–1501/1304–1307), Tell Rumeileh (Israel map ref. 1477/1286), el-Maghar (Israel map ref. 1380–1386/1291–1295), Palmaḥim Quarry (Israel map ref. 12234–1235/1489–1490), and Kibbutz Palmaḥim-Givʾat Ha-esev (Israel map ref. 1225/1495). All settlements are considered in order of rele-

1. The Shephelah is the high, inland plateau paralleling the Coastal Plain (Smith 1966: 143–71; Aharoni 1967: 23).
2. *Naḥal* is Hebrew for watercourse.
3. The major sites along this route that will be familiar to the reader are Beth Shemesh (Grant 1929; 1934), Hartuv (Mazar and Miroschedji 1989; 1993; 1996), Tel Batash (Kelm and Mazar 1982), Teluliot Batashi (Kaplan 1958), and Yavneh Yam (Kaplan 1993).

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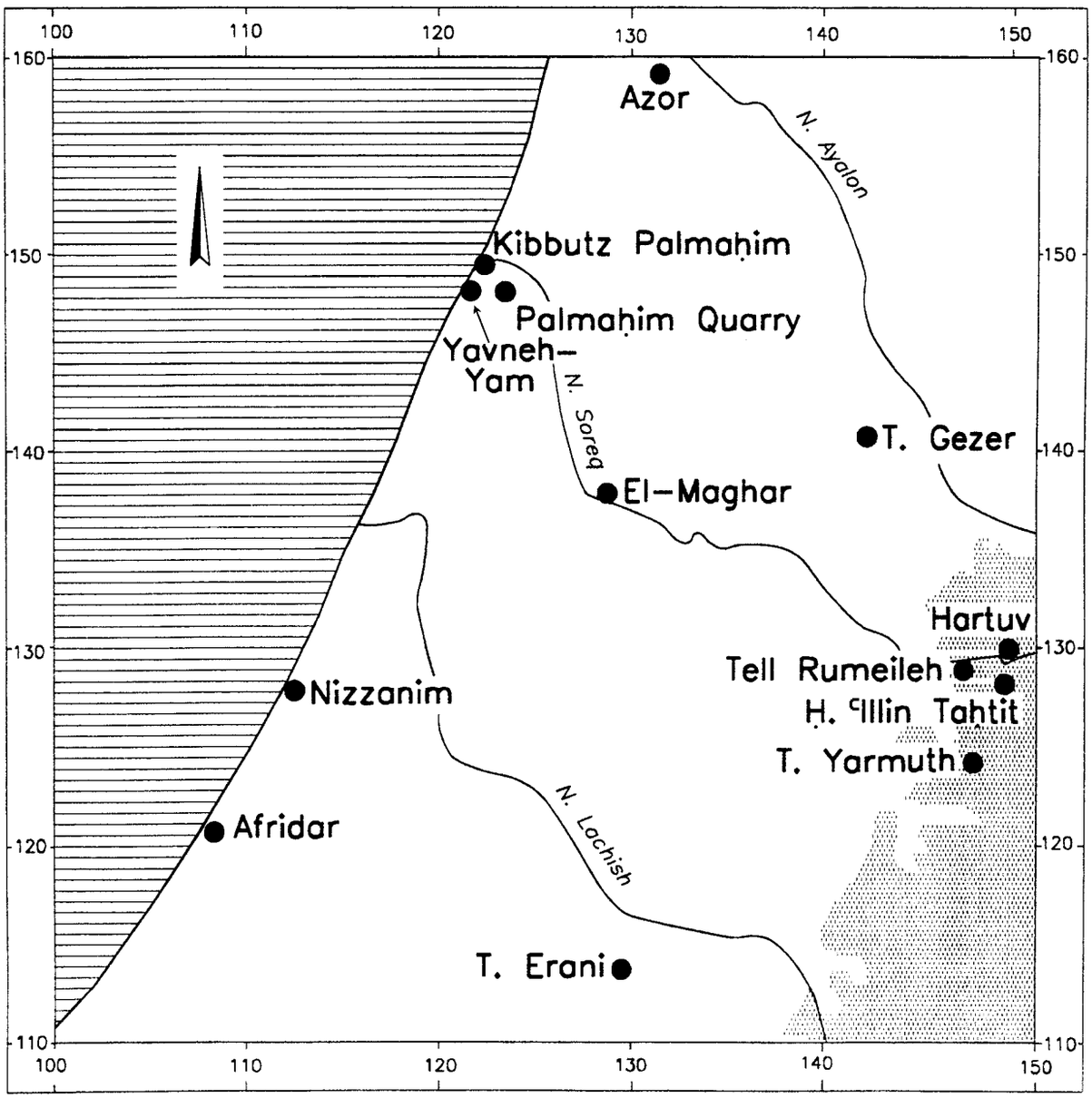

FIGURE 4.1. Map of sites mentioned in text.

vance to this discussion rather than in any particular geographical order. In addition, Tel Yarmuth (map ref. 1474–1240), not actually within the Soreq basin, but only some 4 km south of it, is also briefly discussed because of a solitary find, once identified as of Egyptian character.

Palmaḥim Quarry

This site occupies a commanding position on a high *qurqar*[4] ridge with a view of the sea (pl. 4.1a). It is about 1 km east-southeast of the point where Naḥal Soreq presently debouches

4. *Qurqar* is a local name for calcareous sandstone formations characteristic of the Mediterranean littoral in this region.

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into the surf; at its nearest, it is scarcely 0.5 km from the streambed. First identified by J. Kaplan, the site was subsequently surveyed and intermittently excavated[5] by R. Gophna and S. Lifshitz (see table 4.1; Gophna 1974: 46–50, 115–17; Gophna and Lifshitz 1980). More recently R. Reich (1988–1989) conducted a limited sounding that indicated the need for extensive excavation. This extended salvage project, under the direction of E. Braun (1992), lasted several seasons and unearthed more than 1,500 m^2 of occupation dated to EB I. Of direct concern to this study are Strata 2 and 1, representing continuous occupation of the site late in EB I. A small quantity of Egyptianized artifacts is derived from these occupation levels.

Ḥorvat ʿIllin Taḥtit (henceforth HIT)[6]

This site is located on a limestone ridge, just to the west of the Judaean Hill chain where the latter rises abruptly at its juncture with the Shephelah. The early settlement sprawls along the southern end of a hillside on its gently graded, western slope. It sits astride[7] a narrow, elongated, shallow depression—Naḥal Shemesh (Hebrew); Wadi ʿIllin (Arabic)—that drains the surrounding hills into the Soreq basin approximately 1.2 km to the west. About 1,100 m^2 of this site, now a green belt within the confines of modern Beth Shemesh, were excavated and later backfilled.

HIT proved principally to be a late EB I village with an overburden of later agricultural structures and some scant evidence indicating human activity in the Chalcolithic and Late Neolithic periods (table 4.2). Strata IV and III are apparently a continuous occupation of Late EB I and are to be understood as closely, if not absolutely, contemporary with Palmaḥim 2 and 1, respectively.

Hartuv

The site is situated on a small mound on the west bank of Naḥal Soreq, precisely where the narrow gorge widens as it opens into the Shephelah. Strata II and III are remains of an EB I settlement that includes what appears to have been a public building, possibly a shrine (Mazar and Miroschedji 1996). Although the architecture is somewhat unusual for this period, the remainder of the material culture of this site is typical for the Shephelah. It dates somewhat earlier than the late EB I of Palmaḥim Quarry and HIT. Ceramic finds indicate that it is associated with an earlier, but somewhat advanced phase of EB I best known from Tel Erani C (Kempinski and Gilead 1991; Braun 1996). A claim for Egyptian affinities for some of the artifacts from this assemblage is discussed below.

Tell Rumeileh (Biblical Beth Shemesh/Ain Shems)

This site is a small mound on a limestone outcrop, some little distance southwest of Hartuv, at the eastern end of the broad Soreq basin. Although most of the occupations unearthed

5. These were intermittent, brief salvage excavations of specific caves or deposits unearthed during modern quarrying operations.
6. The designation Taḥtit, meaning "lower," distinguishes this prehistoric village from the late, historically prominent ruins (Ḥorvat ʿIllin ʿIllit; i.e., "upper") capping the crest of the same hill, just to the north (Seligman and May 1994).
7. Just to the south side of this depression, H. Stark (1994) excavated portions of structures of this same cultural horizon.

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Table 4.1. Stratigraphy, Period, Cultural Ascription, and Type of Deposit at Palmaḥim Quarry

Stratum	*Period*	*Cultural Ascription*	*Type of Deposit*
I[a]	Late EB I	Southern[b]	Settlement
II[c]	EB Ia[d]		Settlement
1	Late EB I	Southern	Settlement
2	Late EB I	Southern	Settlement
3	Early EB I	Northern[e] and Southern[f]	Settlement
4	Early EB I and Late Chalcolithic	Ghassulian-Beersheva related	Deposits above and on bedrock
Uppermost[g]	Late EB I?		Settlement
Middle[h]	Early EB I?	Northern, Southern?	Settlement
Lowest[i]	Late Chalcolithic?	?	?
	Late EB I		Settlement and pits
Unstratified[j]	Late EB I	Southern	Burial cave and reused burial caves[k]
Unstratified	Early EB I? Late Chalcolithic	Southern?[l] Ghassulian-Beersheva	
Unstratified[m]	Late Neolithic[n]		Flint tools scattered in fills

a. Stratum I of Gophna's soundings corresponds to Stratum 1 of Braun's excavations.
b. As defined by Amiran (1969: 49–54).
c. Stratum II of Gophna's soundings corresponds to Stratum 2 of Braun's excavations.
d. This is equivalent to early EB I.
e. As defined by Wright 1958; Amiran 1969: 41–49; and Braun 1989; 1996; 2000.
f. For a discussion of the ceramics of an initial phase of southern EB I, see Braun 2000.
g. Reich (1989), working to the east of Area B on a part of the site badly mauled by bulldozing prior to his salvage operation, was barely able to distinguish three strata in a small sounding. His test pit determined the need for a larger scale salvage project, eventually conducted by Braun.
h. Unnumbered by Reich (1989).
i. Unnumbered by Reich (1989).
j. This includes salvage excavations conducted by Gophna in eleven caves, all discovered serendipitously during commercial quarrying of the site.
k. These were late deposits found mostly in caves originally hewn out of the soft *qurqar* bedrock in Late Chalcolithic times.
l. Some of this material resembles the earliest pottery of southern EB I. For a discussion of these ceramics, see Braun 2000.
m. From mixed contexts in Braun's excavations.
n. As defined by A. Moore (1973).

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Table 4.2. Stratigraphy, Period, Cultural Ascription, and Type of Deposit at HIT

Strata	*Period*	*Cultural Ascription*	*Type of Deposit*
I	Modern		Rubbish pits and stone fences
II	Roman to modern		Terraces
III	Late EB I	Southern	Settlement
IV	Late EB I	Southern	Settlement
V	Late EB I?	Southern?	Settlement
VI	Late Neolithic	Qatifian[a]	Settlement
Unstratified	Late Chalcolithic	Ghassulian-Beersheeva	From fills

a. This designon is based on a preliminary examination of the material by R. Gophna who has noted parallels with Qatifian as defined by Gilead and Alon (1988) and Goren (1990).

in excavations (Grant 1929; 1932; 1934; Grant and Wright 1938; 1939) date to historical periods, the assemblage includes several Egyptian objects that can be dated to the time span of EB I. They are discussed below.

el-Maghar

The site of el-Maghar, occupying a high *qurqar* outcrop (pl. 4.1b), about 600 m north of the Soreq streambed, dominates a wide plain in which it is located. Discovered by Kaplan (1955) and noted for its Chalcolithic material (S. Levy n.d.; Gophna 1974: 51–55, pl. 13), the site has also yielded, in surface collections, pottery of the EB Age. Included are a number of vessel fragments of Egyptian origin (Gophna 1974: pl. 30:18–20; Brandl 1992: 465; Porat[8] 1992: 439, table 1).

Because the EB settlement of el-Maghar has not been excavated,[9] its date cannot be more accurately established than that indicated by material derived from the sherding of its surface. Insofar as dating is possible, based on the ceramic finds (fig. 4.2:4), the site would seem to have been occupied sometime in the latter part of EB I and possibly into early EB II. It may be dated somewhat later than the sites central to this discussion. The Egyptian ceramics can be dated to late Dynasty 0 or Dynasty I (Naqada IIIb–c; see below).

Kibbutz Palmaḥim (Givʿat Ha-esev)[10]

Within the modern collective settlement of Kibbutz Palmaḥim, at the point where the Soreq brook debouches into the surf, is a high *qurqar* bluff characteristic of this part of the Mediterranean littoral. Minimally exposed by bulldozer activity in the 1960s, the site yielded evidence of stone wall foundations, ashy lenses, faunal material, and a quantity of typical, late EB I potsherds (Gophna 1974: 46). More than a decade later, on a naturally eroded part of the

8. Alternate transliterations of the name of this site are Maʾar (Porat 1989a) and Maghar (Brandl 1992).
9. The site has been largely obliterated by modern activity.
10. This is the local nickname for the sandy hillock on which the site is located.

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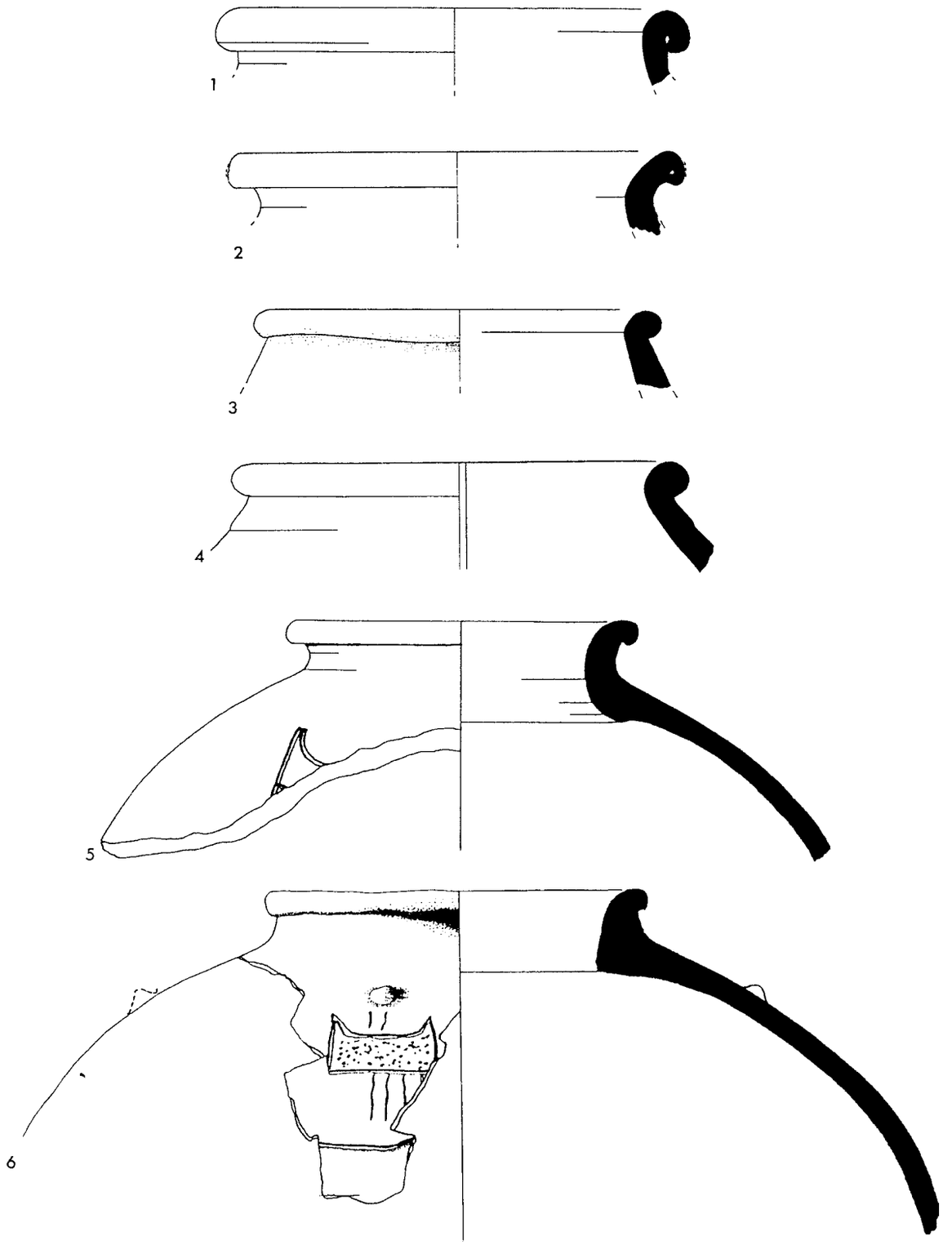

FIGURE 4.2. Egyptian and Egyptian style pottery from Ḥorvat ʿIllin Taḥtit, el-Maghar, and Palmaḥim Quarry 2. *1–3:* Fragments of Egyptian jars from Ḥorvat ʿIllin Taḥtit (field reg. nos. 1779/140/510, 1779/140/519, 1779/858/1051); *4:* Fragment of an Egyptian wine jar from el-Maghar; *5–6:* Upper portions of locally made storage jars with Egyptian style rim and incised (fragmentary) *serekh*s from Ḥorvat ʿIllin Taḥtit IV *(5*, field reg. no. 1779/220/894/1) and Palmaḥim Quarry 2 *(6,* field reg. no. 1617/2044/522/1).

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site, S. Lifshitz, kibbutz member, discovered additional material from this same occupation (see below).

Yavneh-Yam (Minet Rubin; Map Ref. 1214/1483) Findspot

An Egyptian flint knife (see below), also found by S. Lifshitz, was retrieved from the beach at the ancient site of Yavneh-Yam, 1 km south of Kibbutz Palmaḥim. The artifact is, nevertheless, virtually without context. Its smooth contours indicate that the surf from the sea in which it had lain for an extended period washed it up.

Tel Yarmuth (Map Ref. 1475/1240)

The major EB site of Tel Yarmuth, located about 3 km east southeast of HIT, is not strictly within the Soreq basin but is near enough to have some bearing on this discussion. In deep soundings beneath the EB II–III city are deposits dated to late EB I[11] or EB II (Miroschedji 1988: 32, tableau 1). Two objects from this site may have bearing on the present discussion (see below).

THE DATE AND CULTURAL SETTING OF PALMAḤIM QUARRY 2 AND HIT

Central to this discussion is an understanding of the date and cultural setting of the two sites in the Soreq basin that have yielded the most important evidence of connections with Egypt. Within a single topographical feature that has no major impediments to communication, they are separated by only 30 km. Not surprisingly, the sites exhibit a great deal of similarities in their material cultures.

Buildings at both these and, indeed, at many other sites in the southern Levant, share architectural traditions (Braun 1985: 73–77; 1989: 15–18) common to late EB I. They include conventionalized building plans (i.e., the broadroom, pls. 4.2a, 4.3b), complex houses of rectilinear chambers, particular features such as stone door sockets, stone pillar bases, small circular storage structures, circular stone-lined storage pits, benches lining internal walls, and rounded corners.

The ceramic assemblages of Palmaḥim Quarry and HIT, despite the relative proximity of the sites, appear, however, to belong to two distinct, local stylistic groups (Braun 1996: 171–237) that have as many differences as commonalties. Both are clearly associated with a late EB I southern subculture, and they share more than a modicum of ceramic types, compelling evidence of strong links between them. Common features are in morphology of vessels and in modes of plastic[12] and painted decoration[13] on jars, pithoi, jugs, and holemouths. Some

11. Similarities between ceramics from this site and nearby HIT suggest that they were contemporarily occupied late in the EB I period.

12. This is most often a narrow, flat band of clay that is flattened onto the body of the vessel at short, regular intervals. On pithoi it generally appears in two parallel bands, one below the shoulder of the vessel and another just above its base. Often these bands are looped where they meet in imitation of a tied rope. Similar decoration is also applied just below the rims of holemouths, either in a continuous band or in short lengths at regular intervals.

13. The use of lime washes, especially when further covered by vertical red stripes, as well as a special type of rope decoration employed (see previous note 12), are hallmarks of a late southern EB I "subculture."

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specific parallels between Palmaḥim Quarry and HIT are high loop-handled cups (e.g., fig. 4.3:7), hemispherical bowls (e.g., fig. 4.3:2, 3), lamp-bowls, and bowls with inturned rims (e.g., fig. 4.3: 5).

On the basis of these parallels it is possible to interpret these two sites as closely contemporary. Their relative chronology within the last phases of EB I is based on the similarity of shared types with ceramics from such sites as Arad IV (Amiran et al. 1978: 115; pls. 7–12, n. 202) and assemblages such as Tombs C and G at Ai (Callaway 1964). Additional similarities are found at Tel Yarmuth, Strata V and IV (Miroschedji 1988: pls. 20–26) and Arad III and II (Amiran et al. 1978: pls. 13–54). Thus, these parallels clearly indicate a relatively tardy date within EB I.[14] Notably, these sites do not continue on into EB II. Pottery from Palmaḥim Quarry is devoid of any EB II types, while a handful of sherds from this later period[15] in the HIT assemblage are statistically inconsequential and may be explained by increased activity in the region during the later period.[16]

EVIDENCE OF EGYPTIAN IMPORTS AND EGYPTIANIZING IN THE SOREQ BASIN IN THE EARLY BRONZE AGE

Evidence for Egyptian involvement in the Soreq basin is of differing degrees of reliability. It includes imports of incontrovertible, scientifically provable *bona fides*, morphological types that are reliably identifiable as of Egyptian inspiration (henceforth "Egyptianized"), and an assortment of artifacts that have come to be understood, based on interpretation of their characteristics, as Egyptianized. These objects are discussed below in order of their importance.

Jar Fragment from Palmaḥim Quarry 2, Incised with a Serekh *(fig. 4.2:6, pls. 4.2b, 4.3a; Field Reg. No. 1617/2044/522/1)*[17]

The excavation of a large broadroom at the intersection of two streets showed it to have been in use for some period of time. Two of its three floors are assigned to Stratum 2, a third, considerably raised, belongs to Stratum 1. On the earliest floor of this house (local phase b of Stratum 2), a number of pottery spreads were found (pl. 4.3b). When restored, they proved to

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Nevertheless, these features are of limited chronological significance. Dessel (1991: 142–54) and Yekutieli (1991: 39, 90) report such decoration in the early phases of southern EB I, while this style can be found as late as Stratum II at Arad (Amiran et al. 1978: pl. 33:5).

14. By corollary, the relative late date of these sites is confirmed by an absence of pottery typical of an earlier phase of EB I at nearby Hartuv (named after Level C at Tel Erani; Kempinski and Gilead 1991). It is inconceivable that these communities could have existed within the same valley system and had such disparate ceramic traditions.

15. These include several sherds of "metallic" ware (Greenberg and Porat 1996) associated with EB II.

16. Recent excavations in the territory immediately to the south, known modernly as "Ramat Beth Shemesh," have uncovered evidence of a number of EB II sites (Y. Dagan, Israel Antiquities Authority, pers. comm.). They and the relative proximity of Tel Yarmuth could account for the presence of these sherds.

17. This number indicates the following information: Excavation license/locus/basket/arbitrary designation within basket.

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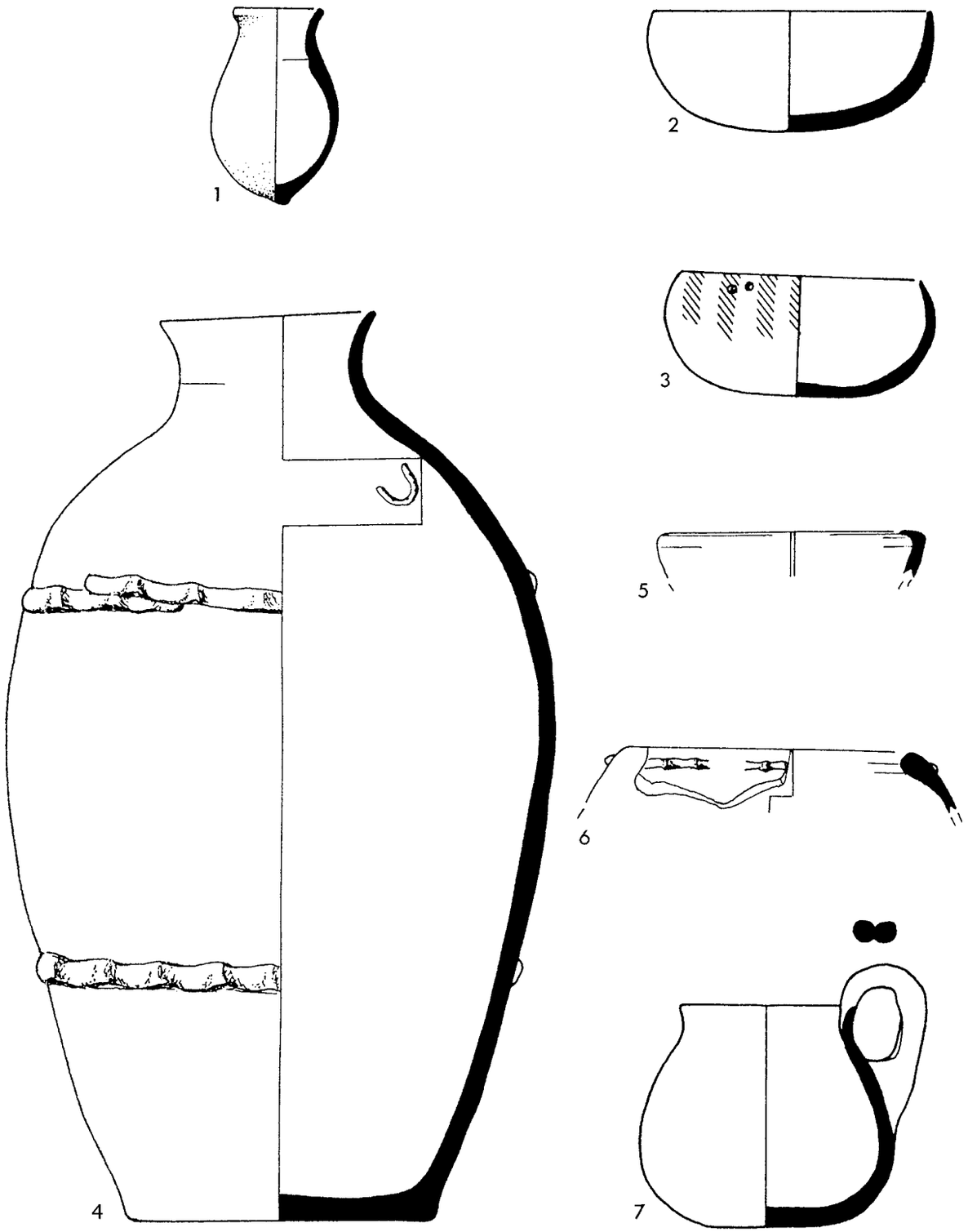

FIGURE 4.3. *1:* Egyptian style vessel from Givʿat Ha-esev; *2:* Hemispherical bowl from Givʿat Ha-esev; *3:* Hemispherical Bowl from a late EB I tomb at Palmaḥim Quarry; *4:* Pithos from Ḥorvat ʿIllin Taḥtit IV; *5*: bowl with inturned rim from el-Maghar; *6:* Holemouth vessel from el-Maghar; *7:* High loop handled juglet from a late EB I tomb at Palmaḥim Quarry. Scales 1–3, 5–7, 2:5; 4, 1:5

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be portions of vessels clearly dated to a late phase of the southern horizon of EB I[18] (e.g., Amiran 1969: 49–54; 1978: 182, 184; Amiran et al. 1978: 116; Gophna and Iron-Lubin 1996: figs. 41, 44). The tardy character of the HIT assemblage is particularly emphasized by the striking similarities with the Stratum IV assemblage from Tel Dalit (e.g., Gophna and Iron-Lubin 1996: figs. 51:7, 52:3–4, 53: 10, 54:1, 55:1, 57, 58).

The sole, atypical exception in this collection is a sizable fragment, the rim and shoulders of a large storage jar that bears a *serekh*, crudely incised prior to firing (fig. 4.2:6). It is one of a handful of artifacts of Egyptian inspiration that derive from the late EB I occupation of Palmaḥim Quarry. The morphology of the upper portion of this pithos differs considerably from all additional vessels at the site and is unknown, with one exception, at other contemporary sites (e.g., Amiran et al. 1978: pl. 12). Its rim is apparently of Egyptian inspiration, although the remainder of the vessel strongly reflects local potting traditions, both in morphology and in the manner of its fabrication.

Not unexpectedly, this vessel was fashioned of local clay. It has a protruding knob, a feature commonly found on local EB I storage vessels.[19] The upper portion of this jar was made as an independent unit and subsequently attached to the body. The join of the neck and body left the inner wall of the vessel with a smooth surface.

The remains of the Palmaḥim Quarry storage jar include the orifice (diameter 15 cm), a short neck, and part of the shoulder. The shape of the externally folded rim[20] of this vessel is not included in the local, southern late EB I ceramic repertoire. However, it can be related to near contemporary storage jars of Type I (van den Brink 1996) found in burials in Egypt and at sites in northern Sinai, some of which are also inscribed with *serekh*s. They include examples found at Abusir el Meleq (Tombs 1021 and 1144; van den Brink 1996) and Rafiah (Gophna 1970; Levy et al., chap. 22, this volume) as well as HIT (see below).

Whether the Palmaḥim Quarry jar originally may have had two or four wavy patterns on its shoulder (representing very degenerated ledge-handles), as was the case with the Abusir el Meleq and Rafiah jars noted above, is (due to the incomplete preservation of the jar) impossible to say. A second and most interesting feature of this particular jar, confirming its Egyptianized character, is the presence of an almost completely preserved *serekh*, just below the projecting knob on the widest part (shoulder) of the vessel (figs. 4.2:6; 4.4:1).

The *serekh* (measuring 5.5 cm x 7.5 cm), incised not very deeply into the wet clay of the vessel prior to firing, is preserved but for part of the lower base line and the right delineation. A break occurring on the vessel wall, exactly along the groove of the left delineation of the *serekh*, gives the impression that it is less than complete.

18. These include jugs, hemispherical bowls, and storage jars with typically indented ledge handles, decorated with vertical red stripes on a white lime wash.

19. Examples of such knobs are found at many sites including HIT, Gezer (Seger et al. 1988: pl. 4:4), Azor (Ben-Tor 1975: fig. 8:9–10, pls. 14:4–5, 20:3), Lachish (Tufnell et al. 1958: pl. 57:72), Tel Aphek (Iliffe 1936: fig. 73), Jericho (Kenyon 1965: figs. 4:17, 9:9; Kenyon and Holland 1983: figs. 114:18, 125:14, 140:3, 144:30, 145:9, 147:17; Amiran 1969: pl. 12:18), Arad (Amiran et al. 1978: pl. 34), Bâb edh-Dhrâʿ (Schaub and Rast 1989: figs. 19:2, 38:2), and Tell el-Farʿah North (de Vaux 1951: fig. 12:6).

20. This thickened rim should not be confused with the "rail rim" of the northern subculture which it somewhat resembles. This latter type, often painted red or decorated in the "grain-wash" style, makes its appearance towards the latter half of early EB I in northern Israel (Braun 1985: 51, 115) and seems to develop locally, remaining an exclusively northern phenomenon.

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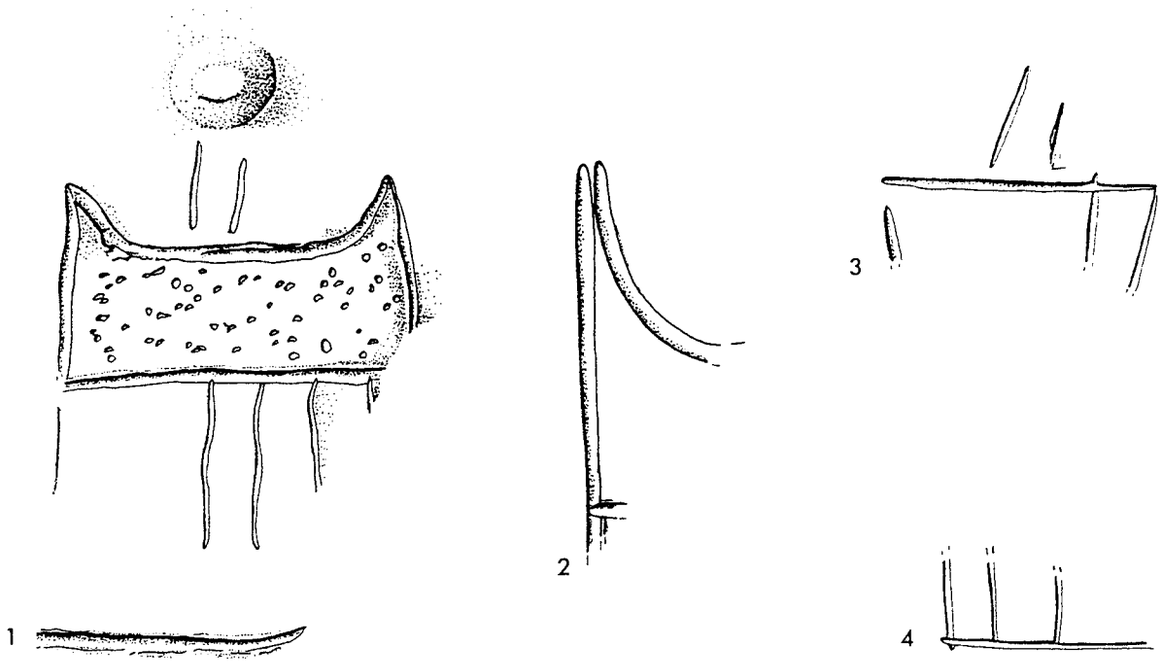

FIGURE 4.4. *1:* Rendering of the *serekh* from Palmaḥim Quarry 2 (fig. 4.2.6); *2:* Rendering of the *serekh* fragment on a locally made jar of Egyptian style from Ḥorvat ʿIllin Taḥtit (fig. 4.2.5); *3:* Graffito, incised after firing on a sherd of a locally made storage jar from Ḥorvat ʿIllin Taḥtit IV; *4:* Rendering of a *serekh* fragment on a sherd of Egyptian origin (fig. 4.5.1) from Ḥorvat ʿIllin Taḥtit.

The top of the upper register is concave. This space, which in other examples was reserved for the king's name (e.g., *Nj-Ḥr, Ḥȝ.t-Ḥr*, "Horus Ka" and "Horus Narmer"; Kaiser and Dreyer 1982: fig. 15:6, 8), and which we suggest to call the "name compartment," was filled with small punctures, randomly incised with a sharp tool or stylus. The inner composition of the lower portion of the *serekh*, the presumed schematic representation of a palace-facade, is somewhat asymmetrical. Its four vertical, inner bars descend from immediately below the horizontal base line of the "name compartment" but notably do not reach the *serekh*'s lower base line. Moreover, they are concentrated on the right side of the depiction, leaving empty space on the left.

The punctured style of the otherwise empty "name compartment" together with the concave top of the *serekh* are features strongly reminiscent of two similarly executed *serekh*s found on two Egyptian storage jars almost of the same period at el-Beda (Clédat 1913: pl. 13, figs. 3–4). It should be stressed that although at least one of the related el-Beda jars differs notably in shape from the jar from Palmaḥim Quarry,[21] they should be understood as contemporary on the basis of the stylistic execution of the *serekh*s.

A pair of antithetically placed falcons, also adorned with punctures, surmounts both el-Beda examples. Similar in style is the incised *serekh* on yet another jar, found in Turah (Junker 1912: 4, fig. 57:5), although here the *serekh* is straight-topped and without a separate, punctured "name compartment." The pair of antithetically placed falcons surmounting it is filled with puncture marks.

21. For a full treatment of incised *serekh*s and seriation of related storage jars, see van den Brink 1996.

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Although the Palmaḥim Quarry example lacks the characteristic pair of falcons,[22] it does show two small vertical strokes that perhaps symbolize or are an abbreviated form of the antithetically paired birds. A second, although admittedly less likely explanation for the two small vertical strokes above the *serekh* could be that they represent accompanying (pot?) marks made in conjunction with the *serekh*; something that is more the rule than the exception with other *serekh*-signs (van den Brink 1992: 276). These additional signs on other examples are, however, almost always incised either to the left or right side of the actual *serekh* (a space not preserved in the Palmaḥim Quarry example). Rarely are they below it and never above (Kaiser and Dreyer 1982: fig. 14), as in the case of the vessel from Palmaḥim Quarry.

In any event, a comparison of the general style of execution of the Palmaḥim Quarry *serekh* to the ones found in el-Beda and Turah on Egyptian storage jars of van den Brink's Type II, dated to Naqada IIIb1–2 (van den Brink, 1996: table 5), and on the partially related similarities in vessel morphology with Egyptian storage jars of van den Brink's Type I found at Abusir el Meleq and Rafiah (dated to Naqada IIIa2–b1) is informative. It allows us to safely assume a near chronological synchronism between all of them. If one accepts van den Brink's typological division concerning Types I and II, then they would fall in terms of relative Egyptian chronology at the very beginning of the Naqada IIIb1 period (ca. 3100 B.C.).

This date seems corroborated, moreover, by the early Naqada III date suggested by Williams (1980) for the rock carving from Gebel Sheikh Suleiman near the Second Cataract of the Nile. This graffito displays, inter alia, a *serekh* with a "name compartment" similarly filled with a punctuate design (Arkell 1950: fig. 2, pl. X).

This information is of major historical importance since the Palmaḥim Quarry *serekh* could, but does not necessarily, considerably predate the next inscriptional evidence for local involvement of an Egyptian administrative body in the southern Levant, at ʿEn Besor.[23] The Soreq basin *serekh*s belong to a time span perhaps associated with the reigns of as many as seven Egyptian rulers.[24] Moreover, they provide us with some suggestion of a time scale for the process of Egyptian involvement in the southern Levant during late EB I. This is in keeping with other interpretations offered by Amiran (1974: 6), Gophna (1974: 173), Brandl (1992: 447), Porat (1992: 435), and Braun and van den Brink (1998).

The petrographic examination of the jar reveals the following features: The matrix is rich in tiny (less than 50 microns) rhombohedral, dolomite crystals, perhaps altered into calcite due to firing, which can be identified only under the microscope. This clay, in fact, may be classified as marl. Except for the dolomite rhombs, this marl contains tiny nodules of ore minerals. Quartzite and chalcedony particles are also apparent. This sediment also contains fragments of

22. This is possibly due to a lack of space because of the presence of a knob, almost immediately above the *serekh*.

23. These are the Egyptian seal impressions applied to bullae made out local clay (Porat 1989a: 86) found at ʿEn Besor), dated to the very end of Dynasty 0 (i.e., Naqada IIIb2–c4) or the beginning of the First Dynasty (Mittmann 1981; Quack 1989, and most recently Gophna 1990; but see Schulman 1989; 1992 for a different dating).

24. These include two unidentified rulers (van den Brink 1966: table 5), nos. 10, 17–19) *Nj-Ḥr* (nos. 7–8), *Ḥꜣ.t-Ḥr* (no. 9), Iry-Hor (no. 14), Horus Ka (nos. 15–16), Horus Crocodile (no. 13). This time span is uncertain because it is not known whether they ruled consecutively or whether there was some overlapping of these reigns.

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fossils or grains of biogenetic limestone. Under oxidizing firing conditions, the clay matrix was burnt into very light pinkish colors.

Nearly pure, angular calcite crystals dominate the non-plastic assemblage. The calcite crystals are clear, exhibit typical twinning and zoning features, and are split by their cleavage plains, indicating that the potter crushed them prior to their admixture in the clay. Calcite was mined from naturally occurring veins in limestone deposits, then carefully crushed and mixed into the body of clay (Glass 1978). This activity certainly required a significant investiture of time spent on the manufacturing process, and therefore was probably dictated by some specific demands. The use of calcite as temper increases the thermal-shock resistance of the vessel and reduces its porosity. Crushed calcite is therefore very common as a main tempering material of cooking pots and holemouths, from EB I to the end of the Iron Age, when it was replaced by other compositions.

Additional components include grog and some spherical limestone and dolomite grains. Grog temper includes grains of various pottery types, some of which are isotropic due to the process of refiring. Some of the grog contains crushed calcite temper, similar to that of the jar discussed here.

The lithology represented in this vessel point to a geological environment that is dominated by marl, a series of limestones and dolomite formations exposed in vast areas on the Judaean-Samarian anticline. Moẓa marl, located underneath the clay unit of this formation, contains about 18% of calcareous minerals compared with about 4% in the clay unit above (Bentor 1966: 48).

Moẓa marl, the sole significant clay/marl formation in this region, has been used extensively in pottery production throughout many periods.[25] The application of both crushed calcite and grog are very common in south Levantine EB I pottery assemblages (Porat 1989a, 1989b), yet it is unknown in Egyptian wares. Thus, it may be stated that the jar under discussion was produced in the southern Levant, most likely in the area of the Judaean Mountains.

Additional Egyptian and Egyptianized Finds from Palmaḥim Quarry

Additional, notable artifacts derived from the excavations at Palmaḥim Quarry can be related to contacts with Egypt. They include the following items:

(1) A bowl with potter's mark (fig. 4.5:3; field reg. no. 1900/4030/1181/1). The shape of this simple vessel and the wheel marks it bears are features that are used to point toward an Egyptian association (Mazar and Miroschedji 1989; n. 4). Neither of these attributes particularly indicates such an association. However, the potmark, albeit only partly preserved, may be related to the corpus of Egyptian potmarks of Early Dynastic date, namely, van den Brink's (1992: 287) Group IV. It belongs to the second most common group within the corpus, with over 300 references. A bowl of similar style with a similar mark incised in its wall (although facing upward, toward the rim) has been recovered from a cave dwelling (Locus 1535) of the Northwest Settlement at Lachish (Tufnell et al. 1958: pl. 58: 80). It probably dates to EB I and has been identified as of Egyptian style by Brandl (1992: fig. 4:80).

Petrographic examination of the Palmaḥim Quarry bowl indicates that it was produced of a light, highly calcareous clay (a marl), rich in iron oxides. The matrix is rich in fine, fibrous

25. For the relevant references see Goren 1995.

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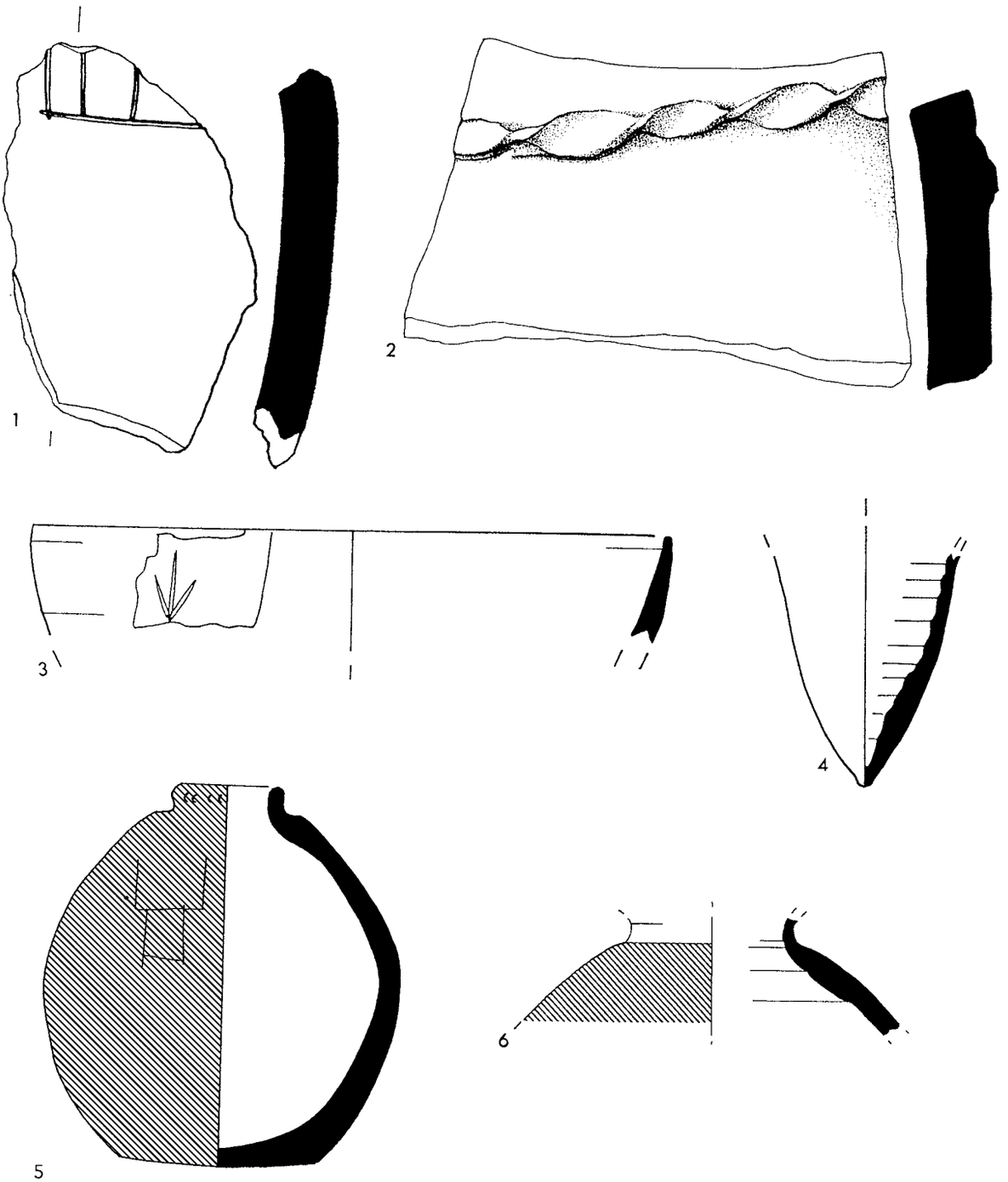

FIGURE 4.5. *1: Serekh* fragment on a sherd of Egyptian origin from Ḥorvat ʿIllin Taḥtit; *2:* Fragment of a storage jar of Egyptian origin from Ḥorvat ʿIllin Taḥtit (field reg. no. 258/1051/2); *3:* Fragment of a wheelmade bowl bearing an "Egyptian" potmark (field reg. no. 1900/4030/1181/1); *4:* Wheelmade vessel of a type sometimes claimed as "Egyptian" from Palmaḥim Quarry 1; *5:* Bottle of Egyptian manufacture, red polished with incised graffito (note the broken rim which has been intentionally scored and probably reworked, after firing) from Ḥorvat ʿIllin Taḥtit IV (field reg. no. 1779/220/1445/1); *6:* Jar fragment of local manufacture, red polished, probably in imitation of Egyptian bottles, from Ḥorvat ʿIllin Taḥtit. Scales: 1–2, 1:1; 3–6, 2:5.

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carbonate crystals and exhibits a weak optical orientation (length fast). Well-sorted, sparsely distributed, silty quartz appears in minor quantities. This raw material is identified as marl of the Taquya Formation of the Paleocene age (Porat 1984: 63–73; 1989b: 177–78). It was commonly used in the EB assemblages of the Negev, especially at Arad, for the production of jars and holemouth vessels. The non-plastic component includes quartz sand, limestone, and nari particles. [26]

The Taquya formation is exposed over a widespread region including the northern and central Negev, the Judaean Desert, and the western slopes of the Judaean-Samarian anticline. This formation is almost constant in its stratigraphic position and even in details of its composition. Equivalent beds appear also in Egypt (Esna shales) and even in Morocco and Turkey (Bentor 1966: 73). Therefore, it cannot be used for a definitive determination of provenance. Nevertheless, it seems that in most periods its use as a raw material for ceramic production has been restricted to southern Israel (Goren 1995: appendix A). The so-called Egyptian marly clay (cf. Bourriau 1981; Hope 1987; Nordström 1972; 1985) is of a totally different nature and cannot be mistaken with this material. Thus, it is likely that this vessel also is of local origin.

(2) One sherd, possibly of Egyptian origin (fig. 4.5:7), was recovered in fill associated with pits in the *qurqar*, discovered after Area B was bulldozed and cleared for quarrying. It may be associated with Stratum IV. While its stratigraphic provenance is questionable, its appearance at the site is noteworthy. The object, a slightly concave base (similar to that of the Egyptian bottle from HIT discussed below), is of a closed vessel, possibly of a type known in Egypt (e.g., Reisner 1908: fig. 173; Petrie 1953: pl. XXV:85B, 85E, 85F; Oren 1989: fig. 5:10); the base is highly fired, orange in color with a gray-brown core. Inside it is covered by a thin, cream-colored slip; outside the slip is a very pale green.

(3) A type of small vessel (fig. 4.5:4; a goblet?), identified as Egyptian by Brandl (1989), is notable for having been made on a wheel. It appears to have been fashioned locally, as are similar examples from Tel Erani (Porat 1986–87). The Egyptian inspiration for this rather crude vessel type is questionable (Braun forthcoming a; forthcoming b).

(4) True imports from Egypt at the site appear to be limited to twenty-five shells of *Aspatharia* rubens, recovered in three major excavation seasons at Palmaḥim Quarry. These freshwater mollusca are not found locally but must have originated in the Nile. Notable for their beautiful, iridescent, mother-of-pearl interiors, these were probably trade items.

Jar Fragment from HIT Incised with Serekh *(Fig. 4.2:5, Pl. 4.4a; Field Reg. No. 1779/220/894/1)*

The upper portion of a storage jar was found in Stratum IV. It lay, upside down, at floor level, within burned debris filling a sizable broadroom, part of a larger, composite structure (pl. 4.4b). This vessel is one of a number of Egyptian and Egyptianized objects derived from this same occupation (see below).

The top portion of this jar, but for the absence of a protruding knob, is remarkably similar in overall dimensions (even to the thickness of the shoulder wall) and style (with its distinctive rim and short neck) to the jar bearing the *serekh* from Palmaḥim Quarry (see above). Clearly, these two vessels are variations of an Egyptian prototype (Type I in van den Brink 1996).

26. This is a local name for a hard, thick crust of limestone found on the Shephelah and in other areas of Israel.

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The jar from HIT also bears a *serekh* on its shoulder. Unfortunately only the upper part of the left delineation and a very small part of the horizontal bar separating the "name compartment" from the lower (i.e., palace facade compartment) of the *serekh*, remain. Deeply incised with a narrow, blunt stylus, this *serekh* must have been considerably larger than that from Palmaḥim Quarry. The height of the upper register alone is 5.0 cm). The concave top of the "name compartment" is similar to that of the *serekh* from Palmaḥim Quarry, although there are no signs of any attempt having been made to fill in the register with any type of decoration in the preserved portion. The sign is, unfortunately, too fragmentary to allow anything more specific to be said about it other than that it falls within Kaiser's (Kaiser and Dreyer 1982) Horizon A–C.

On the basis of the similarity in morphology between this vessel and that bearing the *serekh* from Palmaḥim Quarry, we opt for a roughly similar date in Naqada III$_{b_1}$. This dating is corroborated by what is so far known about the pottery assemblages of Palmaḥim Quarry 2 and HIT IV.[27]

Egyptian Serekh *from HIT (Fig. 4.5:1; Field Reg. No. 1779/303/1595/1)*

Incised before firing by a thin stylus in the slipped and polished wall of a small sherd is either the top part of a *serekh* or, more likely, a corner of the bottom register (cf. Amiran, Ilan, and Arnon 1983: esp. fig. 1). Petrographic analysis informs us as to the ultimate Egyptian origin of the vessel to which the sherd belongs. However, the diminutive size of the sherd and the absence, within the locus and its immediate environs, of any additional fragments (of what must have been a vessel of considerable dimensions) suggest that the findspot is unrelated to its function as (a portion of) an intact storage jar. Thus, this *serekh* fragment cannot be directly associated with the final destruction and abandonment of Stratum IV, as may the larger, Egyptianized jar fragment.

Additional Egyptian and Egyptianized Finds from HIT

Altogether some twenty-five sherds of vessels of Egyptian origin were culled from the very sizable assemblage of ceramics at HIT. Although statistically they are not very important, nevertheless they represent a considerably larger proportion than recovered at Palmaḥim Quarry. In addition, there is another group of Egyptianized vessels that suggests some greater degree of influence than existed at the coastal site. Following is a discussion of the most notable of these artifacts.

(1) A ceramic bottle (fig. 4.5:5; pl. 4.5a; field reg. no. 1779/220/1445/1): This vessel, fashioned of finely levigated, red burnished clay with straw temper, was found in the same room as the jar with the complete *serekh*. That it is imported from Egypt is certain from its petrographic profile, typical of Egyptian "Nile silt" pottery. Morphologically similar vessels are known from Egypt (e.g., Petrie, Wainwright, and Gardiner 1913: pl. LVII:87g, but with more rounded bases; Petrie 1921: pl. XI:36a, 39, both red polished). The slight gutter on the shoulder, the slipping and burnishing, and the slightly convex base are typical of this class of Egyptian vessels (e.g., Reisner 1908: 95, fig. 173 [Type IX]; Oren 1989: fig. 18). The rim of this example was apparently removed in antiquity. The short, straight neck was then reworked,

27. The pottery from these sites has only been studied in a preliminary fashion.

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leaving the remaining fragment with a crudely smoothed, simple rim (see below, no. 2). The incised marks on the shoulder were made after the vessel was fired. Perhaps they can be related to Group XVIII of a corpus of Early Dynastic potmarks (van den Brink 1992: 291).

(2) Assorted fragments of imported Egyptian wares have been found in fills throughout the site. Although little morphological information may be gleaned from these sherds, their Egyptian origin is easily recognizable in their outstanding fabrics that contrast sharply with that of local wares. Included in this group is one sherd (e.g., fig. 4.5:2; field reg. no. 1779/258/1051/2) with rope or wavy line decoration. It appears to be part of a large jar with decoration highly reminiscent of the kind found on wine jars of Dynasty I (Petrie 1953: pl. XXII:76A; Iry-Hor; S.D. 78). Its petrographic examination revealed its Egyptian origin.

Fragments of two jars with thickened, folded rims (fig. 4.2:1, 2; for parallels see Kroeper and Wildung 1985: Abb. 14; Kroeper 1988: fig. 147, respectively) represent additional vessels of Egyptian origin. Another example is of less well-levigated clay (fig. 4.2:3; cf. fig. 4.2:4), while a fragment of a bottle (fig. 4.5:6), notable for the distinctive gutter on the shoulder, shows a splayed rim, a red slip, and the straw temper of its fabric. Again, its Egyptian origin was confirmed by petrographic examination. A third bottle (not illustrated), of which only the globular body survives, shows similar manufacturing techniques. It is fashioned of gray fabric with a light orange, polished slip. On the basis of petrographic examination, it proved not to be of Egyptian origin. However, on the basis of morphology and technological details of manufacture, it is suspected that it could be the product of a potter working in the southern Levant, according to Egyptian traditions.

(3) At least two more rims of storage jars of the same morphological attributes and comparable in size and color with the *serekh*-bearing vessels were found in the debris of houses in Stratum IV at HIT. None of the identifiable fragments of these jars bears any incised decoration.

(4) Numerous large storage jars, obviously of local fabrication, are identifiable in the HIT assemblage as belonging to a distinctive group by virtue of their folded, tapered rims (e.g., fig. 4.6:3, 4). This rim seems to be of Egyptian inspiration, although at HIT it is appended to jars that are generally larger than those associated with their Egyptian counterparts. Egyptian vessels with such rims are known from ʿEn Besor (Gophna 1990: fig. 8:2, 4, 5–7; 1992: fig. 6:1, 2) and northern Sinai Site B: 61 (fig. 4.6:1, 2).[28] In Egypt they are found on ovoid storage jars (e.g., Needler 1984: fig. 25:41; van den Brink 1988: fig. 17:75, 76; Kroeper 1988: figs. 82, 98, 147).

(5) Graffito incised before firing, on the lime-slipped wall of a storage jar of local manufacture (fig. 4.4:3). It is not inconceivable that this is a less than successful attempt at imitating a *serekh*.

(6) A large fragment of a piriform mace-head (fig. 4.7:2; field reg. no. 1779/115/1158/901), fashioned of calcite, was recovered in the fill of a room of Stratum III. The stone may be of Egyptian origin, but it is not known where the object was manufactured. A number of similarly shaped mace-heads, albeit fashioned of limestone, were also found at the site.

28. The authors wish to express their thanks to Prof. E. Oren and Dr. Y. Yekutieli of Ben Gurion University of the Negev for permission to publish drawings of two rims from this site.

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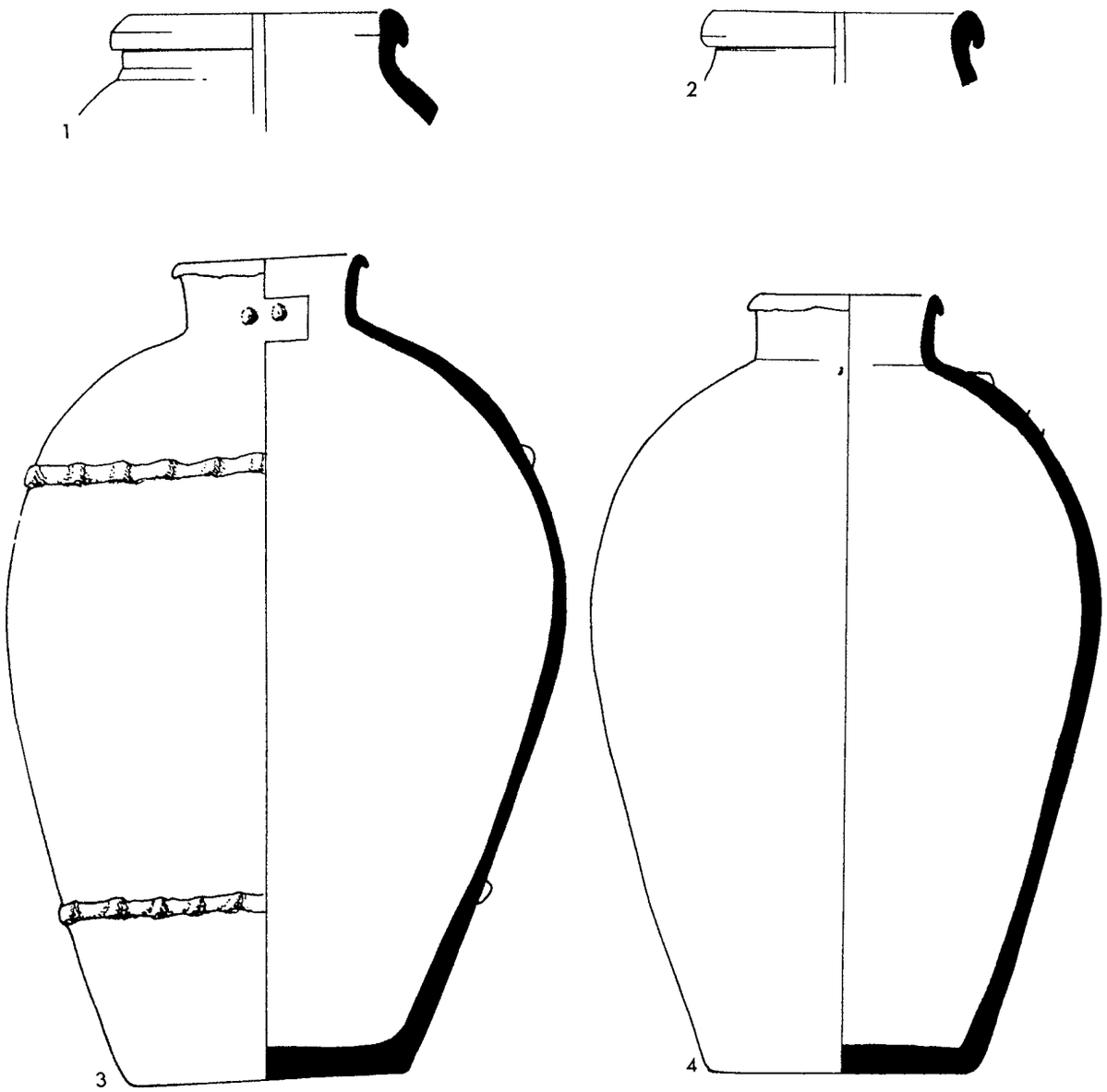

FIGURE 4.6. *1–2:* Rims of storage jars of Egyptian manufacture from Site B:61 in northern Sinai; *3–4:* Pithoi from Ḥorvat ʿIllin Taḥtit IV with rims similar to those found on Egyptian storage jars. Scales 1–2, 2:5; 3–4, 1:5.

Objects of this type are commonly found on sites of the Chalcolithic and EB I periods in the southern Levant as well as in Egypt.

(7) A large fragment of a roughly rectangular, limestone palette (fig. 4.7:3; field reg. no. 1779/229/1579/601) from Stratum IV was badly burned in the conflagration that destroyed the site. Although it appears to be of local material and workmanship, it is undoubtedly of Egyptian inspiration. Such objects are uncommon in the southern Levant in EB I.

(8) A curved, pressure-flaked knife blade (fig. 4.8:2; field reg. no. 1779/339/1427/503) of pale yellow flint with white ripples is of a type well known in Egyptian proto-dynastic contexts (e.g., Petrie et al. 1913: pl. VI:2; Schmidt 1992: fig. 10:55). Some few examples are

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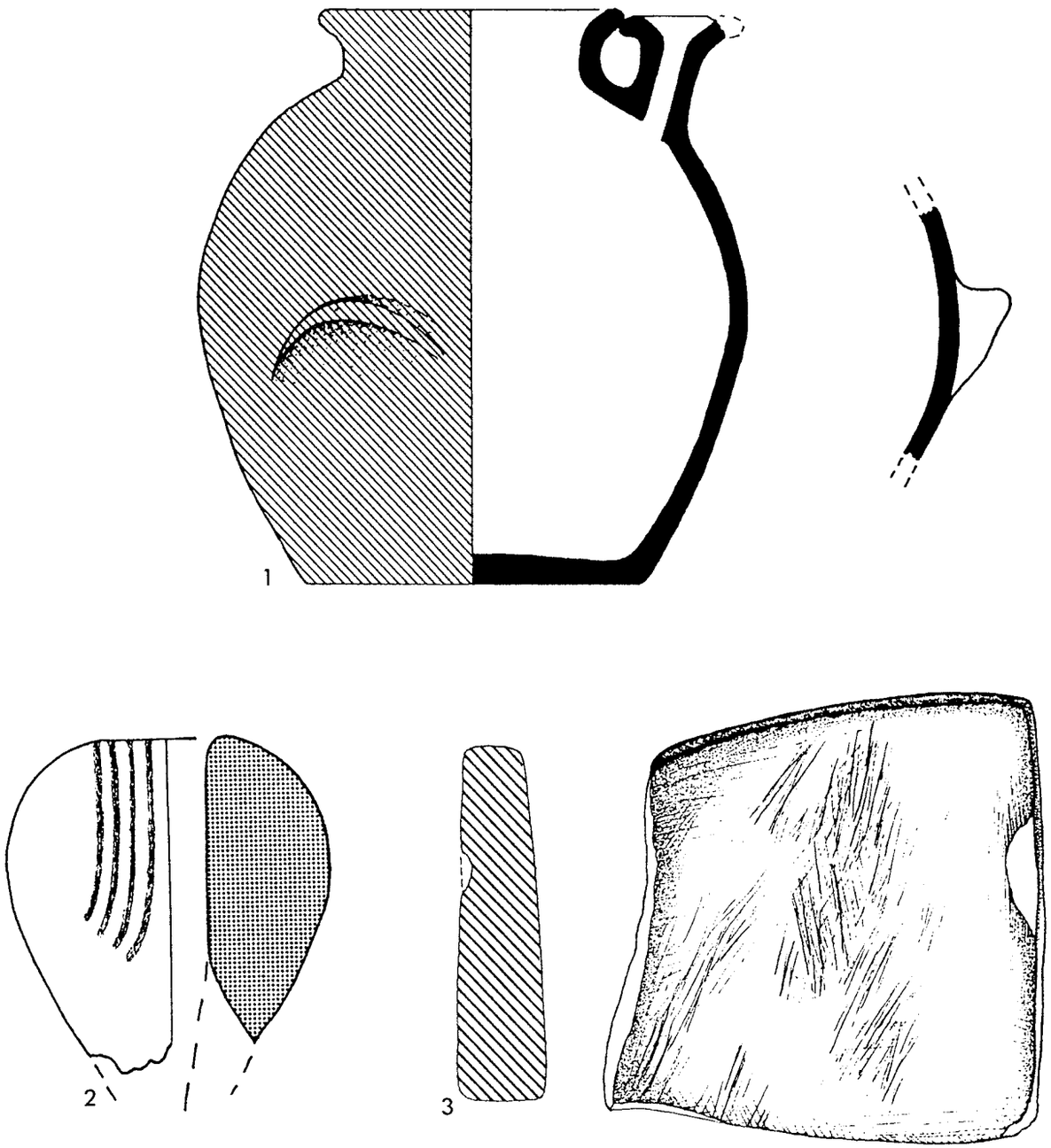

FIGURE 4.7. *1:* Storage jar of the Late EB I horizon from a tomb at Palmaḥim Quarry; *2:* Alabaster mace-head from Stratum III at Ḥorvat ʿIllin Taḥtit (field reg. no. 1779/115/1158/901); *3:* Stone palette from Palmaḥim Quarry (field reg. no. 1779/229/1579/601). Scales: 1, 2:5; 2–3, 1:1.

known from Southern Canaan (Gophna 1969; see also above; Rosen 1988: fig. 1:1, n. 12; Gophna and Friedmann 1993). The flint from which it was knapped does not appear to derive from local sources.

(9) Seven specimens of *Aspatharia rubens* were recovered from fills at HIT. As at Palmaḥim Quarry, it is assumed that these were trade items.

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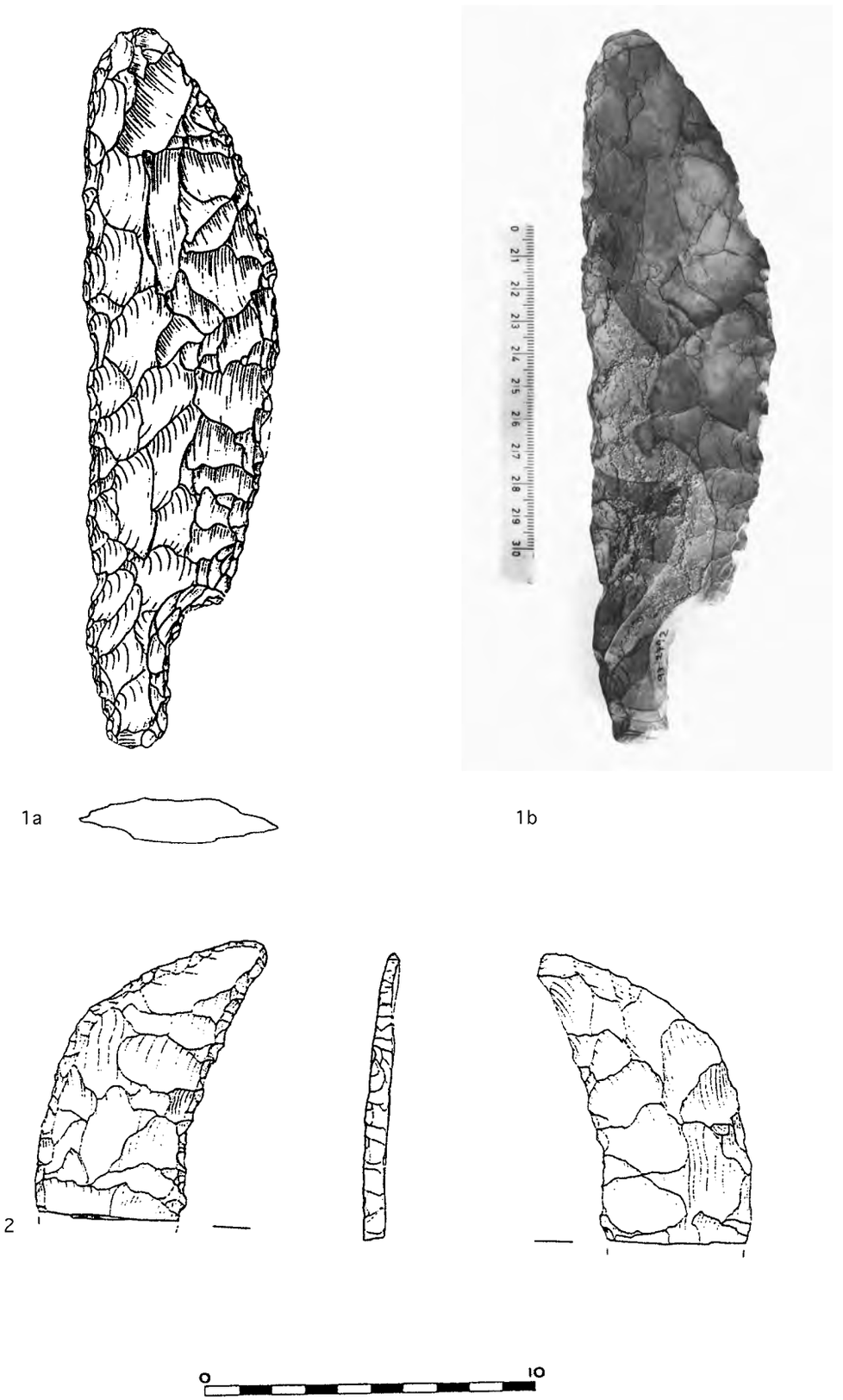

FIGURE 4.8. Egyptian flints from Yavneh Yam and Ḥorvat ʿIllin Taḥtit. *1a, b:* An Egyptian flint knife from a findspot on the beach at Yavneh Yam; *2:* A fragment of a flint blade of Egyptian type from Ḥorvat ʿIllin Taḥtit, field reg. no. 1779/339/1427/503.

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Egyptian Finds from Hartuv

Ceramics from Hartuv are suspected of having Egyptian affinities. The excavators' description of these objects is noteworthy for this discussion (Mazar and Miroschedji 1996: 23–24):

> A small number of sherds belong to vessels presenting Egyptian affinities, either in shape and surface finish or in fabric. These vessels are mostly bowls, appearing in two varieties. The first consists of deep bowls with thin rim (fig. 17:26); it is of local manufacture, but its technique appears Egyptian. The second type comprises large, deep bowls with profiled rim (fig. 17:27–29). It is also possible that small jars with lug handles (cf. fig. 18:10) should be added to this group of Egyptian-inspired vessels (Y. Yekutieli, pers. comm.). Petrographic analyses by N. Porat (Appendix B) have shown that these "Egyptian" vessels were not imported from Egypt, but rather from the southern Coastal Plain, possibly from the area of Tel Erani, where immigrants from Egypt or people in close connection with Egypt had settled in large numbers in EB I.

Recent research (Braun forthcoming a, b) now seriously questions the determination of Egyptian inspiration or affinities of numerous locally produced vessels of this cultural horizon. For the present, the "Egyptianized" bona fides of the Hartuv ceramics must remain questionable; those specified by the excavators are simple types that do not make good diagnostic indicators. What seems quite certain is that they indicate links between Hartuv and Tel Erani otherwise noted for local ceramic styles.

Tel Rumeileh

A fragment of the rim of an Egyptian bowl (Grant and Wright 1938: pl. LIV:65), of a hard black and white stone, albeit published as "alabaster," was recovered from basal deposits at Tell Rumeileh (ancient Beth Shemesh). Its provenience, designated as Strata VI–IV, is uncertain. On the basis of the published material, these deposits represent activity at the site dating any time from late Neolithic to EB I.[29] The shape of this fragment suggests the latest period as the most likely although parallels from Egypt seem to be later (e.g., Petrie and Quibell 1896: XV:157–58; Petrie, Wainwright, and Gardiner 1913: fig. XLIV:804; Petrie 1921: fig. XXXIX:88, 108; Dunham 1978: pl. XXII).

An intact diorite bowl of an Early Dynastic type (e.g., Petrie and Quibell 1896: VIII:1–3; Brunton and Caton-Thompson 1928: fig. LI:14; Forbes 1996) was recovered at the same site but in association with Middle Bronze Age deposits (Grant 1932: pl. XLVII:3; B. Routledge, pers. comm.). It is not known whether these objects originated in earlier, on-site deposits that made their way there during the EB Age, or whether they arrived as heirlooms.

Egyptian and Egyptianized Finds from el-Maghar

Surface collections from el-Maghar (Gophna 1974: fig. 13) have produced a small quantity of Egyptian pottery that appears to be dated to late EB I or early EB II. Figure 4.2:4 depicts the rim and neck of one such vessel. Petrographic examinations confirm its Egyptian origin. It

29. The artifacts (Grant and Wright 1938: pl. XXIII) attributed to Stratum VI include ledge handles (nos. 1–11), hallmarks of the EB I horizon. Other objects (nos. 12–13) are pottery sherds that appear to date from Late Neolithic through early EB I. The lithics illustrated on ibid., pl. IV, attributed to Strata VI–IV, include types dated to these same periods.

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clearly belongs to a class of "wine jars" of Dynasty I (cf., e.g., van den Brink 1988: figs. 14, 15). Porat (1989a: appendix 5c: Maʿar) and Brandl (1992: 465) have identified other sherds from this site as Egyptian. They include fragments of wine jars (one of which had been impressed with rope decoration (cf. Naqada IIIb2/c1, dated to Dynasty 0), cylindrical jars, and a portion of what appears to be a bread mold of Egyptian style. Such molds are common at sites of the Proto-Dynastic period (e.g., van den Brink 1992: fig. 7:3; Dreyer et al. 1996: Abb. 23h).

Egyptianized Finds from Kibbutz Palmaḥim (Givʿat Ha-esev)

The small, drop-shaped bottle (fig. 4.3:1; pl. 4.5b) found within a hemispherical bowl at this site is, without doubt, of Egyptian style (e.g., Petrie 1921: 69). This type seems to be related to several examples noted by Ben-Tor (1975: fig. 10:6, 7), Gophna (1978: fig. 4; 1992: figs. 4–7), Amiran (1976), Brandl (1989: fig. 14:2–3), and Kempinski and Gilead (1991: fig. 12:11–13) that have been found in southern Israel.[30] The closest parallel found locally is from Azor (Perrot 1961: fig. 40:14), where two such vessels are attributed to Level 3 (crevices in the bedrock), dated by ceramic parallels to EB I. Petrographically, the vessel from Palmaḥim proved to be produced locally, as are other similarly shaped vessels from sites in southern Israel (Porat 1986–87).

Egyptian Bifacial Flint Knife from a Findspot at Yavneh Yam (Fig. 4.8:1a, b)

An Eqyptian flint knife was dated in its original publication (Gophna 1969) to EB III. However, in light of more recently discovered parallels in Egypt (Fairservis 1971–72: fig. 28j, k, l; Schmidt 1992: fig. 3:1) and additional information concerning Egyptian influence derived from the constellation of EB I sites along the Soreq basin, it seems more appropriate to suggest an earlier date for this artifact. Bifacial knives were popular in Egypt for an extended period, from at least the Early Dynastic period. Gophna (forthcoming) suggests the possibility of maritime trade in this period, with this object as possible evidence for it.

Tel Yarmuth

Although Tel Yarmuth is situated on a branch of the Lachish basin, it is only 3 km south of HIT. While the major finds at the site belong to EB III, there are deposits in deep soundings beneath even well-buried EB II layers that have produced artifacts eminently comparable to those from the late EB I of HIT.

Miroschedji (1988: pls. 22:4, 47:8) reported on a sherd that could be interpreted as having a *serekh* incised on it, but nothing more is known of this object. Conceivably it could have originated in one of the early occupations of the site. Thus, the proximity of the site to the Soreq basin and its possible early origin suggest it could be related to the subject of this paper.

A rim of a large jar from this same site (Miroschedji 1988: pl. 20:10) is paralleled in the jars with Egyptian-like rims at HIT. It is attributed to Chantier B, niveau B–V, and dated to EB II. Additional material from this level is also paralleled at HIT, and thus the suggestion is made that these objects could equally date to late EB I.

30. For a convenient review of the appearance of these vessels see Amiran and van den Brink, chap. 3: fig. 3.10, this volume.

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DISCUSSION

Recent archaeological exploration has shown the Soreq basin to have been an important focus for settlement during EB I. Not unexpectedly, the largest population centers there were located within the more fertile, low-lying regions of the Shephelah and Coastal Plain. Of these, Palmaḥim Quarry may well have been the largest; apparently it once boasted a sizable population.[31] The remains at el-Maghar also suggest a settlement of considerable size, although just how much of it dated to EB I is impossible to quantify. HIT was a village of lesser dimensions than Palmaḥim Quarry, while Hartuv appears to have been smaller still, perhaps because of its specialized function. The least of these, Kibbutz Palmaḥim-Givʿat Ha-esev, is quite restricted in area and may well have been closely associated with the nearby site of Palmaḥim Quarry.

Virtually nothing is known of the settlement at Tell Rumeileh; only artifacts from fills attest to its existence. The hill country settlements at Moẓa and Sataf were explored only in limited soundings, but it seems likely, given their topography and available resources, that they would not have been very sizable.

Not only are EB I settlements strung out along the length of a meandering Soreq streambed, but they also represent sporadic, chronological episodes within the period. Stratum 3 at Palmaḥim Quarry is devoid of Egyptian influence, and the site was abandoned for a considerable period of time before resettlement in Stratum 2. Moẓa perhaps dates to the same time span and similarly lacks an Egyptian element. This chronological factor is significant for explaining a lack of any evidence of Egyptian influence on the material culture of these sites. Pottery from this same early phase is also found at Tell Rumeileh but, on the basis of parallels, it seems unlikely that the two Egyptian stone bowls could date from so early an occupation. They must be understood as either heirlooms or attributed to a later EB I settlement about which nothing is definitely known.

Hartuv is somewhat tardier than Moẓa and may have been contemporary or nearly so with the settlement at Sataf. Although this latter site has very few chronologically diagnostic features; those few recovered suggest an affiliation with the cultural horizon of Erani C, albeit without any Egyptian element. Evidence for Egyptian involvement at Hartuv is extremely equivocal. The supposed foreign attributes of a group of ceramic vessels are rather dubious. None of the so-called Egyptian features (including the use of the wheel and the morphology of these objects) is particularly identifiable as Egyptian. The claim to this distinction is based on attributes found on parallel objects at other south Levantine sites (e.g., Brandl 1989; Kempinski and Gilead 1991) where they have been identified as Egyptian. However, careful scrutiny of their diagnostic bona fides suggests that their foreign inspiration is based on tendentious interpretation rather than on real attributes (Braun forthcoming a; forthcoming b).

Investigations by Yekutieli (1991 and pers. comm.) of the pottery assemblage from Kempinski's and Gilead's excavations indicates that major Egyptian involvement at Tel Erani may actually be confined to a post–Stratum C occupation. If this is indeed the case, then the

31. Quarrying prior to excavation had destroyed most of the site, making it impossible to even estimate its original size with any accuracy. It should, however, be noted that scattered, heavily concentrated remains of structures, dated to late EB I, were found hundreds of meters to the east and west of Area B.

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"Egyptianized" pottery from Hartuv, paralleled at Erani C, is even less likely to be Egyptian inspired. Thus, Egyptian influence in the Soreq basin as early as the Erani C phase remains doubtful.

All early EB I sites noted above seem to have been abandoned before late EB I, when Palmaḥim Quarry and HIT became flourishing communities.[32] It is interesting to note that only in this late EB I context did the denizens of the Soreq basin appear to have attracted the attention of a nascent Egyptian state. Could this contact be due to particular demands of a developing polity, perhaps even of a vigorous royal policy directed toward the southern Levant (e.g., Gophna 1976; 1992)? Or did communication come only at this stage because there was a sufficient population in the region to attract Egyptian interest?

This new information from the Soreq basin can be particularly illuminating as to the degree of Egyptian involvement in the southern Levant. The overwhelming bulk of the material culture at the sites where the *serekh*s were discovered is in keeping with local traditions and does not show any overt evidence of Egyptianization. Egyptian influence apparently is confined to the few items enumerated above. Thus, neither HIT nor Palmaḥim Quarry can be identified as Egyptian colonies, nor even centers of major Egyptian involvement, in the manner of Tel Erani and ʿEn Besor (Gophna and Gazit 1985). Indeed, the level of Egyptian influence at the former site can only be rated as slight; at the latter, even slighter.[33] This modicum of Egyptian-related finds at sites in the Soreq basin in this time span suggests that at least these communities, with the possible exception of el-Maghar, were not in the forefront of any network of communication that might have existed between Egypt and the southern Levant. Egyptian and Egyptianized artifacts are exotic elements in an otherwise local phenomenon.

Nevertheless, the presence of *serekh*s at both Palmaḥim Quarry and HIT is understood as indicative of some sort of royal Egyptian involvement with these southern Levantine villages, and hence their very existence is of import for the study of Egyptian-Southern Levantine relations in this period. The two, perhaps three *serekh*s from these sites increase the number of these incised titularies found outside of Egypt to seventeen (see Levy et al. Chap. 22, fig. 22.14). Their presence, further north than those previously and latterly discovered, is not entirely surprising in itself; significant Egyptian connections have been noted at nearby Azor (Amiran 1985) and more recently at Lod (van den Brink forthcoming). Preliminary work at Tell es-Sakan (Miroschedji 2000) produced large quantities of Egyptian and Egyptianized pottery in an extraordinary concentration (purported to be as high as 90% of the total for the appropriate level; Miroschedji, pers. comm. 2001) in what appear to be late EB I contexts. If this site fulfills the promise of the first seasons, then it is likely to be an example of a large-scale, truly Egyptian settlement, in contrast to the contemporary Naḥal Soreq sites of Palmaḥim Quarry and HIT, that exhibit primarily and overwhelmingly, evidence of local material culture. A notable surface find from this site is a *serekh* of Horus Narmer, incised into

32. It seems likely that Kibbutz Palmaḥim-Givʿat Ha-esev may have existed contemporaneously. However, the evidence for dating the smaller site is insufficient for any precision in this matter.

33. Both these sites show a great deal less evidence for Egyptian influence than even that found at the late EB I settlement at Ḥalif Terrace. Recent excavations there have unearthed a sizable assemblage of Egyptian and Egyptianized artifacts (Levy et al. 1997), although the village itself is cast in a mold typical to the Soreq basin and other sites of the indigenous late EB I culture.

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a vessel of apparently Egyptian origin. However, for the first time, these artifacts inject a royal element into a somewhat larger sphere and earlier than was hitherto known.

That two of these *serekh*s were found incised, before firing, not on imported Egyptian jars, but on locally manufactured vessels, makes them outstanding. They can only be understood within the larger context of Egyptian and Egyptianized finds from the Soreq basin and the Mediterranean littoral. It is no coincidence that two such vessels bearing royal symbols were found within two similar structures[34] at sites along the Soreq basin, an easy path of communication. They are clearly contemporary and indicate close links, either directly between the sites or with a third communicant.

Notably, at HIT there are numerous jars of a type (fig. 4.6:3, 4) that appear to be stylistically Egyptianized or severely influenced by the morphology of Egyptian prototypes.[35] These vessels may be the key to understanding the relationship between the local denizens and Egyptians at the site. Such jars, distinguished from the *serekh*-bearing type, are not common at other sites but have been found at Jericho (Kenyon and Holland 1983: fig. 82:16, 17) and Ai (Callaway 1972: fig. 17:29) in late EB I contexts. Very significantly, not one of this type has turned up in the voluminous ceramic assemblage of Palmaḥim Quarry. Thus, it is not inconceivable that this type jar is specifically associated with some Egyptian-related activity and that its presence in quantity indicates some special status for HIT. In this context it would be easy to understand a relatively greater degree of Egyptian influence at this site as compared with that found at Palmaḥim Quarry, as is reflected in their artifact assemblages.

Were these jars made by Canaanites especially for Egyptians or, what appears to be less likely, did Egyptians make them for a local population? For what purpose were they fashioned? Is there significance in their distinctive rims on vessel bodies that are otherwise typically local? That a sizable number of them was found alongside local types could be meaningful, but the evidence may be interpreted in different ways. Were the contents of these jars intended for some special function or purpose, or were they perhaps used as a standardized measure? Or could that have been the function of the jars with incised *serekh*s?

The two *serekh*-bearing vessels are remarkably similar in their proportions and, not inconceivably, they may have had identical capacities. They are of a type that is particularly rare; only one of its kind was encountered at Palmaḥim Quarry and perhaps three or four (out of scores of large vessels) are known from HIT. To date, no other morphological parallels are known within the considerable late EB I ceramic assemblages available to us for inspection.[36] Thus, the significance of these vessels must be emphasized while their precise meaning remains obscure.

34. It is noteworthy that at HIT this vessel, as well as the red-polished Egyptian bottle, was recovered in one of the largest chambers, a broadroom with pillar bases. At Palmaḥim Quarry, the jar incised with the *serekh* was retrieved in the largest single room excavated, also a broadroom with pillar bases. Speculation as to the significance of these archaeological contexts could suggest these structures were houses of Egyptian personnel or representatives of an unnamed Egyptian king, stationed in these villages. Alternately, they could be understood as located in domiciles or special storerooms associated with people of wealth or elevated status who were involved with Egyptian-related activity.

35. These are large storage jars that have the distinctive “Egyptian style” rim noted above.

36. This includes published and unpublished material.

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All these speculations still leave open the questions of precisely what was the nature of Egyptian involvement in the Soreq basin and what particular role might an Egyptian monarchy have played in this intercourse. On the basis of the archaeological record of these sites, we can only continue to speculate as to what it might have been. Numerous scenarios suggest themselves. Was it trade or perhaps a more one-sided arrangement of tribute? Was there some Egyptian presence in the region that might have affected the political situation of these late EB I sites in the Soreq basin? Here again the evidence of the archaeological record is equivocal and may be interpreted with great flexibility. Recent excavations by the Israel Antiquities Authority at the tel of Lod have unearthed a large EB I–II site from which a sizable quantity of Egyptian and Egyptianized pottery was recovered. Included in this specialized assemblage are a number of *serekh*s, incised before firing. Notably, the overwhelming bulk of pottery from these levels is representative of the local, regional cultural horizon of these periods.

Notably, Palmaḥim Quarry 2 and 1 and HIT IV and III each show continuity to the end of EB I, when they are permanently abandoned. However, the occupations at these sites seem to have met quite different fates. Palmaḥim Quarry was gradually and perhaps peacefully abandoned in the manner of such processes. In contrast, HIT IV was entirely destroyed in a violent conflagration, and its successor, Stratum III, was literally built atop the earlier houses, sealing their ash-filled, artifact-laden rooms. This final settlement seems also to have suffered an extraordinarily rapid abandonment as may be judged by the relatively large number of small, intact objects found on its floors.

The early chronological position of these *serekh*-incised jars, somewhere in Dynasty 0 or close to the beginning of the First Dynasty (Naqada IIIb1; cf. Levy et al., chap. 22, this volume: table 22.3), has been discussed at some length (Braun and van den Brink 1998). In terms of Egyptian chronology, this is probably several decades later than Tomb U-j at Abydos (Umm el-Qaab) dated by Dreyer (1992) to Naqada IIIa2. That tomb notably contains vessels that belong to the Erani C horizon so that we can be sure of the relative chronology of these objects and their correlation with Egyptian chronology.

Thus, whatever the nature of royal Egyptian involvement with these two sites, it predates the unification of Upper and Lower Egypt and indeed, these *serekh*s are the earliest evidence of royal Egyptian involvement in the southern Levant. They precede and perhaps presage later developments at sites farther to the south, where intercourse between these two cultural spheres is more intense and perhaps protracted.

We do not know whether Egyptians bear any responsibility for the demise of these late EB I sites, nor for the rise of major urban-like settlements at Tel Yarmuth, Tel Erani, and other locations, but such a possibility cannot be ruled out. The time span when these changes in settlement patterns occur corresponds with major developments at sites farther south and north. There Egyptian influence is substantially greater (e.g., Tel Erani, Ḥalif Terrace, ʿEn Besor, and Lod), although Egyptian elements in the Soreq basin may actually decline from the previous phase (corresponding with Palmaḥim Quarry 3 and HIT IV). This lessened influence could be interpreted as a change in Egyptian policy during the reign of King Narmer, perhaps even owing to increased strength of the monarchy on the eve of unification. Such a scenario would then favor more peaceful and perhaps a balanced mutually beneficial trade arrangement between an Egyptian monarch somewhere early in Dynasty 0 and the settlements in the Soreq

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basin. Models of less equitable, tribute-like arrangements or royal trading establishments might better fit the evidence from later and more southerly EB I sites.

It is not known how, if at all, the site of el-Maghar may fit into this scenario. Its role in this scheme may only be guessed at because our information is based on casual surface sherding without benefit of excavation of the EB settlement. The Egyptian jar illustrated from this site (fig. 4.2:4) suggests continued Egyptian involvement in this region, after the abandonment of Palmaḥim Quarry and HIT, into EB II. The site's location on a major overland route (i.e., the Via Maris) from the south to Azor, Lod, and farther north suggests the possibility of more intensive Egyptian activity at this site, although this remains to be shown. Unfortunately, too little is known of what may have been a site of key interest in the period under discussion.

SUMMARY

The Soreq basin was, during late EB I, one of several focal points for interaction between Egyptians and the local population. Our present understanding of the archaeological record suggests that the excavated sites may well provide evidence for the first official contacts between a Proto-Dynastic Egyptian monarchy and the southern Levant. This interaction seems to have been rather low-keyed in comparison with more intensive activity during the reign of King Narmer and the kings of the early First Dynasty. With the possible exceptions of el-Maghar and Lod, the focus of Egyptian contacts in the later period seems to have shifted toward more southerly sites. Notably Tell es-Sakan (Miroschedji 2000), Tel Erani (Brandl 1989), the Ḥalif Terrace (Levy et al. 1997), Afridar, Area C (Brandl 1992; Brandl and Gophna 1993), Tel Maʾaḥaz (Amiran 1977; Gophna 1995; Amiran and van den Brink, this volume) and ʿEn Besor (Gophna 1995) show appreciably more associations with Egyptian material culture, although perhaps not to the extent that is often claimed (Braun forthcoming a; Forthcoming b).

Our present understanding suggests that the Soreq basin served as a conduit for Egyptian goods and influences into the south-central region of the southern Levant and perhaps vice versa. The evidence from these newly discovered artifacts clearly places this region within a zone of Egyptian activity, if only for a brief span of time. Future research may, however, alter this perception. For the present, the Soreq basin can be understood as indicative of the complicated and shifting patterns of interaction between two distinct cultural spheres, Egypt and the southern Levant during the EB Age.

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PLATE 4.1a. Aerial view of Palmaḥim Quarry.

PLATE 4.1b. The site of el-Maghar occupying a high *qurqar* outcrop.

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PLATE 4.2a. Broadroom at Ḥorvat ʿIllin Taḥit.

PLATE 4.2b. Storage jar with incised *serekh* from Palmaḥim Quarry.

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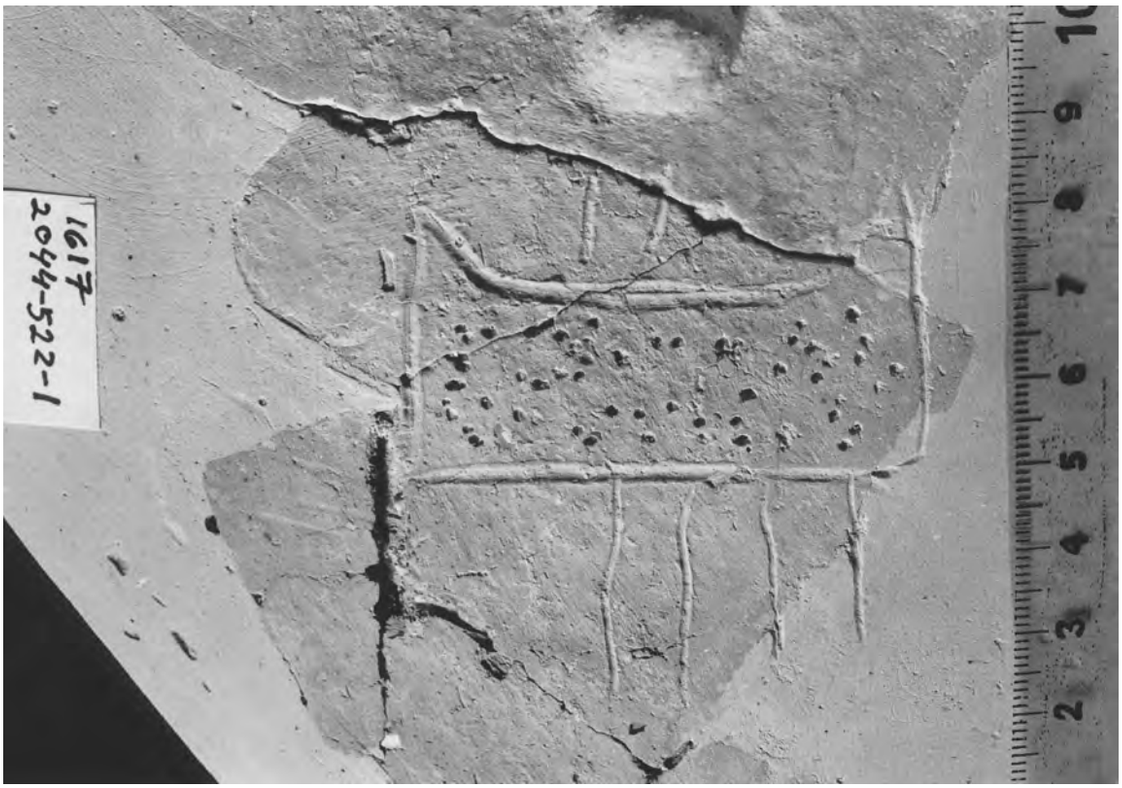

PLATE 4.3a. Close up view of incised *serekh* on a storgage jar from Palmaḥim Quarry.

PLATE 4.3b. Broadroom at Palmaḥim Quarry, Stratum 2.

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PLATE 4.4a. Storage jar (field reg. no. 1779/220/894/1) with incised *serekh* from Ḥorvat ʿIllin Taḥtit.

PLATE 4.4b. Findspot of a storage jar with incised *serekh* from Ḥorvat ʿIllin Taḥtit.

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PLATE 4.5a. A bottle of Egyptian manufacture from Ḥorvat ʿIllin Taḥtit.

PLATE 4.5b. Egyptian style drop-shaped bottle from Kibbutz Palmaḥim-Givʿat Ha-esev.

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5

THE RELATIONSHIP BETWEEN CERAMIC PRODUCTION AND SOCIOPOLITICAL RECONFIGURATION IN FOURTH MILLENNIUM CANAAN

J. P. DESSEL

Over the last twenty years archaeologists working with ceramics have paid increasing attention to ceramic technology and methods of pottery production (see generally Howard and Morris 1981; Rye 1981; Olin and Franklin 1982; van der Leeuw and Pritchard 1984; Kingery (ed.) 1990; Nelson 1991). It is now more widely recognized that ceramic analysis, when limited to simple typological observations based solely on attributes of form and decoration, serve to limit and constrain archaeological interpretations (Franken 1974: 37–42; Kingery 1982; Steponaitis 1983: 47–50; van As 1984; Smith 1985: 257–58). When looking within a larger ceramic context—the raw materials and manufacturing technology, along with aspects of style and function—it is possible to reconstruct the organization of ceramic production. It is the changes in the production of ceramics that are more clearly related to larger social, political, and economic changes within a society. Though not the cause of such changes, ceramic production can act as a barometer of sociopolitical developments. Doug Esse articulated the parameters of this discussion in a programmatic essay written in 1989 entitled "Village Potters in Early Bronze Palestine: A Case Study." Doug's enthusiasm for the Early Bronze Age (EB) served as an inspiration to my own research, and it is in memory of Doug's warmth, friendship, and unstinting optimism that I offer this article.

The collapse of Developed Chalcolithic culture of the northern Negev and the transition to EB I in Canaan are poorly understood processes (see Amiran 1985; Hanbury-Tenison 1986: 251–55; Braun 1989; Joffe 1993: 41–48; Joffe and Dessel 1995). It is particularly vexing in that the Chalcolithic has long been understood as significantly more complex than EB I. This can obfuscate our understanding of the origins of social complexity in EB II, a period in which urbanism rapidly emerges from the relatively undifferentiated sociopolitical landscape of EB I. There is a tendency to disregard the decline in social complexity in EB IA in order to reconstruct a seamless evolutionary trajectory toward ever increasing social complexity, reaching a protoliterate peak with the urban settlements of EB II and III.[1] More recently, this type of elision has been addressed by Alexander Joffe (1993: 63–64), who views the emergence of cities in EB II as a "disjunctive leap," and indeed the type of archaeological data which often presage the emergence of cities is clearly lacking.

Part of the difficulty in charting the development from the Chalcolithic through EB II is a lack of sites which have this complete stratigraphic sequence. Recently a Terminal Chalcolithic

1. T. Levy (1986: 86) suggests that the roots of social complexity in EB should be sought in the Developed Chalcolithic of the northern Negev; however, Gilead's (1988) view of a less complex society during the Developed Chalcolithic would argue against this view.

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phase has been detected at a number of sites which continue into the Early Bronze Age (Joffe and Dessel 1995). Sites such as the Ḥalif Terrace, Lachish Area 1500, and Gat Guvrin/Zeita typify the Terminal Chalcolithic. Some of the connective tissue linking Chalcolithic institutions to the Early Bronze Age ones can be seen in types of material culture which might reflect, however dimly, the presence of elite constructs, who maintained some semblance of their former hierarchical positions after the collapse of the Developed Chalcolithic chiefdoms. Unfortunately their low profile during EB IA, a period of reorganization and consolidation, makes their detection difficult (Stager 1992:28, 32–33; Joffe 1993: 41–48). The detection of continuity in elite structures into EB I would, at the very least, help to shorten the distance of any disjunctive leap.

In an attempt to gain a better insight into some of the organizational structures operative in EB I, it is instructive to closely examine ceramic production at a site where Chalcolithic ceramic traditions persist, as newly emerging EB traditions develop. By assessing the organization of production and changes in that organization, subtle shifts in the level and intensity of EB I socioeconomic structure might be clarified. The identification of differing organizations of production, such as the household level or workshop level, along with other economic interactions—such as the control over restricted resources, technological differentiation, active exchange networks, and the manipulation of a limited iconographic vocabulary—can be used to support the appearance of varying degrees of social differentiation and emerging economic forces (Rice 1981: 219–22; Steponaitis 1983: 160–61). Esse (1989) had anticipated many of these issues already in his study of EB ceramic industry.

The ceramic material from the site of the Ḥalif Terrace provides a unique opportunity to examine the relationship between cultural collapse and reformulation and the organization of ceramic production during the transitional Terminal Chalcolithic/EB IA in the southern Levant. The Ḥalif Terrace is located at the juncture of three environmental zones: the southeast corner of the Shephelah, the northern edge of the Negev Desert, and the southwest corner of the Hebron Hills (Seger 1983: 1) (see fig. 5.1). The site covers upward of 12 hectares along a limestone terrace above the Yaval Valley (Alon and Yekutieli 1995: 184). It is spread along a sloping terrace and includes Site 101, a troglodyte settlement which underwent successive roof collapses (Seger 1996: fig. 6). The terrace site was initially reported on by R. Gophna (1972), who commented on the presence of Egyptian pottery. The first excavation of the Ḥalif Terrace was undertaken by David Alon (Alon and Yekutieli 1995: 186, n. 1) and Kibbutz Lahav in 1972. The Lahav Research Project, under the direction of Joe D. Seger, has conducted extensive excavations on the terrace from 1986 to 1994.[2] Most recently Thomas E. Levy (Levy et al. 1995) has also excavated at the Ḥalif Terrace, adjacent to the Lahav Research Project's Site 301 and some of Alon's original trenches. Seger (1996: 249–51) has identified four clear occupational phases at Site 101; Phase 10 dates to the Terminal Chalcolithic, Phases 9 and 8 date to the EB IA, and Phase 7/6 dates to EB IB. It is during Phase 7/6 that the Egyptians establish a permanent presence at the site.

Though there is a growing corpus of comparable ceramic material for the Terminal Chalcolithic/EB IA transition, the pottery is still relatively unknown (see Dessel 1991; Alon

2. I would like to thank Joe D. Seger who generously allowed to me use the Chalcolithic and EB ceramic material from the Lahav Research Project for my dissertation research. I would also like to thank the Lahav Research Project and the Cobb Institute of Archaeology for their support of this research.

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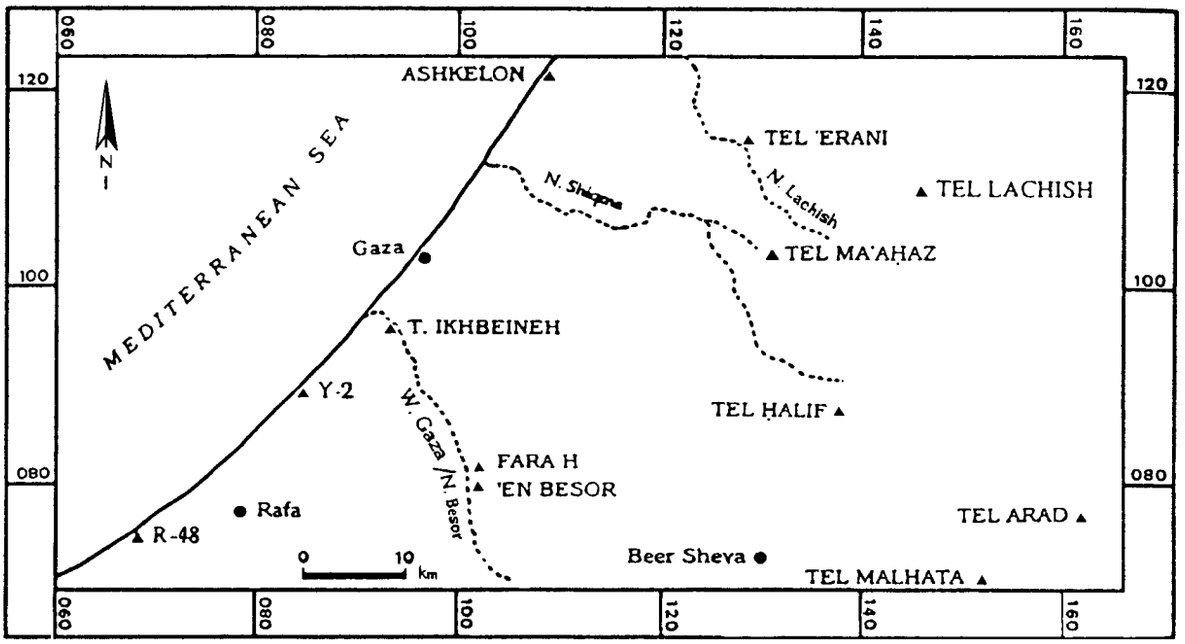

FIGURE 5.1 Map locating Tel Ḥalif in southern Canaan (after Oren and Yekutieli 1992: fig. 2).

and Yekutieli 1995). Some of the best direct evidence for ceramic production in this transitional period is found at the Ḥalif Terrace. Three distinct ceramic production systems are operative at the Ḥalif Terrace: workshop production reflecting some degree of craft specialization, a more informal level of household production, and nonlocal potters responsible for the ceramic needs of their own community, in this case Egyptian (Dessel 1991: 246–60). Each production system is responsible for very specific components within the overall ceramic assemblage and has a very distinct set of production interests and criteria which tends to make it exclusive. The maintenance of boundaries between production systems can be seen in the very limited number of hybrid vessels.[3]

LOCAL HOUSEHOLD PRODUCTION

Household or domestic production is generally defined as representing a level of domestic self-sufficiency (van der Leeuw 1977: 72, table 1; Arnold 1985: 225–28; Rice 1987: 184). The data suggest that at this level vessels were produced and utilized on-site. Production concerns focus on the relationship between ware and form with no regard for size standardization or rigorous adherence to a well-defined decorative vocabulary. Manufacturing and firing techniques are kept intentionally simple although more sophisticated techniques are available. Vessels manufactured at this level of production generally have a low firing temperature, between 650° and 750° centigrade.[4] The decision to eschew a more sophisticated firing technology was

3. Hybridization in craft industries is often overlooked when examining the nature of cross-cultural interactions. It is seen clearly in a variety of craft industries at Beit Shean in Late Bronze II (McGovern et al. 1993: 92; Glanzman and Fleming 1993: 102; McGovern and Swan 1993: 152, 162–63).

4. The temperature ranges presented here are based on extensive refiring tests carried out by the author. These ranges were corroborated by petrographic analysis done by Naomi Porat (1988).

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probably deliberate, for such technology was available at the workshop level, where vessels are fired at temperatures of up to 850° centigrade (Dessel 1991: 119). Perhaps the household production tradition selected for lower firing temperatures due to economic concerns linked to a least-cost optimizing principle (cf. Feinman, Upham, and Lightfoot 1981: 872–74; Rands 1988: 166–71). Household production accounts for the manufacture of vessels closely associated with domestic activities such as cooking and storage, including holemouth jars, vats, storage jars, and open bowls (fig. 5.2:5–7, 9, 10).

Holemouth vessels can be divided into two types based on ware type: cooking pots and storage jars (fig. 5.2:1, 2). Ware Type 1 is used in the production of cooking pots and contains crushed calcite temper in a calcareous matrix.[5] This basic fabric type is common throughout Canaan in EB I although the specific clay matrix always reflects the use of local resources (Porat 1989: 7). These vessels are coil built and show almost no evidence of any secondary forming techniques such as rotation, turning, smoothing, or even wiping. A polymodal distribution of rim diameters (fig. 5.3) suggests a lack of any distinct size standardization. These vessels are fired at low temperatures, between 650° and 750° centigrade. There is no evidence of any meaningful correlation among rim type, ware type, manufacturing methods, vessel size, and temporal phasing. The lack of any clear patterning among these variables indicates production at the household level.

In the Terminal Chalcolithic and EB IA (Phases 10 and 9 respectively) there is a second holemouth cooking pot tradition, which makes use of a different ware type. Ware Type 2 utilizes crushed chert as temper in a matrix of decomposed foraminifera. This ware is fired at a much higher temperature, possibly over 850° centigrade. It probably represents a highly localized Chalcolithic tradition which dies out in the initial subphase of EB IA. In Phase 10 it comprises 60% of the cooking pot assemblage by weight, whereas in Phase 9 it drops to 11% and completely disappears by Phase 8 (fig. 5.4).

Holemouth storage jars, necked storage jars, and vats are also constructed by hand using a coil technique (fig. 5.2:2, 6, 10).[6] These vessels are found in Ware Types 3, 4, and 5, types that do not ameliorate stress from thermal shock. Ware Type 4 is tempered with varying proportions of calcite, limestone, and grog in a dolomite matrix. Ware Type 5 is similar to Ware Type 4, but wall thicknesses have been reduced by about 60%. Ware Type 3 is composed of rounded grains of limestone or chalk and quartz in a calcareous matrix. An important difference among these wares is the processing of the temper. In Ware Types 4 and 5, the temper has to be crushed and added to the clay body, whereas in Ware Type 3 the temper is uncrushed wadi sand which may even occur naturally in the raw clay. Ware Type 3 is a Chalcolithic ware tradition and comprises 18% of the total assemblage by count and weight in Phases 10 and 9 and drops to 8% in Phase 8. Ware types 4 and 5 are EB traditions which are very similar to ware types found on the adjacent site of Tel Ḥalif in EB III (Porat 1988: 3). These vessels are fired at about 750° centigrade. A lack of size standardization is evident in a variety of storage

5. Complete descriptions of all ware and form types with comparative and quantitative analyses can be found in Dessel (1991: 97–245).

6. London (1988: 119) has determined that in EB III, large vats are made using sequential slab construction; however, the EB I vats at the Ḥalif Terrace are smaller and do not display the type of evidence normally associated with sequential slab construction (Rye 1981: 71–72; Vandiver 1987).

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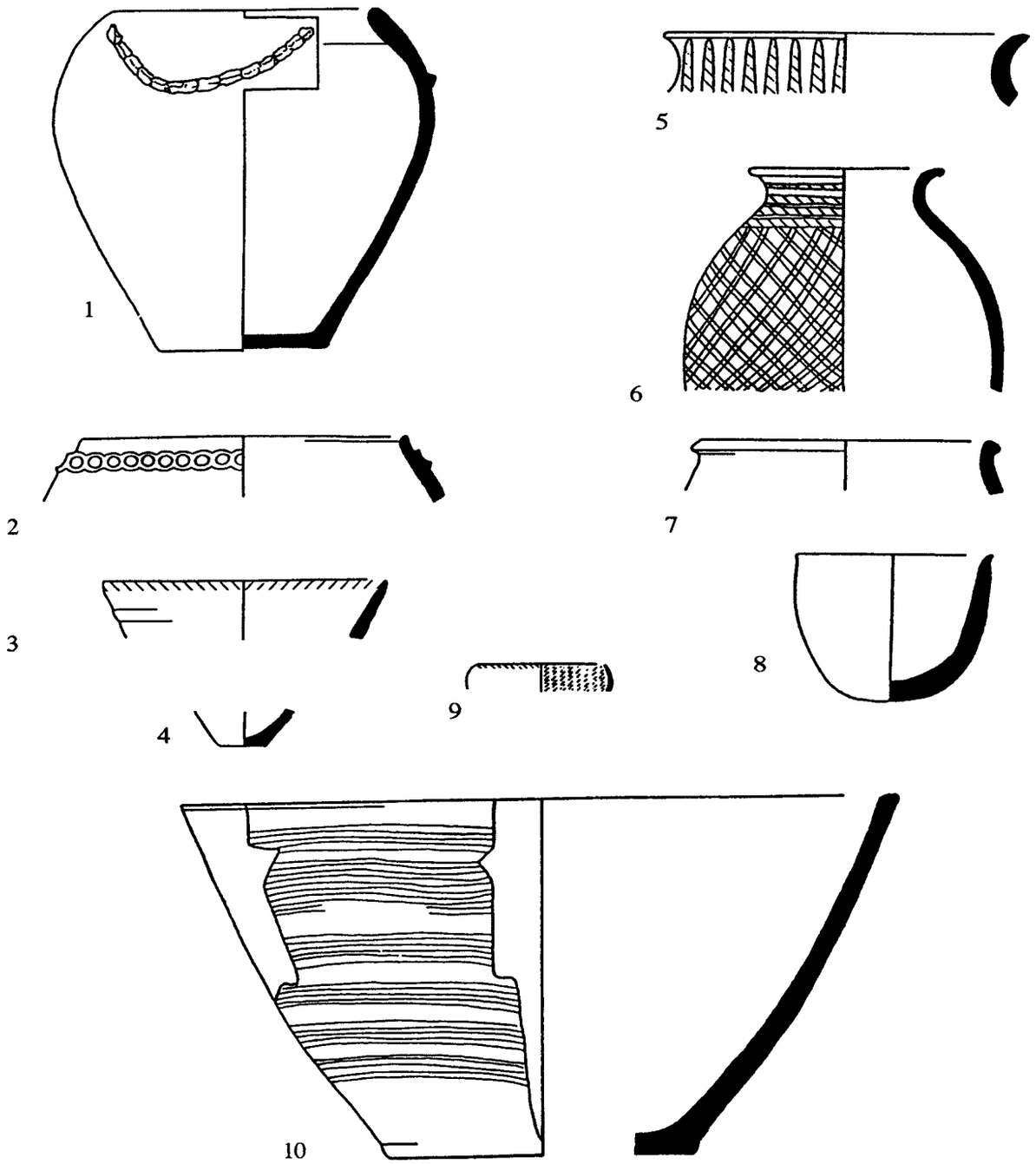

FIGURE 5.2. Canaanite pottery types from Site 101, Ḥalif Terrace. Scale 2:5.

jar types (fig. 5.5), and again there are no meaningful correlations among vessel size, ware type, rim type, or temporal phasing.

The most common open form is the simple open bowl (fig. 5.2:9), which is handmade and then rotated in order to finish the rim. These bowls are found in a variety of ware types, usually Ware Types 4 and 3. Occasionally they are also made from Ware Types 5 and 7, and even

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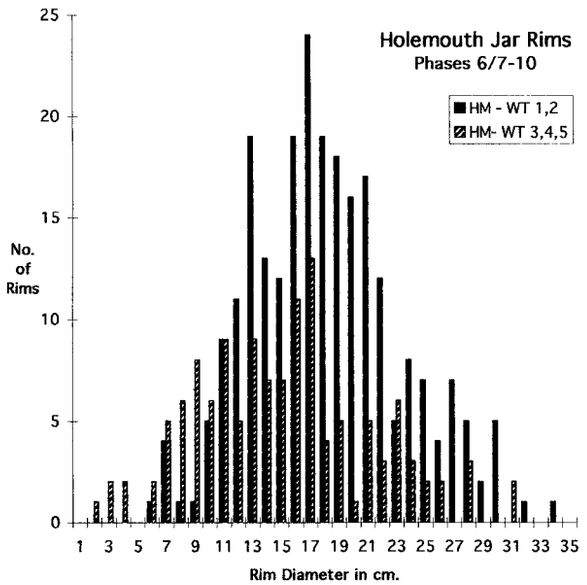

FIGURE 5.3. Holemouth jar rim diameters.

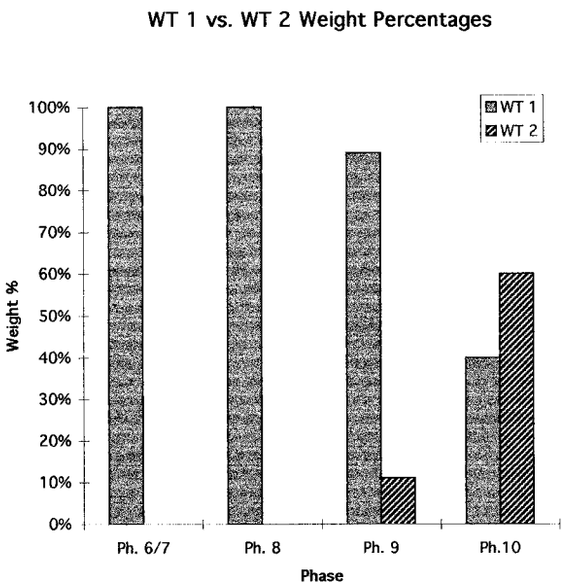

FIGURE 5.4. Weight percentages of Ware Type 1 vs. Ware Type 2.

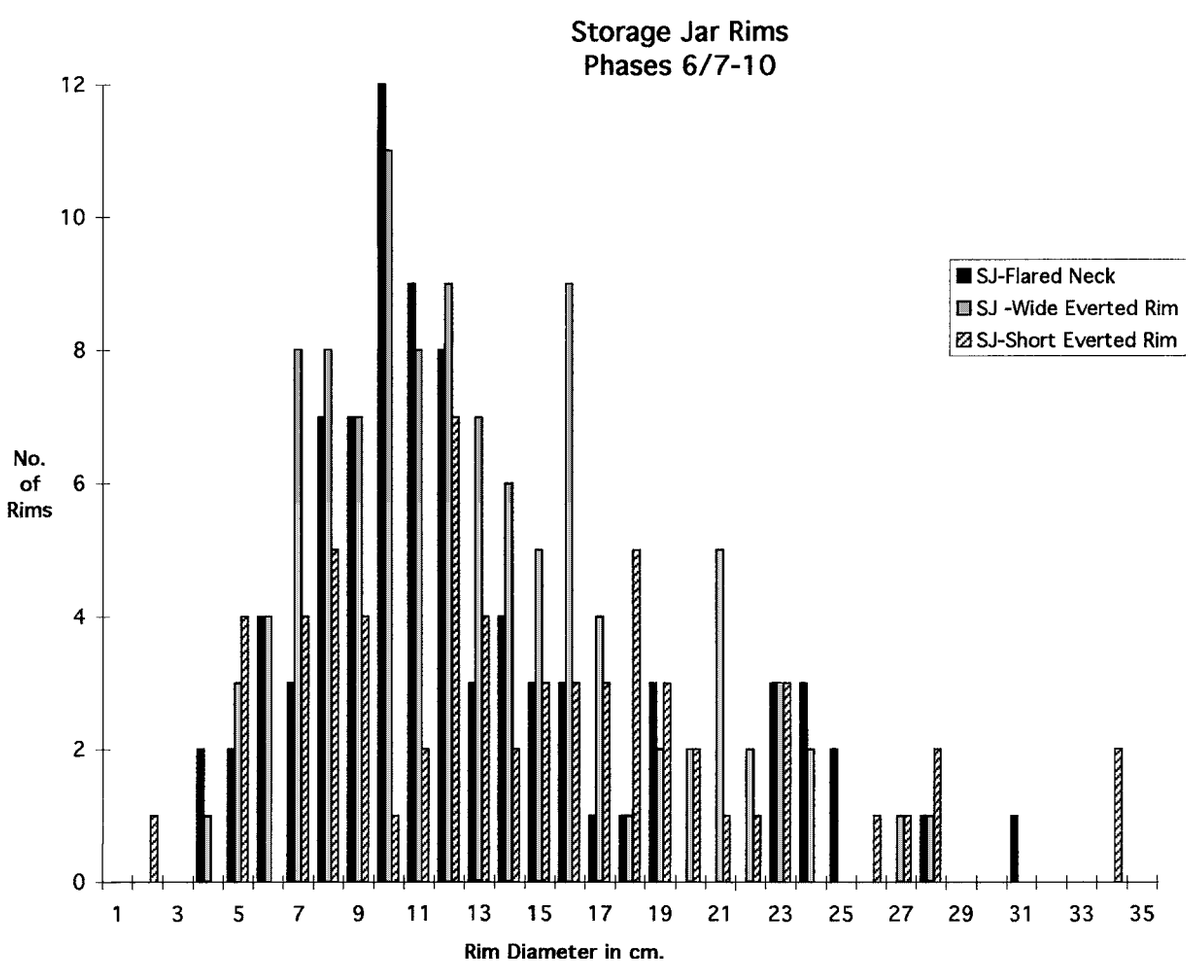

FIGURE 5.5. Storage jar rim diameters.

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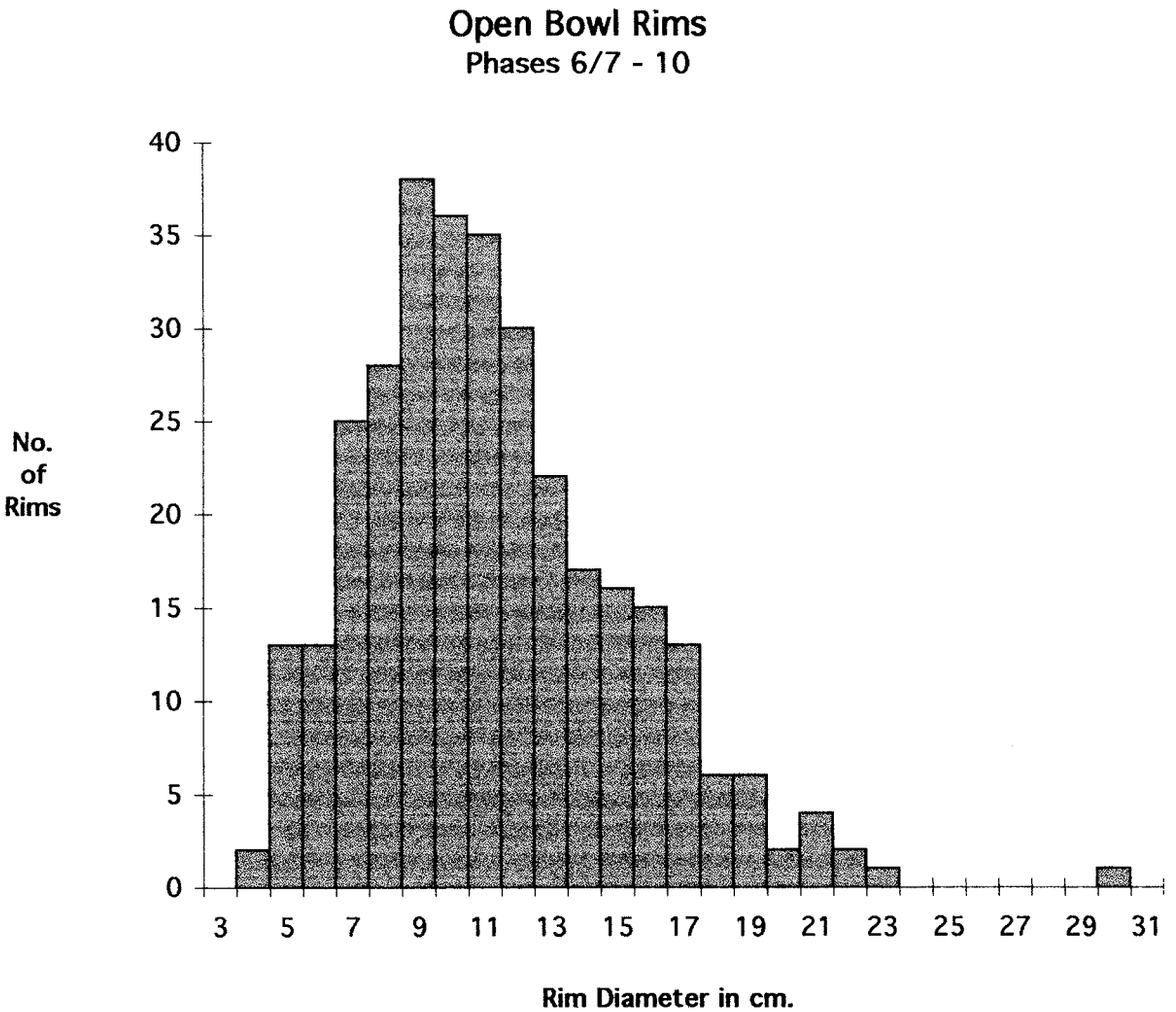

FIGURE 5.6. Open bowl rim diameters.

Ware Type 1. The size distribution (fig. 5.6) shows more clustering than with holemouth cooking pots, storage jars, or vats and less defined clustering than with V-shaped bowls. Though decoration is common, usually a band of red slip around the rim, this motif is not nearly as consistently applied as on V-shaped bowls.

At the level of household production, production concerns are weakly focused on function. There is some correlation between ware types and form in order to meet functional demands. This is seen most clearly in the case of holemouth jars, which are used either as cooking pots or storage jars depending on which ware type is used. In fact, it is only with cooking pots that distinct ware traditions are adhered to. Closed and open vessels used for other domestic activities, such as storage and serving, use a variety of ware types which behave as somewhat independent variables. Decisions are made by individual potters representing independent pot-making traditions and show the most variability in aspects of rim morphology and vessel size. These attributes are embedded within a more conservative tradition which is reflected in shared but not identical ware traditions and manufacturing methods (cf. London 1991).

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It is important to note that there are distinct ware traditions associated with the Chalcolithic and EB I ceramic assemblages, represented by Ware Type 3 and Ware Types 4 and 5, respectively. As the Ḥalif Terrace is continually occupied in the Terminal Chalcolithic and EB IA, both traditions briefly coexist in Phases 9 and 8. Ultimately the Chalcolithic traditions die out by late EB IA. The change in ware traditions might be indicative of a period of adaptation after the abandonment of a very different environment, the northern Negev Desert, for the foothills of the southern Shephelah. A shift in resource utilization in a new environmental niche underscores the local nature of the resource procurement found at the household production.

Although the basic clay and temper traditions are similar throughout EB Age Canaan, there is a much higher degree of regionalism in other attribute categories such as decoration and form. Functional ware types thus have a much wider interregional distribution in EB I, whereas there is more intensive regionalism at the level of vessel form and decoration. This suggests that a similar level of ceramic technology and organization of production quickly developed and spread throughout Canaan in EB IA. This technological integration is found operating at the lowest organizational level of production, perhaps laying the groundwork for the increasing homogenization of the Canaanite ceramic assemblage during EB II and III.

LOCAL WORKSHOP PRODUCTION

At the level of local workshop production there is an investment of capital and energy in utilizing specific resources such as clays, temper, and pigment, and technology, including the use of tournettes and molds (Esse 1989: 88; van der Leeuw 1977: 73, table 1; Rice 1987: 184; London 1991: 200–202).[7] Differing manufacturing techniques are but one criterion to suggest a distinct and even separate organization of production than that found at the household level.

The local workshop accounts for the production of V-shaped bowls and straw tempered beakers (fig. 5.2:3, 4, 8). The V-shaped bowl is one of the hallmarks of the Developed Chalcolithic of the northern Negev and has several unique characteristics (Wright 1937: 21; Commenge-Pellerin 1987: 34, 37, 107–8; 1990; de Contenson 1956: 173, 177) . They are made on a tournette and are the only well-turned pottery found on the Terrace. The consistent base diameter (fig. 5.2:4), drag marks on bases showing they were string cut, and well-rotated rims indicate these vessels were thrown off the hump (Rye 1981: figs. 61, 63, 64; Franken 1986: 59–61; Levy 1986: 94). Seventy percent of all V-shaped bowl rims are made from Ware Type 3. V-shaped bowls are also produced in Ware Type 6, a fine ware variant of Ware Type 3, which appears to be a version of "Cream Ware."[8] "Cream Ware" is produced from Eocene

7. The terms "workshop" and "specialist" are notoriously difficult to define and are used in a variety of ways in the literature; for instance Esse (1989: 88) combines workshop and village industry. Initially, I am more interested in determining whether vessels are manufactured at either the household or workshop levels of production. This is a fundamental distinction, which is often implied but never fully demonstrated. More refined inferences regarding levels, types, and the economy of specialization cannot be made if the initial determination of production levels is not made explicit.

8. This term was first used by R. A. S. Macalister (1912: 137, pl. LXCI:3, 4, 6, 9) for pottery found at Gezer. Though W. F. Albright (1932: 3) and Wright (1937: 21–23) discuss "Cream Ware," the term could not be used with any degree of precision until Ruth Amiran's landmark study of this distinctive pottery (Amiran 1955).

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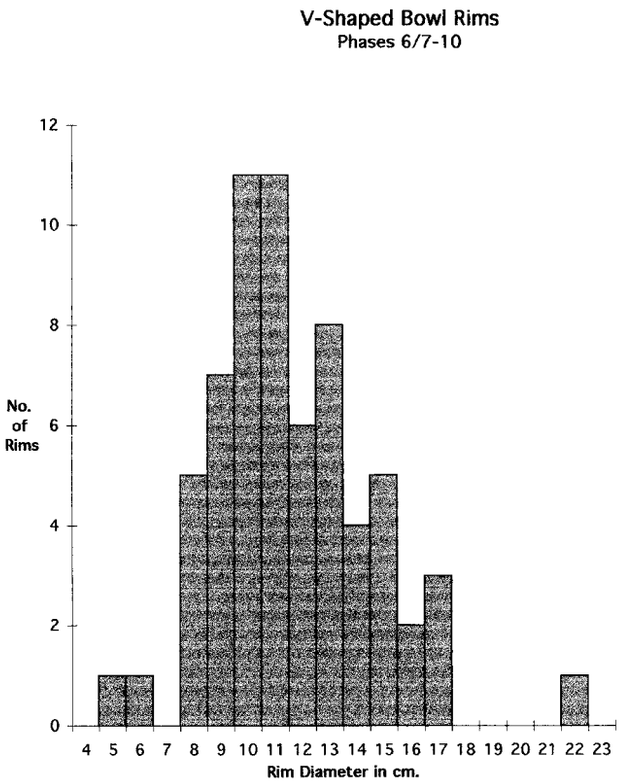

FIGURE 5.7. V-shaped bowl rim diameters.

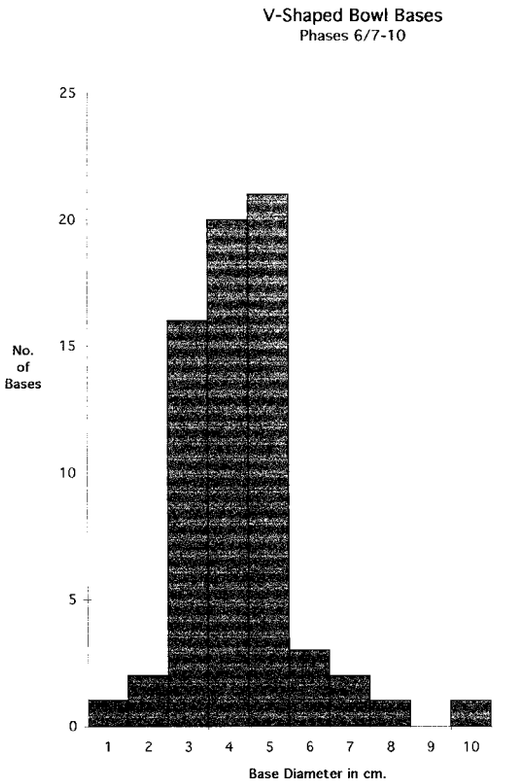

FIGURE 5.8. V-shaped bowl base diameters.

chalk deposits in the Beer Sheva basin and southern Shephelah (Gilead and Goren 1989: 9). The majority of sites that report "Cream Ware" are found within the boundaries of these chalk deposits. However, it also appears outside this region at Tel Qatif, Ghassul, Arad, ʿEn Gedi, Tell el-Farʿah North, Palmaḥim, and ʿAfula (Hanbury-Tenison 1986: 112–13; Gilead and Goren 1989: 7–8). This suggests that "Cream Ware" vessels are part of a Developed Chalcolithic exchange system that ranges beyond the northern Negev (cf. Rosen 1986).

V-shaped bowls are produced in a highly consistent manner. Three-quarters of their rims are decorated with a red band. The size distribution (fig. 5.7) of these vessels is bimodal with one size class at 10 cm and a larger size at 15 cm. Base diameters, however, consistently cluster around 4 cm, with over 90% ranging from 3 to 5 cm (fig. 5.8). This correlation among size, ware, decorative vocabulary, and manufacturing technology suggests a much greater degree of control over production than that exhibited for the rest of the local ceramic assemblage. The majority of V-shaped bowls are found in Phases 10 and 9 where, respectively by weight, 22% and 66% of all V-shaped bowls are found. They almost entirely disappear in Phase 8 (late EB IA) where the percentage significantly declines to 7%.

The V-shape bowl probably had multiple functions, as do most small, open vessels (Smith 1985: table 11.2; Hally 1986: 288–89; Rice 1987: 224–25). While they appear in domestic assemblages (e.g., Levy and Menachem 1987: 315, fig. 2:2), they are also consistently found in specialized or decidedly non-domestic contexts. V-shaped bowls appear as the only ceramic grave goods found in the burials at Mezad Aluf (Levy and Alon 1985: 132, table 1). They also

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appear in great quantities at cult centers and hoards including ʿEin Gedi (Ussishkin 1980: 20), Ghassul (Mallon, Koeppel, and Neuville 1934: 95–97), Gilat (Levy and Alon 1993: 516), and Nahal Mishmar (Bar-Adon 1980: ill. 5:1–4, 6, 7). The V-shaped bowl shares close similarities with cornets in form, ware types (including the use of "Cream Ware"), and decorative motifs (Gilead 1995: 202–5). Perhaps, the V-shaped bowl should be conceptualized as a truncated cornet, as cornets are also associated with cult centers and the symbolic vocabulary of the Chalcolithic.[9] While there is no indication that V-shaped bowls had a specialized function at the Ḥalif Terrace, the persistence of this form in a Terminal Chalcolithic context hints at a continuing need for a symbolically laden and specially produced object.

The straw-tempered beaker is the most enigmatic vessel found at the Ḥalif Terrace (fig. 5.2: 8). The lower portion of the beaker is mold-made, with the upper part and rim built up by hand. The vessel is roughly finished with a rotating motion. It is found in all strata; however, by weight, 70% of all straw-tempered beakers come from Phase 9. Of the 660 rims found, 97% are made from the same ware, Ware Type 7, a loess ware similar to that of locally produced Egyptian pottery, but with a much higher percentage of straw temper. The unimodal size distribution (fig. 5.9) suggests that size standardization is an important production consideration. The correlation between size, ware type, form, and unique manufacturing technology again points to a degree of control over production that greatly exceeds that of the household level and is more appropriately associated with workshop production.

This vessel has a limited distribution in the southern Levant. It appears at the Ḥalif Terrace and at the nearby cave dwellings of the contemporaneous site of Cemetery 6000 in the North-West Settlement of Lachish (cf. Tufnell et al. 1958). In describing the Lachish examples Tufnell et al. (1958: 145–46, pl. 11:11, 12) suggest they are used as crucibles, although there is no metallurgical evidence to support this interpretation.[10] Preliminary results from gas chromatography analysis on the Ḥalif examples have detected traces of acids associated with wine (P. McGovern, personal communication). The presence of large numbers of these vessels, especially in EB IA, suggests this area of the southern Shephelah was actively involved in wine production. The presence of a wine industry, regardless of scale, might provide a clue regarding the Egyptian interest in the area, and it is clear that in EB IB (contemporaneous with Dynasty 0), wine was exported from Canaan to Egypt.[11]

9. Cornets are found at specialized sites including ʿEin Gedi, Gilat, and Ghassul. David Alon (1977; Levy and Alon 1993: 515) excavated a zoomorphic statuette of a ram with three cornets inserted onto its back. For more detailed discussions of Gilat and Chalcolithic cult, see Fox (1995), Alon and Levy (1989), and Joffe, Dessel, and Hallote (forthcoming).

10. These vessels are found in almost all of the Cemetery 6000 cave dwellings including 1517, 1534, 1509, 1503, 1550, 1526, 1520, 1528, 1540, 1553 and 1500 (Tufnell et al. 1958: pl. 56:1, 12, 14, 15, 23, 31, 32–35, pl. 57:42, 43, 45, 46, 50–58, 65–67, 71). One other possible parallel might be from Wadi Gaza Site H (Gophna 1990: 6, fig. 3:2).

11. The discovery of over 400 imported Canaanite store jars, thought to contain wine, in Tomb U-j at Abydos (Dreyer 1992: 295–97, pls. 3, 5) would seem to point to trade. However, Dryer observes that the Canaanite vessels in Tomb U-j are quite unusual and, in fact, Tomb U-j itself is also somewhat unusual. The appearance of such a large quantity of Canaanite vessels in a tomb suggests that their importation reflects a single, short-lived, and highly delineated interaction and may not represent an actual trade relationship (Dessel 1991: 317–20; Joffe 1993: 57–58; but see Ben-Tor 1982; 1991; Rizkana and Seeher 1989; Gophna 1992;

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In addition to this indirect evidence for localized workshop production there is more direct evidence. The upper part of a tournette and a deposit of raw clay were found in subterranean Phase 10. This is the only example of a Chalcolithic tournette, although they have been reported in EB I contexts (Esse 1989: 79, n. 3). The storage of raw clay underground has been observed by Rye and Evans (1976: 40, 45) in Pakistan; however, whether the cave itself is the exact location of the workshop is uncertain. This is the clearest indication of on-site ceramic production and helps to bolster the interpretation of on-site workshop production of V-shaped bowls. As V-shaped bowls significantly decrease after Phase 9, the appearance of a tournette in the Terminal Chalcolithic is logical. V-shaped bowls found in EB I contexts were likely to have been produced in the Terminal Chalcolithic and kept as heirlooms.

It would appear that V-shaped bowls continued to be produced in the face of complete socioeconomic upheaval. The one violin-shaped figurine found at the Ḥalif Terrace is very poorly rendered when compared with examples from the Developed Chalcolithic (Seger et al. 1990: fig. 6:d), and the overall character of the Terminal Chalcolithic material culture from the Ḥalif Terrace is one of impoverishment. There is no indication of continuity in any other crafts such as ivory carving or metallurgy, hallmarks of the Developed Chalcolithic (Levy 1995: 232–33), or any other specialized ceramic production. The abandonment of northern Negev at the end of Developed Chalcolithic and resettlement in uninhabited and unfamiliar caves in the southern Shephelah must have intensified a sense of dislocation (Joffe 1993: 36–37; Levy 1995: 241–43). Yet there was an impetus to continue the production of V-shaped bowls, a vessel whose ideological landscape had all but ceased to exist. Additionally, great care was taken to maintain the high production standards employed during the Developed Chalcolithic. Efforts were made to continue to standardize the size of the vessel, maintain a traditional decorative vocabulary, utilize specific and possibly imported raw materials, and utilize a distinct manufacturing technology that was not made available to other production systems. Whether this represents the presence of elites or just the craftspeople who perhaps now appropriated elite markers is enigmatic.

EGYPTIAN CERAMIC PRODUCTION

In Phase 7/6 an Egyptian residency was established and contained large quantities of locally produced Egyptian pottery (Seger 1996: 251–56, fig. 2; Dessel 1991: 305). Unlike the Canaanite material, the Egyptian ceramic paste is comprised of loessy sediments rich in quartz, calcite and heavy minerals (Porat 1988). There is a prominent utilization of varying amounts of straw as a temper, whereas rounded limestone fragments and quartz are used sparingly (Porat 1989; 1992: 433–40, figs. 1–3). The use of straw temper allowed for easy macroscopic identification of Egyptian pottery. Straw had been discontinued in Canaanite ceramic

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Brandl 1992; Harrison 1993). Regarding chronology, Joffe (1993: 41) has noted the difficulty in establishing synchronisms between Egypt and Canaan in the late fourth millennium; but see Amiran and Gophna 1992: 357–60, table 1) and Stager (1992: fig. 1). For the chronology of prehistoric Egypt, see Kaiser (1957), Kaiser and Dreyer (1982), and Hartung (1994).

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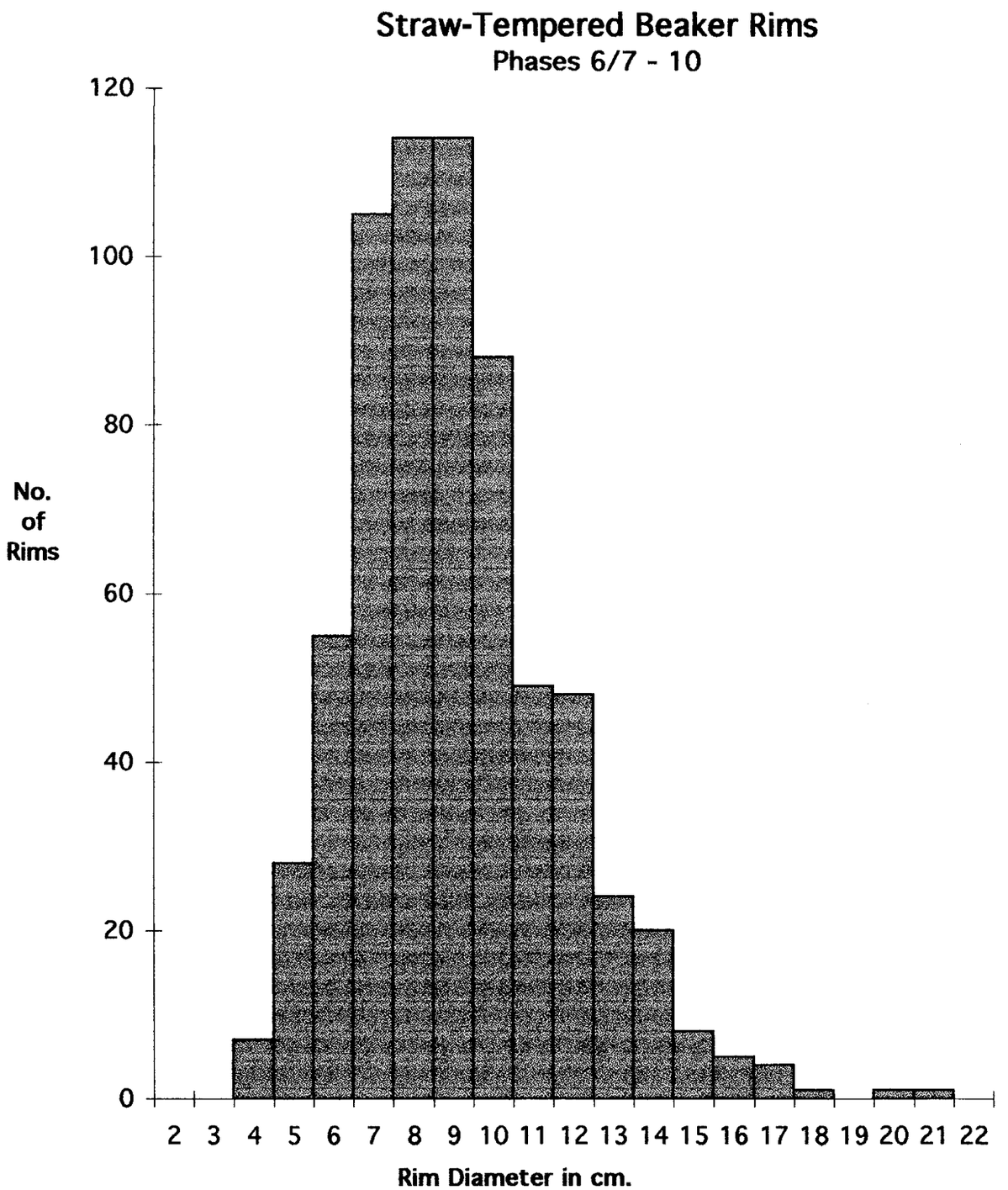

FIGURE 5.9. Straw-tempered beaker rim diameters.

assemblages in the Neolithic, although there are notable exceptions. The type of clay paste, the tempering tradition, vessel forms, and even finishing techniques all clearly distinguish Egyptian pottery from the Canaanite assemblage.

Egyptian pottery (fig. 5.10) first appears in Phase 9 in small quantities and may be the result of interactions with sites to the north such as Tel Erani or Tel Maʾaḥaz, which have an

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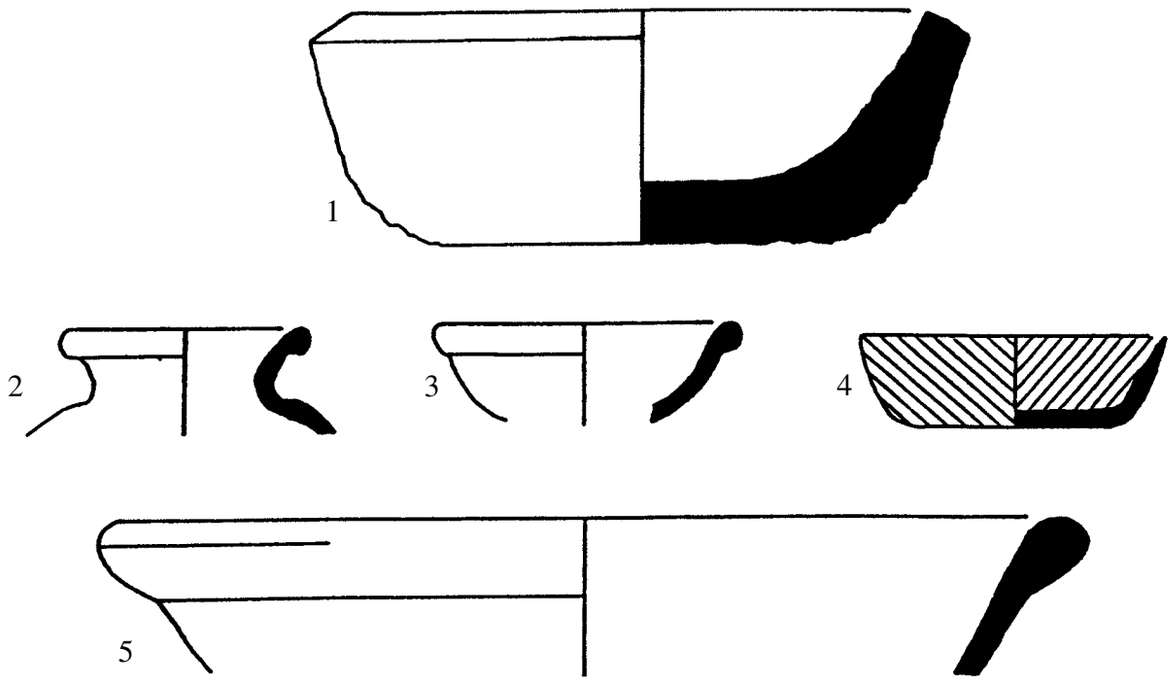

FIGURE 5.10. Egyptian pottery types from Site 101, Ḥalif Terrace. Scale 2:5.

earlier and more intensive Egyptian occupation (cf. Brandl 1992). Petrographically the locally made Egyptian material from these three sites is very similar (Porat 1988: 4). Bread molds are the dominant type of Egyptian vessel found at the site (fig. 5.10:1). Based on the sheer quantity of Egyptian material, which included over 42 kilograms of bread molds, production must be taking place at the Ḥalif Terrace by Phase 7/6. The discovery of fragments of a partially baked bread mold on the floor of the Residency and use of local loess all point to on-site production. These poorly fired, coarse bowls have a long history in Egypt where they are used to bake bread (Davies 1920: pls. XI, XII; Bourriau 1981: 14, 63, fig. 113; Jaquet-Gordon 1981). Along with other data, their sudden appearance in such large quantities indicates the establishment of a permanent Egyptian presence at the Ḥalif Terrace.

Other Egyptian vessels include straight-sided bowls, various types of large rolled rim vats and bowls, and a limited number of imported cylindrical jars from Egypt (fig. 5.10:2–5). Cylindrical jars are made from a marly Nile clay and are clearly imported to the site as finished products (Porat 1986–87: 116; 1989: 75–76). They are frequently slipped or polished, and the rims show evidence of wheel finishing. These vessels appear first in Phase 9. Even after the establishment of the Egyptian Residency, these vessels continue to be imported rather than produced locally by on-site Egyptian potters.

The establishment of Egyptian settlements and their subsequent abandonment is well organized and simultaneous. Not only are Egyptian craftspeople producing Egyptian pottery, they are also producing Egyptian-style chipped stone tools (E. Futato, pers. comm.). There is almost no evidence at the Ḥalif Terrace for any ceramic hybridization, Egyptian-style vessels made in Canaanite wares or the inverse (although see Brandl 1989: 376). It would appear that the Egyptians brought their own potters with them who showed little interest in either interacting with Canaanite potters or coopting their ceramic industry (as is seen much later in the

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Late Bronze Age II [McGovern 1989]). The Egyptian settlements in southern Canaan appear to be interested in developing a self-sufficient community, with a very specific and as yet undetermined amount of direct interaction with their Canaanite neighbors.

CONCLUSIONS

There is evidence for the presence of three major ceramic production systems operative at the Ḥalif Terrace in the Terminal Chalcolithic and EB I. The local household level of production accounts for basic utilitarian vessels such as cooking pots, storage jars, and vats. Production concerns focus on the relationship between certain physical properties of the ware and vessel function. As each household is a potential producer, vessel types show no overall production standardization at the intrasite level. The workshop level of production focuses on the relationship between ware types, form, a consistent decorative vocabulary, and size standardization. This reflects a tighter degree of control over production seen at both intrasite and intersite levels, as imported raw materials suggest these vessels are part of a regional exchange network. The Egyptian ceramic workshop focused only on providing its own community with familiar vessels (functionally and aesthetically) made from local resources.

These production systems are not all contemporaneous. Household production is found in all phases at the site; however, workshop production is limited to the Terminal Chalcolithic and initial phase of EB IA (Phases 10 and 9). With the establishment of an Egyptian settlement workshop, production ceases. These changes in the organization of production reflect some of the larger social, political, and economic events in southern Canaan.

There may be some connection between the disappearance of workshop production and the establishment of an Egyptian presence at the site. Workshop production maintained a vestige of Developed Chalcolithic ceramic traditions, presumably for a clientele that still understood the underlying social, economic, and cultural values embedded within the workshop products, specifically the V-shaped bowl. The care and efforts undertaken to maintain this mode of production suggest a prominent role by elite remnants or craft specialists. They attempted to reformulate their own sociopolitical roles in the uprooted Terminal Chalcolithic society by coopting and manipulating the few elite status markers that remained available to them in their new environment.

The conservative nature of craft production led to almost no crossover of pot-making traditions or technology between the workshop and household levels of production, as there is very little hybridization between ceramic production traditions at the Ḥalif Terrace. The tournette was not utilized at the household level, and the workshops did not take over the production of cooking pots and storage vessels. Workshop production was most active in EB IA, Phase 9, when V-shaped bowls and straw-tempered beakers appear in the greatest quantities. The activity of the local workshop begins to wane in Phase 8, the late EB IA, as the Egyptian presence intensifies.

When the Egyptians actually settle at the site, these vestiges of Developed Chalcolithic culture quickly fade. Though workshop production ceases, other hints of low-level elite formations appear. In Phases 8 and 7/6 new types of material culture appear which suggest some degree of social stratification. The appearance of a Canaanite cylinder seal and stamp seals impressions (Seger et al. 1990: fig. 6b) all allude to a newly emerging elite. This nascent elite no longer utilizes ceramic craft specialization as a means of controlling resources or as a

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method of self-articulation. Other media and ideological constructs are now being manipulated in order to establish and define a social hierarchy.

The ceramic industry at the Ḥalif Terrace was constantly in a state of flux, reflecting larger social and economic transformations in the region. Chalcolithic ceramic production traditions persist into EB IA and then fade as the Egyptians begin to infiltrate into southern Canaan. The changes seen in pottery production and distribution reflect the changing needs of the community and may indicate shifting reformulations in the socioeconomic organization at Ḥalif Terrace.

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6

IRON AGE KERNOI AND THE ISRAELITE CULT

WILLIAM G. DEVER

INTRODUCTION

Douglas L. Esse rendered our complementary disciplines of archaeology and biblical studies a great service in his pioneering 1991 study of a supposedly "Israelite" type-fossil—the infamous collar-rim store jar and its implications for the vexed question of "ethnicity and early Israelite origins" (Esse 1992). That question continues to be discussed in the current literature, a discussion that might generate less heat and more light if Esse were still with us to contribute.

In honor of Douglas Esse and his promising work cut tragically short, I wish to address another area where material culture remains are now beginning to illuminate ancient Israelite thought and life: the cult. My point of departure will be the several Iron Age kernoi that are now in evidence and in my view must have played a role of some sort in religious rituals in ancient Israel, as "magic vessels" did elsewhere in the eastern Mediterranean world.

THE KERNOI AND THEIR CULTIC BACKGROUND

The term *kernos* (pl. *kernoi*), from classical and Aegean archaeology, denotes a class of small bowls with a hollow rim, usually with various attachments *(protomes)* for pouring around the rim. Sometimes they are termed "ring-vases" or "trick-vessels." The spouts around the rim may be modeled in the form of other ceramic vessels; in the form of human or animal heads; or as pomegranates and other forms from nature. Some more elaborate kernoi may feature clusters of small bowls, or may stand atop a ceramic column or on legs.

Kernoi are attested sporadically throughout the eastern Mediterranean world from as early as the fourth–third millennia B.C. A number of early examples have been published, especially from Crete and Cyprus. In the southern Levant, there are a few examples as early as the Late Chalcolithic and Early Bronze I (EB) period, notably one from Bâb edh-Dhrâʿ (below). Middle Bronze Age (MB) examples are rare to my knowledge (Holladay 1997: 252, pl. 7.23.A), but there are several Late Bronze Age (LB) examples known (below).

Most of the kernoi found in Palestine come from three contexts in the Iron Age: (1) twelfth–eleventh century B.C. levels of Philistine sites along the coast, especially Tell Qasile; (2) from later "Neo-Philistine" sites of the ninth–seventh centuries B.C., such as Ashdod; and now (3) from a few tenth–seventh century B.C. sites in Israel and Judah. Despite the exotic character of the Iron Age kernoi, they have attracted scant attention from biblical scholars and historians of Israelite religion, and very little attention even from Syro-Palestinian archaeologists. No complete catalogue or synthetic study has been published so far, but one of the best

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comparative discussions was that of A. Mazar, who published the several examples from the Philistine temples of Strata XII–X at Tell Qasile, near the mouth of the Yarkon River.[1]

Here I add three more kernoi to our small corpus from Iron Age Palestine, all probably from Kh. el-Qôm. The site was noted by Israeli surface surveys shortly after the Six Day War in 1967, then investigated further in salvage excavations directed by me in 1968 and 1969, and by J. S. Holladay in 1971 (Dever 1970). The small hilltop lies 12 miles west of Hebron, just at the juncture of the Judaean foothills and the inner Shephelah, along the inner reaches of the Naḥal Lachish. Although biblical "Makkedah" has been located at several sites, Kh. el-Qôm now seems the best candidate (Dorsey 1980). The excavations have revealed a cyclopean town wall and a two-entryway gate; a largely robbed cemetery of dozens of Iron Age bench tombs; quantities of tenth–seventh century B.C. pottery; and miscellaneous items such as shekel weights (Dever 1993).

Some of the Kh. el-Qôm material has since become well known, such as the shekel weights, an inscribed decanter, and an eighth century B.C. bowl reading "El." One should note especially the three mid–late eighth century B.C. Hebrew inscriptions from Tombs I and II. These inscriptions attracted little attention when I first published them in 1970, but now they have become the focal point for many recent discussions of the ancient Israelite cult, largely because of the phrase "May ʿUriyahu be blessed by Yahweh, and saved from his enemies by his ʿAsherah" in lines 2–3 of Inscription 3.[2]

The small-scale Kh. el-Qôm excavations were emergency operations intended to save whatever could be rescued from the wholesale looting of tombs that broke out in the villages west of Hebron in the aftermath of the Six Day War. The site came to my attention after I acquired a collection of over 100 Iron II vessels, as well as the inscribed decanter and bowl, 10 shekel weights, and Inscription 1 noted above. The pottery, which covers the entire Judaean Iron II repertoire, is now housed in the two Skirball Museums at the Hebrew Union College-Jewish Institutes of Religion in Jerusalem and Los Angeles.[3]

Kernos No. 1

Among the unpublished pieces from Kh. el-Qôm is the kernos published here for the first time on plate 6.1. It was purchased by me in 1968, repaired by Moshe Levy, and later presented to the Israel Museum in Jerusalem where it is now displayed.[4] Other pieces seen in the dealer's possession and persistent questioning of both the dealer and of the Kh. el-Qôm villagers with whom we were working at the time make the provenience of this, as well as of Kernoi 2 and 3 below, reasonably certain. Kernos 1 is a small, deep bowl about 15 cm in diameter, covered

1. See references in Mazar (1980: 134, n. 43). Mazar, however, treats the "ring vessels" (our no. 3 below) separately from the kernos bowls—a distinction that does not seem to have a functional component to me.
2. The bibliography on the Kh. el-Qôm inscriptions has become too cumbersome to cite, but see conveniently the references in Ackerman (1993: 391). For all references to my own and other recent discussions of the cult of Asherah in ancient Israel, see Dever (1994, 1995).
3. Cf. Dever (1970) for the published material. The bulk of the Iron Age pottery, especially Iron II, in the two Skirball Museums is probably from Kh. el-Qôm, but it is a typical corpus and thus has not been published.
4. Israel Department of Antiquities and Museums No. 75–115 (R. 4725). Mazar (1980: 108) has commented on this kernos and has noted some parallels in Cyprus, but he thinks the Cypriot vessels were imported from the Levant. See further below.

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with a thick, dark red slip and carefully burnished over most of the exterior surface, including the two heads. These two-horned heads, probably meant to represent a young bull, are attached to the hollow tubular rim of the bowl in such a way that liquid poured into the bowl can be drawn up and spouted out the other head when the kernos is tilted back and forth. Kernos 1 was purchased and so has no direct archaeological context. But the deep red slip and hand burnish would suggest a tenth or a ninth century B.C. date at latest, well in keeping with the known ceramic range of Kh. el-Qôm.

There are several parallels for the distinctive attitude of the two heads. The earliest ones feature painted geometric designs and are from eleventh century B.C. Philistine contexts: (1) a kernos from Stratum X at Tell Qasile (fig. 6.1a); and (2), another from Stratum III(?) at Beth Shemesh (fig. 6.1b; cf. a tenth–ninth century B.C. Phoenician example from Turʿa). Several kernoi with a combination of a horned (bull?) head and a frog in the bottom of the bowl (fig. 6.1c), with the animals disposed in the same way, are known from Cyprus, dated to the White Painted 1 or Cypro-Geometric horizon, ca. 1050–950 B.C. The horned heads of our Kernos 1 are duplicated in many examples, especially from eighth century B.C. levels at Ashdod.[5]

Kernos No. 2

Kernos 2 came to my attention in 1972 when the late Moshe Dayan, then Israeli Minister of Defense, came for a surprise visit to the Hebrew Union College in Jerusalem. I showed him the small museum and collections, but the real purpose of his visit was obviously to see a particular object about which he had "heard"—Kernos 1. He informed me that he had purchased a similar kernos after the war, also said to have come from the villages "west of Hebron." Dayan felt that he had independently traced his kernos to Kh. el-Qôm, and therefore he wanted to see mine. He graciously invited me to come down to see his collection at his home in Zahala, and when I had done so he lent me Kernos 2 to photograph, draw, and publish (fig. 6.1d).[6]

Kernos 2, like no. 1, is a small, deep, hollow-rimmed bowl. It is covered with red slip and still has traces of hand burnish, although it is much more weathered than Kernos 1. It obviously had two attached animal spouts at one time, but only one now remains, apparently, to judge from the upcurved tail, a scorpion. It was added after the bowl had been roughly wheel-made, then given appliqué "bug-eyes" and stick-incised decoration. The scorpion's mouth spout is right on the bottom of the bowl, and the missing spout would then have been facing

5. For the Tell Qasile kernos in fig. 6.1a, see Mazar (1980: 107, fig. 39:1); for the Beth Shemesh kernos in fig. 6.1b, see Grant (1934: 29; fig. 2A; pl. B); for the Turʿan example, see Gal (1993: fig. 3). Another parallel—also from the Dayan Collection, and probably from Kh. el-Qôm as well—is in the Israel Museum, but published only in the Catalogue of the Dayan Collection (see Ornan 1986: no. 47; Israel Museum no. 82.2.3). For the Cypriot kernos in fig. 6.1c, see Maier and Karageorghis (1984: 143; the drawing here, by Kate McKay, is from the published photograph); the other two Cypriot frog kernoi from Lapithos and Kition are in the Cyprus Archaeological Museum (see further Pieridou 1971: 18–26, pl. XII). For Ashdod examples, see M. Dothan (1971: figs. 66–71; 92). Sam Wolff calls my attention to a red-slipped and burnished bull's head, identical to the ones on Kernos 1 here, found by him and Alon Shavit at Tel Ḥamid, near Gezer.

6. The Dayan kernos is now in the collections of the Israel Museum, no. 82.2.4 (cf. Ornan 1986: no. 46). The Munsell Soil Color Chart of the ware is reddish yellow 5 YR 6/6; of the faint hand-burnished slip, red 10 R 4/6.

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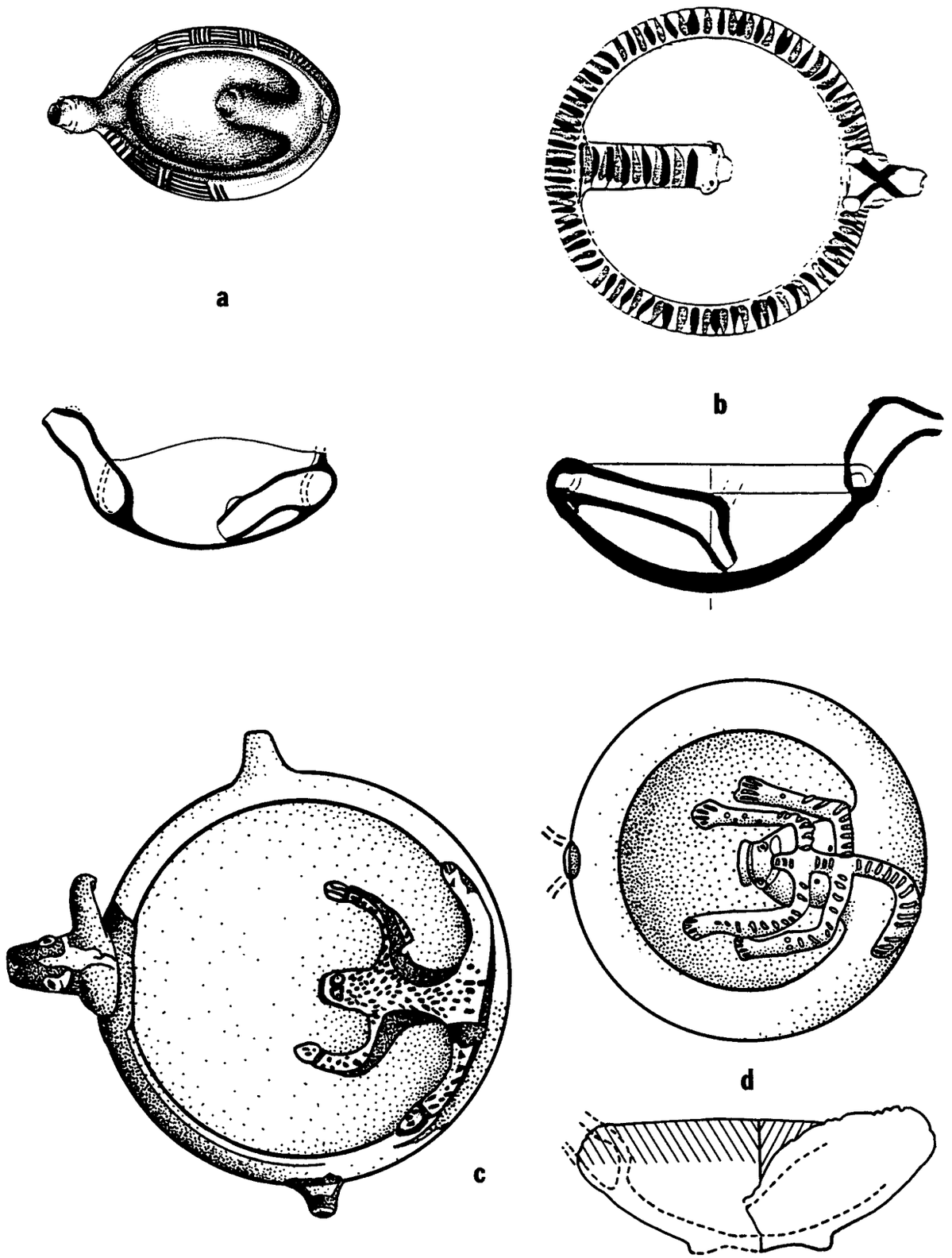

FIGURE 6.1. *a:* Kernos from Tell Qasile Stratum X (from Mazar 1980: fig. 39:1); *b:* Kernos from Beth Shemesh Stratum III (?) (after Grant 1934: 29, fig. 2A); *c:* Kernos from Cyprus; (from Maier and Karageorghis 1984: 143); *d:* Dayan kernos (no. 2 here), probably from Kh. el-Qôm. Scale: *a* = 1:5; *b, c, d* = 2:5.

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the same direction but projecting outside the bowl rim. Both spouts had communicated with the hollow bowl rim. The similarities to our Kh. el-Qôm kernos and the parallels cited above are obvious and may suggest a similar tenth–ninth century B.C. date.

The scorpion, although native to the area, seems an odd choice for a Palestinian kernos spout since most are far more familiar and obvious animals' heads. Scorpions appear only rarely in the iconography of the ancient Near East as far as I know, but there are a few, and in cultic contexts at that. One is on an Old Babylonian cylinder seal in a private collection (fig. 6.2a), as part of a presentation scene before a deity. An Old Syrian seal now in the Damascus Archaeological Museum (fig. 6.2b) has a similar scene, this time the scorpion flanked by a fish (below). Two other Old Syrian seals in a private collection feature well-modeled scorpions (fig. 6.2c, e), as does an Old Assyrian seal in a private collection (fig. 6.2d). An Old Syrian seal in the Bibliothèque National de France in Paris features a pair of scorpions (fig. 6.2f); while another Old Syrian seal in the Pierpont Morgan Library has three scorpions (fig. 6.2g).[7]

A final example is much closer to home: a seal from Schumacher's old excavations at Megiddo, apparently from an Iron II context and Neo-Babylonian in style (fig. 6.2h). It features the combination of a scorpion, a fish, a star, and a crescent moon, all connected, it seems, to the king standing before Marduk. Keel and Uehlinger interpret this and a number of other Iron II seals and impressions in Palestine with the astral cults that the Assyrians and later the Babylonians are thought to have introduced into Israel and Judah in the eighth–seventh centuries B.C. They even go so far as to see the scorpion-fish combination (see also fig. 6.2b; and many others illustrated by Keel and Uehlinger) as early examples of what became the constellations of Scorpio and Pisces on the later Zodiac. It does indeed appear that the classical period zodiac derives from earlier Mesopotamian astronomical iconography.[8] If so, our Kernos 2 should perhaps be dated somewhat later, ca. seventh–sixth century B.C., and associated with Neo-Babylonian influence in late Judah. That would probably explain the rather odd use of the scorpion motif.

Kernos 3

This kernos or kernos ring was acquired by me in the village of Kh. el-Qôm in pieces and restored by Moshe Levy at Hebrew Union College. It was later given to the Israel Museum, where it is now on display in a case with MB IIA (or my "MB I") materials, following my original intuition (pl. 6.2). That was based, however, entirely on the two surviving bowls attached to the rim, which do indeed bear some resemblance to classic MB IIA red-burnished carinated or biconical bowls.

7. The seals in fig. 6.2a–g are from Winter (1983: nos. 93, 232, 201, 195, 224, 205, 206 resp). Fig. 6.2h is from Keel and Uehlinger (1992: 337, no. 290).

8. Keel and Uehlinger (1992: 332–429) present an extended, well-illustrated, and documented argument for Neo-Assyrian and Neo-Babylonian influence on the Iron Age Israelite and Judaean cult. For more traditional, negative assessments, see McKay (1973) and Cogan (1974). On the origins of the signs of the zodiac in the Neo-Assyrian and Neo-Babylonian eras, see Rochberg (1995), Gurstein and Gardner (l997). Keel and Uehlinger's suggestion (1992: 335) that the late Iron Age scorpion motif is already connected with astronomy, divination, and the like is thus reasonable. It may be worth noting that the Sumerian deity Asharu, god of good luck, was associated with the scorpion, an association that persisted well into the Kassite era.

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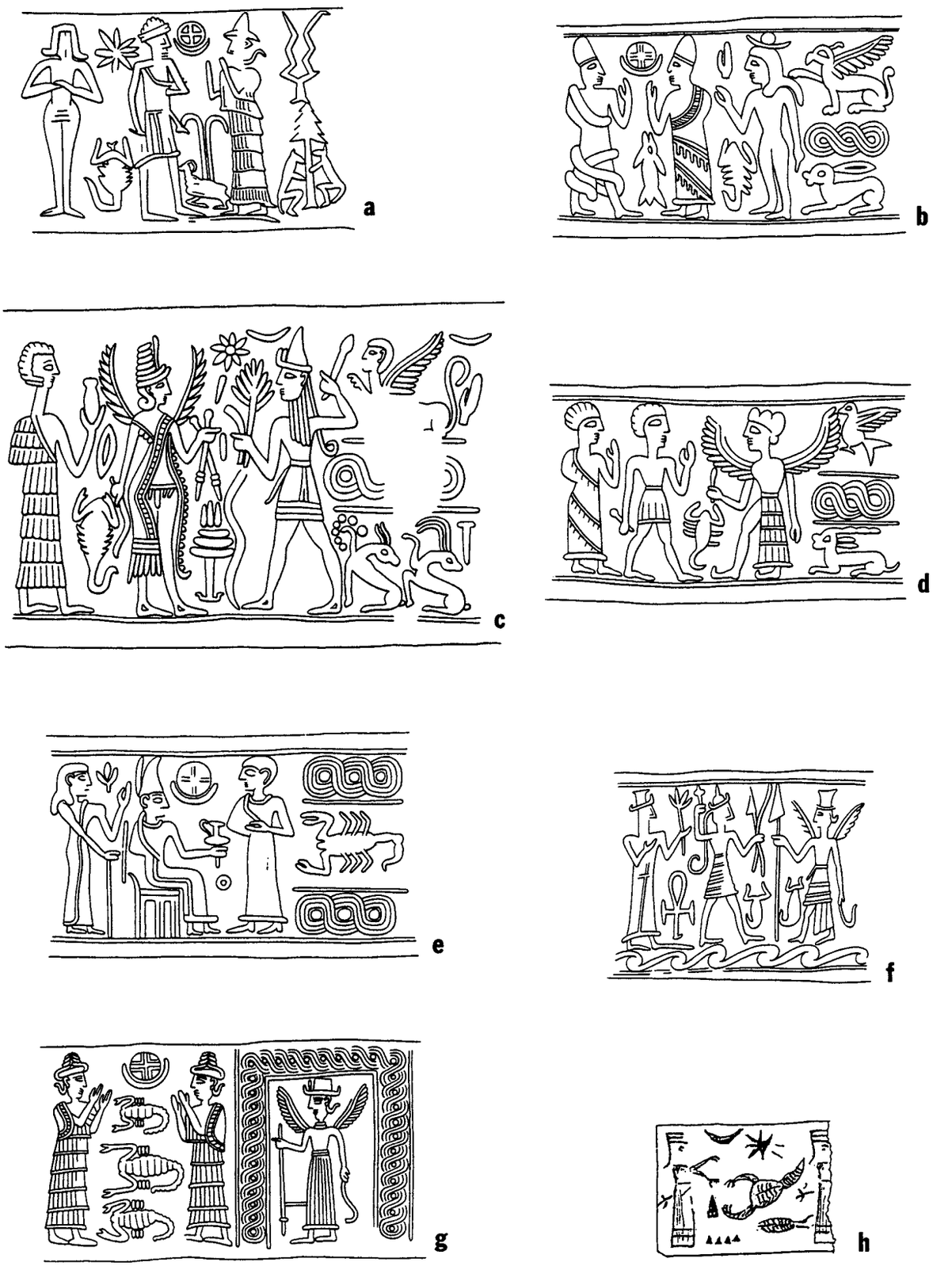

FIGURE 6.2. Seal impressions showing scorpions. *a–g:* after Winter (1983: figs. 93, 232, 201, 195, 224, 205, 206); *h:* after Keel and Uehlinger (1992: fig. 290).

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More pertinent is the fact that the large Kh. el-Qôm cemetery contained only Iron Age tombs. Furthermore, our intimate knowledge of tomb robbing in the entire Hebron district in 1967–68 did not reveal any MB cemeteries that were being plundered at that time. Finally, the handmade body, deep red slip, and hand-burnishing are almost identical to the features of Kernos 1. All things considered, an Iron II date is preferable for this kernos, but an MB II date cannot be ruled out.[9]

The two small bowls attached to the hollow rim (originally four) are a bit unusual, but only for their simple form. On other kernoi, especially the Iron Age examples from Cyprus, the attached miniature pottery vessels can be quite elaborate and are often combined with various types of zoomorphic heads or forms from nature such as pomegranates[10]

The other unusual thing about Kernos 3 is that it stands on three high, slender legs, which appear to end in tenons that might have attached it to a wooden base. Such "tripod kernoi" are quite rare, but there is, in fact, another example from Palestine. It was found in Tomb 3 at Bâb edh-Dhrâʿ in a clear context and must therefore date to EB I, ca. 3200 B.C.[11] Three-footed kernoi ring vessels with simple bowls attached to the rim are also known from third millennium Cyprus, as shown by a White Painted I vessel from T. 52/27 at Kouklia-Skales.[12]

THE ORIGINS OF THE IRON AGE KERNOI IN PALESTINE

In the study already mentioned, A. Mazar (1980: 108) has argued that the few early examples of kernoi in LB Palestine antedate the main period of their floruit in Cyprus in the White Painted I or Cypro-Geometric period (ca. 1050–950 B.C.), and thus Palestine provides the prototypes. I would differ somewhat. I suspect that the early traditions were independent developments since kernoi are known both in the southern Levant and Cyprus in the third millennium B.C. Again in the twelfth–eleventh centuries B.C., however, kernoi become rather popular in both Cyprus and the southern Levantine coast, as Mazar notes. Therefore I would see the kernos tradition being *reintroduced* in Canaan by the newly arrived "Sea Peoples"

9. For typical MB II carinated or biconical bowls, see, for example, Amiran (1970: pl. 27:2). However, the bowls and other vessels on the rims of one-of-a-kind kernoi cannot be expected to conform necessarily to normal typological developments. For a 12th century B.C. kernos ring fragment with a biconical bowl similar to ours from Megiddo VI, see May (1935: pl. XV). For a clear MB II ring kernos with four cup protomes, see Holladay (1997: pl. 7:23:A [Tell el-Maskhuta in the Delta]).

10. For local examples of elaborate protomes with both animal heads and natural motifs, see the eleventh century B.C. kernos ring from Sasa in Galilee (Gal 1976: 5 [bowls, birds, pomegranates]; and cf. Gal 1993). See also the tenth(?) century B.C. kernos ring from Tell el-Hammah in the Jordan Valley (Cahill and Tarler 1993: 562; cf. the eleventh century B.C. example from Beit Shean VI, in T. Dothan 1982: chap. 4, pl. 6). More of the Cypriot examples have these and other "exotic" combination (see, for example, Tatton-Brown 1974: pl. 66). Needless to say, bulls, birds, and pomegranates are all well-known cult symbols in the ancient eastern Mediterranean world—underlining the proposed cultic function of the kernoi.

11. I have seen one unpublished example, personally. For two smaller EB I kernoi with three bowls on a ring, but no legs, see Rast and Schaub (1989: fig. 75:1, 2 [TA 7]; see also Amiran 1986 [two examples, surely from Bâb edh-Dhrâʿ] and Saller (1964–65: 186–88, fig. 25:2).

12. For a three-legged kernos ring with three bowls attached to the rim, from T.322 at Lapithos, ca. 2000 B.C. (EC III/MC I), see Bucholz and Karageorghis (1973: 409).

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from Cyprus. The close stylistic affinities of many of the kernoi are well documented by Mazar himself, as also with the bird's (swan's) heads on similar bowls for use with cult stands.

I would argue that the kernoi of Iron Age Palestine, including those adopted in Israelite circles by the tenth–ninth century B.C., may preserve local Canaanite tradition but are ultimately of or are influenced by Cypriot LB–early Iron Age developments. The "missing link" with Iron I in Palestine is the group of eleventh century B.C. kernoi from Stratum X at Tell Qasile, certainly a Philistine site, and one that has many connections with Cyprus and the Aegean world. In short, it was the Philistines, invading the Levantine coast from Cyprus at the beginning of the Iron Age, who introduced (or perhaps reintroduced) the kernoi.

If I am correct, this was not the only cultural feature that the Israelites borrowed from the Philistines and other "Sea Peoples." The typical Israelite bench tomb has been traced back to Aegean LB prototypes by Jane Waldbaum (1966). Israelite ashlar masonry of the tenth–ninth century B.C., usually attributed to the coastal Phoenicians, in fact may have its origins in LB/Iron I Cyprus, as suggested by many recent excavations there.[13] The bronze-wheeled stands and braziers of the Temple of Solomon (1 Kgs 7:23–37) are clearly modeled on well-known Cypriot prototypes. The few tenth–ninth century B.C. kernoi that we now have (Gal 1993) could also be derived, like the Israelite examples, from the Philistines (and even Cypriot) influence.

THE KERNOI AND THEIR FUNCTION IN THE ISRAELITE CULT

Libation offerings were a part of cultic rituals in ancient Israel, but references are infrequent in the Hebrew Bible. Ex 29:38–42 includes in the "continual offering" a libation offering of one-quarter of a *hin* of wine, or about a half-cup. Num 28:3–6 and 2 Kgs 16:13 mention "drink (*nĕshĕq*) offerings," possibly of wine. Other libation offerings of wine are referred to in Gen 35:14 (with oil) and in Hos 9:4. Three passages describe libation offerings made in the tabernacle, using two specific kinds of gold vessels: Ex 25:29; 37:16; and Num 4:7. The first is some kind of "flagon" (the meaning of the root *qsh* is uncertain), while the second is an open "bowl" (from the root *nqh*, "to be empty; purged"; cf. Lat. *patere,* "to be open," thus the classical *patera,* or libation bowl). Simple, ad hoc libations or "drink offerings" of water could be made anyplace—in public, or even on the roof of a private house—as indicated in 1 Sam 7:6; 2 Sam 23:16; Jer 19:13; 32:29; 44:17–25. The vessels used for these humbler offerings would presumably have been pottery, although the texts do not specify.[14]

The tradition of libation offerings of wine, oil, water, and perhaps milk in ancient Israel probably derived from earlier Canaanite and Mesopotamian religion, both of which were "fertility cults" that incorporated the return of food and drink to the gods who had provided them.

13. On the question of ashlar masonry and whether it immediately precedes or follows several well-documented late thirteenth century B.C. invasions of "Sea Peoples" in Cyprus (such as Maa-Paleokastro and Kalavosos-Avios Dhimitrios), see conveniently several papers in Karageorghis and Muhly 1985. See also Karageorghis (1984).

14. A typical logocentric approach, virtually oblivious to archaeological data, is Haran 1985; (see, on libation offerings, pp. 32, 41, 216–34). The latest comprehensive work on ancient Israelite religion does not even discuss libation offerings, although it does make some use of archaeological data; see Albertz 1994. Note the recent publication (Deutsch and Heltzer 1994: 23–26) of a typical eighth century B.C. water decanter, inscribed: "Belonging to Mattanyahu. Wine for libation, one-quarter" (i.e., of a *hin*).

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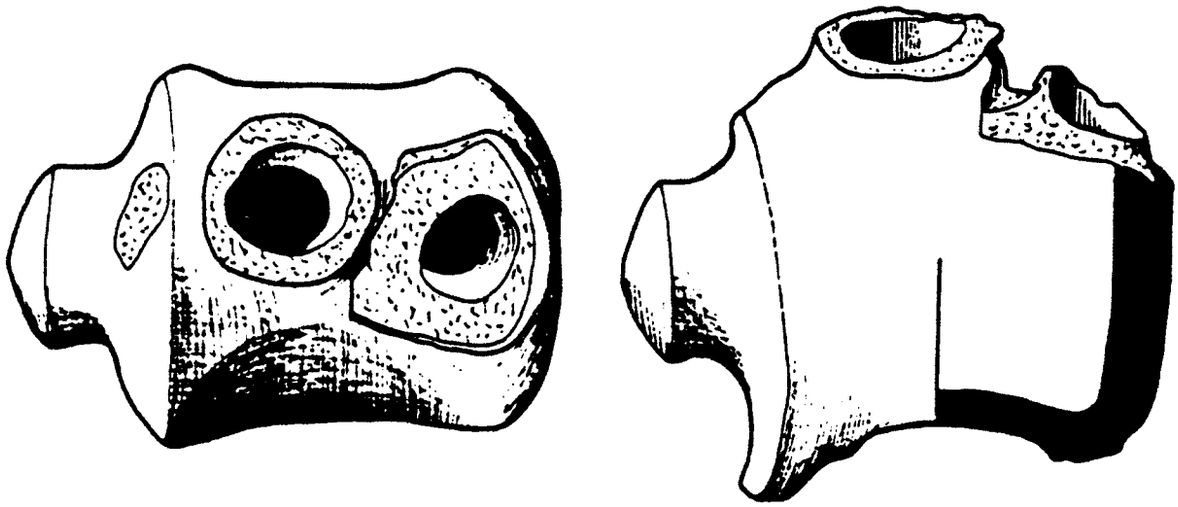

FIGURE 6.3. Hollow zoomorphic quadruped figurine from Gezer Stratum X, eleventh century B.C. (after Dever, Lance, and Wright 1970: p1. 37:9). Scale = 1:2.

Libation offerings of oil (*šmn*), "quality" oil (*šmn rqm*), wine (*yn*), and spelt (*ksm*) are mentioned in the LB texts from Ugarit (van der Toorn 1995). Third–second millennium Mesopotamia and Syria redound with examples of cylinder seals depicting "presentation scenes" (above) in which cups, goblets, chalices, and bowls, presumably containing liquids of some sort, are proffered to the gods, either in the outstretched hand or poured out on or around altars and stands.

If kernoi functioned in connection with libation offerings in ancient Israel, as seems likely, they should then be associated with certain other unusual Iron Age ceramic vessels that were designed for pouring. These would include a few anthropomorphic figurines, and in particular numerous zoomorphic figurines of the tenth–seventh centuries B.C. that are hollow and have filling and pouring devices (fig. 6.3). Most of the latter are quadrupeds, some realistically modeled but others quite stylized. These Iron Age examples harken back to LB traditions, where, for instance, imported Cypriot pouring-bull figurines with handles are well attested, in Base Ring II ware.

If, as I suggest, the Iron Age kernoi (and some of the zoormorphic vessels) were associated with libation offerings in the Israelite cult, we seem to be faced with a dilemma. Why are there no indisputably clear references to them in the texts of the Hebrew Bible? The apparent discrepancy between text and artifact is not, however, confined to the kernoi but extends to nearly all the Iron Age cultic paraphernalia brought to light now by archaeology. These would include small horned incense altars; terracotta offering stands; *naoi* or temple models; hundreds of female "Asherah" figurines and molds for making them; and amulets and magic devices of several kinds. Thus far, perhaps only the biblical *bâmōt* or "high places" and the *maṣṣēbôt* or stelae find their obvious counterparts in actual archaeological discoveries (Dever 1994).

In the case of the kernoi, if libation offerings actually were made in ancient Israel, vessels of *some* sort would have been required. Three possibilities suggest themselves for the lack of specific correspondence between text and artifact, both for the kernoi and the other cultic objects noted above. (1) The biblical writers were fully aware of these ritual items in use in the

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"popular cults," but they deliberately downplayed or even suppressed any mention of them simply because they disapproved—especially the final, orthodox redactors of the postexilic era. (2) Another possibility, of course, is that the original authors did not actually know much, if anything, about these items used in the "popular cults," even though they condemned them, because as elitists—representatives of the "official" religion and of the Jerusalem priestly establishment—they had no direct knowledge of those objects. As a possible indication of that, one might note the proscription of the *miflĕṣĕt*, or "abominable thing," in 1 Kgs 15:13 (= 2 Chron 15:16). The meaning of this term, which occurs only here, is unclear. But it appears that what the biblical writers were really saying is, "We don't know exactly what that awful thing is, but you shouldn't *have* it!" (3) A final possibility is that the current "revisionist" school of biblical scholarship is right after all. The Hebrew Bible was written—not simply composed—entirely in the Persian-Hellenistic period, with the result that the final editors and writers were ignorant of the actual religious practices of Iron Age Israel, long extinct.

My own view of the matter, which I have developed elsewhere (Dever 1987, 1994, 1995), is that if we "read between the lines" in the texts of the Hebrew Bible, we can sometimes reconstruct the historical reality behind the texts, despite the obvious propagandistic intent of the authors and editors. In short, despite their distaste for "popular religion" and their advocacy of an idealistic, pure Yahwism that never existed, the biblical writers gave themselves away. In their determination to condemn "popular religion," they inadvertently preserved at least a faint memory of it. And archaeology has now confirmed the authenticity of that memory.

The most dramatic instance is Asherah, the Mother Goddess, and her cult in ancient Israel, suppressed in the literary tradition and almost forgotten by the Rabbinical period, but now brought to light again vividly by modern archaeological discoveries.[15] Such convergences raise the question: What *are* the "primary" data for reconstructing the cult of ancient Israel? Texts or material culture remains? Both? And if so, in what balance?

In the specific case in point here, I suggest that the biblical descriptions of libation offerings refer, as might be expected, exclusively to rituals associated with the Jerusalem Temple (whether they ever actually existed is a moot point here). Thus the *hin* of liquid referred to in the libation offerings described in Ex 29:38–42 (above) would have required a large vessel, said to be of gold, which would not likely have been preserved. This supposition would also explain the other temple *k^{e}lîm* or "vessels" of which we lack any archaeological evidence.

Yet it is becoming clear in many recent studies of Israelite "popular religions" that the overwhelmingly majority of ancient Israelites and Judaeans had scant if any acquaintance with the Jerusalem Temple, its official priesthood and cultus, and the elaborate rituals described in the biblical texts, especially in the priestly strand of the literature (again, presuming that they ever existed in the Iron Age in this form). At local shrines in the countryside, and especially in domestic contexts, family piety and popular religious practices would obviously have involved very simple implements, sometimes one-of-a-kind. That would be precisely our kernoi—not to mention the naoi figurines and magic symbols noted above. *All* of this paraphernalia, as well as other items others found in Iron Age household and burial contexts, becomes explicable if we simply posit the widespread existence of "popular cults" in ancient

15. On the cult of Asherah in particular, see now Dever 1994 and 1995, several essays in Miller, Hanson, and McBride 1987, Olyan 1988, Smith 1990, and Dietrich and Klopfenstein 1994.

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Israel that once flourished, virtually disappeared in the literary tradition, and finally reemerged into the light of day thanks to archaeological discoveries.[16]

CONCLUSION

Some of this scenario presented here is speculative, of course. But it is certainly more pervasive to me than the speculations of a past generation of logocentric biblical scholars, who were not only elitists and males but also were mostly scholars, clerics, and representatives of the modern religious Establishment. They created an Israelite cult—or better, a *theology,* since most eschewed "cult"—in their own image. In short, these scholars were coopted by the idealist, orthodox religious parties that produced the final version of the biblical text that we now have. Archaeology, on the other hand, starts from a different perspective, not that of the Bible as a "curated artifact," but rather of the other artifacts that have long been lost, but when recovered may reflect the actual religious practices of the masses in ancient Israel more accurately. *This* was the "normative" religion of the time, at least if numbers mean anything.

16. See further Dever (1994). In the case of the kernoi, I suggest tentatively that they may be referred to, even if obliquely, by the term *qᵉsôt hānāsĕq*, "cups/bowls for libations" in the Hebrew (only once, however, in Num 4:7). The term *qᵉnāqqiyyāt* (Ex 25:29; 37:16), "bowl," seems to refer to the gold vessels in the Temple (above).

The author of this paper is indebted to a seminar paper of one of his students, Abigail Limmer, for assistance with some of the material presented here; to another student, Sarah Gardner, for the reference to Gurstein and Garner listed in footnote 8, and to Kate McKay for the drawings in figure 6.1. The author is also much indebted to Sam Wolff for calling his attention to the following references: Amiran 1986, Gal 1993, Ornan 1986, Holladay 1997, Saller 1964–65, and Bignasca 2000.

This manuscript went to press before the appearance of A. M. Bignasca, *I kernoi circolari in Oriente e in Occidente: Strumenti di culte e immagini cosmiche.* Friburg: Vandenhoeck & Ruprecht, 2000. The author has not seen this publication.

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PLATE 6.1. Kernos 1, from Kh. el-Qôm.

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PLATE 6.2. Kernos 3, from Kh. el-Qôm.

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7

REGIONAL ASPECTS OF THE IRON AGE POTTERY IN THE AKKO PLAIN AND ITS VICINITY

ZVI GAL

For many years it was common in "biblical archaeology" to identify certain characteristics of the material culture as "Israelite," "Canaanite," or "Philistine." Generally, it had been acceptable to identify the "collared rim pithoi" as representing the Israelite tribes and their settlements in the Iron I Age, or the "white slipped" ware with the Philistine population. Studies carried out in the last two decades have presented different concepts regarding the early history of the Israelite tribes and the nature of their settlement. Similarly, the settlement of the Sea People was questioned as well as their ethnic and political entity. These studies raised doubts as to the validity of using archaeological evidence to identify and determine an ethnic or national group. Consequently, the issue of whether material culture can serve as mean for ethnic identity has come to be a significant focus in the scholarly discussion (e.g., Bunimovitz 1990; Esse 1992).

The results of the archaeological survey in the western margins of the Lower Galilee which were followed by the excavations at Ḥorvat Rosh Zayit shed light on the mutual relations between Phoenicia and the Kingdom of Tyre and the Kingdom of Israel, during the tenth century B.C. and the beginning of the ninth century B.C. Moreover, it seems that the archaeological evidence can clarify the identity of the inhabitants of this site, contribute to the discussion of the possible linkage between material culture and ethnic groups, and suggest a framework to deal with this issue.

Ḥorvat Rosh Zayit is located on the western slopes of the Lower Galilee, 6 km northeast of Tell Keisan and 15 km east of Akko (fig. 7.1; Gal 1990a; 1992a: 84). The area is part of a hilly zone running north from Tivʿon to the Lebanese coast and was, both in the past and today, the boundary between the Galilean hill country and the coastal plain (Gal 1985). This geographical feature finds expression in the description of the eastern boundary of the tribe of Asher (Josh 19:25–28, and see recently Frankel 1998).

Several sites were found in the course of the survey conducted in this region, some of which were identified with cities along Asher's eastern boundary (Gal 1985: 114–23). One of these sites is Cabul, whose name is preserved in the Arab village of Kabul, just 1.5 km south of Ḥorvat Rosh Zayit.[1] The proximity of the present-day village of Kabul to this site, in addition to the archaeological evidence, supports the identification of Ḥorvat Rosh Zayit with biblical Cabul (Gal 1990a: 96–97; Gal and Alexandre 2000).

1. Not surprisingly, Cabul also marked the boundary between Galilee and Phoenicia in the Roman era; cf. Josephus, *Jewish Wars* III, 3a.

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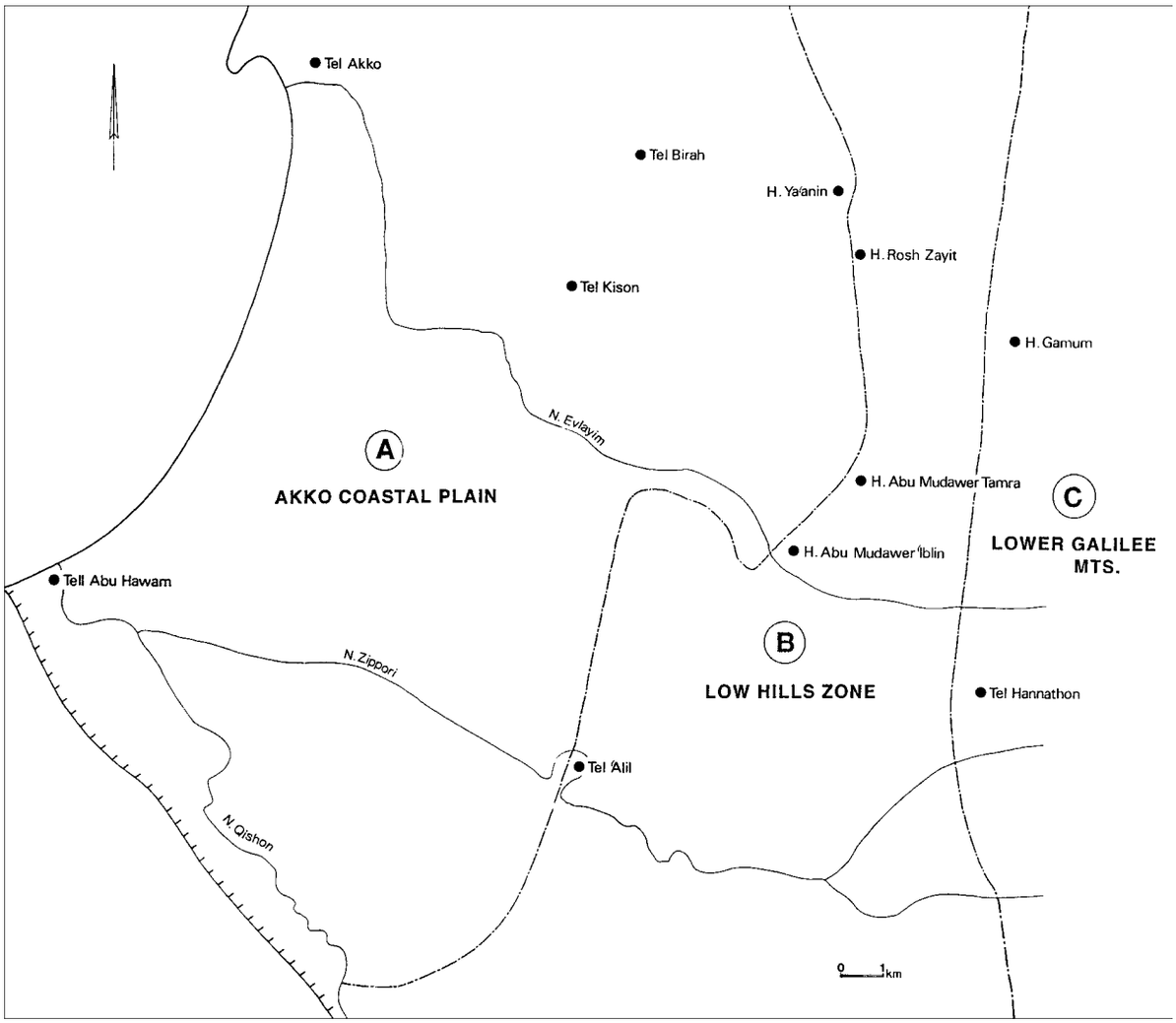

FIGURE 7.1. Map of the Akko Plain and its vicinity.

The same Cabul is mentioned in the biblical account of the territorial exchanges that took place in this region toward the end of the tenth century B.C. when Hiram, King of Tyre, was granted by King Solomon a region known as "the Land of Cabul" (1 Kgs 9:12). Thus, the possible identification of Ḥorvat Rosh Zayit with biblical Cabul makes it a significant key for understanding the relationship between Israel and Tyre in the Iron Age.

Three major periods of occupation were revealed in the excavation at Ḥorvat Rosh Zayit:[2]

(1) The site was first occupied by a rural village in the first half of the tenth century B.C.

(2) The village was replaced by a fortified administrative center protected by a wall and towers. The walls of the fort were built of local fieldstones with ashlar corners and doorjambs laid in the headers and stretchers technique. The rooms contained hundreds of storage jars with carbonized wheat as well as evidence for storing wine and oil. In addition, a large number of vessels was found comprising Phoenician bichrome ware, Black-on-Red ware, red-slipped

2. The excavations at Ḥorvat Rosh Zavit were directed by the writer on behalf of the Israel Antiquities Authority (see Gal and Alexandre 2000).

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ware (Akhzib and Samaria wares), Cypriot white painted ware, and Phoenician plain ware (see Gal 1992b). Carinated handleless cooking pots with triangular rims predominate the domestic kitchen ware. According to this pottery assemblage, the fort lasted from the middle of the tenth century B.C. to the begining of the ninth century B.C.

(3) Subsequent to the destruction of the fort and around its ruins, once again a village was founded on the site. It appears that there was a short occupational gap between the final stage of the fort and the establishment of the village.[3] This village incorporates the four-room and two-room houses with monolithic pillars, of which several were excavated. The pottery assemblage found in the village differs from that of the fort and is characterized by flat bowls, elongated "torpedo" storage jars with only a few Black-on-Red ware sherds, and a notable absence of red-slipped (Akhziv) ware. The kitchen ware is remarkably characterized by two-handled cooking pots with carinated body and a short ridged rim. All these date the village to the eighth century B.C. (Gal 1992a: 67–72; Gal and Frankel 1993).

In discussing the cultural diversity between the tenth century B.C. fort and the eighth century B.C. village at Ḥorvat Rosh Zayit, one should take in account the settlement history of the region during the Iron Age. It is clear and widely accepted that the Akko Plain was part of southern Phoenicia (Stern 1997: 5, 10–12; Gal 1991).[4] The archaeological finds revealed in the fort—its architectural characteristics, the numerous Phoenician and Cypriot wares, and its location on the fringes of the Akko Plain—all indicate that the site should be associated with the Phoenician arena. Ḥorvat Rosh Zayit is, thus, being added to several other sites in the Akko Plain whose archaeological evidence shows that the material culture of this region is Phoenician in nature: Tell Abu Hawam (Hamilton 1934), Akhziv (Prausnitz 1993), Akko (Dothan 1976), Tel Kabri (e.g., Kempinski and Niemeier 1990), and particularly Tell Keisan (Briend and Humbert 1980).

The diversity between the fort and the village is reflected also in the pottery typology that should be considered in the present discussion. The archaeology of Iron Age II generally presents continuity in the material culture throughout the period. However, fine typological distinctions allow one to suggest chronological subdivisions of the period. One of the first observations on the pottery typology was made at the Tel Hazor excavations (Aharoni and Amiran 1958), where the main distinction was evident in the cooking pot typology. There were clear differences between the cooking pots of Strata XII–IX (Yadin et al. 1961: pls. CLXV, CCVII:9–17, CCXII:25–32) and those of the later strata, especially Stratum V (Yadin et al. 1958: pl. LV:3–10; 1960: pl. LXXXV; 1961: pl. CCXXVII:11–17). The earlier cooking pot is the type found in the fort at Ḥorvat Rosh Zayit (fig. 7.2), and the latter is the type found in the village (fig. 7.3).

This typological distinction between the earlier and later Iron Age cooking pots is evident at many other sites throughout the country: Tel Kinrot Strata II and IV (Fritz 1990: pls. 59, 72),

3. It seems that the village was established shortly after the fort was destroyed. The archaeological evidence indicates the abandonment of the village at a date around the time of the campaign of Tiglath-Pileser in 732 B.C.

4. Some scholars tend to underestimate the significance of the Akko Plain for the study of the early phases of the Phoenician culture. This is demonstrated in Ciasca's review which relates very briefly to sites in southern Phoenicia (1988: 151). It is important to recognize the potential of the region for research, since in contrast to the Lebanese coast, here no modern cities overlie the ancient tells (Gal 1990b; Wolff 1993: 277).

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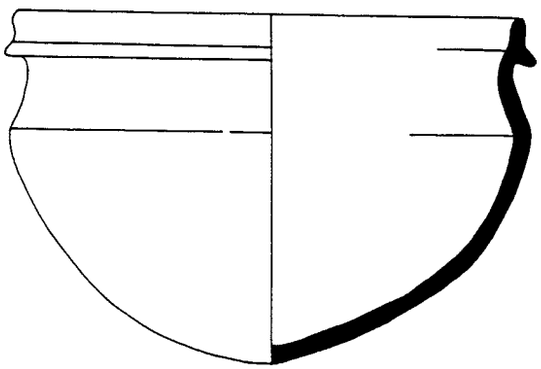

FIGURE 7.2. An "earlier" cooking pot.

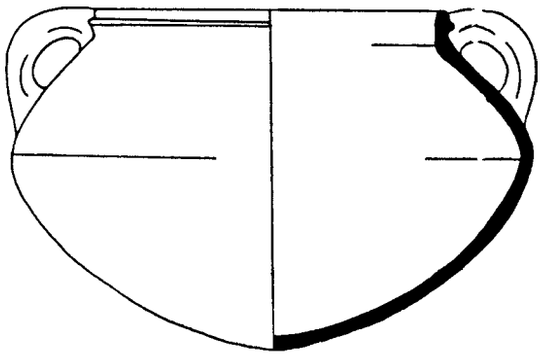

FIGURE 7.3. A "later" cooking pot.

Megiddo Strata V and IV (Lamon and Shipton 1939: pls. 40:16, 39), Tell el Farʿah North Strata 7d and 7a (Chambon 1984: pls. 52, 53), Samaria Periods I–IV and VI–VIII (Crowfoot, Crowfoot, and Kenyon 1957: 187–192, fig. 30c), Beersheba Strata V and II (Aharoni 1973: 87–80, pls. 54:11, 56:10, 60), and others. This distinction has become broadly accepted and is utilized as one of the major criteria for distinguishing between pottery assemblages of the tenth–ninth centuries B.C. from those of the ninth–eighth centuries B.C. (Amiran 1969: pl. 75).

However, excavations in Iron Age II sites in the Akko Plain and its vicinity have shown a different pattern in the development of the cooking pot typology. Although this could be observed already at Tell Abu Hawam (Hamilton 1934: fig. 10), it was not fully appreciated at the time, partially due to the problematic nature of the stratification at that site (see Herrera 1990).[5] It was the publication of the Tell Keisan excavations in 1980 that led to the postulation of an alternative, regional cooking pot typology. Although modifications should be made to the absolute chronology of the Tell Keisan strata (see Gal 1992a: 74), it is evident that the early type of cooking pot continued in use from Stratum 9a–c up to Stratum 5 (Briend and Humbert 1980: pls. 48–80). Thus, the entire Iron Age pottery repertoire at Tell Keisan, from the late twelfth to the early eighth centuries B.C., is characterized mainly by one basic type of cooking pot: the handleless type with an elongated triangular rim, the so-called earlier type. The cooking pot with the short ridged rim, the so-called later type, which is extremely common in the contemporary strata at Hazor and at the other sites mentioned above, is only sporadically represented at Tell Keisan.

It is thus evident that there is a local development of the Iron Age II cooking pots that characterized the Akko Plain and its vicinity. The earlier type of cooking pot in the northern, mainly inland, sites of the country remains the common type in the Akko Plain throughout the Iron Age down to the eighth century B.C., with only minor exceptions.[6]

5. Herrera has suggested the tenth to eighth centuries B.C. as the life span of Stratum III at Tell Abu Hawam. If so, the earlier cooking pot mentioned above may also show a continuing appearance of this type through Iron Age II.

6. It should be stated that no comprehensive statistical study of the two types of cooking pots from sites in the Akko Plain was undertaken because of the limited number of published excavations. Yet, it is clear that in spite of several sporadic finds of the later type (e.g., Kempinski and Niemeier 1990: fig. 15:6–8; p. 18*), the overall impression is that the earlier cooking pots dominate the Iron Age I–II strata of the region under dis-

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Table 7.1. Typological Cooking Pot Distinctions among Inland Sites and the Akko Plain

	Cooking pot	
Sites and Strata	*Earlier type*	*Later type*
Hazor Strata XII–IX	X	
Hazor Stratum		X
Tel Kinrot Stratum IV	X	
Tel Kinrot Stratum II		X
Megiddo Stratum V	X	
Megiddo Stratum IV		X
Tel el Farʿah Stratum 7a	X	
Tel el Farʿah Stratum 7d		X
Tell Keisan Stratum 9	X	
Tell Keisan Stratum 5	X	
Tell Abu Hawam Stratum III	X	
Tell Abu Hawam Stratum II	X	
H. Rosh Zayit (fort)	X	
H. Rosh Zayit (village)		X

These typological distinctions among the inland sites and the Akko Plain are presented in table 7.1.

To sum up, the material culture of the Ḥorvat Rosh Zayit fort accords well with other Phoenician sites in the Akko Plain. On the other hand, the rural village that was founded on the site after the destruction of the fort has different characteristics, and its material culture exhibits stronger connections with the inland of northern Israel, as at Hazor (Yadin et al. 1960: pls. CCIV, CCV) and Tel Kinrot (Fritz 1990: pls. 14–15), with the Jezreel Valley, as at Megiddo (Lamon and Shipton 1939: fig. 12), and with the central hill country, as at Tell el-Farʿah (Chambon 1984: fig. 13, pl. III).

These changes occurring in Ḥorvat Rosh Zayit can be apparently attributed to the time lapse between the fort and the village. However, a closer examination shows that at the time when these changes took place at Ḥorvat Rosh Zayit, there was no substantial change in the nature of the settlement at Tell Keisan, where the earlier buildings and the earlier cooking pot type continued to be in use throughout the eighth century B.C.

The explanation for the divergent course of events at Ḥorvat Rosh Zayit from the adjacent contemporary Tell Keisan in the Phoenician Akko Plain should be apparently sought in a

cussion. Moreover, those who claim that this cooking pot typology may be a result of regional diversity cannot ignore the association of the Phoenicians and the Israelites with the Akko Plain and the Galilean hills respectively.

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different historical-geographical background for the village than from the earlier fort. The settlement history of Ḥorvat Rosh Zayit had begun with the early tenth century B.C. rural settlement, which can be associated with Cabul of Asher (Josh 19:27). The subsequent foundation of the fort was probably the consequence of the transferring of "The Land of Cabul" by King Solomon to Phoenician sovereignty. The fort served as an administrative and economic (and maybe even commercial) headquarters of the Phoenician regime in the "Land of Cabul," on the border between the Akko Plain and the Israelite territory in the Galilean hill country. Following the destruction of the fort at the beginning of the ninth century B.C. (Gal 1990a: 93), it seems that the Phoenicians withdrew from the hilly zone immediately adjacent to the Akko Plain, and new inhabitants, with a different material culture, founded the village. The village material culture, which correlates well with sites within the Israelite territory, indicates that it was the Israelites who reoccupied Cabul.

The settlement history of Ḥorvat Rosh Zayit is an interesting case study for analyzing regional archaeological aspects and the question of relating material culture to ethnic groups. It seems that the possibility of identifying ethnic material culture cannot be excluded. Each case should be evaluated in the light of the archaeological evidence on one hand, and the historical-geographical background on the other. It is clear, however, that regionalism alone, namely a common regional background of sites, is not an adequate, all-encompassing explanation for the material culture of sites, their ethnic identity, and the changes they underwent. Therefore, despite the proximity of Tell Keisan and Ḥorvat Rosh Zayit and their association with the Iron Age Phoenician Akko Plain, the first site is marked by cultural continuity and the latter passed through major changes. These changes, as they are reflected in the archaeological evidence and as the historical record enlightens them, allow us to associate the fort with the Phoenicians and the village that followed it with the Israelites.[7]

7. This article is based on the Hebrew version published in 1998 (see Gal 1998).

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8

WARRIOR BURIAL CUSTOMS IN THE LEVANT DURING THE EARLY SECOND MILLENNIUM B.C.

YOSEF GARFINKEL

INTRODUCTION

Fenestrated duck-bill axes are considered one of the most characteristic features of the early Middle Bronze IIA period in the Levant, and are dated to the beginning of the second millennium B.C. (Yadin 1963; Oren 1971; Dever 1975; Gerstenblith 1983; Miron 1992: 58–67). However, most scholarly discussions deal with the typology of the axes, and only seldom is any consideration given to the customs associated with the warrior burials, where these axes are found (Oren 1971; Philip 1995).

Duck-bill axes have been reported from dozens of sites in the Levant and from a few other sites in neighboring regions, usually as grave goods accompanied by other metal weapons. The geographical distribution of duck-bill axes from north to south of the region is presented in table 8.1. All together some eighty-one duck-bill axes have been reported from thirty-one sites. Some of these items were collected from the surface or bought on the antiquities market, and thus lack any archaeological context. Most of the finds excavated in regular archaeological excavations were found in tombs that were often reused and hold a large number of interments. The finds were thus discovered mixed within a larger assemblage and not associated with one particular skeleton. Even the assemblage from Tomb 92 at Beit Shean, which has served as the focus for an extensive discussion of warrior burials (Oren 1971), was not found in situ. Thus, despite the wide distribution of warrior tombs and weapons reported from the Levant and nearby regions, the available information about the character of the burials themselves, the way the corpses were treated, and the position and number of grave goods related to the interment, is quite limited. This article concentrates on these less documented aspects, focusing on the Gesher finds and comparing them with data from three other sites: Baghouz, Tel Rehov, and Kabri.

WARRIOR BURIALS

Warrior Burials at Gesher

The site of Gesher lies in the central Jordan Valley, about 14 km south of the Sea of Galilee. Two excavation seasons were conducted at the site in 1986 and 1987, supervised by the author (Garfinkel 1993). A Pre-Pottery Neolithic A settlement from the beginning of the eighth millennium B.C. was exposed (Garfinkel and Nadel 1989), as well as a cemetery from the beginning of the Middle Bronze IIA period (Garfinkel and Bonfil 1990; Maeir and Garfinkel 1992).

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Table 8.1. The Geographical Distribution of Duck-Bill Axes

Region	*Site*	*Quantity*	*Context*	*References*
Anatolia	Kültepe	2	—	Özgüç 1986: pl. 6:70
	Acemhöyük	1	—	Erkanal 1977: 22, pl. 6:70
Syria	Ebla	1	Tomb Q.78.B1	Matthiae 1980: fig. 11
	Ugarit	20	Tombs	Shaeffer 1949: figs. 18, 25; 1962: fig. 26, 1978: fig. 9:1
	Tell Sukas	2	No context	Buhl 1983: pl. XXII:367–68
	Baghouz	11	Tombs	Du Mesnil du Buisson 1948: pls. XLV–LVII
	Mari	1	—	Parrot 1959: 85, pl. 33:999
	Hama	2	Tomb G.I	Fugmann 1958: pl. X:5A812–813
	Kedesh	3	No context	Petrie 1917: pl. VI:169–71
	Tell el-Tin	1	Tomb	Oren 1971: 122; Gautier 1895
	Yabrud	4	Tomb 4	Assaf 1967
Lebanon	Byblos	2	Tomb III	Montet 1928: 247–48, pl. CXLIX:940–41
	Byblos	4	Hoards	Dunand 1950: 389:10645–6; Seeden 1980: pl. 126:4–7
	Lebea	1	Tomb 1	Guigues 1937: 39
	Kfar Jarrah	1	Tomb 57	Guigues 1938: 30–34
	Sin el-Fil	2	Tomb	Chehab 1939
Palestine	ʿEin Saʾed	1	No context	Epstein and Gutman 1972: 290
	Shamir	1	Surface find	Miron 1992: 54
	Tel Dan	1	Glacis	Biran 1994: 63–65; Ilan 1992
	Safed	2	—	Miron 1992: 54, Bahat excavations
	Safed	2	Tomb	Damati and Stepanski 1987–88
	Meron	1	Tomb 1	Ṭpilinsky 1962: 25; Miron 1992: 53
	ash-Shajeriyeh	1	Chance find	Maxwell-Hyslop 1949: 121
	Kabri	1	Tomb 990	Gershuny 1989
	Nahariya	1	Chance find	Miron 1992: 53
	Tell Kurdaneh	1	Tomb	Maisler 1939: 154; Miron 1992: 54
	Gesher	3	Three tombs	Garfinkel and Bonfil 1990
	Beit Shean	1	Tomb 92	Oren 1971; 1973: 61–67
	Tel Rehov	1	Tomb 2	Yogev 1985: 104–105
	ʿEin es-Samiyeh	2	Cemetery	Dever 1975: 30; Miron 1992: 54, from the market
	Aphek	2	Two tombs	Miron 1992: 54
	Ashkelon	1	No context	Maxwell-Hyslop 1949: 121
Egypt	Tell el-Dabʾa	1	Built tomb	Bietak 1991: 56–58
Cyprus	?	Few	No context	Maxwell-Hyslop 1949: 121
Total	31 sites	81		

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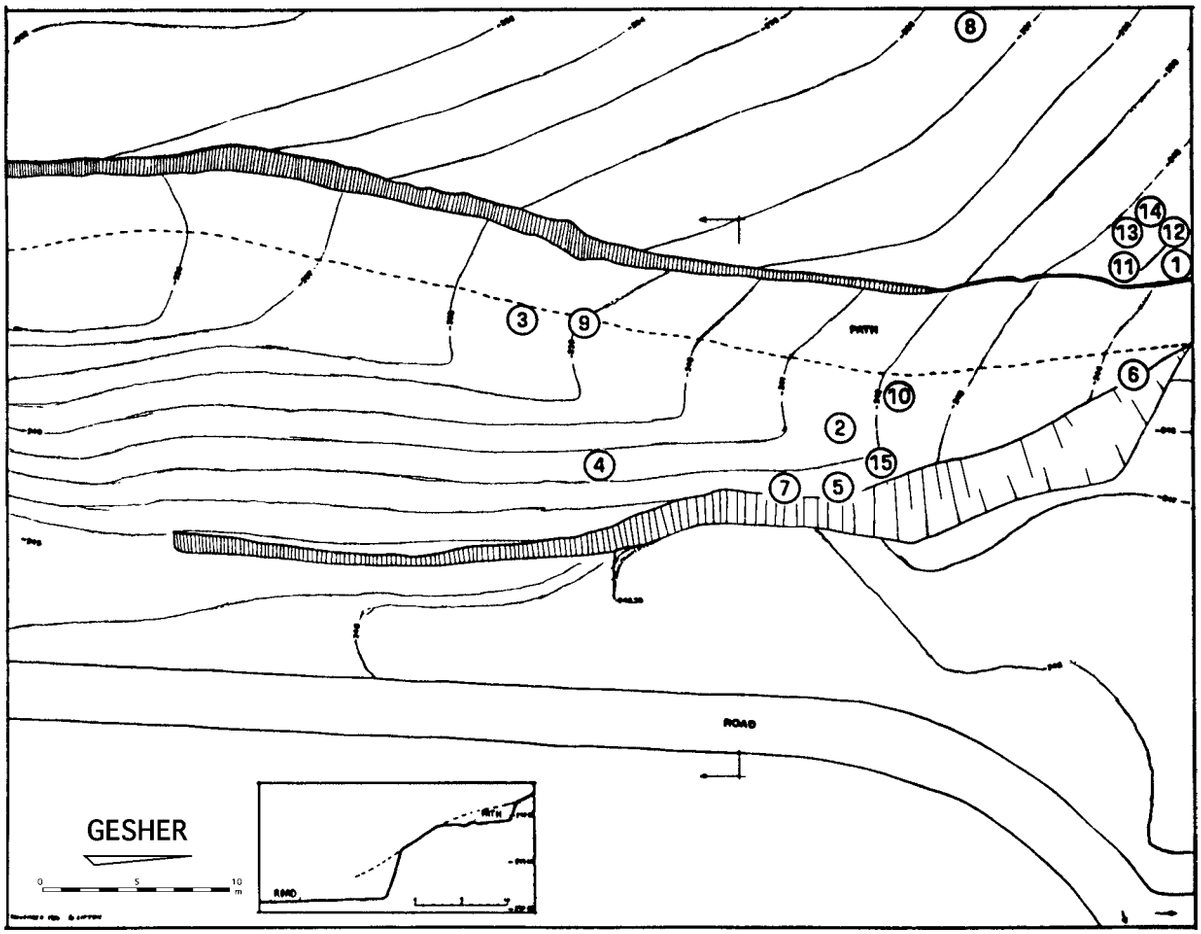

FIGURE 8.1. The Middle Bronze IIA cemetery at Gesher.

In the cemetery fourteen graves were unearthed (fig. 8.1)[1]. They had been cut into the soft sediment of the Jordan Valley. This sediment had caved in over time, so it was impossible to discern the layout of the graves. However, the heaps of stones which were found near the skeletons, together with the grave goods, suggest that the cemetery at Gesher consists of shaft tombs, and that the stones had originally sealed the burial chambers. Similar Middle Bronze II tombs have been reported from other sites in the southern Levant, such as Jericho (Kenyon 1960: figs. 139, 159; 1965: figs. 132, 138, 211) and Tel Aviv (Kaplan 1955: pl. I:1).

The most common burial pattern at Gesher is of one body in each tomb. The burial is primary, and the corpse was placed with its head facing east and its legs extending to the west. The grave goods included a number of clay vessels and occasionally bronze items. Weapons were recovered among the other grave goods in four tombs, which were thus identified as warrior tombs:

Grave 2 (fig. 8.2). This is an individual primary burial. The corpse was laid in a semi-flexed position on an east-west axis, its head facing east and its legs west. The knees were bent northward. The head was placed on two flat basalt stones. At the feet of the deceased a flat

1. The "grave" labeled number 6 on figure 8.1 turned out to be only a group of stones.

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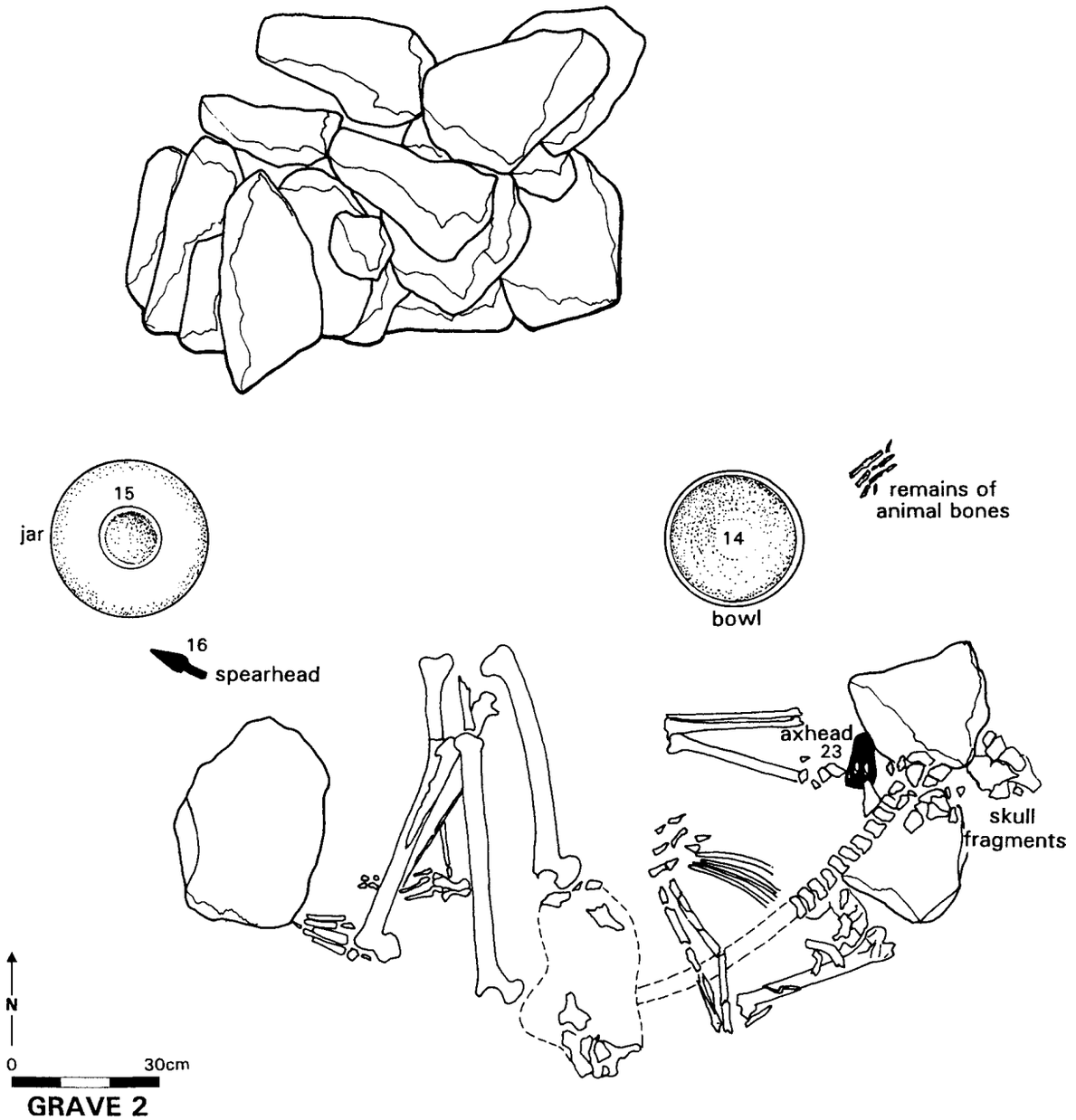

FIGURE 8.2. Grave 2 at Gesher.

stone was placed, sealing the corpse on the west. A bronze duck-bill ax (pl. 8.1a) and a bowl were found next to the head. Next to the bowl, animal bones, which had served as food offerings, were discovered. A large jar and a bronze spearhead were placed by the corpse's legs. To the north of the skeleton a rectangular stone heap was discovered, sealing the entrance to the burial chamber.

Grave 12 (fig. 8.3). This is an individual primary burial. The corpse was laid in a semi-flexed position on an east-west axis, its head facing east and its legs west. The skeleton was found close to the modern ground surface, and little of it was preserved. Next to the head a jar was found with a bronze duck-bill ax (pl. 8.1b) close by. Ten centimeters from the ax was a small bronze nail. North of the corpse a massive row of stones, five to six courses high, was unearthed.

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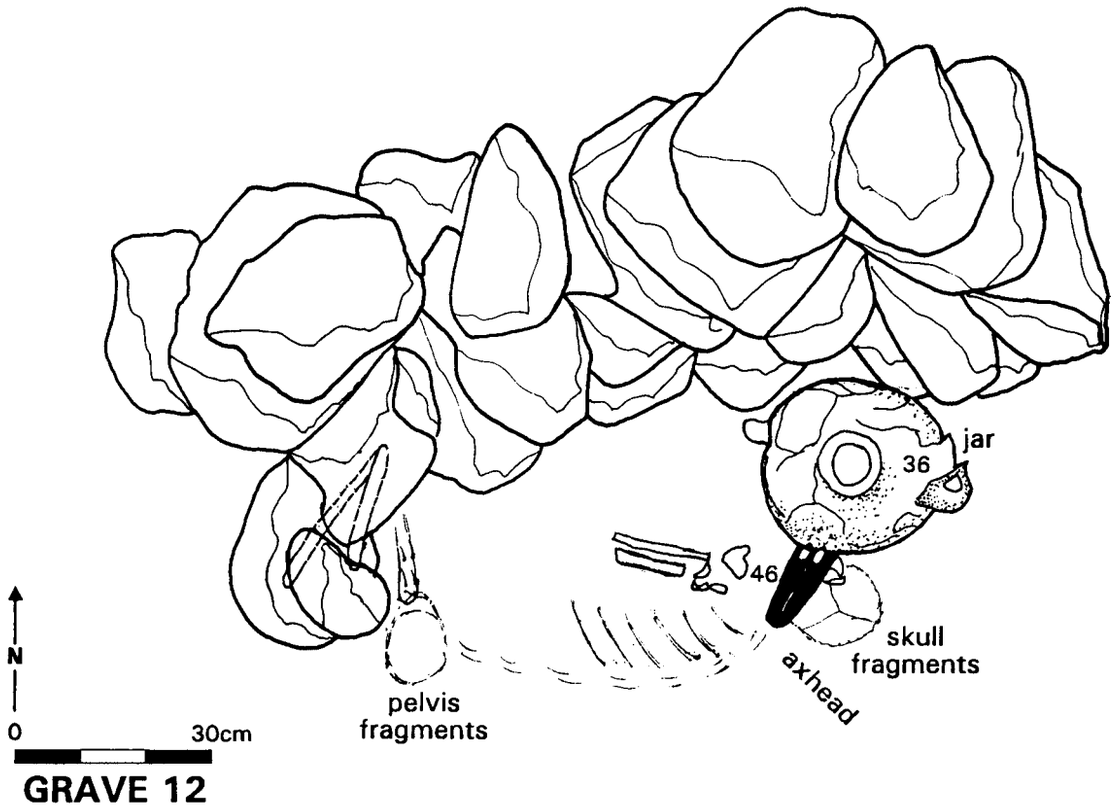

FIGURE 8.3. Grave 12 at Gesher.

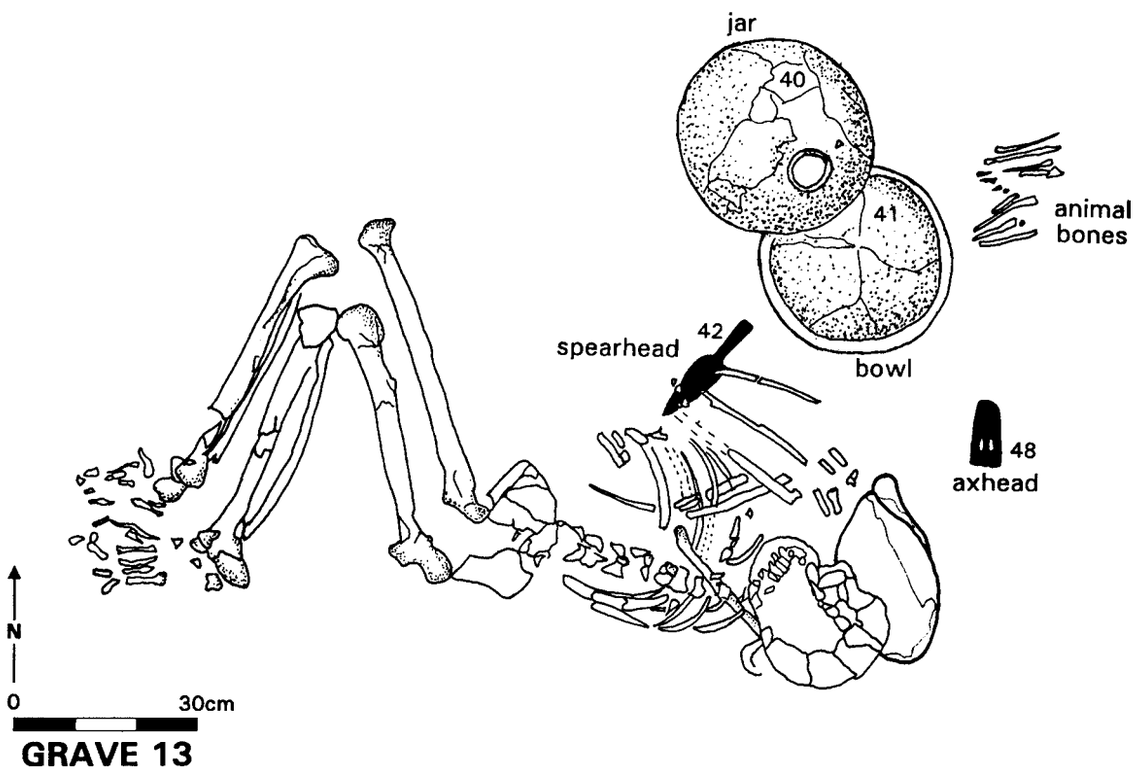

FIGURE 8.4. Grave 13 at Gesher.

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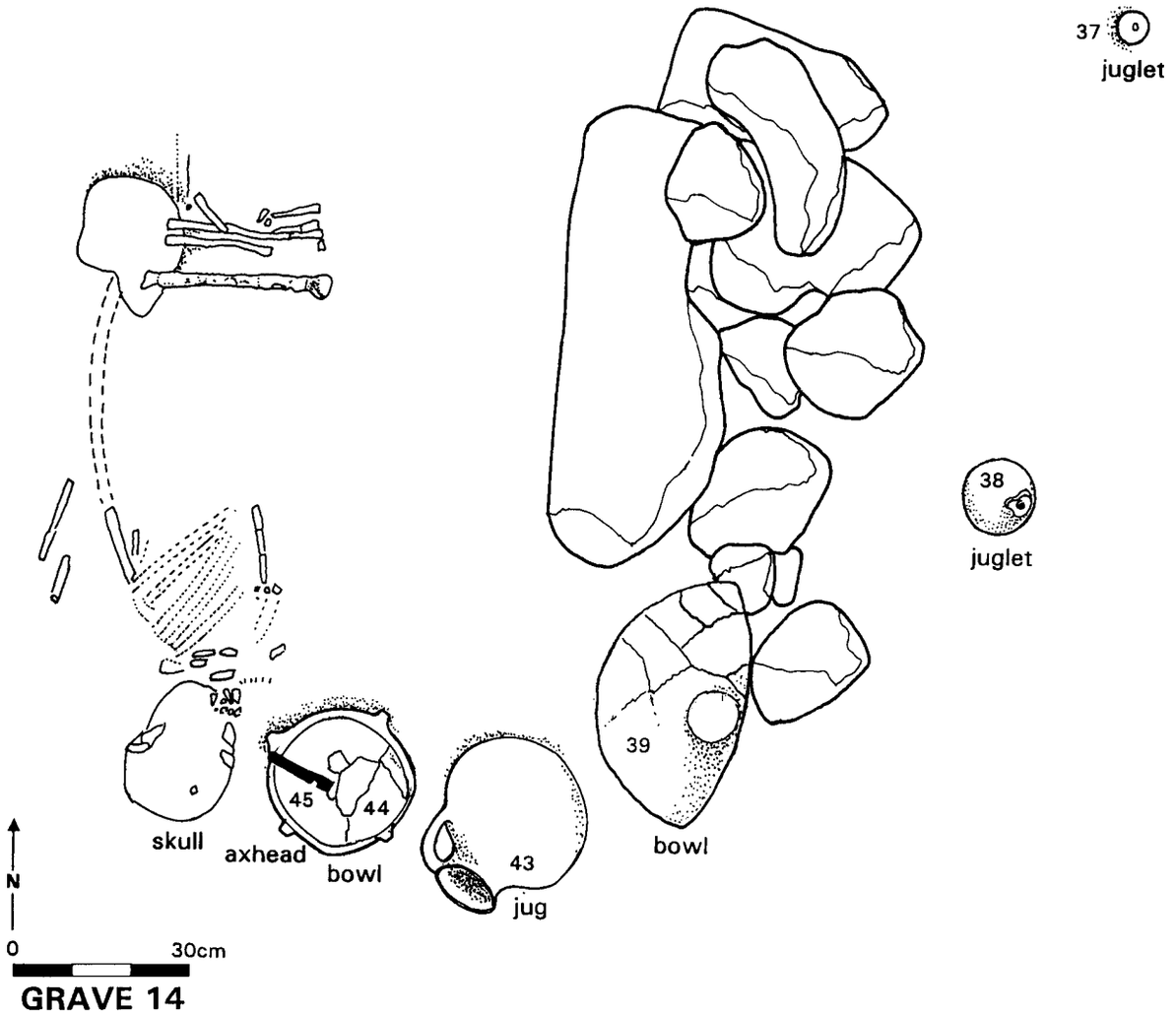

FIGURE 8.5. Grave 14 at Gesher.

Grave 13 (fig. 8.4). This is an individual primary burial. The corpse was laid in a semi-flexed position on an east-west axis, its head facing east and its legs west. The face and knees are turned to the north. The skull is laid on a flat basalt stone. Just to the east of the head a bronze duck-bill ax was found (pl. 8.2a). A bronze spearhead was recovered beneath the elbows. North of the corpse's breast were a jar and a bowl. Animal bones, which had served as food offerings, were found by the bowl.

Grave 14 (fig. 8.5). This is an individual primary burial. The corpse was laid in a semi-flexed position on a north-south axis, its head to the south and its legs to the north. This was the only burial in which the deceased was not laid on an east-west axis. The legs are flexed and the knees face east. A jug and a bowl decorated with four knobs were found close to the head. Inside the bowl lay a narrow, elongated socket ax (pl. 8.2b, c). A stone heap, composed of two rows of stones, was found to the east of the corpse. East of the stone heap, about 35 cm higher than the level of the skeleton, three more clay vessels were discovered: a bowl turned upside down and two juglets. It seems that these items were

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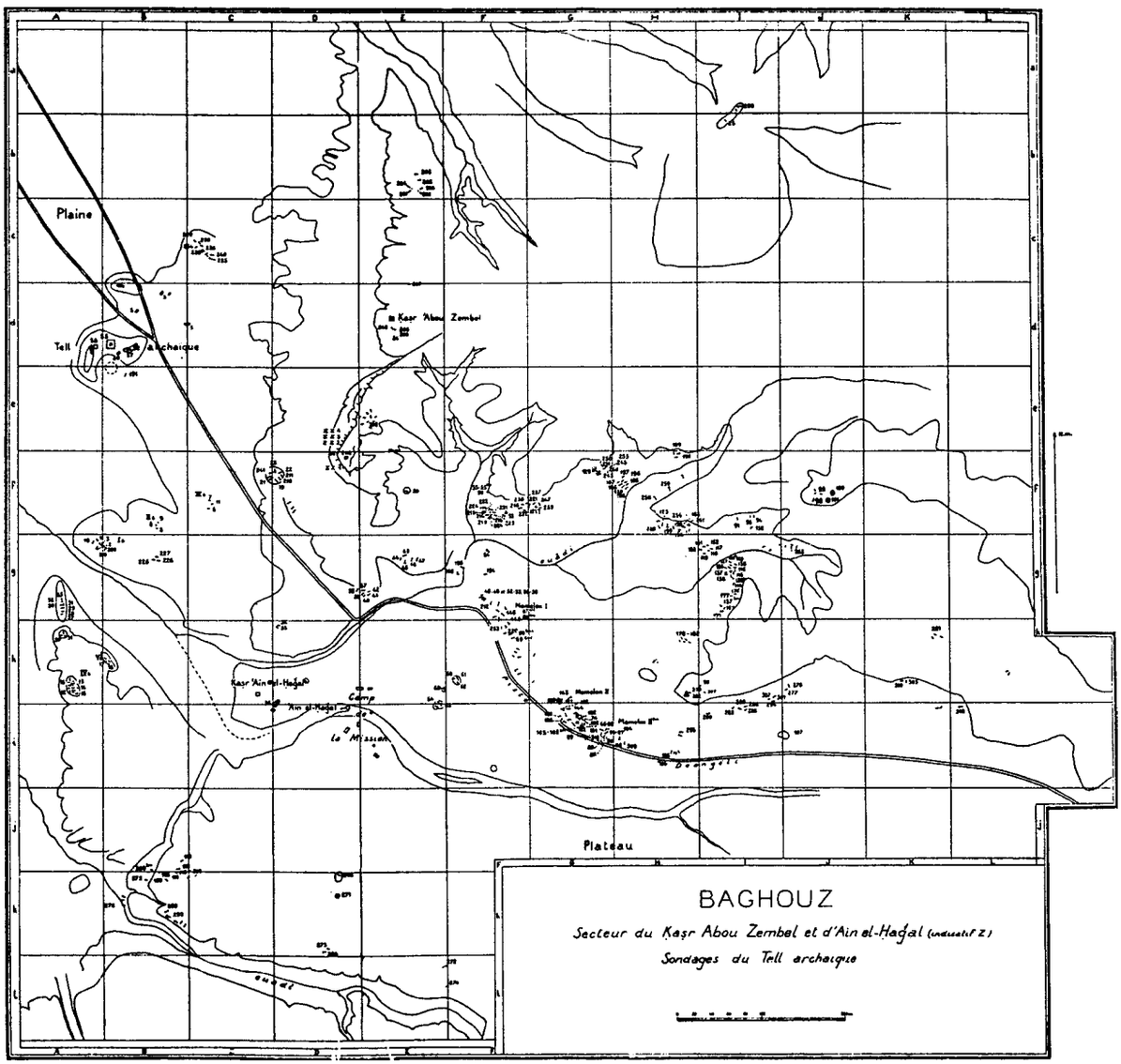

FIGURE 8.6. General plan of the Baghouz cemetery (after Du Mesnil du Buisson 1948: pl. VI).

placed in the tomb shaft and not in the chamber. A similar case has been reported from Jericho (Kenyon 1965: figs. 132, 139). It appears that these items had been added later and were not part of the original burial equipment. These three items are thus not included in table 8.3 and in fig. 8.11.

Warrior Burials at Baghouz

The site of Baghouz lies 10 km south of Mari, near the Syrian-Iraqi border. A total of 320 tombs were excavated (Du Mesnil du Buisson 1948; Hrouda 1990) in an area of about 1 sq km (fig. 8.6). In Baghouz, as shown in table 8.2, eleven warrior tombs were reported, and in nine cases the exact location of the tomb on the site can be traced (the report fails to record the location of Tombs 141 and 305). The nine tombs whose location is clear are grouped together in a

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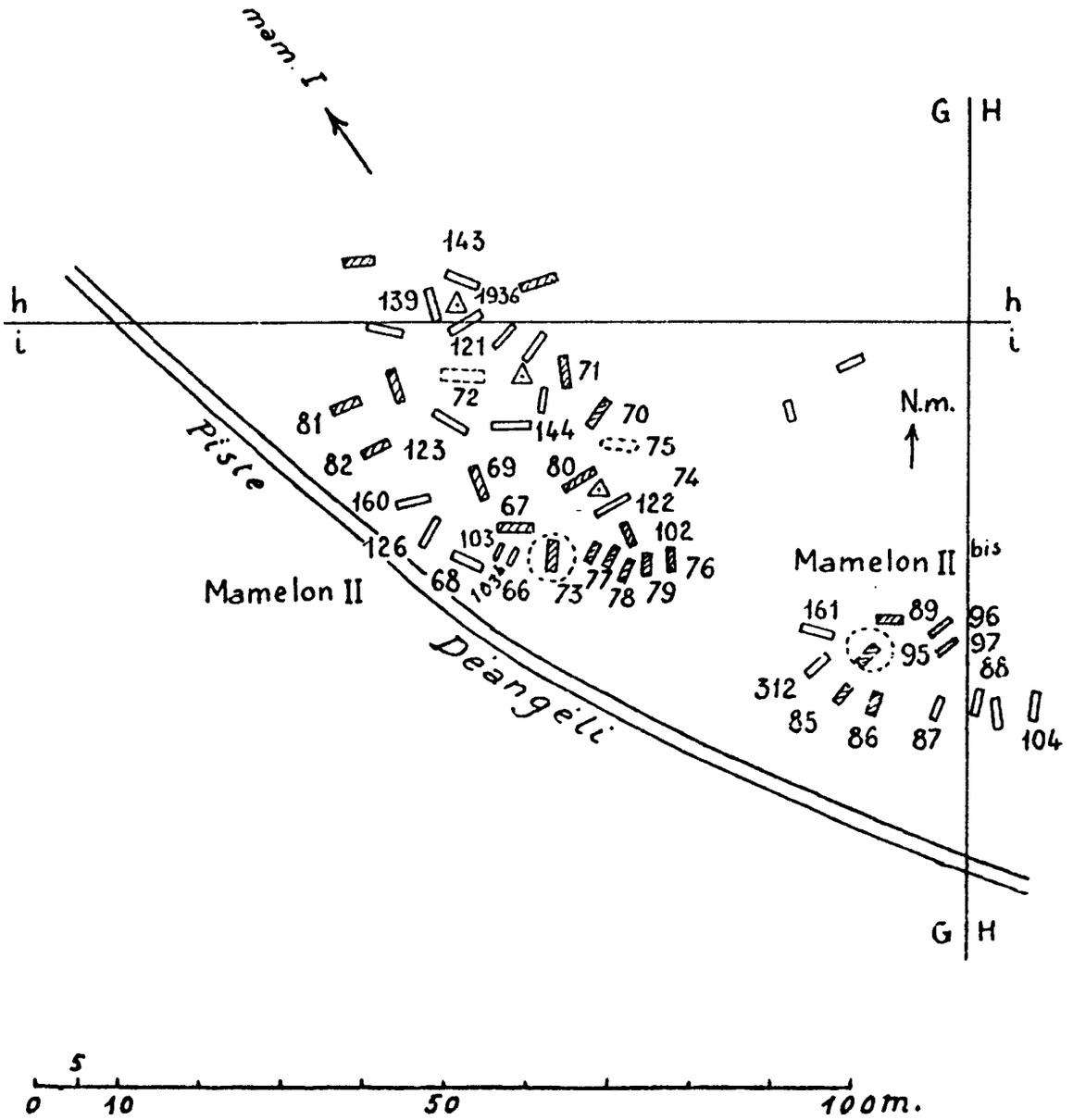

FIGURE 8.7. Detailed plan of the tombs at "Mamelon II" (after Du Mesnil du Buisson 1948: pls. VI, XXXIX).

limited area on "Mamelon II" (fig. 8.7). It should be stated that Tomb 309 is not marked on the original map of "Mamelon II" (Du Mesnil du Buisson 1948: pl. XXXIX), and its position is based on information gathered from the general map (pl. VI, Mamelon II bis).

A careful study of the map of "Mamelon II" shows that forty-eight tombs were found in this area, of which forty are numbered and another eight are not. Such a discrepancy is not surprising for an excavation that took place in the 1930s. It is quite likely that Tombs 141 and 305 are also located in this area, since tombs with consecutive numbers such as 309 or 143 are noted on "Mamelon II." Be that as it may, if we only take into account the forty tombs marked on the map, the nine warrior burials constitute 22.5% of the graves. If eleven warrior tombs are calculated as a percentage of forty-eight tombs, they constitute 23%.

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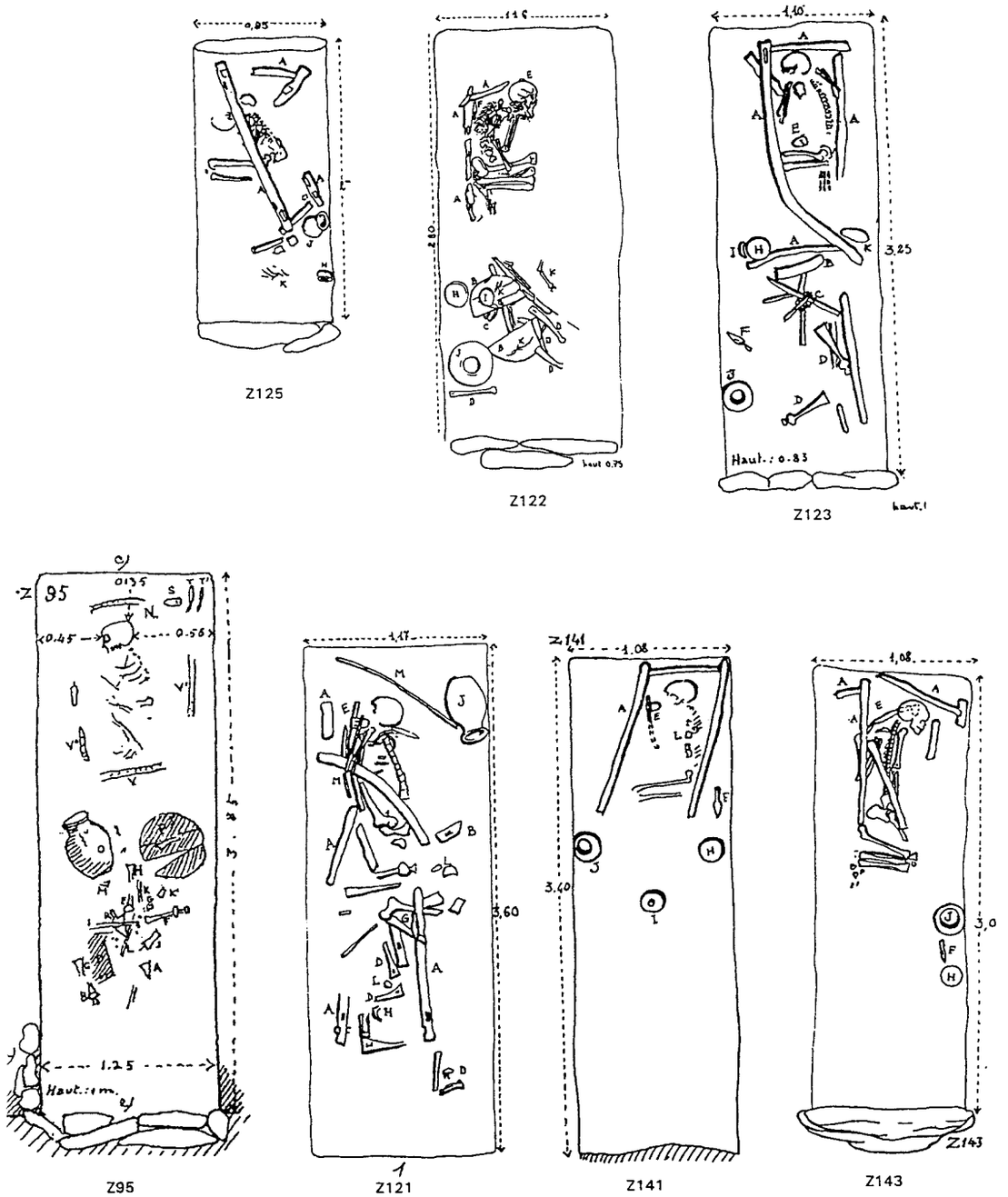

FIGURE 8.8. Warrior tombs at Baghouz (after Du Mesnil du Buisson 1948: pls. XLV, XLVIII, LI, LII, LIV, LVII).

The warrior burials were found inside stone-built tumuli, as were other tombs at the site. Inside the tombs individual burials were found. The corpses were laid out in a flexed position, on wooden biers that were preserved because of the dry desert climate. Various offerings were found next to the deceased, including duck-bill axes, spearheads, daggers, clay vessels, wood and bone tools, and animal bones. The plans of these warrior burials, as published in the excavation report, are presented together, at the same scale in figure 8.8.

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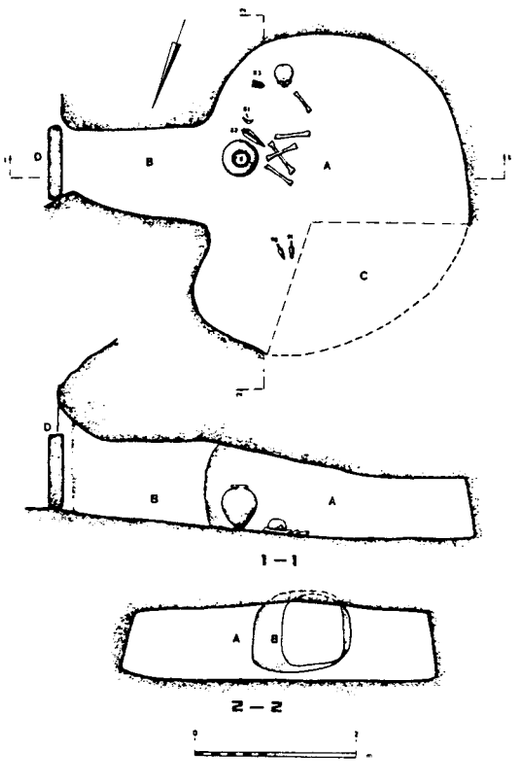

FIGURE 8.9. Tomb 2 at Rehov (after Yogev 1985: 93).

Table 8.2. Data on Warrior Burials from the Baghouz Excavation Report

No.	*Tomb no.*	*Plan*	*Location*
1.	67	XLII	Mamelon II
2.	95	XLV	Mamelon II
3.	102	—	Mamelon II
4.	103b	—	Mamelon II
5.	121	XLVIII	Mamelon II
6.	122	LI	Mamelon II
7.	123	LII	Mamelon II
8.	141	LVII	—
9.	143	LIV	Mamelon II
10.	305	—	—
11.	309	—	Mamelon II

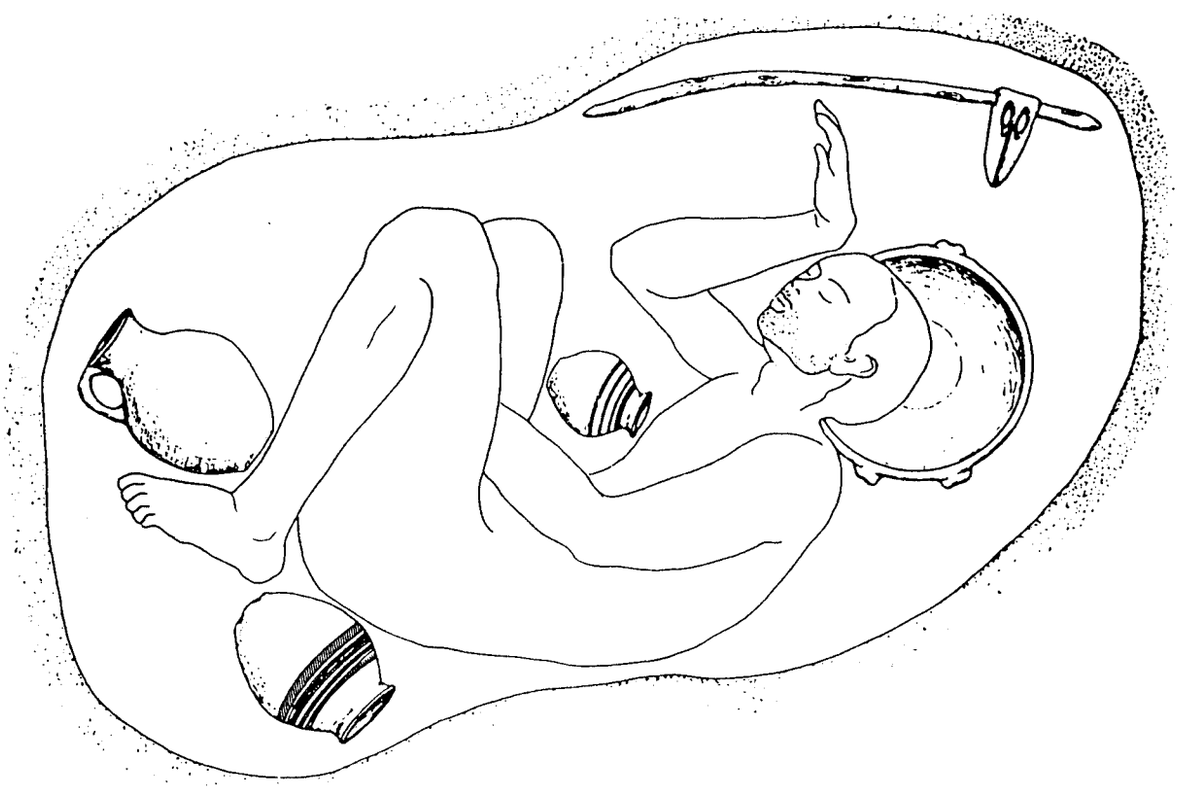

FIGURE 8.10. Tomb 990 at Kabri (after Gershuny 1989).

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Warrior Burial from Rehov

Tel Rehov lies in the central Jordan Valley, near Beit Shean. Nine tombs dated to the following periods were excavated near the tell: Middle Bronze I, Middle Bronze IIA, and Middle Bronze IIB (Yogev 1985). In Tomb 2, dated to the Middle Bronze IIA, a single skeleton in a flexed position was unearthed (fig. 8.9). The excavators described it as follows:

> In the burial chamber, about half a meter from the corridor, an intact jar was uncovered standing on the floor. Beyond were the remains of a skeleton, laid from S to N in a flexed position, facing E. To the right of the pelvic region (the bones of which were not preserved) was a dagger and an alabaster crescentic pommel. A few centimeters to the right of the skull was a duck-bill ax-head, with its cutting-edge facing the skull. Two spear-heads were uncovered in the northern part of the chamber beyond the limbs. (Yogev 1985: 93)

Warrior Burial from Kabri

One warrior burial (Tomb 990) was discovered at the site of Kabri in western Galilee (fig. 8.10). The skeleton was found in a flexed position together with a duck-bill ax and clay vessels (Gershuny 1989). Only an artist's reconstruction of the burial was published in a preliminary report, without a conventional tomb plan (Gershuny 1989: fig. 3). The ceramic assemblage includes a bowl decorated with knobs and a juglet near the head, a juglet near the pelvis, and two closed vessels (a jug and a small jar with no handles) near the legs (Gershuny 1989: 14, fig. 14). The juglet near the head does not appear in the drawing of the tomb (Gershuny 1989: fig. 3) nor in the drawing of the pottery (Gershuny 1989: fig. 14), and is only mentioned in the text (Gershuny 1989: 14). A second excavation season revealed that another person had been interred together with the first corpse (Gershuny, pers. comm.).

DISCUSSION

Treatment of the Corpse

Despite the differences in shape of the tombs in the various sites—tumuli at Baghouz, a rock-hewn cave at Rehov, and shaft tombs at Gesher—similar patterns can be observed in the treatment of the bodies and the offerings at these sites:

1. Primary burial. The bones are found in anatomical order, suggesting no special retreatment of the corpse.
2. Flexed burial. The dead were placed with their legs folded.
3. Individual burial. Only in Kabri Tomb 990 is another skeleton associated with the warrior.

Composition of the Offerings

Details of the weapons and clay vessels (mainly jars, jugs, and bowls) placed as offerings in the warrior tombs of Baghouz, Gesher, Rehov, and Kabri are presented in table 8.3. These do not include the wooden tables and beds found at Baghouz since such items could not have been preserved in the other sites. One should not rule out the possibility that wooden items were also deposited in the other three sites since wooden items were preserved in Middle Bronze tombs at Jericho, thanks to the dry climate (Kenyon 1960: 327, 340, 382–90, 462–66).

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Table 8.3. Weapons and Vessels Placed as Offerings in Warrior Burials

Tomb	*Jar/Jug*	*Ax*	*Bowl*	*Spearhead*	*Dagger*	*Juglet*
Baghouz Z-67	1	1	1	1	—	—
Baghouz Z-95	1	1	—	3	—	—
Baghouz Z-121	1	1	1	1	—	—
Baghouz Z-122	1	1	2	1	1	—
Baghouz Z-123	1	1	2	1	—	—
Baghouz Z-141	1	1	2	1	—	—
Baghouz Z-143	1	1	1	1	—	—
Gesher 2	1	1	1	1	—	—
Gesher 12	1	1	—	—	—	—
Gesher 13	1	1	1	1	—	—
Gesher 14	1	1	1	—	—	—
Rehov 2	1	1	—	2	1	—
Kabri 990	2	1	1	—	—	2
Number of items	14	13	13	13	2	2
Number of tombs	13	13	10	10	2	1

It is evident that the offerings in warrior tombs consisted of the following items:

Closed vessels: A total of sixteen closed vessels (jars, jugs, and juglets) were discovered in the thirteen tombs. Each of the burials was provided with one jar or one jug, probably containing beer (Maeir and Garfinkel 1992; Gates 1988: 69–73). Two small juglets were reported in only one case, at Kabri, in addition to a jar and a jug. Perhaps they could be interpreted as offerings for the second corpse buried there.

Axes: Thirteen axes were reported from thirteen tombs. Thus every warrior was buried with one ax. Most axes are of the duck-bill type and only one (in Gesher Grave 14) was a narrow, elongated socket ax.

Bowls: Thirteen bowls were reported from ten tombs. At Baghouz some of the bowls were made of wood. Seven tombs contained one bowl for each warrior, and three tombs contained two bowls for each person. It should be noted that in Grave 14 at Gesher and in Tomb 990 at Kabri the bowls were decorated with knobs. This kind of bowl has often been reported from tombs where weapons were found, such as Tomb 1 at Ginnosar (Epstein 1974: fig. 7:3, 15) and Level 3 of Tomb IV at Tell Sukas (Thrane 1978: 25–26, figs. 32–33, 78, 86).

Spearheads: Thirteen spearheads were reported from ten tombs. Eight of the burials had one spearhead each, while the warrior buried in Grave 2 from Rehov had two, and the warrior interred in Tomb Z-95 at Baghouz had three.

Daggers: Two daggers were reported, each from a different tomb.

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The variety of items placed in the tombs was quite limited, as shown in table 8.3. The standard assemblage seems to have been four items that included an ax, a spearhead, a jar/juglet, and a bowl. Sometimes one or another of the items was lacking and sometimes one was added, but these variations do not alter the composition of the basic paraphernalia of the deceased. It should be stated that other items which are quite common in tombs from this period, such as toggle pins or small carinated bowls, were not found at all in the warrior tombs. Thus the items were not placed in the tomb at random but rather according to an accepted norm linked to the dead person's position and social status.

Position of Offering in Relation to the Corpse

Figure 8.11 illustrates the position of the offerings in the tombs in relation to the skeleton. The following patterns can be discerned:

Position of Ax: Out of thirteen axes discovered in the various tombs, twelve (92%) were placed close to the head of the deceased, and one (8%) was found near the pelvis.

Position of Spearhead: Out of thirteen spearheads discovered in ten different tombs, eight (61%) were found at the feet of the corpse, four (31%) close to the head, and one (8%) close to the hands.

Position of Dagger: Out of two daggers found in two tombs, one (50%) was placed near the pelvis and the other (50%) near the legs.

Position of Jar/Jug: Out of fourteen jars or jugs discovered in thirteen tombs, nine (64%) were placed near the legs and five (36%) near the head.

Position of Bowl: Out of thirteen bowls discovered in ten tombs, eight (61%) were found near the legs and five (39%) near the head.

Position of Juglets: Two juglets were discovered in one tomb, one (50%) near the head and the other (50%) near the pelvis.

The axes were almost always found near the head, and it may be assumed that the corpse was grasping the ax handle. As for the other items, there seems to have been no definite rule. In four graves, all the offerings were placed near the head (top row of fig. 8.11). In four other cases the offerings, particularly the vessels, were scattered around the head and legs (middle line of fig. 8.11). In the other five cases, only weapons were found near the head, while vessels, and occasionally some more weapons, were found near the legs.

Percentage of Warriors among the Interments

The grave sample is undoubtedly too small to support any definite conclusions, but it may nevertheless be noted that the percentage of warriors among the total interments in Mamelon II in Baghouz is 22.5% and is 26.2% in Gesher. These are rather similar figures, suggesting that warriors constituted a quarter of the population buried in these cemeteries. What does this figure imply? It is known that children were buried in storage jars under the floors of houses in this period. Children's graves have not been found in Gesher, Rehov, or Baghouz. The cemeteries thus reflect the composition of the adult community. Half of the interments are female, and thus a quarter of the population indicates that every second male was a warrior. This percentage is rather high and could not represent a segregated social class of warriors; it rather suggests that most of the adult population carried arms.

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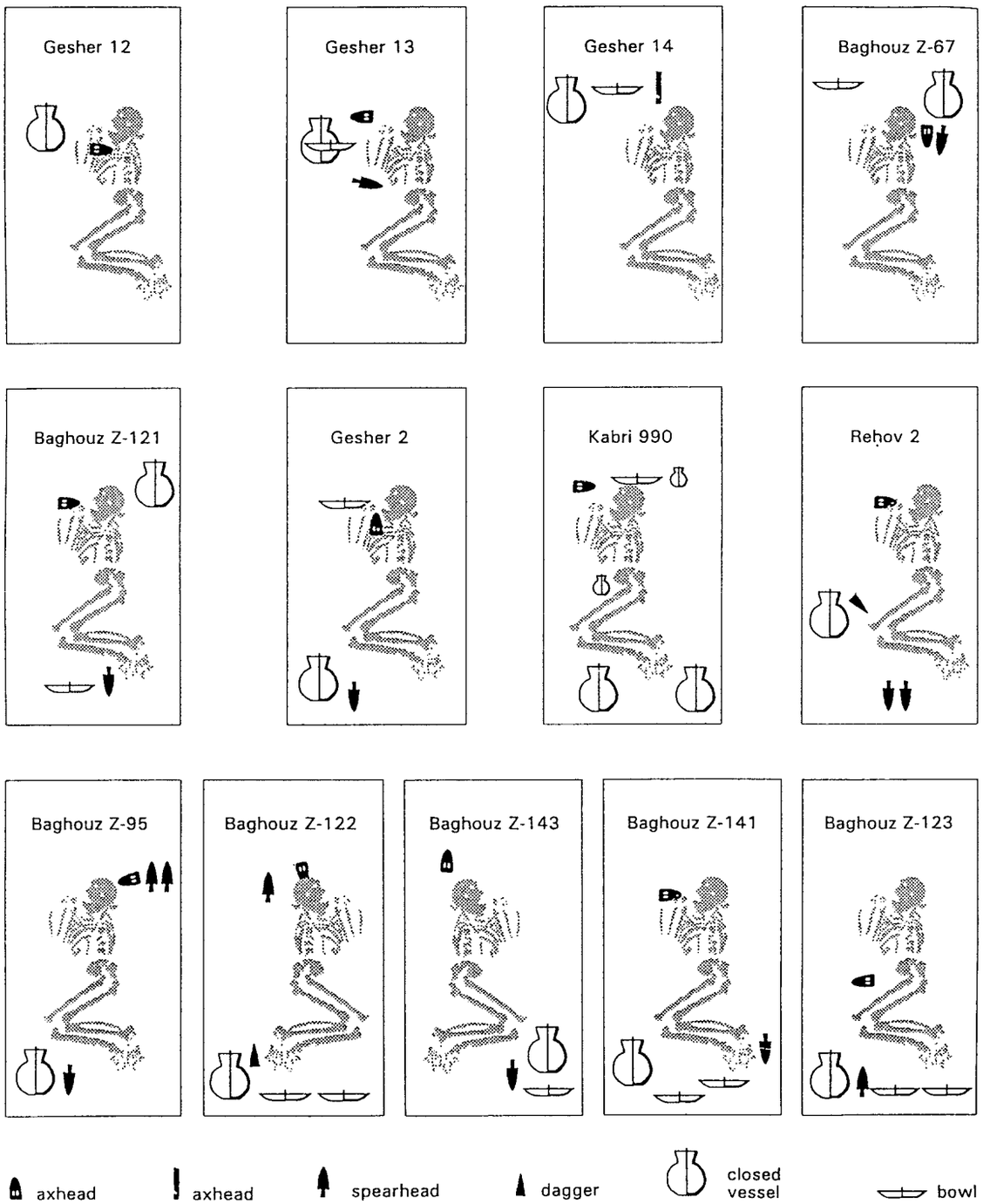

FIGURE 8.11. Position of the offerings at the various tombs.

Origins of the Custom of Warrior Burial

It should be noted that burials associated with weapons as grave goods were common in the southern Levant in an earlier period—the Middle Bronze Age I, ca. 2300–2000 B.C. (Philip 1995). Such burials have been reported in almost every cemetery of the period. The following examples are listed from north to south: ʿEnan (Eisenberg 1985), Beit Shean (Oren 1973: 170–81), Dhahr Mirzbaneh (Lapp 1966: fig. 24), Jericho (Kenyon 1960: 188–90), Lachish (Tufnell et al. 1958: pls. 14, 21), and Tell el-Ajjul (Petrie 1932: pls. IX–XIII).

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Many Middle Bronze I graves are composed of the following elements:

a. Individual burial.
b. Flexed burial; however, in many cases the bones of the decayed corpse were later reinterred.
c. Offerings, including a few clay vessels.
d. In a few graves the offerings also include weapons, usually daggers and javelins. In rare cases, axes of the fenestrated "eye" type were also included, as reported from Neve Eytan, Megiddo, and Maʿabarot (Miron 1992: 53). It thus appears that the custom of burying warriors individually with weapons crystallized in the last third of the third millennium B.C. in the Levant.

CONCLUSIONS

Despite the fact that bronze objects in general and bronze weapons in particular were precious items, they were nevertheless buried with their owners. This suggests that the weapons were the personal possessions of the warrior and were not controlled by a central authority or stored together in a community arsenal. Weapons were considered personal belongings. At the warrior's death, they were not bequeathed but were buried with him. Costly weapons thus went out of circulation. The society was nevertheless able to produce new weapons, since the copper and tin required for the production of bronze were available.

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PLATE 8.1a. Fenestrated duck-bill ax from Grave 2 at Gesher.

PLATE 8.1b. Fenestrated duck-bill ax from Grave 12 at Gesher.

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PLATE 8.2a. Fenestrated duck-bill ax from Grave 13 at Gesher.

PLATE 8.2b, c. Narrow elongated socket ax from Grave 14 at Gesher.

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9

THE SIGNIFICANCE OF IRON AGE "WAVY-BAND" PITHOI ALONG THE SYRO-PALESTINIAN LITTORAL, WITH REFERENCE TO THE TEL DOR PITHOI

AYELET GILBOA

INTRODUCTION

The conspicuous pithoi with wavy and horizontal band decoration (fig. 9.1) have been a matter of much discussion; for recently published examples, and overviews and references to the principal literature on their mainland distribution, see Cohen-Weinberger and Goren 1996: 77; Golani and Yogev 1996: 51–54, fig. 7; and Stepansky, Segal, and Carmi 1996: fig. 9. The accumulating evidence that has emerged from these studies (complemented here by some additional references) may be summarized as follows:

a. Chronology: On present evidence, "wavy-band" pithoi occur on the mainland from Late Bronze Age II (LB) to ca. the mid-eleventh century B.C.
b. Mainland distribution: The pithoi are found at Eastern Mediterranean coastal and hinterland sites from Ugarit to Ashdod—at Ugarit; Sarepta in Area II, Sounding Y, mainly in Strata G–E Anderson 1988: 323, fig. 6a, pl. 30:18; Tyre, at least in Strata XV and XIV;[1] Akko, Tell Keisan 9c, Dor (see below), and Ashdod XII–XI; and in the Upper Galilee (Tel Dan V, Hazor XII [but see also below], Ayelet Ha-Shahar, Tel Sasa, H. ʿAvot, Har Adir, H. Jelil, a site near Kibbutz Eilon, Tel ʿAvdon, and Tell el-Ghaiyada); for the four latter sites, see respectively Frankel (1994: 27) and Frankel and Getzov (1997: figs. 2.142.10:19; 2.194:10).
c. Use: Most scholars agree on the obvious—the storage purpose of these containers—though in most cases, what exactly they contained, or were meant to contain is still elusive. In a few cases (e.g., at Tyre and Tell Keisan) they were shown to be used (probably secondarily) for industrial purposes.[2]

1. The example in Anderson (1988: l. 30:18) is from Stratum F; no provenance is indicated for the example in fig. 6a. It is not clear which of the pieces recorded in table 21 (spanning Strata J/H-D1) belong to the types examined here. Anderson (1988: 324) suggested a possible correlation between fragments with this type of decoration and the pithos rims, designated by him RR-2, occurring throughout Strata J/H–D1 (see Anderson 1988: table 8A/B) and possibly also RR-4, but this remains inconclusive. These data are omitted from our discussion. On the other hand, at least part of the bases designated by Anderson as B-17 certainly belong to this type of pithos. These occur chiefly in Strata G–E (Anderson 1988: 242, pl. 52). For the distribution of pithos rims and bases at Tyre, see Bikai 1978: tables 5A, 5B. It is not clear, however, which of them belong to the specific types under discussion.
2. For the functions of the Cypriot pithoi discussed below, see Pilides (1996: 115–19).

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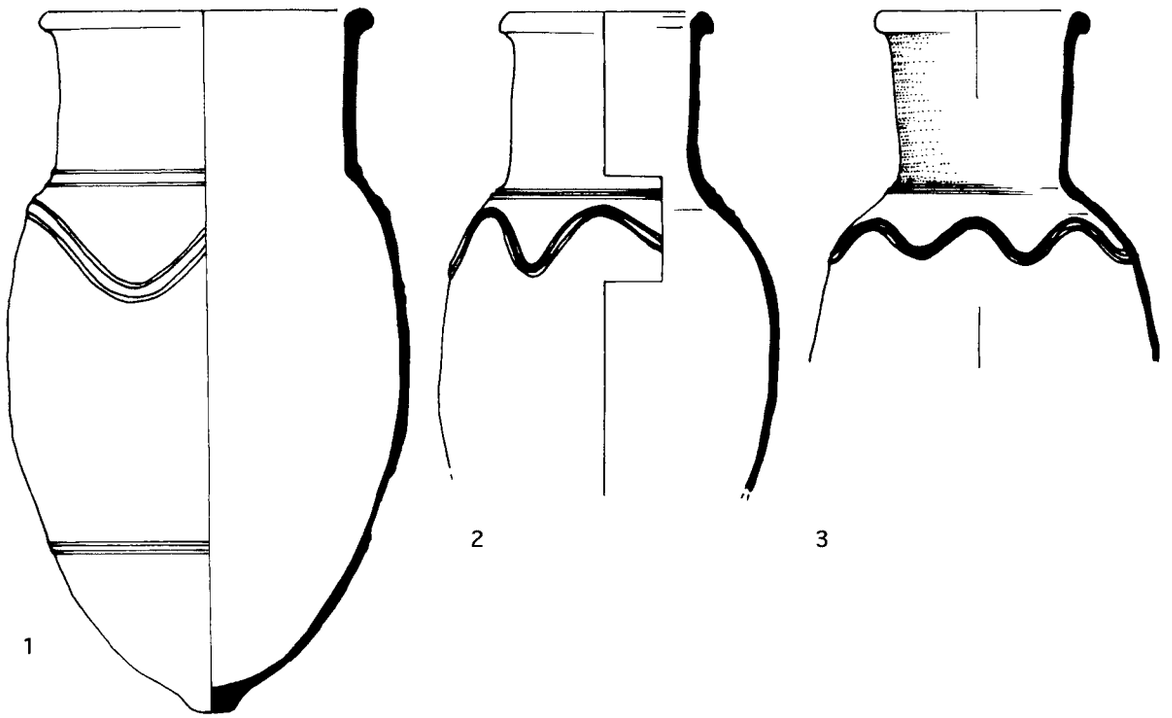

FIGURE 9.1. "Wavy-band" pithoi from Iron Age I contexts: 1: Dor; 2: Tel Sasa; 3: Tyre.

d. Production areas: All examples analyzed (only Iron Age examples), both by petrographic analysis (Sasa) and Instrumental Neutron Activation Analysis (Dan and Dor), proved to have been produced on the mainland (Cohen-Weinberger and Goren 1996; Yellin and Gunneweg 1989; Yellin forthcoming). More specific provenances that could be pinpointed were (mainly) the southern Phoenician coast, and Upper Galilee (one example).[3]

LATE BRONZE AGE OCCURRENCES

At least five mainland sites, all major urban centers, produced "wavy-band" pithoi in this period: Ugarit (including Minet el-Beidha, numerous), Sarepta (apparently numerous, see n. 1), Tyre XV (one definite, but probably more, see n. 1), Akko ("considerable amounts, late thirteenth–early twelfth centuries"; see Raban 1988: 290), and at least one has lately been uncovered at Hazor, in the LB IIB conflagration deposits of the Area A palace (for possible examples in LB contexts at Ashdod and Beth Shemesh, see below). To date no other clear examples are known, although it should be emphasized that in both coastal and mountainous Upper Galilee, a crucial area in this puzzle, this could be due to lack of data. Moreover, the only LB site extensively excavated there—Hazor—seems to have been destroyed early in the thirteenth century B.C., followed by an occupational gap that lasted for at least

3. But it should be borne in mind that these are also the areas in which the analyzed pithoi were uncovered. As yet, other provenances (northern Phoenicia and Philistia, for instance) cannot be ruled out. The results of the petrographic examination of the Tell Keisan pithos were inconclusive (Courtois 1980: 356).

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the second half of this century, and most of the following one (see summary in Finkelstein 1988: 100–01). This is one of the main lacunae in our data. The fabric of none of these pithoi has been analyzed.

The Ugarit pithoi were considered by Monchambert (1983: 32) to be local products, due to their abundance, homogeneity, and size. In contrast, because of their resemblance in shape and fabric to the Cypriot ones and her view that it is unlikely that such large vessels were transported across long distances, Schuster-Keswani (1989: 17–18) interpreted them as products of itinerant potters (presumably she meant Cypriot potters?). It should be emphasized that these LB pithoi not only closely resemble the contemporaneous Cypriot ones, but that the repertoire as a whole (evident mainly at Ugarit and Minet el-Beidha, see, e.g., Schaeffer 1949: fig. 86) seems to echo a full range of Island types—of various fabrics, sizes, shapes, and decorations—unlike the Iron Age ones (see below), indicating two different phenomena.

The locale of their production still remains to be determined. But considering the above observations, and the fact that it is now obvious that Cypriot-made pithoi reached even more distant destinations in the Mediterranean—such as Crete, mainland Greece, Sicily, and Sardinia (see, e.g., Vichos and Lolos 1997: fig. 5,[4] and summary and references in Pilides 1996: 113; Knapp and Cherry 1994: 127)—it would be a fair guess that they were exported to Syria-Palestine as well,[5] though a mainland origin, for at least part of the LB pithoi, is definitely possible.

THE IRON AGE

Tel Dor Examples[6]

The one pithos analyzed by INAA (Yellin forthcoming; reg. no. 77598, L.7926; fig. 1:3) originates in the Iron Age I destruction layer in Area B1 (Phase B1–12), that is dated by E. Stern, the site's excavator, to the mid-eleventh century B.C.; see Stern 1994: 94.[7] Two similar pithoi were crushed in situ under a contemporaneous destruction level in Area G (Phase G-9), but no sizable profiles of these can yet be reconstructed or illustrated. Fragments of at least three other such pithoi were found under this destruction layer. Only a few fragments of similar vessels, with horizontal and "wavy-band" decoration, were uncovered in contexts postdating this destruction—dated to the mid-eleventh to early tenth century B.C.—but none in primary deposition. Theoretically they could be redeposited pieces, but the pottery accompanying them belongs to the very typical post–destruction assemblage, and thus it seems that to a certain extent similar pithoi were at least used here until about the year 1000 B.C.

4. I thank S. Wolff for this reference.
5. I am quite confident that careful scrutiny of LB site reports (and future excavations) will indeed reveal evidence of such pithoi; see possibly at Beth Shemesh (Grant 1931: pl. XL:18), and additional pieces in Stratum IV. At Tell Abu Hawam a rather small pithos that seems to be Cypriot (but undecorated) was uncovered in Building 52, probably from the end of LB (Balensi 1980: pl. 12:285).
6. See also Cohen-Weinberger and Wolff, chap. 32, this volume, which came to my attention after this paper was submitted for publication.
7. For general discussions and interpretations of the Iron Age I stratigraphic and artifactual sequence at Dor, see Stern (1990; 1994: 90–104) and Gilboa (1998).

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The fabric of most (but definitely not all) fragments appears, to the eye, strikingly similar (however, only the composition of one has been analyzed). On the other hand, all of them are very different, even to the naked eye, from that of the Upper Galilee pithoi I examined (from Sasa, Har Adir, Dan, and H. ʿAvot).

Of the three in situ pithoi, two were found in clear storage assemblages, in association with other jars (the example presented here, and others, were also accompanied by "collared-rim" jars). The third pithos was uncovered near an industrial installation of as yet unclear function (Stern et al. 1997: fig. 11).

Use Contexts

The occurrence and distribution of "wavy-band" pithoi on the mainland in the Iron Age should be considered within the framework of the general "pithoi phenomenon" of the late 13th to early 10th century (indeed, they are frequently found in the same systemic contexts with other pithos types, as at Dor). Like their "collared-rim" contemporaries, their distribution encompasses settlements of different hierarchies (from hamlets/villages to major urban centers), and like them they are found in association with the three main "pottery cultures" of the era: the highland culture, that of Philistia, and the Canaanite/coastal one (for a schematic characterization of the latter, see Gilboa 1998). But unlike the "collared-rim" jars, "wavy-band" pithoi have not been encountered in any of the numerous sites excavated in the central hill country and as yet are not attested to in the northern valleys.

The ethnic (Israelite) affiliation of the users of the "collared-rim" jars has long been rejected by most scholars and explanations of socioeconomic nature for their distribution offered in its stead (e.g., London 1989b; Esse 1992). As far as consumption is concerned, the "wavy-band" pithoi should be similarly interpreted; thus in Dan and Upper Galilee, they do not *per force* indicate a Phoenician population, and the terms "Phoenician" and "Tyrian" should be abandoned, and likewise they are not evidence of "Sea Peoples" (as suggested by Raban and Stieglitz 1991: 41–42). Their distribution results from the same (as yet not entirely comprehended or agreed upon) demand for large containers, though the larger capacity of most of them and their wider aperture may have served different commodities than those of the "collared-rim" jars.

Production Contexts

The most conspicuous attributes of these pithoi are their Cypriot-inspired shape and decoration. Although applied clay bands and ridges are perhaps the most common decoration on pithoi in different cultures and periods, wavy bands on pithoi, in the mainland regions under discussion, are confined to this relatively short period. On the other hand, pithoi with this type of decoration have been produced in Cyprus for centuries and pots similarly decorated are indeed still being produced there. However, as already mentioned, all pithoi analyzed proved to be of mainland manufacture.

All the mainland Iron I pithoi known to date, that are either complete or where a substantial part of the vessel could be reconstructed are fairly uniform in shape and proportions (see examples in fig. 9.1) and differ in many morphological respects from the Cypriot ones (see

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below), and likewise from all complete or near complete LB examples known from the mainland, and thus in this respect also seem to be "local." They are much less elegantly shaped (or "stately," to use Pilides' definition) than the Cypriot ones, and as a rule lack handles.

Except the Akko examples, whose contexts are still unpublished and cannot be evaluated, only one pithos fragment—the one from Ashdod XII—was dated to ca. the early or mid-twelfth century B.C. It originates from a fill of Stratum XII that contained redeposited material, according to the excavators, of Strata XIIIB and XIIIA (Dothan and Porath 1993: 70–71, fig. 34:3). It differs from all other Iron Age mainland examples in that it is provided with handles and may well be a redeposited LB piece.

Other than this sherd, all other pithoi (Tyre XIV, Dan V, Hazor XII,[8] Tell Keisan 9c, Dor and Sasa) date between the late twelfth and late eleventh, possibly early tenth century B.C. (an exact date for the Har Adir and H. ʿAvot examples has not yet been established). Examples from Sarepta, Tyre, and Akko (see above and n. 1) may prove to be earlier within Iron I.

DISCUSSION

My point of departure is based on a few comments offered by Cohen-Weinberger and Goren (1996: 81). Considering the fact that out of the four "wavy-band" (so-called "Tyrian") Tel Sasa pithoi analyzed by them, three formed a separate petrographic family (Family B, produced in northern Israel or Lebanon) and one was grouped with "Galilean" pithoi[9] (Family A, produced in Upper Galilee), the authors considered two possibilities. One possibility—that both types were produced by the same potters, intended to "satisfy demand related to differing traditions, functions, or ethnic identities" (that is, the difference was determined by the clients). The second possibility—that there were two "groups" of local potters, one producing "Galilean" and the other "Tyrian" (i.e., "wavy-band") pithoi (the difference was determined by the manufacturers).

To evaluate these alternatives, one may try to consider the meaning of the most conspicuous formal attribute of the pithoi—the wavy band decoration. As indicated above, it does not derive from any local tradition. The suggestion of a possible different function for the "wavy-band" pithoi (vs. "Galilean" of both types, and for that matter also "collared-rim" jars) cannot explain their conspicuous Cypriot character. (Also, there were other pithoi on the scene—of the "Galilean 1" type—of similar sizes and proportions, that could satisfy the same functional demands).

Thus if we assume that "local" potters were producing vessels with Cypriot attributes, this would require another explanation. Although, as indicated above, Cypriot pithoi with these

8. Hazor Stratum XII, dated by the excavators to the twelfth century B.C., probably does not antedate the very end of this century; see summary in Finkelstein 1988: 100–01.

9. There seems to be some confusion regarding the use of the term "Galilean pithos." Some scholars (e.g., Biran 1989: figs. 4.7:8, 4.16:9; 1994: 129; Stepansky, Segal and Carmi 1996: fig. 7:1) use this term to define the wide pithoi with large aperture, which resemble in shape the LB ones, e.g., the Hazor pithoi (henceforward designated "Galilean 1"); while others refer to pithoi that closely resemble the "collared-rim" jars of the central hill country (henceforward "Galilean 2"). See also Finkelstein 1988: fig. 30b vs. 104, fig. 32.

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attributes undoubtedly circulated in the vicinity at least until the end of the Bronze Age, no evidence of imported pithoi later than that has been forthcoming.[10] It is therefore hard to assume emulation, for whatever reasons, of Cypriot originals.

Another possibility would be to assume that potters of Cypriot origin were operating on the mainland. In this case, three main explanations may be offered for the conspicuous decoration:

1. The decoration may have just been the potters' "way of doing things" (e.g., Sackett's [1990] "isochrestic choice").
2. The decoration may have functioned as some conscious mode of message emission ("stylistic behavior" in the sense promoted by Wobst 1977: 320–23), possibly pertaining to the vessels' quality, contents, origin, or affiliation of producers.
3. The decoration negotiated some sort of group identity ("stylistic behavior" in Wiessner's 1984 terminology, only one of Wobst's [1977: 328] "stylistic behavior" modes.)

To my mind explanation 1 should be rejected because of the very restricted range of shapes, sizes, and decorative motifs used here, out of the much larger "original" Cypriot repertoire. The selection seems to have been deliberate.

Explanation 2 would require a specific clientele, to whom the information encoded in shape and design was addressed. I would consider the local population out of the question for the reasons stated above. The existence of a Cypriot clientele on the mainland, to whom the vessels may have conveyed some sort of information, is possible but as yet lacks corroborating evidence.

On present evidence I would thus favor explanation 3—that the vessels were produced on the mainland by Cypriot potters who deliberately adorned their products with the most conspicuous of traditional motifs, as a cognitive expression of group awareness and distinctiveness, with no other specific target population. This interpretation does not lack difficulties, the principal one of which, to my mind, lies in the morphological differences between the mainland pithoi and the Cypriot originals,[11] indicating a somewhat remote kind of familiarity. Also, as already indicated, those pithoi somewhat resemble, in size and proportions, the "Galilean 1" pithoi (cf. Biran 1989: fig. 4.7:8–9; see also Pilides 1996: 119). Still, this seems to me the most plausible reconstruction.

10. The distinction alluded to above, between LB and Iron Age examples, is largely based on the morphology of complete or near complete vessels. Thus fragments that may have bridged the chronological gap between the known LB II and Iron I examples (especially at Tyre and Sarepta, and the unpublished examples from Akko) cannot be evaluated. It is not clear whether they (or part of them) are imported or not. On present evidence there was no chronological overlap between imports and mainland products, but I would not rule out this possibility: at Dor there are two pithos fragments, in Iron I contexts, which to the naked eye look Cypriot-made. This of course will have to be confirmed by analysis. At Tell Kazel too, a possibly Cypriot-made pithos was uncovered in an early Iron Age context (Badre et al. 1990, fig. 39:f). These instances, though, are very few.

11. Bearing in mind that there is as yet very little information concerning the contemporary (mainly Late Cypriot IIIB and Cypro-Geometric G IA) repertoire in Cyprus and its shapes, and that comparison is based on the earlier (mainly late Late Cypriot IIC) examples, see below.

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Let us now examine this proposed phenomenon in its regional historical context:

Cyprus

In Cyprus, the pithoi that most resemble the mainland ones (but see more on this below), constitute the hallmark of numerous Late Cypriot IIC sites (see Pilides 1996: 110–13, fig. 2). They are of various sizes and fabrics; some (mainly the larger ones) bear the horizontal and wavy decoration, some have other designs, and some bear none. Some have handles and some not, while most have flat bases (see, e.g., Schuster-Keswani 1989: 13–17, tables 1, 2; Webb and Frankel 1994: 10 and references therein, p.12).

Cypriot society at that time was stratified and complex, with ever increasing levels of specialized labor, production and exchange (e.g., Knapp 1993: 97, 100–101; Schuster-Keswani 1993; Webb and Frankel 1994). As suggested by Schuster-Keswani (1989: 17–18) and others (Vermuele and Wolsky 1990: 378, 380; London 1991: 222, 231), the pithoi could only have been manufactured by highly skilled specialists (by an "esoteric guild," to use Åström's definition quoted in Pilides 1996: 109), though it is not clear whether these were itinerant potters or else to what extent production was centralized.

No doubt, the lion's share of this pithos production served the widespread storage and redistribution facilities of the time, most vividly demonstrated at sites like Kalavassos-*Ayios Dhimitrios* (South 1995: fig. 3), Maroni (Cadogan 1992: 54), and Analiondas-*Palioklichia* (Webb and Frankel 1994 and extensive references on p.12; see Webb and Frankel 1994: 16).

Nearly all these centers ceased to exist either by the end of Late Cypriot IIC or during Late Cypriot IIIA. Pithoi, including the decorated types, are still known from Late Cypriot IIIB and early Cypro-Geometric contexts (e.g., Enkomi, Level IIIa, see Dikaios 1969: pl. 68:190; Kition, Area II, Floor III, see Karageorghis and Demas 1985: pl. CXXVII), but the quantities and variety were dramatically reduced, and they soon disappeared altogether (see overview in Pilides 1996: 110–11, 115).[12]

These were turbulent times in Cyprus that witnessed dramatic demographic shifts, island-wide destructions, and possibly also population dislocations (for recent overviews of late Late Cypriot IIIA and Late Cypriot IIIB, see Catling 1994: 136–37; Iacovou 1994), but during which nonetheless ongoing traffic was maintained between the island and the mainland, though perhaps reduced in scale (Negbi 1992: 611, n. 83; Mazar 1994: 51; Sherratt 1994: 70; Gilboa 1998: 423).

CONCLUSIONS

I would thus argue that the lasting (or growing) demand for pithoi in many close-by regions on the mainland, coupled with the drastically diminishing demand on the island, and the collapse of the Late Cypriot IIC organizational production structure (see Knapp and Cherry 1994: 163) attracted these specialist potters to the mainland (cf. Anthony's [1997] "Career Migration").

Did they reside there permanently, or are we to envisage itinerant potters—somewhat similar to the model suggested by London (1989a) but involving overseas venturing and

12. The paucity of excavated Late Cypriot IIIB and Cypro-Geometric IA non-funerary sites should be borne in mind (this is obviously not a common grave good), but the process, by and large, is clear.

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assuming that production was performed close to the clientele? Or perhaps were there seasonal workshops operating on the mainland (see Vermuele and Wolsky's suggestion [1990: 398–99] concerning Toumba Tou Skourou)? At present I see no way of resolving this matter, though the clustered distribution on the mainland (excluding the naturally wider distribution in harbor towns) may indicate a permanent operation milieu. Whether this restricted distribution was merely an outcome of marketing strategies or technical constraints, or whether it also had political reasons (see Frankel 1994: 33; Kochavi 1984: 67) still remains to be determined. Although Cypriot presence in northern Canaan/Phoenicia around 1150–1050 B.C. has not yet been demonstrated, this seems to me the more likely scenario, and would constitute a clue to the fate of some Island *pitharades* during the great Late Cypriot III upheavals.

ACKNOWLEDGMENTS

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I thank the following individuals and institutions that kindly permitted me to examine pithoi, and to mention those that are not yet published: Prof. A. Biran and Dalia Pakman (Tel Dan expedition); Prof. A. Ben Tor and Anabel Zarzecki-Peleg (Hazor); Prof. E. Stern (Dor); The Israel Antiquities Authority, Karen Covello-Paran, and Eliot Braun (Sasa, Har Adir, and H. ʿAvot).

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10

AN UNPUBLISHED RELIEF SHERD FROM ALIŞAR HÖYÜK

RONALD L. GORNY

Douglas Esse was an extremely supportive and inspirational friend. He was also a gifted scholar who possessed an investigative spirit that was thorough and relentless in the pursuit of excellence. Though working primarily in the Levant, he had a deep and abiding interest in Turkey, as well as other areas of the Middle East. Esse had, in fact, just before his death, received a permit to reopen the Oriental Institute excavations in the Amuq Plain. The fact that Doug and I were both attempting to resurrect old excavations provided us with a strong common bond. Esse was among the few people who truly believed that the excavations at Alişar, like those in the Amuq, could be invigorated with new life. The fact that we are excavating at Alişar today is due, in part, to Esse's encouragement and is a testament to his belief that dreams can become reality.[1]

Although Doug's archaeological interests were as varied as his talents, he always had a deep appreciation for ceramics, and we spent many hours in the basement of the Oriental Institute comparing notes on pottery from sites of mutual interest. The realm of ceramics was one in which Doug excelled, and his research resulted in many fascinating insights. His interest in Khirbet Kerak ware even brought him into contact with Anatolia where this particular ware is known in the local jargon as "Karaz" or "Early Transcaucasian"(ETC) ware. In honor of his abiding fascination with ceramics, I would like to dedicate this investigation of the Alişar relief sherds to Esse, hoping that he would have approved of the topic and knowing how pleased he would have been to see the long-held dreams I shared with him about Alişar now being realized.

Alişar Höyük is an 18-hectare site located in the Kanak Su basin, midway between the important ancient political centers at Ḫattuša-Boğazköy and the Kültepe-Kaneš (fig. 10.1). The site is composed of a high central mound which is surrounded by a terrace that takes its shape from the imposing fortification wall that ringed the settlement in the early second millennium. Excavations were originally conducted at Alişar by the Oriental Institute of the University of Chicago from 1927 to 1932, and although the identity of the site during the second millennium has still not been positively affixed, there are good reasons for equating it with the Hittite city of Ankuwa, an equation I use as a working assumption throughout this paper (Gorny 1990: 395–437; 1994; 1997).[2]

One of the fascinating discoveries made by the original Alişar excavation team was the large number of sherds with relief decoration. Although some of these fragments are now

1. Excavations were resumed at Alişar Höyük in 1993 after a hiatus of sixty-one years. See Gorny (1994) and Gorny et al. (1995).
2. Note, however, that Popko (1994), based on his identification of Zippalanda with Alaca Höyük, places Ankuwa at Eskiyapar (cf. Gorny 1997).

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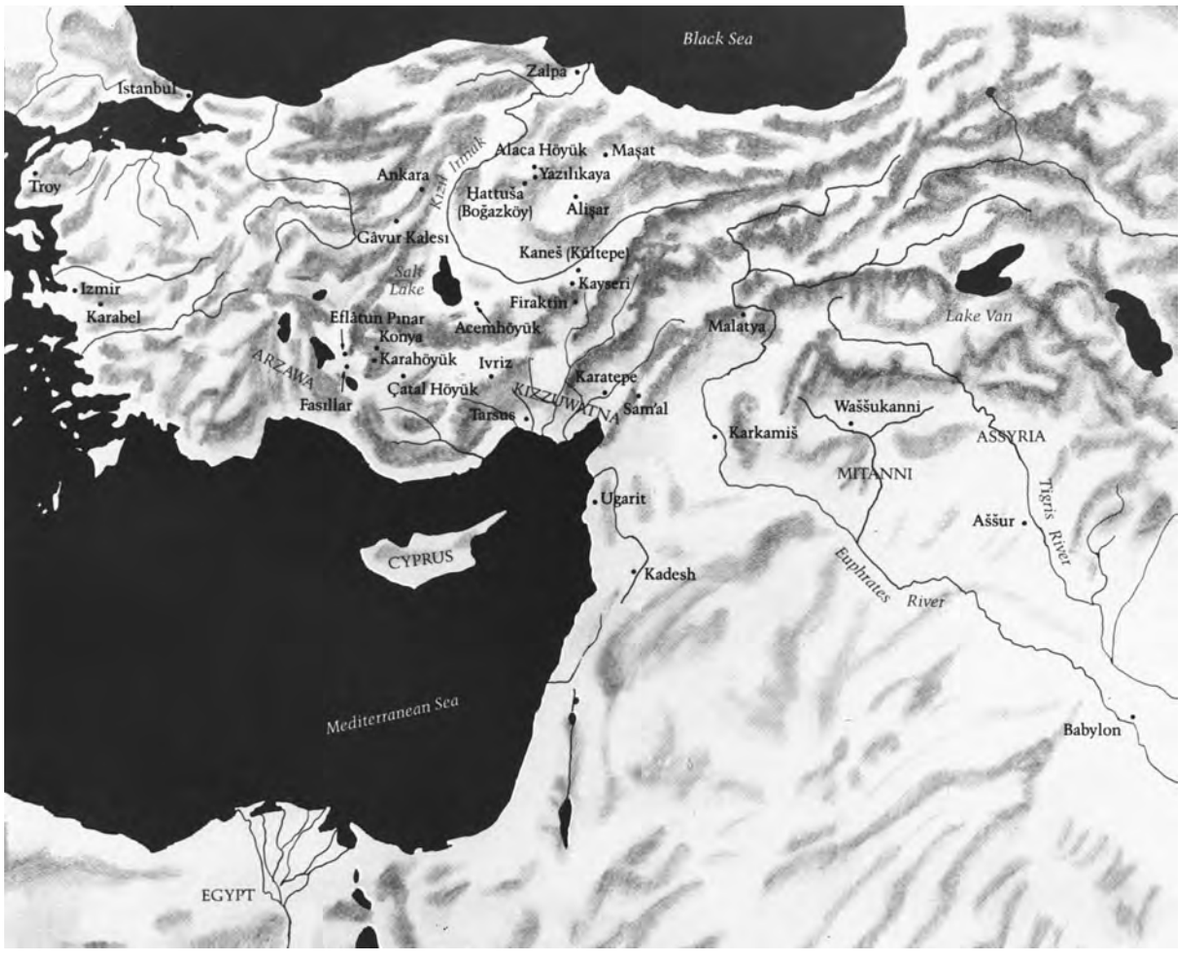

FIGURE 10.1. Map of Hittite Anatolia (Courtesy of *Biblical Archaeologist*).

housed in the Anadolu Medeniyetler Müzesi in Ankara,[3] many can be viewed in the Oriental Institute Museum at the University of Chicago.[4] In all, about twenty-three pieces are known to have been found at Alişar,[5] though only seventeen can be given any kind of provenience. Five relief sherds, not including the present piece, are problematic and remain unpublished.[6]

There are two distinctive types of relief sherds at Alişar that vary somewhat in style, motif, and manner of execution (T. Özgüç 1957: 8; 1988: 105). On the first, both the background and

3. Schmidt 1932: 132, fig. 162; Osten 1937b: 112, fig. 153; p. 113, fig. 154; p. 115, fig. 155; and p. 116, fig. 156; Osten 1937a: 73, fig. 80:1.
4. Schmidt 1933: fig. 85, b 166; Osten 1937b: fig. 153 (= no. d 2100); fig. 154, nos. d 1622, d 2100, d 2516a, and d 2937; fig. 155, nos. d 1620, d 2997a, d 2997b, and d 2999; fig. 156, nos. d 2518 and 2996; and fig. 157, no. d 1896.
5. There is some confusion over the exact number of pieces involved here as it appears that some pieces have been counted twice or renumbered at a later time. If we look at the piece numbered in (Osten 1937a) as d 2997a, for instance, we find it numbered on the sherd itself as d 1628. Similarly, d 2440 is mistakenly cited as d 2648, which is actually a different sherd (cf. Schmidt 1932: 132–33, figs. 162–63; Osten 1937a: 111–14, figs. 153–57).
6. These are to be published by the author in a future article.

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the relief are finished with a heavy red monochrome slip. Details of body and dress are indicated by stamped or incised designs. The second is characterized by a highly polished polychrome finish that makes use of red, dark red, brown, white, and black paint to emphasize artistic details. Human figures are the most common form of representation within this category. The flesh on the polychrome examples remains red slipped, but accoutrements and details are indicated by the application of additional colors of paint or slip. Relief decoration is lower on the polychrome pieces than on the monochrome examples, perhaps because the painted details make raised plastic ornamentation less necessary. In style, subject, and decoration the polychrome examples from Alişar are clearly related to those on the large Old Hittite sherd from Bitik[7] and are especially close to the reliefs from the ritual procession and cult scenes depicted on the Inandık vase.[8] Although the monochrome figures from Alişar come from the neck of a vessel differing in shape from the Bitik and Inandık examples, the close resemblance of the various pieces seems to betray a common origin.

As noted above, several relief sherds found during the original Alişar excavations were never published. Of this group, one example is of more than passing interest and deserves special note.[9] The sherd in question comes from a wheel-turned vessel made of finely worked clay. It depicts what appears to be a wooden framework similar in design to a picket fence which is set atop a wheeled platform. This superstructure is painted white and juxtaposed against a red background. The surface is burnished to a lustrous finish. Interestingly enough, this sherd was found to join a piece previously published by Osten (d 2997a /d 1626).[10] Together, the two pieces provide curious new evidence that may help to illuminate the history and function of relief art in Anatolia as a whole, and at Alişar in particular.

After joining the two relief sherds, it becomes clear that, whereas the previously published piece had depicted part of a wheeled cart and what appeared to be the feet of a person or deity mounted at the rear, the new fragment reveals much of the vehicle's superstructure (fig. 10.2) and portrays a rather typical four-wheeled wagon with slatted or wicker sides that is similar to other vehicles depicted in early Hittite art (figs. 10.3, 10.4; cf. Moorey 1986: 201 and figs. 2–3). The combination of these two relief fragments from Alişar is interesting, not only from an artistic point of view, but from a cultural standpoint as well. Since the representation of this presumably ox-drawn wagon is a theme known from other ancient Near Eastern sources,[11] the two sherds may offer us a glimpse into one aspect of Hittite culture. Although the Alişar

7. Bitik is a small site 42 km northwest of Ankara. It was excavated in 1942 by Remzi Öğuz Arık. For the results of the Bitik excavations, see Arık's report (1944: 342 ff.) and for descriptions of the vase, see T. Özgüç (1957: 57 ff.).
8. Inandık is located near Çankırı and is clearly an important Hittite site during the Old Hittite Kingdom. Alp, relying on the cuneiform tablet found in association with the relief vase, has identified the site as the cult city of Ḫanḫana, but note the objections by Yakar (1980: 75–95). The results of excavations at the site, along with a description of the vase, have been recently published by T. Özgüç (1988). A line drawing of the vase can also be found in Boehmer (1983: p. 21, fig. 7) and a photograph appears in Macqueen (1986: 103, fig. 86).
9. Alişar Study Collection (ASC) 201.
10. In Osten 1937a: 115, fig. 155; this piece is published as d 2997a, but the actual piece is marked d 1626. Excavation records fail to shed any light on this discrepancy or on the findspot.
11. For a discussion of wagons, see the reviews in Littauer and Crouwel (1979; 1986: 395 ff.); Strommenger (1990: 267–306); Boehmer (1983: 36–42); and Leinwand (1984; 1992).

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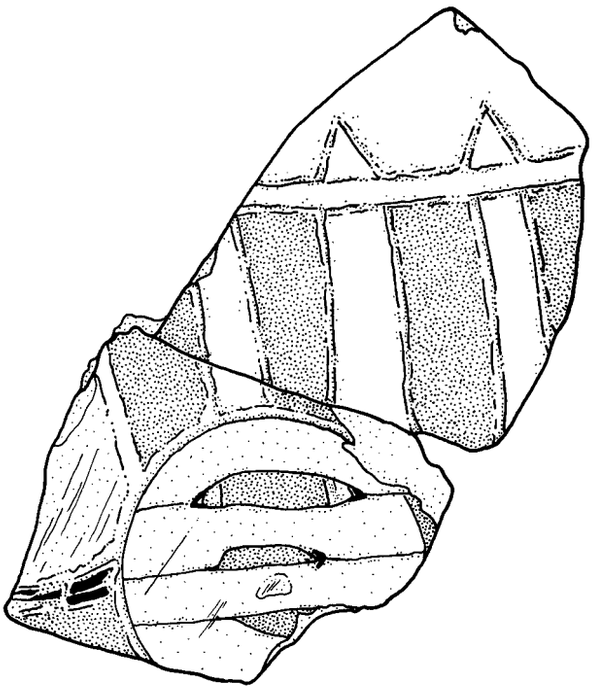

FIGURE 10.2 Joined relief sherds ASC 201 (top) and d 2997a (bottom). Scale: 2:5.

relief sherd represents only a small portion of the original vessel, there is sound basis in pre-Hittite and Hittite iconography for suggesting a connection between what is depicted on the sherds and the Hittite cult. Tahsin Özgüç, for instance, places the Alişar sherds in the same category as those from Inandık and Bitik and clearly states his belief that vessels of this type are to be associated with the Hittite cult (T. Özgüç 1988: 100–06).

This being the case, the Alişar sherds then may reveal some interesting insights into religious life at Alişar. Nancy Leinwand provides some additional food for thought by pointing out several metal examples of bull-drawn four-wheeled wagons dating to the Early Bronze Age that seem to provide the earliest evidence for the Weathergod's cult in ancient Anatolia (Leinwand 1984: 173–77; 1992: 165–70)[12] and which may prefigure the two-wheeled bull-drawn vehicles associated with the Weathergod in later Hittite iconography (Leinwand 1984: 174, n. 9, p. 192; 1992: 167, figs. 23, 25; also see Moorey 1986: 201, fig. 4).[13] The close association of this particular motif with Syria (cf. also an example from Tell Biʿa, Strommenger 1990: pl. 101a) and southeast Anatolia suggests that its origins lie in the mixed Hurro-Luwian culture of that region where the god in the wagon is associated with the Hurrian deity Tešup (Leinwand 1992: 165–68).

Contextually, the Alişar relief sherd fills several gaps in our knowledge about life in Hittite Anatolia. As Leinwand pointed out, not only is there a surprising absence of this motif in the

12. Of special note here is the rock-relief at Immamkulu that depicts the Stormgod striding over the personified mountains and onto an ox-drawn cart (cf. Kohlmeyer 1983: 80–86, esp. 83, fig. 33, pls. 29–30).

13. Technologically, the Alişar relief sherd illustrates the continuation of the four-wheeled vehicle into the Old Hittite period where it precedes the more maneuverable two-wheeled chariot for which the Hittites were later to be known (cf. Moorey 1986).

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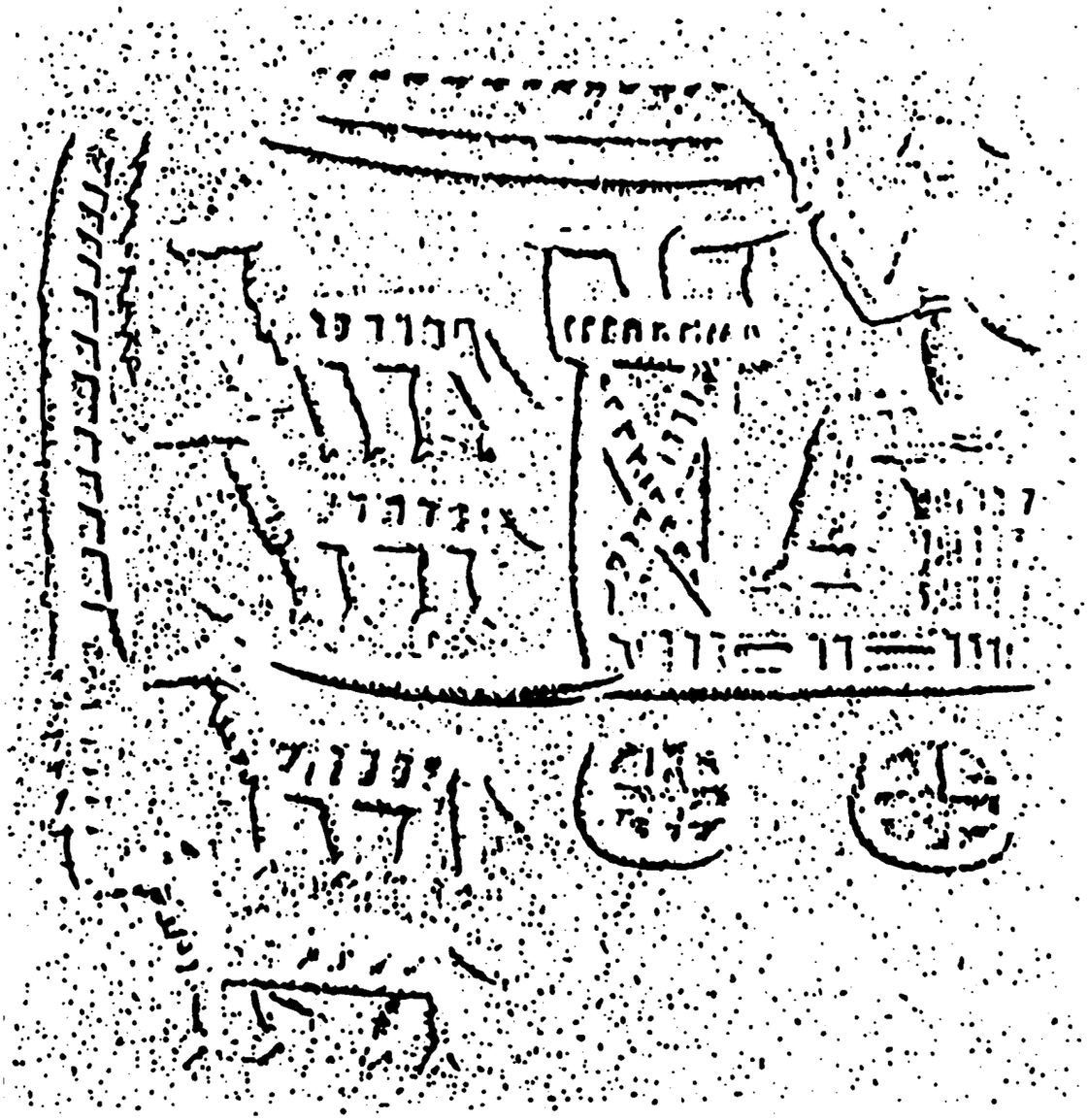

FIGURE 10.3. Enlarged drawing of four-wheeled cart of Alişar type from Karum Kaneš II cylinder seal. (After Littauer and Crouwel 1979; Moorey 1986.)

glyptic of the Old Assyrian Colony period, or roughly between the third millennium and the late second millennium (1992: 166), but it also remains largely unattested in the iconography of the geographic area between southeastern Anatolia and the Hittite capital at Boğazköy (1992: 167–68). The Alişar relief sherd becomes significant, therefore, in that it not only bridges the chronological gap between the third and the late second millennium manifestations of this motif, but it also serves geographically to link the Boğazköy representations with those of the Hurro-Luwian populations of southeast Anatolia where it seems to be at home.[14] As such, these links may well portend the subsequent reconfiguation of Hittite religion wit-

14. In light of recent discoveries, the increasing influence of Hurrian culture on Hittite Anatolia should come as no surprise; see, for instance, the discovery of nearly 2,000 cuneiform tablets written primarily in Hurrian at the site of Ortaköy (Hittite Sapinuwa) near Çorum (Gates 1996).

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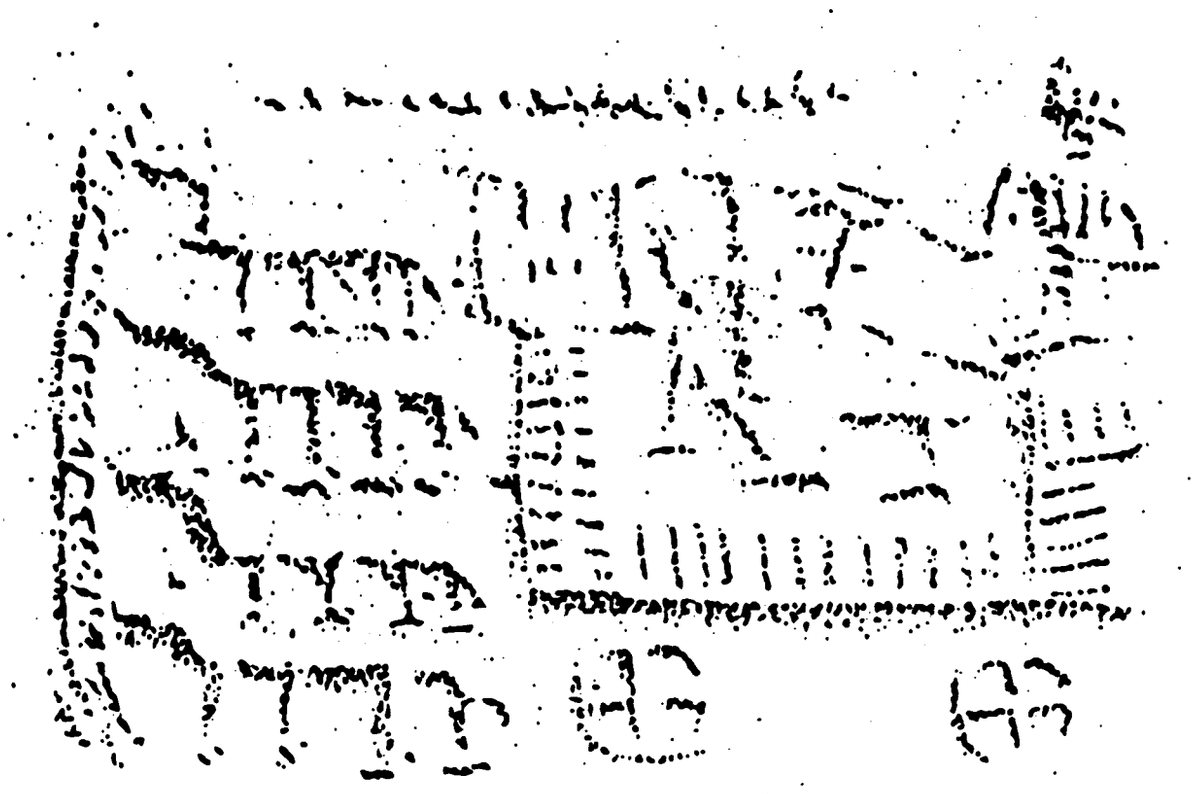

FIGURE 10.4. Enlarged drawing of four-wheeled cart of Alişar type from Karum Kaneš II cylinder seal. (After Littauer and Crouwel 1979; Moorey 1986.)

nessed in the rock-cut reliefs of Yazılıkaya where the Anatolian Weathergod is represented in the iconography by the Hurrian deity Tešup.[15]

Bearing all this in mind, we should recall that the Alişar relief sherd is still incomplete. However, despite the fact that no bulls or oxen are visibly linked to the wagon on the sherd, the presence of several other fragments with oxen in relief provide good reason to believe they once existed as part of the overall motif.[16] One relief sherd (Schmidt 1933: fig. 85, b166), in fact, depicts a pair of yoked oxen that nicely fit the motif suggested by Leinwand (1988). While this is the one sherd that comes from a different portion of the mound (square G8), the presence of yoked oxen and a mounted wagon at Alişar adds further support to her suggestion,

15. We are also reminded that Šarruma, who is often syncretized with the Stormgod of Nerik (KUB 21.27 + rev. iv 42′; see Haas 1970: 107 ff.; but cf. Deighton 1982: 103, n. 4), as well as with the Stormgod of Zippalanda (Popko 1994: 32–33), is represented at Yazılıkaya as the son of Tešup (the Stormgod of Ḫatti) and Ḫepat (the Sungoddess of Arinna). For more on the idea of reconfiguration in Hittite religion, see Gorny 1996: 70–71.

16. Further evidence for this motif comes from a colossal statue of the Stormgod recently discovered in a field near Adana. The white limestone statue is nearly 3.0 m in height and portrays the god on a black basalt base in the form of a chariot drawn by bulls. While the chariot depiction represents a technological and chronological evolution from the use of a wagon, the basic motif remains the same. The statue is apparently late as the base has a hieroglyphic and a Phoenician inscription, presumably bilingual, which is similar to Karatepe inscriptions, perhaps the work of Urikki-Awariku (cf. Ipek, Tosun, and Tokoğlu 1999).

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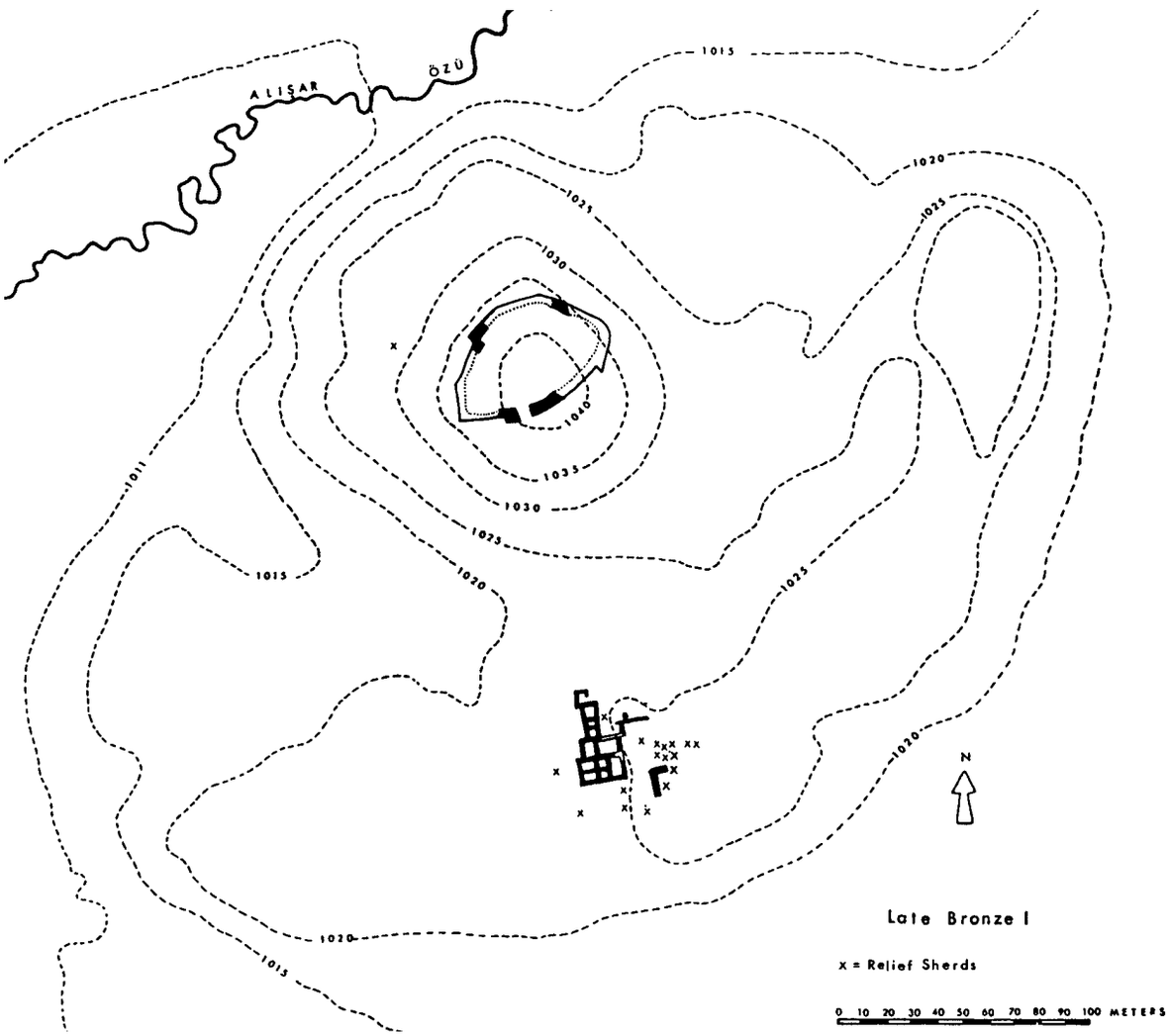

FIGURE 10.5. Distribution of relief sherds at Alişar Höyük (after Gorny 1995c: fig. 6).

and fits in well with textual materials that describe similar scenes. Of special note in this connection are the festivities associated with the Weathergod at Zippalanda.[17]

The types of vessels on which relief representation appears can be very different. Several of the Alişar specimens, for example, come from the neck of a bottle-shaped jug while another comes from a bowl.[18] The best example of a relief vessel, however, is from a large complete vase that was found at the Old Hittite period site of Inandık.[19] The ornamentation on this extraordinary vessel was composed of four registers of human figures, each depicting some

17. See, for instance, KBo 13.214 rev. 4 10 + 1 ff. where, after riding in a wagon to Zippalanda and performing offerings in the temple of the Weathergod, the Hittite king mounts a chariot and rides off to either Katapa or Ankuwa. The representation on the sherd may then be that of the Hittite king as he rides in a wagon to one of the cities on the cult itinerary.

18. Three pieces labeled d 2100 come from the neck of a bottle-shaped jug (Osten 1937a: figs. 153, 154) while d 2996 (Osten 1937a: fig. 157) comes from a large bowl.

19. See footnote 8, above.

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aspect of the cult.[20] The representation of music, processions, and worship on the sherds is a strong indication of the relief sherds' cultic character. Stylistically, the vessels from all three sites represent a similar style and must have come from the same period.

While the Inandık vase was important in and of itself, what gave its discovery special significance was the discovery of an Old Hittite clay cuneiform tablet from the period of Ḫattušili I in the northern part of the temple (Balkan 1973; T. Özgüç 1988: 71, 110–11). Since the vessel would then have to be contemporary with the tablet or of a slightly later date, it is possible to supply an Old Hittite kingdom date in the sixteenth century not only for the Inandık vase, but also for the whole group of similarly executed vessels.

It should be noted, however, that numerous examples of relief ware were found in the excavation of Boğazköy's Upper City (Neve 1992: fig. 78; also Parzinger and Sanz 1992: 62–63, pls. 66–68). Since the Upper City is essentially an Empire period construction, the discovery of so many pieces would seem to create a problem for our date in the Old Hittite Kingdom period. Parzinger and Sanz note, however, that these pieces were fashioned in the Old Hittite and Early Empire period (Parzinger and Sanz 1992: 62–63) but had a long life-span with many of the vessels apparently continuing in use all the way into Upper City Period 3 (between ca. 1240 and 1220 B.C.; for dates see Parzinger and Sanz 1992: 72–73). The presence of Old Hittite ceramic vessels of this type is also consistent with the discovery of other Old Hittite materials in the area such as tablets and seals (Neve 1992: 30, also fig. 83). The longevity of such materials undoubtedly results from a purposeful preservation based on the value accorded the materials for historical or cultic reasons. This archaic style of relief ware is no longer attested, however, in Upper City Period 2 (Parzinger and Sanz 1992: 63), perhaps as a result of the destruction that befell the city at the hands of the usurper Kurunta in the reign of Tudḫaliya IV (Neve 1992: 19).

The date of the Alişar relief fragments must then, based on analogy, be set somewhere in the Old Hittite Kingdom, a date already proposed by Bittel (1955: 32). The same conclusion was later reached by Boehmer whose recent publication on the relief ceramics uses the same logic for placing the Alişar relief ware in the Hittite Old Kingdom.[21] An exception is a single piece that differs significantly enough from the other Alişar examples that it is thought to be contemporary with the Early Hittite Empire sherds from Boğazköy (above).[22]

20. It may be objected at this point that, based on the two clear depictions of sexual intercourse on the vessel, the Inandık vase is more characteristic of a (possibly royal) wedding scene. From what we can tell, such scenes are not known in the Hittite cult. T. Özgüç, however, calls it a "sacred marriage" (1988: 100 ff.) and states that "all of these cannot represent anything but cult scenes." In this respect, such activities are probably tied to the divinities' role as the guarantor of health and prosperity throughout the Hittite lands.

21. Boehmer (1983) places sherds c 2623 (musician with cymbals, p. 128), d 2517 (offering bearer?, pp. 22–24), d 2997b ("alter ?" p. 31), d 2100, fig. 36 (god, p. 34), d 2997a (wagon, p. 37), b 166 (bull, p. 40), d 1896 (two horse heads, p. 45), and d 2518 (cow, p. 47) in the Old Hittite period. In the course of the project, piece d 2997a was found to join ASC 201. The resulting combination shows a wheeled wagon with vertically slatted sides.

22. The one example that seems to fall outside of this early period is a sherd depicting a deer with back-turned head and bulging pupils which dates to around 1400 (Osten 1937a: 114, 116, fig. 156, d 2996; cf. Boehmer 1983: 59). A similarly styled deer is also known from a complete vase now in the Cleveland Museum of Art (see Turner 1986: 36, no. 24; also see photograph of the same piece in the *Bulletin of the Cleveland*

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One point of note in the manufacture of the Inandık vase is an enclosed tubular channel around the wide everted rim of the vessel. The channel connects spouts that are molded in the shape of a bull's head and allows fluids to empty through the bull's mouth into the vessel's cavity.[23] Such vessels seem to have been relatively common at Anatolian sites and may have been used for mixing liquids in the various types of rituals commonly found in the Hittite cult (Gorny 1995a). While no complete vessels of this type were found at Alişar, several fragments of similarly constructed vessels were unearthed there.[24] Additional vessels of this type are also known from Alaca Höyük (Košay 1951: pl. 70, 1a–b, 2a–b); Maşat (T. Özgüç 1982: 152, pl. 87, 1a–b); and Eskiyapar (T. Özgüç 1988: 117, 145, pl. 29, D3); and Yörüklü.[25]

The distribution pattern of the relief sherds at Alişar may also be of some significance (fig. 10.5). With the exception of the relief fragment found in square G8 (b166), the location of findspots for the other relief sherds attributed to the Old Hittite period (at least sixteen pieces) are all clustered in the vicinity of the so-called Mansion, a multi-roomed building on the terrace which seems to have been of some importance during the Old Hittite Kingdom and early Hittite Empire periods (fig. 10.6; cf. Gorny 1990: 366–69; 1996). The largest group (nine sherds in all) came from squares S-U 28 and R-U 27–31 just east of the Mansion and north of Building B.

The concentration of Old Hittite relief sherds in this limited space may provide us with some clues about the area's functional character. In particular, if one accepts the premise cited above that the relief sherds have special relevance to the Hittite cult, the density of sherds in the area between the Mansion and Building B may well suggest the presence of a religious sanctuary somewhere in the vicinity, perhaps associated with a much larger complex of buildings to which both the Mansion and Building B apparently belonged.[26] Unfortunately, a

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Museum of Art 72: 248). Note, however, that Muscarella questions the authenticity of the Cleveland vase (pers. comm.).

23. For further discussion concerning this type of vase, see T. Özgüç 1988: 84–85, color pl. H, nos. 3–4, pl. 41; Boehmer 1983: 45–54, esp. figs. 40–44.

24. Osten 1937a: 121, fig. 163, e 1721 (note that e330 is also of a similar style).

25. Two large relief vases were recently uncovered at a spot known as Huseyindede in north-central Turkey. The site is near Yörüklü in the northern part of the Sungurlu district (Çorum province). Most of the fragments of these two relief vases were recovered, making it possible to restore the vessels nearly completely. The two vases resemble the Inandik vase (above) with scenes displayed in decorated bands characterized by brightly colored figures in high relief. Based on analogy to other such pieces, the Yörüklü vases probably date to the reign of Ḫattušili I (1650–1620 B.C.). Of note is the fact that the smaller of the two vases depicts two somersaulting acrobats leaping over a bull, which is reminiscent of the famous scenes from the Minoan Palace at Knossos. However, since the vases apparently predate the Minoan Palace frescoes, they may provide important new evidence for cross-cultural links, perhaps even Anatolian influences on Minoan civilization (cf. Ediz et al. 1999).

26. The Mansion and Building B seem to have been the westernmost part of a larger complex of buildings that probably focused on an interior courtyard. This can best be seen in Osten's plan of the Mansion (Osten 1937a, pl. 18). The remainder of the building was apparently destroyed during the Phrygian renovations of the seventh century B.C. More of the complex may still be located in the vicinity as a large structure with a stone foundation can still be seen in the remains of a tunnel von der Osten dug directly below square O 31 (Osten 1937b: 12, fig. 81).

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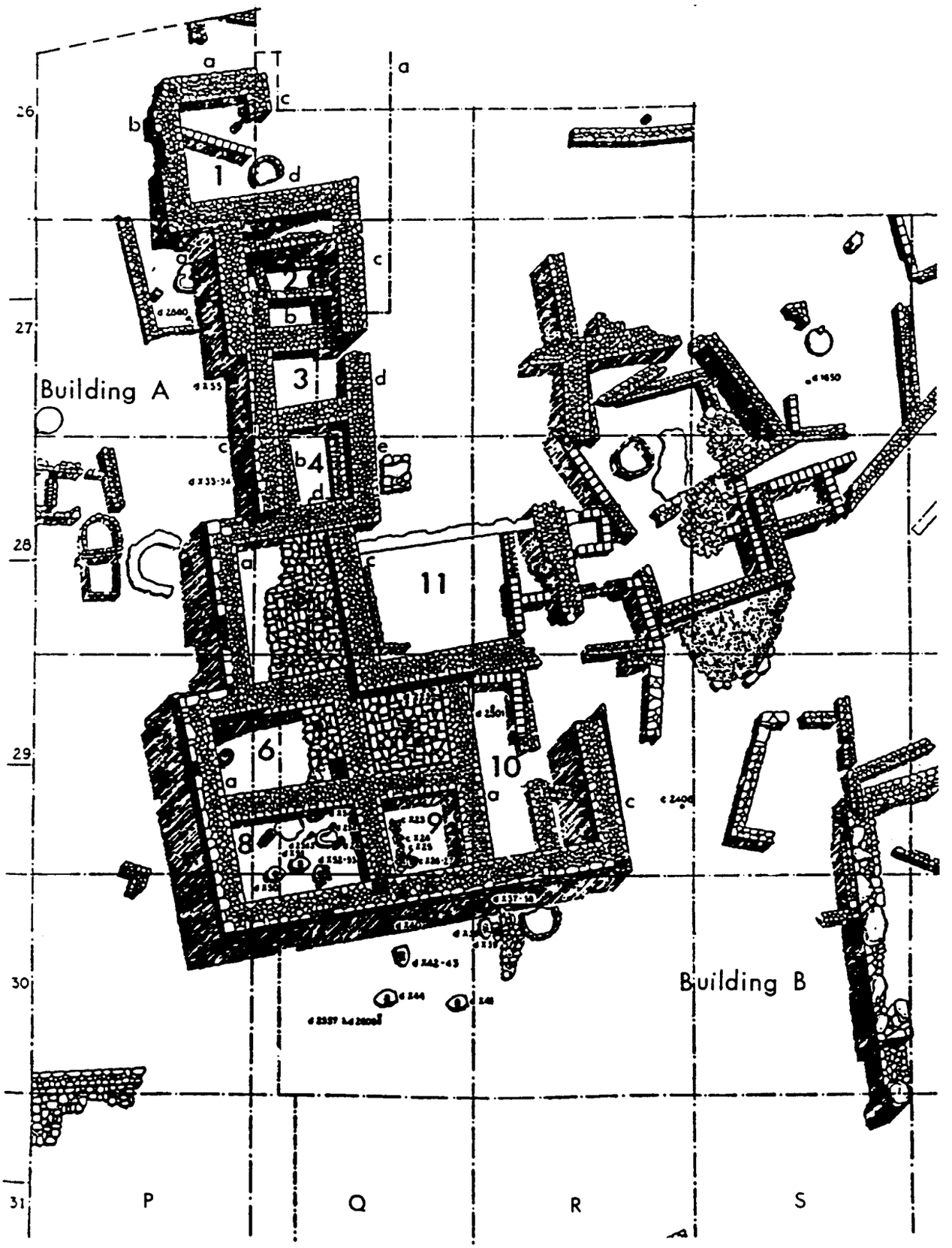

FIGURE 10.6. Plan of the so-called Mansion at Alişar Höyük (after Osten 1937a: pl. 17).

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massive disturbance of the site by later Iron Age settlers has, so far, made this impossible to substantiate in archaeological terms. If, however, we are to take this line of reasoning a little further, and we accept the linkage of the ox-dawn cart motif on specialized ceramic vessels with the cult of the Stormgod, it would suggest the possibility of a sanctuary located in this area of Alişar that might have been dedicated to such a deity.

One might argue that if we accept the equation of Alişar Höyük with the ancient Hittite city of Ankuwa, we might posit a connection between the Mansion and the goddess Kataḫḫa who is known to have been the patron deity of that town (Ünal 1980: 477–78; 1984: 87–107). The prominence of her cult in the city of Ankuwa might lead us to believe that any temple or cultic area found at Alişar would most likely have been dedicated to her.[27] Hittite texts from Boğazköy show, however, that several Weathergods were also worshipped in Ankuwa, among which was the Weathergod of Zippalanda and the Weathergod of the Rain.[28] Thus, based on our previous discussion, it is plausible to understand the presence of the relief sherds on the Alişar terrace as indicating the approximate location of an artifice dedicated to some manifestation of the Weathergod.

In the end, if Alişar can be equated conclusively with Ankuwa, the Mansion may well turn out to have housed the worship of other deities,[29] although the Weathergod remains the most likely candidate for its primary occupant. A temple for the Weathergod in the vicinity of the Mansion would not, however, exclude the possibility of a temple dedicated to a patron deity such as Kataḫḫa on another part of the terrace or, more likely, on the ravaged citadel mound.[30] It is also conceivable, on the other hand, that Kataḫḫa could have shared a temple with this

27. A temple is attested for Kataḫḫa at Ankuwa in an AN.TAḪ.ŠUM festival text (KUB 11.27 vi 3′).

28. A Rain Festival was known at Ankuwa to which this particular deity may have been connected. See KUB 30 73 (NH colophon for AN.TAḪ.ŠUM Festival) and KBo 22.214 (colophon). For more on the Rain Festival, see Ünal (1984: 102–3), and more recently Jakob-Rost (1990: 35–39). Other deities known to have been worshipped at Ankuwa include Ištar (Šaušga) of the fields (KUB 27.1 ii 49), the Stormgod of the Heavens (^{d}U AN^{E} KUB 11.27), Stormgod of the houses (^{d}U É^{TIM}), the Sungod of the Earth of Ankuwa (KBo 34.203 iii 11′, Zawalli, divinity of Ankuwa (KUB 5.6 ii 65–57), and a variety of other general gods (for a complete list, see del Monte and Tischler 1978: 21–22; 1992: 6–7).

29. The *ḫalentuwa*, a building now understood to be a "palace" or "residence," is known to have housed multiple temples. Puhvel notes the appearance of *ḫalentuwa* in ritual text KUB 32.13 ii 3 (1992: 15–19) as the equivalent (ibid., I 2) of the Hurrian word *ḫikkali* (Ugr. *hkl* , and Heb. *Hēkal*) which translates as "palace"; also see Popko's description of the *ḫalentuwa* as a residence (1994: pp 18 ff. and 24 ff.). For examples, see KUB 11.34 vi 51–52, *INA* É ^{D}IM URU *ḫalen*[*tu*]*waš* É.DINGIR.MEŠ-*ya ḫūmandaš*, in the temple of the Stormgod and all the temples of the *ḫalentuwa*; KUB 30.34 iv 4–5, *kinuna* ^{É}*ḫalinduwaš* É.DINGIR.MEŠ-*ya parkunut*, and now he has cleansed also the temples of the *ḫalentuwa*: KUB 30.34 rev. 7–8, *nu ēšḫananza linkiyaz* ^{É}*ḫalinduwa* É.DINGIR.MEŠ *lē ēpzi*, may bloodshed [and] perjury not seize the temples of the *ḫalentuwa*. Also see Puhvel (1992: 19) where he notes that in this context the habitual plural is significant. Also see Singer (1975: 65–84; 1983:111–12).

30. Once again, this can not be substantiated by archaeological finds because the citadel at Alişar was much disturbed by the later Iron Age occupants who leveled the top of the mound for their new constructions. Very few remains dating to either the Hittite Old Kingdom or the Hittite Empire have been preserved from the citadel. The discovery of the Old Hittite relief sherd mentioned above in G 8, however, provides evidence of at least a Hittite Old Kingdom settlement on the citadel mound. Empire period biconvex seals found in association with the citadel walls point to an even later thirteenth century settlement (Gorny 1993: 163–91).

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Weathergod[31] and that relief-ware vessels come from activities held in a building with a double adyton such as is suggested for Temples I and V at Boğazköy (Bittel 1970: 57). We hope that future excavations will help to clarify this situation.

31. It has been suggested, in fact, that Kataḫḫa was the consort of the Weathergod of Zippalanda, making the suggestion of a multiple adyton more appealing (see Popko 1994: 30, 35). It should be noted however, that KUB 11.27 vi 1′–7″ seems to indicate that the temple of Kataḫḫa was separate from the *ḫalentuwa* and apparently existed as an entity unto itself.

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11

EARLY BRONZE AGE II–III PALESTINIAN CYLINDER SEAL IMPRESSIONS AND THE NORTH CANAANITE METALLIC WARE JAR

Raphael Greenberg

More than two decades have passed since Ben-Tor's pioneering compilation and discussion of Early Bronze Age (EB) Palestinian cylinder seals and sealings (Ben-Tor 1978). During this time, the number of glyptic finds has more than doubled, and the number of flat-carved geometric and cultic seal impressions of the EB II–III—included in Ben-Tor's Classes I and III—has increased fivefold, approaching a total of 250 (e.g., Lapp 1989; Esse 1990; Ben-Tor 1992, 1994; Mittmann 1994; Greenberg 1996, forthcoming). Nonetheless, the following fundamental issues left unresolved by Ben-Tor have not been systematically addressed: (a) The chronology of the EB II–III seal impressions has not been refined; (b) their function has not been ascertained; and (c) their specific provenance has not been established.

New evidence presented since 1974, when Ben-Tor's corpus was compiled, casts important light on issues *a* and *c*. As for issue *b*, the question of function, the solution seems tantalizingly close at hand. The key to all three issues is the understanding that seal impressions are not artifacts in themselves; each different seal-impressed sherd represents the jar or pithos to which it was affixed. It is these vessels, nearly always identifiable as northern Canaanite[1] metallic ware jars or pithoi, that comprise the subject of the following pages.

CHRONOLOGY

It is a curious and significant fact that, to date, not one cylinder seal impression of the EB II–III (Classes I, III) can be associated with a complete vessel, nor even with a rim. Thus, ceramic morphology offers little in the way of chronology, and dating relies largely on other considerations, such as ceramic fabric and stratigraphic context (insofar as stray sherds may be dated by their context). Recent finds appear to provide ample evidence for the dating of the sealings to both EB II and EB III. Finds from well-defined EB II contexts come from Beit Yeraḥ (Esse 1990: 30–31), Tel Dan (Greenberg 1996: 149), and Qiryat Ata (Golani 1996; Greenberg forthcoming) as well as from sites that were abandoned before the onset of EB III (e.g., Tel Kinnerot—Fritz 1990: 23–24; Beit Ha ʿEmeq—Beck 1976; Givon 1993). The very large collection of seal impressions from Khirbet ez-Zeraqun, representing more than one half of the entire corpus (Mittmann 1994), seems mostly to originate in EB III contexts and can be associated with pithoi common in Zeraqun EB III levels (although at least some

1. The term northern Canaan is used to denote the area currently comprising northern Israel, northwest Jordan, southeast Syria, and southern Lebanon. There are occasional finds from more southerly sites (e.g., Lapp 1989), but these should be seen as offshoots of what is fundamentally a northern phenomenon.

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seal-impressed sherds could be residual, from EB II strata thus far inferred only on the basis of finds in fills—H. Genz, pers. comm.).

The attribution of the seal impressions to both EB II and EB III conforms with what is known of the chronology of the vessels to which they were affixed. Metallic ware jars, thin-walled and no more than 60 cm in height, were produced mainly in EB II. Pithoi, thick-walled and 80–105 cm high, were produced both in EB II and EB III (Greenberg and Porat 1996); thus it seems quite likely that the production of the seals spanned the transition between the two periods.

Circumstantial evidence can be adduced to narrow the chronological range within EB II–III: numerous restorable pithoi representing the final phase of occupation at Khirbet ez-Zeraqun are consistently unsealed (with the exception of one jar, its rim removed, impressed with a unique variant of the cultic-type seals); of the 126 vessels represented by the Zeraqun sealings, only the one mentioned above could be even partly restored (H. Genz, pers. comm.). Two restorable late EB III pithoi, one at Hazor (Area A, L. 636) and one at Tel Dan (Area A, L. 18), are not sealed (Greenberg 1996: fig. 3.32:10; 1997: fig. II.4); the same is true of pithoi found at Beit Yeraḥ (E. Eisenberg, pers. comm.). It would thus seem safe to conclude that the seal-impressed vessels do not belong to the latest phases of settlement at these sites, but to a somewhat earlier phase. The lack of restorable sealed vessels in EB II strata at the above-mentioned and other sites could be attributed to (a) the generally small exposures excavated in this period; (b) the absence of EB II destruction layers at some sites (e.g., Tel Qashish); and (c) the apparently smaller number of seals produced in this period (assuming EB III Zeraqun represents the high-water mark of seal production and distribution).

Thus a gradual increase in the application of cylinder seals to metallic ware jars and pithoi may be posited, following their introduction in EB II. The use of sealings peaks in early EB III, then rapidly declines before the end of the period.

PROVENANCE

As cylinder seals were applied to the ceramic vessels before firing (but after the completion of all other aspects of vessel-forming, including pattern-combing), the provenance of the seals may be assumed to be identical to that of the jars themselves; and as the vessels to which virtually all the geometric and cultic impressions from northern sites were affixed were of metallic ware, studies of the provenance of such ware are pertinent to this discussion.

Petrographic studies of metallic ware, conducted by Naomi Porat and Yuval Goren, have shown that all analyzed metallic ware vessels from EB II–III contexts in northern Israel are comprised of a similar association of raw materials derived from Lower Cretaceaous formations which crop out from the Hermon foothills and the flanks of the Naphtali hills and northward, into Lebanon (Greenberg and Porat 1996). This would suggest that the seal-impressed vessels originated from ceramic workshops situated on the northern margins of the Hula Valley or northward (but not too far north, in view of the absence, so far, of Class I and III seals on metallic ware in Lebanon).

In order to confirm this attribution, Porat examined seal-impressed sherds with both geometric and cultic motifs from six widely separated sites in northern Israel, using petrographic and trace element analyses (these will be presented in a forthcoming report). The analyses demonstrated that sealed sherds from Tel Dan, Beit Yeraḥ, H. ʿEn Ḥor (near Ḥanita), Beit Ha ʿEmeq, Qiryat ʿAta, and Tel Qashish (figs. 11.1, 11.2) were all of similar Lower Cretaceous

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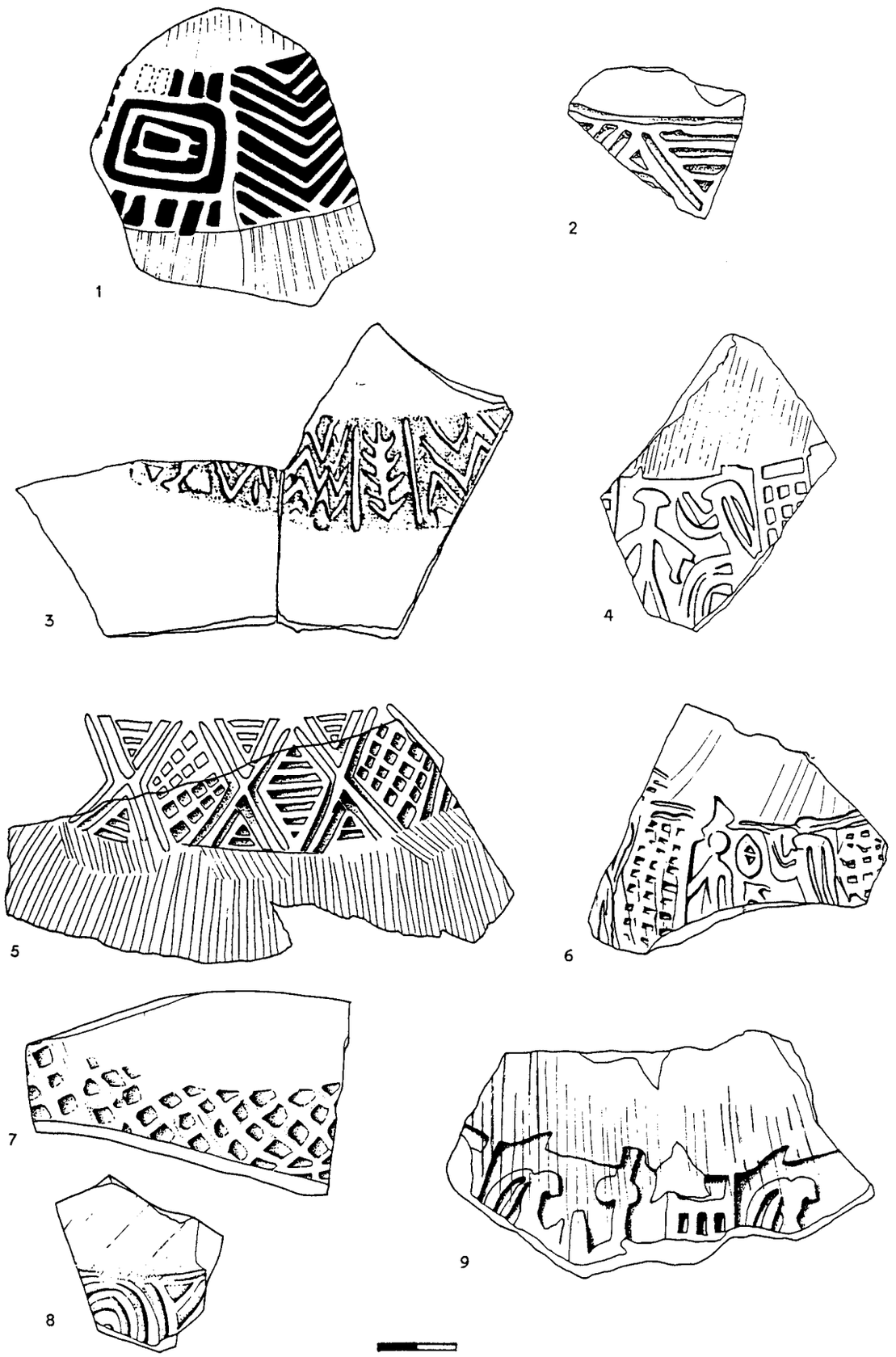

FIGURE 11.1. Selection of analyzed cylinder seal impressions of Classes I (1–3, 5, 7, 8) and III (4, 6, 9) from Beit Ha ʿEmeq (1–2), Tel Qashish (3–4), Beit Yeraḥ (5–6), and Tel Dan (7–9).

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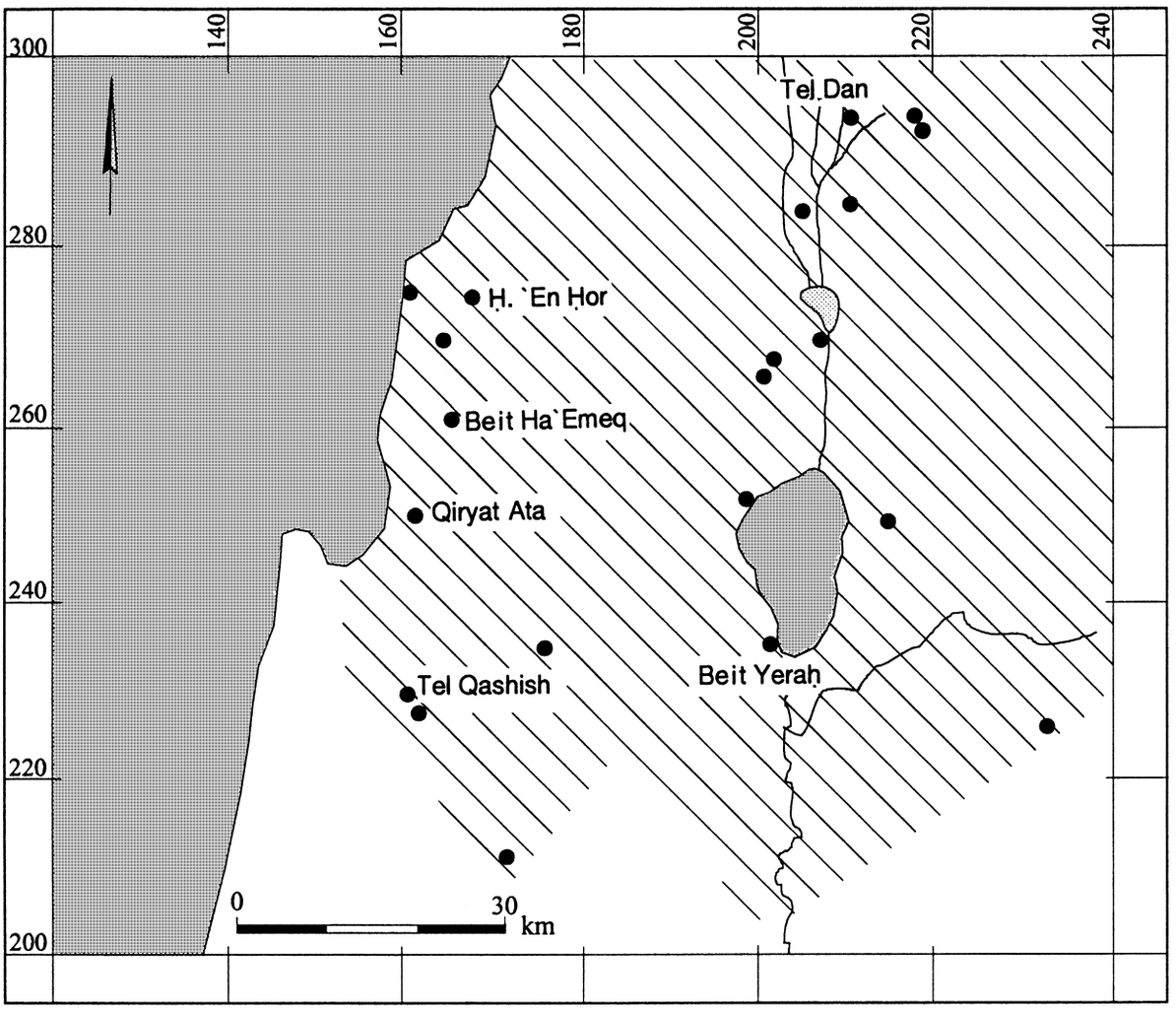

FIGURE 11.2. Map of northern Canaan showing area of intensive distribution of metallic ware and sites yielding Classes I, III cylinder seal impressions of EB II–III. [Hatching indicates the approximate extent of mass distribution of metallic ware; dots represent known findspots of EB II, III cylinder seal impressions (Classes I, III)].

clays and tempers. This again suggests a single zone of production for the sealed vessels. In view of the distance to the nearest plausible clay sources from sites such as Beit Yeraḥ (50 km, as the crow flies) and Tel Qashish (80 km), the suggestions regarding local production of seals in the Jezreel Valley (Ben-Tor 1992: 160) or by itinerant potters at Beit Yeraḥ and other sites (Esse 1990: 32*) no longer seem tenable. Figure 11.2 illustrates the congruence in the distribution maps of metallic ware and of Class I and III flat-carved cylinder seal impressions.

FUNCTION

The fragmentary nature of the evidence bars confident assertions about the function of cylinder seals. Nonetheless, with a corpus of more than two hundred sealings amassed over several decades, the question of function cannot be avoided.

At the purely technical level, the seal impressions usually served to mask and strengthen the join between the wheelmade neck and handmade body of the jars—a function often filled, in unsealed jars, by applied rope-decoration (e.g., Ben-Tor 1975: fig. 10:4, 5, 7, 8; Givon

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1993: fig. 15:2). In this, the sealed metallic ware jars differ significantly from their EB I forerunners (e.g., ʿEn Shadud and Megiddo—Braun 1985: figs. 34, 35) and their EB IV Syrian successors (Mazzoni 1984: 20; 1993: figs. 8–10), on which seals were applied either randomly or on the rim itself.

Beyond this technical aspect, the cylinder seal impressions may be assumed to have been related to some aspect of the economic role of the vessels. Past interpretations have attempted to associate seals either with the content of the vessels or with the circumstances of their manufacture (e.g., Ben-Tor 1978: 101–4; Mazzoni 1984, 1993; Esse 1990; for discussions of similar problems in Cyprus, the Aegean, and the Near East, see Webb and Frankel 1994; Aruz 1994; Pittman 1994). These approaches must be reexamined in light of the identification, presented above, of a single zone of production for the seal-bearing jars. Fundamental to whatever approach is taken is the recognition that no regular pattern has yet emerged in the distribution of either geometric or cultic motifs, nor any predictable association of specific motifs with specific sites. Even among the 126 different sealings at Zeraqun, the vast majority are types well known from other sites in northern Canaan, and only a small number of new types have been identified (Mittmann 1994:15; H. Genz pers. comm.). This can only mean that all the motifs conveyed a limited, fixed set of meanings, universally understood at all sites, and lacked connotations specific to the sites and contexts in which they were recovered.

Insofar as the issue of content is concerned, the sealing of the pot could (a) indicate standardization of volume, (b) comprise an a priori dedication of specific pots for a specific type of content (best wine, temple oil, priest's tithe, and the like), or (c) have a general protective intent. The central production of the seal-bearing jars would indicate the existence of either a central authority commissioning the seals and controlling weights and measures (for possibility *a*, above), or—what is more likely—a high degree of cultural uniformity and integration, permitting the widespread use of similar symbols to denote similar functions at each site. There is no evidence yet for a central store for sealed jars, or for the ingathering of vessels to a specific site.

lf considered as a potter's device, the seals may be understood as trademarks of different ateliers in the zone of production. This may well explain their wide and apparently random distribution and accords with their consistent functional application at the neck-rim join; yet it leaves unanswered questions such as why most vessels (including all restorable jars found to date) were not decorated, and what would have been the relation between potter's seals and the potter's marks found on many metallic ware vessels, including jars (e.g., Givon 1993: fig. 15:1; Greenberg 1996: fig. 3.27:12).

To complicate the issue further, the function and significance of the seal impressions may have changed over time, in tandem with shifts in the contexts of pottery production between EB II and EB III. In EB II, northern Canaan manifests features of a centralized scale economy: within a cultural *oikumene* that embraced settlement patterns, architecture, and various aspects of material culture, the pottery industry looms large, with great quantities of metallic ware bowls, platters, vats, jugs, jars, and pithoi being exported from workshops, possibly in the vicinity of Mt. Hermon, to points as far as Beit Ha ʿEmeq and Tel Qashish (see Greenberg and Porat 1996). The affixing of seals to EB II metallic ware *jars*, which could be transported with their contents, might have been commissioned by an agent of authority with the purpose of marking the content of the jar. Under this configuration, the significance of the sealing could be understood in a manner similar to that suggested with regard to central stores, such as those

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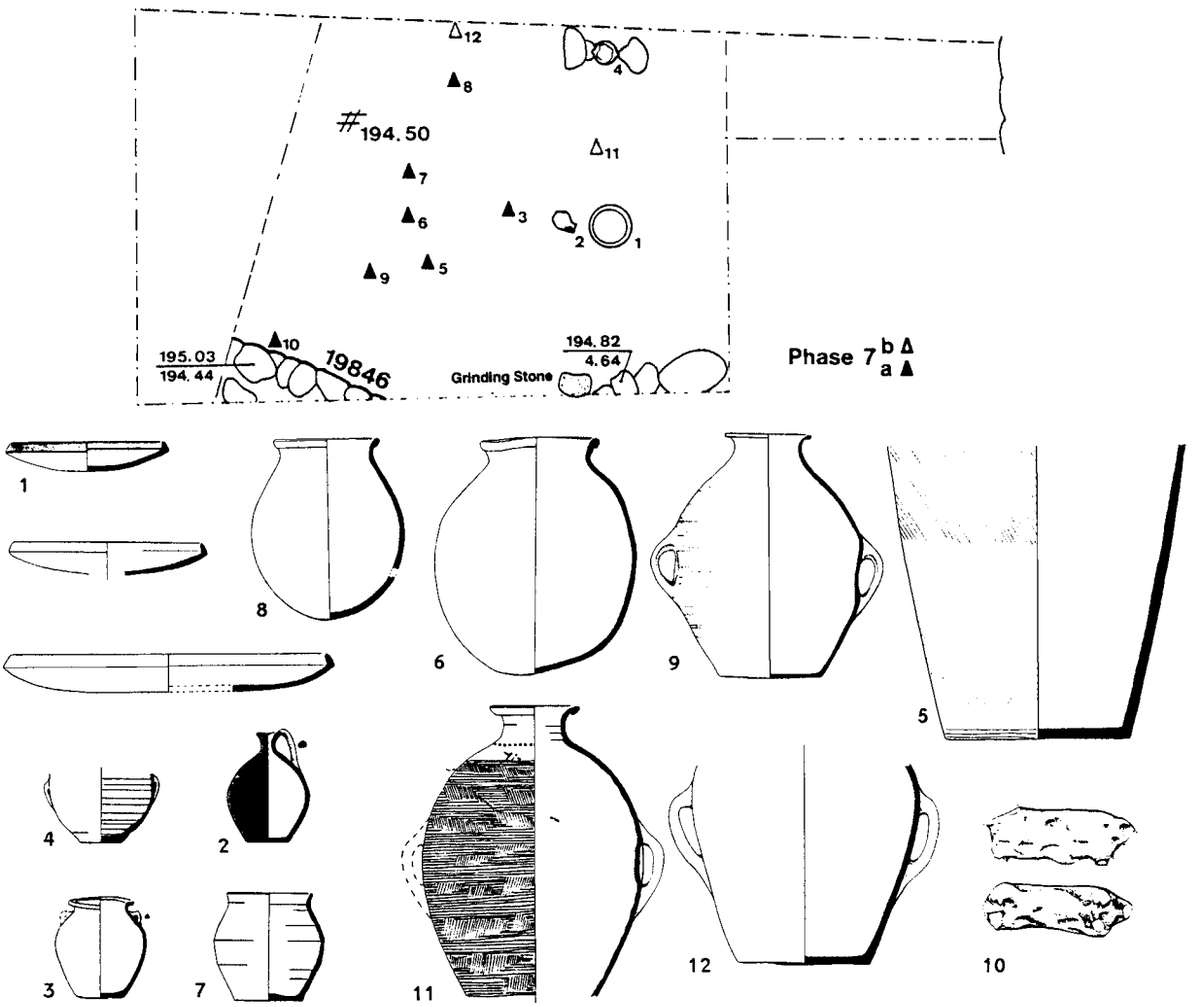

FIGURE 11.3. Plan and contents of presumed kitchen at Tel Dan, Phase B7 (EB II); No. 5 is the lower portion of a pithos.

found at the Ebla palace (Mazzoni 1984), or, to cite a later example, the *lmlk* jars of Iron Age Judaea (Naʾaman 1986).

Metallic ware pithoi, however, had no role in interregional or international trade in perishables. As far as we know, these cumbersome handleless containers were intended mainly as household installations: ubiquitous, yet rarely found in groups. Their function within the household is illustrated by part of an EB II kitchen excavated at Tel Dan (fig. 11.3). The symbolic import of seals applied to pithoi has to be understood in the context of the specific sites where each pithos was located (cf. the seal-impressed cooking pots found at Ebla—Mazzoni 1993: 407). In such contexts, the sealings either conveyed a message regarding the content, setting it apart from that of other containers, or served to identify the manufacturer of the vessel itself. The difference may be visualized in modern terms as that between the label on a mineral water dispenser and the label on a refrigerator.

The onset of EB III marked the end of metallic ware's virtual monopoly of the ceramic repertoire in northern Canaan. Sites characterized earlier by a uniform ceramic assemblage began to show greater diversity. At Hazor, for example, several independent and nearly contemporaneous ceramic traditions are attested: (a) common ware bowls, platters, jugs and jars,

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produced in techniques similar to those of the earlier period, but in a coarse, soft-fired fabric often covered with a peeling red slip (Yadin et al. 1961: pl. 154:11–16); (b) Khirbet Kerak ware, clearly introduced by potters of Syro-Anatolian descent, used for small bowls, kraters or large jugs, and stands (Yadin et al. 1961: pl. 155:1–3; Greenberg 1997: figs. III.2:9–12; III.4:12–22); (c) metallic ware, limited to jars and pithoi (Yadin et al. 1961: pl. 154:17; Greenberg 1997: figs. II.3:15; II.4); (d) wheelmade ware: bowls, jugs, and bottles reminiscent of Syrian EB IV forms; (e) imports, apparently from the Lebanese coast (the latter two groups are described in Greenberg 1997: 21–24).

This diversity appears to be linked to a more sophisticated, cosmopolitan urban phase, marked by more pronounced social ranking. The metallic ware workshops, forced to compete for their share in the market, abandoned the broad range of ceramic production and concentrated on the single item in which their advantage was preeminent—the meter-high pithos. From the manufacturer's point of view, the decoration of these items with cylinder seals was intended either to enhance their value or to set apart the various metallic ware workshops. From the consumers' point of view, the marked pithoi may have been acquired in increasing quantities to answer the needs of an incipient bureaucracy, as the storage and redistributive functions of the urban centers gained in importance (cf. the pithos storerooms recently excavated in the Tel Yarmuth palace: Miroschedji 1994: 148–51).

However, the conditions that led at first to the increased use of metallic ware pithoi might have been the ultimate cause of the demise of cylinder seal production. The symbolic "language" of the cylinder seals, universally appreciated in EB II, would not have had the same broad appeal in the socially and ethnically fragmented EB III. As the production and distribution of the broad range of metallic ware declined and, with it, the prestige of the metallic ware ateliers, the cost of supporting both specialist potters and seal engravers might have become prohibitive. Local workshops began to produce pithoi of a lesser quality on their own, and the metallic ware market slowly contracted to the immediate environs of the original workshops—hence the discovery of restorable undecorated metallic ware pithoi in upper Jordan Valley sites, and of common ware pithoi at sites farther to the south (Megiddo, in which no Type I or III seal impressions have been found, being a case in point). This ended the remarkable conjunction of the two highly specialized crafts of seal carving and pithos production.

CONCLUSION

To sum up, the use of geometric and cultic cylinder seal impressions on Canaanite metallic ware jars was initiated in EB II by the metallic ware ateliers in the region of Mt. Hermon, perhaps as a means of controlling the movement of specific goods (on small jars), or as a symbol referring to content or locus of manufacture (on jars and pithoi). Their broad and apparently random distribution, closely matching that of the metallic ware repertoire in general, is illustrative of the broad appeal and universal appreciation of their symbolism and could be construed as a metaphor for a high degree of social and ideological solidarity in northern Canaan at this time. By EB III the principal use of the seals appears to have been as a label on widely distributed metallic ware pithoi. As the demand for these vessels dropped toward the end of EB III, the production of seals of the geometric and cultic type ceased.

By way of an epilogue it is noted that both Canaanite cylinder seal production and application to jars, as well as the metallic ware technique, survived into EB IV, taking varying

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trajectories. Among the former, the Class II animal-file seals continued to be used, appearing on EB III vessels at Numeira (Lapp 1989: fig. 7), at Byblos, and on a probable Byblite import at Giza (Ben-Tor 1978: 69–79), as well as on an EB IV jar at Beit Yeraḥ (Bar-Adon 1973); metallic ware metamorphosed into the ubiquitous "combed ware" found in southern Canaan in late EB III and all along the Syro-Lebanese coast throughout EB III and IV (Mazzoni 1986: 152). Their brief joining of ways in EB II–III northern Canaan remains a fascinating episode, whose full significance continues to elude us.

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12

TOMBS, CULT, AND CHRONOLOGY: A REEXAMINATION OF THE MIDDLE BRONZE AGE STRATA OF MEGIDDO

RACHEL S. HALLOTE

INTRODUCTION

While the ceramics of the Middle Bronze Age (MB) tombs of Megiddo have often been used to date the architectural strata of the site, the tombs themselves, and their placement under floors of houses, have seldom been scrutinized. A careful examination of the tombs and the architectural strata with which they were associated will lead to several conclusions about the dating of the Megiddo strata and about cult in the MB.

Megiddo has always stood out in the archaeology of the southern Levant as a site of great importance. Because of its location, historic significance, impressive cultural remains and complex history of excavation, modern scholarship has had cause to carefully examine the site. Megiddo has been excavated several times, from the German work of the early twentieth century (Schumacher 1908; Watzinger 1929), to the current joint Tel Aviv and Pennsylvania State University excavations, with the University of Chicago's formative work in between (Fisher 1929; Guy 1931; Engberg and Shipton 1934; Lamon 1935; May and Engberg 1935; Guy and Engberg 1938; Lamon and Shipton 1939; Loud 1939, 1948), as well as Yadin's smaller-scale explorations (Yadin 1970). The result of so many different expeditions, each with its own methodology, has produced complicated reconstructions of the ceramic and architectural sequences.

Kenyon's attempts to clarify the ceramic sequence of the Bronze Age strata (1958, 1969) succeeded in fine-tuning some aspects of these periods that were left cloudy by the main Chicago publication (Loud 1948), but ultimately her work led to many more questions and conflicts. The approach suggested here may help in sorting out both the chronology and the content of the strata. Instead of tackling the issues through traditional ceramic and architectural studies once again, the approach to be taken here is more oblique and only involves one period, MB, ca. 2000–1550 B.C.

This approach reexamines the contexts of the tombs excavated in the MB levels of the Chicago excavations. The presence of the tombs, coupled with the lack of any temple structure in these levels, suggest that private religious rituals, including those relating to death and burial, temporarily superseded public temple worship. We begin by stating some questions that have been raised, but only partially solved, by previous scholarship on the site. For instance, what was the chronological extent of the temple sequences of Area BB? Was the transition from the MB to the Late Bronze Age (LB) abrupt or smooth at Megiddo? Why did Loud treat the tombs found on the tell as if they were simple stratigraphic remains, and why, in refining the pottery sequence from the site, did Kenyon specifically utilize the tomb

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materials, even while acknowledging that their dates relative to the strata needed rethinking? The answers to these related questions suggest a connection between the gap in the temple sequence and the abundance of tombs in domestic areas.

THE LACK OF A MIDDLE BRONZE AGE TEMPLE IN AREA BB AND THE SMOOTH TRANSITION FROM THE MIDDLE BRONZE AGE TO THE LATE BRONZE AGE

The first question involves the temples of Area BB, Temple 4040 of the Early Bronze Age (EB) period, and Temple 2048 of the LB. Loud was the first to assume that a now lost MB temple once existed, based on the evidence of the earlier and later temples, and also based on the presence of a group of standing irregular monoliths in Stratum XII (Loud 1948: 92). The possibility of a missing MB religious structure was taken up in various forms by Kenyon (1969) and Thompson (1970). Yet when the preconception that an MB temple should exist is laid aside, one can recognize that a public cultic structure was not as necessary as it had been in the preceding periods and would be again in the following periods. In fact, the religious practices of MB demonstrate a cultural discontinuity that is also visible in many aspects of the material culture of the southern Levant ca. 2000 B.C. (see Gerstenblith 1980, 1983). At Megiddo as well as at other sites, public religious architecture was temporarily replaced due to a privatization of religion which was physically represented by the placement of tombs within domestic structures.

Although EB Temple 4040 and associated Altar 4017 appear in the Chicago plan of Stratum XIV (Loud 1948: fig. 395), they had already gone out of use. The date of this complex has been argued over repeatedly. Kenyon suggested that it belonged to the EB IV/MB I period, her architectural phase G, and that it continued in use through Phase K and ceramic group B of the MB IIB period and was abolished by Phase L (see table 12.1). Others have dated it to the MB IIA period. However, in a discussion of some small-scale excavations at Megiddo, Dunayevski and Kempinski (1973) demonstrated that this temple fits firmly into the Early Bronze Age, as did Esse (1991: 87–89). Contrary to Kenyon's suggestions, the structure was probably no longer standing in the Middle Bronze Age.

Because it was such a substantial complex, some of its ruins were almost certainly still visible during the next period of settlement, either as an abandoned mound or possibly as an organic place of worship.[1] The plan of Stratum XIV (MB IIA) depicts the interior of the temple as partially filled in (Loud 1948: pl. 395). Rather than implying a separate phase of use, this stage could represent the preparations for rebuilding the area, which was becoming predominantly domestic. By Stratum XIIIA even the southern part of square N13, where the temple had been located, contained walls of domestic units. Thus, while 4040 was probably recognized as a former temple in MB IIA, it was in a ruined state and almost certainly was not used as an official place of worship.

Some past studies of the next temple, LB Temple 2048, have attempted to push its date into the MB (see below), so that there would not be a chronological gap between the last phase of 4040 and the first of 2048. This would mean that there was no break in Area BB as a temple area. Similarly, the presence of the irregular monoliths of Stratum XII has been used as an

1. Compare Jewish worship at the western wall of an ancient temple mount today.

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Table 12.1. Description of Kenyon's Megiddo Stratigraphy (Adapted from Kenyon 1969)

Date	*Stratum*	*Cultic features*	*Architectural phase*	*Ceramic group*
Post-ca. 1480 (Thutmosis III)	VIIA	Temple 2048	S	—
Gap	Gap	Gap	Gap	Gap
Late 16th century	VIIB	—	R	—
(Early LB)	VIII	—	Q	—
	IX	—	—	—
	X	—	—	H (including bichrome)
		—	—	G
MB IIB	X	—	P	F
	XI	Monoliths	O	E
	XIIA	Monoliths	N	D
	XII	Monoliths	M	C
	XIIIA	—	L	B
MB IIA–MB IIB	XIIIA	Temple 4040	K	A
MB IIA	Later than XIIIB	Temple 4040	J	—
EB IV/MB I	XIIIB	Temple 4040	—	—
	XIV	Temple 4040	H	—
	XV	Temple 4040	G	—

argument for a lost temple structure. However, a reexamination of the evidence does not support these interpretations.

Kenyon was the first to propose the now accepted idea that the "ghost walls" of 2048, which appear in Stratum IX (Loud 1948: fig. 401) were only foundations dug into this earlier stratum, which suggested that 2048 was not actually constructed until the LB period. She further suggested that there was a gap in the occupation of Megiddo due to the campaigns of Thutmosis III in the early LB II, and that 2048 was built only after occupation had resumed (Kenyon 1969: 49–53). Her classification of the Stratum IX walls as foundations dug down from a later level is accurate, but the notion of a gap must be questioned since the MB–LB transition is a rather smooth one, especially at Megiddo.[2]

Epstein's study of Area BB is helpful for understanding this transition (1965). Although she argued for an early dating of 2048, beginning in MB Stratum XII and continuing down through LB Stratum VIIB, her analysis still contains some important clues to the MB–LB transition. A problem in Epstein's discussion is that she relied heavily on the unpublished field

2. See Bunimovitz (1995: 322) on the continuity from MB to LB.

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Table 12.2. Chronologies of Megiddo

Stratum	*Features*	*Loud*	*Kenyon*	*Current proposal*
VII	Temple 2048	LB I	LB II	LB IIA
IX	—	MB IIB	MB IIB	LB IB
X	—	MB IIB	MB IIB	MB IIC/LB IA
XI	—	MB IIB	MB IIB	MB IIB/MB IIC
XII	Change in plan; standing monoliths	MB IIB	MB IIB	MB IIB
XIII	—	MB IIA	MB IIB	MB IIA
XIV	Absolute end of Temple 4040	MB IIA	MB IIA	MB IIA

diaries of the excavators, which she took at face value, even while showing that the published material should not be wholly trusted. In fact, the field diaries are somewhat anecdotal and asystematic for these periods and should not be used as reliably as they have been for later periods (cf. Esse 1992).

References in these diaries to what seemed to be dumps led Epstein to postulate an earlier temple, or an early phase of Temple 2048 in MB (Epstein 1965: 204–5, 208–9). However, she did not take into account the mixture of levels that took place due to the excavation techniques of the Chicago team. It is well known that the excavators were attempting to peel layers off a large area that was not built up in a manner suitable for such a strategy. The scale and speed of the project prevented a more detailed approach and led to some mixture of materials from different strata (see below). Furthermore, the ceramics of the loci that Epstein calls into question as possibly MB could instead comfortably belong in the MB IIC/LB I and LB I periods (Epstein 1965: 210–13; Loud 1948: pl. 235:20). Because she still followed the dating of the strata published by Loud, she did not recognize that Stratum X represents an MB–LB transitional phase, or that Stratum IX is solidly LB (table 12.2).

Within her discussion, Epstein points to the core of the issue for these strata. She acknowledges the continuity from Stratum XII all the way down to Stratum VIIA in Area BB but assumes that the change in plan that is first recognizable in Stratum XII is due to the establishment of Temple 2048 (Epstein 1965: 213). However, this new plan is actually due to the change from MB IIA (Stratum XIII) to MB IIB (Stratum XII), as seen in table 12.2. Following this architectural shift, there is a great degree of continuity visible in the plans of Strata XII, XI, and X, again suggesting that the transition from MB to LB is a smooth one. Similar observations can be made for these strata in Area AA.[3]

This MB–LB continuity has been discussed before for Megiddo as well as for other sites. When differences between MB and LB are suggested, they often have historical bases, not

3. The new excavations at Megiddo conducted by Tel Aviv University and Pennsylvania State University will most likely confirm the hypothesis of a smooth transition from MB to LB at Megiddo, particularly through the evidence uncovered so far from the northern lower terrace, Area F. This area, which had not been previously excavated, contains an apparently unbroken sequence of MB and LB remains.

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archaeological ones.[4] In fact, the only significant new feature found in Megiddo's Area BB during the MB and LB strata is Temple 2048, in Stratum VIII. At that point the western house complex had mainly gone out of use, although the structures to the east continued with little change. Thus MB and LB can best be distinguished from each other not by new settlement patterns, new houses, or new technologies, but by the reintroduction of public religious architecture.

THE MB TOMBS OF MEGIDDO AND THEIR ARCHITECTURAL ASSOCIATIONS

Since no large temple structure existed at Megiddo in the MB, it is logical to investigate whether or not religious rituals of the period can be discerned archaeologically in any other way. In fact, rituals were carried out in private, domestic contexts, not public, formal ones. The main physical manifestation of MB religion at Megiddo and elsewhere is funerary remains. A discussion of the tombs and their associated strata will underscore the importance of mortuary ritual in MB, which in turn will clarify the private nature of religious ritual.

There have been many discussions of Megiddo's MB strata and associated tombs. Kenyon (1958; 1969) formed a new interpretation of the published data by reconstructing the contents of all the tombs of the EB, MB, and LB periods and dividing their ceramics into her lettered groups (see table 12.1). She chose this particular approach to the site because she believed that there was more clarity in the ceramic assemblages of the tombs than in the ceramic assemblages of the settlement levels (Kenyon 1969: 25). This argument has been both criticized and defended in several debates which only further complicated the understanding of the site (see, for instance, Thompson 1970; Dunayevski and Kempinski 1973; Williams 1975: 906–51; Cole 1984; Bienkowski 1989; Kempinski 1989). One of the main contributions of Kenyon's work was the division of the MB tombs into the eight ceramic groups, the first of which represents the MB IIA period, and the following seven, the MB IIB period. Kenyon's results have been indispensable to ceramic studies; however, her overseparation of the material has not assisted in understanding the MB of Megiddo as a whole.[5] Kenyon tended to view the ceramics in isolation and only looked at their architectural contexts after completing her typology. This omission of contexts from the most important sections of her two studies led to errors in the reconstructions of architectural phases, which she based on the dates of the tomb ceramics alone (Kenyon 1969: 43–60). We now attempt to reunite the MB tombs with their contexts.

Megiddo is one of many examples of a southern Levantine site where burials are commonly found under the floors or courtyards of domestic structures. The tombs of the tell (as opposed to the shaft-and-chamber tombs on its slopes) include masonry constructed tombs,

4. See for instance Weinstein 1981. Weinstein examines sites where there are no destructions dating to the reign of Ahmose, only destructions dating to Thutmosis III. These sites, as well as some others that he did not list, not only do not have a gap in occupation between MB and LB, but also demonstrate the direct continuity described for Megiddo. Additionally, he lists a separate group of sites with destructions and gaps at the time of Ahmose—the MB–LB transition. Thus the destructions and changes of culture that took place did not occur all at once, but rather spanned a long period of time. For further discussion of the end of the MB in archaeological and historical terms, see Bienkowski 1989; Dever 1990; Hoffmeier 1989, 1990; Bunimovitz 1995.

5. Kenyon divided the MB pottery from the Jericho tombs into similar groups (see Kenyon 1960, 1965).

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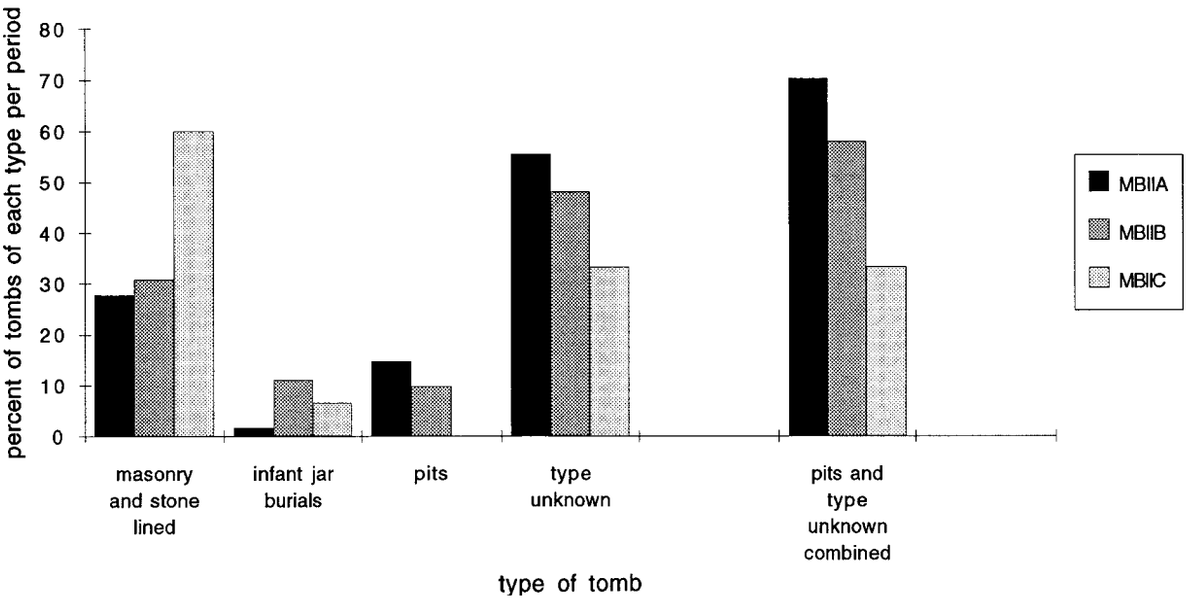

FIGURE 12.1. Frequency of tomb types by period.

simple pits, stone-lined pits, and infant burials in store jars (see Hallote 1994: 191, 240–54; Ilan 1995: 122). There are a total of 150 burials published in Loud 1948 that date to MB, spanning Strata XIV through X. Of these, fifty-four date to MB IIA, eighty-one to MB IIB, and only fifteen date to MB IIC. In many cases, the information on both burial type and number of individuals interred in each tomb was not properly recorded and can only be reconstructed through the photographic and negative records, published and unpublished, which themselves are not complete. Often no information is available at all. Therefore, burials of unknown type account for 56%, 48%, and 33% of the burials of MB IIA, MB IIB, and MB IIC respectively. It is likely that most of these were simple pits. Figure 12.1 compares the frequency of tombs of each type by period. Figure 12.2 suggests that the majority of the sixty burials for which this information was available were single inhumations, while fig. 12.3 represents the breakdown of burial by age for the same sixty burials.

A key characteristic of the MB burials at Megiddo and contemporary sites is their placement under the floors of houses. Although this crucial fact was even recognized by Kenyon (1958: 59), she downplayed it in her chronological reconstruction. The fact that these tombs were under floors was never given sufficient attention before now, partly because of the lack of precision in the excavation mentioned above (Loud 1948: 1). The series of floor levels usually found in domestic areas in use for long periods was built up very slowly, with minimal architectural changes of significance. Houses probably stayed in use for generations, with walls removed, replaced, or added gradually during the centuries of occupation. Therefore, when the Chicago excavators of Megiddo attempted to "peel" the strata off the various areas of the mound one at a time (Fisher 1929: xi), they removed what they considered to be the entirety of the latest MB IIA phases. In doing so, they inadvertently removed walls that were in use for many consecutive phases. After the removal of most of the walls, all that remained of the lower, earliest MB IIA phases were scraps, such as those that appear in the plans of

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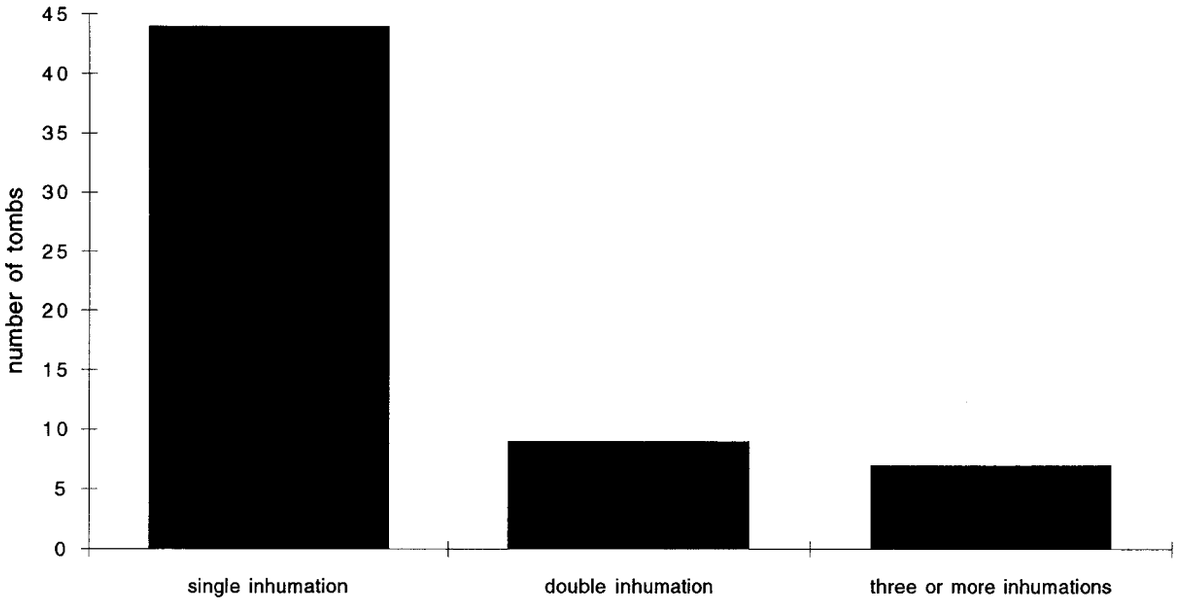

FIGURE 12.2. Proportion of single vs. multiple inhumations.

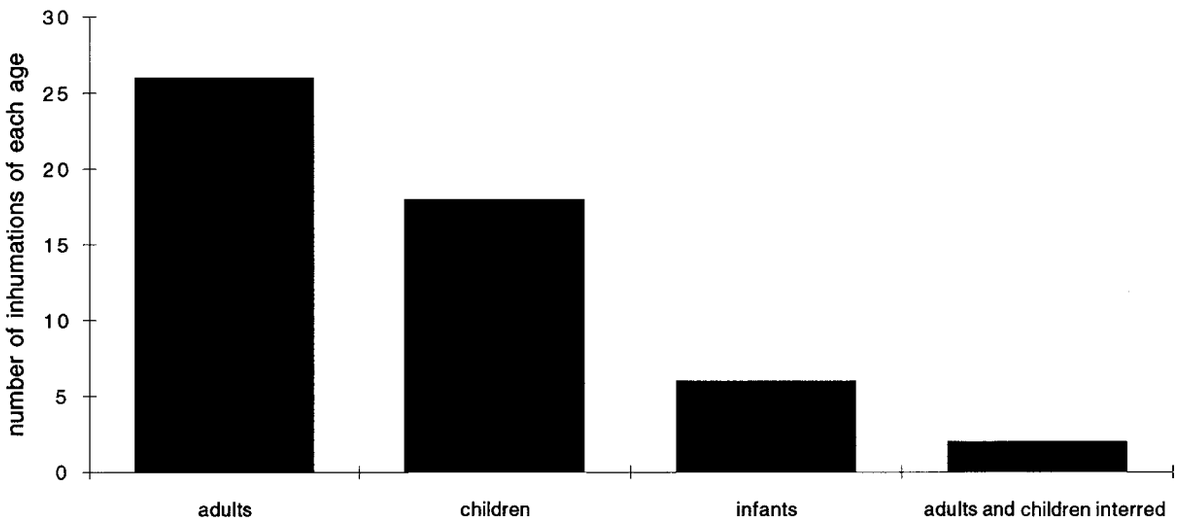

FIGURE 12.3. Age of inhumations.

Strata XIV and XIII B (Loud: pls. 395, 396). This often makes associating individual tombs with specific structures and floors impossible.

However, it is clear from sites throughout the Levant that tombs were commonly dug into floors of the domestic structures that were concurrently in use (see Hallote 1994: 51, 61; see also Ilan 1995: 124; 1996). Like the houses, these tombs were probably reused for several generations. It is likely that the floor levels of the rooms would rise, but the openings to the tomb shafts would remain at least partially visible (see fig. 12.4). Therefore, in archaeological terms, these tombs are contemporary with the floors above them, the very floors that appear to be cut by their shafts.

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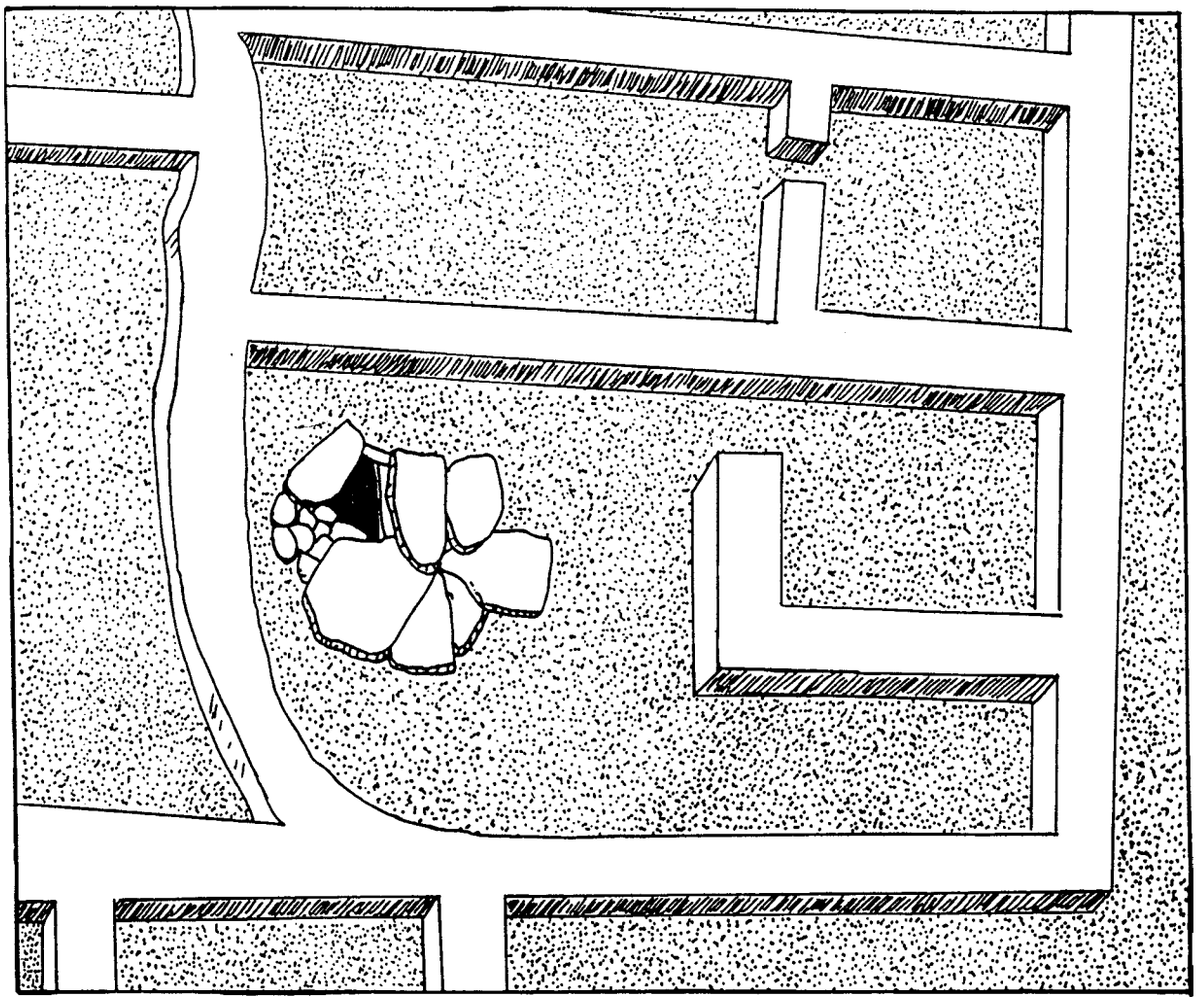

FIGURE 12.4. Plan of Megiddo Tomb 3070. (Adapted from Loud 1948: fig. 400.)

Kenyon understood that the Megiddo excavators should not have associated tombs with the floors on which they sometimes rested. But while she acknowledged that tombs were placed beneath houses, she did not recognize the probability that they were sealed by floors of their own period. She therefore used burials only as termini post quem, and because of this concluded that the architecture of Stratum XIV was pre–MB IIA (EB IV/MB I) and that Stratum XIIIA included early MB IIB material (Kenyon 1958: 60; 1965: 49).

She even suggested that in MB IIA, Area BB consisted of a cemetery surrounding an MB IIA version of Temple 4040 (Kenyon 1969: 43). She based this on a locational analysis of the MB IIA tombs relative to each other and to the temple mound. This analysis ignored the relationships between tomb locations and the architecture of the strata to which the tombs had been assigned since her assumption was that the assignations were incorrect. Kenyon was misled by the absence of the walls that had been peeled off the earlier MB IIA levels, which caused the loss of their associations with several different phases.

The best surviving features of these first phases of MB IIA are the burials themselves, which were placed under the floors of the houses and therefore remained untouched and unaffected by renovations. Since they were beneath the floors, they also were not displaced by the

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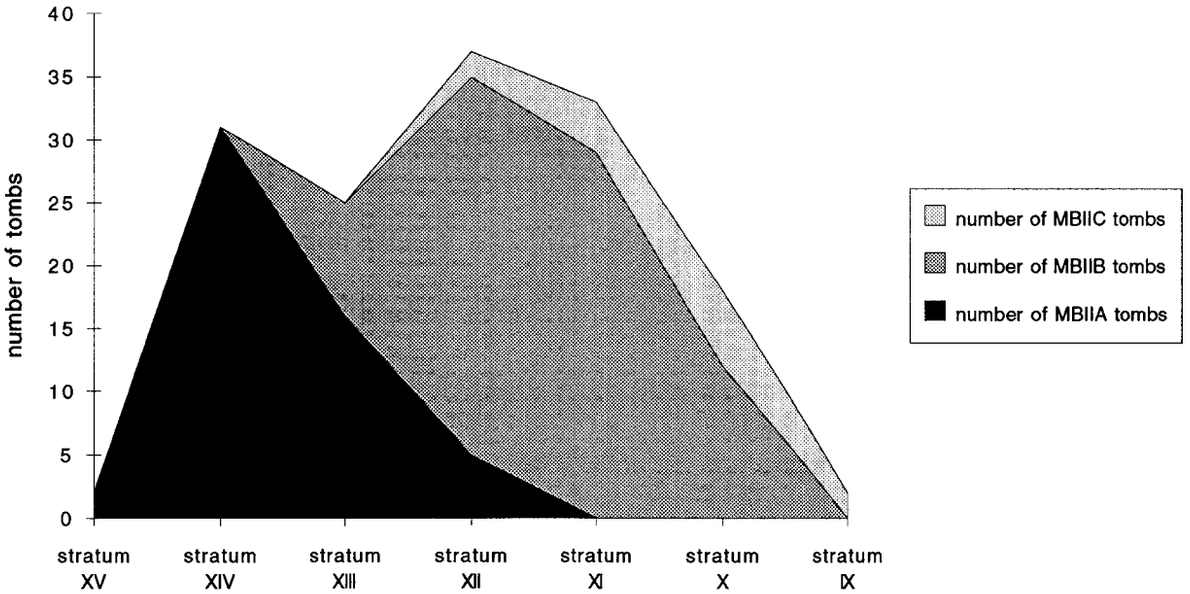

FIGURE 12.5. Numbers of MB IIA, MB IIB, and MB IIC tombs in each Megiddo stratum.

excavators' removal of the associated walls and upper layers of floor plaster. The number of undisturbed burials, combined with the amount of disturbed architecture, is what led Kenyon to postulate a cemetery in the area in Stratum XIV. A closer look at the situation reveals that the MB IIA tombs of Stratum XIV are all near walls or wall fragments, that is, under floors of rooms, near the walls. In Strata XIIIB and XIIIA, where the architecture is less scrappy, many of the tombs are clearly within rooms. Stratum XIV includes only MB IIA burials, while Stratum XIII includes a few burials of the early parts of the MB IIB as well (see fig. 12.5; also see Loud 1948: figs. 395–97). Since it is clear that the custom was to place tombs in houses, under floors that were concurrently in use, it is likely that Strata XIV and XIII were MB IIA strata and that they consisted largely of domestic areas in Area BB. The MB IIB strata can be viewed through the means of a similar analysis and include Stratum XII and part of Stratum XI.

THE CULT OF THE DEAD IN THE MB SOUTHERN LEVANT

In order to understand the connection between the two topics discussed so far— the lack of an MB religious structure at Megiddo and the presence of tombs in domestic contexts—it is necessary to view the tombs of Megiddo as a subset of the larger topic of funerary practices of the MB southern Levant, which in turn is part of the even larger issue of MB religious activities. Instead of concentrating on the numerical and statistical aspects of tombs, they can be viewed more productively as evidence of culturally specific symbols, parts of rituals relating to death (Metcalf and Huntington 1991: 62–75). It has been pointed out that the burial represents only the middle section of a funeral since rituals relating to death and mourning may well have preceded and followed the interment (cf. Bartel 1982). Yet the burial is the only feature of these death rituals that is visible archaeologically. Specific applications of mortuary archaeology and theory to the MB southern Levant have been dealt with elsewhere (Hallote 1994, 1995). What is important here is the recognition that ceremonies and rituals relating to death,

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including the burial itself, were significant cultic activities, not only in the Middle Bronze Age, but in the preceding and following periods as well.

By the Iron Age, death related rituals had been solidified into a "cult of the dead" that is known from both biblical and Ugaritic sources. The manifestations of this cult have been described most recently by Bloch-Smith (1992; see also Brichto 1973). Most of its features can be traced to the Middle Bronze Age if not to earlier periods. These features include the offering of sacrifices to the dead, the related practice of feeding the dead, burial in one's hometown or city, and burial on land associated with family or ancestors, often in family tombs (Bloch-Smith 1992: 119–27, 148–50). Bloch-Smith has suggested (1992: 131) that family and clan loyalties were strong enough to lessen the influence of the central government, and that in response to these loyalties, the eighth and seventh century reformers of the Monarchy attempted to abolish the cultic practices that emphasized clan, including the cult of the dead.

It is quite possible that this cult originated in the Middle Bronze Age. For example, by the MB, the practice of feeding the dead was a regular feature of burials. Almost every burial included food and drink, as well as non-edible offerings. Similar offerings have also been found in the EB and even earlier tombs, but another, more striking feature of the MB tombs in light of the Iron Age textual material is the probability that they contained family groups. A typical MB burial, in either a cemetery or a domestic area, consisted of one to three individuals interred together. Occasionally a tomb would be reopened and another burial added. These burials do not represent nuclear families but rather several members of an extended kin group or clan who were interred together. Tombs, especially shaft tombs in nondomestic contexts, occasionally would be reopened and burials would be added, presumably alongside those of ancestors or family members (Hallote 1994: 69–74).

Because of these similarities to the Iron Age cult, the treatment of the dead in the Middle Bronze Age can be understood as the beginning of the family-oriented worship that characterized that later cult. Although ancestor worship clearly existed in the southern Levant in different forms in earlier periods (cf. the Neolithic [Banning 1995: 4; Watkins 1992] and EB IV/MB I [Dever 1987]), the cult of the dead was able to flourish in a more significant manner in the MB because forms of individual clan worship temporarily overwhelmed public temple worship at this time.

We have already seen that no temple was present at Megiddo in MB Strata XIV through IX. During this same period, many tombs were placed under houses, and it is likely that they often visibly protruded above the floors into which they were set (see fig. 12.4). This day to day visibility suggests a daily consciousness of a specific religious ritual. The immediate presence of deceased family members, constant reminders of both beliefs and ceremonies concerning afterlife and death, had an active part in daily household life which was important enough to diminish the need for a large central temple. The frequent choice of domestic contexts for burial suggests that communal religion had been superseded by the cult of the dead and probably by other private rituals as well (Hallote 1994: 224–39).

This underdevelopment of public temple worship in the MB is not unique to Megiddo. In MB IIB southern Levant it appears that only local shrines existed, far away from the larger, important cities, and that true temples were not reinstated until the MB IIC–LB IA horizon. Worship in the MB seems to have been a family or household affair, and the cult of the dead was one of its most visible physical manifestations. It is likely that this cult propelled the

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household worship of the period and helped encourage familial and clan, rather than public and community, responsibilities.

When subjected to close scrutiny, most temples that have been classed as MB actually date to the MB IIC period rather than MB IIB proper and continue into the LB with only minimal changes. For instance, the temples at Hazor mainly date to MB IIC. The Double Temple of Area F dates to MB IIC, as well as the earliest Orthostat Temple, which begins in the MB IIC and continues with only slight changes into the LB I. The Long Temple of Area A continues with an unchanged plan from MB II into LB I, again demonstrating the continuity from the end of MB to the beginning of LB (Yadin 1972: 75–76, 96–98, 102–03). It appears that for the greater part of MB there were few if any temples at Hazor, which suggests that nonmonumental expressions of religion existed. Similarly, the High Place at Gezer dates to MB IIC. The temples at Shechem, the Migdal temple, and the Gerazim sanctuary nearby are also MB IIC structures (Dever 1971: 94–132; G. E. Wright 1965; Boling 1969: 82–103).

Shechem's casemate courtyard temple complex dates to MB IIB. However, this so-called temple is built on a domestic plan (G. E. Wright 1965: figs. 58, 64, and esp. 65). Although the scale is somewhat larger than traditional domestic architecture, the plan is certainly not one of a temple but better resembles an elite residence. In fact, it has previously been suggested that part of the reason that the structure was recognized as a temple was because of the later temple in the area (G. R. H. Wright 1968). This argument is augmented by features within the complex that belong to domestic, rather than religious structures, such as ovens and tombs (G. E. Wright 1965: fig. 64). In short, the area was not purely a religious precinct but was at least partially domestic, again suggesting that in the MB, domestic and private life briefly took precedence over religious and public life.

Among the few temples from the southern Levant that do clearly fall into MB IIB are the temple at Tel Kitan, and its counterpart across the Jordan River at Tell el-Hayyat (Eisenberg 1977: 77–81; Falconer and Magness-Gardiner 1984: 49–74; Falconer 1987: 251–59). These small temples, which are stylistically similar to each other, may well represent a specific regional phenomenon of the Jordan Valley, not the culture of the southern Levant as a whole.

The coastal sanctuary at Nahariyah is problematic. Ben-Dor dated the temple he excavated there to MB IIB (Ben-Dor 1950). Dothan suggested that a nearby structure slightly to the south predated the temple. Dothan dated the entire site to the "Hyksos" period, and its destruction to MB IIC–LB I, following Egyptian chronology (Dothan 1956). However, some of the ceramics Ben-Dor published are clearly MB IIA in character. It is therefore likely that the use of these structures spanned the Middle Bronze Age. Yet this sanctuary was small and had specific functions. Presumably it was dedicated to the worship of the goddess Asherah of the sea (Ben-Dor 1950: 1–41; Dothan 1956: 14–25). It was not a large public temple and does not indicate that there was a large-scale public forum for worship in this region.

Tel Kitan, Tell el-Hayyat, and Nahariyah can be understood as anomalous small sanctuaries representing individual regional variations. Similarly, the much discussed MB temple at Tell el-Dabʿa is located in Egypt's Nile Delta, not in the southern Levant, suggesting that, like the other regional temples, it does not represent the norm (Bietak 1981: 250–53). Except for these, all the known MB sanctuaries date only to the very end of the period and continue into the Late Bronze Age.

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A few other structures identified as small sanctuaries have been excavated recently. These include an MB IIA shrine at Kfar Shemaryahu (Gophna and Ayalon 1980: 149; Kaplan 1971: fig. 11), as well as structures at Tell Haror, Givat Sharet, Naḥal Rephaim, and Kfar Rupin (e.g., Oren 1993: 580;, Edelstein and Greenhut 1990: 120; Edelstein 1993: 1282). These have yet to be published sufficiently, and the specific dates within MB of many of them are still unclear. Additionally, these appear to be small, local shrines, often within domestic areas, implying household use rather than public use. This is clearly the case at Naḥal Rephaim (Edelstein and Greenhut 1990; Edelstein 1993). The presence of such small, private cultic structures does not undermine the current argument, but in fact demonstrates a second approach to family-oriented, rather than communal, worship.

The lack of emphasis on public worship described here seems not to be unique to the southern Levant. A similar phenomenon has been detected by Dabney and Wright (1990) for contemporary Middle Helladic (MH) Mycenaean society. Within the larger context of palatial society and state formation, they discussed how burial practices can reinforce allegiance to ancestors and can demonstrate a focus on individual power. In MH Mycenaean society, as in the MB southern Levant, cult centers and cult symbolism appear to be underdeveloped and seem not to be used as a means to control or unify the populace in relation to king and palace, as they were to be in the Late Helladic.

Although the temporal convergence of this phenomenon in the Aegean and the southern Levant is probably little more than coincidence, the same principle may well be at work. In the southern Levant mortuary practices that emphasize lineage and ancestors become prominent at precisely the moment when communal cult activities are somewhat curtailed. When the family-oriented cult of the dead began in the MB, it either became popular to the point of temporarily eclipsing temple worship, or alternatively, it grew in importance as a response to an already dwindling interest in public worship. In either case, the cult continued through the Late Bronze Age, when temple worship resumed, and into the Iron Age, when the clan ties that sustained the cult were not only perceived as a threat to communal worship but also as a threat to the central organization of the state.

SUMMARY AND CONCLUSIONS

Because Megiddo's role was that of an important Bronze Age center, analysis of its MB levels is essential for unraveling the social systems of the period. The architectural and ceramic sequences at Megiddo have helped to establish the smooth nature of the transition from MB to LB. As the material similarities between these periods become apparent, the fact that the site did not have an MB temple seems rather incongruous. Since the EB and LB temples were always located in the same area of the site throughout the Bronze Age, the gap in the temple sequence during the MB is particularly noticeable and therefore warranted investigation.

A close reexamination of the tombs in the contexts of their strata has suggested that at the time when no temple existed at Megiddo, tombs were commonly placed under floors of houses still in use. Furthermore, the entry shafts of these tombs most probably projected partway up into the living areas. This constant presence of deceased individuals, almost certainly members of extended kin groups, reinforces an aspect of the most prominent type of the MB

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worship—small-scale clan or family rituals, specifically the cult of the dead, taking the place of temple worship.

Although other sites may not demonstrate this phenomenon in as sharp relief as Megiddo does, it is clear that intramural burial begins on a large scale throughout the southern Levant in the Middle Bronze Age. Furthermore, no site of central importance in the MB has yet been found with a significant cultic structure that predates MB IIC. Although future excavations at Megiddo as well as at other MB sites may lead to refinements of this hypothesis, it is likely that such work will help confirm the relationship between private cultic rituals and the temporary deemphasis of public temples.

ACKNOWLEDGMENTS

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13

EARLY BRONZE SOCIAL ORGANIZATION AS REFLECTED IN BURIAL PATTERNS FROM THE SOUTHERN LEVANT

TIMOTHY P. HARRISON

Ethnographic studies have long drawn attention to the behavioral significance embedded in the symbolism and rituals expressed in the burial of the dead (Bartel 1982; Metcalf and Huntington 1991). With the calls for a sounder theoretical base in archaeology ringing out in the 1960s, it was not long before attempts to submit archaeological mortuary data to more rigorous theoretical scrutiny utilizing ethnographic case studies began to appear (see particularly Saxe 1970; and the assembled papers in Brown [ed.] 1971). This early euphoria was soon tempered by a cautious skepticism, particularly regarding the reliability of ethnographic analogy. In an important study, P. Ucko (1969) demonstrated the diverse functional and ideological considerations that can accompany a particular method of burial and all too easily obscure the archaeological record.

Despite this, and other raised concerns (see particularly Hodder 1980; 1982: 195–201; Pader 1982; Parker Pearson 1982; and also Braun 1981; with response by Tainter 1981), the archaeological analysis of mortuary ritual has forged ahead,[1] generating numerous operational hypotheses. Central to these has been the assumption that the *social persona*, the composite of the social identities maintained by the deceased in life, will be recognized symbolically at death. Furthermore, the relative rank of the social position held by the deceased will reflect the composition and size of the social group recognizing status responsibilities to the deceased (Binford 1971: 17). Stated simply, the effort expended to bury an individual will be proportional to the ascribed social status of that individual.

The implications for archaeological analysis logically follow. Principally, we might expect the ceremonial complexity exhibited in a given burial to reflect, at least indirectly, the level of social complexity experienced by the responsible social group. In a ranked (or nonegalitarian) society, certain archaeological correlates should be discernible. At least two dimensions of social personae have been associated with the burial practices of ranked societies:

> The first, *superordinate dimension*, must be a partial ordering that is based on symbols, energy expenditure, and other variables of mortuary ritual, and which is *not* simultaneously ordered on the basis of age and sex. That is, membership in the class and some variability within the class are based on the ascriptive qualities of an individual's genealogy. . . . The second, *subordinate dimension*, will be a partial order based on symbols, energy expenditure and other variables, which generally will be ordered on the

1. The literature is immense. By way of example, see Tainter 1975, 1978, 1982; Chapman, Kinnes, and Randsborg 1981; O'Shea 1984; Chapman 1987; Beck 1995; Carr 1995; and Campbell and Green 1995.

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> basis of age and sex. That is, beyond the "given" features of age and sex, variability in this dimension will reflect achievement through life histories of individuals. The older an individual, the greater the opportunity for accomplishment, therefore, on the average, the higher the rank. (Peebles and Kus 1977: 431)

The degree to which the superordinate dimension becomes less evident and the subordinate dimension more prominent, therefore, should be a reliable index of the increasing social complexity of the particular social group in question.

Mindful of the complexity of mortuary ritual and the symbolic nature of the evidence, this paper examines burial patterns in the Early Bronze Age (EB) cemetery at Bâb edh-Dhrâʿ, located on the southeastern plain of the Dead Sea in Jordan, for what they broadly reveal of EB social structure. Well known for its long history as an active burial ground, Bâb edh-Dhrâʿ affords the opportunity to trace the evolution of burial customs practiced in the cemetery over the course of the EB. The presence of an adjacent settlement permits comparisons with contemporary nonmortuary archaeological data and improves the possibility of distinguishing recognizable patterns of social organization within the EB culture that buried its dead at Bâb edh-Dhrâʿ. For further comparison, the mortuary data from the site of Jericho is also examined to determine whether the burial customs practiced at Bâb edh-Dhrâʿ reflect broader cultural patterns. The chronological framework used here follows that established in the third edition of *Chronologies in Old World Archaeology* (Stager 1992: 40–41).

BÂB EDH-DHRÂʿ

Bâb edh-Dhrâʿ first received archaeological attention when W. F. Albright stumbled upon the site in 1924 during an exploratory trip to the Dead Sea region (Albright 1924, 1926; Kyle and Albright 1924; Albright, Kelso, and Thorley 1944). Despite Albright's early interest, systematic excavations did not begin until almost four decades later, after pottery plundered from the site began appearing on the Jerusalem antiquities market. In an effort to forestall further destruction, an expedition was put together by P. Lapp in 1965 (Lapp 1966a, 1966b, 1968a; see also Schaub and Rast 1989). In the course of his excavations, Lapp distinguished three basic tomb types representing the three main periods of the cemetery's use. The first phase consisted of multichambered subterranean shaft tombs, and corresponded to the start of the EB period. Charnel houses, the second tomb type, represented the urban phase of the EB II–III. The final phase, assigned to the EB IV (or Lapp's "Intermediate Bronze Age"), consisted of shallow pit burials termed "cairns."

Eventually, leadership of the expedition was transferred to two of Lapp's colleagues, W. E. Rast and R. T. Schaub. Under their direction, a multidisciplinary approach was adopted, and the expedition took on a more regional perspective (preliminary reports have appeared in Rast and Schaub 1974, 1978, 1980; Rast and Schaub [eds.] 1981; Fröhlich and Ortner 1982; and Schaub and Rast 1984). While excavations continued on a large scale in the cemetery, the expedition now also focused attention on the nearby settlement site. Specialists were engaged to study a wide range of issues concerning the ancient economy and environment of the settlement and its surroundings. Over the course of five field seasons, the project successfully elucidated the settlement history of Bâb edh-Dhrâʿ, exposed a large portion of the cemetery, and conducted a regional survey and limited soundings at a number of neighboring sites that

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have helped to establish the larger regional context. It is from the published results of this fieldwork that the data used in the analysis below have been drawn.

PATTERNS OF BURIAL

Surveys by the current research team indicate that when the cemetery reached its greatest extent, during EB IA, the cemetery stretched over an estimated twenty-eight hectares (280,000 sq. m). When certain wadis were excluded, a more accurate approximation suggested 244,000 sq. m, still a sprawling area (Rast and Schaub 1980: 40). In the course of excavations, the tombs were separated into four principal cemetery subgroups (A, C, G, H) (fig. 13.1). To date, at least fifty-one EB IA shaft tombs, including six from 1981, have been investigated, about one-third of the total number of estimated tombs dating to this period (Fröhlich and Ortner 1982: 256–64). Six EB IB shaft tombs and two circular charnel houses have so far been published, while at least thirteen EB II–III charnels have been cleared. The extent of the EB IV burial population is not clear, although it appears the cemetery was only sparsely used, because only four stone-lined shaft tombs have been reported.

Early Bronze IA (3500–3300 B.C.)

Shaft tombs were the primary form of burial during the EB IA period. They follow a remarkably uniform pattern. Lapp has furnished a thorough description of Tomb A76, typical of this tomb type (fig. 13.2) (1968b; see now also Schaub and Rast 1989: 151–56). Access to the burial chambers was achieved through a vertical shaft approximately 2.1 m in depth. The entrances to the chambers themselves were sealed with a combination of stone and mortar. There were two chambers in Tomb A76, although the number varied in other shaft tombs anywhere from one to five chambers. The chambers in Tomb A76 were circular, averaging 1.8 m in diameter and 0.87 m in height.

The burial deposits in a chamber typically consisted of a pile of disarticulated bones placed on a mat in the center of the chamber floor. The long bones were arranged neatly in parallel fashion, and the crania were aligned in a row to the left of the postcranial material. In most cases, the number of long bones corresponded to the number of crania, while the catalog of smaller bones was incomplete. The grave goods were gathered around the sides of the chambers and typically consisted of large numbers of intact ceramic vessels, often stacked, and smaller objects such as figurines, jewelry, weapons, and an occasional perishable item such as a reed basket, a pair of sandals, or a wooden staff (Lapp 1968b: 19–26).

It was clear that the material in each chamber was the result of a single interment, and that once a chamber entrance had been sealed it was not reopened for a second or third burial. However, all of the chambers within a shaft tomb were not necessarily filled at the same time. In fact, a significant amount of time could elapse between the occupation of two chambers of the same shaft tomb, so that the life of the tomb could easily stretch over a considerable span of time. This being the case, it is likely that the shafts were marked, or at least left open until all of the chambers had been filled. In Cemetery A, the density of the EB IA tombs has raised questions about the degree of planning involved in its creation. The arrangement of the tombs appears to follow a regular pattern, implying that the tomb cutters were familiar with the overall layout of the cemetery. If so, this would suggest that a distinct population group used

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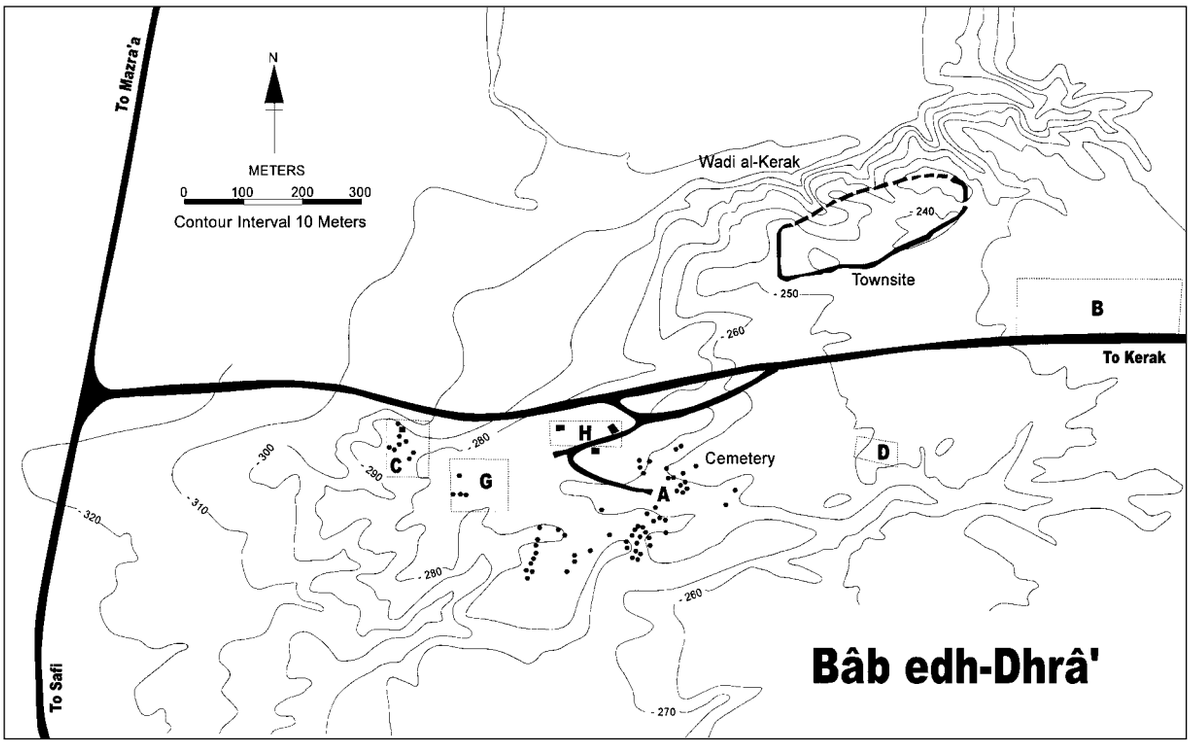

FIGURE 13.1. Plan of the town site and cemetery at Bâb edh-Dhrâʿ (adapted from Rast and Schaub 1980: 33, fig. 8; and from Schaub and Rast 1989: 23, fig. 2).

the site as a burial ground, rather than a dispersed or unrelated assortment of groups (Schaub 1981: 46–47, 56).

In light of this, it has been hypothesized that the consistent pattern of secondary, disarticulated burials was the result of periodic returns to the site by a nomadic EB IA population. If an individual died while the group was away from the cemetery, the body was given primary burial treatment elsewhere. When the group returned to the burial site, the skeletal material that remained of the deceased was placed in one of the chambers of the "family" (or "clan") shaft tomb (Schaub 1981: 57). It would appear that the sparse evidence of the EB IA settlement at the nearby town site supports this hypothesis (Rast and Schaub 1980: 40).

It should be noted, however, that a few EB IA shaft tombs produced articulated skeletons. Tomb F2, for example, located just to the west of the walled EB II–III settlement, contained an articulated female adult (Rast and Schaub 1978: 5–6). Furthermore, articulated burials were discovered in the EB IA shaft tombs excavated in 1981. Four chambers from two separate tombs (A110NE, A110SE, A111E, and A111W) contained the remains of both male and female adult articulated skeletons (Fröhlich and Ortner 1982: 256–61). Although articulation does not necessarily indicate primary burial, it does permit only a limited amount of time between death and disposal of the body. Thus, these articulated remains could represent the burial of individuals from either a nearby settled community, or from a nomadic group that was in the area of the cemetery, perhaps disposing of other deceased, at the time of death. Based on the data currently available, it would appear that the pattern of secondary, disarticu-

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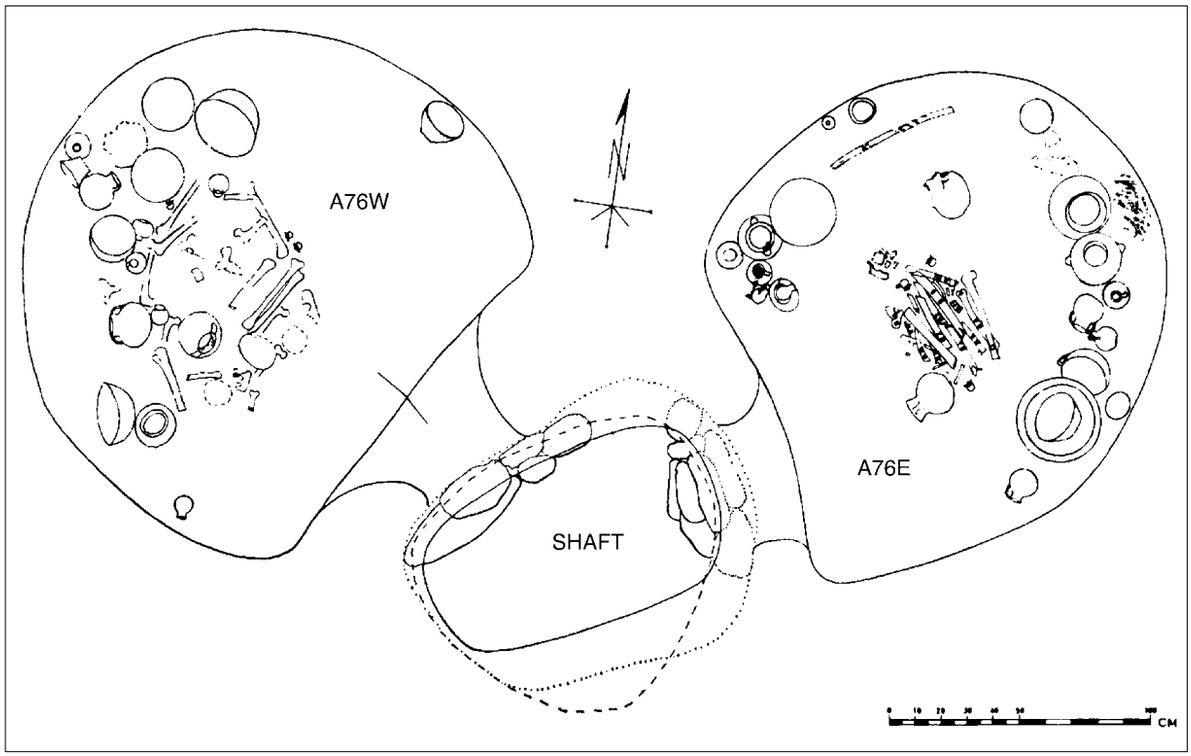

FIGURE 13.2. Plan of Bâb edh-Dhrâʿ Tomb A76 (after Lapp 1968b: 16, fig. 4).

lated burials, together with the scant settlement evidence, point to a relatively transient EB IA population, one that nevertheless felt the need for a formal burial ground and the importance of maintaining it.

Early Bronze IB (3300–3100 B.C.)

The tombs excavated with EB IB pottery indicate that this period was transitional in nature. In addition to the continued use of shaft tombs, the period marked the introduction of the charnel house tomb type. While the EB IA witnessed a proliferation of shaft tombs, only six EB IB chambers have so far been published, along with two circular charnel structures.

Three of these chambers were attached to shafts with other chambers that contained EB IA material. Tomb Chamber A100N (fig. 13.3), for example, which consisted of a flat stone floor with one articulated adult skeleton and other partially articulated remains, contained EB IB pottery, while the other three chambers that shared its shaft held disarticulated burials and EB IA ceramic material (Schaub 1981: 58–59). There are two possible interpretations of the occupational history of this tomb. The first is that the life of Tomb A100 simply spanned the transition from EB IA to EB IB, with Chamber A100N representing the final interment. Since the various chambers of a shaft tomb were filled individually, a significant amount of time could have elapsed between burials, drawing out the life of the tomb. An alternative possibility is that the original EB IA contents of Chamber A100N were removed at a certain point and

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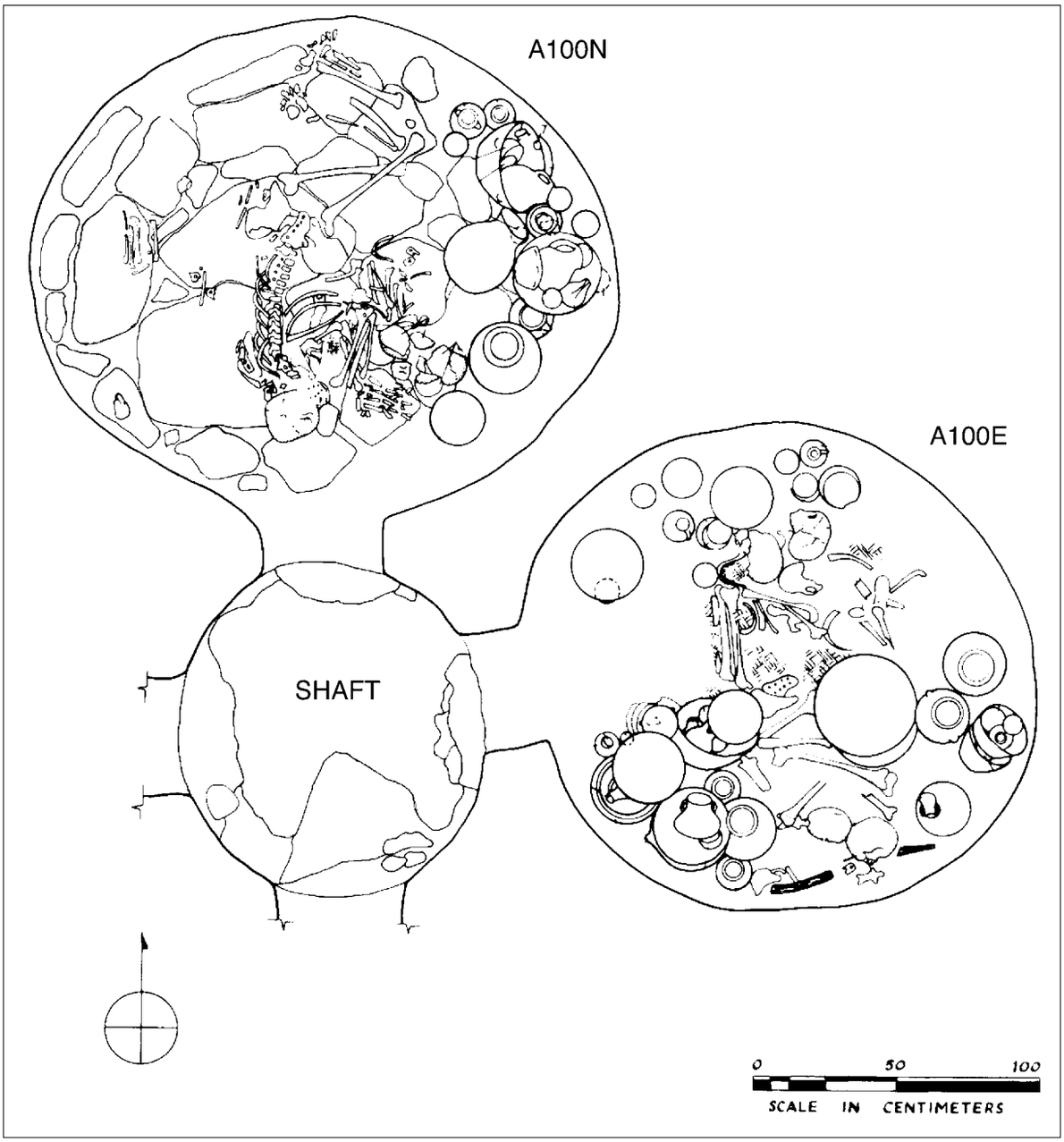

FIGURE 13.3. Plan of Bâb edh-Dhrâʿ Tomb A100, shaft, and Chambers A100N and A100E (after Schaub 1981: 59, fig. 18).

then later replaced by the EB IB material. In this context, it is noteworthy that the adjacent Chamber A100E contained two distinct bone piles and two groups of crania (fig. 13.3). Schaub has proposed that the bone pile and crania found on the right were in fact originally buried in Chamber A100N and then moved to Chamber A100E by the EB IB users of Chamber A100N (Schaub 1981: 60). Since then, excavations have produced an additional example of a shaft tomb with chambers containing both EB IA and IB pottery (Tomb A111) (Fröhlich and Ortner 1982: 261–62). Thus, it seems likely that these two tombs were in use during the transition from EB IA to EB IB.

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The other EB IB shaft tombs had only one chamber. One of these, Tomb G2, contained mostly EB IA ceramic forms, but also had some EB IB types, indicating its transitional nature (Schaub 1981: 57–58).

One of the most unique tombs discovered in the Bâb edh-Dhrâʿ cemetery was the EB IB circular charnel house Tomb G1 (fig. 13.4). Although much of the southern part had been destroyed by modern military trenching activity, careful clearance revealed the intact northern half of the tomb. The structure measured 3.7 m in diameter, with a 0.37 m thick encircling wall. The northern section of the wall, which curved upward in beehive-like fashion, was preserved to a height of 1.3 m. Entrance to the charnel was achieved through a semicircular forecourt made of mudbrick. Two orthostats flanked the entryway, and a large stone slab served as a threshold. There were fragments of a possible stone lintel, and the blocking stone was found in situ. The skeletal material, though widely scattered, indicated primary articulation. There was also evidence of extensive burning, with the few surviving ceramic forms all dating to EB IB (Schaub 1981: 63–65).

Tomb G1 closely resembles the round mudbrick Charnel A53 excavated in 1967 by Lapp (1968a: 90–91; see now also Schaub and Rast 1989: 209, 222–32). Tomb A53 was actually better preserved, with evidence of a second story or wooden beam roof. Both date to EB IB and mark a departure from the subterranean shaft tombs of the EB IA period. Nonetheless, several architectural features can be seen as carryovers from the earlier shaft tombs, including the circular plan, and the forecourt, which functionally paralleled the purpose of the shaft. At the same time, the freestanding structure anticipated the charnel houses of the following EB II–III. All of this serves to highlight further the transitional nature of the period. Not surprisingly, these developments coincided with the expansion of the nearby village site. The functional features of these charnel structures, with their more immediate accessibility and larger storage capacity, certainly would have lent themselves to a larger, more permanently settled population (Schaub 1981: 65).

Early Bronze II–III (3100–2250 B.C.)

The tradition of circular charnel houses continued into early EB II with the construction of Tomb A56. Slightly smaller than its EB IB predecessors, Tomb A56 experienced two depositional phases and contained skeletal remains exhibiting some articulation (Schaub 1981: 65–66).

In addition to the circular charnel, the EB II period saw the development of a new tomb type, the rectangular charnel house. It is not clear whether the two were in use contemporaneously, or whether the rectangular structures emerged later out of the circular charnel house tradition. In any event, the large rectangular charnels became the standard tomb type and remained as such until the end of the EB III. Although quite a few have been excavated, space permits the description of only one, Tomb A22.

Tomb A22 was cleared in 1979 for the sake of enlarging the skeletal sample available for anthropological study (fig. 13.5). The tomb measured 7.8 x 15.5 m, making it the largest tomb discovered in the cemetery. The mudbrick outer walls were preserved to a height of fourteen courses, or about 1.39 m. The floor of the structure was paved with small pebbles, and there were traces of reed matting. The presence of wattle and daub, and charred wooden beams, hinted at what had once been the roof. An interior wall divided the charnel into two sections (Rast and Schaub 1980: 34–37).

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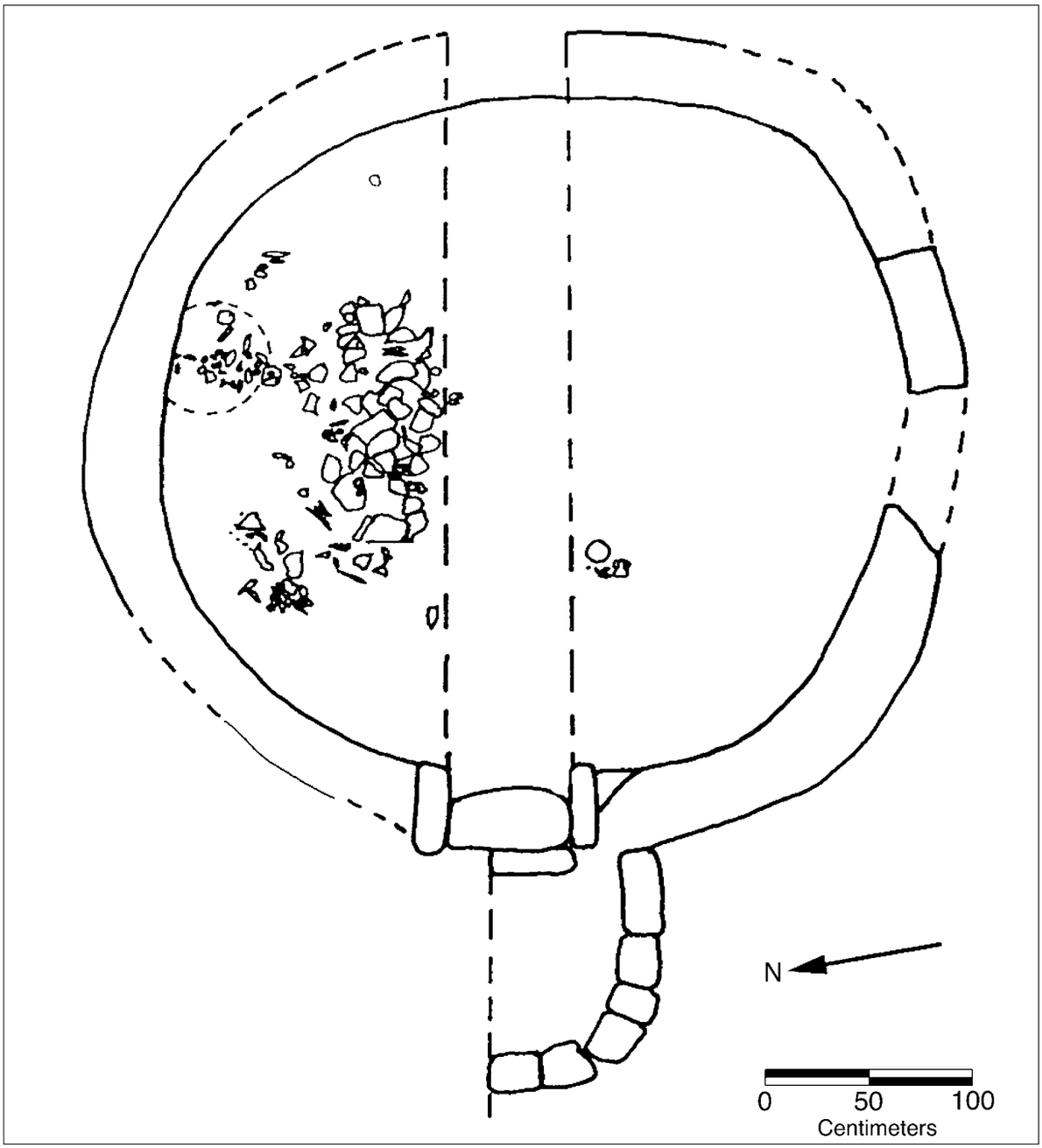

FIGURE 13.4. Plan of Bâb edh-Dhrâʿ Charnel House G1 (after Schaub 1981: 64, fig. 23).

The depositional remains indicated that a portion of the building had been subjected to severe burning. Most of the burials were in disarray, mixed together with mudbrick detritis and other debris from the fire. Despite this disturbance, however, the tomb still yielded evidence of primary articulation. In addition, some skeletons showed no signs of exposure to fire, indicating that they might have been placed in the charnel after it had burned. Three articulated burials, all heavily charred, were found in association with what might have been a pallet made of poles and reed matting. The remaining burials (all disarticulated), including 161 crania, had been heaped in mixed piles along the walls of the charnel. The interment process

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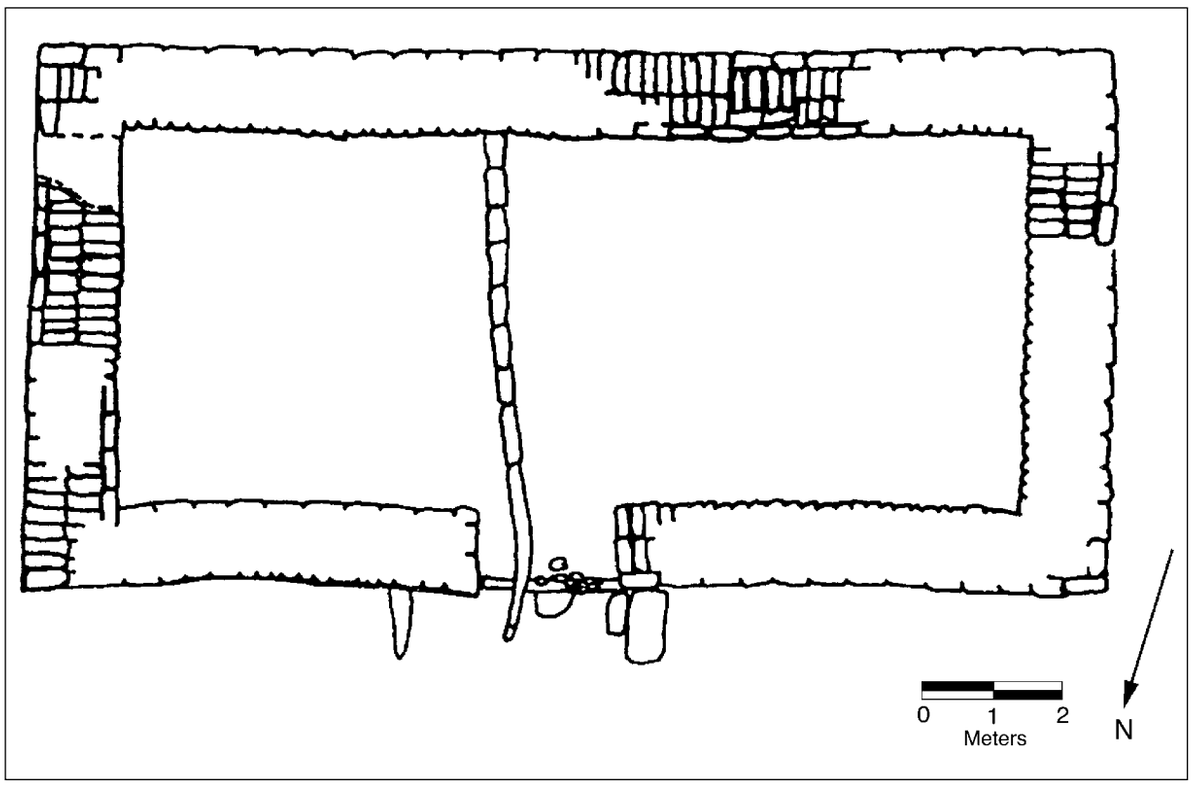

FIGURE 13.5. Plan of Bâb edh-Dhrâʿ Charnel House A22 (after Rast and Schaub 1980: 36, fig. 12).

seemed to involve a pattern of initial primary articulated burial, followed later (after decomposition) by removal to the sides of the charnel, leaving space for the next interment (Rast and Schaub 1980: 37–38).

Analysis of the associated pottery indicated that the earliest burials were concentrated in the east room, and the latest in the west chamber. Initially, both sections were probably used, with the east wing receiving the most activity. In time, the dividing wall was built to close off the east room, and burials were placed only in the west wing. Among the rather meager grave goods were pieces of gold leaf jewelry with incised designs. Based on the ceramic evidence, Tomb A22 was finally destroyed (or abandoned) late in EB III, or early in EB IV (Rast and Schaub 1980: 38–39). The burial practices evident in Tomb A22, and in the other charnels that have been cleared, point to a sedentary EB II–III population, not surprising given the thriving fortified settlement that existed at the nearby town site.

Finally, a series of "tholoi," averaging 5 m in diameter, were found by the Lapp expedition extending in a line eastward from the town site. Surface sherds tentatively suggested an EB II–III date for these freestanding structures (Lapp 1968c: 10; Schaub and Rast 1989: 489).

Early Bronze IV (2250–2000 B.C.)

As stated earlier, very few EB IV tombs have been excavated. Lapp believed that a scattered group of "cairns" on the far eastern edge of the cemetery dated to this period (1966a: 106; 1968c: 10). Subsequent investigations, however, have failed to substantiate Lapp's preliminary findings, and it now appears that these tumuli were simply the result of agricultural

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field clearing efforts (McCreery 1977–78; Clark 1979; Rast and Schaub 1978: 24, 29; Schaub and Rast 1989: 483, 489).

Four single-chambered, stone-lined shaft tombs located directly within the cemetery have been positively dated to the EB IV. The first two, Tombs A52 and A54, were discovered during the Lapp excavations and have been reported by Schaub (1973; see now also Schaub and Rast 1989: 473–87), who described Tomb A54 in detail (fig. 13.6). The vertical shaft was circular and lined with stones and had been filled with stone rubble once the burial had been placed in the chamber below. At the bottom of the shaft, a large stone blocked the entrance to the chamber. The entryway was flanked by two upright slabs seated on a threshold and crowned with a lintel. There was a slight step down to the floor of the chamber (Schaub 1973: 3–4). The chamber itself was kidney-shaped and contained four articulated burials resting on a thick layer of broken bones and assorted debris. The skeletal remains appeared to have been deposited in successive layers, with subsequent burials disturbing the articulation of earlier deposits. It is possible that the stone lining of the shaft was installed in an attempt to strengthen it for this apparent repeated use. Arranged around the sides of the tomb were twenty-six pottery vessels dating to the early EB IV period (Schaub 1973: 5–6, 17–18).

In addition to Tombs A52 and A54, two chambers, designated RTTI and RTT2, were accidentally discovered in 1979. They produced a large number of EB IV pottery vessels and some skeletal material. The range of forms proved to be similar to those published from Tomb A54 (Rast and Schaub 1980: 40–41).

Together, these four single-chambered shaft tombs constitute the extent of our knowledge of the EB IV burial practices at Bâb edh-Dhrâʿ. In keeping with the conclusions already drawn about the EB IA shaft tombs, these EB IV burials would suggest a relatively transient population.

SOCIAL ORGANIZATION

Early Bronze IA

A key question concerning EB IA Bâb edh-Dhrâʿ is whether or not the cemetery was associated with a sedentary population. EB IA Palestine is generally believed to have experienced widespread nomadic activity (Richard 1987: 25). The excavators of the Bâb edh-Dhrâʿ cemetery accept this prevailing view and have concluded, citing the scant settlement data and evidence of disarticulated burials, that the site was used primarily by semi-nomadic pastoralists (Rast 1981: 7). However, a recent study by G. Bentley has now challenged this semi-nomadic hypothesis. In addition to emphasizing the need for a more precise understanding of nomadic pastoralism, she questions the assumption that Bâb edh-Dhrâʿ lacked a permanent EB IA settlement (1987: 11–21).

The primary reason for her skepticism centers around the apparent formal nature of the EB IA burial grounds (Bentley 1987: 21–31). Ethnographic studies have highlighted the close relationship that often exists between settled populations in control of restricted land resources and their cemeteries (see, e.g., Douglass 1969; Bloch 1971; Saxe and Gall 1977; Glazier 1984), supporting the general principle that "the most elaborate formalized descent and alliance structures . . . only evolve when there is an increased scarcity of land to support them" (Harner 1975: 129). Archaeological research has formulated a similar postulate. First pro-

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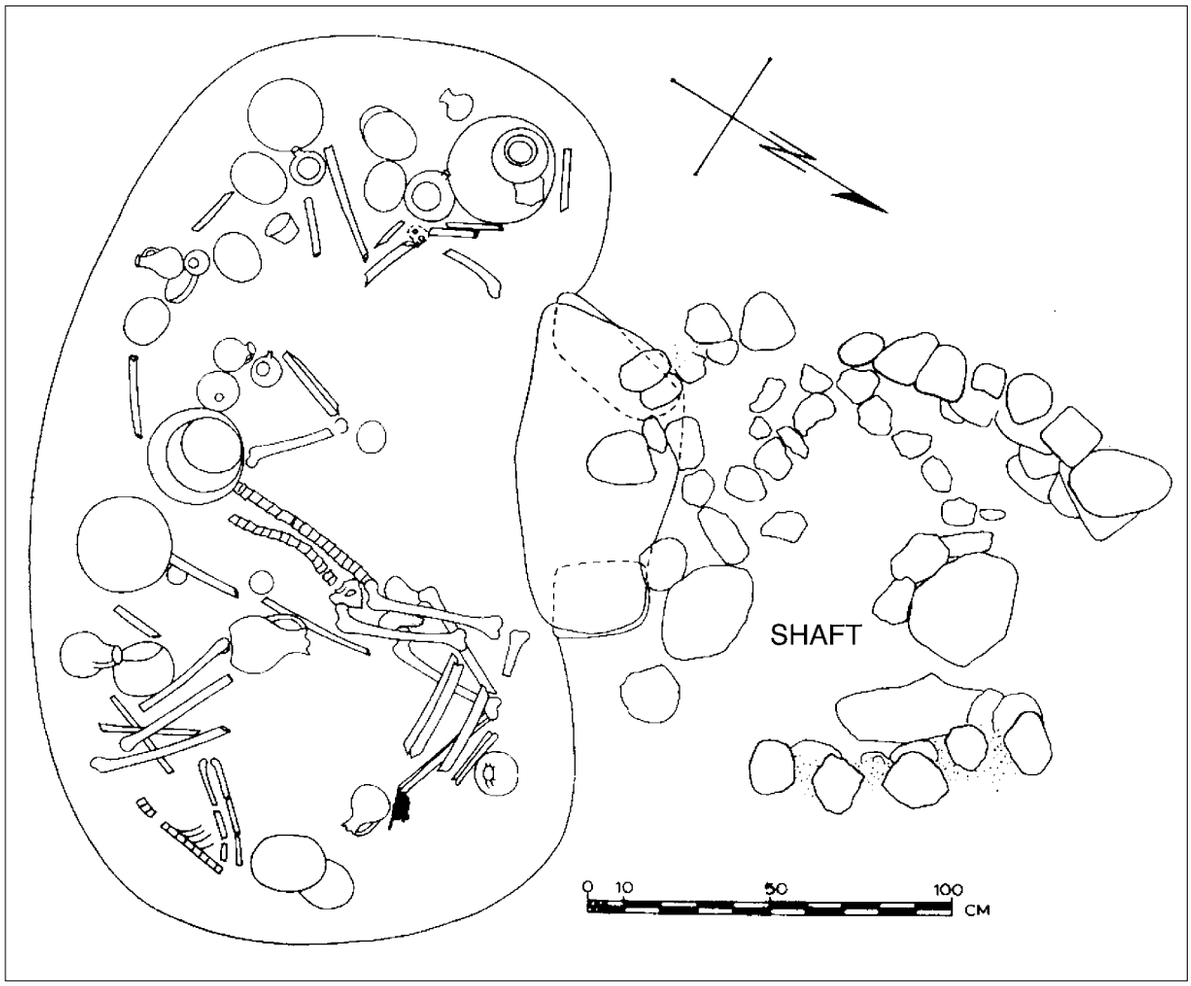

FIGURE 13.6. Plan of Bâb edh-Dhrâʿ Tomb A54 (after Schaub 1973: 6, fig. 4).

posed by A. Saxe as his "Hypothesis 8" (1970: 119),[2] it states basically that a corporate group, in order to affirm its ancestral right to a particular restricted resource, will often establish a formal disposal area for its dead.

From what we have seen of the EB IA cemetery at Bâb edh-Dhrâʿ, its "formal" nature seems apparent. The arrangement of the shaft tombs within the cemetery appears to follow a coherent plan, while the burials themselves maintain a consistent pattern. In addition, there is every indication that specific shafts were used repeatedly by the same corporate (possibly even familial) unit. As Bentley insists (1987: 28), there can be little doubt that the cemetery functioned as the formal disposal ground of a distinct and well-defined population group. Yet, it is also difficult to ignore the absence of extensive settlement remains. It is conceivable, therefore, that by maintaining a formal cemetery, the otherwise transient EB IA population was not laying claim to restricted land resources, but to another limited resource, namely water (for a survey of local environmental conditions, see Harlan 1981, 1982, 1985). If indeed

2. Subsequent research has largely substantiated, although in revised form, his initial hypothesis. In particular, see the work of L. G. Goldstein 1976, 1980, 1981; and more recent critique in Morris 1991.

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we are dealing with semi-nomadic pastoralists, control of one of the few perennial water sources in the region would have been of vital concern. Since the cemetery is adjacent to one of the principal wadis in the region, it is possible to see its creation as the result of the systematic efforts of a distinct population group, whether transient or not, seeking to legitimize its claim to this valuable water source through the presence of a nearby ancestral burial ground (see the paper by Rast, chap. 27, this volume, for a similar view; see also Rast 1999).

In addition to addressing the question of settlement, Bentley also tried to determine whether kinship played a factor in the social organization of the EB IA Bâb edh-Dhrâʿ cemetery population. To further test the possibility that the spatial arrangement of the EB IA shaft tombs was the result of repetitious use by familial, kin-based social units, Bentley studied the nonmetric dental traits of approximately 300 incomplete skeletal individuals collected from twenty-six of the tombs. This approach was chosen because of its well-established ability to elucidate relationships, both spatially and chronologically, within a given population (Bentley 1987: 45–67). The results of her analysis favored the conclusion that family groups were buried together in the shaft tombs and reinforced the notion of corporate group structure within the EB IA population at Bâb edh-Dhrâʿ. Moreover, the homogeneity exhibited in the dental traits suggested a history of inbreeding and the possibility of endogamous marital relations (Bentley 1987: 205–07).

To determine whether social ranking occurred within the cemetery population, Bentley also studied the spatial dimensions of the accompanying tomb artifacts. Generally, she found little differentiation in the artifact distribution, suggesting a relative absence of social ranking. Indeed, the consistent spatial arrangement of the burials, with the central pile of postcranial bones and row of crania on the left, may have been an attempt to downplay the individuality of the deceased in favor of the collective group (Bentley 1987: 208–40). Altogether, the evidence gathered from the EB IA mortuary data indicate a population with a strong corporate structure in which social ranking played a minimal role.

Early Bronze IB

The limited EB IB mortuary evidence makes it precarious to venture a reconstruction of the level of social organization achieved during this transitional period. Excavations on the mound have revealed a more substantial settlement than in the preceding period, and with the appearance of charnel houses in the cemetery, the indication is of an increasingly sedentary population.

The emergence of the round charnel tomb type provides some hint of social transformation within the cemetery population. Its form clearly betrays a development from the earlier EB IA shaft tombs and leaves little doubt that this transformation was an indigenous one. Also significant was the marked increase in primary burials. In the circular charnel, Tomb G1, primary articulation was the predominant pattern. Although the building had experienced extensive damage from burning, it was still possible to distinguish the remains of some 150 individuals. Interestingly, three of these individuals had sustained injuries that had healed prior to death, including two that had received ax blows to the cranial region (Ortner 1982: 93–95).

It is possible that the growing number of primary burials reflects a decreasing concern with mortuary ritual and the "symbolic utility" of the dead (Bentley 1987: 247). If true, this implies that the population that used the cemetery no longer felt the same need to legitimize its claim to certain resources through the presence of a formal burial ground, although the high visibil-

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ity of the freestanding charnels also would have carried much of the same formal quality. Either way, controlled access to violence, implied by the wound-inflicted crania, might well have rendered useless the symbolic value of the cemetery as a legitimization of the settlement's control of a limited resource. The decline in the concern for the symbolic utility of the dead may also suggest a shift in group affiliation. Rather than relating only along kinship lines, there may now have been an emphasis on membership within a larger corporate body. Such a shift likely would have coincided with the move to a more sedentary existence and its inevitable focus on agriculturally oriented subsistence strategies. Under such circumstances, where labor becomes a critical resource, and the need for greater organization more immediate, social stratification would have become an increasingly evident reality.

Early Bronze II–III

This period witnessed settlement expansion reach its peak. The town site not only grew to its largest extent, but was also encircled with a fortification wall for protection (Schaub 1982: 71). In the cemetery, the charnel house became the established tomb type. These large rectangular structures were capable of holding significant numbers of interments and might have stood as visible unifying symbols for a sedentary population whose strong earlier kinship ties had now been engulfed by the larger corporate identity of a more complex social order. They might also have been designed to resemble contemporary domestic architecture, as recently suggested for the Neolithic megaliths of western Europe (Hodder 1984:53), reinforcing the permanence and stability associated with sedentism. Although the almost haphazard treatment of the burials could suggest a nonstratified, egalitarian society, the apparent absence of differential treatment may be misleading. It is possible, for example, that the symbolism embodied by these collective burials had the intended effect of masking internal conflicts, or the inherent social disparities, existent within the EB II–III population that resided at Bâb edh-Dhrâʿ (Bentley 1987: 249; see also Shennan 1982; and Bradley 1985).

These rectangular charnels, however, were apparently not the only tomb type used during this period. The so-called tholoi discovered by Lapp, and suggested by him to have contained the burials of the ruling "aristocracy" of the town (1968c: 10, pl. III:2), probably also date to the EB II–III period. Although the dating and precise function of these structures remains uncertain, if they were indeed the elaborate tombs of individuals buried during the EB II–III period, it is tempting to see them as the final resting place of a ruling elite. Such clear differentiation in burial treatment would indicate a more sharply ranked, hierarchical society, one in which a predominantly sedentary population had come under the authority of a political (or religious) elite in control of the social institutions and economic resources of the community. Whether this level of social organization represented that of a chiefdom or a state is difficult to determine and open to speculation.

Early Bronze IV

The town site at Bâb edh-Dhrâʿ came to an abrupt and destructive end at the close of the EB III. Nevertheless, there is good reason to believe that some of the local population survived and continued to settle in the area. The evidence comes in part from the burial practices that reappear during the ensuing EB IV period. The return of a tomb type strikingly similar in both structure and burial content to the EB IA shaft tombs allows for certain observations to

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be drawn about the EB IV social organization. In particular, it argues for the reassertion of a strong, kin-based social structure and raises the possibility that kinship ties had remained intact throughout the (Bentley 1987: 250–53). Certainly, the ability of kinship networks to survive, and even thrive, in complex social contexts (including urban environments) is well established. Thus, despite the hierarchical pressure asserted during the urban phase of the EB II–III period, it is likely that kinship ties remained a powerful organizing force, at least on the familial level, until they reemerged more visibly with the decline of sedentary activity in the EB IV.

In this context, it is possible that the cemetery came to function as a kind of "ritual center" (cf. Zohar 1992), replacing the nearby destroyed (or abandoned) EB III settlement as a place of gathering for the economic, social, and political activities associated with the former town site, thereby establishing a territorial (and possibly ancestral) claim to the surrounding region, not unlike that suggested for the EB IA period. A similar pattern has been identified at other EB IV sites in the region (Harrison 1997: 17–19).

TELL ES-SULTAN (JERICHO)

Located near an important perennial spring and situated in the same Irano-Turanian phytogeographical zone as Bâb edh-Dhrâʿ, the cemetery and settlement site at Jericho provides relevant comparative data on the burial patterns and social organization of the southern Levant. Although the site of Tell es-Sultan had been subjected to earlier large-scale excavations, it was not until K. Kenyon's work in the 1950s that the adjacent cemetery received extensive attention (see, in particular, Kenyon 1960, 1965). As a result of her efforts, an incredible 369 tombs were recorded. Of these, the vast majority dated to her Intermediate Early Bronze–Middle Bronze (i.e., EB IV) period, some 344 in all, while only twenty-five were assigned to earlier EB periods. Ten of these twenty-five tombs were identified as Proto-Urban (i.e., EB I), and the remaining fifteen simply as EB, with an additional Proto-Urban tomb (Tomb A114) apparently being reused later in the EB (Kenyon 1965: 546–47).

The Jericho Proto-Urban tombs typically consisted of a single chamber accessed by a shaft and containing large numbers of burials. One such tomb, Tomb A94, held a minimum of 113 individuals, at least as evidenced by the number of crania found (fig. 13.7) (Kenyon 1960: 16–40). The burials in the Proto-Urban tombs were usually single interments, implying that each tomb was in use for a lengthy period of time. The burials generally followed a disarticulated burial pattern, although the disturbed nature of many of the tomb deposits often obscured this distinction. Frequently, the tombs contained little but the partial remains of crania and ceramic grave goods. Although there are details that differ—for example, the possible emphasis on secondary burial at Jericho—the general pattern of burial evident at Proto-Urban Jericho broadly parallels that found in the EB IB cemetery at Bâb edh-Dhrâʿ.[3]

Despite the disturbed nature of the mortuary data, there was a discernible shift in burial methods by the EB III period. Single-chambered shaft tombs were still the preferred tomb type, but articulation had clearly become a common burial practice. Some tombs contained

3. I wish to thank W. Rast for drawing to my attention the parallels between the Proto-Urban chamber tombs at Jericho and the EB IB circular charnel houses at Bâb edh-Dhrâʿ and, more generally, for his helpful comments regarding the Bâb edh-Dhrâʿ tomb material.

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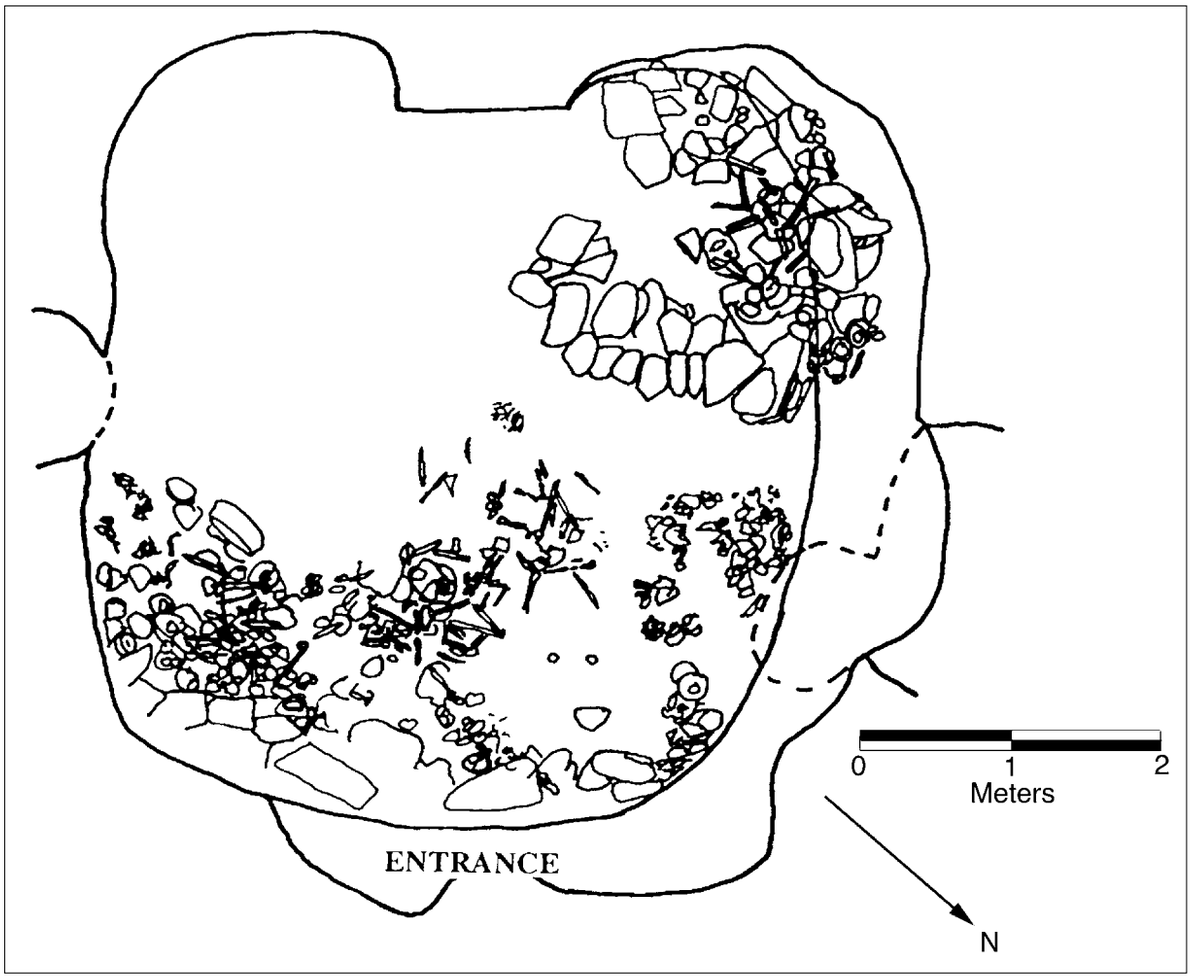

FIGURE 13.7. Plan of Jericho Tomb A94 (adapted from Kenyon 1960: 20, 22–23, figs. 5–7).

large numbers of individuals, as did Tomb A, which contained an estimated 300 individuals (Kenyon 1960: 52–53). In addition, the shape of the tomb chambers was now more rectangular (fig. 13.8) (Kenyon 1960: 94–96), not unlike the charnel houses at Bâb edh-Dhrâʿ. These developments suggest that the cemetery had become the burial ground of a more sedentary population, and indeed, excavations at the nearby tell support this view.[4]

Finally, during Kenyon's Intermediate Early Bronze–Middle Bronze (i.e., EB IV) period, there was a decisive shift to the practice of individual primary burial. Rather than large "communal" repositories, the EB IV tombs contained only one, or occasionally two, individuals (fig. 13.9) (Kenyon 1960: 180–81). In keeping with what we have seen at Bâb edh-Dhrâʿ, this development suggests a breakdown in urban life, and a corresponding increase in seminomadic activity, a pattern that has been documented elsewhere for the southern Levant (Dever

4. The German excavations between 1907 and 1909 succeeded in clearing a large portion of an EB wall, as well as a residential section at the northern end of the settlement (Sellin and Watzinger 1913: 20–45). In the course of his excavations, Garstang identified two distinct EB urban phases, with Tomb A dating to the second phase (Garstang and Garstang 1948: 75–88).

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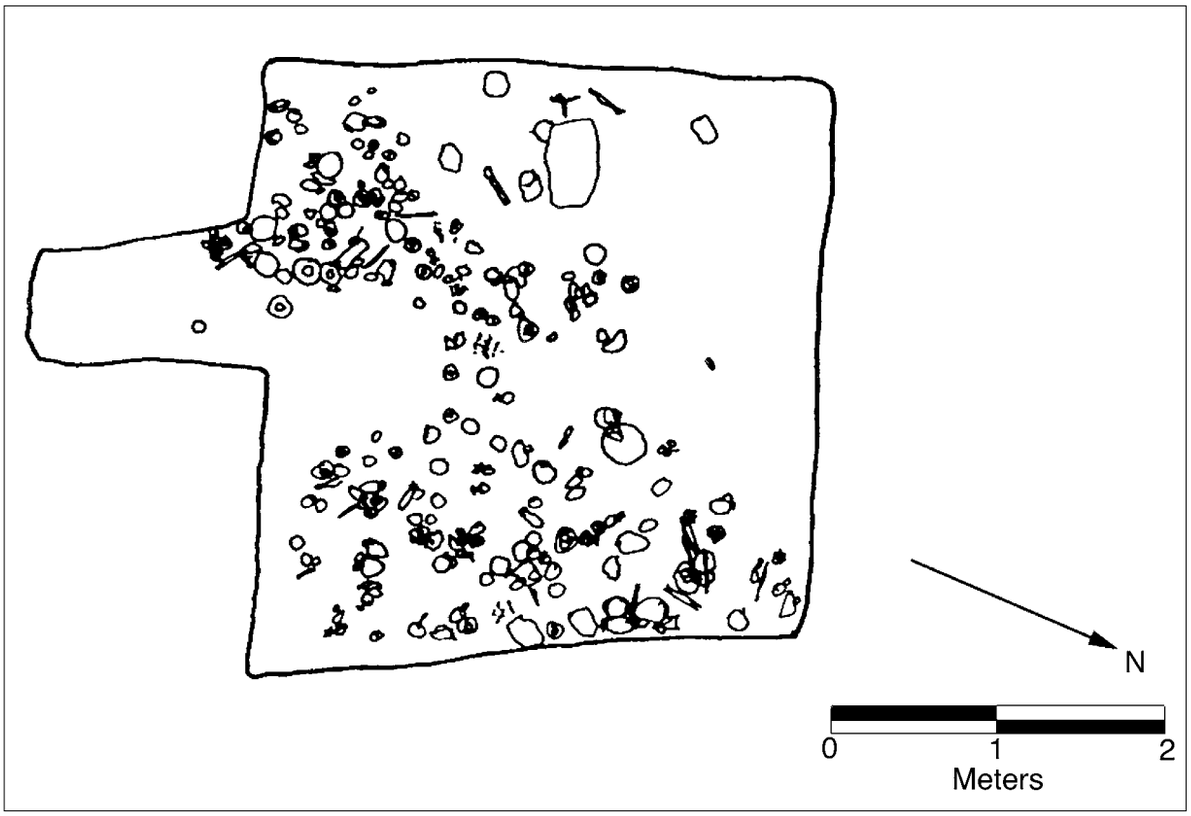

FIGURE 13.8. Plan of Jericho Tomb D12 (after Kenyon 1960: 95, fig. 32, layer 1).

1987). In addition, a study of the age, sex, and burial treatment of forty-six individuals from these EB IV tombs found little evidence of differentiation and concluded that the social structure of the local population probably resembled that of an egalitarian society (Shay 1983, 1985). Ranking, in other words, did not play an important role in the social organization of the community. However, a subsequent study utilizing much the same data, but different analytical methods and assumptions, has challenged this reconstruction, arguing instead that the social structure of the EB IV population was stratified and not egalitarian (Palumbo 1987; see also Shay's response, 1989).[5] While no society may ever be "egalitarian" in the strictest sense of the term, it is nevertheless difficult to see the preserved EB IV mortuary evidence from Jericho as reflective of a stratified social order. Despite the apparent emphasis on the individual, there is very little unambiguous evidence to suggest a concern for ranking within the interred cemetery population. It is possible, however, that the burials found in the cemetery represent only one part of an EB IV community, presumably that segment ascribed high (or at least differential) status, with the remainder of the population receiving treatment insufficient to have been preserved in the archaeological record.

5. Most recently, yet another study has taken up the argument for a sharply differentiated, or stratified, EB IV population at Jericho (Baxevani 1995).

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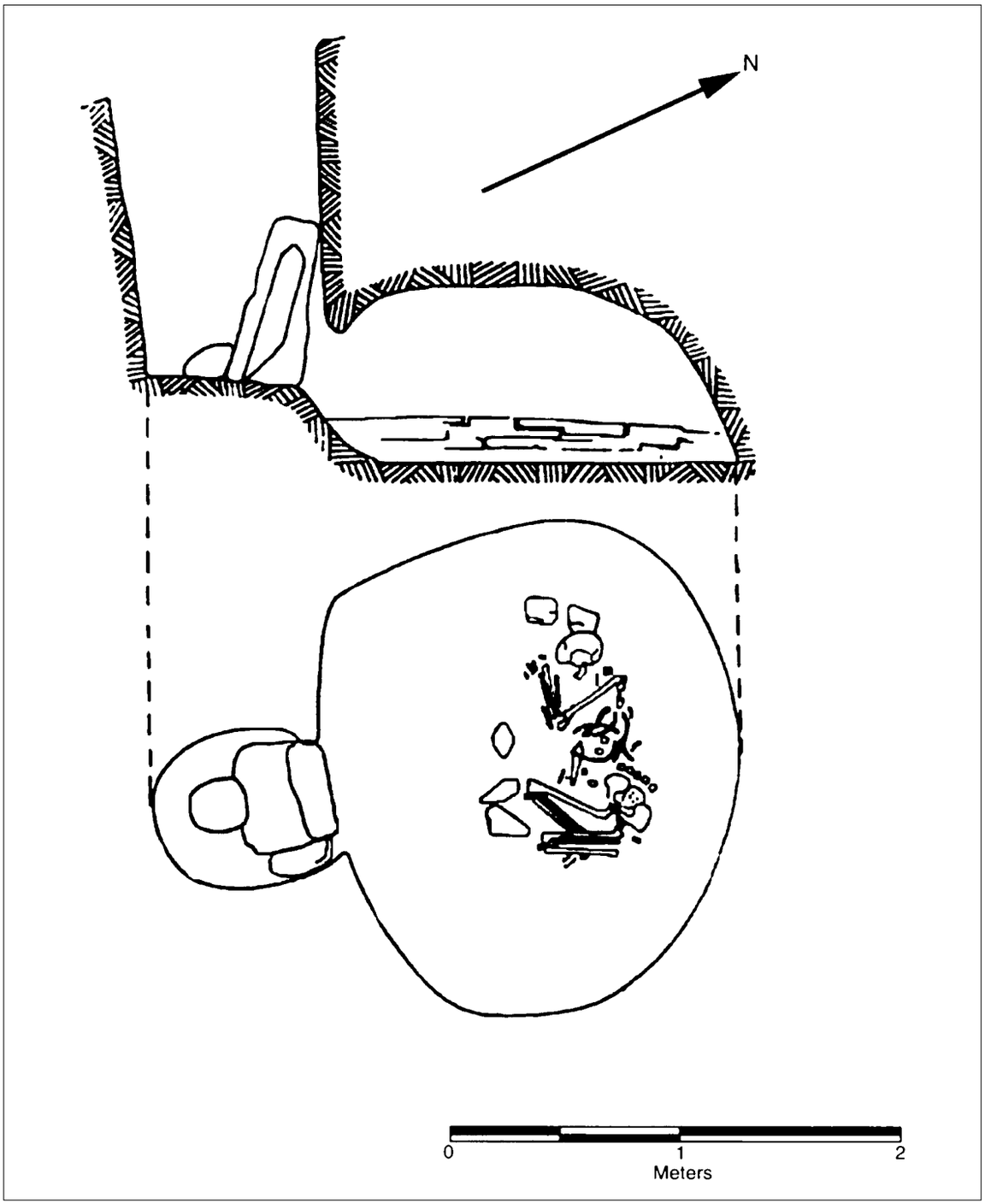

FIGURE 13.9. Plan of Jericho Tomb A111 (after Kenyon 1960: 188, fig. 69).

While differences in detail do exist between the burial practices at Bâb edh-Dhrâʿ and Jericho, the broader patterns exhibited by both cemeteries follow a remarkably similar path of development, and together substantiate the observations drawn about the EB social organization in the region.

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SYMBOLISM, RITUAL, AND EARLY BRONZE SOCIAL TRANSFORMATION

This paper has examined the burial patterns evident in the cemeteries associated with the sites of Bâb edh-Dhrâʿ and Jericho for what they reveal of the EB social organization in the southern Levant. One of the most intriguing aspects of mortuary ritual is its potential to reveal familial or kinship networks, a basic organizational feature in most societies. The possibility of identifying such ties enables this fundamental level of human relationship to be incorporated into the analysis of broader patterns of social development. In the case of the EB southern Levant, the preservation of kinship structure during the urban phase of the EB II–III is implied by its reappearance in EB IV, following the collapse of centralized political control. Rather than seeing the successive phases of EB as disparate stages of development with distinct breaks in between, the underlying kinship structure allows them to be placed on a social continuum along which configurations shifted between the polar extremes of a highly stratified society at one end, and a socially unranked society at the other.[6] Hence, kinship ties maintained in EB I can be seen as "hidden," rather than eliminated or suppressed beneath the larger corporate identity constructed by the more centralized, "urban social order of EB II–III. This systematic approach to the mortuary record thus permits the charting of emerging complex levels of social organization without ignoring lower level structural relationships, like familial or kinship networks, that typically persist within a society despite changes to the social order. In this way, the symbolism expressed in the EB mortuary ritual can enhance our understanding of the dynamics involved in the social transformation of EB society.

6. R. M. Adams has constructed a similar model for Mesopotamia (1975), as has L. Marfoe (1979) for the Biqaʿ Valley in Lebanon.

ACKNOWLEDGMENTS

This paper owes much to Douglas Esse, who first pointed me in the direction of mortuary studies and convinced me of the importance of utilizing mortuary data when analyzing broad patterns of sociopolitical development. [It represents an updated version of a paper written in 1989 for a graduate seminar on the "Archaeology of Death." I wish to thank A. Graham and S. Batiuk for their help reproducing the figure illustrations.]

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14

THE HISTORY OF THE COLLARED PITHOS AT TELL EL-ʿUMEIRI, JORDAN

Larry G. Herr

INTRODUCTION

One of Doug Esse's important interests was the collared pithos (Esse 1992). It is with pleasure, therefore, that I submit new discoveries regarding the history of this vessel from the excavations at Tell el-ʿUmeiri. Located south of Amman near the border of the Ammonite hills where they meet the Madaba Plain, the site was occupied from the Early Bronze Age to the Persian period with a few breaks from time to time. Five seasons of excavation have been conducted there by the Madaba Plains Project in 1984 (Herr 1989), 1987 (Herr 1991a), 1989 (Herr 1997), 1992 (Herr 2000), and 1994 (Clark 1994). The pithoi under discussion came from three episodes of settlement which spanned the end of the Late Bronze Age (LB) to the Persian period. Each episode, separated from the others by periods of abandonment, included more than one stratigraphic phase but without significant changes to the essential material culture.

We first present an overview of the archaeological context followed by a discussion of the pithoi. It is the purpose of this paper to explore evidence that, whereas collared pithoi disappeared toward the end of the Iron I period in Cisjordan, they seem to have continued throughout the Iron Age at Tell el-ʿUmeiri and elsewhere on the central Transjordanian plateau.

STRATIGRAPHY

The stratigraphic chart of phasing at ʿUmeiri in table 14.1 corresponds with that following the fourth (1992) season. We present only the relevant phases from LB to the Persian period. The stratigraphy of each field of excavation (the horizontal axis) is broken down into phases on the vertical axis. Each field has its own series of phase numbers which are retained here so that this study can be integrated with other published results of the excavation (for these phase numbers, see the field reports in the *Madaba Plains Project 4*, Herr 2000). The short horizontal lines indicate periods of abandonment separating the three episodes of activity. The "episode" numbers occurring in this study are not found in any other preliminary or seasonal reports. They are intended to facilitate references within this paper only.

Field A is located at the western rim of the site (fig. 14.1); Field B stretches down the western slope; Fields C and G were outside the main settlement on the northern slope; Field D was on a shelf on the southern slope outside the settlements of our periods; Field E was at the water source at the bottom of the north slope; and Field F was laid out on the eastern rim.

Table 14.1 is an attempt to establish a site-wide stratification. However, none of the connections are certain between the fields, except most of those between Fields A and B, which are adjacent to each other. We have tried to avoid phase proliferation by tentatively suggesting

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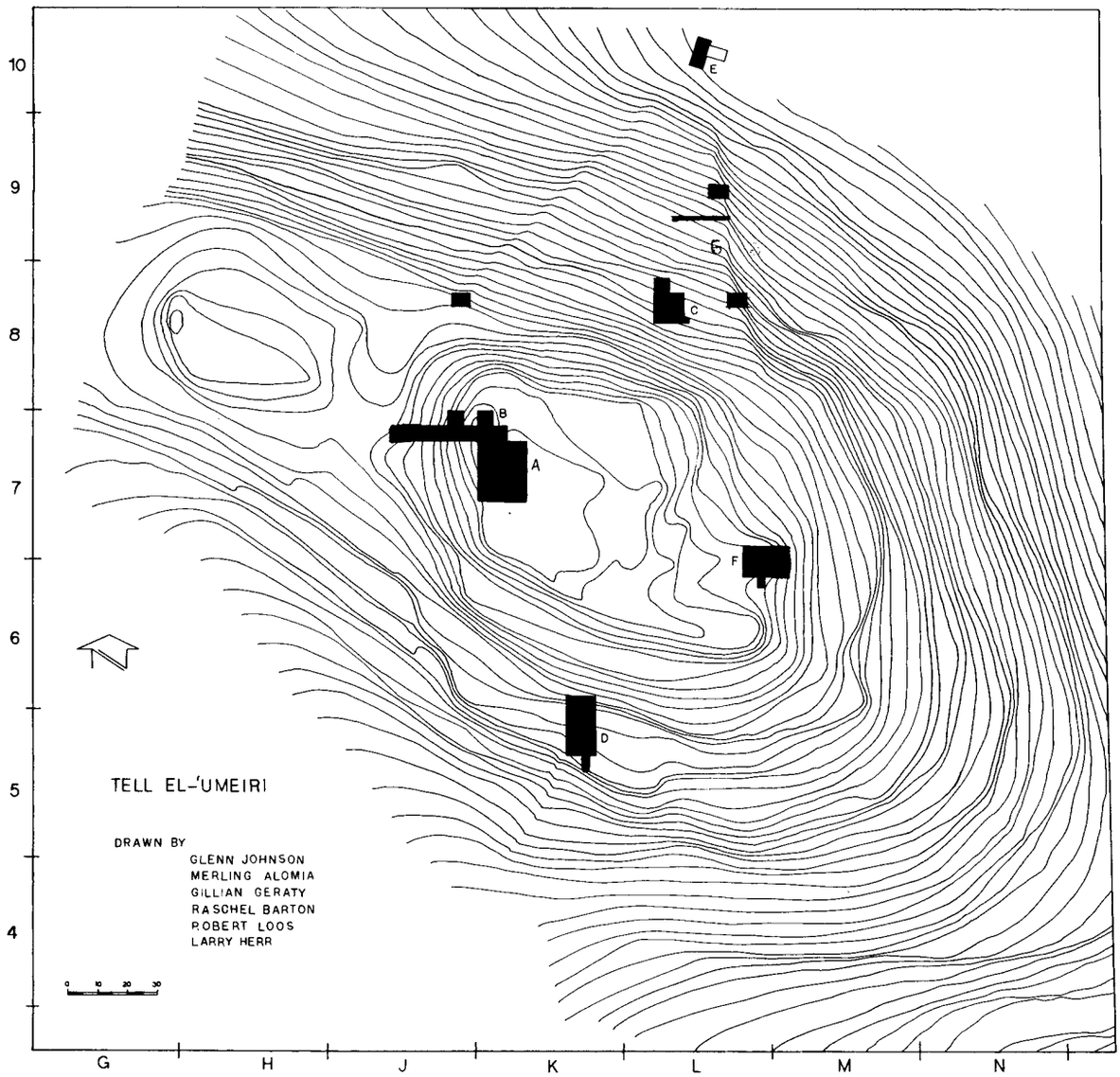

FIGURE 14.1. Topographic map of Tell el-ʿUmeiri with the fields of excavations.

connections. A question mark beside a phase number indicates that the attribution is correct for the time period, but we are uncertain about its precise relationship to phases in other fields. Usually, the least certainty occurs in those fields outside the top of the mound, such as Fields C, E, F, and G.

HISTORY OF THE SITE

Episode 1 (LB IIB–Iron IA)

Episode 1A consisted of fill debris with LB pottery immediately on top of Middle Bronze Age IIC walls in Field F (Low 1997) and the earliest stages of a terrace wall in Field C (Battenfield 1991: 85).

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Table 14.1. Stratigraphy at Tell el-ʿUmeiri

Episode	*Period*	*A*	*B*	*C*	*D*	*E*	*F*	*G*
1A	LB IIB	11	—	4	—	—	10	—
1B	Iron IA	10	11B	4	—	8?	9?	Loci 9,15?
1C	Iron IA	9	11A	4	—	8?	8?	Loci 9,15?
2A	Iron I/Iron II	—	10	—	—	—	—	—
2B	E. Iron II	8	9	—	—	7	—	—
3A	L. Iron II	7	8	3?	—	6	7	—
3B	L. Iron II/Persian	6	7	3?	—	5	6	—
3C	Persian	5	6	2?	—	4	5	—
3D	Persian	4	5	2?	—	4	4	—
3E	Persian	3	4	?	—	4	3	—

The remains from Episode 1B suggest a smooth transition from LB IIB to Iron IA. In Field C, the terrace wall from the previous phase was expanded (Battenfield 1991: 85), while in Field F a long terrace wall was constructed that preserved the LB fill behind it (Low 1997: fig. F7) and allowed Iron IA debris to accumulate, as well. The Iron IA levels from Field E, the water source, probably belong here (Fisher 1997: fig. E8), as do fragmentary walls in soundings beneath the later administrative buildings in Field A. The presence of significant numbers of Iron IA potsherds in the rampart of Episode 1C in Field B infers a settlement that preceded the rampart construction (Episode 1B). An earthquake that cracked bedrock in several places was apparently responsible for the destruction of this settlement.

The most astonishing phase at ʿUmeiri is Episode 1C, dated to Iron IA. It contains the best preserved fortification system so far discovered from this time in all of Palestine, including a casemate wall, a sloping rampart or glacis laid against the outer casemate wall, a retaining wall at the bottom of the rampart, and a dry moat (Clark 1994). The two casemate rooms so far excavated have produced large numbers of collared pithoi standing against the walls. Domestic structures were found inside the fortifications in both Fields B and A (Clark 1994; Lawlor 1991: fig. 3.3). One of them seems to have contained a small cultic corner, while another had two rows of pillar bases and might have been a "four-room house." Some of the house walls were up to 2.5 m high. This strong, fortified settlement was abruptly and violently destroyed. The destruction debris (1.5–2.5 m deep) contained reconstructable collared pithoi high above the floors, fallen from the upper stories.

Episode 2 (Early Iron II)

Episode 2 is made up of two more or less ephemeral phases. Above the inner wall of the casemate fortification was a small, thin surface with transitional Iron I/Early Iron II pottery, Episode 2A (Clark 1989: 249–50).

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Directly on top of the surface was Episode 2B, a domestic storeroom containing two storage jars and a jug, dated most likely to the ninth century (Clark 1989: 250–53, fig. 16.5–7). In Field A, fragmentary walls, oriented similarly to the storeroom, also contained associated early Iron II pottery and, at the water source, shallow debris layers can be attributed to this period. It appears that the settlement was limited to a few houses scattered over the site but most heavily concentrated in the west.

Episode 3 (Late Iron II to Persian)

Episode 3 contained five phases best differentiated in Fields A and B, which have the same number of phases and similar relationships to earlier and later phases. Although Field F also contained the same number of phases, no certain connection of the phasing can be made. The attribution of phases in Field C is guesswork, based on their general ceramic date. We have lumped all the late Iron II/Persian materials from the water source into one phase and connected them with all tell phases. Episode 3A is made up of pits (Field B) and small, flimsy installations (Field A). The date for the beginning of this episode is important. Based on inscriptional and palaeographic evidence from ostraca and seals, activity appears to have begun during the first half of the sixth century, probably soon after the Babylonian invasion of 582 B.C. avenging Ammonite complicity in the murder of Gedaliah, the Babylonian-appointed governor of Judah (Jer 40) (Herr 1993; Sanders 1997). The ephemeral remains from this earliest phase seem to reflect the activities of builders who were constructing the new administrative complex of Episode 3B for the Ammonite monarchy after it became subject to Babylon.

In Episode 3B at least two large buildings formed an administrative complex in Field A, while several smaller structures to the north produced domestic material culture. Because the Ammonite government was subject to the Babylonians, there was no fortification system. The outer casemate wall of Iron IA in Field B might have been used to support the buildings, and a flimsy entrance structure in Field F (Low 1991: 186; 1997: fig. F11) might have taken the place of a gate, but without an associated wall. Small, extra-urban structures were found on the northern slope (Battenfield and Herr 1989: 280) and the water source (Fisher 1997: fig. E5). It is probably to this phase that we should ascribe several Ammonite seals and seal impressions found in the topsoil, such as the impression of Milkomʾur the servant of Baʿalyashaʿ (Herr 1985; Younker 1985). A mid-sixth-century jar sat on the floor of the southernmost building (Herr 1991b: fig. 19.5:23), and an Attic sherd datable to the late sixth or fifth century was found in the fill above the floors (Waldbaum 1991: 243). This phase thus lasted most likely into the earliest years of the Persian period.

Episode 3C consisted of new floors in the administrative complex about 1 m above the previous ones and included slight alterations to the rooms (Lawlor 1989: 238, cf. figs. A3 and A7; Clark 1997: fig. B32; Low 1997). This phase must date to the beginning of the Persian period. That the function of the administrative complex remained the same during this period is clear from three Persian provincial ʿAmmon seal impressions from the end of the sixth or beginning of the fifth century (Herr 1992: 190–93 discusses two of them). The impressions also suggest that the population was still Ammonite.

Episode 3D begins the abatement of the Persian settlement. At least parts of the administrative buildings went out of use and new structures with smaller rooms were built to the east (Lawlor 1997: fig. A10).

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Small fragments of walls in Fields A, B, and F suggest a further thinning of occupational intensity during Episode 3E (Lawlor 1997: fig. A17; Clark 1997: fig. B34; Low 1997: fig. F16). At some point, perhaps during the late fifth or fourth century, settlement ceased.

THE PITHOI

By presenting examples of pithoi from Tell el-ʿUmeiri ascribed to these three episodes of activity, we hope to establish a typological connection between Iron I collared pithoi and the extremely frequent holemouth pithoi from the end of the Iron Age on the Transjordanian plateau; the latter are rare elsewhere. We present the pithoi from surfaces or destruction layers that we can confidently ascribe on the basis of stratigraphy to the three episodes described above. From Episode 1 the collared pithoi occur both as complete vessels standing on the surfaces and as reconstructable vessels in the massive destruction. The data from Episode 2 are the most problematic because we could isolate very few surface deposits to this period, and we have found no complete or reconstructable vessels. Moreover, pithos sherds came from layers that feasibly could contain earlier material, as well. However, the pithoi from this horizon are clearly foreign to the early Iron I assemblage in terms of ware and form and, because there is otherwise apparently no settlement at the site between the twelfth and tenth centuries B.C., it is safe to assume that the pithoi are not intrusions from the eleventh and tenth centuries. For Episode 3, we do not have complete examples from ʿUmeiri, but the sherds occur in such great numbers and such large sizes (we have found the bottom halves of several vessels) that they cannot be intrusions from earlier periods. They also occur in similar numbers at contemporary sites in the region (Hesban [Lugenbeal and Sauer 1972: pl. 7], Jawa [Daviau, pers. comm.], Jalul [Younker, pers. comm.], and Amman [Dornemann 1983: fig. 57]). Identical forms have been reconstructed at Tell Jawa (Daviau 1992: 151).

We also present other forms from fills or secondary layers that, regardless of the unclear date of their deposition, can be ascribed to either the second or third episode on typological grounds.

Episode 1 (LB IIB–Iron IA)

All illustrated pithoi from this period (figs. 14.2–14.4) were found together in one casemate room in Field B, Square 7J89, smashed by the destruction (see Clark 1997, Field Phase 11). The reconstructed vessels, of which only the rims and necks are shown in fig. 14.2 (for the complete forms, see Clark 1997), were found at one end of the room, and the sherds in figs. 14.3–14.4 were found in the destruction layer that covered them and most likely came either from other jars in the room that have so far not been reconstructed or from those stored in an upper story.

One of the most surprising aspects of our assemblage is the great variety of rim and collar forms. All the rims are everted, many strongly. Most rims are varieties of thickened ovals or rounded triangles (figs. 14.2; 14.3:8; 14.4:1, 3, 4, 6), but others are plain (figs. 14.3:1, 2; 14.4:2, 7), or profiled (fig. 14.3:5, 6, 9, 10). The most typical type of collar in Cisjordan is the simple ridge below the neck on the upper shoulder; it is also found at ʿUmeiri (figs. 14.2; 14.3:1, 2). But there are also examples with double ridges (figs. 14.2:2; 14.4:3, 4), thickened collars (figs. 14.3:5, 8; 14.4:2), thickened collars (short or long) with grooves, ridges, or waves (figs. 14.2:3, 4; 14.3:5–8, 10; 14.4:5), and a second ridge on the upper neck (fig. 14.4:1, 2, 6, 7).

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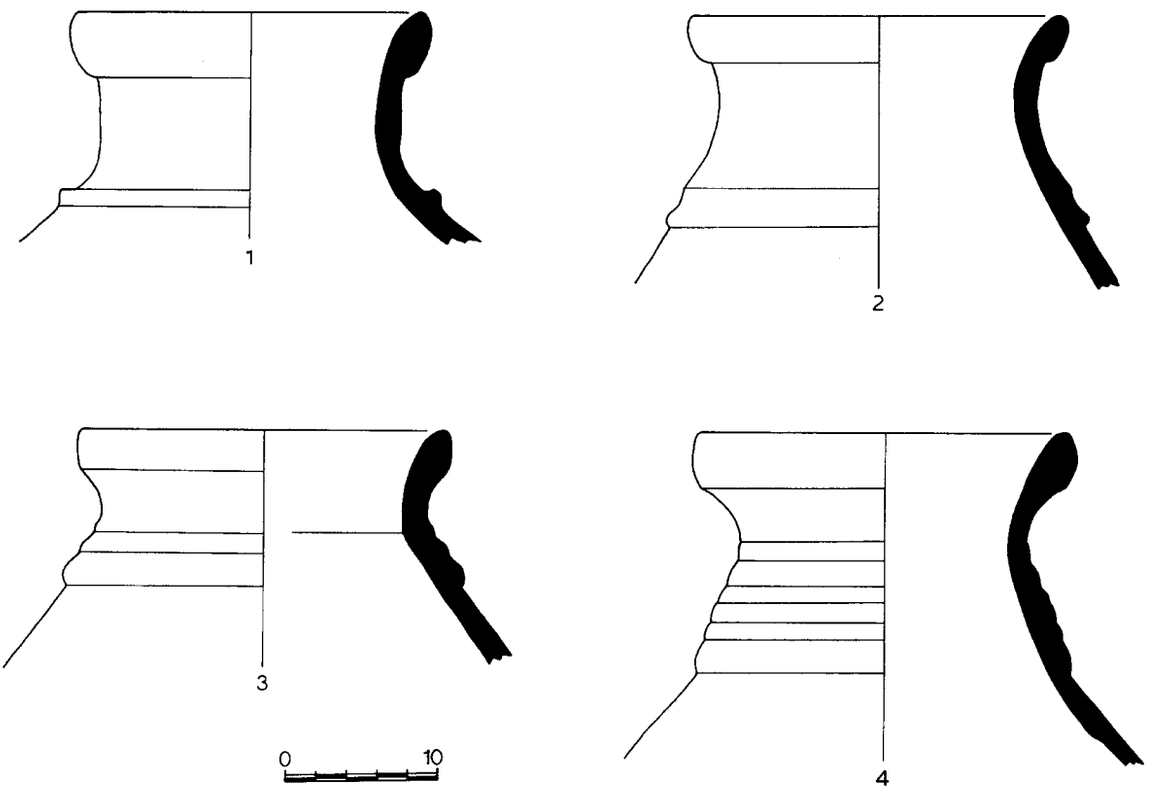

FIGURE 14.2. Collared pithoi from Tell el-ʿUmeiri from a casemate room.

There is variety also in neck and shoulder relationships. Sometimes the neck and shoulder turn outward to form a long shoulder (figs. 14.2:2–3; 14.3:2, 6), but most have long necks and more horizontal shoulders.

Although all vessels went through the destruction fire which was so hot it turned some of the stones in the surrounding walls to lime and vitrified much of the pottery, the wares of most of the vessels seem similar to each other and to others outside the room (not illustrated here).

The other pottery forms (cooking pots, jugs, etc.) retrieved from the rampart in use with the casemate room in which our pithoi were found were identical to those in the destruction layer. Because the rampart pottery must have been made before the pottery from the destruction illustrated here, the similarity between the two assemblages suggests a short life-span for the casemate room and its associated phase of Episode 1C. The variety of forms cannot, therefore, be attributed to temporal causes, but must be attributed to potting techniques or stylistic preferences of potters or users. In any case, this assemblage provides an excellent picture of the variety of contemporary vessels at one site, most likely made of the same clays (a technological study of the ware is being undertaken by Gloria London).

Episode 2 (Early Iron II)

Lying on a surface at the watercourse (Locus E.2:42) was a later version of the collared pithos (fig. 14.5:1), in which the rim is barely thickened. Indeed, the neck and collar are so short there is barely room for any distinctiveness to the rim. This collar is very different from

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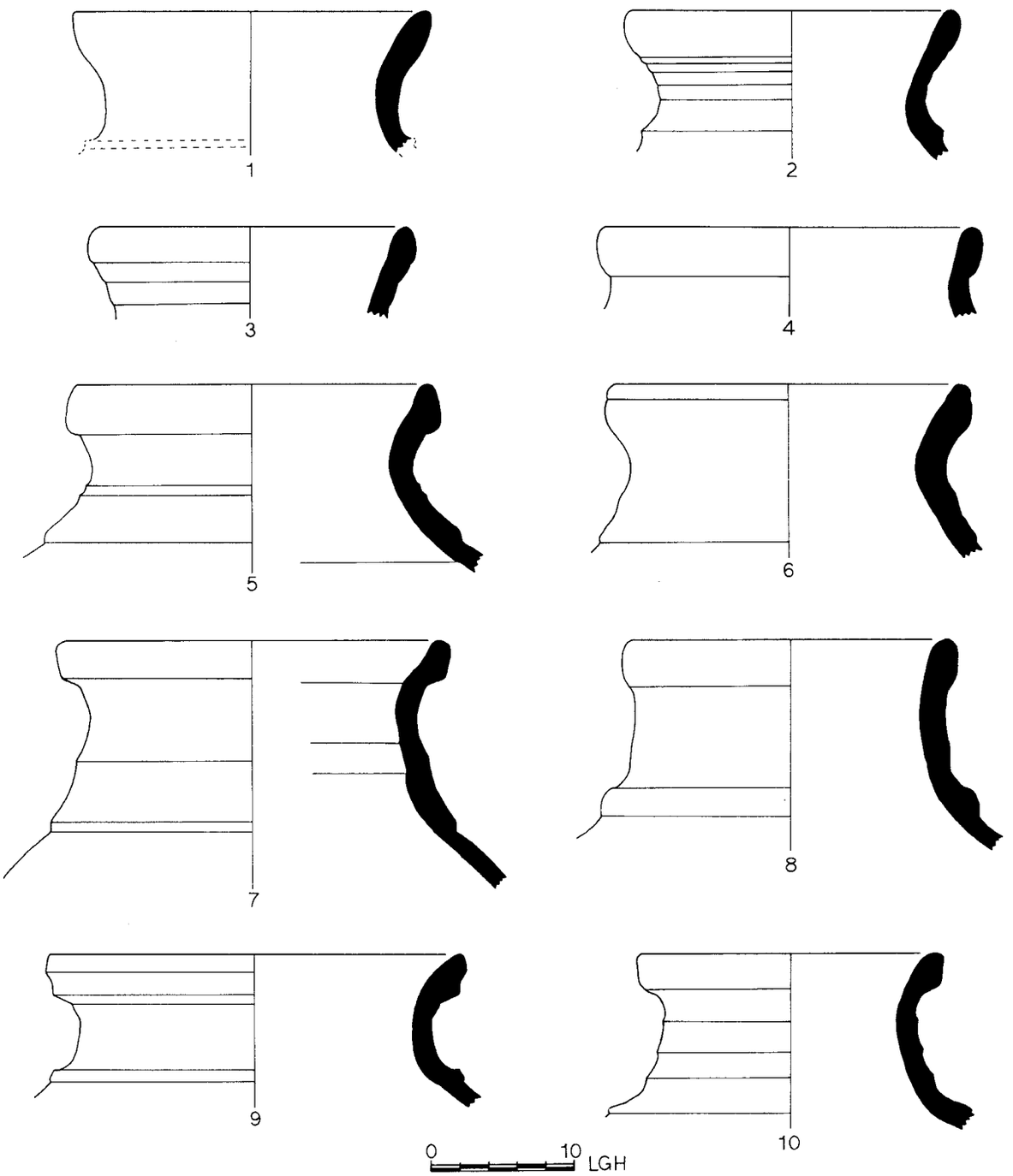

FIGURE 14.3. Rims and collars of collared pithoi from Tell el-ʿUmeiri from a casemate room, excavated within two layers of the Iron I destruction.

the typical long-necked, long-collared forms from the early Iron I period. It appears to be the descendent of the early Iron I form with the thickened collar (figs. 14.3:5, 8; 14.4:2). This vessel appeared together with jug forms dated to Iron I and early Iron II (Herr 1997).

Another pithos with a very short neck is found in figure 14.5:2. It came from postoccupational debris immediately above one of the early Iron II surfaces in Field A (Locus 7K51:

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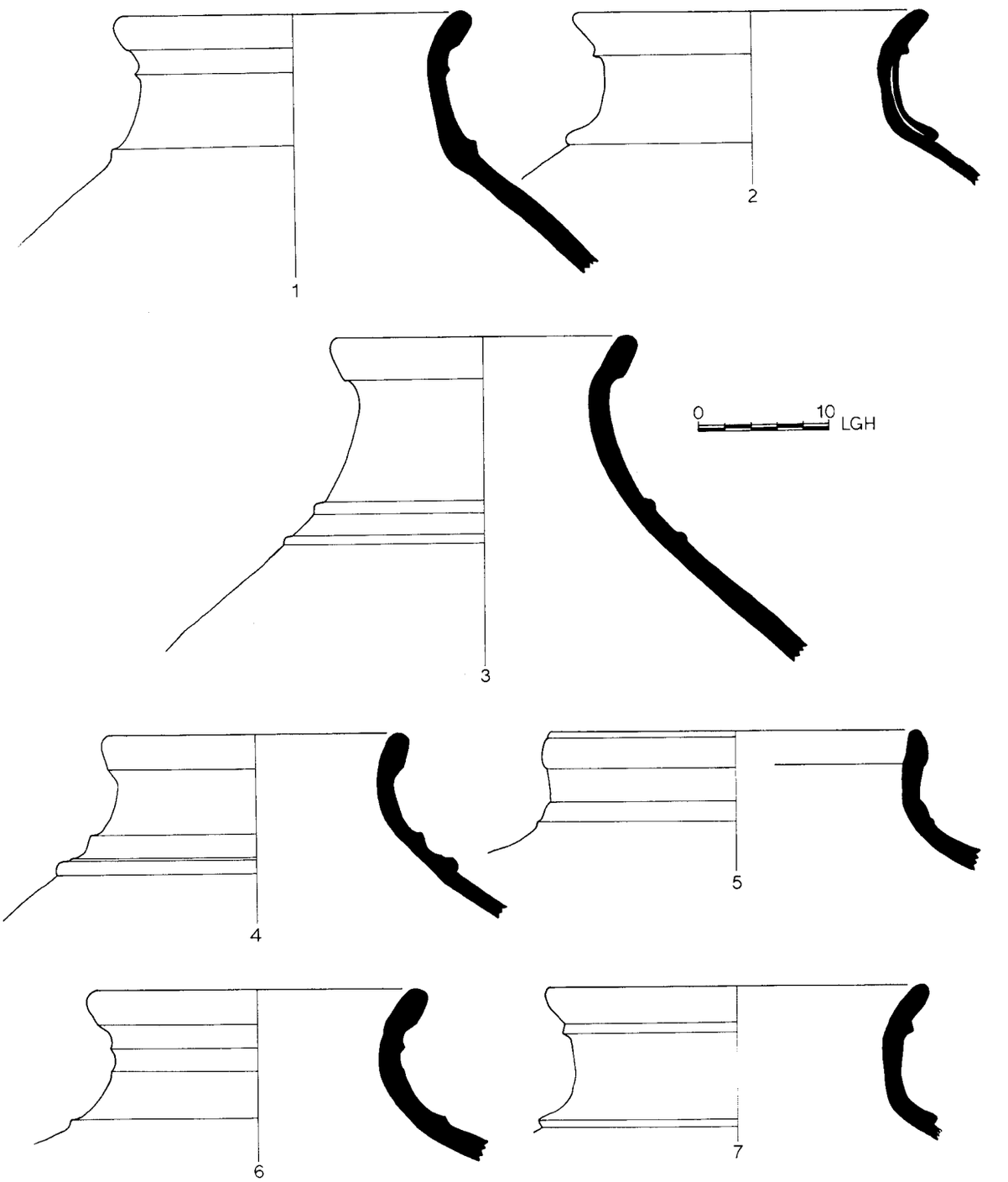

FIGURE 14.4. Rims and collars of collared pithoi from Tell el-ʿUmeiri from a casemate room, excavated within two layers of the Iron I destruction.

34). There is a ridge below the rim and a vestigial ridge on the upper shoulder. This seems to be a descendent of the early Iron I type of collared pithos with both rim and shoulder ridges (fig. 14.4:1, 2, 6, 7).

These two examples recall the early Iron I forms, but a third suggests the direction subsequent pithoi would take (fig. 14.5:3). It came from the floor of the storeroom in Field B (Locus

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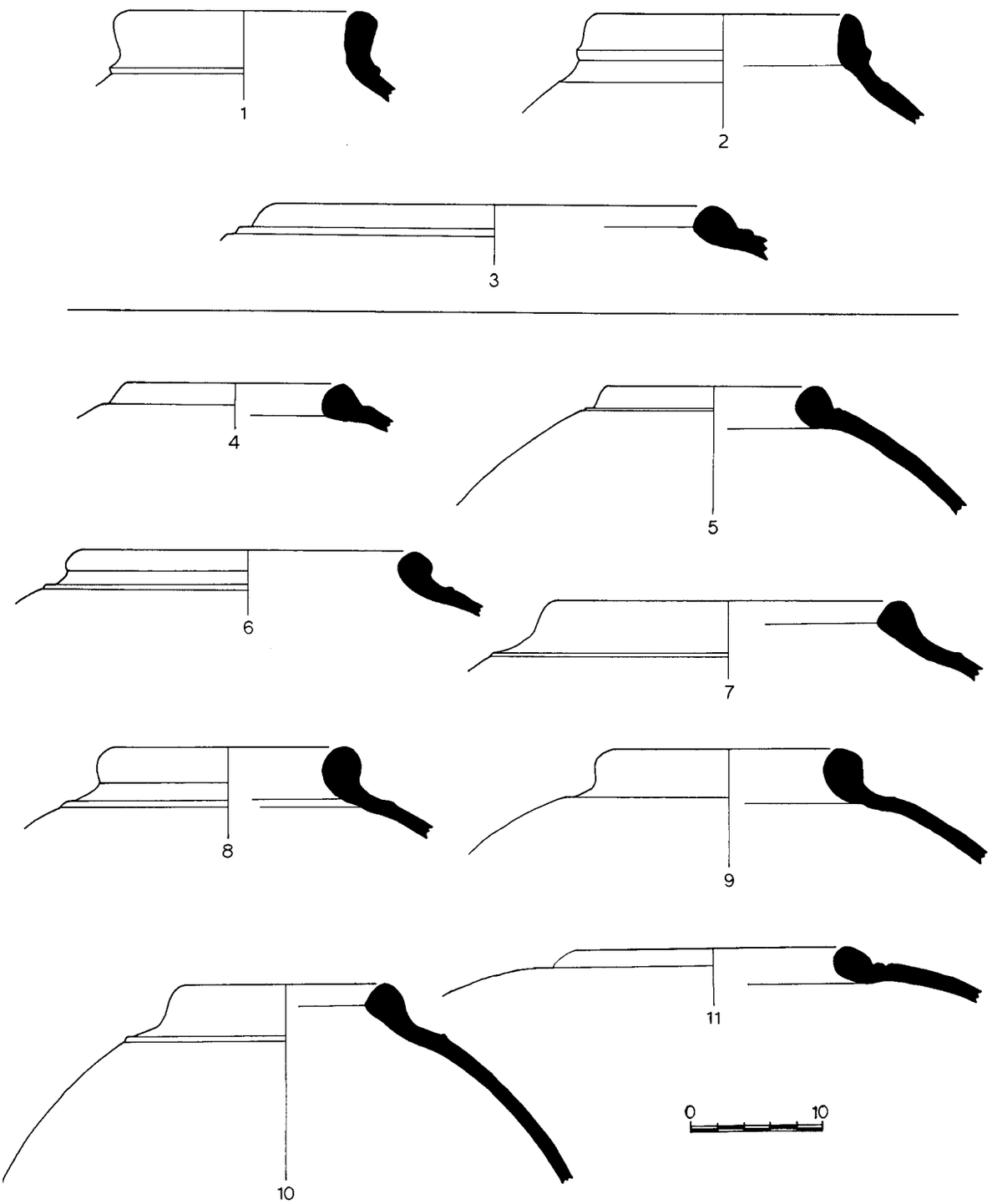

FIGURE 14.5. Rims and collars of pithoi from Tell el-ʿUmeiri dating to early Iron II *(1–3)* and late Iron II/Persian *(4–11)*.

7J89:6) built immediately above the destruction layer of the Early Iron I city, but below the domestic buildings belonging to the Episode 3. The rest of the pottery in the storeroom clearly dated to the ninth–eighth centuries (Herr 1989: fig. 19.4:1–16). This pithos, which can now be called a "holemouth pithos," retains a version of the short, thickened collar reminiscent of that

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in fig. 14.5:1, but the neck has completely disappeared, and the rim reduces the upturn to a bulbous thickening (Sauer has noticed this "bulbous" rim on earlier forms of collared pithoi from Hesban dating to the tenth century: 1994: 240). This holemouth form, which may be as early as the late ninth century, is ubiquitous at Iron II sites in central Transjordan.

Although the archaeological deposits for Episode 2 are weaker than those of Episode 1 and there is a hiatus of 250–300 years between them, the jump from the Iron I forms to those of early Iron II is not significant, except for the third example. However, other examples from unstratified fill loci (below) illustrate its connection, as well. Thus, we would suggest the typological development of the collared pithos that occurred in the late Iron I, while ʿUmeiri was in hiatus, was to shorten the neck and collar and reduce the significance of the rim, moving slowly toward the holemouth form of the later centuries of Iron II.

Episode 3 (Late Iron II/Persian)

During this period all pithoi are holemouth forms and are very frequent at every late Iron II and early Persian site on the central Transjordanian plateau. Their rim and upper shoulder treatment vary greatly, but many examples reflect typologically later developments of specific earlier collar treatments. The first examples seem to recall the short, thickened collar from the previous episode (cf. the late examples in figure 14.5:4, 5 with the earlier one in fig. 14.5:1). The rim is bulbous in one example and slightly turned up in the second, but the ridge below the rim on the upper shoulder is where we would expect it if the collar continued to shorten after the early Iron II examples were made. The sherd in figure 14.5:4 came from a fill layer (Locus 7K71:8) deposited after the Persian administrative complex went out of use; although the locus dates to the Persian period, the vessel from which the sherd came might have been made earlier. The example in figure 14.5:5 came from a surface (7K42:16) laid after the Persian administrative complex went out of use. Embedded into the surface were the bottom thirds of two pithoi from which this rim may have come. These pithoi thus continued well into the Persian period.

Holemouth pithoi also reflect the collar form with the simple ridge on the upper shoulder (fig. 14.5:6–10). Compare them with the early Iron I examples (figs. 14.2:1; 14.3:1, 2). Although the late forms are from holemouth vessels, they still retain a thickened or upturned rim and a distinct collar-like ridge on the upper shoulder. Figure 14.5:6 came from a postoccupation fill (Locus 7K60:5), but its form clearly belongs to this episode of activity. The sherd in figure 14.5:7 came from a surface in Episode 3C of the administrative complex in Field A dated to the early Persian period (Locus 7K51:13). Figures 14.5:8–10 all came from fill layers immediately beneath the surface of the Episode 3C administrative complex (Locus 7K51:30), and therefore date to the very end of Iron II or the first decades of the Persian period.

Other forms seem to be variations of these late vessels rather than strict descendents from earlier types. We would call attention to the form in figure 14.5:11 with two grooves below the rim. This is a particularly frequent type at Tell el-ʿUmeiri in several subforms: the grooves can be sharply made, have the appearance of waves, or appear more like ridges. When they appear as ridges they are reminiscent of the double-ridged variety of collared pithos from the Iron I assemblage (figs. 14.2:2; 14.4:3, 4).

Typologically Intermediate Pithoi

Other examples have been found in loci belonging to unstratified deposits, primarily topsoil, but their forms typologically appear to belong to earlier periods. Because it is very pos-

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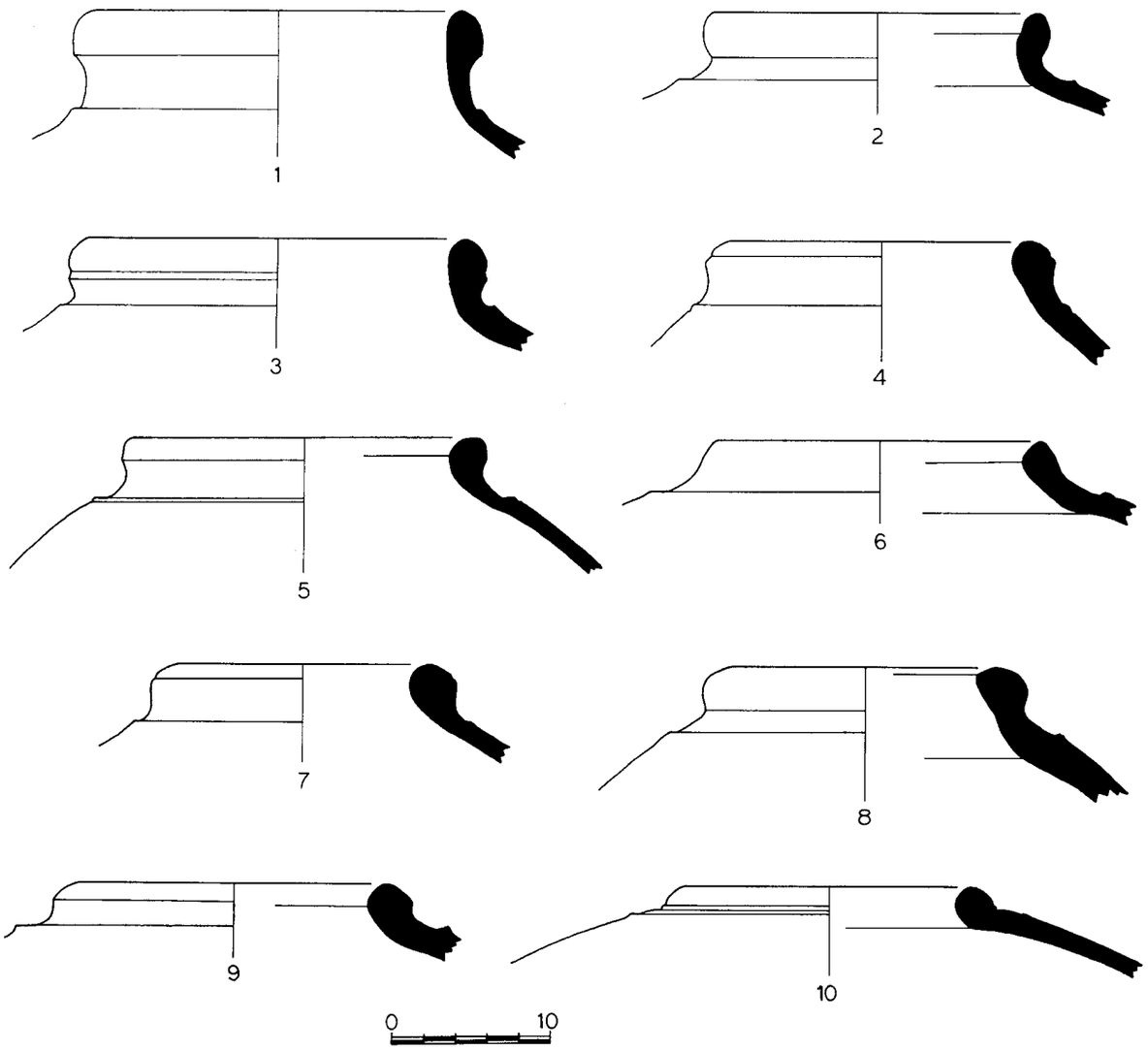

FIGURE 14.6. Rims and collars of pithoi from Tell el-ʿUmeiri from a variety of periods in unstratified deposits.

sible for sherds from later loci to have been made earlier, we include them here for interest's sake and because there were only three examples from the stratigraphic layers of Episode 2. It is likely that most of these forms represent collared pithoi intermediate between those of Iron I and the Late Iron II/Persian periods. Certainly, they are typologically intermediate. In all cases the ware is typical of Iron II, not Iron I, and two examples are slipped (fig. 14.6:2, 7), a trait typical of Iron II.

The first example (fig. 14.6:1) looks similar to those of Episode 1, but the rim is upright, the neck is short, and the weak collar is very high on the shoulder; the ware is also very different from the Episode 1 pithoi, more akin to those of Iron II. This form could very easily belong to late Iron I. The following two examples (fig. 14.6:2–3) also have upright rims, but there is almost no neck. Indeed, if the rims were not turned up quite as strongly, they would appear to be holemouth forms. Note the memory of a ridge at the bottom of the rim similar to examples from Episode 1; this is a trait on several other rims, as well.

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With the next two examples (fig. 14.6:4–5), the rim is not turned up as strongly as the preceding examples, and we can begin categorizing them as holemouth forms. But strong similarities with the necked pithoi still remain: above the collar is a semblance of a neck; the rim is thickened, even with a ridge at the bottom of one (fig. 14.6:4); the collar is clear.

The next four examples are similar to the previous two but appear closer to the standard holemouth forms of Episode 3 (fig. 14.6:6–9). The collars are weaker, except for one (fig. 14.6:9); the rims are becoming bulbous (fig. 14.6:7, 8) or triangular (fig. 14.6:6). Note the rim ridge on figure 14.6: 7. Some of these forms are so similar to holemouth types they could belong to Episode 3. The last example (fig. 14.6:10) is a full-fledged holemouth pithos typical of Episode 3. The collar is still apparent as is the ridge at the bottom of the rim thickening.

EVIDENCE FROM ELSEWHERE

Worschech has already presented hints that collared pithoi continued into Iron II at Balua (Worschech 1992), but some of his late forms are jars with ridged necks, not true collared pithoi. Although we still need more examples from Moab, it looks like collared pithoi continued into Iron II there, as well. The debate between Finkelstein (1992) and Bienkowski (1992) over the presence of Iron I at various Edomite sites based on the presence of collared pithoi actually illustrates their presence in Edom during Iron II, as well. Although some of the vessels Finkelstein calls our attention to may not be collared pithoi (Finkelstein 1992: fig. 2:1, 11–12, 14–15), and although most of the others have significantly different rim forms from ours at ʿUmeiri, it is easy to place them in the middle to end of our typology, dating to the ninth through the seventh centuries. All necks slant inward strongly, and the collars are mostly weak waves, grooves, or ridges. Because Finkelstein used the history of collared pithoi in Cisjordan for his paradigm, where they ended by the tenth century, he tried to place the Edomite examples in Iron I, as well. We owe him thanks for recognizing them to be collared pithoi. However, now that we can document similar pithoi continuing throughout Iron II at ʿUmeiri, recognizing the Edomite examples as Iron II forms fits the basic stratigraphy of their sites of origin. There is still, therefore, no reason to see Iron I at these sites. Only one of the forms from Edom has a good parallel at ʿUmeiri (Finkelstein 1992: fig. 2:17). The unique rim forms from Edom may thus represent specific regional variants. Note that at least one form is reminiscent of smaller "Edomite" jars (Finkelstein 1992: fig. 2:4).

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COMMODITIES AND CUISINE: ANIMALS IN THE EARLY BRONZE AGE OF NORTHERN PALESTINE

Brian Hesse and Paula Wapnish

INTRODUCTION

Before Douglas Esse began his excavations at the Jordan Valley site of Tel Yaqush, he asked if we would be able to tackle the analysis of the animal remains he anticipated recovering in the course of the project. We signed on enthusiastically, knowing from working with him at Ashkelon that he would apply the meticulous standards of excavation that insure the collection of a reliable sample of the bones, teeth, and shells preserved in an archaeological site. More important to us, however, was the knowledge that this request was based on a question that lay at the core of his program of research, one that demanded the engagement of zooarchaeological skills. Esse wanted to know how the economy at Tel Yaqush, and in particular the agro-pastoral sector, was integrated into and shaped by the surrounding and emergent urban landscape of the Early Bronze Age (EB). He recognized that the bulk of our knowledge of this period in the southern Levant was based on extensive and detailed survey work (e.g., Esse 1991; Joffe 1991, 1993; Portugali and Gophna 1993) combined with the excavation of a small number of the largest settlements. While a few smaller communities had been sampled (e.g., Braun 1985), relatively little was known of the systems of production and exchange that supported them, and not much of that was based on biological evidence (for a review, see the survey of Horwitz and Tchernov 1989).

From the discussions we had with Esse while setting up the project, we concluded that a basis for constructing a model should include ideas drawn from locational geography, analogies from ethnographic evidence, reports from those areas of the late fourth and third millennia B.C. that have yielded textual evidence bearing on the problem, and archaeological parallels from outside the region. All pointed to the proposition that Tel Yaqush was a node in a pastoral production, distribution, and consumption system that involved interaction between and exchange of animal products by nomadic groups, hamlets and villages of various sizes, and the large walled cities that dotted the region (see also, Schwartz and Falconer 1994; Falconer 1995: 399–401). Small though the site was, it likely contained distinct social components that had differential access to animal products. Since Tel Yaqush was occupied throughout most of EB, it was further thought that the animal remains could be brought to bear on suggestions that the social and economic organization of the region underwent significant oscillations in the degree of centralization and urbanization during this multi-century period (Portugali and Gophna 1993; Finkelstein 1995).

The research plan that evolved required the examination of the faunal remains from Tel Yaqush to see if evidence for a locally differentiated cycle of pastoral production, exchange,

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and consumption could be detected. Could we support the idea that the animal resource–related activities at Tel Yaqush were different in some way from those going on in nearby communities and, further, that the differences implied the existence of a coordinated system? Was the familiar modern system already in place? Were animals and their products already circulating in economic systems as commodities (Appadurai 1986), or were the technological and sociopolitical limitations of the EB society in the southern Levant such that these resources had only limited importance as sources of exchange value compared with their use value as consumables (see the general suggestions of Kopytoff 1986: 87)? Could we show that within Tel Yaqush itself, different sectors had different relations to the products of animal management? Did some slices of the social pie construct and express their status through the consumption of certain types of animal products—cuisines? Did consumers obtain meat, milk, fiber, and access to draft power directly from herdsmen, or was there, as Zeder (1991) terms it, indirect access to animal products, with some elements of the social system depending on formalized systems of redistribution to obtain their shares? Could we show that these two aspects of the system, one external and one internal from the perspective of a resident of Tel Yaqush, developed over time in some manner?

As it turns out, these are extremely complicated and difficult questions. In our view, there is a significant gap between the high level theory which historians and ethnographers offer to describe the operation of a Near Eastern pastoral production system and the evidence zooarchaeologists offer to illustrate its operation in a particular historical context. The problem is the familiar one of the lack of effective "middle range theories" that are able to overcome the uncertainties brought on by the difficulties of equifinality (Trigger 1989: 20–22). As we discuss below, animal bone samples were produced by the reflexive interaction of a variety of ancient actors and, setting aside the uncertainties implied by taphonomic processes (Lyman 1994), it is not at all clear a priori which element of the system—production, distribution, or consumption—a particular zooarchaeological statistic reports.

THE ZOOARCHAEOLOGICAL COLLECTIONS

The comments we offer on these issues have as their core the collections of bones obtained in the 1989 and 1991 excavations directed by Esse at Tel Yaqush together with a small sample obtained in 1995 by David Schloen, who now has taken over responsibility for the excavation and publication of the site under the continuing auspices of the Oriental Institute. Given the lack of fully elaborated quantitative models of pastoral production, distribution, and consumption, it became apparent in thinking about the project that our examination of the problem would have to be more inductive and explorative than deductive and evaluative. We were not likely to find ourselves able to test our suppositions about economic organization; rather we hoped to refine our expectations about the potential of zooarchaeological evidence while inching toward a resolution of the larger issues.

Further, we felt that attempting to discern interaction between communities in pastoral production from the perspective of a single site could prove frustrating. Therefore we expanded our analysis to include other collections of EB faunal materials. The first possibility we considered was the sample recovered by the Oriental Institute excavations at Beit Yeraḥ. A large site located in the immediate orbit of Tel Yaqush, it is an ideal candidate for comparison and, since the materials were in Chicago, Doug was able to let us examine those bones. Unfor-

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tunately we discovered that the recovery procedures used to obtain that collection, coupled with difficulties in reconciling stratigraphic problems in the material, made comparison to Tel Yaqush problematic. Therefore we turned to two other collections—those from the sites of Tell el-Mutesellim (Megiddo) and et-Tell (Ai). While less ideal comparisons, in that each site is located at some distance from Tel Yaqush and so was unlikely to have acted directly in the local production systems of the Jordan Valley, each seemed to be sufficiently different in community character to provide grounds for comparison. However, before we could compare these three sets of material, we had to establish rough expectations for our analysis.

ORGANIZATION OF THE PRODUCTION, DISTRIBUTION, AND CONSUMPTION OF ANIMAL RESOURCES

Many of the texts that have been found by archaeologists in the lands of the Fertile Crescent record domestic animals and the exchange of pastoral products. While brief, these mentions are sufficient to permit the reconstruction of some of the components of the production and distributions systems associated with husbandry. Further, works of art illustrate the appearance of individual animals as well as the ubiquity of herd animals in the cultural landscapes of the past. These ancient words and pictures combine with the images of day to day activity developed by Near Eastern ethnographers to attest that raising stock, exchanging pastoral products, consuming meat and milk, and utilizing fiber, hides, and the labor of draft animals were core economic activities in ancient societies. However, even in the heartland of Mesopotamia, the textual and artistic record of husbandry and the movement of pastoral products is partial, both in terms of the kinds of communities and animal production systems whose activities are reported and the historical periods and places for which we have documents (see, e.g., Postgate 1975; Zeder 1994; and a number of articles in *Domestic Animals of Mesopotamia*, Parts I and II, which appeared as Vols. VII [1993] and VIII [1995] of the *Bulletin on Sumerian Agriculture*). We know much more of the major cities and the herding operations of temples and palaces than we do of the flocks and herdsmen of smaller communities. One effect of this imbalance in the available information has been to shift attention to the most direct source of evidence about past pastoral economies: the animal remains found on archaeological sites.

In reconstructing past animal production systems, zooarchaeologists have emphasized three variables—the relative abundance of the taxa, the mortality or culling pattern associated with each type of animal, and the spatial distribution of different kinds of bones (for an extended example, see Wapnish and Hesse 1991 or Zeder 1991). For example, Redding (1981, 1993) observed that the ratios of sheep to goats and sheep/goats to cattle that are kept by pastoralists is shaped by their perception of risk and the nature of the surrounding agricultural system (see also Rosen 1986), as well as the character of the environment in which the animals are raised. Payne (1973) provided a series of idealized sheep and goat age curves that he links to three of the goals of pastoral production—dairy, meat, and fiber—while Cribb (1984, 1985, 1987) illustrated how herd growth rates condition these models. Hellwing and Gophna (1984) argued that the degree of complexity in the sociocultural system that moves animals from pasture to table is reflected in the spatial disposition of different parts of animal carcasses across a site, a theme expanded upon by Zeder (1991), while Grantham (1992) has contended that these distributions are shaped by the cultural values collected under the concept of cuisine. Doubtless everyone is right, the question is when to apply which index.

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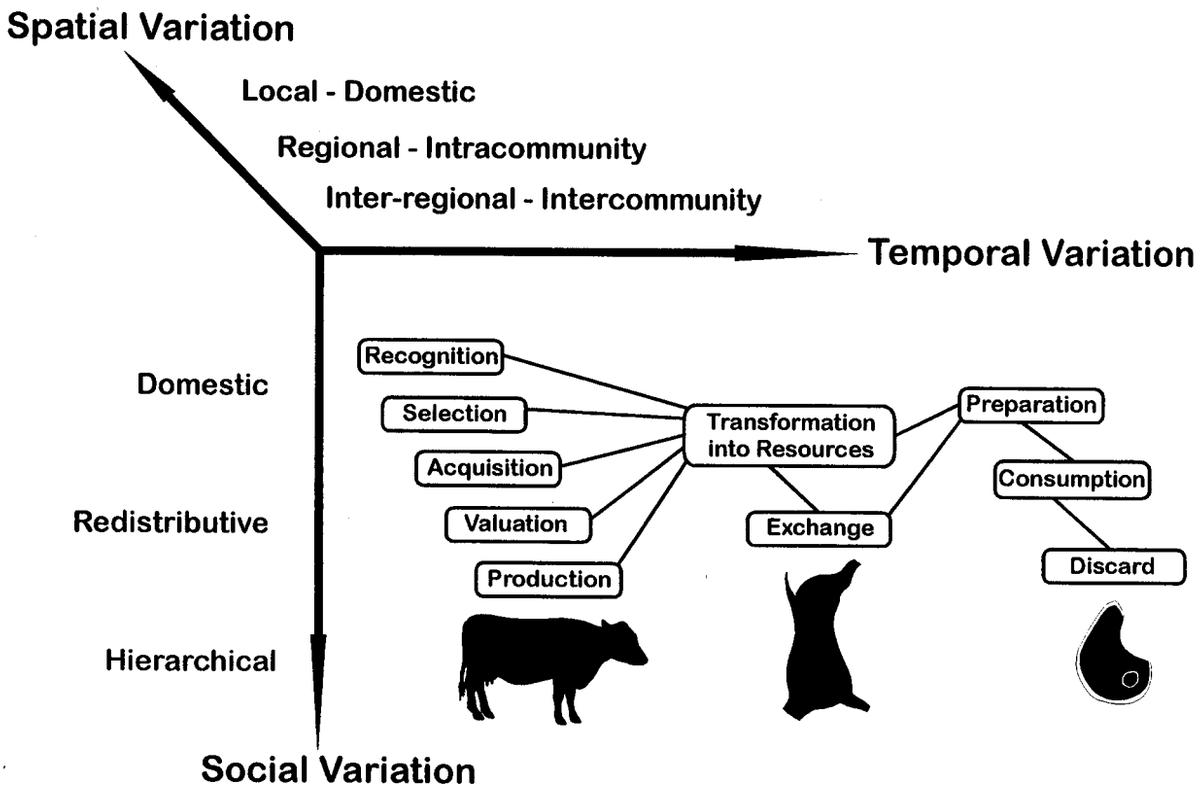

FIGURE 15.1. Schematic model of the organization of pastoral production. Three axes of variability are highlighted—a temporal one that records the movement of individual animals through the system from birth to slaughter and final consumption, a spatial one that describes the range of possibilities for the distribution of animal-related activities across the landscape, and a social one that expresses the possible relationships that might exist between the human actors in the system.

To appreciate these and other zooarchaeological indicators, each has to be seen in the context of a general model of animal exploitation (see fig. 15.1)—a version of which we present schematically here. The work of exploiting animals is differentiated along three axes—temporal, spatial, and social. The temporal axis expresses the vector of production. Animals must be recognized as useful, then acquired, assigned relative value, selected for the production of various resources, and managed. Once their useful lives as sources of secondary products (milk, fiber, labor, and young) are deemed complete, animals enter their final circuit of exchange where they are slaughtered, butchered, and prepared as meals, with skeletal refuse discarded at each step. Depending on the animal, the products desired, and the technology available, for a single creature this process may last from months to years. For a male goat it may take only six months, while a female camel may be in the system for more than twenty years. The pace is accelerated or slowed by the social and economic situation in which herdsmen and the consumers of animal products find themselves: do they need to "sell" the animal now to meet pressing needs, or can that decision be put off to a more advantageous moment.

The spatial axis expresses the fact that production, exchange, and consumption may be contained within the same local circle or extend to a chain of specialists and middlemen

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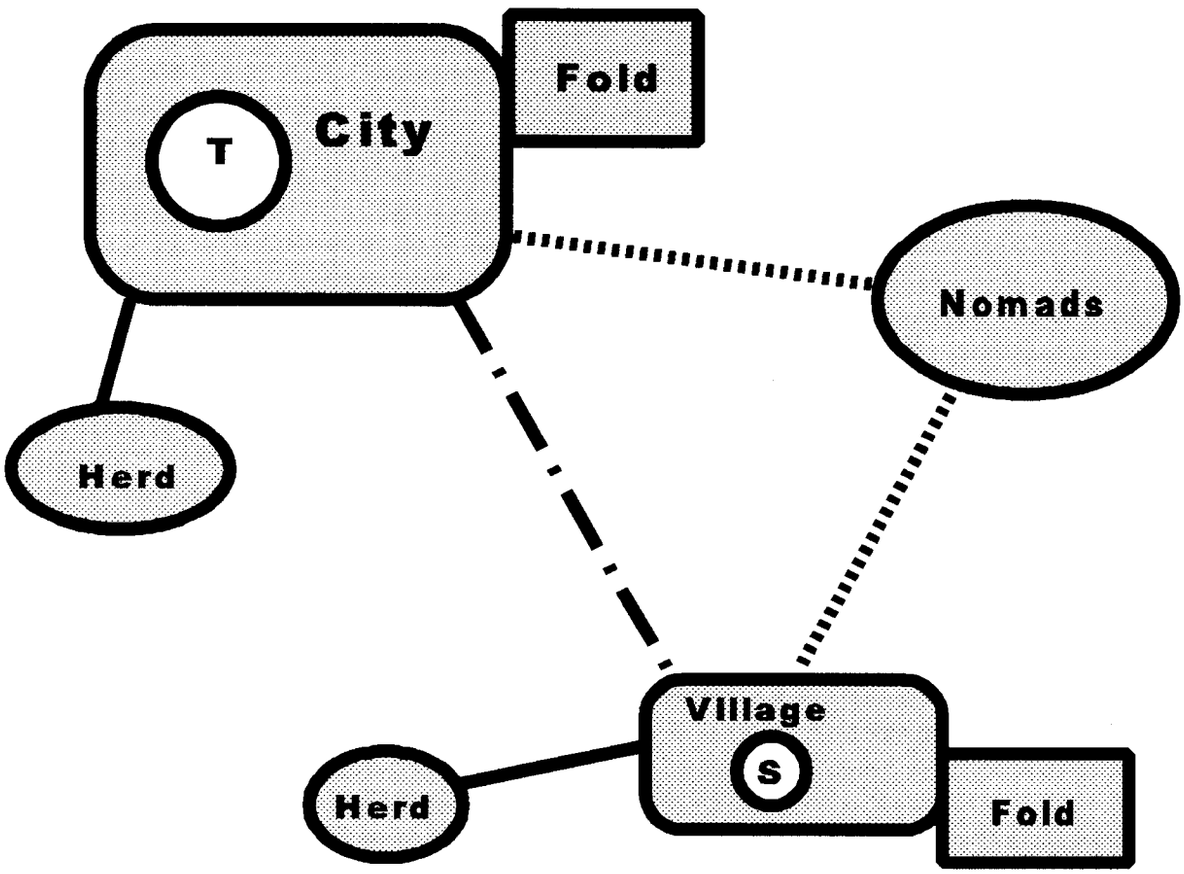

FIGURE 15.2. Schematic model of the primary loci of pastoral production in a generalized Near Eastern system. Dotted and broken lines represent the flow of animals and animal products between the three basic types of communities in the system. Cities and towns not only receive products from nomadic groups, but they generate them from their own tethered transhumant groups, and from close-herded animals maintained near to the settlements. (T = temple; S = shrine)

including herdsmen, drovers, slaughterers, butchers, and cooks who are spread across communities and even over huge territories. Each link in the chain may be motivated by a wide range of ideological, economic, or pragmatic factors. A striking example of the scale to which these systems can grow is provided by Altorki and Cole (1989) who report that animal trading systems established by Arabian extended families were able to shift large herds of animals between the main cities of Syria and Arabia to take advantage of shifting market opportunities.

The social axis reflects the fact that the social and political relations between the various human elements and tasks in the system may be egalitarian, heterarchical, or hierarchical and involve mechanisms of kin-based obligation, tribute, or market relations. The social axis is complexly reflexive—herdsmen are not free to raise what they want, they answer to the middlemen and consumers down the temporal line even if those individuals are members of their own households. Similarly cooks must deal with the realities of what is possible, altering the scheduling and form of the meals they prepare in response to the carcasses available to them.

The structure of human communities within which Near Eastern animal husbandry is practiced can be presented schematically (fig. 15.2). Three primary elements are identified here—cities, villages, and nomadic groups—though it is obvious that these exemplars reflect points

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on continua of sedentism, size, and the significance of land or animals in energizing social relations (Ingold 1987) rather than neatly bounded categories. Animals are raised by nomads who use their products both for domestic consumption and for exchange with settled communities. Some authorities have argued that specialized nomadic pastoralism is a precipitate of the emergence of large agricultural communities (Lees and Bates 1974), while others suggest that nomadism is a lifestyle adopted during periods of agricultural collapse (LaBianca 1990).

We suspect that these two types of mobile herding should be separated analytically, given the fundamentally different economic orientations to intercommunity dependence each model presupposes. In the first case, pastoral nomadism is understood as a husbandry specialization extruded from and rewarded by the complex agro-pastoral systems based on irrigation and other intensive techniques that emerged in the fourth and third millennia B.C. Capital investment in the fields surrounding towns and cities pushed pasturage further and further to the periphery in order to rationalize land use. While the social and political ties to sedentary communities held by mobile groups became somewhat attenuated (though not lost), distant, and formalized, economic interdependence remained strong. Perevelotsky (1986) has shown that the type of animals exchanged by this type of nomadic pastoralist is strongly influenced by the quality of the land they are able to use as pasture and their relative wealth. This is directly expressed in the age of marketed/delivered stock recorded at urban centers. Only the most favorably situated pastoralist can afford to take the risks associated with fattening animals, which involves maintaining them into early adulthood, even when the "market" rewards for this practice are high (Barfield 1981: 98). Usually, in fact, these herdsmen are those who have not adopted the nomadic lifestyle at all but are husbanding stock as a sideline in conjunction with agricultural activities. Marginal producers, whether mobile or sedentary, move animals to "market" as soon as they are salable (often in their first year of life), in order to meet pressing social and financial obligations. These findings appear to be examples of what Stein (1992), following Sandford, describes as the contrast between opportunistic and conservative herding strategies. The general point is that the kind of stock flowing along the dotted lines in figure 15.2 linking the nomads with the villages and cities will be constantly varying with the shifting economic fortunes of the pastoralists as well as the relative value/price assigned animals of different type in the sedentary communities.

Pristine ethnographic cases of the economic behavior of the second type of nomadic pastoralist, those that adopted a mobile lifestyle as a result of the collapse of sedentary systems, are hard to find. On the economic grounds established by Cribb's simulations (1984, 1985, 1987), however, we can predict that these communities will pursue dairy production, given the fact that this alternative yields the highest energy return of the basic three pastoral strategies. An additional observation that can be made, based on a near example, is one provided by Shahrani (1979). He describes herding communities who occupy high altitude pastures in the panhandle of Afghanistan and have only limited contact with settled communities and little possibility of practicing agriculture in their habitat. While, of course, it is not reasonable to generalize from a single case, it is interesting to note that here the outcome of long-term relative isolation from sedentary communities in an environment of climatic uncertainty is the concentration of great numbers of stock in the hands of a few extremely successful individuals, rather than some kind of economic leveling effect that equalizes outcomes across the various pastoral enterprises. Once amassed, this is capital available for investment in political as well

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as economic ventures. This would imply that the retreat into a nomadic pastoral lifestyle as a response to agricultural reverses actually sows the seeds for reentry into sedentism.

The visual drama of the nomadic pastoralist has deflected attention from the animals raised by agricultural communities. Not only are draft animals maintained at these settlements but close-herded stock, those animals which, as milk producers or for other reasons, require daily attention. Domesticates, like pigs, which are not suitable for transient lifestyles, are husbanded there as well. Labeled "Fold" in the figure, these are immediately available sources of animal products. The need to invest in these urban production modalities is inversely related to the ability of a sedentary center to regulate its pastoral inputs from a network of external suppliers. Towns and villages also may maintain transhumant pastoralists, often groups of men and boys drawn from the community, who herd village stock in distant pastures "owned" by the village. The need to develop such a strategy is often tied to the development of a ring of intensive agriculture around the settlement and the resulting conflict with the needs of pasturing herds. The links describing the flow of animals between these satellite nodes of production and the communities to which they are tied are described by solid lines to reflect the tethered quality of the social relationships. A broken line is used to describe the link between village and city. This choice of graphic symbol is meant to indicate the variable nature of the tribute obligations or the market opportunities that may obtain between the two. As Fernea (1972) has warned, the strength of the economic or political relationship between adjacent communities may not be indicated by their physical proximity as models of locational geography might suggest. In any case, the key point is that as villages are incorporated in the political systems dominated by cities, they tend to act more as conduits than end points in the flow of animals and pastoral products.

As can be seen from the outline provided here, the flow of animals between communities may be extremely complex and multiply motivated. Even if we were able to provide one, which at this point in the development of our knowledge of pastoral systems we cannot, it does not require a computer simulation to recognize that similar distributions of animal remains at a single site may be generated by different combinations of inputs and outputs between the nomadic, transhumant, and sedentary communities tied into a system. As a result the organizational information embedded in the zooarchaeological remains found at a single site is difficult to characterize unambiguously. In cases where most products are obtained from community-based herds and few animals are either exported or imported, it may be possible to read the production goals of the herdsmen from the species proportions and mortality information recovered. That is why most of the quantitative zooarchaeological models (e.g., Redding 1981) of Near Eastern pastoral production that have been developed are couched in the domestic mode of production. More qualitative models—which predict the direction of change in zooarchaeological variables but do not provide quite such specific numerical targets (e.g., Grantham 1992; Redding 1991; Zeder 1991)—have been useful in examining an emerging urban end point in a system, though it is dangerous to presume that just because a site is large and politically significant, it does not engage in the export of animals to even more powerful centers (Wapnish 1993, 1996).

For villages and towns, communities that might be expected to engage in relaying animals produced by their satellites and nomadic partners to the cities to which they were tied politically, the interpretive problem is exceptionally confusing. This is true for two interlocked

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reasons. First, because we sample an unknown proportion of an original amount of deposited material that has been subject to taphonomic processes, we never have measures of the actual total amount of resources that were available to the community in some period of occupation at a site, but only estimates of relative abundance. Second, it is not clear in most situations whether a particularly salient datum in the list of species abundances or a particularly high frequency of animals of a particular age reflects the import/choice of animals of that species and age or the residue left when most of the other species or age categories have been exported. For these reasons, it is probably premature at this point to try to characterize the production goals of smaller sedentary communities from zooarchaeological remains, though we can examine the consumption choices their residents made and perhaps the distribution systems that supported them.

Within-community differentiation in access to animal products is represented in figure 15.2 by the circled T, for temple, in the city, and the circled S, for shrine, in the village. This choice of symbol is tied to the observation, based on ethnohistoric documents, that animal products, often in the form of sacrifices, circulated through religious institutions in ancient Near Eastern communities. While temples and shrines may be over identified by archaeologists given the scanty architectural or artifactual evidence usually available, the existence of strong contrasts in the size and quality of different buildings within a settlement can reasonably be taken as indicative of some degree of social and political differentiation. So here, temple and shrine are taken as shorthand for the existence of hierarchical social complexity, the existence of public and private space, and the possibility of differential access to pastoral products, even if a textual record like the one that supported our analysis of the Tel Dan Iron Age material (Wapnish and Hesse 1991) is not present.

Given this multidimensional model, the initial part of the task of analyzing zooarchaeological remains from sites such as the three we report here is coming to some conclusion about which portion or portions of the spatial-temporal-social field, within which animal exploitation is accomplished, is represented by the collection at hand. Thus we turn to a description of the character of the archaeological contexts that produced the samples.

Tel Yaqush

Tel Yaqush is located in the eastern Lower Galilee near two tributaries of the Jordan River. During the EB it was an agricultural village on a main north-south artery connecting Canaan with Syria. Excavations by the Oriental Institute of the University of Chicago were conducted at the site in 1989 and 1991 under the direction of Douglas L. Esse (see Esse 1993 for a basic description) and in 1995 by David Schloen who excavated Square H6 (fig. 15.3). Faunal remains were recovered from most of the areas excavated.

The bulk of the animal bone fragments was assigned by the excavators based on ceramic associations and stratigraphic considerations to one of the three main periods of EB: I, II, or III. Some material was assigned to indeterminate or mixed periods, such as EB II/III, but these relatively few remains are not reported in this study. The faunal distributions by square for EB I, II, and III are found in table 15.1. A listing of finds by species and period of occupation is provided in table 15.2.

Based on Esse's report (1993) we can assign some of the material presented here to phases within each of the three main periods of occupation. EB I, the earliest occupation at the site,

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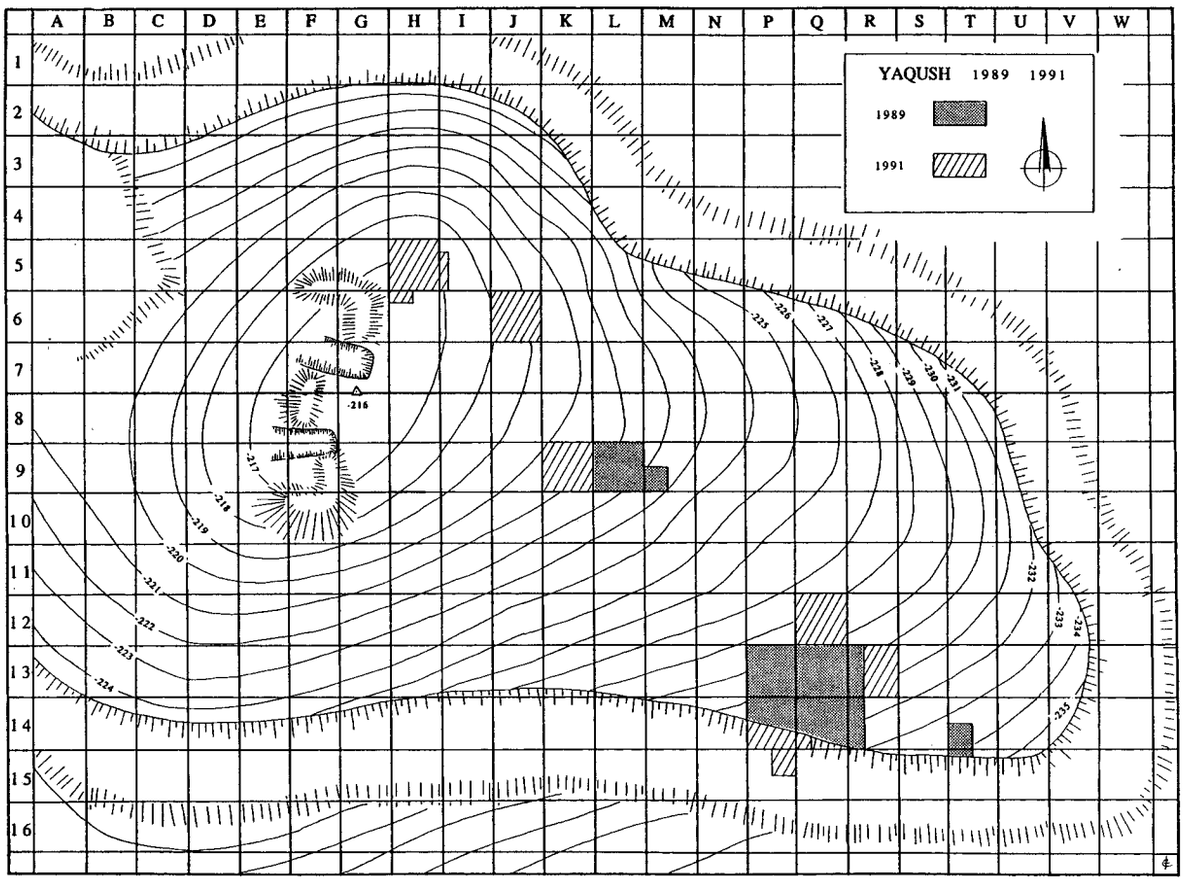

FIGURE 15.3. Plan of the excavations at Tel Yaqush. The areas excavated by Esse in 1989 and 1991 are indicated. An additional square, H6, was excavated in 1995 by Schloen. In this analysis, the materials from the cluster of squares in columns H, I, and J at the top of the mound were referred to as the Northwest Group, those in columns P, Q, R, T at the margin of the site as the Southeast Group, and those in columns K, L, and M as the Central Group.

was distinguished by (at least) four architectural levels. The largest concentration of faunal material, 1,392 specimens, derives from the earlier phases of EB I, from a long building (11+ m) in Square P14 at the southeastern edge of the mound. Later EB I remains were found at the crest of the site (Square H5) and again at the southeast edge (square T14). They date to the end of EB I, ca. 3200 B.C. Square T14 contained only thirty-two bones, but from the summit, Square H5 yielded a substantial number (167) of bone fragments. Both areas showed evidence of a very destructive fire. Approximately 10% of the bones from Square H5 were burned, a high proportion for any given subsample, and certainly the highest percentage of burned material from any area at Tel Yaqush. Square J6, also on the summit of the mound, yielded 196 bones, but Esse does not mention it when describing the burned areas, and indeed, no burned bones were found in this square. A large number of bones, 697, were recovered from Schloen's excavation in Square H6, but since we can only date these to EB I in general, they should not be attached to the phasing based on Esse's report. We do use them, however, in the total counts when comparing the three subperiods of the EB. Based on the ceramic evidence Esse (1993) suggested that Tel Yaqush expanded most rapidly during the later EB I,

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Table 15.1. Distribution of Tel Yaqush Faunal Remains by Early Bronze Age Period and Square within the Site.

Tel Yaqush	*H*	*I*	*J*	*K*	*L*	*M*	*P*	*Q*	*R*	*T*
5	I: 167	I: 30	—	—	—	—	—	—	—	—
6	I: 697	—	I: 196	—	—	—	—	—	—	—
	—	—	—	I: 3	—	—	—	—	—	—
9	—	—	—	II: 3	—	—	—	—	—	—
	—	—	—	III: 429	III: 105	III: 15	—	—	—	—
12	—	—	—	—	—	—	—	III: 239	—	—
	—	—	—	—	—	—	I: 14	—	—	—
13	—	—	—	—	—	—	II: 23	—	II: 1	—
	—	—	—	—	—	—	III: 205	III: 116	III: 50	—
	—	—	—	—	—	—	I: 1,392	—	—	I: 32
14	—	—	—	—	—	—	II: 906	II: 444	II: 5	II: 11
	—	—	—	—	—	—	III: 205	III: 103	III: 20	III: 9
15	—	—	—	—	—	—	I: 1	—	—	—

reaching its greatest extent of six acres in the block of time marked by the transition between EB I and II.

The faunal remains dated to EB II were recovered from two adjoining squares, P14 (906 bones) and Q14 (444 bones), on the southeastern edge of the mound. A house, small forecourt, and a street that was in use over a fairly long time suggest a domestic setting, with the bones perhaps representing discard from household meals. Wood-charcoal samples from the forecourt date to ca. 3100 B.C.

EB III Tel Yaqush was a small village covering one to two acres. Excavations in two areas of the site uncovered (at least) three successive architectural phases. An area on the southern edge of the mound was the most intensively excavated and yielded the greatest concentration of faunal remains: squares P13 and 14 (each with 205 specimens) and Squares Q13 and 14 (116 and 103 specimens respectively). Three successive architectural levels were uncovered in this area, the earliest consisting of a complete house and courtyard. In the same area, Square Q12 (239 faunal specimens) appeared to be distinct from this earliest house/courtyard and belonged to the following architectural phase. It contained portions of a large building with a substantial foundation and wall, large paving stones, and several architectural modifications. Ten votive juglets and two votive bowls were among the finds from the building's later phase of use, on the basis of which Esse (1993) suggested that it had served as a shrine. In the latest phase of EB III, the architecture on the southern mound was again domestic in character. Accordingly, the material from squares P13/14 and Q13/14 belong to the earliest phase, and the Q12 fauna to the second phase; we had no bones from the third phase. Squares K9 (429 bones) and L9 (105 bones) were the main units of the second area of the site with excavated EB III remains. The scale of the building and street and the effort expended to modify this sector suggested to Esse (1993) that the area served a public function.

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Table 15.2. Abundance of Taxa in the Faunal Remains, 1989, 1991, and 1995 Excavations at Tel Yaqush

Tel Yaqush	*EBI*			*EBII*			*EBIII*		
	No.	*%*	*%*	*No.*	*%*	*%*	*No.*	*%*	*%*
Cattle	100		19	91		23	113		32
	TNF	23		TNF	23		TNF	34	
	MNI	30		MNI	30		MNI	36	
	RF	23		RF			RF	36	
Sheep & goats	343		66	292		73	215		62
(Including next two	TNF	77		TNF	76		TNF	66	
categories)	MNI	70		MNI	81		MNI	64	
	RF	77		RF	76		RF	64	
Sheep	17	71		18	72		14	74	
Goats	7	29		7	28		5	26	
Pigs	22		4	4		1	4		1
Equids	1		<1	—		—	1		<1
Gazelles	18		3	2		1	2		<1
Deer	17		3	2		1	5		1
Total large mammals	501		96	391		98	340		97
Dogs	1		<1	1		<1	5		1
Foxes	1		<1	1		<1	1		<1
Birds	2		<1	1		<1	1		<1
Turtles	1		<1	—		—	1		<1
Fish	8		2	3		1	1		<1
Crabs	7		2	—		—	2		<1
Total minor species	20		4	6		2	11		3
Total species	521			397			351		
Medium mammal	918	74		370	75		441	67	
Large mammal	323	26		123	25		217	33	
Total Identifiable	1,762	70		890	65		1,009	74	
Scrap	763	30		488	35		361	26	
Grand total	2,525			1,378			1,370		

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Ai (et-Tell)

Shortly before his death, Joseph A. Callaway gave us a small collection of faunal remains that he had excavated from EB strata at et-Tell, a site located to the east of Bethel in the central hill country and generally accepted as the biblical city of Ai (Callaway 1972). Et-Tell began as a small, unfortified village in the EB IB period (Callaway [1993] dates this to 3100–3000 B.C.; in a later reworking of the chronology, Cooley [1997] dates EB IB to 3250–3100 B.C.). A dramatic change in the character of Ai occurred during the EB IC period (Callaway: 3000–2860 B.C.; Cooley: 3100–2950 B.C.) when the site became a planned, walled city with massive fortifications that included four city gate complexes, an acropolis, citadel and sanctuary, and designated market and residential areas (Esse [1984: 323–24] assigns EB IC to EB II). This settlement ended in destruction that was evidenced by a thick ash layer. During the EB II period (Callaway: EB IIA–B, 2860–2720 B.C.; Cooley EB II, 2950–2775 B.C.), the earlier city was rebuilt and modified, albeit as an inferior version of its predecessor. The massive destruction of the EB II city may have been the result of an earthquake that spawned a widespread fire. The city and the entire fortification system were again rebuilt in EB III (Callaway: EB IIIA–B, 2720–2400 B.C.; Cooley EB III, 2775–2240 B.C.), apparently an effort undertaken with Egyptian involvement. This city also ended in a violent destruction, and the site was abandoned for more than a millennium.

The faunal remains we analyzed come from EB IB–C, IIA, and IIIA, according to the listings provided in Callaway 1972: table 15.3. Two phases of the EB IB are represented at the site. Phase I is a series of fill layers and erosion deposits (Callaway 1972: 59). In phase II, still the pre-urban period, the bones come from in and around a hut-like structure (Callaway 1972: 62). Faunal remains from the first urban settlement, EB IC (Esse: EB II), derive from building C inside the fortification wall (Callaway 1972: 104), which Callaway (1972: 105) suggested was the living quarters for the keepers of the citadel and therefore at the "hub" of city life. The EB IIA faunal remains were recovered from building B, home to a family or clan whose daily activities revolved around a courtyard (Callaway 1972: 149). Building B was located far from the bustle of city traffic (Callaway 1972: 150). Finally, our material which is dated to EB IIIA derives from a domestic complex of two living units and may be attributed to Egyptian rebuilding activities (Callaway 1972: 253). Although major public, official, and cultic contexts characterize et-Tell's cities, all the animal bones we studied were from domestic deposits.

Megiddo

Tell Megiddo (Tell el-Mutesellim), a large mound in the eastern Jezreel Valley, was the site of many large cities in antiquity. Numerous archaeologists have excavated its ruins since work began early in the twentieth century, producing an extremely complicated set of records, reports, and interpretations. In 1994 large-scale excavations were renewed at the site in a campaign jointly directed by Israel Finkelstein and David Ussishkin of Tel Aviv University and Baruch Halpern of Pennsylvania State University. The EB occupation they uncovered is part of the huge cultic complex at the east and northeast sectors of the mound (referred to in publications as Area BB) that had been discovered by earlier projects. Architectural and artifactual remains from the Chalcolithic period suggest that the area was used for cultic purposes in

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Table 15.3. Distribution of Faunal Remains from Ai

Ai	*EB IB*			*EB IC**			*EB II*			*EB III*		
	No.	*%*	*%*	*No.*	*%*	*%*	*No.*	*%*	*%*	*No.*	*%*	*%*
Cattle	53		21	28		20	54		12	14		12
	TNF	22		TNF	20		TNF	14		TNF	14	
	MNI	12		MNI	23		MNI	10		MNI	14	
	RF	18		RF	18		RF	13		RF	14	
Sheep & goats (Including next two categories)	187		75	110		78	397		86	100		84
	TNF	78		TNF	80		TNF	86		TNF	86	
	MNI	88		MNI	77		MNI	90		MNI	86	
	RF	82		RF	82		RF	87		RF	86	
Sheep	32	74		12	60		44	58		9	60	
Goats	11	26		8	40		32	42		6	40	
Pigs	1		<1	—		—	1		<1	—		—
Equids	2		<1	2		<1	1		<1	1		1
Gazelles	1		<1	1		<1	4		1	2		2
Total large mammals	244		98	140		99	457		99	117		98
Dogs	2		1	2		1	1		<1	1		1
Bear	1		<1	—		—	—		—	—		—
Bird	1		<1	—		—	1		<1	1		1
Turtle	1		<1	—		—	—		—	—		—
Total minor species	5		2	2		1	2		1	2		2
Total species	249			142			459			119		
Medium mammal	81	80		30	65		134	80		38	95	
Large mammal	21	20		16	35		35	20		2	5	
Total ID	351	97		188	95		628	96		159	92	
Scrap	12	3		10	5		28	4		4	8	
Grand total	363			198			656			163		

* Esse (1984) considered this period EB II. The original designation, EB IC, is retained here for consistency with the site reports.

that earlier period as well. The systematic collection of faunal remains was not a part of the first excavation efforts, although we may surmise from a few published notes and other reports that such remains were abundant. For instance, reports of the excavations (1925–1939) by the Oriental Institute of the University of Chicago, an effort which unearthed the large circular

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Table 15.4. Distribution of Faunal Remains from Megiddo

Megiddo	*Temple XIX*			*Monumental*			*Squatters*		
	No.	*%*	*%*	*No.*	*%*	*%*	*No.*	*%*	*%*
Cattle	6		7	87		15	25		8
	TNF 8			TNF 16			TNF 8		
				MNI 26			MNI 18		
				RF 16/27			RF 6/20		
Articulations				Art = 1					
Sheep & goats (including next two categories)	71		87	475		83	273		89
	TNF 92			TNF 84			TNF 92		
				MNI 74			MNI 82		
				RF 84/73			RF 94/80		
Articulations	Art = 2			Art = 2			Art = 9		
Sheep	2		67	6		75	29		74
Articulations	Art = 1			Art = 1			Art = 5		
Goats	1		33	2		25	10		26
Articulations							Art = 2		
Pigs	1		1	—			3		1
Deer	1		1	1		<1	1		<1
Total large mammals	79		96	563		98	302		98
Rodents	—			—			1		
Birds	2			5			3		
Turtles	1			—			1		
Fish	—			7			1		
Crabs	—			1			—		
Total minor species	3		4	13		2	6		2
Total species	82			576			308		
Medium mammal	105	93		997	87		398	84	
Large mammal	13	7		141	13		77	16	
Total Identifiable	200	54		1,714	50		783	65	
Scrap	165	46		1,700	50		433	35	
Grand totals	365			3,415			1,216		

altar (4017), noted that the surrounding area contained much broken pottery and animal bones (Loud 1948).

A large volume of faunal remains was recovered from the cultic area during the 1994 and 1996 field seasons, but here we consider only the 1994 material for which analyses are complete (table 15.4). After the 1996 field season the excavators proposed a provisional phasing

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of the occupations in the cultic area (see Wapnish and Hesse 2000). We have sufficient material to warrant analyses for three of these phases, all of which date to EB I. The earliest material comes from the Stratum XIX temple, in which an earlier and a later phase were recognized. We had to combine the material from both phases for a large enough sample to manipulate, but in fact most of the fauna date to the earlier phase (328 and thirty-seven bones respectively). The largest EB I faunal subsample (3,415 bones) found in 1994 is stratigraphically subsequent to the Stratum XIX temple and derives from surfaces and surface buildup that accumulated between a set of parallel and monumental walls. This characterization of the feature is purposely left vague since a clearly delineated "building" has yet to be exposed. Nevertheless, the massive size and construction of the walls is incontestable and clearly implies a context of specialized public and probably ritual function. The third EB I subsample (1,216 bones) in our collection also comes from the area of monumental construction and is superposed on the earlier surfaces. However, the existence of small wall stubs abutting the walls of the massive structure and other features have led the excavators to characterize the phase as produced by "squatters" who built a number of insubstantial enclosures between the earlier monumental EB I construction. Presumably at some time before, and during this phase, the area had ceased to function as a cultic center. We employ the terms "Temple XIX," "Monumental," and "Squatters" to refer to these three deposits in the tables that accompany this report.

The character and quality of the bone material found in the Monumental and Squatter phases of occupation contrast in ways that suggest a microbehavioral distinction. In the Monumental phase much of the recovered bone is scrap, broken bits that cannot be assigned to a particular anatomical element (e.g., femur, rib) or to a taxon more descriptive than "animal." The bones are very fragmentary, a condition often characteristic of surface or floor deposits which we call the "trampling effect." Many of the identifiable fragments are from sheep/goat heads, with fewer bones from meaty parts of the carcass. Only two articulations are present—that is, the recovery of two or more bones from the same individual in correct anatomical position. Articulations are important indicators that bones were not disturbed after initial discard. This is significant because redeposition in tell sites is the single most significant factor in clouding the chronological assignments given animal bones since with few exceptions the bones found in historic period tell sites in the Middle East are not datable by intrinsic attributes (Hesse and Rosen 1988). The recovery of only two articulations points in the direction of increased disturbance, either from activities that took place in the area, or as an indication that bones were redeposited there as secondary refuse from activities that occurred elsewhere. Indeed, the latter may be inferred from the substantial number of burned bones in this subsample because the burning does not appear to have taken place in situ. We conclude therefore that the Monumental deposit represents an accumulation of a series of small secondary dumpings, perhaps removed from floors elsewhere.

On top of and to some extent intermingled with this subsample was a collection of microfauna (small birds, rodent-like mammals, small frogs, and lizards) from owl pellets, the regurgitated remains of owl (or raptor-like bird) meals. The archaeological significance of such deposits is that the site of collection might have been unoccupied for a time, because owls do not usually roost in the center of human activity. The area where this collection was found was unused or deserted for a period following its earlier active phase. Accordingly, this second time frame of the EB I period has informally been dubbed the "owl" level.

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The 1,216 faunal specimens found in the Squatters phase contrast in several important ways with those of the earlier phases when the cultic center was in operation. Primary among them was the recovery of nine articulations and substantially less scrap bone (35% rather than 50% of the total subsample) than in the Monumental phase, both evidence that the Squatters deposits were transformed less by postdiscard factors. A complete lower jaw (mandible) from a cow found in the deposits of this phase provided the informal moniker "cow" level. The fact that the jaw was intact further suggests little disturbance to this portion of the deposit because the symphysis, or mandibular section which forms the chin, is a weak area of the bone that is often broken off. Taken together, these features suggest a more "in situ" deposit of material discarded near the area of primary activity.

The nature of the architecture of the earlier phases of the EB I period have led us to assume that Megiddo functioned as a large cultic center for a considerable portion of the surrounding countryside, commanding a regular input of animals to be offered up as sacrifice. We may expect that animal remains found in temple precincts will differ from their non-cultic counterparts in socially complex environments. The power of a ritual center would have permitted the selection of particular kinds of animals based on the ideological requirements of the cult. Thus the species proportions and mortality information may contrast with that found in "secular" urban debris. The expectations for carcass part distributions vary in a different direction. The usual prediction for city-based animal processing activities (slaughter, butchering, cooking, eating, and discard) is that they will be dispersed across the community, resulting in the scattering of the various parts of a single animal carcass across a site (e.g., Hellwing and Gophna 1984). But in those cultic complexes where the animal was usually consumed by temple personnel in the sacred precinct and carcasses were not redistributed after sacrifice, all these distinct processes are concentrated in one area. Cultic carcass proportions may closely mirror "domestic" debris, but we may expect species abundances and age curves to differ from both small-scale domestic and urban secular contexts given the widely divergent objectives of the three systems and the constraints limiting their choices.

ANALYSIS

General Features of the Collection

Table 15.5 summarizes the main chronological contexts that we were able to evaluate. The faunal remains recovered from all the sites were divided into three broad categories of identifiability (table 15.6). In those cases where a bone fragment could be assigned both an anatomical and a taxonomic label, we considered it "identifiable"; where we could only determine it was part of a limb and either a medium-sized mammal (more or less sheep-sized) or a large mammal (more or less cow-sized), we called it a "long-bone shaft fragment"; and where only the fact that it was bone was known, we labeled it "scrap." In practical terms scrap bone contains relatively large amounts of cranial, vertebral, and costal fragments. Thus abundance of these tiny fragments is both a measure of how strong the taphonomic forces acting on a collection were and an estimate of the degree to which all parts of the carcass are present in a deposit. The ratio of long-bone shaft fragments to identifiable specimens is a measure of the degree of taphonomic pressure (e.g., the influence of scavenging by dogs) since the diagnostic end of most bones is also usually less robust than the shafts and survives less readily. In

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Table 15.5. Chronological Contexts of Faunal Remains in the EBA, Northern Palestine

Site	*Phase*	*Context*
Tel Yaqush	EB I	Domestic
	EB II	Domestic
	EB III	Non-Cultic—Cultic—Public
Ai	EB I	Pre-Urban—Urban Domestic
	EB II	Urban Domestic
	EB III	Urban Domestic
Megiddo	EB I	Temple—Monumental—Squatters

Table 15.6. Distribution of Identifiable Fragments, Long Bone Shaft Fragments, and Scrap Bone in the Subsamples from Tel Yaqush and Megiddo

Find type		*EB I*	*EB II*	*EB III*	
Tel Yaqush NW					
H5/H6/	Scrap	41%			
I5/J6	Long Bone	32%			
	Ident	27%			
	No.	1,082			
Tel Yaqush CEN				Public	
K9/L9/	Scrap			32%	
M9	Long Bone			30%	
	Ident			38%	
	No.			548	
Tel Yaqush SE				Cult	Non-Cultic
P13-15/	Scrap	27%	28%	49%	40%
Q12-14/	Long Bone	38%	37%	35%	32%
R13-14	Ident	35%	35%	16%	28%
T14	No.	1,440	1,390	238	571
		EB I-Temple XIX	EB I-Monumental	EB I-Squatters	
Megiddo					
	Scrap	44%	50%	36%	
	Long Bone	19%	20%	14%	
	Ident	36%	30%	50%	
	No.	371	3,423	1,245	

Note: The sample from Ai contains little of this material and might have been presorted to some degree before it was turned over for investigation.

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the case of the sample from Ai, few scrap bones or long-bone shaft fragments were found in the preserved collection. We suspect that this is a result of some degree of preselection by the excavators in the field since, to our knowledge, intensive recovery methods such as dry-sieving were not routinely employed during the excavation. Thus the general data from this site are not provided.

In the Tel Yaqush sample two contrasts deserve note. The EB I sample from the northwest portion of the excavation and the EB III samples from the southeast have somewhat more scrap than that recovered from EB I–II southeast. We suspect that this is a result of the former samples being less deeply buried and so more affected by depositional conditions. The second set of contrasts relates to the material from the three EB II contexts. The ratio of long-bone shaft fragments to identifiable bones is much lower in the "cultic" sample. We suspect that this is due to the fact that, as we discuss below, the animals in the "cultic" sample were slaughtered at a much younger age and so were represented in the sample by long bones with much less well-ossified epiphyses, specimens that did not survive well.

One contrast appears in the sample from Megiddo. The Squatters sample contains relatively more identifiable fragments and less long bone and scrap material. This reinforces the picture drawn above of a collection that had undergone less taphonomic pressure than those obtained from the two earlier phases of occupation.

Taxa Represented

The number of taxa found in the three samples is low, and most of the remains are concentrated in only a few species (see tables 15.2–15.4). The samples were divided into several broad categories. Large Mammals include hunted or husbanded herbivores gazelle-sized and larger. Minor Species include the carnivores, rodents, birds, reptiles, fish, and mollusca. In no case did the minor species contribute more than 4% to the specimens found in one of the ten chronologically defined contexts at the three sites. Assuming that abundance is a rough measure of economic significance, these are trivial and so not considered further. The categories Medium Mammal and Large Mammal are used for those specimens, mostly rib and vertebra fragments, long-bone shaft fragments, and small cranial fragments that could not be further identified. Most of these bones are likely to have come from the three abundant taxa in the sample: sheep, goats, and cattle. The fact that the ratio of Medium Mammal to Large Mammal mirrors that observed between sheep/goat (this term is used to refer to the combined sample of bones including those that can be identified as either sheep or goat as well as those that are indeterminate) and cattle suggests that the various parts of the carcasses of the two taxa were accumulating in the deposits in roughly similar ways.

In nine of the ten contexts, sheep/goats and cattle provided more than 94% of the sample of large mammals. The one exception is the EB I sample from Tel Yaqush, where 10% of the sample comprises pig (*Sus*), gazelle (*Gazella* sp.), and deer (*Cervus/Dama*)[1] bones (see Uerpmann 1987 for a review of the archaeological distributions of the wild forms of these animals and the taxonomic complexities involved). The very low frequency of pig is particularly surprising given the amount of swine reported at such nearby Chalcolithic and EB I sites as en-Shadud (located not far to the northeast of Megiddo in the Jezreel Valley, where approxi-

1. In a provisional report on the Tel Yaqush fauna cited by Esse (1993), hartebeest was identified. Further comparison has shown that initial impression to have been wrong.

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mately 25% swine is reported [Horwitz 1985]), Tell esh-Shuna North (situated across the Jordan River from Tel Yaqush, which produced about 34–46% in the Chalcolithic and earlier EB I [Croft 1994]), and Tel Kinrot (a multiperiod tell site northwest of the Sea of Galilee, where about 8% pig was found in the EB [Hellwing 1988–89]). We have suggested elsewhere (Hesse 1990) that pigs are a measure of a community's disengagement from large-scale tributary or "market" systems. Additionally, Redding (1991) has hypothesized that pigs are dropped from husbanding strategies as agricultural effort is intensified. On the basis of these models we believe the data from all of our sites indicate the three communities were incorporated in larger political systems and engaged in a "market"-oriented and specialized farming system. The drop in the number of pigs at Tel Yaqush from EB I to the later two periods of occupation may reflect the completion of that process of development and incorporation. Significantly, no increase in the use of swine is observed as Tel Yaqush shrinks in size during its occupation. This (admittedly single case) may suggest caution in equating site size with degree of political significance or agricultural intensification in a way parallel to Fernea's (1972) observation that propinquity is not a certain indicator of political engulfment.

We were able to separate some of the sheep/goat bones by genus following the criteria provided by Boessneck (1969). Using the total number of fragments identified to each species as an estimator of abundance, remarkably similar values are found across the three sites. The bones from Ai EB IC, II, and III, those that accumulated after the city was walled, have slightly higher numbers of goats, 40%+, compared with the rest of the samples, which have between 25% and 33%. Redding's (1993) summary of the evidence for Near Eastern animal production, while a survey of regions outside the Levant, provides a model for interpreting sheep-to-goat ratios. The values in our samples, which closely center on 3.5 sheep to 1 goat, would, following his prescriptions, indicate a lively exchange of animals, particularly sheep, as commodities between nomadic pastoralists (or transhumant herding camps) and the sedentary communities (with perhaps somewhat less of a link between Ai and its surrounding satellites). If production at our three EB sites was decoupled from a larger system and targeted household consumption, Redding's model would project that goats would outnumber sheep. On the other hand, the value of 3.5:1 is not high enough to suggest that the surrounding pastoral producers were engaged in some sort of specialized wool production orchestrated by permanent settlements, which themselves did little local husbandry. The fact that the ratios for Megiddo and Tel Yaqush are so similar suggests that despite the considerable difference in the scales of the three sites, the larger was not significantly more dependent on external specialized producers.

The ratio of abundance of the combined sheep/goat collections to the cattle sample was computed in three ways (Hesse and Wapnish 1985). Total Number of Fragments (TNF) is an estimation based on the sum of bone fragments assigned to a taxon. As a measure of abundance it suffers from the usually unmeasurable effects of interdependence (when more than one bone in the collection came from the same individual animal). Minimum Number of Individuals (MNI) is established by the most frequent element type in the collection of bones assigned to a taxon. It establishes the smallest number of carcasses that would be required to provide the bones recovered. It tends to produce high estimates for rare taxa and is affected by the way the spatial area represented by the sample is established. Relative Frequency (RF) is computed by dividing TNF by the number of bone fragment categories in the sample. It attempts to correct for the fact that different animals have different numbers of bones in their

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skeletons. If the estimates produced by these three counting methods produce sharply divergent results, it usually means that the carcasses of the various species were processed differently by the ancient inhabitants of the sites.

Within each set of subsamples there is close agreement between the three estimators except in the case of the Megiddo Squatters. We suspect that the range of 8% to 20% for the cattle in that period is an artifact of the very small sample size involved. The results for the sheep/goat-to-cattle computations show more variability than that seen in the sheep-to-goat ratio. At Tel Yaqush there is an increase in cattle between EB II and III, while at Ai the number of bovines decreases between EB II and III. The number of cattle at Megiddo EB I is generally lower than found in the other sites, although in the Monumental phase at Megiddo EB I, it reaches the lowest values found in the other two sites.

All of the sheep/goat-to-cattle ratios are within the limits, between 1:1 and 10:1, suggested by Redding (1993) for intensive agriculture (see also Rosen 1986, for a similar estimate arrived at from different assumptions and data). Further, within the Megiddo samples, the contrast between the Monumental sample (5:1) and that from the Squatters (9:1) fits the expectations of the model as well. However, what also is striking about the data is that in general the larger the site, the higher the ratio, the reverse of expectations. Taken at face value, this would suggest that massive, specialized, urban sites such as Megiddo were supported by less intensive agricultural systems than that which provided resources for a village like Tel Yaqush.

However, there are at least three other alternatives. First, the difference may reflect the local environmental settings of the three sites. Sheep and goat pastoralism in the Jordan Valley in the immediate environs of Tel Yaqush might have been a less attractive strategy than husbanding the animals at the margin of the Jezreel near Megiddo or in the central hill country at Ai. If it was, the number of animals produced in the Tel Yaqush community folds would be reduced. Also, the nomadic groups or transhumant camps would be situated at a greater distance, a factor that would reduce the level of contact between mobile supplier and urban customer. Both conditions would depress the sheep/goat-to-cattle ratio. Second, the apparently larger number of sheep and goats in the urban centers may be related to internal differences in access to animals between sectors of those communities. That appears to be the case at Tel Yaqush in EB III (table 15.7). Comparison of the Public, Cultic, and Non-Cultic areas shows that the ratio is about 1.5:1 in the first two of these areas while nearly 3:1 in the Non-Cultic area. The samples we have from those large settlements are not very diverse, and excavation in domestic housing at Megiddo or the temple complex at Ai might produce the kind of differentiation we found at Iron Age Dan. Here the temple debris could be distinguished from that found in contemporary dwellings on the basis of the sheep/goat-to-cattle ratio (Wapnish and Hesse 1991), though in this case the direction of the contrast is the opposite of that found at Tel Yaqush. If the diachronic contrast between the Monumental and the Squatter phases are taken as a surrogate model for a synchronic comparison at EB I Megiddo, it suggests that in both the Tel Yaqush shrine and the Megiddo temple cattle were preferred. Third, the lower than expected value for sheep and goats at Tel Yaqush may be the result of animal export. If the site was required to deliver small bovids to a higher node in the political hierarchy or there was a market to be tapped, this demand would depress the proportion of animals available for local consumption. At this point it is not possible to make a clear distinction between these alternatives.

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Table 15.7. Comparison of EB III Tel Yaqush Areas

Tel Yaqush EB III		*Cultic? Square Q12*	*Non-Cultic? Squares P13-14/ Q13-14*	*Public? Squares K9/L9/M9*
Sheep and goats		60%	70%	57%
Cattle		38%	25%	41%
Pigs/deer/gazelles		2%	5%	2%
Medium mammal "meaty" axial + limbs		62%	43%	56%
Medium mammal "spare" head + toes		38%	57%	44%
Large mammal "meaty" axial + limbs		67%	56%	46%
Large mammal "spare" head + toes		33%	44%	54%
Sheep/goat	0–1 yr.	40%	22%	0%
Mortality	1–3 yrs.	30%	28%	10%
Tooth wear	3+ yrs.	30%	50%	90%

Note: A possible "cultic" area was found in Square Q12. An adjacent area contained "domestic" occupation while an area in the center of the site might have contained "public" buildings. The cultic and public material contains more cattle and more medium mammal "meaty" carcass parts than the domestic debris. The cultic and domestic areas contrast similarly in terms of the large mammals. The public area contained substantially more "spare" elements of large mammal. The small samples of ageable sheep/goat teeth present a strong contrast. The cultic area produced largely young animals while the other two areas contained mostly—and in the case of the public area, almost all—older animals. These contrasts suggest that even in this small 1- to 2-ha community, access to animal products was differentiated.

Carcass Parts

The manner in which the various parts of animal carcasses are found at archaeological sites has been taken as evidence for the complexity of the animal production, redistribution, and consumption system. Once slaughtered, animals are reduced to packets of meat, fat, hide, hair, horn, and bone. Each of these resources can follow a separate pathway through the social economy of a site, and some of these packets are associated with specific skeletal parts. Thus the fact that various sectors of the community value them differently or have different access to them can be recorded in the spatial distribution of bone fragments. For instance, the different parts of any carcass have more or less meat associated with them. If the elite chooses to express its power by claiming through economic or other means the meat-rich parts of an animal (the limbs and trunk) and leaving the spare portions (the heads and feet) to hoi polloi, then some sectors of the community will produce garbage that is relatively rich in long bones, ribs,

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and vertebrae, while others will, by default, discard fragments of cranial fragments and toes. While the appeal to efficiency incorporated in this model makes it an attractive approach to the study of animal remains and we employ it below, it is dangerous to reify the categories of meat-rich and meat-poor carcass parts. In complex societies, elites can exercise their authority by simply claiming more of what they want, ignoring the benefits of the principles of economy and thrift in their pursuit of a distinctive "lifestyle." As Goody (1982) points out, in the process of civilization meals are ever more elaborately translated into the language of cuisine. As that occurs, the significance of a general category like "meat" recedes as the salience of "pork," "beef," and "mutton" grows.

Unfortunately, the zooarchaeologists of the Middle East have not achieved consensus in the way they assign different bone fragments to various parts of the carcass. As a result it is dangerous to compare numeric values across sites although examining the general shape of the distributions and the way they change may be useful. In table 15.8 we present the information for Tel Yaqush and Megiddo. Because of the problems of presorting mentioned above, data from Ai are not reported. In our system, Axial remains are fragments of vertebrae and ribs; Limbs include shoulder blades and hips as well as the long bones down to the proximal metapodials (cannon bones); Toes include the distal metapodials and phalanges; and Head includes skull and mandible fragments as well as teeth. The first two categories are the meatier carcass elements, the last two are more spare. Two taxa are used—Medium Mammals are mostly sheep and goats, and Large Mammals are mostly cattle.

In the Megiddo samples, there are proportionately less meaty medium and large mammal fragments in the Monumental deposit than are found in the Squatters. Some of this difference may be due to the greater destruction brought on by taphonomic factors in the first sample, although it may also reflect a greater degree of spatial segregation of the activities of slaughter and initial carcass dismemberment in the Squatters phase and a greater spatial concentration of the same steps in transforming a carcass into a meal in the Monumental phase.

At Tel Yaqush there is little difference between the two subsamples of EB I material. However, there is an important contrast in the comparison of the material from EB I to all of the later material. In the earlier occupation, meaty parts are slightly more abundant than in the later phases. However, this comparison conceals the even larger contrast between the abundance of the two kinds of meaty parts, the Axial elements and the Limbs. In the earlier material, Axial fragments are from two to four times as abundant, while in the later material, Limbs are either equal or more abundant. We suggest that this is evidence for the emergence of the spatial segregation of animal processing activities and perhaps ones related to the preparation of different kinds of meals from different parts of the carcass.

The remains found in the three sectors of the EB III sample also showed differences (table 15.8). The Cultic area produced the most "meaty" portions of both Large and Medium Mammals. The Non-Cultic area, which had the most sheep and goats, also yielded the most "spare" Medium Mammal. The Public area, in contrast, had the least amount of cattle and the "sparest" portions of that carcass type, while the Medium Mammal sample approaches the values seen in the Cultic area. We believe that these contrasts suggest that the people occupying the different areas of Tel Yaqush, even in its shrunken state, still were differentiated in the way they obtained their meat resources.

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Table 15.8. Distribution of Skeletal Parts in the Main Periods at Tel Yaqush and Megiddo

Skeletal Parts	*EB I*		*EB II*		*EB III*			
	Medium mammal	*Large mammal*	*Medium mammal*	*Large mammal*	*Medium mammal*		*Large mammal*	
Tel Yaqush NW								
H5/H6/ Axial	43	54						
I5/J6 Limbs	18	20						
Head	34	16						
Toes	5	10						
No.	216	63						
Tel Yaqush CEN					Public			
K9/L9/ Axial					17		32	
M9 Limbs					38		14	
Head					38		49	
Toes					6		4	
No.					81		71	
Tel Yaqush SE					C	N-C	C	N-C
P13-15/ Axial	45	63	24	26	33	20	20	30
Q12-14/ Limbs	20	16	31	36	29	23	47	26
R13-14 Head	31	17	41	33	24	49	26	37
T14 Toes	4	4	4	5	14	8	7	7
No.	337	189	373	111	51	107	30	43
	Temple XIX		*Monumental*		*Squatters*			
Megiddo–EB I								
Axial	36	—	45	43	47		62	
Limbs	29	—	14	10	23		6	
Head	29	—	38	44	22		27	
Toes	6	Insuff.	3	3	8		5	
No.	119	Data	813	152	534		66	

Note: "C" and "N-C" in the Tel Yaqush SE EB III samples refer to the material from the "cultic" and "non-cultic" areas respectively. Data from Ai are not included because the small number of rib fragments found in the collection seems to be a product of presorting the sample.

Mortality

From an archaeological perspective, the decision about when to slaughter animals is the second most visible decision (after the choice of what kind of stock to husband) in pastoral management. Efficient husbandry starts with the careful evaluation of the capacity of individual animals to yield milk, meat, fiber, labor, and young in the context of the market for those resources. By culling those with low potential, maximum benefit is obtained from the pasture and forage available to a community. Because of this relationship, zooarchaeologists have developed methods to reconstruct the mortality pattern associated with each type of stock in order to gain insight into both the production goals of herdsmen and the market demands of

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customers. Two primary methods are used—the degree of tooth eruption and wear and the relative proportions of completely mature bones. Deciduous teeth erupt and are replaced by permanent dentition at predictable times in the life of an animal (Hillson 1986). The rate of attrition as expressed by the degree of crown reduction and changing patterns of the occlusal surfaces of cheek teeth has also been employed (Davis 1987). Here the procedures outlined by Payne (1973) based on tooth wear patterns are used to estimate mortality in sheep and goats. The various bones mature at different times in an animal's life as is signaled, for instance in the case of limb bones, by the shaft or diaphysis completely fusing to the ends or epiphyses and the metaphyseal line disappearing. While the age at which this occurs is affected by a host of genetic and environmental factors, useful approximations have been established for the main types of barnyard stock (Silver 1969). By calculating the proportion of fused ends, we can estimate the percentage of animals in a cohort that lived past the age at which fusion occurs. By arranging the fusion percentages at each diaphysis/epiphysis location by the age at which that fusion is expected to have occurred, a mortality curve is produced.

Table 15.9 presents the information based on tooth wear for all three sites, while tables 15.10–12 are tabulations of fusion scores for Tel Yaqush, Megiddo, and Ai, respectively. Only information on sheep/goat mortality is presented since cattle remains are not abundant enough to produce any estimates. Also, there were not enough sheep and goat remains in the Temple XIX sample from Megiddo to generate an estimate by either method. Sheep and goats are merged in these calculations despite the fact that the two animals were likely managed in different places for different reasons. This is done because zooarchaeologists have not developed sufficiently reliable methods for distinguishing the two species at all stages of their development and because our samples in all contexts are small.

The site of Ai presents the most consistent pattern. Whether estimated by tooth wear or fusion, most of the sheep and goats consumed at the site were fully adult, more than two-thirds died at ages greater than two years, and somewhat more than half were older than three years. Through time the number of one-to-two or one-to-three year olds declines that may indicate a slight selection for more well-fattened animals in the latest occupation.

The Megiddo estimates for the Monumental sample and that of the Squatters are quite different. In the latter case, based on tooth wear, almost two-thirds of the sheep and goats were slaughtered in their first year, while in the former substantially more animals one to two years of age were recovered. The fusion scores for these two samples are in rough accord with this pattern. The large kill-off of very young animals in the Squatters phase is consistent with dairy production or the marketing of stock as soon as it has any market value. The emphasis on yearlings found in the Monumental phase is consistent with meat production models.

The Tel Yaqush fusion scores indicate a shift between EB I and both later periods. In the earlier phase slightly more very young animals were being consumed and a large number of individuals were culled at the end of their second year. In later periods, both of these slaughter emphases are reduced. On the basis of tooth wear, the most striking feature in a remarkably similar set of scores is the absence of animals one to two years old. Does this reflect the export of animals of this age to larger centers? Even more striking is the contrast in the dental evidence between the three contexts in Tel Yaqush EB III (table 15.7). Young animals dominated the cull in the Cultic area but were conspicuously absent in the Public area. The Non-Cultic

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Table 15.9. Sheep/Goat Mortality at Tel Yaqush, Megiddo, and Ai

Payne stage	*A* %	*B* %	*C* %	*D* %	*E* %	*F* %	*G* %	*H* %	*I* %
Tel Yaqush									
EB I	3	6	19	16	12	8	17	13	6
EB II	1	10	25	12	8	15	17	8	4
EB III	0	8	15	14	17	22	20	3	1
Megiddo EB I									
Monumental	0	0	31	29	7	10	12	7	4
Squatters	0	11	56	14	3	3	7	3	3
Ai									
EB IB Pre-urban	0	2	8	26	18	14	19	10	3
EB IC Urban*	0	0	10	18	22	22	18	10	0
EB II Urban	0	0	15	19	14	18	19	13	2

Age in years	*0 - 1* %	*0 - 2* %	*1 - 2* %	*1 - 3* %	*2 +* %	*3 +* %	*Specimens* No.
Tel Yaqush							
EB I	28	44	16	28	56	44	24
EB II	36	48	12	20	52	44	23
EB III	23	37	14	31	63	46	18
Megiddo							
Monumental	31	60	29	36	40	33	13
Squatters	67	81	14	17	19	16	9
Ai							
EB IB Pre-urban	10	36	26	44	64	46	24
EB IC Urban*	10	28	18	40	72	50	10
EB II Urban	15	34	19	33	68	52	32

Note: Mortality based on the degree of dental attrition (Payne 1973). More young and less old individuals are found in the Megiddo Squatters sample compared to Tel Yaqush. The Ai sample exhibits the reverse, more older animals, less younger.

* = EB II (Esse 1984)

area was intermediate. Once again it would seem that different social sectors of even so small a site as EB III Tel Yaqush could claim different types of animals as resources.

Taken together, the three sites present quite different pictures. The two large walled sites contrast most strongly. Megiddo samples include large numbers of young animals, while those from Ai are mostly mature. Part of this difference seems to be linked to the secular/cultic

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Table 15.10. Tel Yaqush Sheep/Goat Mortality Based on Percentage of Fused Long Bone Epiphyses

Age in months	*Fusion point*	*EB I*			*EB II*			*EB III*		
		M	*I*	*%*	*M*	*I*	*%*	*M*	*I*	*%*
> 6–10	Acetabulum	4	2		18	1		4	1	
	Scapula	2	2		0	1				
	D. Humerus	6	0		6	0		1	0	
	P. Radius	3	0		4	2		3	0	
		15	4	79	28	4	88	8	1	89
> 13–16	Phalanx I	8	2		8	2		10	2	
	Phalanx II	4	1		2	0		1	0	
		12	3	80	10	2	83	11	2	88
> 18–24	D. Tibia	1	2		8	1		3	2	
	Metacarpal	1	4		2	4		2	3	
	Metatarsal	2	4		2	2		1	2	
		5	10	33	12	7	63	7	8	47
> 30–36	Calcaneus	2	4		2	2		3	1	
	P. Ulna							1	1	
	P. Humerus	0	2							
	D. Radius	0	1		1	2				
	P. Femur	1	0		2	2		1	0	
	D. Femur	0	3							
	P. Tibia	1	0		0	3		1	0	
		4	10	28	5	9	36	6	2	78

Note: Percentages reflect the number of animals who survived the age category listed in the left-hand column. Fusion locations are grouped based on the estimates of fusion age given in Silver (1969). Two linked observations about the Tel Yaqush samples are most significant. The number of young animals going to slaughter is much greater in EB I. This is true both of the animals who died as lambs and kids and those that died at the end of their second year. By contrast the number of mature animals in EB II and EB III culls is greater.

contrast. The Megiddo Monumental and Tel Yaqush Cultic subsamples are quite similar, suggesting a tradition of young animals being selected to enter sacrificial systems. The Ai urban domestic samples compare favorably with the Tel Yaqush Non-Cultic remains, suggesting that the secular areas at both sites received the complement, mostly mature animals. The major anomaly is the sample from the Megiddo Squatters phase. The large number of young animals would be understandable if goats were more common in the sample and cattle less so since that would suggest the community, while squatting in a huge building, was in fact largely domestic in economic focus. At this point, however, the question is unresolved.

CONCLUSION

At the outset we indicated that this report would be inductive and explorative rather than deductive and evaluative. Zooarchaeological research in the Near East in general and the

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Table 15.11. Megiddo Sheep/Goat Mortality Based on Percentage of Fused Long Bone Epiphyses

Age in months	*Fusion point*	*Monumental* M	I	%	*Squatters* M	I	%
> 6–10	Acetabulum	8	2		4	1	
	Scapula	–	–		3	1	
	D. Humerus	2	1		4	1	
	P. Radius	5	0		3	1	
		15	3	83	14	4	78
> 13–16	Phalanx I	2	2		12	5	
	Phalanx II	3	3		9	2	
		5	5	50	21	7	75
> 18–24	D. Tibia	3	2		2	1	
	Metacarpal	2	4		1	1	
	Metatarsal	0	4		0	4	
		5	11	31	3	6	33
> 30–36	Calcaneus	0	2		4	3	
	P. Ulna	0	2		1	2	
	P. Humerus	–	–		0	7	
	D. Radius	0	3		0	4	
	P. Femur	0	4		0	4	
	D. Femur	0	1		1	2	
	P. Tibia	–	–		0	1	
		0	12	0	6	23	21

Levant in particular is far behind the study of survey data, pottery distributions, and the evaluation of architectural remains in constructing a database. Thus our ability to reconstruct actual animal production systems is limited by the necessity of comparing sites that actually did not act in the same economic network but are used as surrogates for those that did.

In the case of the Tel Yaqush, Megiddo, and Ai samples reported here, we believe we found ourselves in the middle of the developmental process that was the Early Bronze Age. We have no material that is comparable to the Chalcolithic evidence, particularly in terms of the exploitation of swine that has been reported elsewhere. All three sites come onto our zooarchaeological stage as participants in complex systems of multinoded husbandry rather than collections of independent households focused on the domestic production of consumables. Animals were flowing into sedentary communities from satellite producers and perhaps between settled communities as well. These external tethers between towns and herdsmen do not seem to have reached the stage where specialized wool production by urban-owned flocks had developed. Despite the fires and other disasters clearly visible in the archaeological record that befell Tel Yaqush and Ai as they underwent cycles of building and rebuilding, the animal production system does not seem to have returned to simpler forms—the emphases on commodity exchange in sheep and intensive agriculture continued throughout. Interestingly, the evidence from Tel Yaqush indicates that despite the steady diminution of the community, access to animal products continued to be divided socially. Comparison of the material from cultic contexts at Tel

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Table 15.12. Sheep/Goat Mortality Based on Fusion Proportions in the Ai Samples

Age in months	*Fusion point*	*EB IB* M	I	%	*EB IC** M	I	%	*EB II* M	I	%	*EB III* M	I	%
> 6–10	Acetabulum	5	0		4	0		9	1		4	2	
	Scapula	8	1		2	0		17	2		1	2	
	D. Humerus	12	1		6	1		21	1		5	1	
	P. Radius	5	0		3	0		5	0		2	0	
		30	2	94	15	1	94	52	4	93	12	5	71
> 13–24	Phalanx I	2	1		0	1		5	0		0	1	
	Phalanx II	2	0		1	0		–	–		1	0	
	D. Tibia	3	2		5	1		16	3		1	1	
	Metacarpal	1	0		1	1		3	1		–	–	
	Metatarsal	1	0		0	3		6	3		1	0	
		9	3	75	7	6	53	31	8	79	3	2	60
> 30–36	Calcaneus	3	3		2	1		3	2		1	1	
	P. Ulna	–	–		0	1		0	1		1	0	
	P. Humerus	1	0		–	–		–	–		–	–	
	D. Radius	2	0		1	0		1	1		–	–	
	P. Femur	–	–		0	1		0	1		–	–	
	D. Femur	1	0		–	–		2	1		–	–	
	P. Tibia	1	1		1	0		2	0		–	–	
		8	4	67	4	3	57	8	6	57	2	1	67

* = EB II (Esse 1984)

Yaqush and Megiddo suggests that cattle were somewhat more common in ritual activities than they were in the more secular parts of the communities.

The potential of zooarchaeological analysis to produce information bearing on questions of economic organization and social differentiation seems clear. What remains to be done is to continue the example set by Esse in the careful collection of faunal materials and in the encouragement he gave us to examine the material from anthropological and historical perspectives.

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THE FAUNAL EVIDENCE FOR SOCIOECONOMIC CHANGE BETWEEN THE MIDDLE AND LATE BRONZE AGE IN THE SOUTHERN LEVANT

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INTRODUCTION

The Late Bronze Age (LB) in the southern Levant (ca. 1500–1200 B.C.) is characterized by a marked change in demography, settlement pattern, and material culture, relative to the preceding Middle Bronze Age (MB) IIA–C period (1900–1500 B.C.). The number and density of very large urban sites decreases, with a concomitant increase in the number of small and medium-sized sites. This is indicative of a trend toward ruralism (Gonen 1984; Falconer 1994). Moreover, fortifications are absent or greatly reduced in scale relative to the Middle Bronze Age. Population demography also changes, with a shift to the coastal plain and a concomitant emptying of the interior, especially the highlands. Few sites show an uninterrupted occupation from the MB to the LB, either as a result of Egyptian military activities in the region (Falconer 1994) or due to local sociopolitical upheavals (Finkelstein 1993). Other sites appear to have been established for the first time in this period (Gonen 1984). In contrast to these changes which are reminiscent of a recession or deurbanization process, there is evidence for the involvement of the southern Levant in extensive political activities and cultural commerce on an international scale (Falconer 1994).

Despite these clear patterns, there is little consensus as to what these changes signify. It has been argued (e.g., Albright 1960: 101; Kenyon 1960: 209–14, de Vaux 1978: 122; Aharoni 1982: 122, 150–51; Knapp 1987, 1989; Falconer 1994) that the LB represents a period of cultural decline and impoverishment characterized by deurbanization, as evidenced by the poor level of the material culture, demographic changes, and sparseness of large settlements. However, Liebowitz (1987, 1989) has argued to the contrary, stating that the Late Bronze Age was a period of prosperity and a high point in terms of material culture as attested by the extensive assemblages of ivory artifacts. A third view (Bienkowski 1989) argues for a mosaic pattern, with the marginal areas of the southern Levant deteriorating in the LB in contrast to the principal areas that prospered under Egyptian rule. Finkelstein (1993, 1994) has presented a similar view, arguing for a highland-lowland dichotomy with the MB IIC/LB I transition in the highlands being marked by a period of upheaval resulting from local sociopolitical conflicts rather than Egyptian intervention. The outcome of this transition was that the MB ended with the abandonment of many of the highland sites, and the LB in the highlands was characterized by a return to pastoralism. Bunimovitz (1993, 1994) has suggested that the level of sociopolitical organization also shows evidence for regional diversity, with the hill country

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representing a more integrated settlement system, while an inverse pattern is seen in the lowland regions (such as the coastal plain and Jezreel Valley), where the semiautonomous city states show a low degree of integration. We may conclude that despite the absence of consensus on the exact nature of the LB, all researchers acknowledge that at least certain regions of the southern Levant underwent a period of recession and deurbanization. The present study aims at evaluating this hypothesis in the light of one aspect of the archaeological record, namely, faunal remains.

THE MODEL

Animal remains form an integral part of the ancient record and may be used to reconstruct the mode of animal production and consumption in the past. As such, they complement and corroborate information obtained from the study of other archaeological remains. Due to the close interrelationship between subsistence and other aspects of a society, it can be expected that large-scale changes in the sociopolitical, ethnic, cultural, or economic status of a site will result in concomitant changes in the manner in which animals are exploited (Wapnish and Hesse 1988; Crabtree 1990; Redding 1991; Zeder 1991; Hesse and Wapnish 1997). Thus, it should be possible to detect changes of the magnitude postulated for the MB–LB transition in the Levant outlined above, in the faunal record of archaeological sites dating to this period.

The options open to a population in the face of economic recession are limited. Hole (1994) has outlined two possible responses to crop failure following changing climatic conditions in fourth/fifth millennium B.C. Mesopotamia. The first response entails the population remaining where they are (termed by him "stand and fight"), but adopting alternative subsistence strategies to agriculture such as herding, fishing, and hunting, or intensifying agriculture accompanied by large-scale storage of surpluses. The second option (termed "capitulation and flight") entails wide-scale abandonment of settlements and movement to areas with more amenable environmental conditions. In this instance, certain sectors of the population may shift to pastoral nomadism in marginal zones suitable for grazing, while others may remain in small-sized settlements living as farmers, hunters, and gatherers.

We suggest that if the southern Levantine LB populations were indeed facing a period of marked economic and/or cultural deterioration or impoverishment, they would have faced similar options to those outlined by Hole (1994). They could either stay where they were and alter their subsistence strategies as outlined above, or migrate and engage in alternate modes of production elsewhere.

In the introduction, we briefly outline some of the observed changes in population demography and settlement pattern that have been documented for the LB. However, few attempts (Finkelstein 1993, 1994) have been made to document changes in subsistence strategies for this period. In order to recognize new subsistence strategies in the animal economy, two features are required:

1. Suitable archaeozoological tools for assessing change
2. A diachronic perspective of the faunal record

In order to deal with the first requirement, we have turned to a model developed by Redding (1981, 1991, 1993) for Near Eastern societies. Redding's model predicts that the faunal record of a society involved in intensive agriculture will contain a low frequency of caprines and pigs; a very high frequency of cattle; more goats relative to sheep; and a high number of

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adult cattle. In contrast, a society primarily involved in nomadic or seminomadic pastoralism, the faunal record will be dominated by caprines (sheep and goats). The frequency of cattle and especially pigs will be low. Moreover, sheep will constitute a greater portion of the herd than goats. To these features we would like to add another (after Hole 1994), namely, that in societies facing economic stress and exploring alternative subsistence strategies, the frequency of wild fauna, obtained through hunting, gathering, and fishing will increase, as may also the number of species exploited (species richness).

To satisfy the requirement of a diachronic trajectory for assessing subsistence change, two types of faunal data were examined. The first data set included animal remains from both MB and LB strata from the same site, while the other included remains from LB sites unoccupied during the preceding MB, or those established for the first time during this period. The resulting information was compared and contrasted in order to elucidate the nature of the subsistence strategies favored by the LB populations of this region.

The rationale for examining material from two different strata at the same site was that this enables us to examine diachronic change while minimizing the effect of external parameters known to influence the animal economy, such as environment, topography, and geography. Furthermore, it facilitated testing the scenario proposed by Hole (1994), in which the population chooses to remain at the same site but has to modify existing subsistence forms.

METHODS AND MATERIALS

For the purpose of this study, six so-called core sites were chosen which contained both MB and LB strata. The sites fall into six different geographic and phytogeographic zones (fig. 16.1) such that they facilitate assessment of changes under different environmental conditions. They include: Tel Dan (northern Galilee), Tel Michal (central coastal plain), Tel Shiloh (the Samarian hill country), Manaḥat (the Judaean hills), Lachish (the Shephelah), and Tell Jemmeh (the southern coastal plain). At each site the same archaeozoologist studied the remains from both of the MB and LB strata of the site, using the same analytical methods. The other LB faunal data were derived from published reports of domestic and cultic sites in this region.

All the assemblages are discussed in terms of their total bone counts (Number of Identified Specimens [NISP]), which were converted into relative frequencies. As most of the assemblages differed markedly in size (NISP), rarefaction tests were run for the MB and LB assemblages represented at the same site. Rarefaction is a statistical test that calculates the number of species one would expect to find given that the assemblages studied were of the same size (NISP) (Ludwig and Reynolds 1988). This test establishes whether the differences observed in the number of species from the two periods were due to differences in sample size as opposed to differences in patterns of animal exploitation.

Several problems were encountered that limited the extent of intersite comparisons that could be made: differences in the state of bone preservation, techniques of bone recovery during excavation, and differences in the extent and character of the areas excavated. Moreover, the published reports differ in the types of analyses undertaken as well as in the form of data presentation when dealing with chronology, bone element representation, as well as age and sex breakdowns for the different species. Consequently, the emphasis in this paper is on patterns in species composition. If more complete data sets are available, age, sex, and bone element representation can be added to elucidate the patterning. With regard to chronology, for

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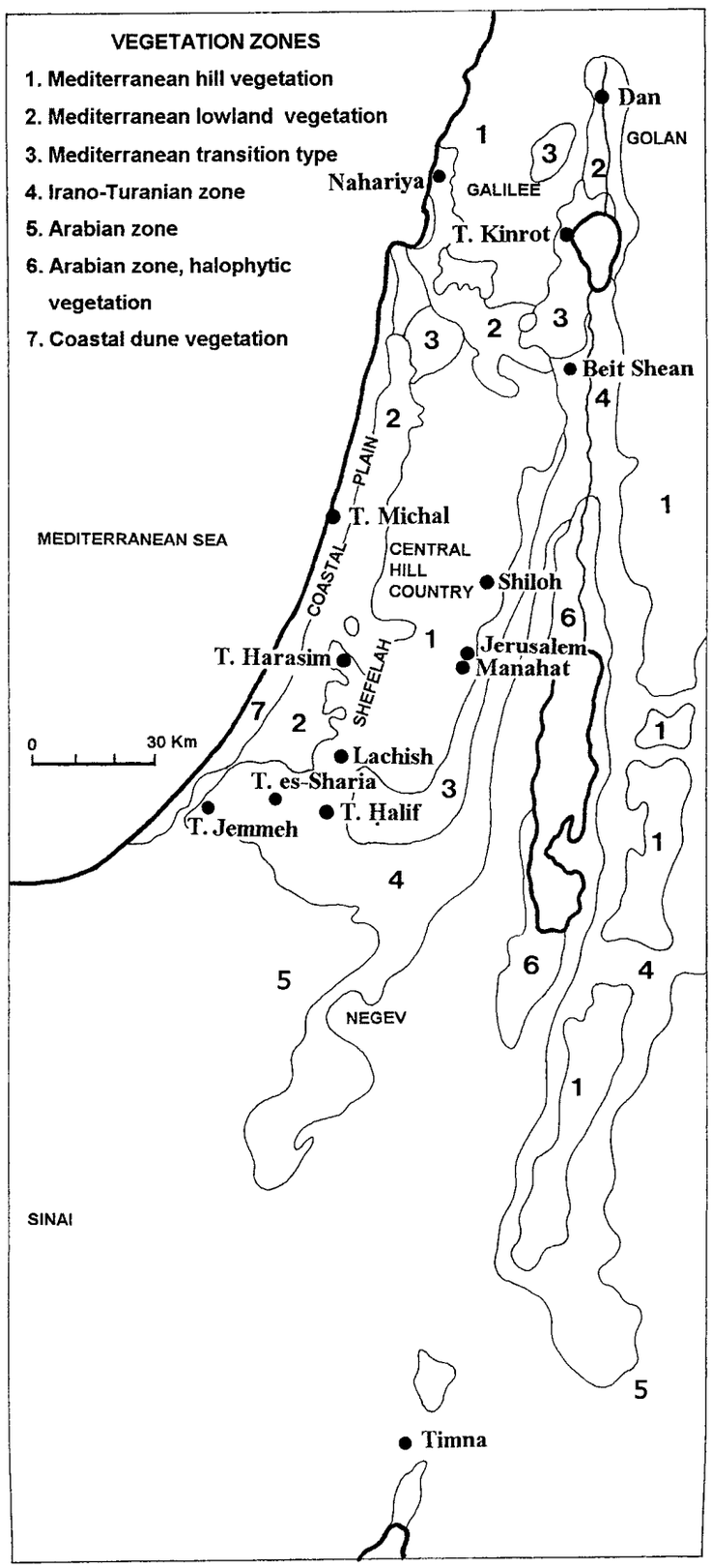

FIGURE 16.1. Map of sites mentioned in text according to their phytogeographic regions (after Orni and Efrat 1971: 165). Drawn by Michael Smelansky.

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most sites no distinction was made between the different phases of MB and LB (i.e., LBI or LB II, MB IIA, B or C). Consequently, the different phases for each period were pooled to form two larger categories: MB II versus LB. Due to these limitations, it has proved impossible to assess with any refinement the chronological development of the faunal changes and only large-scale diachronic trends can be addressed.

INTRASITE COMPARISONS

Tel Dan

The site (Israel grid 2112/2949) lies some 200 m above sea level at the foot of Mount Hermon (fig. 16.1). It is situated in a fertile part of northern Galilee, which receives an average annual rainfall of about 500–600 mm, and is characterized by typical Mediterranean hill zone vegetation (Orni and Efrat 1971: 144–46). In addition, several springs flow in and around the tell, which covers some 200 dunams (Biran 1993, 1996).

The MB settlement at the site, spanning MB IIA to MB IIC, contains a massive earthen rampart but appears to have been unwalled. Only limited remains from the LB have been uncovered at the site, including a built tomb and a large structure in Area K which, according to the excavator (Biran 1993; 1996), might have served a ritual function.

The faunal data used in this study are derived from two faunal reports: that of Wapnish, Hesse, and Ogilvy (1977) which details the collection from the 1974 season and that of Wapnish and Hesse (1991) dealing with material from the 1981 to 1986 excavation seasons. To increase sample size, the medium mammal counts given in Wapnish and Hesse (1991) have been combined with the caprine counts, while their large mammal counts were included in the cattle category. The bulk of the LB bone assemblage (87.5%) originates from one locus in the large structure in Area K. The remainder of this sample was recovered from a deep sounding in a destruction level in Area T. The faunal report does not differentiate between the LB I and LB II periods. The MB sample, dating from the end of MB IIA to the beginning of MB IIB, is derived from fills in Areas B and Y that are associated with the MB II rampart. Those recovered from Area M were recovered from inside a pit. The small size of both Bronze Age assemblages (NISP of >100 bones) limits the depth of the analysis that may be undertaken.

Although the number of species represented in both periods is similar (N = 7 in MB; N = 8 in LB), they differ in the relative proportions of the different animals. Domestic species predominate in both assemblages, with fewer caprines and more cattle in the LB relative to the MB (fig. 16.2). Wapnish and Hesse (1991: 30) propose that the high frequency of cattle in this latter sample may be related to the greater robustness of these bones relative to those of smaller mammals such as sheep and goat. Since the LB sample is burnt, this is a factor that would have made the smaller bones even more susceptible to diagenetic processes. However, as the Minimum Number of Individuals (MNI) counts also reflect a high number of cattle, they conclude that the high cattle numbers probably reflect a reliable estimate of cattle–caprine utilization at the site. The fact that the LB sample may be derived from a cultic context raises the possibility that cattle were specifically selected for ritual activities, and this may account for their presence in such high numbers.

The relative frequency of the three main species, calculated from their combined NISP counts (fig. 16.3), clearly illustrates a change in species dominance over time which follows

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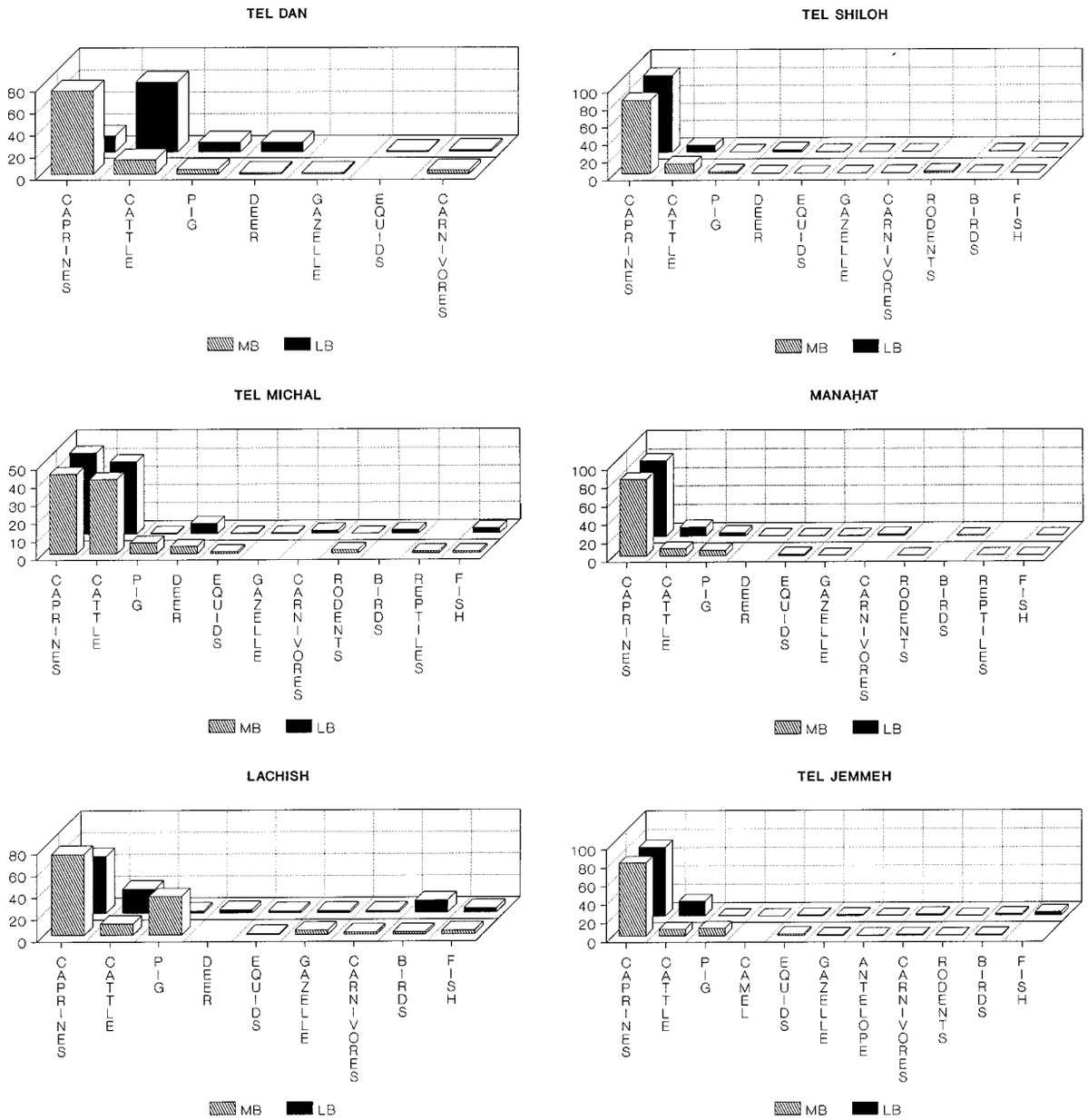

FIGURE 16.2. Histograms showing the relative frequencies of all species found at the six "core" sites.

that observed when all species are included (fig. 16.2). Caprines decline in importance in the LB, while concomitantly cattle increase. Pigs also increase in importance in the LB. However, as they probably represent remains of wild boars and not domestic animals (Wapnish and Hesse 1991: 13), they represent hunted rather than managed animals. Their high frequency in the assemblage is probably a reflection of the favorable environment close to Tel Dan for wild boar: abundant water sources and dense vegetation including oak forest.

In both the MB and LB more sheep were exploited than goats. However, in the LB, there is an increase in the frequency of sheep relative to the MB (fig. 16.4). There is also an increase

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in the frequency of wild animals in the LB (fig. 16.5), with this assemblage particularly rich in remains of deer, boar, and fox.

Tel Shiloh

Tel Shiloh (Israel grid 1775/1626; fig. 16.1) is situated on a fertile valley in the Samarian hills, surrounded by ravines which merge on the west into the Wadi ʿAli, east of the Jerusalem-Nablus road. The area of the mound is about 30 dunams, rising about 710 m above sea level (Finkelstein, Bunimovitz, and Lederman 1993). The vegetation is characteristic of the Mediterranean hill zone with an annual average rainfall of 500–600 mm (B. Rosen 1993: 364).

The MB was present in most of the excavated areas of the site and is derived from two strata: VIII and VII. Stratum VIII contained mid-MB IIB–early MB IIC remains that are associated with fills, some within structures adjoining the city wall (Areas F and H) as well as the glacis in Area D. It has been proposed that the settlement of this period was small and unfortified. In contrast the MB IIC site (Stratum VII) was fortified with a peripheral stone wall and glacis. The faunal remains from this stratum are derived from the city wall and its adjoining rooms as well as earth fills. Finkelstein (Finkelstein, Bunimovitz, and Lederman 1993: 376–77) has suggested that during the MB IIC the site functioned as a cult place and was unoccupied as illustrated by the absence of dwellings. The LB (Stratum VI), in Area D, contained both LB I and LB IIA material. It appears that during this period the site served as an uninhabited cultic center. Indeed, the bulk of the LB assemblage, including the animal remains, was recovered from a dump of an LB I and LB IIA favissa such that these remains relate to the cultic activities carried out at the site (Finkelstein, Bunimovitz, and Lederman 1993: 45; B. Rosen 1993).

The faunal report (Hellwing, Sadeh, and Kishon 1993) deals with the faunal remains from both periods. However, they are not discussed in relation to their exact archaeological provenance, and no separation is made between the two phases of the LB. Distinction is made, however, between the MB IIB and late MB IIC deposits. For the purposes of comparison with other sites in this paper, the two MB strata were combined. The sizes of the bone assemblages differ, with the combined MB samples comprising only 1,200 bones and the LB sample comprising close to 3,000 identifiable bones.

Both of the MB and LB assemblages contain a broad range of animal species, but the LB has a slightly higher frequency of remains of wild animals (fig. 16.5). Both periods are dominated by domestic animals. The LB assemblage is characterized by an extremely high frequency of caprine remains and lower frequencies of both cattle and pigs than in the MB (fig. 16.2). As at other sites, the LB has a higher frequency of sheep relative to the MB (fig. 16.4). The high caprine but low cattle frequencies in the LB have been interpreted as indicative of a reversion to nomadic or seminomadic pastoralism (Finkelstein 1993; B. Rosen 1993), and the deterioration in the economic status of the site (Hellwing, Sadeh, and Kishon 1993: 324). Conversely, the diachronic differences may be related to the diversity of contexts from which the remains were excavated; the LB sample represents remains from a cultic favissa, raising the possibility of species selection for cultic purposes. In contrast, the MB sample is derived from the city wall and associated structures and probably represents domestic debris. Consequently, though the environmental and topographic location of the site in the highlands makes it more suited to caprine herding than intensive agriculture, the high frequency of caprines may be the result of selection for ritual practices. By comparison with fauna from another

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cultic site, B. Rosen (1993) has argued that the Shiloh LB assemblage does in fact provide a true reflection of herd composition during this period.

Examination of relative frequencies of the three most prevalent domesticates found at Shiloh (fig. 16.3) corroborates the overall pattern observed in figure 16.2, with an increase in caprines in the LB and a concomitant decrease in the frequency of cattle and pigs.

Tel Michal

Tel Michal (Israel grid 131/174) is located on the coastal plain, west of Herzliya within a coastal dune vegetation (fig. 16.1) and an annual average rainfall of 500–600 mm (Orni and Efrat 1971: 145). The site is spread over five hills covering an area of about 135 dunams (Herzog, Rapp, and Negbi 1989). The MB IIB assemblage (Stratum XVII) is derived from the high tell, from fills associated with the earthen rampart and from a constructed "platform" on top of which the settlement was built. During the MB, the settlement lacked a defensive city wall. The MB IIB settlement was totally destroyed, probably by tectonic activity (Herzog, Rapp, and Negbi 1989).

The site was rebuilt during the LB, and most of the remains dating to this period are derived from the high tell (Area A) from Strata XV (LB II) and XVI (LB I). The bulk of the LB I sample originates from a structure identified as a military fort as well as from the fill of a rampart on top of the MB IIB earthworks. The LB II remains are derived from two structures and parts of a rampart (Herzog, Rapp, and Negbi 1989: 40–41; fig 16.4). The presence of many imported ceramic vessels and the absence of agricultural settlements around the tell during both the MB and LB periods have led researchers to suggest that the agricultural potential of its hinterland was not developed and that during both periods the settlement served as a small (half acre) trading station (Gophna and Ayalon 1989). The excavators have noted that unlike many of the coastal sites, there is no evidence from Tel Michal to indicate that the site underwent a decline during the Middle and Late Bronze transition (Herzog, Rapp, and Negbi 1989: 41).

The faunal report (Hellwing and Feig 1989) describes the remains by period but does not differentiate between the LB I and LB II strata, nor does it relate to the exact archaeological context of these remains. As there is a great disparity in sample size between the MB (NISP = 110) and LB (NISP = 641), a rarefaction test was run. The results indicate that the difference in the number of species represented in the two periods (MB = nine species; LB = eleven species) may be related solely to differences in sample size and not to differences in patterns of animal exploitation.

Domestic caprines and cattle are the most frequently represented species in both periods, although their relative frequencies increase in the LB (fig. 16.2). It is interesting to note that in both periods, caprines and cattle are represented in almost equal amounts. In contrast, pig remains are significantly more common in the MB. Unfortunately no data is given on the relative numbers of sheep to goats. Comparison of the relative proportions of the three main domestic species in the MB and LB (fig. 16.3) indicates that while the frequencies of caprines and pigs resemble each other for both periods, there is an almost twofold increase in the relative frequency of cattle in the LB. Another marked diachronic difference is in the frequency of wild to domestic species (fig. 16.5), with a significant increase in the LB in the frequency of wild species including fish, gazelle, and especially deer, suggesting increased hunting.

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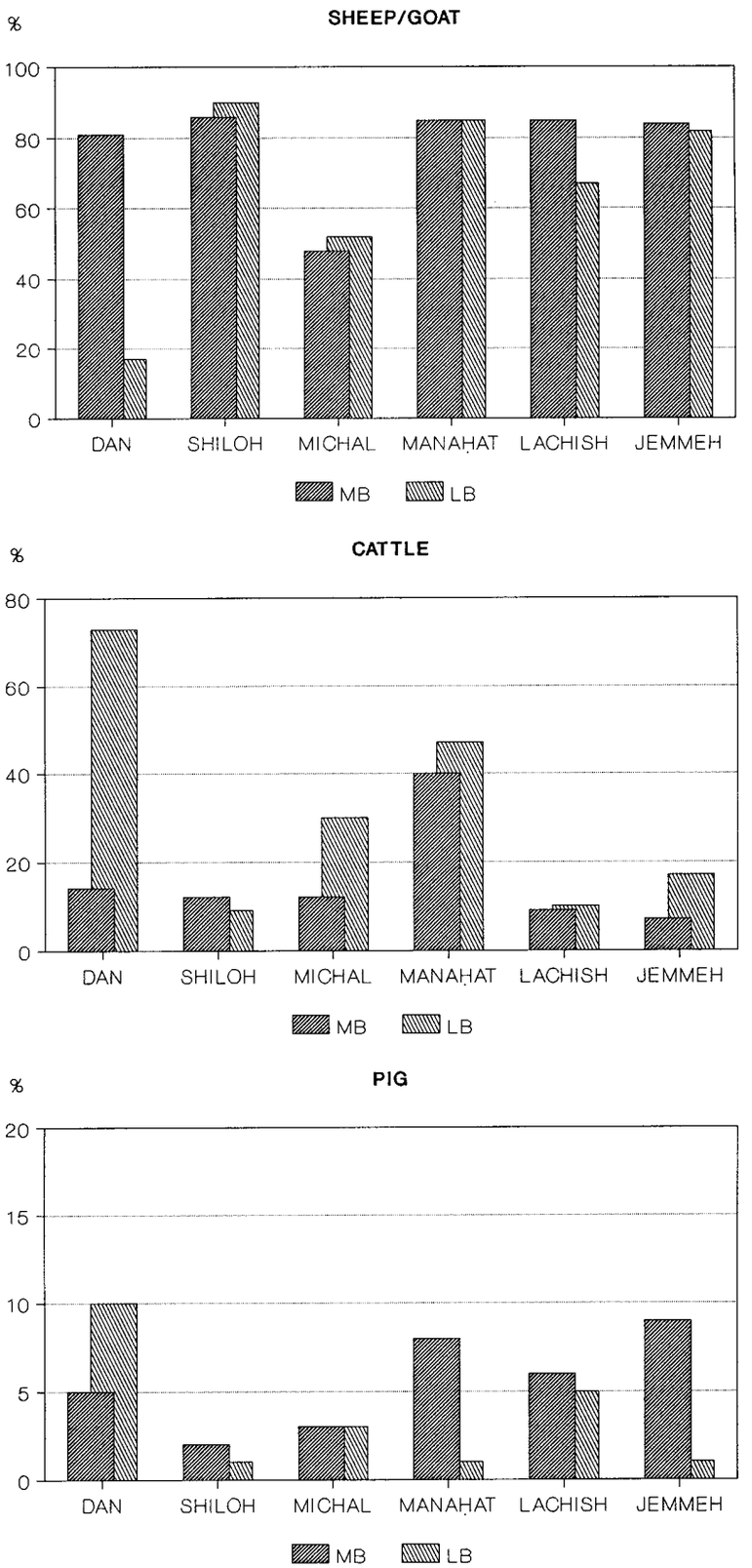

FIGURE 16.3. Relative frequencies of (a) sheep/goat, (b) cattle, and (c) and pigs in the six "core" sites. Calculated from the total NISP counts for these three species.

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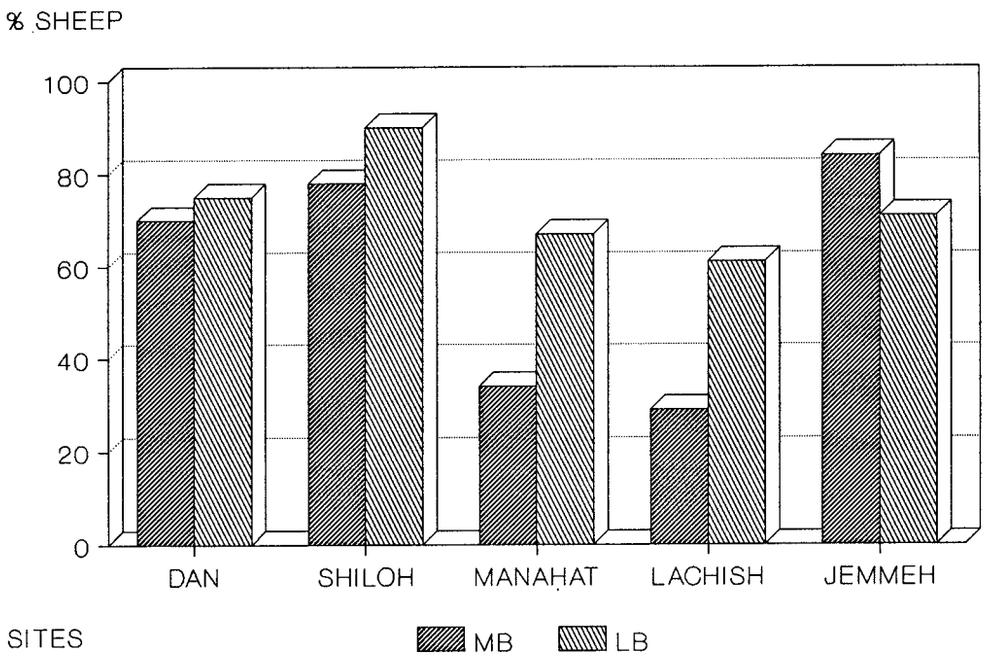

FIGURE 16.4. Relative frequency of sheep in the six "core" sites. Calculated from the relative frequency of identified sheep and goat bones from NISP counts.

Manaḥat

Manaḥat (Israel grid 1289/1679; fig. 16.1) is located in the Rephaim Valley (Wadi el-Ward), 5 km southwest of the Old City of Jerusalem. The site is about 690 m above sea level and covers an area of about 30 dunams. The vegetation around the site is typical of the Mediterranean hill zone with a mean annual rainfall of 550 mm (Orni and Efrat 1971: 144–46). Close to the site is the perennial spring of Ein Yalo (Edelstein, Milevski, and Aurant, 1998).

The archaeozoological report (Horwitz 1998) discusses a small assemblage of bones associated with an LB IIB domestic structure (Building 1028 in Area 1000). The MB IIB–C remains are derived from Area 800 (terrace fills and house floor fills) and Area 1000 (house floors). The character of the LB settlement at the site is unclear, but during the MB it appears to have served as an unfortified rural village (Edelstein, Milevski, and Aurant, 1998).

The number of species represented in the two periods differ somewhat (MB = nine; LB = thirteen) as does sample size; the MB assemblage, which has a lower number of species, is nearly twice the size of the LB assemblage. This indicates that in the LB, the wider range of animal species represented is not a bias resulting from sample size but reflects selection. It is thus not surprising that the frequency of wild fauna increases in the LB.

Compared with the MB, the LB has a lower frequency of pigs but a higher frequency of cattle and caprines, especially sheep (figs. 16.2, 16.4). However, both Bronze Age assemblages at Manaḥat contain relatively high proportions of pigs. This may be explained by the moist, local conditions around the site as evidenced by the palaeobotanical and phytolith remains which suggest the proximity of an oak forest as well as the presence of a marsh area

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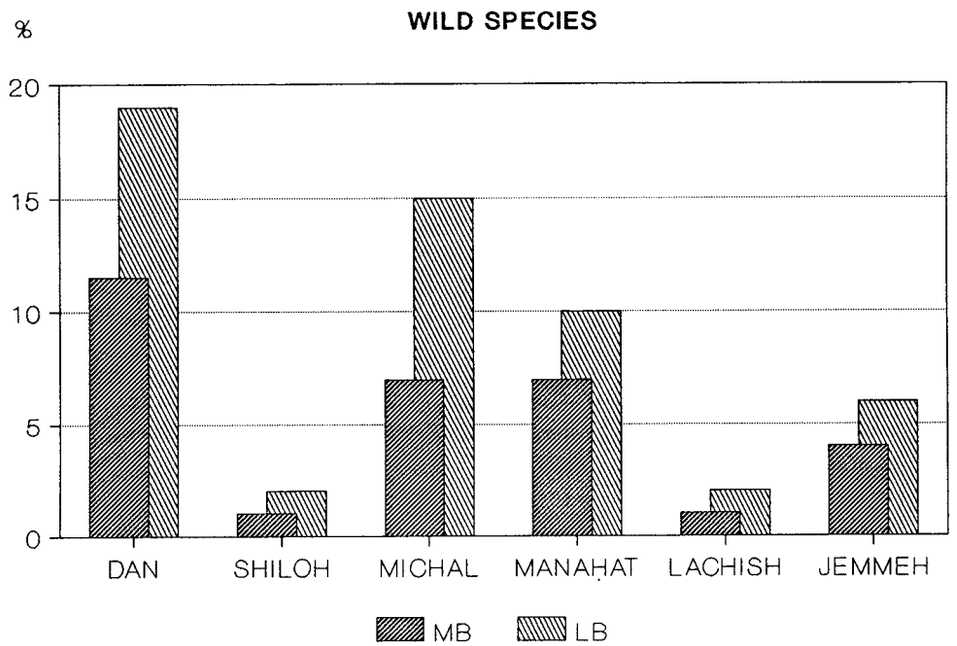

FIGURE Fig. 16.5: Relative frequency of wild species in the six "core" sites. Calculated from the relative frequency of wild versus domestic species from NISP counts.

(Edelstein and Milevski 1994). These data suggest that the water table in the Rephaim Valley might have been higher during the Bronze Age (A. Rosen 1998).

When the relative frequency of caprines, cattle, and pig are calculated (fig. 16.3), a slightly different picture is observed, with caprines represented in equal numbers in the two periods. In the LB, cattle frequencies increase while pigs decrease. The faunal data from Manaḥat illustrate that there is a greater resemblance in subsistence base between the LB IIB and MB IIB faunal assemblages, than between them and the earlier EB IV (Horwitz 1998; Edelstein and Milevski 1994).

Lachish

Lachish (Israel grid 1357/1083; fig. 16.1) is located in the Shephelah about 250 m above sea level. The site covers approximately 120 dunams. It is situated in the fertile region at the southern edge of Naḥal Lachish (Wadi Ghafr). Wells appear to have supplied the city with most of its water (Ussishkin 1993). The surrounding vegetation is typical of the Mediterranean lowland zone giving way to semiarid scrub (Drori 1979). The annual average rainfall is 300–400 mm (Orni and Efrat 1971: 144–45).

The MB site was fortified and probably functioned as one of the major centers of southern Canaan until its destruction at the end of this period (Ussishkin 1993). The MB IIB–C deposits were recovered from Level VIII and relate to a cult site in Area D and a palace in Area P. The LB remains are derived from two levels at the site: Level VII (LB I–III) containing the Fosse Temple, and Level VI LB III Acropolis Temple. During Level VI the city was under

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Egyptian rule. The LB settlement at Lachish was unfortified, and by the end of this period the site might have been one of the largest cities in the southern Levant (Ussishkin 1993).

The LB IIB faunal assemblage used in this study is derived from the excavations directed by D. Ussishkin and includes material recovered during the 1973 to 1978 excavation seasons (Drori 1979). It includes material from a public building and the Acropolis Temple in Level VI of Areas S and P as well as remains recovered from within and underneath the temple floor (Drori 1979: 26, plan 7). The fauna from the sanctuary in Level VI recovered during Aharoni's excavations and analyzed by Lernau (1975) were not included in this study, despite the fact that they are derived from the same excavation area since different methods were used in their retrieval and analysis.

The Lachish LB sample contains a lower frequency of caprines and pig than the MB sample, but a higher frequency of cattle (fig. 16.2). This complements the trend reported by Lernau (1975) who found lower frequencies of caprines than cattle (28.3% caprines, 66.3% cattle) in the sanctuary in Level VI. The same pattern is observed when the relative frequencies are calculated for the three main species (fig. 16.3).

Remains of sheep are more prevalent in the LB than in the MB (fig. 16.4). There is an increase in the relative frequency of remains of wild animals in the LB relative to the MB, especially of birds and deer (fig. 16.5). At least a portion of the MB assemblage, as well as the entire LB sample, are derived from cultic contexts. Although it is difficult to assess the exact influence of this factor on their composition, it is possible that the relative proportions of the animals reflect their selection for ritual purposes. Finkelstein (1988: 343–44) has suggested that there was a pastoral population at Lachish during the LB. However, the faunal remains from the "Solar Shrine" (Lernau 1975) as well as those from the sanctuary (Drori 1979) contain lower frequencies of caprines than cattle, which, according to the model presented here, is characteristic of an agricultural or agro-pastoral community. Based on an analysis of the pollen contained in mudbricks from the excavation, Drori (1979) concluded that the environment in the LB was richer in arboreal pollen than in the MB, suggesting a more humid environment than today (contra A. Rosen 1986: 57). This factor may also explain the relatively high cattle frequencies at the site, which today lies on the edge of a semiarid zone.

Tell Jemmeh

Tell Jemmeh is situated in the northern Negev, close to the southern coastal plain, about 10 km south of present-day Gaza (map ref. 097.088), on the southern bank of Naḥal Besor (fig. 16.1). This area receives about 300 mm in annual rainfall. The surrounding vegetation is typical of the Irano-Turanian zone, as an extension of the northern Negev to the coast (Orni and Efrat 1971: 172). The original area of the tell was about 50 dunams, some 50 m above sea level (van Beek 1993).

During the MB IIB, the site appears to have been a large Canaanite agricultural town with an earthen rampart. The LB occupation, represented by both of the LB I and LB II phases, consisted of a small settlement (about 11–50 dunams). In the northwest excavation area, remains of an LB mudbrick fortification wall were found while remains of several domestic structures, including a large "elite" residence, were also excavated. It is probable that during the LB the site had an Egyptian governor (van Beek 1993).

The faunal remains have only been partially published (Wapnish and Hesse 1988; Wapnish 1982, 1993). Concerning their context, Wapnish (1993) notes that the majority of the LB

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faunal assemblage is derived from the large elite building while the MB sample represents household debris.

Both periods contain a wide range of species. There is a significant difference, however, in the number of species represented in the LB and the MB at the site (LB = twenty-one species; MB = eleven). Since there is a marked difference in the size of the two samples (LB = approximately 4,300 bones; MB = approximately 200 bones), a rarefaction test was run. The results indicate that given the MB sample size, the LB sample should contain eleven species, a result that is very close to that of the MB sample. Consequently, the larger number of species in the LB appears to be directly correlated to the larger size of this sample. Once again wild animal species comprise a relatively larger portion of the LB sample than in the MB sample, indicating a greater emphasis on hunting, gathering, and fishing in the LB (fig. 16.5).

Examination of the frequencies of the various species indicates an increase in the relative proportions of caprines and cattle in the LB and a concomitant decrease in the frequency of pigs (fig. 16.2). Wapnish (1993) has suggested that the decrease in pigs in the LB may either reflect drier climatic conditions than in the MB or, since pigs were not considered an acceptable dietary item for the Egyptian elite (see also Redding 1991), they are absent from the debris of the elite LB residency. Relative frequencies of the three main species (fig. 16.3) show an increase in cattle in the LB but a reduction in the numbers of both pigs and caprines in the LB. In contrast to the other sites studied here, the frequency of sheep decreases in the LB relative to the preceding MB (fig. 16.4).

Diachronic Trends within Sites

The six sites that form the central data set in this study exhibit marked diachronic differences in the relative frequencies of animals exploited between the MB and the LB. These differences are more marked in some sites than in others, a feature undoubtedly influenced by the geographic and environmental differences between them. Similarly, the influence of differences in the function and size of the sites must be considered.

The rarefaction tests showed that interperiod differences in the number of species found at some sites are due solely to differences in sample size and not to differences in human exploitation patterns. Consequently, no significant differences were evident in the number of species exploited between the MB and the LB. Moreover, little diachronic difference was found in the range of animal species exploited.

Examination of the relative frequencies of species represented at the six sites (fig. 16.2) indicates a predominance of the same domestic animals in both periods: primarily sheep and goat (*Ovis aries*/*Capra hircus*), cattle (*Bos taurus*), and pig (*Sus scrofa*). Additional domesticates found in all the sites include equids (both horse and donkey), camel, dog, and domestic birds. Similarly, the same wild faunal elements were represented in both the MB and LB assemblages (fig. 16.2). Their representation at a site appears to be related to the specific environmental conditions around the site, such as the presence of deer species and boar in sites close to woodlands and thickets. It should also be kept in mind that some of the wild species (such as rodents and birds) may represent accidental intrusions into the deposit rather than food items. It may be concluded, then, that the main diachronic trend between the MB and LB periods is not expressed in differences in the range or number of species represented, but rather in their relative frequencies. Indeed, marked diachronic differences are observed in five such features:

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(1) At four of the six sites, caprines increased in frequency in the LB relative to the MB (Shiloh, Tel Michal, Manaḥat, and Tell Jemmeh). However, at Tel Dan and Lachish caprines decrease in frequency, and at Tel Dan are the predominant species (fig. 16.2).

It is interesting to note that the Tel Dan and Lachish LB samples are from suspected cultic deposits suggesting that human selection for ritual purposes may have influenced the species proportions, with cattle the preferred ritual animal at some sites. In contrast, the LB levels at Shiloh, although also derived from a cultic deposit, show a clear predominance of caprines. It is possible that local environmental conditions might have played a role in determining the herd composition in the hill country.

(2) There is an increase in the frequency of sheep in the LB relative to the MB at all sites with the exception of Tell Jemmeh (fig. 16.4). At this latter site, an opposite trend is observed, and the frequency of sheep declines in the LB, although sheep still outnumber goats in this period.

Based on the changing frequencies of pigs and gazelle, Wapnish (1993) suggested that the LB at Tell Jemmeh might have been drier, therefore indicating that it is possible that the increase in goats in this period, a species known to be more heat- and water-tolerant, may also be related to this factor. However, Wapnish (1993) also presents contradictory evidence based on the increased frequency of water birds in the LB, which suggests that this period might in fact have been wetter. The environmental data for this site are therefore equivocal, and the reason for the decrease in sheep may simply represent a local trend. We may conclude that at the majority of sites there is a greater emphasis on sheep herding in the LB relative to the MB.

(3) There is an increase in the frequency of cattle at five of the six LB sites (fig. 16.2). The exception is Shiloh where cattle frequencies are lower in the LB than in the MB.

Two factors may be responsible for the inverse trend observed at Shiloh. The first is that the specific environmental conditions of the hill country may be better suited to caprine herding than cattle keeping. The second is the possible role played by human selection due to the cultic nature of the LB deposits at Shiloh.

(4) In all sites but one examined here, the frequency of pigs is markedly reduced in the LB relative to the MB (fig. 16.2). The one exception is Tel Dan, where the pig frequency increases in the LB.

This apparent anomaly may be explained by the fact that the pigs from Dan have all been identified as wild boar rather than domestic pig. They probably inhabited the environs of the site because of the natural springs in its proximity. Consequently, their increased frequency at the site reflects the increased incidence of hunting rather than an increase in pig herding.

(5) The relative contribution of wild animal species to the assemblage increases in the LB (fig. 16.5).

This includes increased frequencies of fallow and red deer, gazelle, carnivores such as fox and wild cat, antelope species such as hartebeest, and a variety of wild birds and fish. The fact that this trend is found at all the sites studied here suggests that it reflects a substantive change in subsistence strategy over time.

COMPARISON WITH ADDITIONAL LATE BRONZE AGE SITES

In addition to the LB strata from the six “core” sites described above, only a few published reports from other LB sites are available and most describe very small samples. The data from

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these sites are briefly summarized below and discussed in relation to the LB "core" sites described above.

A small but highly selective assemblage was recovered from the LB Egyptian Garrison at Tel Beit Shean in the Jordan Valley (Crabtree and Kane in James and McGovern 1993: 199–200). Species identified included caprines, cattle, equid, fallow deer, dog, wild cat, and fish, indicating that as at the other LB sites both domestic and wild species were common.

At Tel Kinrot a site overlooking the northwestern shore of the Sea of Galilee, the faunal assemblage (Hellwing 1988–89), contains over 60% caprines and 30% cattle but few pigs (2%). Another small assemblage from Tel Ḥarasim, located in the Shephelah (Horwitz 1996a), contains a similar range of species, and the three predominant domesticates are represented in frequencies similar to Tel Kinrot. Both assemblages reflect similar patterns of animal exploitation to that found at the site of Tel Michal (fig. 16.2). They contain a broad range of wild animals: gazelle, deer, hare, fox, birds, and fish. Although Tel Dan broadly shares a similar macro-phytogeographic zone (Mediterranean vegetation) with these sites (fig. 16.1), the extremely high cattle frequencies found in the LB layer at this site deviate markedly from the pattern found elsewhere, suggesting a high degree of species selection as may be expected at ritual sites (Horwitz 1999).

Some thirty bones were recovered from an LB locus at the City of David, Jerusalem (Horwitz 1996b). Only caprines and cattle were represented, the former comprising 74% of the total sample. Although little can be said about such a small sample, the relative frequencies of these two species are similar to those found at Manaḥat (fig. 16.2) which lies only a few kilometers away.

The LB assemblage from Tell es-Sharia in the northern Negev (Davis 1982) contained over 94% caprines, of which goats comprised the majority (75%) relative to sheep. Only 3% of the assemblage was made up of cattle, while the other remaining 3% comprised equids, pig, roe deer, and gazelle. Unfortunately the report does not deal with remains of carnivores, birds, fish, or small mammals which were probably represented at the site. The very southern, and hence very arid, geographic position of Tell es-Sharia probably accounts for the extremely high caprine frequencies, especially goat. When this assemblage is compared with two other north Negev sites, Tell Ḥalif and Tell Jemmeh, notable differences are observed between them. At Tell Ḥalif (Seger et al. 1990: 18–21) both LB I and LB II phases are represented. For the combined LB periods, caprines constitute some 78% of the assemblage, compared with 94% at Tell es-Sharia. Initially it was thought that the caprine frequencies at Tell es-Sharia might be inflated as the other minor faunal elements were not included in the calculations. However, when the relative frequencies of only the three main domesticates were compared, the caprine frequency remained markedly higher than that of the other Negev sites, suggesting a real difference in subsistence base. At Tell Ḥalif cattle form 15% of the assemblage and pig only 3%. Wild species that are represented include gazelle, birds, and fish, including Mediterranean Sea species. Sheep and goats are represented in equal proportions (Zeder 1990: 26–28). With regard to the range of species represented and their relative frequencies, Tell Ḥalif closely resembles Tell Jemmeh (Wapnish 1982), while Tell es-Sharia represents a subsistence base adapted to more arid conditions.

Synchronic Trends between Sites

The data presented in this report indicate some synchronic diversity in faunal patterning between the LB sites discussed here. The relative frequency of species such as caprines or

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cattle show a clear relation to the geographic and environmental position of the sites (fig. 16.1) and reflect the nutritional and water requirements of the different animal species. Caprines (goats especially) are the best-suited species for herding in marginal conditions, while cattle are least adapted to such regimes and require extensive human intervention (Redding 1981). Consequently, LB sites in phytogeographic zones not suitable for the keeping of cattle, such as the hill and arid regions, have relatively low cattle frequencies (8% at Shiloh, 10% at Manaḥat, 10% at Tel Ḥalif, 16% at Tell Jemmeh, 3% at Tell es-Sharia) compared with sites in prime cattle-grazing areas such as Tel Dan (about 60%), Tel Kinrot (about 30%), Tel Harassim (about 30%), and Tel Michal (40%). In contrast, the sites in the hill country and arid regions have higher caprine frequencies (fig. 16.2).

Where all faunal elements have been collected and studied, all the LB assemblages contain a wide range of wild faunal species including hunted animals (deer, gazelle, antelopes), those obtained through gathering and trapping (small mammals, carnivores, and birds) and others obtained by fishing.

Cultic Sites

In addition to Shiloh, Tel Dan, and Lachish, faunal reports have been published for two other LB cultic sites or temples: Timna, in the southern Negev (Lernau 1988a, 1988b), and Nahariya, on the northern coastal plain of Israel (Ducos 1968). The Timna site contains remains of caprines—sheep (44%) and goats (56%)—as well as remains of freshwater and Red Sea fish. The Nahariya Temple contained remains of caprines, predominantly goat (87%), cattle (11%), pig, and fox. When we compare these assemblages with those derived from cultic contexts at Lachish, Shiloh, and Tel Dan, it is evident that there is a high level of intersite variation, both in the species represented as well as in their relative frequencies. The unifying feature appears to be geographic; sites in arid areas such as in the Negev or the hill country have very high caprine and low pig and cattle frequencies. Those lying in the well-watered Mediterranean zone show an inverse pattern. Consequently, the LB populations appear to have exploited for ritual purposes the species most commonly represented in their herds—caprines in the hill country (Shiloh) and in the desert (Timna), versus cattle in the Mediterranean region (Tel Dan and Lachish). However, at Nahariya, a northern coastal site where we would have expected a predominance of cattle, an opposite pattern is seen with a predominance of caprines. There appears, then, to be no single pattern of animal exploitation at the LB cult sites discussed here.

GENERAL CONCLUSIONS

The data presented here from the six "core" sites show a clear, diachronic shift in subsistence strategies from the MB to the LB. The LB assemblages are characterized by an overall increase in the frequency of cattle and an associated decrease in the relative frequencies of pigs and caprines. Sheep are more prevalent in the LB sites than in those of the MB, while the contribution of wild fauna in LB assemblages increases. This pattern is corroborated by the finds from the other LB sites discussed here.

When these data are compared with Redding's model (1991, 1993), they exhibit marked similarities. According to his model, societies practicing intensive agriculture will be charac-

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terized by a high frequency of cattle. Cattle are preferred because (1) they are needed for agricultural labor; (2) the dung they produce can be used for fuel; (3) they are relatively very efficient milk producers; (4) they require less human control than either pigs or caprines; and (5) they require high quality forage that can be provided as a by-product of agriculture (surpluses and fallow field grazing). As the intensity of agricultural production increases, and the accompanying reliance on cattle, so pig and caprine frequencies will decline (Redding 1993).

The main reason for the decline in pig frequencies is that they can cause enormous damage to the crops. Consequently, raising pigs together with intensive agriculture is only cost effective if enough surplus crops can be grown to feed the pigs so that they do not compete with people over food, and they can be efficiently kept away from the fields (Redding 1991). As pigs are unsuited to long distance transhumance (Zeder 1996), this last criteria may be difficult to meet. An additional feature that makes pig raising problematic is their dependence on a daily intake of water. In areas such as the southern Levant where water sources are frequently limited, this may result in pig raising and intensive agriculture being mutually exclusive. Furthermore, watering the animals on a daily basis involves a high cost—human labor—which may be more profitably invested in agriculture that is seasonal. Pigs produce fewer products than cattle or caprines (only meat and skins) and have to be slaughtered in order to obtain these items, making them relatively high in cost relative to the other two species which provide, in addition to meat and skin, milk, wool/hair, and labor, the last three as secondary products. In this regard, Redding (1991) notes that relative to their intake of feed protein, cattle milk provides more animal protein than pork.

Finally, if Redding (1991) is correct and the Egyptian elite refrained from consuming pig, then this might have supplied both a sociopolitical as well as market-oriented motive for decreasing the extent of swine herding. Zeder (1996) has proposed that under conditions of agricultural intensification, pig raising would still have proved profitable on the small-scale level of individual households through the use of sty-raised pigs. Indeed, this factor may account for the continued presence of pigs at all LB sites and their relatively higher frequency at the village site of Manaḥat.

As cattle become more important (i.e., as agricultural intensification increases), so the frequency of caprines in the assemblage should decrease since caprine herding requires a nomadic or seminomadic lifestyle, which is in direct contradiction to the sedentary requirements of intensive agriculture. The latter entails almost year-round crop activities as well as the protection of boundaries and water rights, both features that are less stringently enforced in pastoral regimes. Redding (1991) has noted that as cattle and sheep compete for similar resources, as the one species increases in frequency, so the other will be reduced. However, the LB data presented here show a positive correlation between the two, with both sheep and cattle frequencies increasing in this period.

This apparent contradiction of the model can perhaps be explained by several factors. First, Redding's initial model of increased goat herding relative to sheep comprised not only an increase in agricultural intensity, but also an increase in settlement density (Redding 1981: 260). This feature was not discussed in the later publication (Redding 1991) and is in contrast to the settlement data for the LB. Second, sufficient agricultural surplus was produced in the LB to cope with the interspecies competition for food. Third, with the exception of iron content, sheep milk is nutritionally richer than that of goats, although the latter produce more milk

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(Redding 1981). In addition, in the Near East mutton rather than goat flesh is generally preferred for consumption, probably because it yields more calories per kilogram due to its higher fat content (Redding 1981). Consequently, it is possible that if caprines were being raised for markets, then mutton production was more economically viable than that of goats.

Lastly, it is possible that the demand for wool increased such that the keeping of sheep, rather than goats, proved economically beneficial. It should be borne in mind that by keeping sheep, the producer has access to all three usable and marketable caprine products: meat, milk, and wool. In Crete, from ca. 1400 B.C. onward, during the Mycenaean occupation of the island, we have evidence for a flourishing wool industry (Killen 1964), while the earliest convincing evidence for wool sheep in Egypt dates to the New Kingdom (Ryder 1983). These data suggest that by 1400 B.C., there was an interest in wool production both in Egypt and in the Aegean. Taking into account the political and commercial contacts between these regions and the Levant during the LB, it is possible that they influenced the orientation of Levantine caprine production toward one aimed at wool production.

An example of this may be found in the Egyptian tribute and booty lists of Levantine livestock during the New Kingdom. In the booty taken from Megiddo, 20,500 sheep and 2,000 goats are mentioned (Pritchard 1954: 237), while in the Thutmosis III tribute list of years 29–40, about 21,670 sheep and goats are collected (Breasted 1962: §§447, 462, 471, 482). The ratios of goats to sheep is 1:10 in the booty of Megiddo and 1:7 in the lists of the tribute and booty. The last ratio seems to be closer to the archaeological data of the sites.

As a society increases its involvement in pastoralism, an inverse trend to that outlined above occurs, with an increase in the frequency of caprines, and a decrease in the frequencies of both pig and cattle (Redding 1993). As can be understood, pig frequencies decrease in both instances, except in situations where the economy is essentially deurbanized and made up of private households involved in subsistence farming (Zeder 1996).

We would argue that the pattern of animal exploitation observed in the majority of the LB sites closely follows that outlined in Redding's model, being indicative of a population involved in intensive agriculture on a greater scale than previously practiced in the MB. Population demography for this period supports this claim, as we see a general movement away from areas least suited for agriculture, in the interior and hill country. Further corroboration is provided by the available palaeobotanical information which indicates that during the LB cultivated areas probably existed at Tel Michal (Lipschitz and Waisel 1989; Thompson and Rapp 1989), Manaḥat (Edelstein and Milevski 1994), and Lachish (Ussishkin 1978; Drori 1979). Data for Shiloh are limited for LB, but Lipschitz (1993) has indicated that the abundance of olive trees suggests that they were cultivated. At Tell Ḥalif (Seger et al. 1990: 26) and Tel Ḥarasim (Givon 1993), large silos were found in the LB II strata. Their size and number suggests not only the importance of agriculture in these societies, but also the importance of storage of agricultural produce, perhaps surpluses. It seems feasible to suggest that the need for agricultural surpluses was a direct result of the economic demands exerted by the Egyptians. Perhaps, as proposed by Falconer (1994), it was this very factor that played a critical role in the decline of the LB urban communities.

The six "core" sites studied here all show continuity of occupation from the MB to the LB, but discontinuity in subsistence strategies. The innovation of intensive agriculture observed in these assemblages correlates well with what Hole (1994) sees as the main option open to a society that chooses to remain in the same location during a period of economic instability or

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stress. Additional evidence for economic stress and instability at these sites is seen in their increased reliance on wild animals: hunted, gathered, or fished. This too supports Hole's (1994) claim that people undergoing a period of economic stress turn to alternative subsistence forms. There is, however, little faunal evidence to support a widespread return to pastoralism. The animal remains from sites in the hill country (Shiloh and Manaḥat), with the exception of the extremely high frequency of caprines at Shiloh, do not deviate from the general pattern of animal exploitation observed at the other LB sites. As discussed above, this may be due to factors other than a reversion to pastoralism. These conclusions must remain tentative until further sites are excavated in the hill region.

This paper has offered a theoretical framework against which to assess the nature and extent of changes in the transition from the MB to the LB. We feel confident that our data support the archaeological scenario of the LB as a period of impoverishment and recession. The seemingly anomalous presence of luxury items at many of the LB sites, cited by Liebowitz (1987, 1989) as evidence for prosperity, may be accounted for with reference to an analogous situation: the collapse of Early Bronze Age sociopolitical systems in southeast Turkey (Wattenmaker 1994). In her case study, Wattenmaker (1994) illustrates that the system of specialist (elite) economies, i.e., specialist-produced goods and the extraction of surpluses, continued unaffected despite the disintegration of the political system in the region, which shifted from a centralized hierarchical one to that based on increased local autonomy. It is possible that in the LB of the southern Levant a similar situation occurred, with small households continuing to be involved in the production of specialist goods as long as there was a demand, possibly from the resident Egyptian population or for international markets. Consequently, these data need not stand in contradiction to the interpretation of the LB in the southern Levant as representing a period of socioeconomic decline and impoverishment.

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17

THE RIDDLE OF STRUCTURE 5239 AT MEGIDDO, STRATUM IX

David Ilan

As a product of the University of Chicago and a scholar of Syro-Palestinian archaeology, Douglas Esse was keenly interested in Megiddo (Tell el-Mutesellim) and knew the site well. His work on the Early Bronze Age (EB) led him to reanalyze the Megiddo phases and early strata in light of the expanded horizons achieved in his doctoral work. One of his last projects was the renewed study of the Iron I levels based on unpublished data in the Oriental Institute archives. This latter study resulted in ideas that hold great explanatory potential for reconstructing Iron I society and social processes (e.g., Esse 1992). Doug would certainly have been enthusiastic about the new excavations at Megiddo directed by Israel Finkelstein and David Ussishkin,[1] and I think his sense of adventure would have been piqued by the following investigation, if tempered by a wry, good-humored skepticism.

For all the myriad studies of Megiddo, the site remains an archaeological enigma due to the great extent of its excavation, the wealth of its finds, and the incomplete nature of its publication. At the top of the tell there is now a small bluff that provides the best view over the EB III double megaron temples of Stratum XV (Loud 1948: fig. 394; Kempinski 1989: fig. 14). It is located in the northwestern portion of the University of Chicago expedition's Area BB, mostly in their grid square M12. A few meters east of this bluff, and south of the path that leads down into Area BB, in the northeast corner of square M12 (fig. 17.1) lie

> [t]hree deep chambers of a single unit, 5239 (figs. 244–45), substantially built and carefully paved with excellent lime floors 4.50 m below the level to which the other walls had been destroyed. (Loud 1948: 102: fig. 401)

The southernmost of these chambers is larger than the other two. The remains are still remarkably well preserved and easily visible from all sides (pl. 17.1). What, then, is this finely constructed shaft, and to what, if any, structural configuration did it belong?

Strangely enough, this rather conspicuous feature has received little attention. Moreover, in every study of its contemporary remains, it has been left an architectural orphan. Chicago's Megiddo expedition attributed the shaft-like structure to Stratum IX (Late Bronze Age I). The tops of its walls (top elevation 159.85 meters above sea level) were apparently sealed under a clear Stratum VIII floor—presumably Locus 5227 in Loud's (1948) figure 402. The triple-shafted configuration penetrated down to "absolute levels equivalent to or below the general level of Stratum XV," base elevation being 155.35 meters above sea level. It is further noted that "with no openings in the walls, they [the shafts] must have been storage pits accessible from above only" (Loud 1948: 102).

1. The author participated as an area supervisor in the first full-fledged season of the new Megiddo excavations in 1994. This contribution grew out of the days spent walking about the tell with colleagues and old plans.

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Table 17.1. Register of Finds from Structure 5239, Megiddo Stratum IX (from Loud 1948: 187; corresponds to fig. 17.2)

Object	*Type*	*Field no.*	*Plate*	*Figure* 17.2 *here*
Jug	354	d 745	51:9, 133:21	2
Bowl	156	d 747	54:8	6
Bowl	246	d 746	53:13	1
Bowl	260	d 707	54:21, 134:10	7
Cooking bowl	10	d 749	55:2	5
Chalice	12	d 748	55:16, 134:16	8
Arrowhead	—	d 781	174:6	3
Toggle pin	—	d 780	223:61	4

The register of finds (Loud 1948: 187) lists only a modest artifactual assemblage, but it includes six complete pottery vessels, a bronze spearhead, and a bronze toggle pin (table 17.1, fig. 17.2).[2] All the reported finds were dated to the early part of the Late Bronze Age (LB). It is submitted here that Structure 5239 was a tomb. This idea is not surprising in itself, given the general proclivity at Megiddo (and elsewhere) for sinking tombs under almost every Middle Bronze Age (MB) and early LB edifice. Parallels for a tomb configuration of this kind are few, but certain features do have counterparts. Closest to home is T.3063, located in square O14 of Area BB and assigned to Stratum X by the Chicago expedition (Loud 1948: 170, 192, fig. 400). In the Megiddo Locus Registry it was termed "a burial in a chimney" (Kassis 1973: 14) and, together with its surrounding features, is a virtual replica of the Structure 5239 plan. Kassis recommended that it be considered as sunk into the debris of Stratum X from a surface of Stratum IX, and Gonen (1992: 107) concurs. It too contains a typical burial offering assemblage, including several Bichrome Ware vessels and a silver bracelet.

Another crypt construction, less similar but more striking in scale, occurs in the Alalakh Stratum VII "Palace of Yarim-Lim" (Woolley 1955: 95–97, fig. 35, pls. 20–22), dated to MB II–III. The general configuration and size of Room 17 and the rooms around it resembles that of the Megiddo unit. In contrast to Structure 5239, Room 17 itself was built of basalt ashlars in its lower portion, with a single row of rubble masonry above, followed by brick construction almost 3 m high—typical of the palace walls. The subterranean room was accessed via a stone slab stairway, or dromos, leading down to a basalt door slab on hinges. The jambs and lintel were also basalt ashlars. But the doorway of Room 17 was blocked from the inside (Woolley 1955: pl. 20b). Whoever had done so would have had to exit vertically out of the shaft. Indeed,

2. Only complete or otherwise outstanding objects were published in the Megiddo reports. It is also clear that much of what today would have been sent for restoration was never even registered. During the 1994 season of the new excavations, several important small finds and many large, typologically indicative sherds—many, probably from restorable vessels—were uncovered in the University of Chicago backfills.

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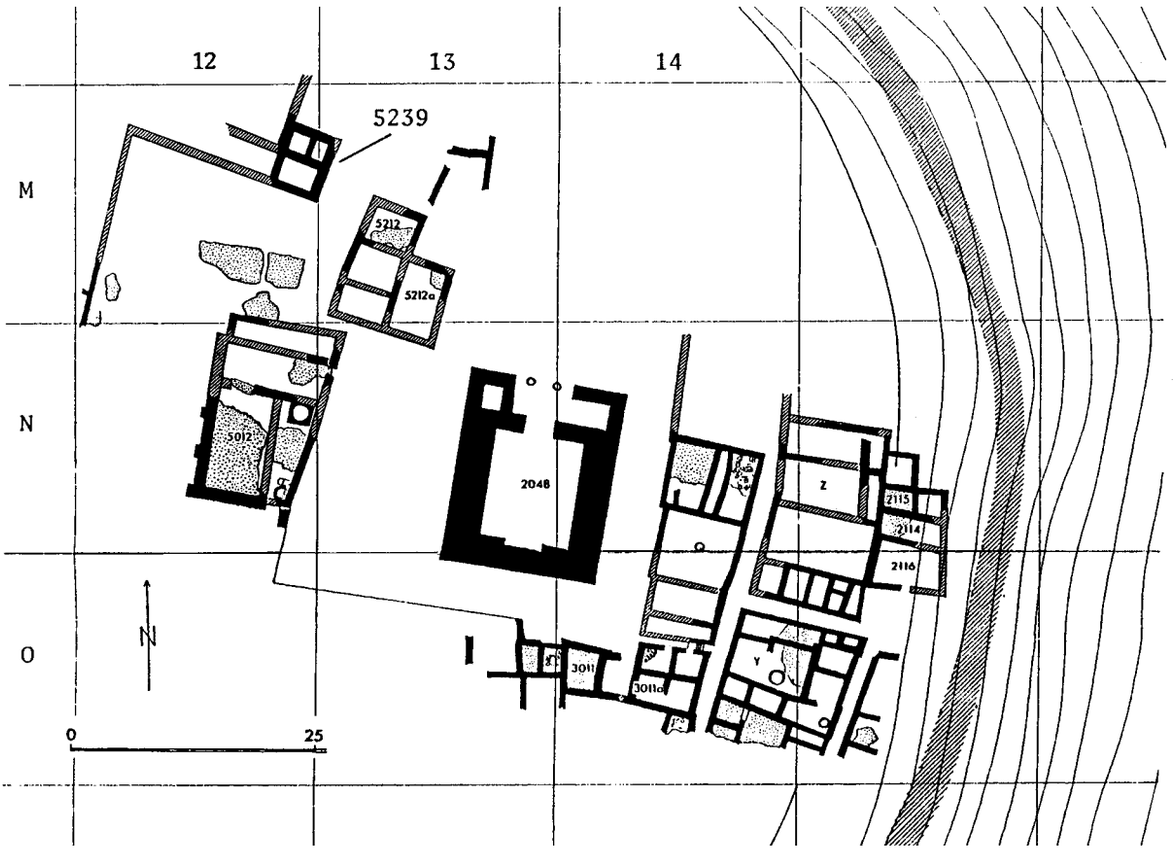

FIGURE 17.1. Stratum IX Area BB at Tell Megiddo as restored by Kempinski (1989: Plan 6; hatched lines are his reconstruction). Structure 5239 is located in the northeastern corner of Square M12.

the chamber was found intentionally filled. There was no clear floor over this fill, but neither was there any evidence for the chamber's having been roofed. It was Woolley's contention that the dromos and chamber were intended as ephemeral entities, never to be accessed again (he suggested the possibility of a foundation offering). His description of Room 17's hard, well-paved, lime cement floor matches that of the Structure 5239 floor.

Woolley was mystified as to the purpose of this chamber, despite the presence of four adult skeletons—and fragments of a child's—contained in a wooden box set against the southwest wall. He took issue with the parallels drawn by Schaeffer between Room 17 and the chamber-and-dromos tombs of Ugarit (Recent), citing structural differences and the dearth of burial goods in the subterranean chamber at Alalakh, which seemed to contrast with the quality of its construction. In this context, one must remember that Woolley had excavated the fabulously wealthy shaft tombs of Ur. In retrospect, his skepticism seems unwarranted; the skeletons, after all, speak for themselves. Rather, it is the differences in technique and the poverty of the burial offerings that require explanation. Several hypotheses might be forwarded, but none could be easily substantiated.

At Megiddo, Schumacher's (1908) T.1 and T.2—dated to MB III—are also reminiscent of the Alalakh Room 17 configuration in that they were constructed together with the overlying architecture as a planned unit. Though we now have no way of knowing, Structure 5239 may

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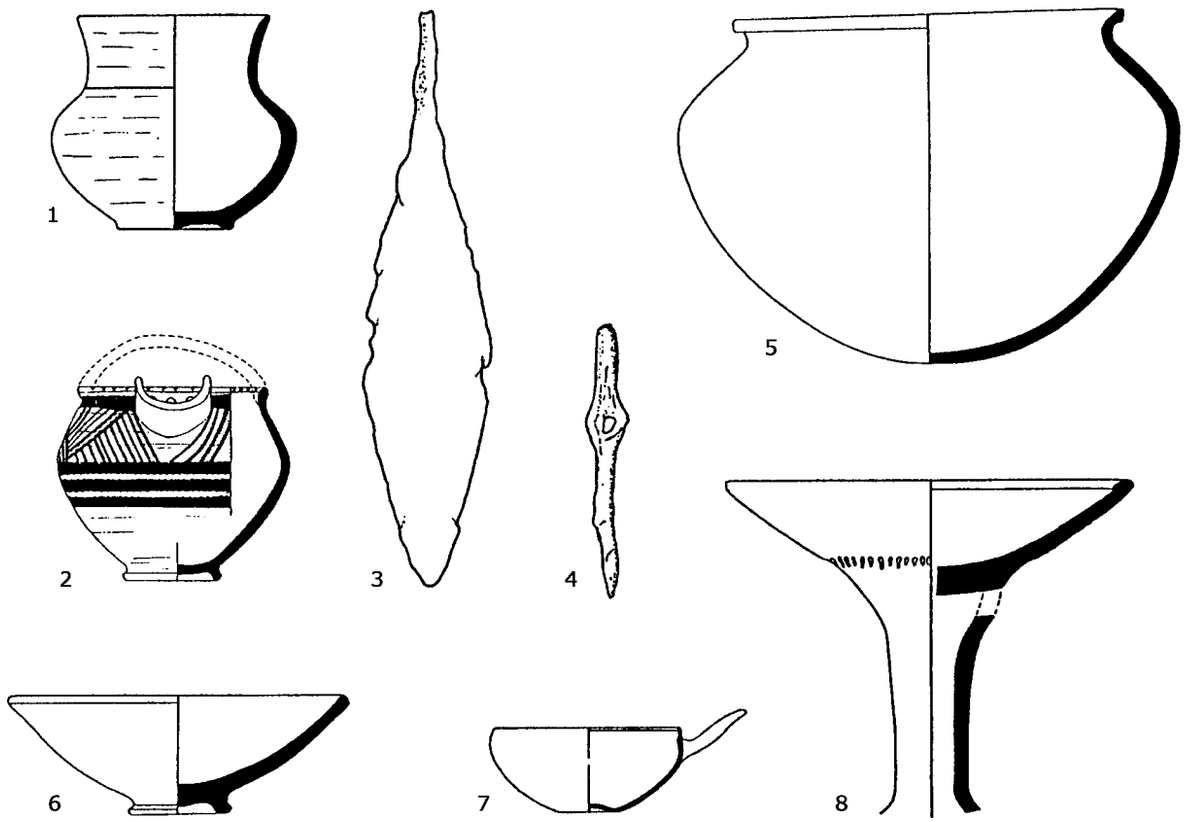

FIGURE 17.2. Finds from Structure 5239 (after Loud 1948). Pottery is drawn to a scale of 1:5 and metal objects to a scale of 1:1.

have been similarly integrated, especially if the superstructure walls were of brick that was not preserved or not detected by the excavators (but see the comments below concerning Kempinski's and Baumgarten's reconstructions).

The "royal" tombs found under the western palace of Tell Mardikh Stratum IIIB may be seen as conceptually similar to Structure 5239 in their location and in the shaft entries of some (e.g., Matthiae 1980). Indeed, the fact that dromos entries coexisted with shaft entries is instructive in itself. The same concept was probably in force with regard to the contemporaneous subfloor chamber tombs at Ugarit, and particularly those within the confines of the palace (e.g., Salles 1987; Schaeffer 1939; Yon 1990).

The artifactual assemblage of Structure 5239 is a fairly typical one for a LB tomb at Megiddo and elsewhere (for a compilation of Megiddo assemblages see Gonen 1992: 98–118). The cooking pot is highly unusual in the mortuary contexts of other periods. In LB, however, it is ubiquitous, and especially so at Megiddo (e.g., Guy 1938: 155 and various plates; Gonen 1992: 49). The toggle pin also is particularly characteristic of the MB and LB tomb offerings; at Megiddo 80% of the LB and MB toggle pins reported originated in tombs (forty-two out of a total of sixty-four items illustrated in Loud 1948 [pls. 219–23], and a total of fifty in Guy 1938). Similar impressions can be gathered from contemporaneous sites. Likewise, the rest of the Structure 5239 assemblage is at home in other LB I–II tomb assemblages.

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Table 17.2. Register of Finds from L.5227 and L.5262 (Stratum VIII) Sealing Structure 5239 (from Loud 1948: 187–88; corresponds to fig. 17.3)

Object	*Type*	*Field no.*	*Locus*	*Plate*	*Figure* 17.3 *here*
Stand	12	d652	5227	62:12, 137:2	3
Scarab	—	d656	5227	152:164, 158:164	4
Blade (bronze)	—	d663	5227	179:32	5
Whorl (bone)	—	d796	5262	172:24	2
"Wand" (ivory)	—	d795	5262	203:1	1

While its context does not facilitate making a clear connection between the two, the corpus of finds from the Stratum VIII loci immediately above the subterranean structure is also suggestive (see table 17.2, fig. 17.3). Despite the fragmentary nature of the architecture, these artifacts seem to imply that the context was not a simple domestic one. Perhaps these were remains of an elite Stratum VIII structure (see below). But the assemblage may also have been related to the underlying tomb, perhaps as part of an ancestor cult (cf. Hallote 1994). Stands, whorls, and curved knives are most prominent in the LB tombs (Guy 1938: 152, 165, 170, and plates). In fact, Structure 5239 may have been inserted from Stratum VIII; there does not seem to be anything in the artifact repertoire to discount such a notion.

The lack of any mention of bones in the final report is acknowledged as a weakness in this hypothesis—one that requires an explanation. At least one tomb at Megiddo (T.2034, assigned to Stratum X) was also identified as such though it contained no bones (Kassis 1973: 9). Tomb 4663 at Tel Dan was reported as lacking any skeletal remains, though it clearly was intended as a tomb (Biran 1986). In preparing the material from T.4663 for final publication, the animal bone assemblage was submitted for analysis to L. Kolska-Horwitz, who identified a few human left metacarpal bones (Ilan 1996: 172). Biran ventured that this tomb might have been a sort of cenotaph, following a similar proposition made by Petrie (1932: 6) for a feature at Tell el-Ajjul. Elsewhere, it has been suggested that the lack of human remains in T.4663 could be the work of scavenging animals (porcupines in particular), diagenesis, or ancient plunderers (Ilan 1996: 176). The tombs reported and illustrated in Loud 1948 all show good skeletal preservation. The question is, were highly fragmentary remains of human skeletal material discerned or collected and recorded by the workmen and the Chicago Megiddo Expedition staff? In the reports of the burial assemblages on the tell, there are few examples of such fragmentary material. In any event, the skeletal material from Megiddo's intramural tombs was not published in any detail by a specialist, unlike the assemblages of the extramural cemetery published by Hrdlička in *Megiddo Tombs* (1938).

Finally, we must ask to what architectural and sociopolitical context this superb shaft tomb belonged. On the one hand, its location in the northwestern corner of Area BB has always limited the potential of plan reconstruction. Square M12 was excavated down to widely varying levels; half of the square—the northwestern part—was taken down only to Stratum IV (Loud 1948: fig. 377). On the other hand, Temple 2048—apparently constructed in Stratum X—seems to have focused attention away from Structure 5239 and every other fragment of architecture

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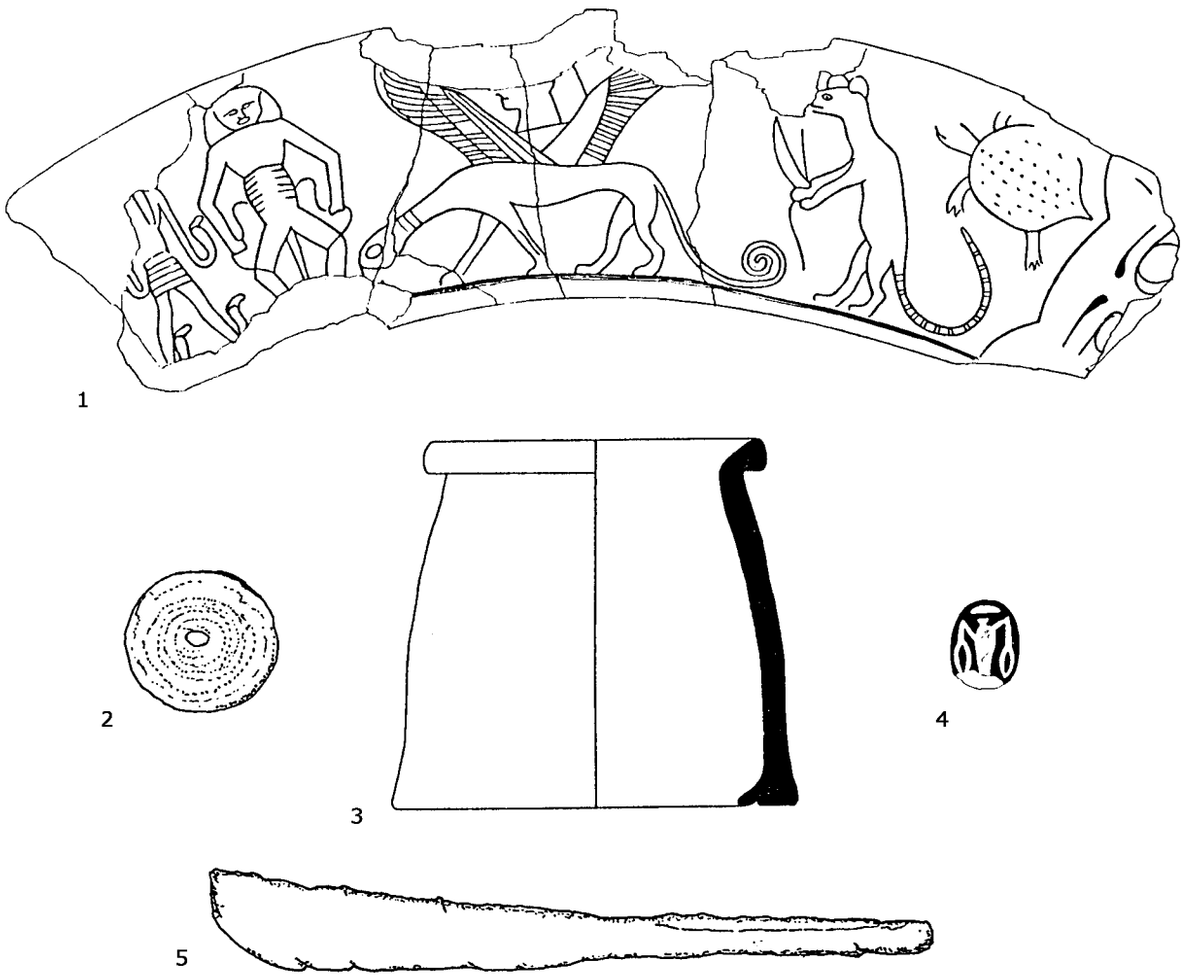

FIGURE 17.3. Finds from the Stratum VIII loci immediately above Structure 5239 (Loci 5227 and 5262; from Loud 1948). Pottery is drawn to a scale of 1:5, other objects to a scale of 1:1.

in this zone. The shaft feature was ignored by Kenyon (1969) in her reevaluation of the MB and LB stratigraphy because it did not contain a rich assemblage, because it was not thought to be a tomb, and because it was one of the few cases in which the Chicago excavators recognized a subterranean feature that originated in a higher level, therefore requiring no stratigraphic revision. For similar reasons, Müller (1970), Kassis (1973), and Gonen (1987, 1992), in detailed reassessments of their own, completely passed it over.

Both Kempinski (1989: plan 6) and Baumgarten (1992: fig. 1) made rather careless attempts to integrate Structure 5239 into some kind of larger configuration. Kempinski connected it to a single wall fragment in the southwest edge of square M12, while Baumgarten construed it as the corner of a large, palace-type structure. Evidently, both considered its subterranean walls as surface level foundations or superstructure for the sake of plan reconstruction. Expanding somewhat on the excavators' suggestion, Kempinski (1989: 133) interpreted Structure 5239 as a public granary administered by the personnel of Temple 2048. He compared it to the small square MB buildings, identified by Welter as Egyptian-style granaries,

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erected *over* (not down into) the C Embankment at Shechem, east of the "tower temple" (Wright 1965: 120, fig. 70). Needless to say, the Megiddo report cited no remains of grain in Structure 5239.[3]

In any event, the shaft structure remained essentially stranded. Although Kempinski (1989: 64) remarked that the architectural changes that took place between Strata X and IX were slight, his plans and his other statements indicate that he viewed the transformation of the area northwest of Temple 2048 as more pronounced. He asserted that the erstwhile palace of this area "fell into disuse" after what had been a long, continuous occupation throughout most of the MB. However, by Stratum VII the zone was once again built up as a public or palatial complex (Kempinski 1989: plan 8). The question is, how do we interpret the emptiness of this zone in Strata IX and VIII. Or was it so empty?

From Stratum XII to Stratum X, the Area BB MB palace plan tended to change in increments, maintaining the same northeast-southwest orientation, gradually adding new areas or subdividing spaces. The few identifiable remains in Strata IX and VIII preserve this orientation, as does, more prominently but less precisely, the renewed Stratum VIIB palace (Loud 1948: figs. 398–403; Kempinski 1989: plans 3–9; Kenyon 1969: fig. 20). By its very existence, the fragmentary Stratum IX and VIII architecture suggests that the area was built up and subsequently greatly disturbed (cf. Baumgarten 1992: fig. 1, aside from the mistaken above-surface integration of Structure 5239). The fact that so few Stratum IX loci were clean in Area BB (Gonen 1987: 89) lends weight to this notion. Kassis (1973: 7–8) has pointed out how similar the plans of Strata X and IX really are and how arbitrary some of the separation between the two is. Their distinction is mostly based on a clear break observed in Area AA.

It is most probable that the large public or palatial configuration of northwest Area BB Stratum X continued to exist here in some form in Strata IX and VIII, similar to what was actually preserved to the east of Temple 2048.[4] This context may reveal something of the social personae accruing to people who would have been interred in our hypothetical tomb—the elite of the town and the territory. Gonen (1987: 89) recognized in Stratum IX the most affluent phase of the LB at Megiddo, comparing it with the contemporaneous levels at Hazor. The formidable construction of Structure 5239 fits such a characterization and assures that, despite the travails of over sixty years' exposure to the elements, the edifice remains an intact source of wonder for the modern visitor.

3. Of course, as with the missing bones, grain may have existed and gone unreported, or it may have decayed. The same holds true for the Shechem structures. By the same token, other hypotheses might be submitted to define Structure 5239. It might have been a cooling cellar, or a water cistern whose wall plaster decomposed and redeposited on the floor. Moreover, it might have been designed with one of these functions in mind and later converted into a tomb or depository of some other kind (cf. the cisterns and tunnels of Hazor's lower city of the MB and LB periods [Yadin 1972: 38–47]).

4. The identification of Structure 5239 as a tomb, and the assignment of T.3063 to Stratum IX, might require the amending of two of Gonen's (1992: 117) assertions: (a) that constructed burials typical of the MB II were no longer erected in that stratum and (b) that the northwestern part of Area BB was no longer used for burial by that stratum.

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PLATE 17.1a. Deep Chambers (5239) of [Megiddo] Stratum IX. From Northeast. Wall in Foreground Belongs to Stratum XI, Small Walls at Corner (left center) to XIV; Porch Walls of XV Temples 5192 and 5269 Appear in Background. (After Loud 1948: fig. 244).

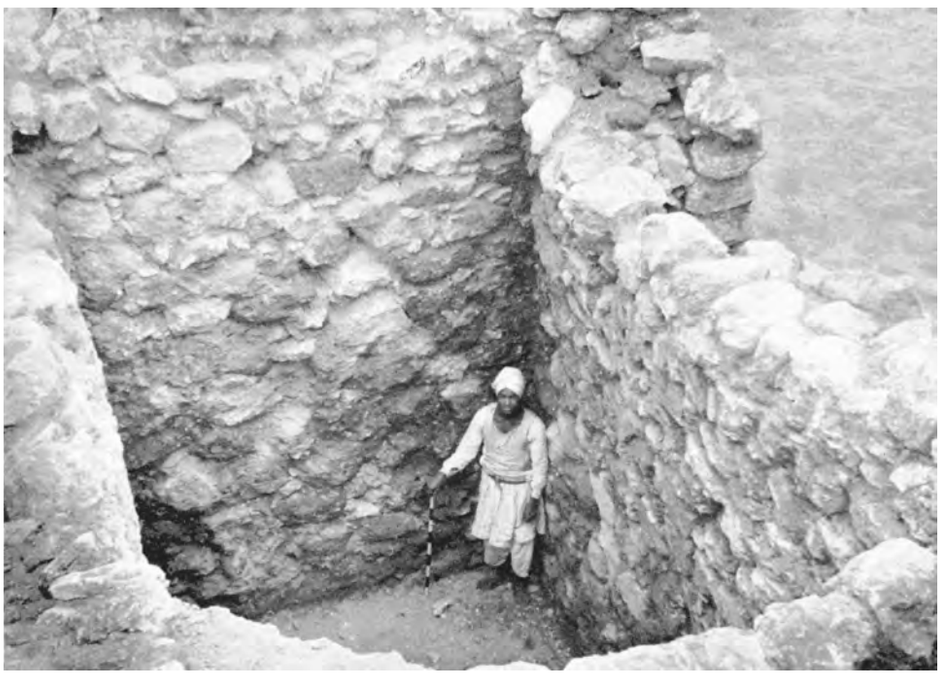

PLATE 17.1b. Largest Chamber of [Megiddo] 5239. Figure Stands on Floor. From Southwest. (After Loud 1948: fig. 245).

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18

HOUSEHOLD ARCHAEOLOGY AT ARAD AND AI IN THE EARLY BRONZE AGE II

Ornit Ilan

The prosaic dwelling—its plan, dimensions, method of fabrication, and its movable contents—is a mirror of lifestyle and social matrix. Recognition of its archaeological potential in this regard has ushered in a branch of our discipline called *household* archaeology (e.g., Wilk and Rathje 1982; Levy and Holl 1987, references therein).

In this study, the principles of household archaeology are applied to domestic assemblages of the Early Bronze Age (EB) II, a period that saw the establishment of urban settlements at most of the large tell sites in Canaan.[1] Two sites with similar settlement histories are investigated: Arad and Ai (fig. 18.1). Both were late EB I village occupations that evolved into walled towns in the EB II.[2] However, each occupied a different ecological zone: Arad, the semiarid Arad Basin, and Ai, the Mediterranean habitat of the central hill country. Two main research questions were posed:

- Do incongruities exist in the material cultures of the respective settlements that can be explained by these differing ecological circumstances?
- Do such incongruities, if they exist, reflect cultural identity (ethnicity)?

We begin by describing and discussing the domestic architecture of the two sites, touching on compound size and complexity, room size, and architectural hallmarks. Following this, the house's contents are analyzed, with emphasis placed on the pottery assemblage. Methodologically, two ethnographic approaches are utilized:

- Analogy with contemporary societies living in proximity to the ancient sites that maintain preindustrial subsistence patterns to a significant degree. This is essentially an attempt to maximize the precision of the archaeological remains' interpretation (e.g., Kramer 1982; Hirschfeld 1995).
- Cross-cultural analogy with broader, even universal applications (e.g., Flannery and Winter 1976; Wilk and Rathje 1982; Henrickson and McDonald 1983).

1. It is now clear that walled settlements first arose in the EB I in several places (Eisenberg 1986; Beck and Kochavi 1993), but the urban impulse achieved endemic proportions only in the EB II.
2. Contra Callaway (1972: 99, 115; 1980: 63), Phase III at Ai should not be dated to EB I, but rather to early EB II (Schaub 1982: 69; Esse 1984: 323).

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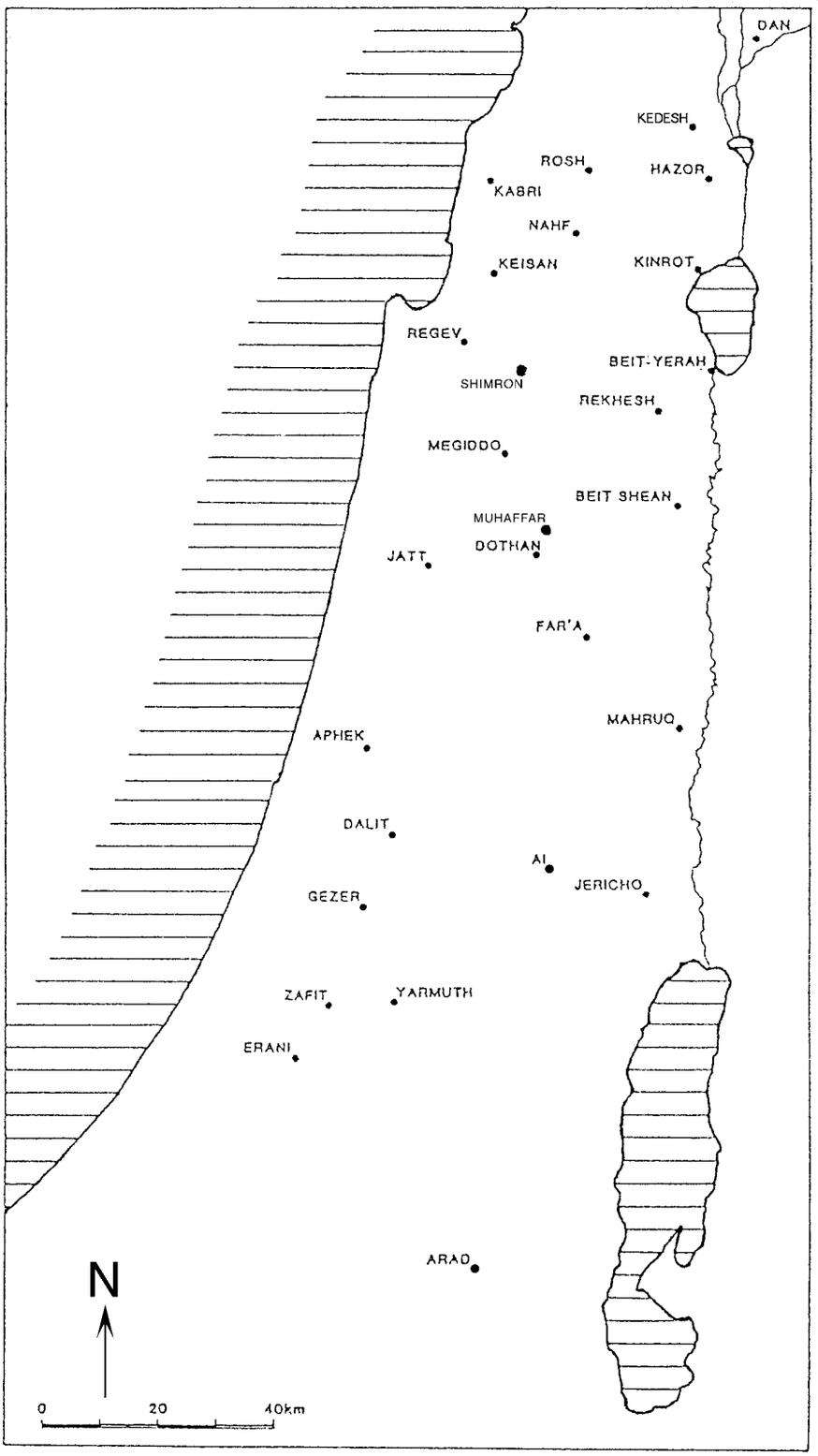

FIGURE 18.1: Map of Major EB II sites in Israel.

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THE PHYSICAL ATTRIBUTES OF DOMESTIC ARCHITECTURE AT ARAD

Residential architecture was uncovered in Arad Strata III–II inside and parallel to the line of the fortification wall in the south and the west (Areas K, N, H), between the western gate and the Temple compound (Area TN) and between the palace and the band of structures surrounding the water reservoir (Area TE) (figs. 18.2, 18.3). These dwellings were organized in "neighborhoods" not always tangent to each other. While not a "typical" neighborhood, some of the structures surrounding the water reservoir in Area M did reveal evidence for domestic activity and are included therefore in this analysis. The dwellings of Stratum I were constructed alongside the town wall at a time when the settlement's urban fabric had unraveled. Architecture was apparently limited to the domestic; public edifices of any kind are lacking.

The Size of the Arad House and Its Components

Stratum III (fig. 18.2)

Twelve domestic compounds of this level were excavated, seven completely, and only the main room in the remaining five. The compounds vary greatly in size (see table 18.1), ranging between 32.8 m^2 and 171.1 m^2 (the biggest being 5.3 times larger than the smallest). The compounds can be divided into three size categories (fig. 18.4):

- small compounds, 32.8–42.4 m^2 ($N = 2$)
- medium-sized compounds, 54.5–67.5 m^2 ($N = 3$)
- large compounds, 153.0–171.1 m^2 ($N = 2$)

Stratum II (fig. 18.3)

The residential areas of Stratum III continued to function as such in Stratum II. Of the twenty-five compounds excavated, sixteen were revealed in their entirety (see table 18.2). Compound area in Stratum II varies between 32.8 m^2 and 126.4 m^2 and can also be divided into three categories of size:

- small compounds, 30.0–45.0 m^2 ($N = 5$)
- medium-sized compounds, 55.0–73.0 m^2 ($N = 4$)
- large compounds, 100.0–126.0 m^2 ($N = 7$)

Stratum I (Amiran and Ilan 1996: pls. 94, 95)

The remains of thirteen residential units were excavated, most of them poorly preserved being so close to the surface. Only two displayed plans that could be traced completely (with areas of 16.7 m^2 and 33.2 m^2 respectively). Of the other compounds, three individual chambers remained (7.6 m^2, 12.0 m^2, 3.1 m^2) and one courtyard (5.5 m^2). The two complete compounds would be classed as "small units" by the criteria applied to Strata II–III, and each consisted of one chamber and one courtyard. The modest size and inferior construction of these buildings contrast starkly with the urban nature of the previous two levels and appear to indicate socioeconomic collapse. It is suggested that Tel Arad came to be occupied by pastoralists and farmers on a seasonal basis, i.e., in the winter and spring, when pasture was available and dry farming expedient.

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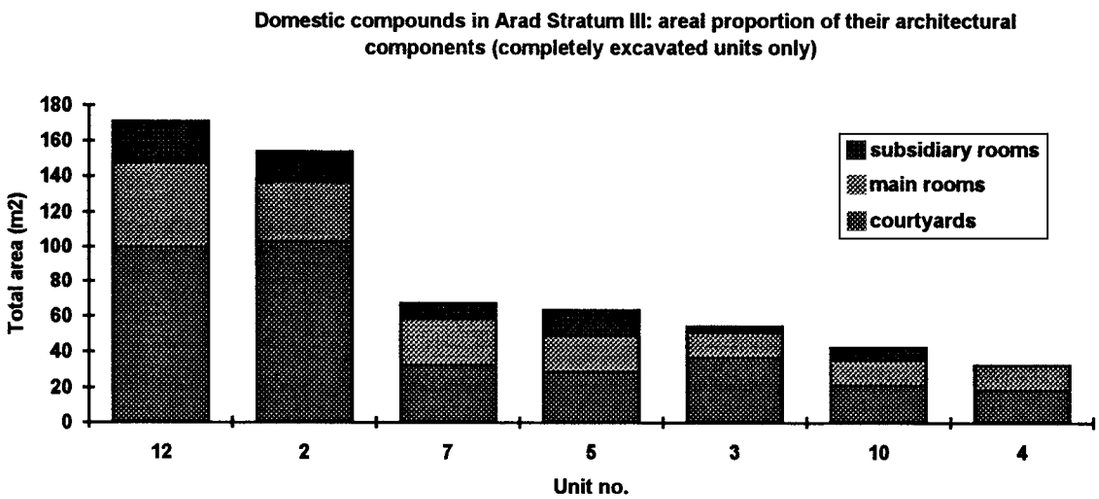
Table 18.1. Domestic Compounds and Component Size at Arad, Stratum III

Unit no.	*Excavation field*	*Total area (m^2)*	*Area of main room (m^2)*	*Area of courtyard (m^2)*	*Area of subsidiary room (m^2)*	*Size category*
1	M	?	21.8	?	?	?
2	M	153.8	34.0	103.0	a = 8.3 b = 8.5	Large
3	M	54.5	14.3	37.0	3.2	Medium
4	M	32.8	14.3	18.5	none	Small
5	M	63.7	20.3	29.0	14.4	Medium
6	M	?	16.5	?	?	?
7	TN	67.5	26.1	32.4	9.0	Medium
8	H	?	26.4	?	?	?
9	H	?	27.5	?	?	?
10	K	42.5	14.3	21.2	7.0	Small
11	K	?	44.0	?	?	?
12	K	171.1	47.5	100.0	a = 17.6 b = 6.0	Large

NOTE: See also fig. 18.2.



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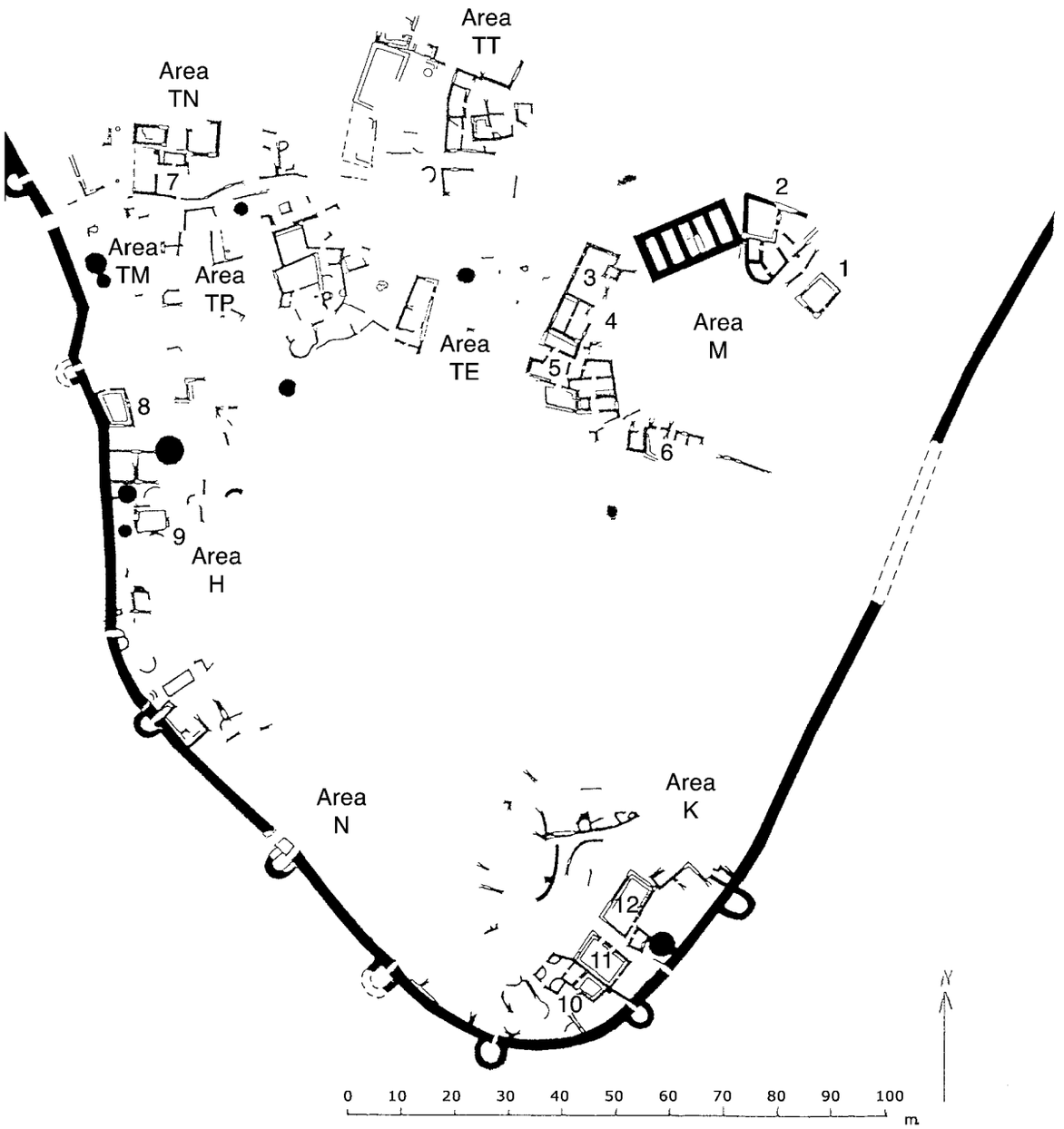

FIGURE 18.2: The location of the dwelling units at Arad, Stratum III. *1:* Unit 5564+5599; *2:* Unit 5347b; *3:* Unit 5006b; *4:* Unit 5071b+5080b; *5:* Unit 5513b+5514b; *6:* Unit 5053b; *7:* Unit 4496+4610; *8:* Unit 1282c+1290c; *9:* Unit 1069b; *10:* Unit 1157b; *11:* Unit 1162b+1163b, 1169b+2318b; *12:* Unit 2440+2519.

The following contrasts between the domestic compounds of Strata III and II can be observed in the above data:

- In Stratum III, compounds of various size categories coexisted in the same neighborhood, while in Stratum II, Area H contained only small units and Area K only large ones (the other areas maintained the previous coexistence).
- Large compounds are larger in Stratum III than in Stratum II.

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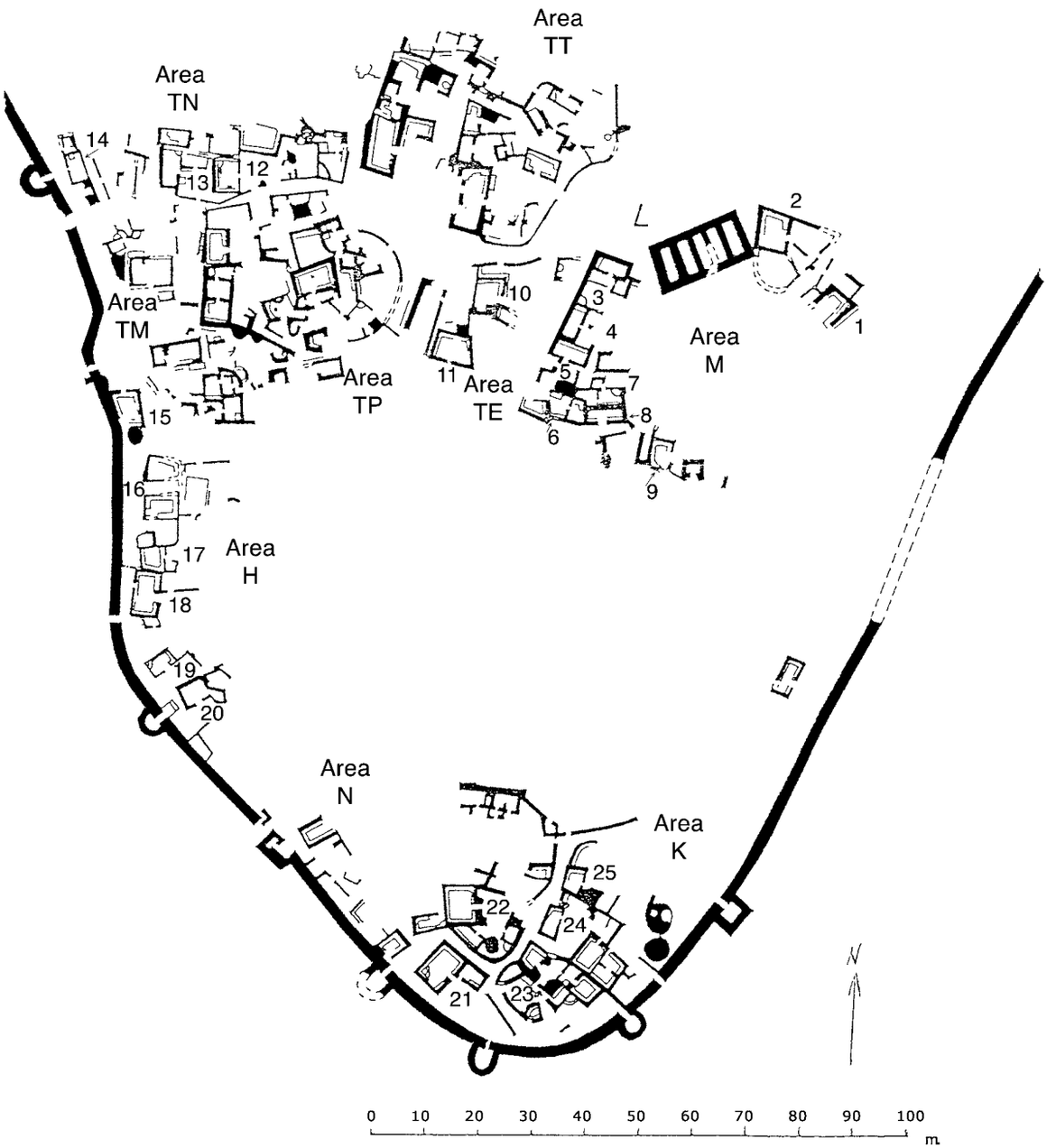

FIGURE 18.3: The location of the dwelling units at Arad, Stratum II. *1:* Unit 5555; *2:* Unit 5347a; *3:* Unit 5006a; *4:* Unit 5071a+5080a; *5:* Unit 5060a+5063a; *6:* Unit 5513a+5514a; *7:* Unit 5021a; *8:* Unit 4974a+4978; *9:* Unit 5053a; *10:* Unit 5821a; *11:* Unit 4699+4866; *12:* Unit 4266+4267; *13:* Unit 4494; *14:* Unit 4387; *15:* Unit 1282b+1290b; *16:* Unit 1065a; *17:* Unit 1076; *18:* Unit 1081; *19:* Unit 1039a; *20:* Unit 1030; *21:* Unit 1234; *22:* Unit 2326; *23:* Unit 1157a; *24:* Unit 1169a+2318a; *25:* Unit 2539.

The study of domestic architecture in ethnographic research tends to find a positive correlation between dwelling size and status and wealth—wealthier people often live in larger homes, e.g., in Iran and Turkey (Kramer 1982: 70, 136) and in Africa (Holl and Levy 1993: 175). The newly instituted separation of neighborhoods of large domiciles from neighborhoods of small ones may be an indication of increased social stratification at Arad (Marfoe 1980: 320).

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Analysis of the domestic compounds' architectural components in Stratum II (see tables 18.2, 18.3, 18.4) bolsters the notion of a correlation between compound size and wealth. On average, the larger the compound the greater the proportion of the courtyard. Conversely, the larger the compound the smaller the proportion of the main room.

Table 18.2 shows that main room size in Stratum II ranges from 12.2 m^2 to 33.5 m^2, somewhat less than a factor of three, while courtyard size ranges from 9.5 m^2 to 84.2 m^2, approximately a factor of nine. We infer (below) that main rooms served as sleeping quarters and as loci for domestic activities such as cooking, while courtyards functioned as livestock pens and contained storage facilities for agricultural produce. Hence, larger compounds did not necessarily house more occupants. Rather, larger courtyards (and more installations) imply more produce requiring storage and more livestock needing to be penned. Larger compounds mean wealthier people.

The ratio of open area to built-up area was 1:1.2 in Stratum III and 1:1.6 in Stratum II, i.e., the latter was more densely occupied than the former—most probably a sign of population increase. Decrease in residential compounds' average size also seems to reflect a rising population density; the town's denizens had to be content with smaller parcels of land.

Architectural Features of the Arad Domestic Compounds and the Organization of Space

The characteristics of the Stratum II and Stratum III house compounds are identical and can be summarized as follows (see figs. 18.4, 18.5):

1. The compound is comprised of a main room, one (sometimes two) subsidiary rooms, and a courtyard, usually surrounded by a stone fence.
2. Generally, no passage exists between the main and subsidiary rooms. Both have openings into the courtyard.
3. Both the main and subsidiary rooms exhibit a broad room plan, i.e., the doorway is in the long wall.
4. Walls are most frequently 50–60 cm thick and only rarely reach a thickness of 90–100 cm.
5. Doorways, located in one of the long walls, vary in width from 40 cm to 100 cm. They usually range 60–70 cm. Thresholds are stone paved or of tamped earth.
6. The doorpost socket is placed to the left as one enters the chamber.
7. Benches 30–40 cm high and 20–40 cm wide are often appended to the walls of the main room. The subsidiary rooms rarely have benches.
8. Floors are made of tamped earth and are lower than the surfaces of the courtyards.
9. One, and sometimes two, stone slabs are usually found stuck in the floor near the center of the main room. These served as socles for wooden columns that supported the roof beams.
10. Various kinds of installations can be enumerated. In main rooms, and less frequently in subsidiary rooms, one finds cooking stoves constructed of flint slabs. Cupmarks—small holes paved with small pebbles within and around their immediate circumference—are present in rooms and, rarely, in courtyards. Stone mortars were placed in the rooms and, rarely, in courtyards. Semicircular and rectangular platforms

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Table 18.2. Domestic Compounds and Component Size at Arad, Stratum II

Unit no.	*Excavation field*	*Total area (m^2)*	*Area of main room (m^2)*	*Area of courtyard (m^2)*	*Area of subsidiary chamber (m^2)*	*Size category*
1	M	?	30.0±	?	11.0±	?
2	M	105.3±	30.0	75.3±	None	Large
3	M	55.3	12.7	31.0	a = 7.3 b = 4.3	Medium
4	M	31.5	12.8	12.5	6.2	Small
5	M	44.8	13.8	31.0	None	Small
6	M	73.8	23.2	42.4	8.2	Medium
7	M	33.5	21.5	9.5	2.5	Small
8	M	?	13.0	?	?	?
9	M	?	16.8	?	4.0	?
10	TE	107.9	24.6	61.8	a = 12.0 b = 9.5	Large
11	TE	?	31.0	?	?	?
12	TN	110.0	25.8	84.2	None	Large
13	TN	61.5	19.7	32.4	9.4	Medium
14	TN	57.2	14.3	37.2	5.7	Medium
15	H	?	25.8	?	?	?
16	H	41.5	17.4	19.1	5.0	Small
17	H	?	24.8	?	3.6	?
18	H	?	30.4	?	14.3	?
19	H	42.2	12.2	30.0	None	Small
20	H	?	13.9	?	3.8	?
21	K	126.4	33.0	83.8	9.6	Large
22	K	113.5	33.5	65.0	a = 9.4 b = 5.6	Large
23	K	101.3	a = 13.8 b = 11.7	a = 22.0 b = 35.7	a = 7.4 b = 5.7 c = 5.0	Large
24	K	123.2	17.8	82.0	a = 11.4 b = 12.0	Large
25	K	?	12.6	?	?	?

NOTE: See also fig. 18.3.

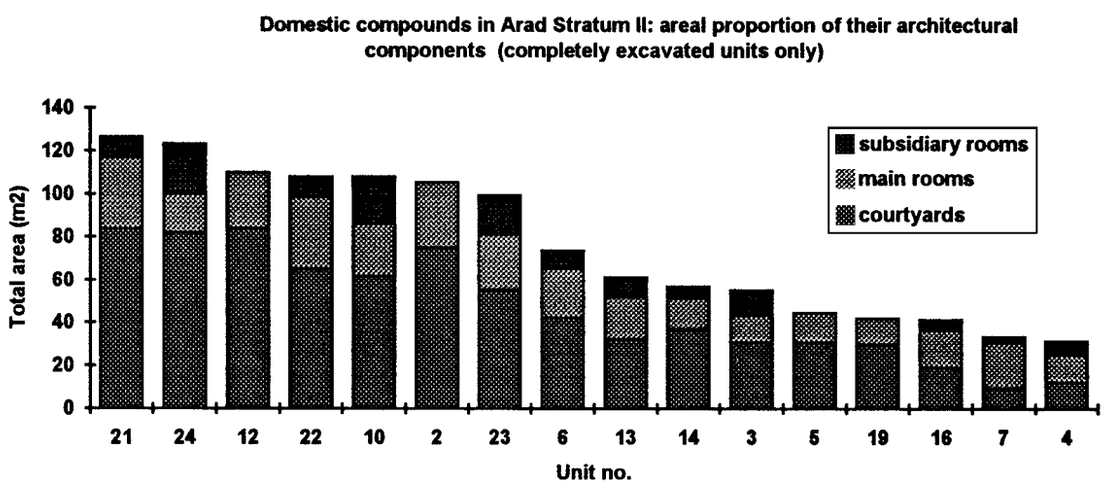

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Table 18.3. The Relative Size of Architectural Components in Domestic Compounds in Arad, Stratum II (completely excavated units only)

Unit no.	*Excavation field*	*Total area (m^2)*	*Area of main room (%)*	*Area of courtyard (%)*	*Area of subsidiary room (%)*	*Size category*
2	M	105.3 (±)	28.5	71.5	None	Large
3	M	55.3	23.0	56.0	21.0	Medium
4	M	31.5	40.6	39.7	19.7	Small
5	M	44.8	30.8	69.2	None	Small
6	M	73.8	31.4	57.5	11.1	Medium
7	M	33.5	64.2	28.3	7.5	Small
10	TE	107.9	22.7	57.3	20.0	Large
12	TN	110.0	23.5	76.5	None	Large
13	TN	61.5	32.0	52.7	15.3	Medium
14	TN	57.2	25.0	65.0	10.0	Medium
16	H	41.5	42.0	46.0	12.0	Small
19	H	42.2	29.0	71.0	None	Small
21	K	126.4	26.1	66.3	7.6	Large
22	K	113.5	29.5	57.3	13.2	Large
23	K	101.3	25.2	56.9	17.9	Large
24	K	123.2	14.4	66.6	19.0	Large
Averages	—	76.81	30.49	58.61	13.41	—

Table 18.4. Average Proportions of Architectural Components in Domestic Compounds in Arad, Stratum II (%)

Size Category	*Courtyards*	*Main rooms*	*Subsidiary rooms*
Large	64.6	24.3	11.1
Medium	57.8	27.8	14.4
Small	50.8	41.3	7.9
Average	57.73	31.13	11.13

of stone or brick, and small cells (silos) defined by low stone walls, were uncovered in rooms and courtyards.

11. Walls, benches, and installations are constructed mostly of local chalk, partially masoned. Column bases, thresholds, and doorposts are sometimes made of dolomite, from the Hebron Hills to the north of Arad.

The broadroom plan and the above enumerated properties also appear in Stratum I. However, the Stratum I structures, besides being smaller, display asymmetry in plan and inferior construction—walls are often crooked and of varying thickness.

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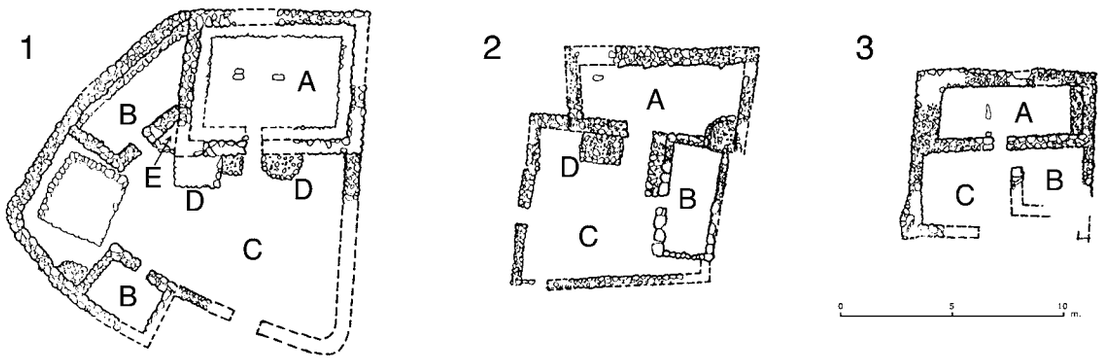

FIGURE 18.4: Large *(1),* medium *(2),* and small *(3)* domestic compounds at Arad, Strata III–II. A: main room, B: subsidiary room, C: courtyard, D: platform, E: silo.

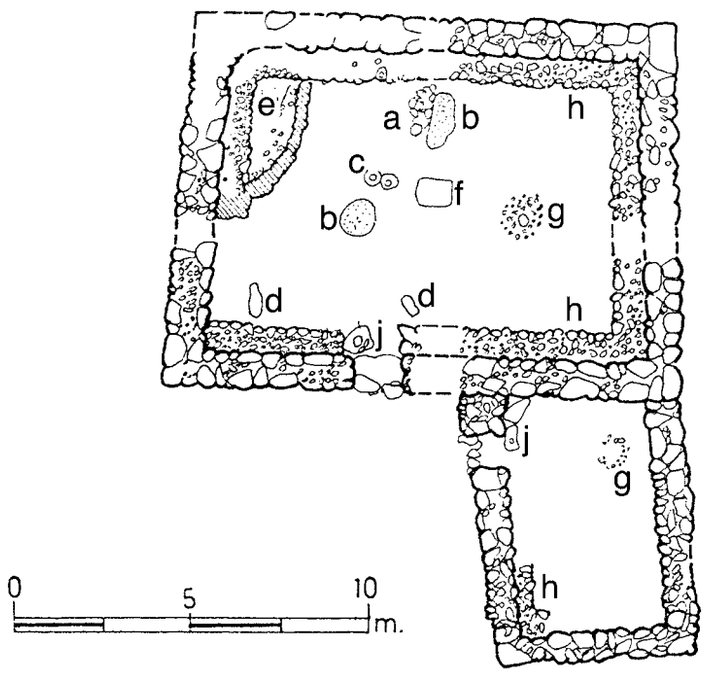

FIGURE 18.5: A domestic compound at Arad with its various installations. Unit 1234, Stratum II. *a:* stove; *b:* clay bin; *c:* mortar; *d:* grinding stone; *e:* silo; *f:* stone base for wooden post; *g:* cupmark; *h:* bench; *j:* door socket.

In all strata, only the houses' walls and artifactual contents were preserved; all roofs collapsed. Fortunately, the discovery of a mold-formed pottery casket in the form of a house allows us to assume a flat roof bordered at the edges by a low (15–20 cm) parapet perforated at intervals to permit collection of rainwater (Amiran et al. 1978: pl. 115). Similar features have been identified in contemporary Syrian villages (Seeden 1985: fig. 1) and in Palestinian villages in the Hebron region, where channels are fashioned to drain rainwater into courtyard cisterns (Hirschfeld 1995: 139). No evidence for windows was discerned at Arad. Walls were plastered (Amiran et al. 1978: 30).

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Utilization of Space

The contents of the main room suggest that much of the inhabitants' daily routine took place here—food preparation and craft activities such as weaving and sewing. Most of the family property was stored here as well. This large room, and not the subsidiary one, was also the living quarters. This is deduced from the following observations:

1. Many of the domestic compounds contain only one room. This room's contents generally evince the prosaic activities of daily life. Preindustrial societies tend to be consistent and conservative concerning the use of space in the family home, unconnected to economic and social status differences (e.g., Kramer 1982: 99–113; Hirschfeld 1995: 119–31). We assume that the citizens of Arad were guided by the same principle and that the space where most of the daily routine took place and where most of the family wealth was stored also functioned as its sleeping quarters.
2. Cooking was carried out in the main room, resulting in the room's being heated. This would have been crucial in the winter, particularly for a family with infants, while in the hot summer months the room could be aired out. Subsidiary rooms, on the other hand, contain almost no cooking stoves and show no evidence of being heated by other means.
3. One assumes that the most important household property would not have been left unattended at night (cf. Hirschfeld 1995: 116).

We suggest that the subsidiary rooms served as supplementary storerooms and as hutches for livestock, especially in the winter. In the cold winter months, the Bedouin of the Beersheva Valley separate the young kids from their mothers and pen them in a heated hutch (Ben-David 1982: 126). In the Hebron Hills, pastoralists and their flocks cohabit in the winter (cf. Hirschfeld 1995: 116).

Domestic Installations: Spatial and Functional Analysis

By the term "installation" we refer to any permanent fixture in a room or courtyard of a domestic compound: benches, mortars, stoves, cupmarks, platforms, and silos (fig. 18.5). A spatial and morphological analysis of these features can illuminate a society's daily life—how people stored their food, prepared their meals, and went to sleep.

BENCHES: Mostly found in main rooms, benches are 30–40 cm high and 20–40 cm wide. We believe that these were shelves rather than for sitting on; restorable small and medium-size pottery vessels were often found on them or at their feet. Food-preparing installations such as mortars, grinding stones, and stoves were always placed at some distance from the benches, suggesting that these activities, executed in a kneeling or crouching position, were not performed on the benches. It can also be proposed that sleeping mats or rugs were rolled up and placed on the benches to clear floor space during the day, while night preparations would have included the spreading of the mats or rugs on the floor and placing the utensils of daytime activity on the benches. The cave-dwelling Arabs of the southern Hebron Hills have adopted such a routine (Havakook 1985: 38–39).

MORTARS: These are generally inserted into the floor, though sometimes a second, portable mortar is also present. Mortars have a full diameter of 30–40 cm, an interior diameter of 15–

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20 cm, and a depth of 10–15 cm. They are most often located about 1 m from the stone shelves. Mortars were used for the pounding and grinding of grain into a coarse flour and for other foodstuffs such as lentils and for the preparation of raw materials like ocher. Grinding stones, for grinding coarse flour into a fine one, were usually found next to the mortars (Sebbane forthcoming).

STOVES: Fashioned of flint slabs, stoves have an average diameter of 40 cm. Flint was used because it is a better heat conductor than either limestone or chalk. Fuel was placed on the slab surface. In one instance, two upright stones abutted the flat surface of the stove to form a sort of cooking pot stand. In other cases, three or more freestanding stones placed on the stove surface would have served the same function (Amiran and Ilan 1992: fig. 61). Stoves were also found closer to the center of the room, usually at some distance from the shelves.

CUPMARKS: Small paved surfaces, about 50 x 60 cm in diameter and densely packed with pebbles in a plaster matrix were often found in the center of the main room next to the column bases. In their centers were depressions 10–12 cm in diameter and 7–10 cm deep. Such cupmarks were sometimes found in subsidiary rooms and, very rarely, in courtyards and open spaces. Despite their frequent occurrence at Arad, their function still eludes us; perhaps they were stands for cooking pots just removed from the fire.

PLATFORMS: These were found in both rooms and courtyards. Platforms display a wide variety of size and form, but most are constructed by the same method—a low stone wall containing a fill of small stones or packed earth and stone. They are usually 20–30 cm high. Indoors, platforms are most often located in corners, having a quarter circle configuration. Outdoors, in courtyards, they are appended to walls and have a square or semicircular outline. Ethnographic parallels suggest that some functioned as working surfaces and others, particularly indoors, as silo bases supporting brick superstructures. In the modern-day villages of Syria and in the Hebron Hills of Palestine, platforms are almost always found in courtyards; in Syria small animal cages and prepared food are placed on small platforms (Seeden 1985: 294, fig. 1), and in the Hebron Hills they are used for sitting and entertaining, cooking, eating, and, in the summer, for sleeping (Hirschfeld 1995: 139–40).

SILOS: These are constructed in rooms (mostly main rooms) and courtyards, in corners or along walls, and vary in size. Their surface tends to be flush with that of the floor or somewhat lower. "Silos" were used as storage cells, probably for materials kept in jars or sacks of skin or cloth.

THE PHYSICAL ATTRIBUTES OF DOMESTIC ARCHITECTURE AT AI

In the 1930s Marquet-Krause (1949: 21) uncovered what she termed "the lower city" of Ai—a 114 m long strip of structures south of the large Building 195b + 238, which she interpreted as a residential quarter, in contrast to the zone of public architecture on the "acropolis" (figs.18.6, 18.7). Callaway (1980: figs. 45, 80) excavated a small portion adjacent to the south end of Marquet-Krause's exposure—Area C—adding 15 m to the residential quarter. For the most part, excavation in this long narrow exposure revealed remains of the EB III town, and only in a strip 49 m long and 3–9 m wide were EB II remains reached. Fragmentary portions of other domestic structures were uncovered in Area A (under the remains of an EB III sanc-

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Table 18.5. Domestic Compounds and Component Size at Ai, Phases III–IV

			Area (m^2)			
Unit/Building	*Field*	*Phase*	*Total*	*Front room*	*Back room*	*Courtyard*
C-north	A	III	?	13.0	13.0	Possibly none
C-south	A	III	33.9	14.8	19.1	Possibly none
83+78	L	III	?	?	?	?
111	L	III	?	?	?	?
OX	C	III	?	?	Possibly none	?
ON	C	III	?	?	Possibly none	?
MN	G	III	?	?	Possibly none	?
KL	G	III	?	?	Possibly none	?
B-north	A	IV	?	13.0	13.0	Possibly none
B-south	A	IV	43.7?	19.2	None	24.5?
195b+238	L	IV	115.0±	39.6	31.0	45.0±
85+78	L	IV	?	?	?	?
111	L	IV	?	?	?	?
OX	C	IV	?	?	Possibly none	?
MN	G	IV	?	30.8	Possibly none	?
KL	G	IV	?	?	Possibly none	?
Average	—	—	64.2	23.03	19.02	34.75

NOTE: See also figs. 18.6, 18.7.

tuary) and in Area G, 200 m east of the Acropolis temple. In short, the residential aspect of the EB II remains exposed at Ai is scanty and not nearly as informative as that of Arad.

The Size of the Ai House and Its Components

Phases III–IV[3]

Eight residential structures were excavated in Phase III and, it would seem, ten in Phase IV (figs. 18.6, 18.7). Most of the units were located next to or nearby the town wall. Table 18.5 gives an indication of the paucity of data available compared to the data from Arad—only three compounds display complete plans with areas of 33.9 m^2, 43.7 m^2, and 115 m^2 respectively. This renders useless any attempt to establish a size hierarchy for domestic compounds. With some reservation, it is possible to propose a size hierarchy for rooms (front and back): smaller rooms 13.0–19.2 m^2 (n = 7), and larger rooms 30.0–40.0 m^2 (n = 4). Similar to the main rooms at Arad, the rooms at Ai display a threefold division into small, medium, and large sizes.

The fact that residential zones exist both along the fortification wall and east of the temple suggests the existence of "neighborhoods" which, like those at Arad, were not necessarily

3. Phase IV includes Phase V, which is the destruction layer of Phase IV. There is no need to differentiate between the two (Callaway 1972: 191).

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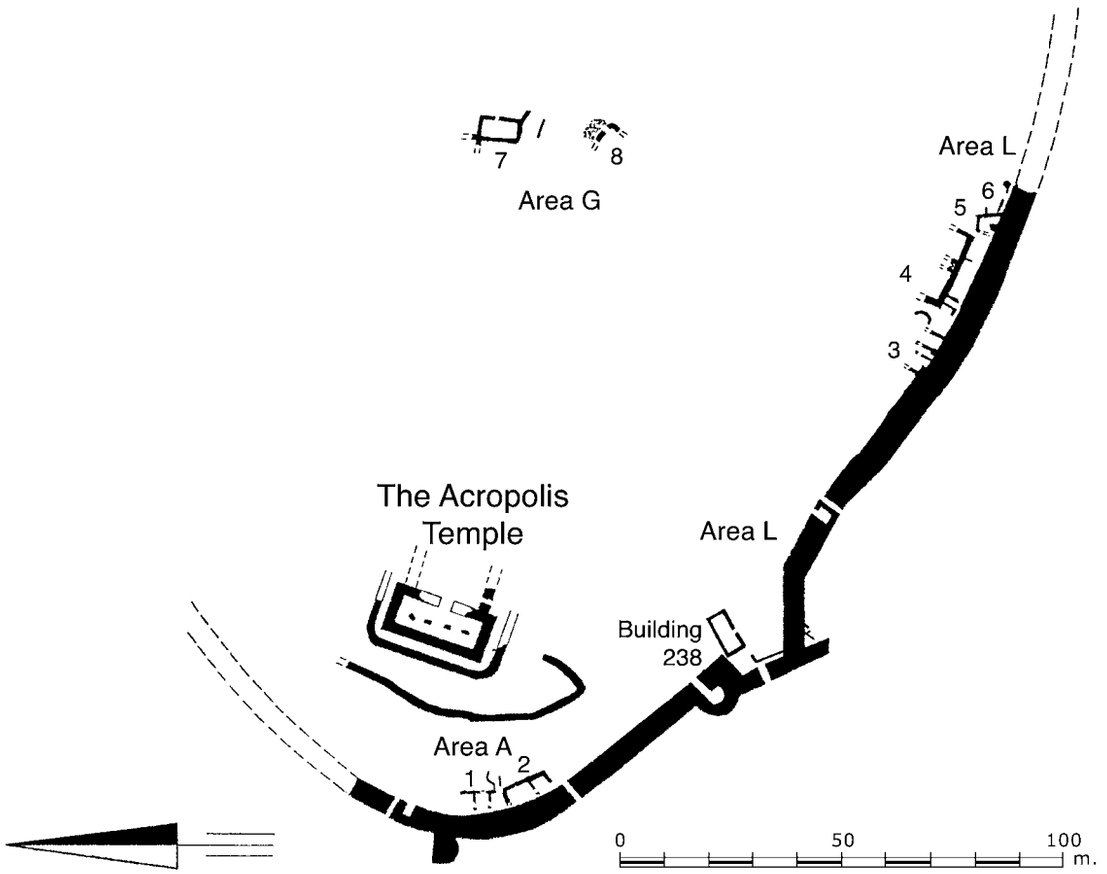

FIGURE 18.6: The dwelling units at Ai, Phase III. *1:* Unit C-north; *2:* Unit C-south; *3:* Unit 83+78; *4:* Building 111; *5:* Unit OX; *6:* Unit ON; *7:* Unit MN; *8:* Unit KL.

tangent. While the lack of data from Ai precludes the degree of socioeconomic analysis possible at Arad, a hierarchy in building size does manifest itself at Ai—a possible indicator of wealth or status.

Architectural Features of the Ai Domestic Compounds and the Organization of Space

Although the lack of data inhibits identification of archetypal architectural features at Ai in Phases III–IV, we can still discern some trends in the planning (figs. 18.8, 18.9):

1. The domestic unit is comprised of one or more rooms, apparently with an appended open space. This open space can be enclosed, forming a courtyard (fig. 18.8:1–2, 5), or not, such that it was essentially a public area, even a street (e.g., the section next to the east side of Unit B-south [fig. 18.9:2]).
2. In units comprised of two or more rooms, the rooms are adjoined in linear fashion (figs. 18.8:5; 18.9:1). Ben-Tor (1992a: 64–66) has called this plan "the forecourt building."
3. The broadroom is the essential component of both residential and public architecture at Ai (fig. 18.8:1–2, 5). However, structures erected next to the fortification wall seem to

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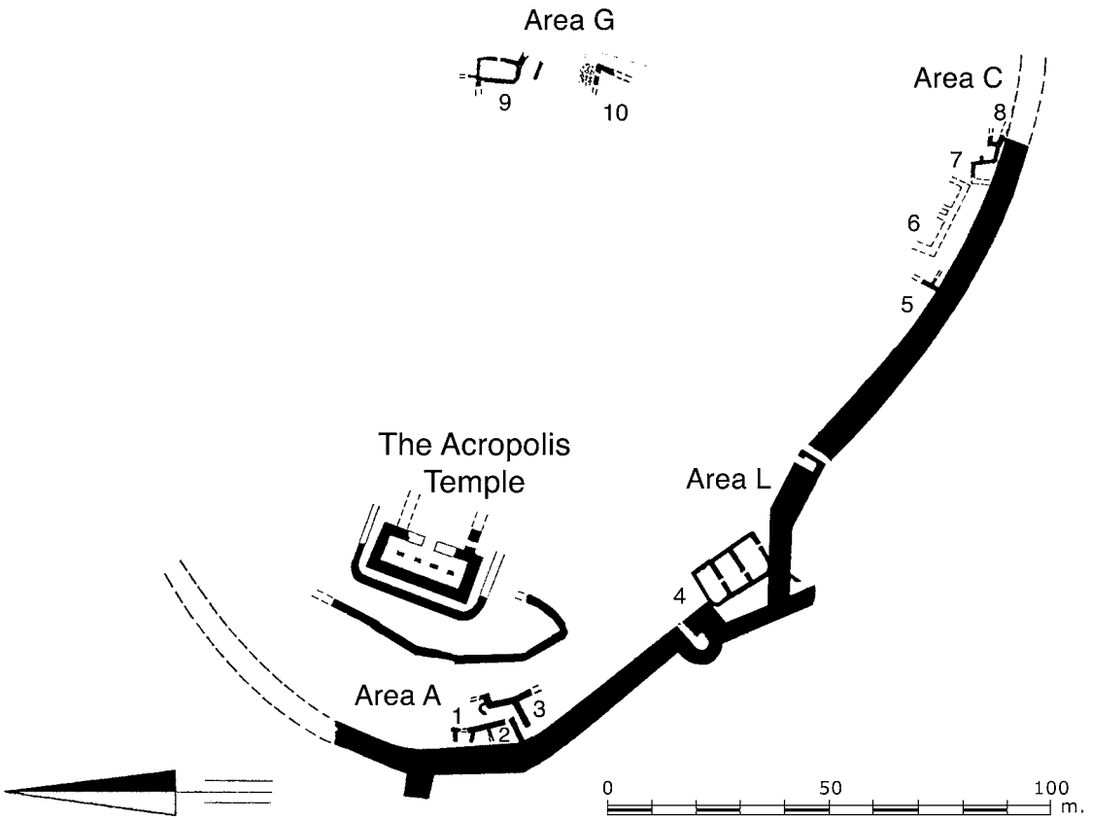

FIGURE 18.7: The dwelling units at Ai, Phase IV. *1:* Unit B-north; *2:* Unit B-south; *3:* Unit E1K; *4:* Building 195b + 238; *5:* Unit 83+78; *6:* Building 111; *7:* Unit OX; *8:* Unit ON; *9:* Unit MN; *10:* Unit KL.

be influenced by topographical, and perhaps other factors that dictate longroom or irregular plans (figs. 18.8:3–4, 18.9:1).

4. Wall thickness ranges 0.8–1.3 m, which may betoken a second story.
5. Doorways range 1.0–2.2 m wide. Thresholds are slab paved or compacted earth.
6. No doorpost sockets were recovered in situ at Ai. This may be fortuitous or it may suggest that doorway closure was achieved by means other than a hinged door. The excavation reports illustrate small mortars with dimensions similar to the doorpost sockets found at Arad, but at the former site these were sometimes found in pairs (Callaway 1980: fig. 94:10, 19), a circumstance that better recommends their interpretation as mortars.
7. No benches were discerned except in Building 195b + 238 (fig. 18.8:5).
8. Floors are made of tamped earth and in most cases are flush with the threshold.
9. The only stone pillar bases were found in Building 195b + 238 (fig. 18.8:5). But they must have existed in other structures as well—it is difficult to envision alternative roofing techniques.
10. Installations: mortars were uncovered in rooms, stoves were found in rooms and courtyards, and pebble-paved surfaces were revealed in rooms as were *tabun* (bread-making) ovens (figs. 18.8, 18.9).

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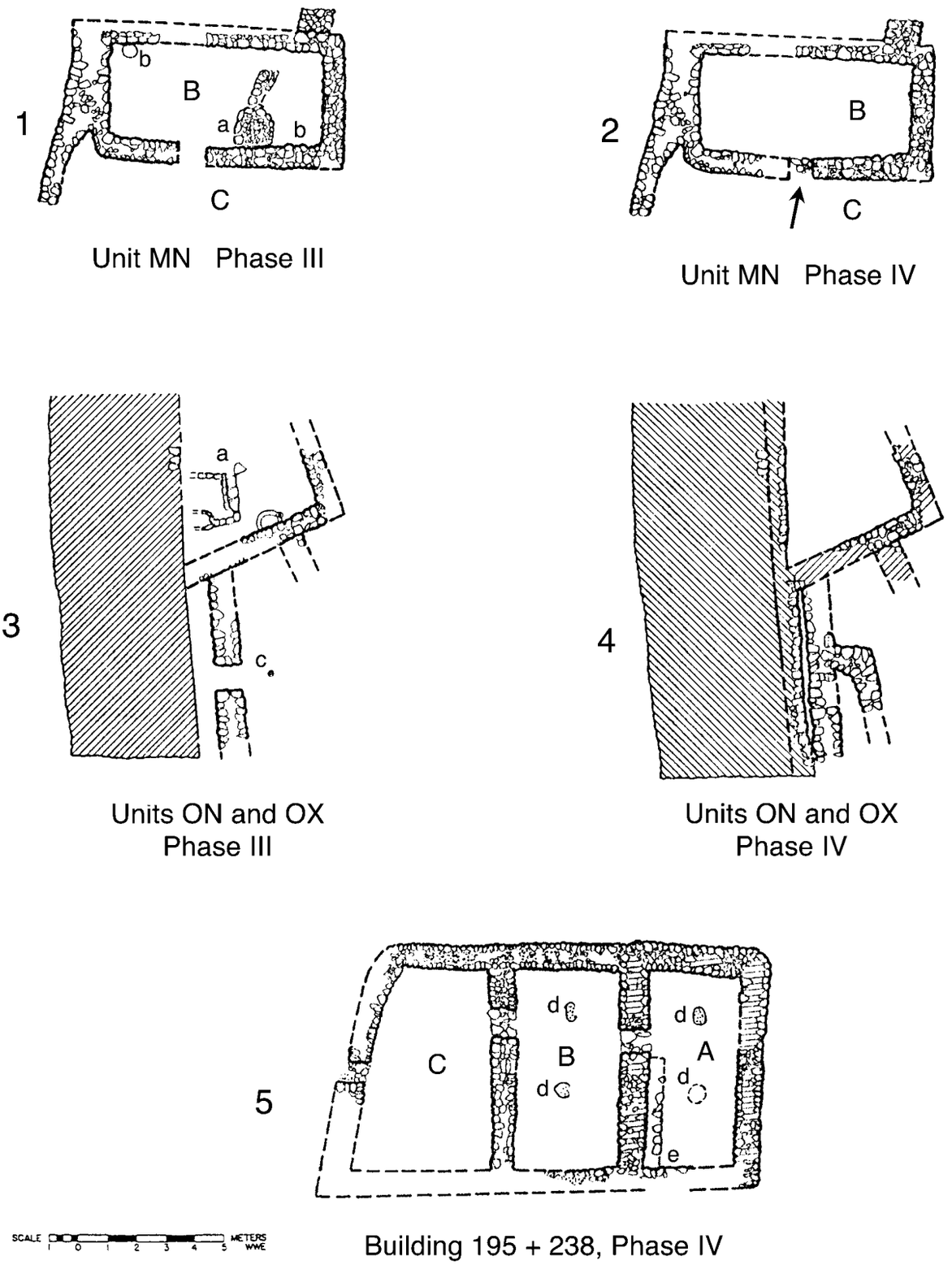

FIGURE 18.8: Domestic units at Ai Areas G (1, 2), C (3, 4), and L (5). A: back room; B: front room, C: courtyard. *a:* stove, *b:* oven, *c:* mortar, *d:* stone base for wooden post, *e:* bench.

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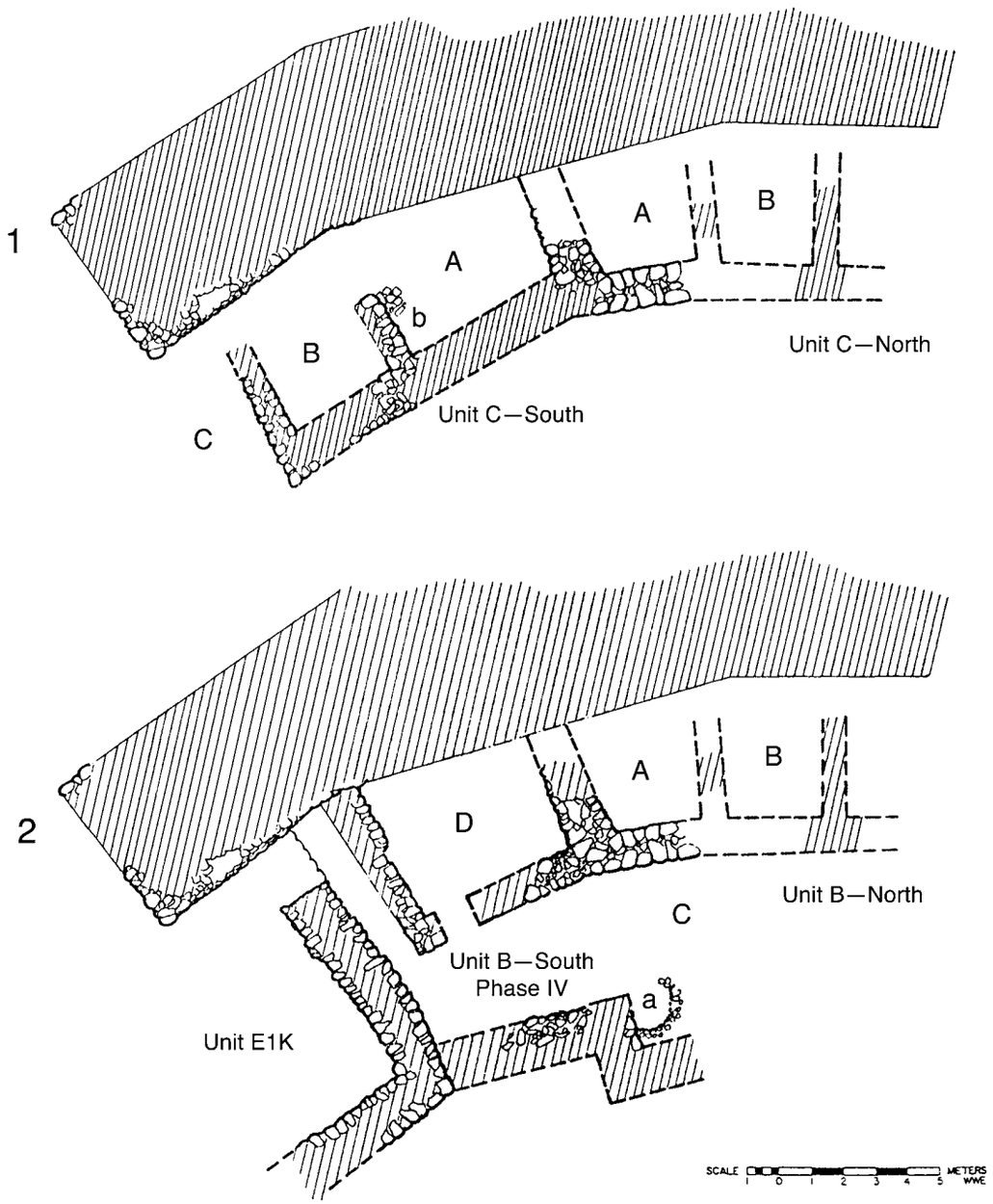

FIGURE 18.9: Domestic units at Ai Area A, Phases III (1) and IV (2). A: back room; B: front room; C: courtyard or open space; D: room. *a:* stove; *b:* flat stone installation.

Utilization of Space

The fact that only three domestic compounds were excavated at Ai with any semblance of completeness (figs. 18.8:5, 18.9) precludes definitive spatial analysis of their components. Our initial impression is that where two chambers are adjoined (Unit C-south and Building 195b + 238; figs. 18.8:5, 18.9:1)—and we do not know whether all or most domestic architecture at Ai was so planned—the interior, larger room was the main one.

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Domestic Installations: Spatial and Functional Analysis

Phase IV shows a steep decline in the number of installations in rooms relative to Phase III. Stoves and ovens disappear completely, and only a few pebble surfaces and mortars occur (figs. 18.8, 18.9; Callaway 1980: fig. 81). It is conceivable that the activities represented by the vanishing installations were transferred to the courtyards and other open spaces in Phase IV (Callaway 1980: 81).

MORTARS: It is not clear from the reports whether or not mortars were imbedded into the floor. Their measurements range as follows: exterior diameter 20–45 cm, diameter of bowl 10–25 cm, depth 2–4 cm. The only mortar indicated in the plans (fig. 18.8:3) is located at some distance from the walls; it could be used from any direction. In all rooms where mortars were found, grinding stones were found too (e.g., Callaway 1980: fig. 67:1–2, 4).

STOVES: Stoves are large, surrounded by a low stone wall, and have a circular (fig. 18.8:1), semicircular (fig. 18.9:2, Stove N2), or rectangular (fig. 18.8:3) outline. Some are paved with limestone slabs and others not at all. Dimensions are (by shape): circular, 1.4 m (diameter); semicircular, 1.5 x 1.8 m; rectangular, 1.5 x 1.9 m. Several cooking vessels could have been heated simultaneously on stoves of this size. The usual cooking vessel at Ai was the hole-mouth jar with the flat base, placed in the fire and not over it (explanation below). The use of limestone (as opposed to flint) surfacing, or no surfacing at all, may be explained by the relative plethora of fuel available in this ecological zone. Stoves are located next to walls and not in corners.

FLAT STONE INSTALLATIONS: Square or semicircular stone surfaces were laid even with the floor. On average they are 70 x 70 cm (fig. 18.9:1). These may have been the foundations of grain silos with mudbrick superstructures. Such surfaces were, like the stoves, found next to walls but not in corners.

OVENS: These were round, sunk installations with diameters of 40–50 cm. Though included in the final reports' plans (e.g., fig. 18.8:1), they do not appear in sections and are not discussed in the texts. Hence, their identification as ovens cannot be substantiated, although it seems most logical.

THE FUNCTION OF POTTERY AT ARAD AND AI

In the following section, we seek to discern the culinary habits of Arad and those of Ai and, if possible, to differentiate between them. Subsequently, we address questions of economy, culture, and ethnicity to which ceramic traditions are germane.

Two universal founding assumptions underlie much of the research on vessel function in antiquity:

- Vessel shape and volume reflect vessel function (e.g., Henrickson and McDonald 1983: 630; Smith 1985: 254).
- The above morphological characteristics are cross-cultural (e.g., Flannery and Winter 1976: 36; Henrickson and McDonald 1983: 261).

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Table 18.6. Selected Domestic Compounds at Arad and Their Contents*

Room	*1162a+ 1163a*	*2318a*	*1045a*	*1801+ 1503*	*1030+ 1077*	*1076*	*4496+ 4610*	*4266+ 4267*	*4699+ 4866*	*5060a+ 5063a*	*2326*	*Total pottery*	*Total % (pottery)*
Area	K	K	H	H	H	H	TN	TN	TE	M	K		
Stratum	II	II	II	II	II	II	III	II	II	II	II	II–III	
Total pottery vessels	8	6	16	22	12	8	21	53	19	34	38	237	100.0
Lamp-bowls	1	1	1	—	—	1	—	2	2	2	2	12	5.1
Bowls/ platters	1	—	1	1	—	—	1	2	—	3	—	9	3.8
Cups	2	—	1	1	1	—	—	—	—	1	—	6	2.5
Juglets	—	1	3	1	—	—	3	3	4	2	7	24	10.1
Jugs	—	—	1	1	2	—	1	6	2	3	3	19	8.0
Amphoriskoi	—	—	—	—	—	—	—	—	—	2	1	3	1.3
Small jars	—	—	2	2	2	—	2	1	—	2	2	13	5.5
Unident. jars	1	—	—	—	—	—	—	—	1	—	—	2	.08
LH jars	—	—	1	2	1	—	2	8	—	4	2	20	8.4
PH jars	—	—	—	—	1	—	—	3	—	1	2	7	3.0
Knobbed jars	—	—	—	—	—	—	—	—	—	—	1	1	0.4
Kraters	—	—	—	—	1	—	—	—	2	1	—	4	1.7
HM jars	—	—	3	7	1	3	4	15	4	11	10	58	24.5
Cooking pots	1	—	3	6	1	—	4	3	3	1	4	26	11.0
Painted jars	—	—	—	—	1	1	—	—	—	—	—	2	0.8
Pithoi	2	4	—	1	1	2	3	6	1	1	1	22	9.3
MS jars	—	—	—	—	—	1	1	4	—	—	3	9	3.8
Copper tools	2 awls	—	—	1 awl	—	—	—	—	—	—	—	3	—
Bone tools	—	—	—	1 awl	—	—	—	—	—	—	—	2	—
—	—	—	—	1 pendant	—	—	—	—	—	—	—	—	—
Flint tools	—	—	—	—	1 s.b.	1 s.b.	—	—	—	—	1 t.s.	3	—
Whorls	—	—	—	—	1	—	—	—	—	—	—	1	—
Mortars	—	1	—	1	—	—	—	—	—	—	—	2	—
Varia—ceramic	—	—	—	—	—	—	—	—	—	—	zoo.	1	—
Varia—stone	1 bowl	—	—	1 bead	1 pendant (hematite)	1 polished ax	—	—	—	—	—	8	—
—	1 digging	—	—	1 basin	—	—	—	—	—	—	—	—	—
—	stick	—	—	1 trough	—	—	—	—	—	—	—	—	—
—	ring	—	—	1 pendant	—	—	—	—	—	—	—	—	—
Varia—copper	—	1 bead	—	—	—	—	—	—	—	—	—	1	—

* HM = holemouth, LH = ledge handled, MS = medium-sized, PH = pillar handled, s.b. = sickel blade, t.s. = tabular scraper, zoo. = zoomorphic figurine.

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Table 18.7. Domestic Compounds at Ai and Their Contents[a]

Room	*C-south, front rm.*	*C-south, back rm.*	*C-north*	*B-south*	*B-north*	*ON*	*ON*	*OX*	*OX*	*MN*	*KL*	*Total pottery*	*Total % (pottery)*
Area	A	A	A	A	A	C	C	C	C	G	G		
Phase	III	III	III	IV–V	IV–V	III	IV–V	III	IV–V	IV–V	IV–V	III–IV–V	
Total pottery vessels	11	34	32	55	78	50	20	10	26	10	4	329	100
Lamp-bowls	1	—	1	—	2	1	—	—	—	—	1	5	1.5
Bowls/platters	3	9	8	10	12	9	5	3	6	2	1	68	20.7
Cups	—	—	—	—	2	1	1	—	1	—	—	5	1.5
Juglets	—	—	—	1	1	3	—	—	1	—	—	6	1.8
Jugs	—	1	—	5	7	4	1	—	1	—	—	19	5.8
Amphoriskoi	—	—	1	1	3	—	—	—	—	—	—	5	1.5
Small jars	—	1	2	2	—	—	—	—	—	—	—	5	1.5
Unident. jars	3	3	1	3	7	2	3	1	4	1	1	29	8.8
LH jars	—	—	—	—	4	1	—	—	—	—	—	5	1.5
PH jars	—	—	—	—	2	2	—	—	—	—	—	4	1.2
Kraters	3	5	—	9	5	—	—	2	1	—	—	25	7.6
HM jars	1	15	18	21	31	26	8	4	7	7	1	139	42.3
Pithoi	—	—	1	2	2	1	2	—	5	—	—	13	4.0
Copper tools	—	—	—	1 awl	—	—	—	—	—	—	—	—	—
Bone tools	1 spat.[b]	—	—	—	—	—	—	—	2 spat.	—	—	—	—
Flint tools	—	—	—	—	1 bl.	1 t.s.	—	—	3 bl.	1 bl.	—	—	—
Spheroids	—	—	—	—	—	1	—	—	4	—	—	—	—
Whorls	—	—	—	—	—	1	—	—	2	—	—	—	—
Grind. stones	—	—	—	—	—	1 l.g.s.	—	—	—	—	—	—	—
—	—	—	—	—	—	1 u.g.s.	—	—	—	—	—	—	—
Mortars	—	—	—	—	—	1	—	1	2[c]	—	—	—	—
Varia	1 Medit. sea shell	1 hippo tusk	—	1 pottery goblet	1 brick frag.	1 brick	—	1 l.p.w.	—	—	—	—	—

[a] Abbreviations: bl. = blade, HM = holemouth, l.g.s. = lower grinding stone, LH = ledge handled, l.p.w. = lower pottery wheel, Medit. = Mediterranean, PH = pillar handled, spat. = spatula, t.s. = tabular scraper, u.g.s. = upper grinding stone.

[b] Possibly an unfinished needle.

[c] One may be a doorpost socket.

These assumptions, and the evidence that supports them, allow us to utilize ethnographic data from widely divergent cultural contexts worldwide to construct a hypothetical series of functional definitions for vessel types that can be applied cross-culturally (Henrickson and McDonald 1983: 630).

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Method

The artifactual assemblages of eleven domestic compounds at Arad (out of a total of thirty-seven excavated) and eleven (out of a total of thirteen) at Ai were compared.[4] The residences of Arad were selected in a manner intended to represent all the size categories defined for Strata II–III (data in tables 18.6, 18.7) and all excavation fields. Calculations have taken into account all complete vessels and fragmentary vessels and rims of defined types. Handles and bases have not been included so as to avoid duplication.[5] While we are aware of possible problems inherent in sample sizes, counting criteria, and collection techniques,[6] we are confident that the following analysis reflects the ancient reality to a reasonable extent.

Kitchenware at Arad and Ai

In most human societies kitchenware serves the following purposes (Flannery and Winter 1976: 36; Henrickson and McDonald 1983; Smith 1985: 281; Dessel 1991: 246):

- cooking, baking, and other food preparation
- eating
- storage of fluids
- storage of dry goods
- transport of water
- illumination
- dipping and pouring
- drinking

Figures 18.10–18.14 illustrate the similarity of the Ai and Arad ceramic repertoires. The principal difference lies in three vessel types present at Arad but absent at Ai: holemouth cooking pots (fig. 18.11:5–7), knobbed jars (fig. 18.12:4), and medium-sized store jars (fig. 18.10:18). This similitude permits the two repertoires to be considered together where vessel function is concerned.

Cooking, Baking, and Other Food Preparation

This category includes three components:

COOKING: Globular holemouth vessels were found at Arad (fig. 18.11:5–7) whose exteriors and rims were covered by soot, making their identification as cooking pots a simple matter (Amiran et al. 1978: 48). In the ethnographic literature pertaining to preindustrial societies,

4. Building 195b + 238 has not been included in this analysis because the separation of its two living surface levels is not sufficiently clear (Wagner 1972: 14–21, figs. 8–10).
5. A few handles and bases are included in the sample but only in cases where it was beyond doubt what type of vessel they represent and where no other fragments of that vessel are included.
6. After many years of work with Ruth Amiran, the author is intimately familiar with her collection methods. From Callaway's (1972, 1980) publications of Ai it is clear that collection and publication were similarly meticulous. Marquet-Krause's (1949) sampling is of an unknown quality and conclusions concerning this material should be considered provisional.

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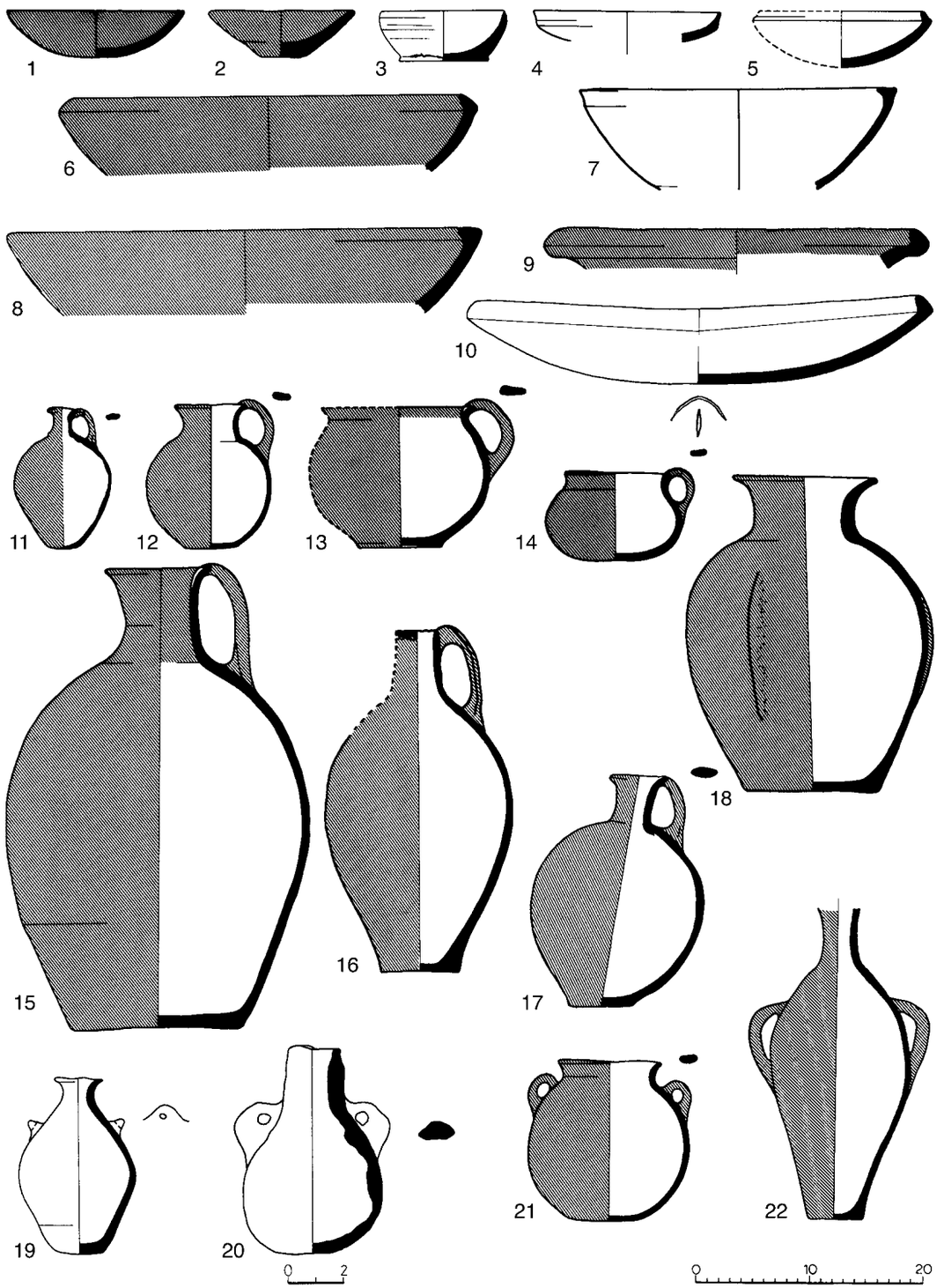

FIGURE 18.10: Typical EB II pottery assemblage from Arad (from Amiran et al. 1978; plate references herein are to Amiran et al.1978). *1:* Lamp-bowl (pl. 22:42); *2:* lamp-bowl (pl. 13:1); *3:* lamp-bowl (pl. 13:28); *4:* lamp-bowl (pl. 22:59); *5:* small bowl (pl. 22:56); *6:* bowl (pl. 23:14); *7:* bowl (pl. 23:22); *8:* bowl (pl. 13:41); *9:* platter (pl. 23:1); *10:* platter (pl. 23:7); 11: juglet (pl. 25:17); *12:* juglet (pl. 25:34); *13:* cup-bowl (pl. 24:20); *14:* cup-bowl (pl. 24:17); *15:* jug (pl. 27:15); *16:* jug (pl. 27:16); *17:* jug (pl. 26:5); *18:* medium-sized jar (pl. 28:4); *19:* amphoriskos (pl. 30:10); *20:* amphoriskos (pl. 30:18); *21:* small jar (pl. 24:9); *22:* small jar (pl. 27:1).

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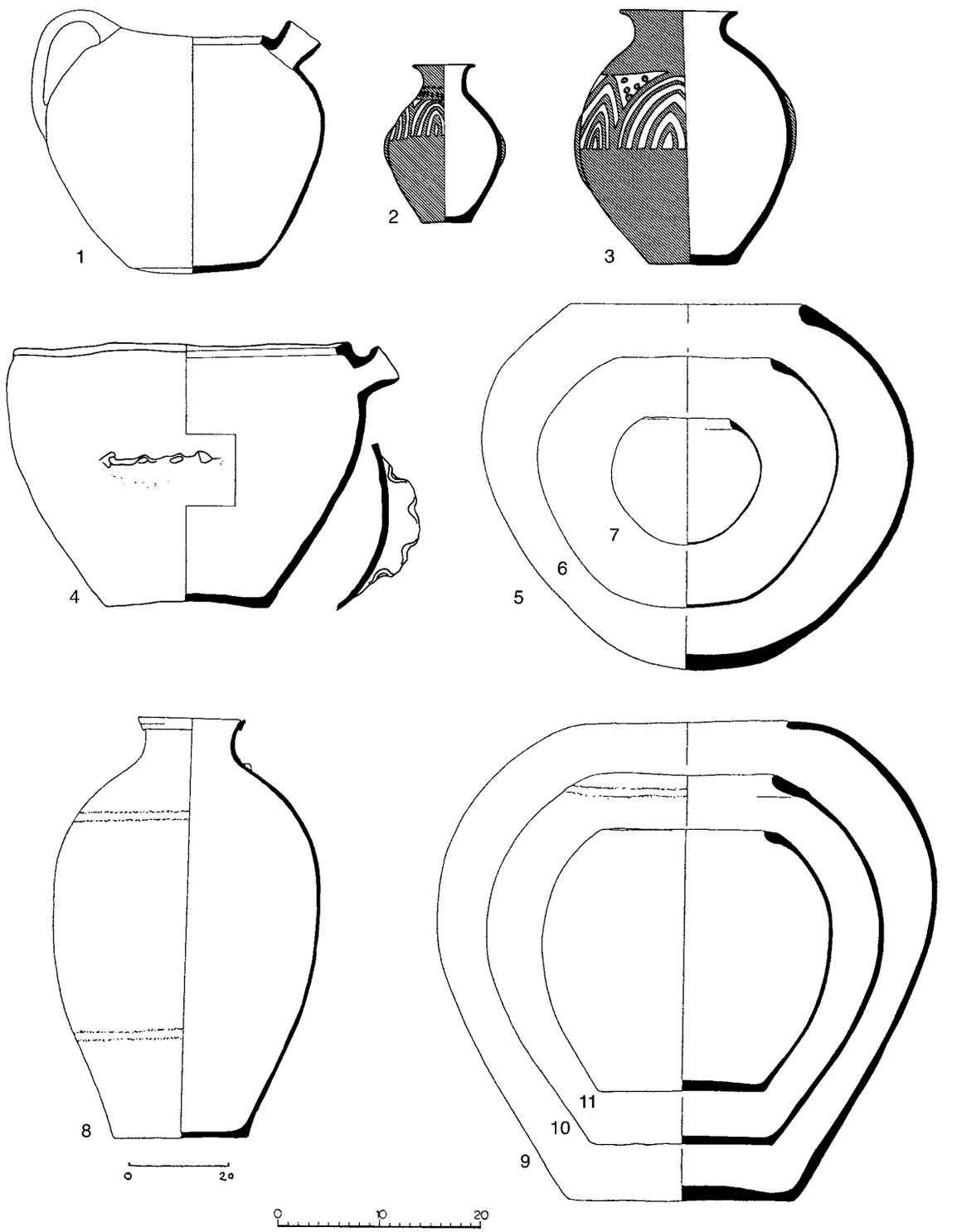

FIGURE 18.11: Typical EB II pottery assemblage from Arad (continued; from Amiran et al. 1978). *1:* krater (pl. 42:9); *2:* painted small jar (Abydos style) (pl. 30:7); *3:* painted medium-sized jar (Abydos style) (pl. 28:7); *4:* krater (pl. 42:2); *5:* cooking pot (pl. 43:10); *6:* cooking pot (pl. 43:11); *7:* cooking pot (pl. 43:8); *8:* pithos (pl. 40:5); *9:* holemouth jar (pl. 46:1); *10:* holemouth jar (pl. 47:3); *11:* holemouth jar (pl. 46:3).

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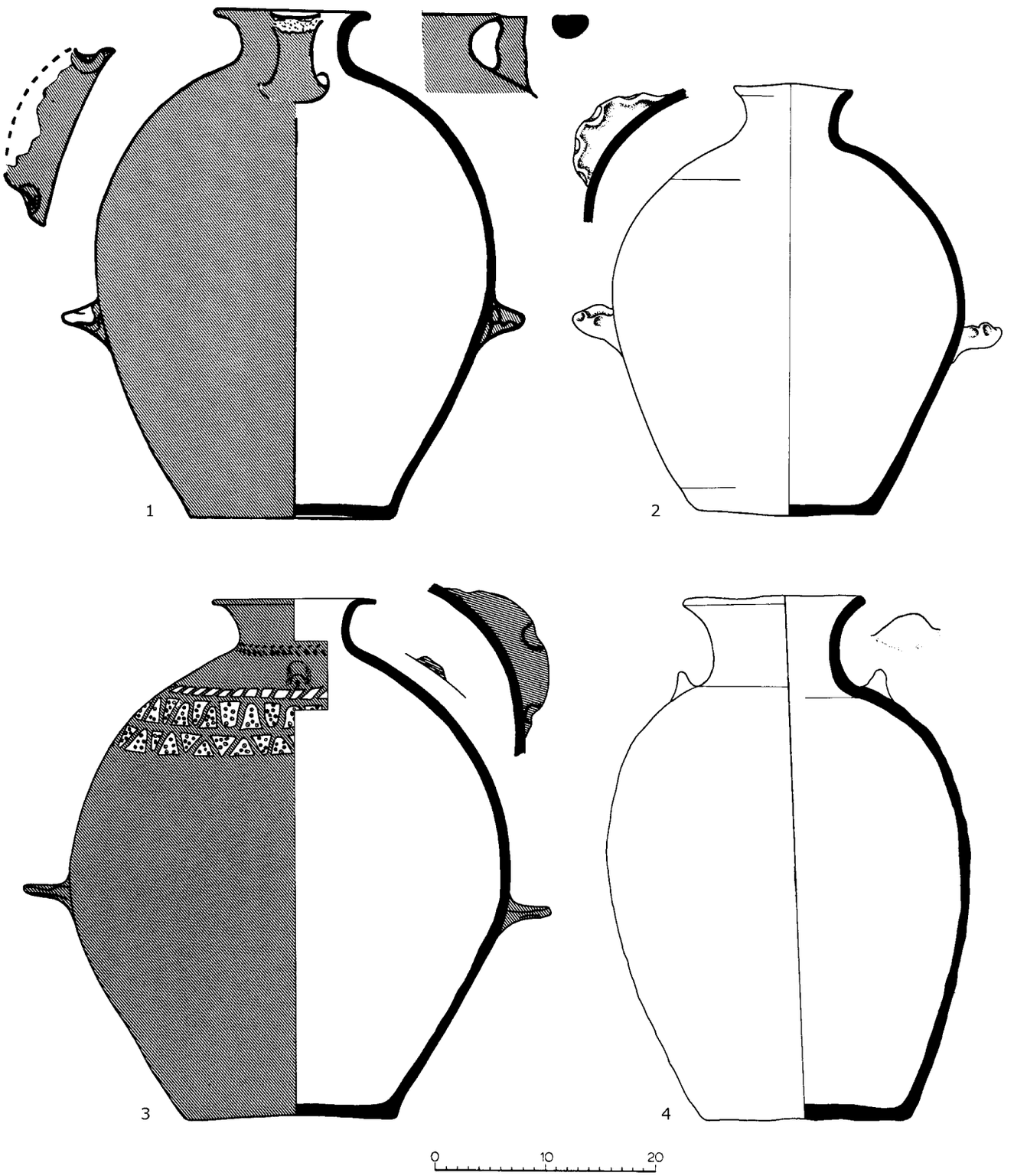

FIGURE 18.12: Typical EB II pottery assemblage from Arad (continued; from Amiran et al. 1978). *1:* Pillar-handled jar (pl. 38:3*); 2:* jar with ledge handles (pl. 31:1*); 3:* painted jar (Abydos style) (pl. 33:2*); 4:* knobbed jar (pl. 34:1).

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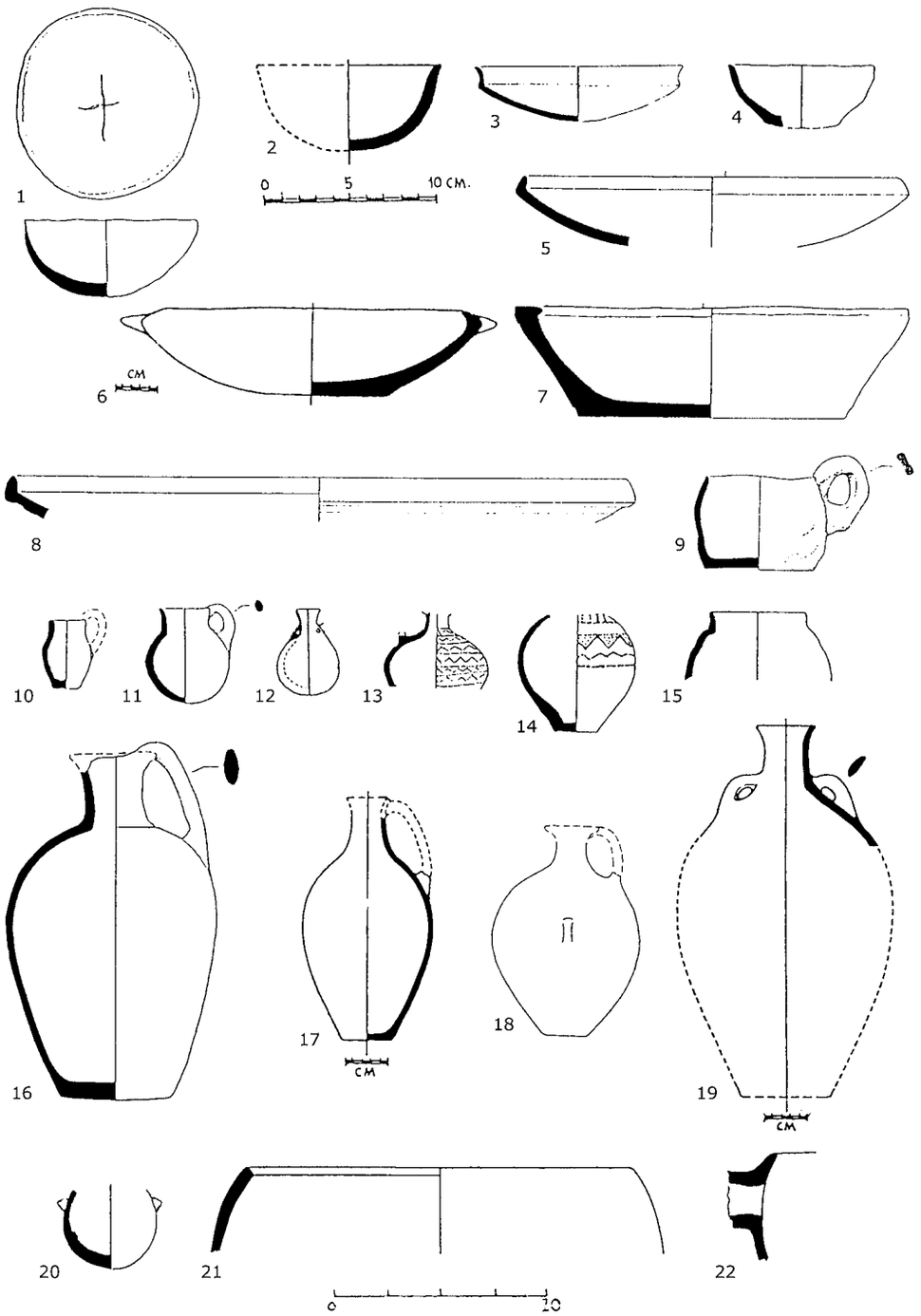

FIGURE 18.13: Typical EB II pottery assemblage from Ai . *1:* hemispherical bowl (Callaway 1980: pl. 61:28); *2:* hemispherical bowl (Callaway 1972: pl. 43:1); *3:* small bowl (Callaway 1980: pl. 61:36); *4:* small bowl (Callaway 1980: pl. 92:6); *5:* bowl (Callaway 1980: pl. 62:4); *6:* bowl (Callaway 1972: pl. 56:19); *7:* bowl (Callaway 1980: pl. 62:5); *8:* platter (Callaway 1980: pl. 62:9); *9:* cup-bowl (Callaway 1980: pl. 92:27); *10:* juglet (Callaway 1980: pl. 62:16); *11:* juglet (Callaway 1980: pl. 62:13); *12:* amphoriskos (Callaway 1972: pl. 45:9); *13:* painted juglet (Abydos style) (Callaway 1972: pl. 45:10); *14:* painted juglet (Abydos style) (Callaway 1972: pl. 45:11); *15:* cup-bowl (Callaway 1972: pl. 45:12); *16:* jug (Callaway 1980: pl. 62:18); *17:* jug (Callaway 1972: pl. 56:24); *18:* jug (Callaway 1980: pl. 62:11); *19:* small jar (Callaway 1972: pl. 43:7); *20:* small jar (Callaway 1980: pl. 92:28); *21:* krater (Callaway 1972: pl. 29:5); *22:* krater (Callaway 1972: pl. 50:25).

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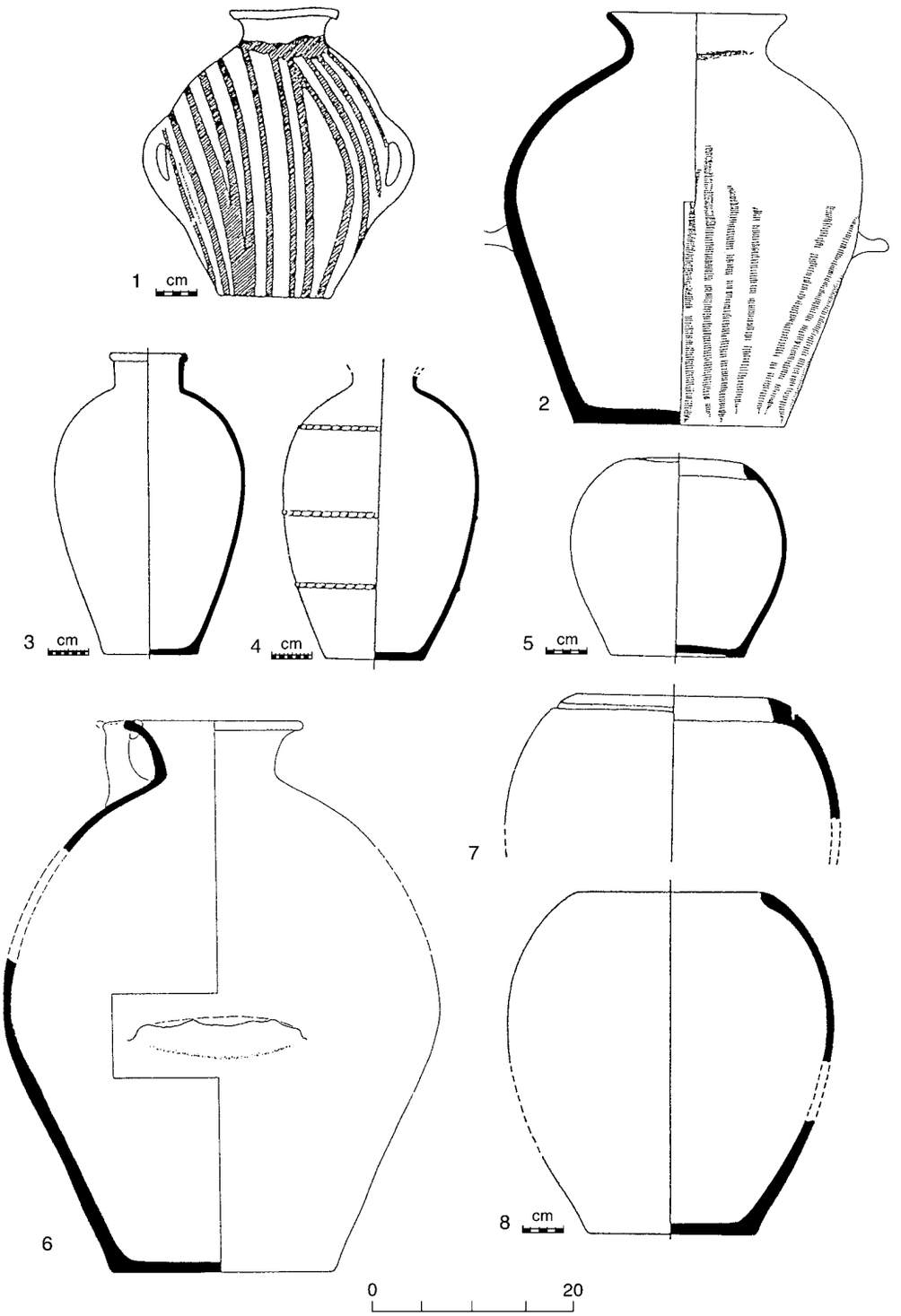

FIGURE 18.14: Typical EB II pottery assemblage from Ai (continued). *1:* Jar with loop handles (Callaway 1972: pl. 57:6); *2:* jar with ledge handles (Callaway 1972: pl. 46:13); *3:* pithos (Callaway 1972: pl. 57:7); *4:* pithos (Callaway 1972: pl. 57:8); *5:* holemouth jar (Callaway 1972: pl. 58:6); *6:* pillar-handled jar (Callaway 1980: pl. 63:10); *7:* holemouth jar (Callaway 1972: pl. 58:13); *8:* holemouth jar (Callaway 1972: pl. 43:11).

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cooking pots are reported as characteristically globular, having rounded bases intended to maximize the distribution of heat. Angular joins—between base and wall, for example—are undesirable since fracture tends to occur at these points of weakness with the introduction of intense heat (Arnold 1985: 226; Dessel 1991: 33). The cooking vessel is wider than it is high, and the opening is narrow so as to avoid rapid evaporation (Henrickson and McDonald 1983: 631). The more the vessel is to be heated, the thinner its walls (Smith 1985: 261). All these features exist in the cooking pots of Arad.

But what vessels did the people of EB Ai cook with? At Ai, and also at Arad, a large number of flat-bottomed holemouth jars were found bearing the remains of soot on their exteriors (figs. 18.11:9–11; 18.14:5, 7–8). Obviously, these too were cooking vessels, but perhaps for different foodstuffs or a different mode of preparation. One assumes that the contents of the round-based and flat-based cooking vessels were heated by different methods: the round-based vessel was placed over the flame, on several stones, while the flat-based jar was placed in the fire. Smith (1985: 274, 276) notes that the contents of a pot placed over a fire are heated gradually from bottom to top, while those of a vessel placed in the fire are heated from the sides, a process that speeds evaporation. The question is, why wasn't the round-bottomed pot adopted at Ai? Might this indicate cultural preferences in food preparation?

Baking: No portable baking vessels were identified at either site. At Ai, the above-noted *tabun* ovens probably served this purpose, and at Arad, a pita-like bread might have been baked on hot stone slabs, ceramic vessel walls, or metal sheets in the Bedouin fashion.

The spouted krater or vat, beer and oil production: The krater is the only vessel having a spout (figs. 18.11:1, 4; 18.13:21–22). To make beer, barley grains and water were placed in the krater to create a fermented liquid. The beer was poured out the spout, and the floating mash of fermented grain remained on the surface inside the container (Katz and Voigt 1986: 32).

Another interpretation of this vessel's function has been offered by Esse (1991: 123), who discerned several of them in one of the rooms at Beit Yeraḥ associated with signs of olive oil production. Using parallels from traditional oil production in modern Greece, Esse proposed that following their soaking in warm water and subsequent crushing, the fruit was placed in the vats to settle. Water was then added, causing the lighter oil to rise to the surface, to be poured out the spout (cf. Fargo 1979: 38).

Eating Vessels

Eating vessels are often divided into personal and collective categories in the ethnographic literature (Henrickson and McDonald 1983: 632). Personal eating vessels are comprised of small bowls 6.0–8.0 cm high (7.0 cm on average) and 10.0–23.0 cm in diameter (14.0 cm on average). Collective eating vessels are between 4.4 and 23.4 cm high (10 cm on average) and have a diameter that ranges from 8.4 to 95.0 cm (24.6 cm on average). The dimensions of bowls and platters from Arad and Ai (figs. 18.10:1–10; 18.13:1–8) show similar modality and allow us to assert a similar functional dichotomy. Dessel (1991: 32), in remarking that slipped and burnished surfaces are easier to clean, suggests that open vessels exhibiting such treatment can thus be considered eating and serving vessels. Indeed, most of the bowls and platters at Arad and Ai were slipped and/or burnished.

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The Storage of Fluids

There is no essential difference between the ceramic containers for the storage of fluids and those for dry goods; easy access to contents and imperviousness are required of both. Hence, it is usually hard to determine the original contents of such vessels. Studies of vessel use in preindustrial societies have shown that some containers have multiple uses; Smith (1985: 280), for example, discerned forty-eight functions for thirty-nine vessel types.

Water Containers: These tend to be large and heavy, almost immovable. The mouth is wide, for easy filling and access, and the rim curves out and is profiled to allow cloth or skin to be stretched and tied over the mouth to seal it (Henrickson and McDonald 1983: 633). All these features are present in the pithoi of Arad and Ai (figs. 18.11:8; 18.14:3–4).

Other Containers: Oil, wine, beer, and perhaps perfumes were other liquids used in the Early Bronze Age. It is not clear whether milk was kept in its initial state or converted entirely into secondary products. Large vessels for the storage of liquids other than water share some of the water jars' features: wide mouths for easy dipping and everted rims to facilitate sealing. These include pillar-handled, knobbed, ledge-handled, medium-sized, and holemouth jars—though the latter are difficult to seal (figs. 18.10:18; 18.11:9–11; 18.12; 18.14:1–2, 5–8). The pillar-handled jar's pillar was perforated and had a concave depression on top to house a dipper juglet. After dipping, precious excess liquid would drain back into the jar via the perforated channel (Amiran and Ilan 1992: fig. 54). Jugs, juglets, small jars, and amphoriskoi, most of which are slipped and have handles, were also used for the storage of liquids in small quantities (figs. 18.10:11, 15–17, 19–20, 22; 18.13:12–14, 16–19). Their narrow mouths and necks were intended to minimize spillage if the vessel was overturned, while the slip retarded evaporation (Henrickson and McDonald 1983: 633).

Storage of Dry Goods

Aside from the pillar-handled jar that clearly contained liquids, any jar could contain either fluids or dry goods. Dry goods, however, could also be stored in baskets, sacks, or constructed bins.

Transport of Water

The shape and size of water jars vary widely and depend on distance from water source, topography over which the water is to be carried, means of transport, and the number of people to be supplied. For the most part, water jars have two or three handles and are carried by one person (Henrickson and MacDonald 1983: 634). The most likely candidate for water transport is the necked jar with ledge handles (figs. 18.12:2; 18.14:2) that could be comfortably borne on the head. The less ubiquitous loop-handled jar (fig. 18.14:1) might have also had this function.

Illumination

Many of the small bowls bear a thick strip of soot around the perimeter of their rims, testifying to their use as lamps (fig. 18.10:1–4). The bowl contained oil, and the wick—probably of flax—protruded over the rim. It is likely that two or more wicks were used simultaneously.

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Table 18.8. Relative Frequencies (%) of Vessel Categories at Arad and Ai[7]

Vessel types	*Usage*	*Arad*	*Ai*
Holemouth cooking pots (round base)	Cooking	11.0	0.0
Holemouth jars	Cooking and/or storing	24.5	42.3
Kraters/Vats	Oil and/or beer production	1.7	7.6
Bowls, platters	Eating	3.8	20.7
Pithoi	Water storage	9.3	4.0
Small jars, jugs, juglets, amphoriskoi	Liquid storage and perhaps drinking	24.9	10.8
Jars (ledge-handled, pillar-handled, knobbed, painted, medium-sized)	Liquids and dry goods storage	17.2	11.6
Lamp-bowls	Illumination	5.1	1.5
Cups	Drinking, dipping	2.5	1.5
Total		100.0	100.0

Dipping and Pouring

Dipper juglets and cups (figs. 18.10:12–14; 18.13:9–11, 15) were used to extract the contents of large jars and cooking pots. Both dipper juglets and cups are usually slipped and burnished—probably to prevent the fabric from absorbing liquids and to facilitate cleansing.

Drinking

Some of the small and medium-sized vessels described in the above section concerning the storage of liquids may also have served as drinking vessels. The small globular jar with the wide mouth (fig. 18.10:21) might also have been a drinking vessel. Though not especially large, it is too big to allow dipping, yet it is generally slipped and burnished and bears two handles.

The Arad "Kitchen" vs. the Ai "Kitchen"

Table 18.8 summarizes the differences in the frequencies of various vessel types between Arad and Ai, based on the data presented in tables 18.6 and 18.7. The following contrasts between the Arad and Ai assemblages are notable:

1. Although we don't know what proportion of the holemouth storage jars served as cooking vessels at Ai, and thus we cannot juxtapose the proportion of cooking vessels at the respective sites, the combined figures for all holemouth vessels reveal higher percentages at Ai (42.3%) than at Arad (35.5%). However, we cannot know whether there were more cooking vessels or more storage vessels at Ai.[7]

7. At Ai, where most of the pottery assemblage is comprised of rim sherds, it is hard to differentiate between rims of ledge-handled jars and those of pillar-handled jars. Therefore, though the two clearly had different functions, they are grouped together in a category that includes vessels that might have had wet- or dry-storage purposes.

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2. Ai has more kraters than Arad by a factor of four. This divergence can be interpreted in two ways:

- If kraters were indeed used for the production of beer, then more beer was produced at Ai. This would be somewhat surprising since barley, the most frequent base ingredient of ancient beer (Zohary and Hopf 1994: 55 and references therein), was the primary grain cultivated and consumed at arid-zone Arad (Hopf 1978: 65), while wheat was readily cultivable in the region of Ai (Zohary and Hopf 1994: 18). A number of explanations could be proffered: for example, that grain was too precious to waste profligately on beer, or that all or part of the population at Arad maintained a cultural bias against beer. Neither of these is very convincing.
- Perhaps a more plausible interpretation is that the krater's main function, at least at Ai, concerned the production of olive oil. Ai is located in the Mediterranean zone in the central highlands of Canaan where, it has been suggested, the olive was firmly established already by the Early Bronze Age (Ben-Tor 1989: 41; Miroschedji 1989: 69–70; Stager 1992: 32; Finkelstein and Gophna 1993: 13; Joffe 1993: 86). Olea would not have flourished in the semiarid climate of EB Arad, given the agricultural techniques of the time (Zohary and Hopf 1994: 137). Of course, the krater might well have served both beer and olive industries, beer being dominant at Arad and oil at Ai.

3. A major variance occurs in the category of eating vessels—i.e., bowls and platters—whose proportion at Ai is seven times greater than at Arad. Perhaps this contrast can be accounted for by different eating habits in the two towns; at Ai food was more often served or partaken in individual portions and at Arad more often in larger communal vessels, or from cups dipped into the communal vessels (see below). The Bedouin of the Negev and Sinai deserts eat off large communal vessels, a habit common in nomadic and seminomadic societies that shun excess baggage (Ben-David, pers. comm.).
4. Pithoi, used principally for the storage of water, are almost 2.5 times more frequent at Arad than at Ai. Water availability is probably reflected here, with semiarid Arad (170 mm average yearly precipitation) requiring greater storage capacity than Ai with about 435 mm average yearly precipitation and a nearby perennial spring. At Ai more public water reservoirs seem to have been constructed (Helms 1982: fig. 18), obviating the need to collect and store large quantities in the home. Yair and Garti (1996) have estimated the runoff and water collection potentials of EB Arad, concluding unequivocally that collection of rainfall from the roofs of houses would have been essential to the existence of a sedentary population.
5. Small and medium-sized vessels for the storage of liquids other than water are also 2.5 times more frequent at Arad. The explanation for this may be that Arad's population purchased expensive commodities such as wine and oil in small quantities from the hill country to the north where such goods were cultivated and processed. Oil and wine used would have been stored in smaller vessels designed to minimize spillage (cf. the Iron Age wine decanter [Zevulun and Olenik 1978: 26]). Conversely, at Ai oil and wine were also stored in bulk in jars.
6. Lamp bowls are three times more frequent at Arad than at Ai. We have no explanation for this.

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7. Cups are proportionally better represented at Arad than at Ai. Here too the reason may have something to do with eating habits. Since small bowls are not common, the cup at Arad might have been both a serving and an eating vessel.

Other Artifacts

Other artifacts found in the Arad and Ai houses (tables 18.6, 18.7) indicate that certain crafts were household activities and not necessarily practiced by specialized artisans. Those discerned include spinning (whorls), weaving (bone shuttles), sewing (bone and metal needles and awls), and drilling (flint drill bits and stone inertia wheels). The flint assemblage from Ai was not analyzed, but at Arad, Schick (forthcoming) has demonstrated that the flint industry was largely a domestic one.

THE EARLY BRONZE AGE HOUSEHOLD AT ARAD AND AI: A SUMMARY

When cross-cultural principles of household archaeology are applied to the patterns exhibited by domestic architecture and artifactual assemblages from well-excavated, well-preserved, well-endowed sites, the result can be a spectacular facsimile of daily life, social intercourse, economic relations, and political structure. This study of the detailed data from Arad and Ai also demonstrate how quantified description can bring to the fore essential contrasts between assemblages which, on the face of things, look quite similar.

Close analysis and comparisons of the two sites lead us to the following conclusions:

Architecture

1. Domestic compounds display hierarchy in size, particularly at Arad, which is better preserved and more extensively exposed than Ai, but also at Ai. At Arad, the compounds of Strata III–II—the paramount strata—can be divided into three size categories: small, medium, and large. The large compounds are three to five times larger than the small ones. This is held to reflect different degrees of wealth among the town's inhabitants, beyond the special and more obvious status accorded the temple and the palace units.

   Since the courtyard functioned as a storage complex and animal pen, its size and complexity can attest to household wealth. In large compounds, the courtyard comprises 64.6% of total compound area—in small compounds only 50.8%. Hence, we have deduced that larger compounds are more likely to mean more goods to store and/or more animals to pen, rather than larger families to house.
2. In Arad Stratum III, 28% of the compounds are of the large variety, while in Stratum II the figure is 44%. This increase may testify to a strengthening of the town's economy and the broadening of its economic elite. Elsewhere we have examined Arad's importance as a focal point for the copper trade and as a gateway community between the desert and the sown (Ilan and Sebbane 1989; Amiran and Ilan 1992). Its primacy in these roles apparently reached its peak in Stratum II, as reflected in the greater number of large compounds with large courtyards.
3. In both Arad and Ai, houses are grouped in neighborhoods. In Arad Stratum III, large, medium, and small compounds existed side by side. In Stratum II, however, Area H

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consists only of small units and Area K only of large ones. The data at Ai are meager, but the four units in Area A are smaller than the single ones in Areas L and G. As a hypothesis for further testing, we can say that, for Arad at least, the wealthier society of Stratum II was also a more stratified one.

4. Despite certain similarities, the architectural traditions of Arad and Ai differ:

- The Arad compound is usually comprised of two rooms (main and subsidiary) opening onto a common courtyard. At Ai, the dominant plan is that of a "forecourt building" whose components are arranged in a linear fashion—a courtyard in front followed by one or two connected rooms.
- In this context, the plan of a single room must be distinguished from the compound's general layout. The single room at both sites is a broadroom. This was the predominant plan in the Chalcolithic period from northern to southern Canaan (Porath 1992: 42; Braun 1989: 18). It was used for both domestic and public architecture in EB I, e.g., at Megiddo (Kempinski 1989: fig. 7), Hartuv (Mazar and Miroschedji 1993: 585), and Small Tel Malhata (Amiran, Ilan, and Arnon 1983: fig. 3), though much domestic architecture of EB I is curvilinear (Braun 1989: 17). The broadroom, usually equipped with a stone column base and sometimes with benches, was again very common in EB II architecture (Ben-Tor 1992b: 100–102). EB II Arad and Ai share this prevalent broadroom tradition. Where they differ is in the arrangement of architectural components.

  Finkelstein (1990: 43) interprets the Arad compound as reflecting the traditions of nomadic pastoralists who opted for a sedentary existence. He emphasizes the open spaces between the Arad compounds, in contrast to the northern sites where houses are built in clusters with common walls (Finkelstein 1990: 39). In contrast, the forecourt building layout that characterizes the architecture of Ai is understood by Ben-Tor (1992a: 64–66, fig. 7) as being rooted in the EB I. The forecourt building seems to be confined to northern Canaan and to the central hill country.[8]
- Both the Arad-type compound and the forecourt-type include an enclosed courtyard and one or two rooms. At Arad, the main room doubled as a sleeping space and as a work area during the day, while subsidiary rooms probably served as additional storage space. At Ai, the sample is so meager as to allow only hesitant speculation. It may be that in the earlier phases cooking took place in the front (or only) room. In Phase IV, installations were no longer present in the rooms. If Unit B-south is any indication, they had moved into the courtyards. Not enough domestic units with more than one room were excavated to differentiate between the functions of back and front rooms. The size of the courtyards at the two sites may be at variance; Building 195b + 238 at Ai, which falls in the category of large compounds at Arad, incorporates a courtyard that comprises 39% of its total expanse. This, of course, is a much lower proportion than is usual for courtyards in large compounds at Arad (50.8%–64.6%).

  Since the courtyard at Arad was also used, in all probability, to hold animals, we might infer that at Ai fewer (or no) animals were penned. Unfortunately, the data from

8. The two ostensible forecourt buildings discerned by Ben-Tor (1992b: fig. 8) at Arad do not really fall in this category since they are modifications of broadroom units.

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Ai are too lean at the moment to make a definitive statement, but it might also be inferred that the economy of Ai placed more emphasis on horticulture and cereal agriculture, perhaps deriving the greater portion of its animal products from a more pastorally oriented population occupying the arid margins and the uncultivated hill country.

Located in a semiarid zone, Arad could not have relied solely on agriculture. Animal husbandry would always have remained a subsistence component, one to be expanded in times of need. Ben-David (1988: 1, 41) has recently described how, despite the accelerated process of sedentarization experienced lately by the Negev Bedouin, and despite the fact that true shepherds are now rare, most families still keep a small herd of three to twenty head of sheep and goats—what Finkelstein (1990: 41) has called "a propagation core . . . should changes in the future require a withdrawal back to pastoralism."

- The average wall thickness of the Ai houses is greater than at Arad—second stories may have existed at Ai.
- At Arad, the floors are sunken, a common feature in the southern EB sites of the Negev and Sinai (Beit-Arieh 1989: 189, 195). At Ai they are not.
- At Ai, rounded corners appear in some of the houses, as opposed to the right-angled walls of Arad. Ben-Tor (1992a: 62) has suggested the Lebanese coast as the source of the rounded-corner type of house, also found at Megiddo, Tel Qashish, and Tel Kitan in the EB I.

We surmise that the disparate architectural traditions displayed by the contemporary towns of Arad and Ai correspond to two populations having distinct cultural identities.

Installations

5. The installations of the Arad and Ai compounds are at some variance:

- There are many more stone installations at Arad than at Ai. We infer that this reflects less access to wood and water (for making bricks) in the vicinity of Arad. At Ai similar installations, shelves for example, were probably built of wood or mudbrick, neither of which preserves well in a moister climate.
- At Arad stoves are made of flint; at Ai they are sometimes formed of limestone slabs and sometimes not paved at all. Flint, being a good conductor of heat, was meant to maximize thermal potential so as to minimize wood consumption in a locale where wood was not easy to come by. The use of limestone, or no stone at all, in the cooking installations at Ai, may indicate that firewood was more abundant.
- No *tabun* ovens were found at Arad. At Ai, it is unclear whether the sunken oval installations defined by Callaway (1980: fig. 59) as *tabuns*, were indeed such. If Callaway was correct, bread was baked differently at each site.

Ceramic Assemblage

6. Comparing the pottery corpus of the two sites, two points are apparent:

- Three vessel types occur only at Arad: globular cooking pots, knobbed jars, and medium-sized jars. Aside from these, the assemblages are very similar to each other. Obviously, the two towns had much in common culturally.

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- While the assemblages are morphologically similar, the numerical proportions of vessel types at the two sites differ. This observation must mirror both different ecologies and, unavoidably, some degree of cultural distinction between the two towns.

Ecology and Economy

7. Water was scarce at Arad, inducing the inhabitants to store as much as possible in pithoi, which are 2.5 times more abundant at Arad than at Ai. Ai enjoyed more rainfall (channeled into several reservoirs, as opposed to the single reservoir at Arad) and had access to a nearby perennial spring.
8. Olive groves and vineyards would have thrived in the hill country around Ai, but not in the semiarid climate of Arad (even under a somewhat moister climate in the Early Bronze Age). This fact resonates in the percentage of kraters—four times more abundant at Ai than at Arad—probably used in the production of olive oil. At the same time, small closed vessels—which probably contained olive oil and wine—are 2.5 times more frequent at Arad. These precious liquids were acquired in relatively small quantities from the central hills and the Shephelah in exchange for goods that Arad specialized in—copper, sheep and goat products, bitumen, and salt. At Ai, where olive oil and wine were manufactured, the liquids were probably accumulated in the larger storage jars.

Eating Habits

9. The denizens of Arad and Ai probably had different eating habits. Eating vessels are seven times more frequent at Ai. At Arad, where those vessels are comparatively few, the local population might have eaten from communal bowls, as do the Bedouin of the Negev and Sinai, who wish to be burdened with as little as possible. Three vessel types found at Arad are known from the Negev and Sinai (Amiran, Beit-Arieh, and Glass 1973: pls. 50–51; Porat 1989: 172–74, 178; Amiran and Ilan 1992: fig. 38) but not at Ai or other northern sites. Among these, the globular cooking pot is most evocative, as it involved a method of cooking different from that applied with the flat-based holemouth jars used at Ai—perhaps a "southern dish" not adopted by northern populations.

To return to the two main questions posed at the beginning of this paper:

- Incongruities do exist in the material cultures of EB II Arad and Ai that can be explained by differing ecological circumstances and the divergent economic bases that grew out of those circumstances.
- Other incongruities exist that do not have direct ecological or economic explanations. These surely reflect distinct cultural identities (ethnicity).

The two communities underwent a similar settlement process in which towns of the EB II emerged from the villages established in the late EB I. Arad was settled mainly by peoples of the desert with a tradition of pastoral nomadism, while Ai was populated initially as part of the penetration of the hill country by lowland people and the intensification of horticulture there.

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In addition, a local sedentarizing element of pastoral nomads might have been part of this process at Ai.

At the time of their initial settlement in the EB IB, the material cultures of Arad and Ai exhibited less similarity to each other than was the case in the EB II. The intensification of production and exchange, and the growth of economic interdependency between the towns and regions of Palestine, resulted in the agglomeration and standardization of material culture discernable in the EB II. Yet a close inspection of the Arad and Ai assemblages reveals that, alongside the commonalities of the EB II material culture (and perhaps of cultural values), old traditions were preserved.

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EARLY BRONZE AGE SEAL IMPRESSIONS FROM THE JEZREEL VALLEY AND THE PROBLEM OF SEALING IN THE SOUTHERN LEVANT

ALEXANDER H. JOFFE

INTRODUCTION

An Early Bronze Age (EB) seal impression was discovered during the 1996 excavation season at Megiddo. Four EB seal impressions were also found in 1995 during a survey of Mizpe Zevulun in the northwest Jezreel Valley. These sealings present the opportunity again to address two of the outstanding issues of the Early Bronze Age: the nature of socioeconomic and political organization, and the nature and extent of "foreign" contacts.

THE SEAL IMPRESSIONS

Megiddo

The seal impression (reg. 96/H/004/AR001) depicts two horned animals facing left, one behind the other (fig. 19.1). The rightmost animal appears to be in the foreground, while that on the left is in the background. The head of the animal on the right is indistinct, which may be partially a function of its position in the composition and also due to wear. The horns of the animal on the left are rounded and curve downward, while the tail on the right-hand animal dips downward and flares up over what may be pointed ears. This may indicate that the left-hand animal is an ibex *(Capra ibex nubiana)* while the right-hand animal could be a lion or leopard *(Felis leo* or *Felis pardus).*

The Megiddo impression was discovered in Area H, one of the major fields currently being excavated to reexamine the Iron Age stratigraphy of the mound. This find is especially unusual in that the vast majority of fills encountered in Iron Age contexts excavated in 1994 and 1996 contained virtually no EB pottery. The particular context of this object was Locus 004, a fill below the courtyard of Building 1853, a structure generally assigned to Stratum III at Megiddo and dated after the Assyrian conquest of Israel in 732 B.C. (Joffe 2000a).

The impression is on a small sherd of pink (Munsell 5 YR 7/4) calcite tempered ware typical for the EB. The sherd itself is 1.8 cm wide and 2.7 cm high. The impression is only 1.3 cm high. Three sides of the sherd appear to have been straightened by chipping. The shape and condition of the sherd suggests that it had been found, modified, and preserved some time after the original impression was made. It might have been a curiosity, trinket, toy, or heirloom.

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FIGURE 19.1. Megiddo seal impression (reg. 96/H/004/AR001) depicting two horned animals. Scale 2:1.

Parallels

The Megiddo seal impression has its closest parallel in an example excavated in the "Stages" on the slope of Megiddo by the University of Chicago. Seal impression 34.2754 shows at least two horned animals facing left with one behind the other (Ben-Tor 1978: no. IIA–4; Engberg and Shipton 1934: 36, figs. 10:C, 11:C). The curved horns of the right-hand animal suggest it is an ibex. The stratigraphic position of the earlier Megiddo sealing, interpreted by Ben-Tor as a pit in Stage V (Ben-Tor 1978: 43–44), simply places it in the EB I. Other impressions from the Megiddo Stages and from the tell are much less similar to our example. A fragmentary impression from Jericho shows a feline pursuing an ibex (Ben-Tor 1978: no. IIA1–3). A recently published example of a feline striding left is found on a handle recovered during a survey of Dayr Qiqub, near Pella (Vieweger 1997). Less precise parallels may be drawn with the stamp seal impression of an ibex from Tell el-Hesi (Ben-Tor 1978: no. IIA-6), the impression of a schematic ibex from Tell el-Fârʿah North (Ben-Tor 1978: no. S-3; Keel-Leu 1989: no. 35), and the stamp seal from Tell Qishyon (Ben-Tor 1978: no. S-4; Keel-Leu 1989: no. 20). There is no indication of *tête-bêche* arrangement as found on seal impressions from Megiddo, ʿEn Shadud, and Tel Qashish, and which Ben-Tor regards as the product of a distinctive Jezreel Valley "school" (Ben-Tor 1995: 67–68).

Overall the new Megiddo example fits well in the corpus of small naturalistic seal impressions (Ben-Tor's Class IIA: Animal File [1978: 8–9, 52–57]) and should be dated on the basis of the ceramic fabric and the impression to the late EB I.

Mizpe Zevulun

Mizpe Zevulun (Khirbet el-Mushreifeh, 1697: 2389)[1] is a classic EB "enclosure" site, located on a spur overlooking the western Naḥal Zippori. It is approximately 6 ha in size and is defended on the north, south, and west by heavy fortification walls. Gate complexes are visible on the northwest and the southeast. There are three descending terraces which appear to be

1. Note that the grid references given in Gal 1992: 17 are incorrect.

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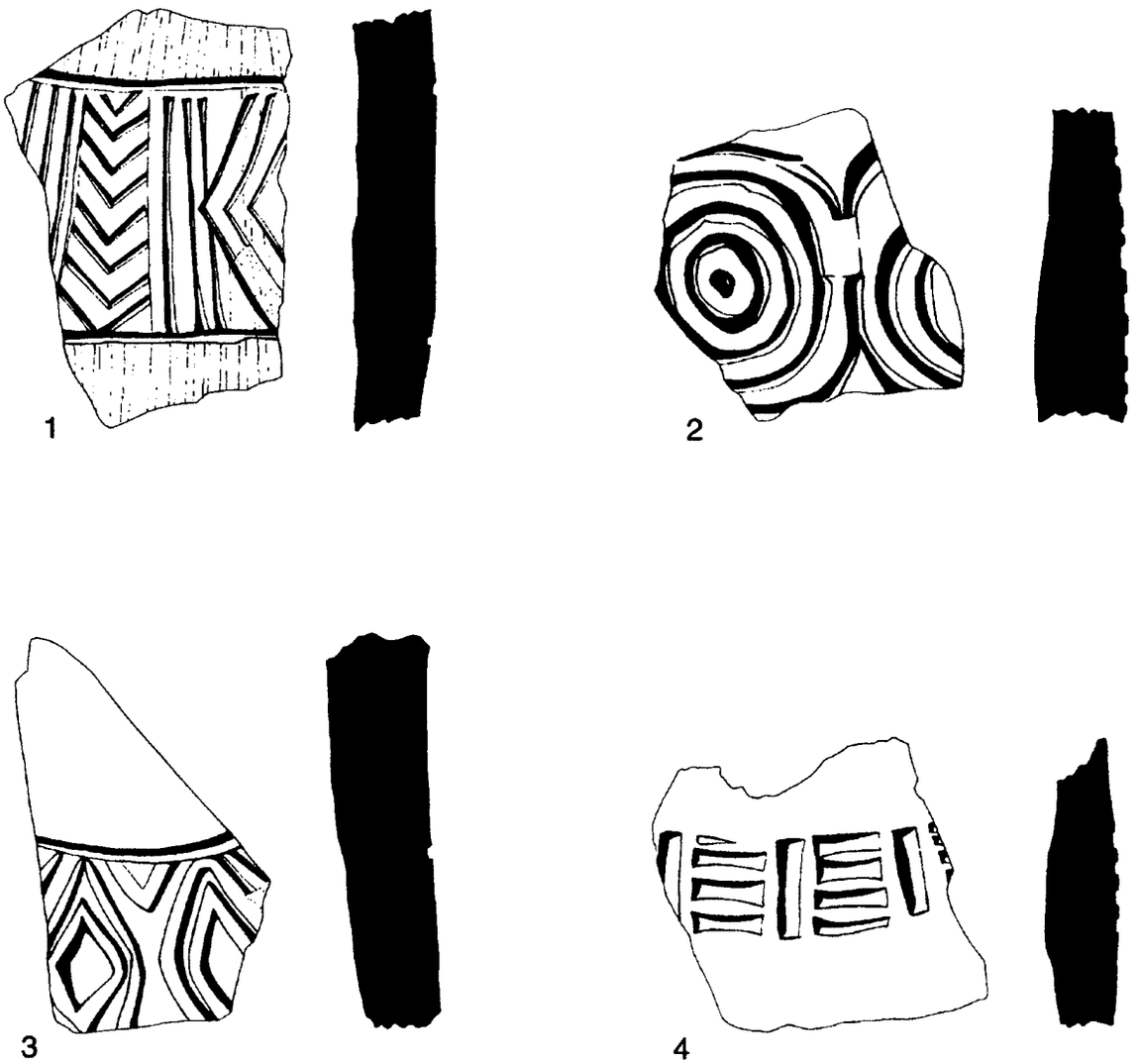

FIGURE 19.2. Seal impressions (reg. 16–23/99/01) from Mizpe Zevulun (Khirbet el-Mushreifeh). Scale 1:1.

separated by fortification walls. The arrangement is uncannily similar to that of Tell el-Fârʿah North, Mitham Leviah in the Golan (Kochavi 1994), Givʿat Rabi near Sepphoris, Mitham Shahal on the Naḥal Tabor (Gal 1988), and other examples in the eastern lower Galilee and western Samaria (Zertal 1993).

The Mizpe Zevulun sealings were discovered on the surface in 1995 during a survey of the western Jezreel Valley, directed by Professors Israel Finkelstein and Baruch Halpern in connection with the Megiddo project. The site had been previously surveyed by Raban (Raban 1982: no. 69) and Gal (Gal 1992: 17), but its true extent had not been realized. In contrast to previous research, the 1995 survey found some EB I and possibly EB III pottery, and an overwhelming predominance of EB II material, especially "Metallic Ware." The four seal impressions (fig. 19.2) and two figurine fragments were discovered roughly in the center of the site.

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Seal impression 1 (fig. 19.2:1) contains a herringbone flanked by three vertical lines, and half of a lozenge, which cuts into the vertical lines, framed by horizontal lines. It is 4 cm wide and 5.5 cm high. The sherd is pink (Munsell 7.5 YR 7/3) and is the shoulder of a medium storage jar. Vertical combing is present above and below the impression.

Seal impression 2 (fig. 19.2:2) contains two concentric circles. It is 3.3 cm wide and 3.8 cm high. The sherd is light reddish brown (Munsell 5 YR 6/4) and is probably the shoulder of a medium storage jar.

Seal impression 3 (fig. 19.2:3) contains two lozenges separated by a triangle above a single horizontal line. It is 3.2 cm wide and 5.5 cm high. The sherd is pinkish gray (Munsell 7.5 YR 7/2) and is the shoulder of a medium storage jar.

Seal impression 4 (fig. 19.2:4) contains two crudely impressed ladders separated by vertical lines. A third ladder may be partially preserved. This impression is 3.7 cm high and 3.9 cm wide. The sherd is light red (Munsell 2.5 YR 7/6). It is probably the shoulder or body of a medium jar.

All four seal impressions are on Metallic Ware, although number 4 has a slightly different surface appearance and contains more visible calcite grits. Numbers 1–3 contain traces of white lime wash, while 4 does not. Combing is evident on Number 1 but might have been present on other parts of the vessels from which Numbers 2 and 3 derive.

Parallels

The Mizpe Zevulun examples have a number of general parallels but few precise ones in the increasingly large Southern Levantine corpus of seal impressions. Overall they fall into Ben-Tor's Class I of geometric motifs (Ben-Tor 1978: 4–8, 47–52).

The herringbone is paralleled on examples from a number of sites such as Tel Dan (Greenberg 1996: fig. 3.40.88, 11), and Shamir (Ben-Tor 1978: IE–3, IE-5). Concentric circles are found on a number of impressions but usually in association with herringbones or rhombuses that frame or connect the circles. It is of course possible that such motifs existed but are not preserved on our sealing. Parallels are found with impressions with full circles such as Tel Dan no. 100091 (Greenberg 1996: fig. 3.41.15), Tel Qashish Qa 81/86 (Ben-Tor 1994: fig. 12), and the half-circles of Bâb edh-Dhrâʿ no. 2947 (Lapp 1989: 3–4, fig. 3). There are also many parallels with the unpublished seal impressions from Khirbet ez-Zeraqun.[2] The use of multiple lines as a divider and the lozenges which use concentric lozenges rather than horizontal or vertical lines as fillers are unusual and lack parallels at present. The ladder motif is found on many impressions, such as IE-6 from Hazor (Greenberg 1997: fig. III.4), but is usually surrounded by other elements. The shortness of the ladders also has no parallel.

Interestingly, the Mizpe Zevulun sealings do not contain any animal, human, or architectural representation similar to examples from nearby Jezreel Valley sites such as Tel Qashish and Givʿat Rabi (Ben-Tor 1992). The Mizpe Zevulun sealings should be dated to EB II–III on the basis of their style and ware. The question of whether they can be dated more precisely is addressed below.

2. I am grateful to Matthias Flender for sharing copies of the unpublished Khirbet ez-Zeraqun seal impressions with me.

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THE FUNCTIONS OF SEALS AND SEALINGS IN THE EARLY BRONZE AGE

Approaching Seals and Sealing

What were the functions of seals and sealings in the southern Levant? Most scholars either state or imply that they are administrative devices used by complex institutions and/or in complex economic interactions taking place over long distances (Ben-Tor 1995: 76). Motifs that include groups of people and structures in particular have been interpreted as representing or belonging to religious institutions (Beck 1976; Ben-Tor 1992; Epstein 1972).

In order to discuss how seals and sealings might have worked in the Early Bronze Age southern Levant, it is useful to review the features of sealing systems. As elements of a visual communication system, seals must contain a limited number of motifs which, while usable in a variety of combinations, still retain sufficient consistency to make them recognizable. Formal variability in size, shape, treatment, and execution may also vary, but not so much as to compromise recognition. The number of repeatable elements may be large, so as to be presentable as a formal syntax, but not so large as to exceed the capacity of individuals or groups working, in the southern Levantine case, without mnemonic devices. As administrative devices sealings serve as "witness to a fact of a legal or administrative nature, elaborated by observing certain set forms which are destined to guarantee its reliability and to give it the force of proof" (Fissore 1994: 340).

What features associated with seals and sealing practices elsewhere are not present in the southern Levant? These can be easily enumerated:

1. There is no writing system, and no other evidence of literacy or numeracy in the form of other mnemonic or accounting systems, such as tokens.
2. There are no bullae in the form of door locks, indicative of sealed installations.
3. There are no bullae that sealed baskets, bags, or other portable items (with the exception of the locally made EB I Egyptian examples from ʿEn Besor, Tel Erani, and the Tel Ḥalif Terrace [van den Brink 1995] indicative of a variety of containers and goods being recorded for transport or storage.
4. There are no caches of bullae or vessel sealings, indicative of temporary or permanent archival activities.
5. There is no practice of countersealing the same object, indicative of information being processed by more than one office or administrator.
6. There is almost no other imagery that extends or complements seal iconography in EB I and none at all in EB II–III.
7. Large EB II and EB III architectural complexes such as Building 3177 at Megiddo, the "Building with Circles" at Beit Yeraḥ, and Area G at Tel Yarmuth, all suggested to be elite residences ("palaces"), storage facilities, or both, have no published seals or sealings at all.[3]
8. There are extremely few excavated examples of seals and sealings from even broad exposures at major EB II and EB III sites, such as at Arad, Tell el-Fârʿah North, Beit Yeraḥ, Tel Yarmuth, and Megiddo.

3. The assemblage from Khirbet ez-Zeraqun and its context remain unpublished.

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9. EB II–III sealings have an extremely limited distribution, primarily the Jezreel, Huleh, and Northern Jordan Valleys, the Galilee, and Northern Transjordan.

These lacunae suggest that southern Levantine sealings have a fundamentally different structure and function from those in the Syro-Mesopotamian, Anatolian, and Iranian worlds (e.g., Alizadeh 1988; Ferioli and Fiandra 1983; Mazzoni 1992; Ferioli and Fiandra 1994; Rothman 1994). Unfortunately, the vast majority of seals and sealings from the southern Levant, the present examples included, were found in either secondary contexts or on the surface. Our ability to reconstruct the use of seals is therefore severely limited. An examination of the motifs of EB glyptic, however, in conjunction with other data gives some indication as to the larger purpose of sealings.

Early Bronze I Seals and Sealings

There are few securely dated EB I seals and seal impressions but many that display a variety of motifs largely oriented toward wild animals and agro-pastoral activities. The splendid stamp seal from Tel Kitan showing two cattle pulling a plow is the most elaborate example of an agro-pastoral scene (Keel-Leu 1989: no. 42). A seal impression apparently depicting a cow suckling a calf was found at Beit Yeraḥ in an EB IV level but is consistent with late EB I styles and ceramics (Bar-Adon 1973; Ben-Tor 1978: no. IIC-3). The "Animal File" and *tête-bêche* arrangement may also depict ovicaprids. These objects find conceptual parallels in other EB I material culture, such as the bowl from Tell el-Fârʿah North containing two yoked oxen (Amiran 1986; de Vaux 1952: 577, pl. LXXXb) and the "laden animal" figurine from Azor (Amiran 1985).

Wild animals, primarily lions and ibexes but also snakes, fish, and a crab, are also common on EB I seals. The most elaborate examples are the impressions from Jericho (Ben-Tor 1978: IIA-1, 2, 3) and a purchased seal in the École Biblique, probably from Byblos (Ben-Tor 1978: IIBb-2). Wild animals, including lions, cattle, and ibex, are also found on the famous Picture Pavement in the courtyard of the Stratum XIX temple at Megiddo (Loud 1948: pls. 275–79), now securely dated to the late EB I period (Joffe 2000b). The long-standing cultic significance of lions and felines is also evident from the Late Neolithic mosaic pavement at the open sanctuary Uvda 6 and other sites in the southern Negev and eastern Sinai (Avner 1984), all the way to the Iron Age, where lions are found on cult stands and an actual skull was found in the temple at Jaffa (Kaplan and Ritter-Kaplan 1993: 656). The carved basalt (or phosphorite) ibex bowl from Cave 134 at ʿEn HaNasiv is an especially beautiful example of EB I art (Amiran 1989; see also Braun 1990; Philip and Williams-Thorpe 1993).

Several seals depict wild and domestic animals together. Seal impression c538 found in Megiddo Stratum XI, but certainly originating in EB I, depicts a horned ox and may include a lion (Ben-Tor 1978: no. IIC-2; Loud 1948: pl. 160:4). Numeira impression 1301 shows a horned animal followed by a lion (Lapp 1989: fig. 7).[4] In contrast, a series of geometric impressions also date to EB I and are localized to the central Jordan Valley, especially Tell Umm Hamad, Jawa, and nearby sites (Helms 1987; 1991b: 110–29, figs. 160–69; 1992:

4. The appearance of animal procession motifs on sherds dated to EB III from Tell el-Handaquq South suggests the survival or imitation of an older style (Chesson 1998: fig. 12).

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fig. 272; Leonard 1992: fig. 22). A possible seal with cross-hatched design carved from a small wadi cobble was found on the surface of Tell el-Handaquq (Mabry 1989: fig. 14.5). The geometric impressions would appear to represent the continuation of Neolithic-Chalcolithic stamp seal traditions (Keel-Leu 1989).

The contrasting animal motifs represent a fundamental tension in the EB I society, between lifeways and perhaps ideologies oriented toward "proto-urban" agro-pastoral activities and those that were more wild. EB I society found itself divided between the lion and the oxen, between subsistence and prestige activities which were rapidly shifting from village to small-scale urban socioeconomic bases. That this tension is captured, however fleetingly, in the glyptic and other art of the EB I reflects the transformational nature of the period. Amiran's persuasive analysis of the ʿEn HaNasiv ibex bowl as an EB I variant of a Chalcolithic shape also supports the idea of significant continuity between the two periods, a conclusion indicated by settlement pattern and other data (Joffe 1993: 36–37, 41–48).

Only the broad outlines of seal distribution in the EB I can be detected at present. Both agro-pastoral and wild animal motifs have been found at the same sites, such as Megiddo, and agro-pastoral motifs have been found at extremely small sites, such as Tel Kitan. The excavated Megiddo examples derive from the domestic area on the slope of the site, while the tell itself was occupied contemporaneously by an extremely large religious complex that has produced no seals or sealings whatsoever. That geometric motifs predominate in the central Jordan Valley may indicate a greater degree of continuity with the Chalcolithic period than elsewhere (Joffe 1993: 37; Joffe and Dessel 1995). But sealings appear on a variety of shapes and sizes of vessels, suggesting that they are not being used as part of a system of administration.

At best we may say that the EB I seals and seal impressions were emblems that might have symbolized emic concepts and visually facilitated communication, not economic contacts. Like other types of the EB I art, they symbolize a selective and idealized view of society, which though increasingly urbanized, still had very little need or capacity for administrative devices.

Early Bronze II–III Seals and Sealings

The practice of sealing in the EB II–III periods is qualitatively and quantitatively different from that of the EB I. First there is a major dating problem to be addressed. While the Metallic Ware tradition clearly begins at the very end of the EB I and overlaps, at least regionally, with the Grain Wash tradition (Esse 1993), the bulk must now be dated to the EB II (Greenberg and Porat 1996). Production of a limited variety of larger storage jars continues, however, into the early part of the EB III prior to the appearance of the Khirbet Kerak tradition. Given that the Mizpe Zevulun and Tel Dan seal impressions come from sites with no appreciable Khirbet Kerak component, a date in late EB II or early EB III seems most likely. The position of Khirbet ez-Zeraqun and its extensive assemblage of sealings in this scheme must await fuller publication. These issues will only be resolved with further radiocarbon assays.

How did seals and sealings function in the EB II–III periods? Once again it must be noted that there are no caches of seals or sealings, although sites such as Tel Dan and Khirbet ez-Zeraqun have produced numerous examples. Vessels were impressed with seals before firing, indicating that the information encoded permanently was known or available at that stage of production. There is a greater degree of repetition and consistency in the geometric and

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representational motifs employed. The human, animal, and architectural motifs have been found at a number of sites ranging from the very small, such as Rosh ha-Niqra, to the very large, such as Beit Yeraḥ.

The strong connection of the sealing with Metallic Ware, and the restricted distribution of the latter, indicate that encoded information was highly localized and highly specific. While Metallic Ware is distributed into the central Levant (Marfoe 1995: 96; Mazzoni 1985, 1987), sealings appear to be restricted to the Jezreel, Huleh, and northern Jordan valleys and immediately surrounding regions. And while a number of sites display similar motifs, such as the "ritual dance," all the examples are made by separate seals. Indeed, virtually all the EB II–III impressions now known, over 200, were made from different seals. Even at sites with large corpora of seals show almost no duplication. Furthermore, no geometric seal impression has been found on any post-EB I southern Levantine vessel in Egypt. This fact also argues for dating sealings later in the EB II after the cessation of Egypto-Canaanite trade. In short, while there was a significant amount of sealing being done, there were not many vessels impressed with the same seal, and sealed vessels were not carried especially far or in significant numbers from one site to another. The geographic extent of known EB II–III sealings is perhaps 80 by 80 km. That they are found almost exclusively on storage jars and pithoi indicates that, if they moved at all, vessels and the commodities they contained traveled only short and medium distances. Petrographic and neutron activation analyses of seal impressions are necessary to determine more precisely the production and distribution patterns of vessels.

If sealings did not play a role in administering long distance trade, what did they do? As noted above, the institutional basis of sealings has been much discussed. Major architectural complexes are becoming better known from all periods of the EB, with "temples" in particular being the focus of much attention (Miroschedji 1993). Were religious institutions separate from political or economic institutions, or were they all one and the same? It has been argued elsewhere that EB II organization was largely communal, with urban elites sharing political, economic, and religious roles (Joffe 1993: 84–87). But by the late EB II and certainly EB III, changes in settlement patterns, the layout of sites, and intrasite architecture all indicate a more centralized and competitive environment. Huge, unequivocal temples appear at Megiddo and Khirbet ez-Zeraqun during the EB III, along with apparently more specialized facilities, such as the Building with Circles at Beit Yeraḥ, and the large "palatial" complex at Tel Yarmuth. In short, late EB II and early EB III see the transformation of the social and economic landscapes of the southern Levant creating new requirements for control of commodities and attendant information.

In the second half of the EB II as Egyptian contacts evaporated, intra- and interregional exchange of commodities, especially Mediterranean crop products, expanded. Local elites, probably urban based, exchanged goods with one another and expanded local control over the rural landscape through control of production, consumption, and exchange of Mediterranean crops. These practices, probably by a variety of competing and increasingly specialized economic, political, and religious elites, culminated in the fully specialized landscape of the EB III (Esse 1991: 98–124; Joffe 1993: 82–86; Rosen 1995). Seals and sealings were another method for local elites, including religious elites with aspirations to become major economic institutions, to control the flow of goods around specific regions and between regions. The proliferation of seals indicates that there were a great number of aspirants, or a great number of local participants, in this system. The reorganization of the landscape coincided with the

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tremendous expansion of Metallic Ware, providing in a sense an increasingly standardized medium for communication and means of exchange. But the system remained highly localized, and institutions never felt the need or achieved the capability to go beyond literally superficial communication. Seals were symbols that marked either producer, distributor, or consumer of the storage vessel and/or its contents and had no further use beyond a single event or transaction. They were in a sense advertisements rather than records of transactions. And once the institutional landscape was fully articulated and centralization intensified around sites, even this amount of information was no longer necessary.

The lack of geometric and representational sealings at Arad, the largest and most important southern site during the EB II, may be accounted for in several ways. First, it was well outside the area of Metallic Ware where most impressions are found. Second, its primary socioeconomic interactions were not with other urban sites but with sedentarizing pastoral nomads in the Negev and Sinai, perhaps even as "urbanism of the nomads" (Finkelstein 1990). Third, Arad might well have been in rapid decline by the time the northern sealing tradition began. Overall, Arad, and the Dead Sea Plain sites which continued into the EB III, had different administrative, organizational, and ideological needs. While the latter sites did employ a few geometric motifs similar to those on Metallic Ware, most were more idiosyncratic (Lapp 1989, 1995).

Seals in Cross-Cultural Perspective

Lerna may provide a hint about the use of seals by highly localized intra-urban institutions, such as the House of Tiles, with specific functions not necessarily related to long-distance trade. Aegean sealing practices provide important similarities and contrasts with those of the Levant. First, only stamp seals are known. Their distribution is also limited, with most sealings deriving from the excavations at Lerna, although several actual seals have been found elsewhere (Heath [Wiencke] 1958; Wiencke 1969; Pullen 1994; Weingarten 1997). But it is in contexts and function that Aegean seals diverge most profoundly from their Levantine counterparts. Stamp seal impressions are used to decorate ceramic hearth rims and vessels (Wiencke 1970; Caskey 1990; Pullen 1994). But at Lerna they are also found on clay bullae uncovered within a corridor room of the House of the Tiles with sealing boxes, jars, and baskets (Wiencke 1969; Aruz 1987: 192–96; Pullen 1994: 43–46). This usage parallels that of earlier and contemporary Mesopotamia, southwestern Iran, Anatolia, and Egypt and indicates an inchoate record-keeping system that is conspicuously absent from the Levant.

Lerna is not the only site with seals and sealings, but it does have the largest corpus (Pullen 1994: 49–50, table 2; Aruz 1994). What was in the various containers being sealed at Lerna? What did the system record: the origins of tribute or offerings received, the ownership of goods being stored, or the destination of disbursements? What is the time span represented? And what is the nature of regional organization? Pullen suggests that the system recorded the contributions of followers to the chief or paramount at Lerna but dismisses the possibility that the seventy separate seals represent items being stored by or for individual groups (Pullen 1994: 45–47, n. 47). In contrast, Wiencke notes that the Lerna sealings were not necessarily administrative or indicative of contents or quality. She believes that the "simplest conclusion is that the different seal designs indicated the providers of goods" (Wiencke 1989: 505). Finally, Weingarten suggests that Lerna was an Anatolian trading outpost employing eastern sealing practices (Weingarten 1997).

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It should be noted that Lerna is only 1.5 hectares in size (Konsola 1990: 469), which makes it an unlikely candidate for an urban site with wide-ranging contacts. It also casts suspicion on the site as the center of a powerful chief, since the resident population was also extremely small. In this respect it resembles Late Neolithic Sabi Abyad (Akkermans and Duistermaat 1997) or Ubaid period Tepe Gawra, both similarly endowed with rich corpora of sealings but with small resident populations (Rothman 1994). Some urban-rural hierarchies existed in Greece, but these were highly localized. No pan-regional pattern of hierarchy is evident. More notable are a handful of large "corridor houses" (Shaw 1990), lacking any storage facilities, mostly at coastal sites with little other evidence of significant social differentiation (Wiencke 1989). The conclusions here can only be that intraregional integration was uneven, and interregional integration sporadic, at best. The Early Helladic sealings should therefore be interpreted in a minimalist fashion: at best as precocious but highly localized efforts at administration, token gifts given in patron-client relationships, or more likely as lower order signs of personal identification within a framework of communal storage and ritual activities.[5]

The lack of bullae or record-keeping indicates that southern Levantine sites did not move goods, secure facilities, and process information at the same level as sites in regions to the north. Whether or not the sealed vessels represent gifts to institutions or from institutions is one major outstanding question, which could be partially addressed by analyzing the ceramics and their sources. The individuals and institutions sealing vessels apparently had no need for more complex information, such as quantitative or volumetric data, probably lacked the ability to process such information, and rarely executed transactions over distances of more than a few dozen kilometers. But the apparent success of sealing on pottery at EB IV Ebla (Mazzoni 1992) indicates that the method itself was useful, provided that the institution needed and was capable of processing information encoded in such a manner.

The EB II–III sealings in the southern Levant should be interpreted in a minimalist fashion, as efforts to encode limited quantities of information on highly specific types of commodities that traveled only short and medium distances. Sealing was a system that served as an ideological statement as much as administrative information. When the ideology and organizations that sealings supported was fixed and the environment transformed, other means of ideological maintenance and administration became necessary.

SEALS AND FOREIGN CONTACTS DURING THE EARLY BRONZE AGE

Foreign iconography in EB glyptic has been extensively debated, but the significance of motifs alleged to be foreign, the conditions of their adoption, and possible routes and mechanisms of transmission have not. This review proceeds chronologically.

Early Bronze I

The question of southern Levantine contacts with the north during the EB I has been discussed by several authors, most notably Hennessy, Amiran, and Ben-Tor (Amiran 1970; Ben-Tor 1985, 1986, 1989; Hennessy 1967). Relations with Egypt are of course well documented, but their precise nature remains a topic of debate. Ben-Tor has discussed in a number

5. See generally Rutter 1993.

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of publications what he sees as widespread Mesopotamian and Iranian influences on the EB I southern Levantine seal iconography and practices. Other scholars such as Beck and Lapp have similarly stressed these influences (Beck 1975, 1976, 1984; Lapp 1995). Interestingly, the discussion by a Mesopotamian glyptic specialist, Beatrice Teissier, concludes that Mesopotamian and Iranian motifs were used haphazardly in southern and northern Levantine glyptic, suggesting little or no understanding of the iconographic vocabulary (Teissier 1987). Several of her points may be repeated and amplified.

First, it must be recognized that the cylinder seal is a Mesopotamian innovation of the (Middle?) Uruk period which increased the ability of an impression to contain information and complemented existing administrative systems based on stamp seals and tokens (Nissen 1977: 16; Pittman 1994: 25). The adoption of the cylinder seal in Syria and the Levant built on preexisting carved bead and stamp seal traditions and was strongly related to the contacts between Uruk settlements along the Euphrates River and in Egypt in the mid to late fourth millennium. These contacts, although probably small-scale, were of enormous significance for Egyptian political iconography.[6] But the evidence for Uruk material culture in the southern Levant is virtually nil. Locally made bent-spout vessels (Amiran 1970, 1992) and some Uruk-like pottery at the Eastern Desert site of Jawa (Helms 1991a)[7] are the only tenuous evidence for northern contacts during the EB I. With one possible exception (ʿEn Besor [Ben-Tor 1976]), there are no southern Levantine seals or impressions that can be argued to have been imported from Mesopotamia or Iran, while there are a number of examples at Byblos and in north Syria that may be imports from the Uruk settlement sites along the Euphrates (Teissier 1987: 40–41). Thus, while the concept of the cylinder seal seems to have arrived in the southern Levant either directly from the north or via Egypt, there are few other data to provide a context for this "influence."

Second, there is the matter of glyptic styles. Animal motifs similar to Iranian examples prevail in southern Levantine glyptic, but as noted above these build on both the local stamp seal tradition and particular local iconographic and ideological conditions. The most distinctive Iranian motifs—such as animal protomes, griffins, animals on snakes, rosettes entwined by serpents, lions attacking quadrupeds, and birds perched on animals—are very rare in the southern Levant, especially during the EB I. Far more common are *tête-bêche,* a device rather than a motif, animals with extra-long goatees, three pronged tails, five legged animals, and exaggerated curved horns (Teissier 1987: 43–45). Given the agro-pastoral economy of the Early Bronze Age, we may ask whether these motifs are simply local innovations rather than foreign imports. Most of these motifs are also common to earlier stamp seal traditions of both Iran and Syria (see generally von Wickede 1990) and the stamp seal traditions of Anatolia (Aruz 1992) and the Levant. The most distinctive Uruk, Jemdet Nasr, and Early Dynastic scenes are conspicuously absent, including scenes of battle, manufacturing, such as weaving and potting, contests, and banquets (see generally Brandes 1979).

6. See Boehmer 1974a, 1974b, 1991a, 1991b; Boehmer, Dreyer, and Kromer 1993; Moorey 1990, 1995; Sievertsen 1992; Smith 1992; von der Way 1992; 1993: 67–75; Mark 1998; Hendrickx and Bavay forthcoming; Joffe 2000c.

7. The dating of Jawa and its pottery is problematic. The "Uruk" elements may, in fact, be slightly later than even the second phase of expansion proposed in the new chronology. See McClellan and Porter 1995; Philip 1995.

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Teissier concludes that "traits characteristic of Iranian glyptic are less common in Palestinian glyptic than those found in sites in the Lebanon and Syria. What can be detected is more likely to have been derived from the north than received second hand from Egypt" (Teissier 1987: 47). She goes on to state that in Syro-Palestine "motifs were absorbed into glyptic art only . . . stripped of their context and used singly" (Teissier 1987: 49). The route of transmission for these motifs to the Levant and Egypt appears to have been via the Uruk period settlements on the Euphrates.[8]

That complex Uruk institutional imagery with a rich iconographic vocabulary is paralleled by only limited animal motifs in the contemporary EB I southern Levant indicates that the southern Levant received nothing directly from the Syro-Mesopotamian world and comprehended less.

Early Bronze II–III

The question of southern Levantine contacts during the Jemdet Nasr and the Early Dynastic periods raises other problems. Does any other evidence exist to suggest late fourth and early–mid-third millennium contacts between the southern Levant and Syro-Mesopotamia? Despite extensive excavation and study, little can be cited besides model beds (Beck 1993; De Cree 1987–88), decorated bone tubes (Zarzecki-Peleg 1993), and most recently a burial at Tell Assawir containing north Syrian pottery (Yannai 2000). Glyptic style and practices comprise the only other evidence. The matter of Khirbet Kerak ware and related material dating to EB III requires separate discussion and has no (clear) bearing on the questions raised here.

The relationship of geometric and representational motifs on southern Levantine and Greater Mesopotamian glyptic has been approached in a way that emphasizes specific motifs rather than the larger iconographic vocabulary and contexts of use in either region. The Early Dynastic period "piedmont" or "geometric International style" (Collon 1987: 20) has recently been discussed by Pittman (1994), who refers to it as the "glazed steatite style." This style is distributed from western Iran to Syria, primarily in peripheral regions surrounding the Mesopotamian basin. The similarities between this widely distributed style and the glyptic of the southern Levant have been long pointed to as evidence for early third-millennium contacts with Mesopotamia. The sealings on vessels from Tell Gubba in the Hamrin Basin have recently been cited as showing practices similar to those of the southern Levant and by implication some organic relationship between the two regions (Ben-Tor 1995: 71; Esse 1990: 31–32; Ji 1988).

The southern Levantine use of several motifs such as concentric circles, lozenges, and chevrons do indeed echo the "piedmont" or "glazed steatite" style (Collon 1987: 23). Without any evidence of imports or other contacts, however, it is difficult to reconstruct a mechanism for transmission. A closer examination of the style in Greater Mesopotamia may yield some insights on its use and possible conditions of transmission. Pittman has suggested that the "glazed geometric style" motifs are at least partially related to signs in the proto-Elamite script, which was emerging at precisely this time. The presence of these motifs on seals in the piedmont suggests proto-Elamite activities in central Mesopotamia (Pittman 1994: 260–61). Matthews disagrees, noting that geometric motifs are found on earlier Uruk sealings (D. Matthews

8. Teissier's conclusions on the Iranian elements of Levantine glyptic also agree with those of Algaze and Moorey on the role of Susa in the Uruk expansion (Algaze 1993; Moorey 1990, 1995).

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1997: 79–86). Both scholars agree that the style and motifs must be seen in the context of Uruk–proto-Elamite interaction.

Rather than seeing the seals as elements of a commercial network, however, Pittman believes that the style might have emerged as a way of visually mediating between two or more language groups (Pittman 1994: 261–62). She also draws parallels with the Jemdet Nasr and Early Dynastic I city seals that apparently relate to specific items exchanged between Mesopotamian cities named on the seals (R. Matthews 1993; Pittman 1994: 262). In both cases geometric motifs complemented other forms of visual communication to facilitate contacts between diverse units. D. Matthews (1997: 84–85) notes that the function of the seals differed in the core areas of glazed (or, as he prefers, fired) steatite glyptic of southwestern Iran, southern Mesopotamia, the Hamrin, and at Nineveh; central administration, ritual contexts, on vessels, and on containers, respectively. The degradation of meaning is apparent over space, as well as over time.[9]

In the absence of long-distance trade networks, local exchange of commodities served as means for down-the-line transmission of motifs. The presence of geometric motifs on sealings served as a form of visual communication, originally based on proto-Elamite forms, which facilitated local interaction along the eastern and northern peripheries of Mesopotamia. From there the motifs, increasingly few in number and without their original symbolism and steatite technique, eventually reached the Levant some centuries after their original diffusion. Whether or not the original intent of the motifs was intact is unknowable, but the simplicity and local effectiveness of sealing pottery with geometric motifs could be relearned or reinvented at each step along the way. In the southern Levant the style, now reduced to a bare handful of motifs, fell on fertile ground (cf. Mazzoni 1993; Flender in Finkbeiner 1995).

The use of architectural facades, animals, masked humans, and other devices raises other problems since these are sometimes suggested to be in direct imitation of Greater Mesopotamian practice (cf. Ben-Tor 1992: 164). These raise again the problem of Early Bronze Age religion and cult. Two problems should be separated. The first is whether religious institutions existed and were socioeconomic entities during the EB II and III periods. The evidence of temples during this period is clear, although it must be noted that no significant associated storage installations have been detected at Megiddo, Khirbet ez-Zeraqun, Ai, Arad, or Tell Yarmuth. This may simply be an accident of excavation. Suggestions as to how such institutions might have used sealings as visual advertisement is offered above. A second and critical question is whether southern Levantine religion and cult were at all related to or modeled after Mesopotamian practice. Amiran (1962, 1972a, 1972b), for example, has long suggested that specific Mesopotamian deities such as Dumuzi were worshipped in the southern Levant, and that this unity of beliefs goes back into the Neolithic.

9. A parallel may be drawn with the third millennium "Intercultural Style" of carved steatite bowls, distributed widely from the Indus Valley and eastern Iran to Greater Mesopotamia and containing complex representational iconography. Most studies have stressed the role of chlorite vessels as commodities in complex interregional and international exchange mechanisms (Kohl 1978, 1982). Recently, however, Lamberg-Karlovsky has reexamined the data and suggested instead that the vessels were highly symbolic objects relating to death and burial and whose motifs united widely divergent groups that shared similar beliefs and ideologies (Lamberg-Karlovsky 1988, 1993).

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If it was indeed the case that a set of beliefs and practices was common across western Asia from prehistory onward, we are presented with possible explanations for the motifs on cylinder seals that appear to depict Mesopotamian cultic scenes, such as masked individuals, temple facades, and processions of animals. One possibility is that specific motifs and their meanings were indeed transmitted to the southern Levant, although as noted above, complementary evidence is lacking. A second possibility is that an underlying matrix of pan-western Asian beliefs provided a similar background for religious iconography in Mesopotamia and the southern Levant. These concepts, including the same basic pantheon, cosmology, and cosmogony, manifest themselves in parallel iconography when similar social conditions developed in each area. Given that religious and cultic scenes in the southern Levant never duplicate entirely Mesopotamian iconography but appear to use only isolated or singular motifs, this latter suggestion may be more reasonable.

Motifs such as the "ritual dance" (groups of people holding hands in front of buildings) have only conceptual parallels on Mesopotamian glyptic. Other iconographic elements suggested as importation—such as the use of masks—are well attested in the Levantine Neolithic, while specific motifs such as masked individuals seated before structures echo Chalcolithic iconography—evident, for example, on Ghassul wall paintings. In other words, southern Levantine iconography could be a local and parallel development. In the absence of clear and demonstrable archaeological evidence for early third-millennium contacts and cultural transmission between Mesopotamia and the southern Levant, the deep common roots of the two areas may suffice to explain most iconographic parallels.

The similarities between southern Levantine sealing practices and those at Lerna have also been frequently cited (Ben-Tor 1995: 74–75; Wiencke 1970; see generally Aruz 1994). The Early Helladic IIA period, or Korakou culture, and Lerna III specifically should now be dated to ca. 2500–2400 B.C. (Manning 1994: 186), some two centuries after the beginning of the Levantine EB III. If southern Levantine motifs and techniques current in late EB II and early EB III indeed reached the Argolid, several possibilities are raised. The first is that they arrived in Greece ca. 2700 B.C. but could not be effectively employed until much later. The second is that contacts were sporadic and that information regarding seals and sealings did not arrive until Early Helladic II. A final suggestion is to see the Lerna practices indirectly inspired by areas increasingly remote from the southern Levant: EB Byblos, EB IVA Ebla (Mazzoni 1992), the Syro-Anatolian traditions of sealing bullae, and the increasingly attested practice of sealing vessels, such as at Late Uruk Hassek Höyük (Behm-Blancke et al. 1981: 24–28; Behm-Blancke 1993) and EB Jerablus-Tahtani (Peltenburg et al. 1996: 5–6, fig. 4; Peltenburg et al. 1997: 4, fig. 3). Overall, the internationalism of the mid-third millennium provides a better context for Aegean-Levantine contacts than the more insular world of EB II (Joffe n.d.).[10]

CONCLUSIONS

The Megiddo and Mizpe Zevulun sealings are, respectively, typical and atypical examples of Southern Levantine glyptic in the EB. While glyptic art was, in a most attenuated fashion, related to larger Western Asian styles, the motifs and practices were particularly attuned to

10. See also Broodbank 1993; Agouridis 1997.

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local ideological and organizational needs. That these features in the southern Levant differed dramatically from those in contemporary large-scale societies points again to the importance of understanding local, small-scale complexity first its own terms and then in comparative perspective.

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THE COLLARED PITHOS IN CONTEXT: A TYPOLOGICAL, TECHNOLOGICAL, AND FUNCTIONAL REASSESSMENT

Ann E. Killebrew

The collared pithos has attracted the attention of many scholars and archaeologists for nearly seventy years, largely owing to its reputation as a container associated with the emergence of Israel during the Iron I period (e.g., Finkelstein 1988: 275–85; Esse 1991, 1992; Wengrow 1996). However, though it is one of the most discussed vessels appearing in the ceramic assemblage of ancient Israel, its significance is still poorly understood. This paper, dedicated to the memory of Douglas Esse and in appreciation of his ground-breaking articles (Esse 1991, 1992) on the collared pithos, attempts to reexamine its significance in the archaeological record. Two sites where collared pithoi have appeared, Beit Shean and Giloh, are showcased here as representing two different phenomena associated with the appearance of this vessel. A typology is proposed for the collared pithos, and an examination of its context and provenience is summarized with the goal of reaching several conclusions about its development, modes of production, and function from its earliest appearance at the close of the Late Bronze Age (LB) through its floruit in the Iron I period.

The collared pithos was first defined as a specific ceramic type by Kjaer (1930), who described it as a storage jar whose rim was folded over with a ridge in low relief at the base of the neck. This ridge is the characteristic feature that later inspired the term "collared storejar" applied to this pithos.[1] Most of the discussion surrounding the collared pithos has focused on whether these jars can be used as "ethnic" indicators or "type fossils" of premonarchic Israelites (see, e.g., Albright 1940: 548; London 1989a; Esse 1992). Several studies have traced the geographic distribution of the collared store jars in general (Ibrahim 1978; Mazar 1981: 27–31; Finkelstein 1988: 281–82; Ji 1995: 136–38; Wengrow 1996: 312–16). They have been found in large quantities during the Iron I period in the central hill country;[2] in

1. W. F. Albright (1934: 12) was the first to coin this term. The name, *collared store jar* or *pithos*, is an unfortunate term resulting in a great deal of confusion regarding this vessel type. Several scholars have misunderstood this term as applying to the "collar-shaped rim" (e.g., Callaway 1969: 8–9; Wengrow 1996: 307), rather than the ridge at the base of the neck. It should also be noted that most pithoi of LB and Iron I periods have a "ridge" at the base of the neck. Thus, this feature is not distinctive enough to be used to characterize these pithoi. In order not to further confuse the issue, I have followed the conventional designation for this vessel; however, I prefer the term *collared pithos* rather than *collared rim pithos* since the former more accurately describes the feature after which these pithoi were named.

2. See, e.g., Manasseh: Zertal 1991: 35–36; Mount Ebal: Zertal 1986–87: 134–36; Shiloh: Kjaer 1930: 97–104; Buhl and Holm-Nielsen 1969: pls. 15, 16: 190, 191, 192; Finkelstein 1988: 220–27; Finkelstein, Bunimovitz, and Lederman. 1993: figs. 6.48:1, 2, 4; 6.49:3, 4; Northern Ramat Manasseh ʿEn Ḥagit: Wolff 1998: fig. 3; Bethel: Kelso 1968: pls. 56, 57:1–5; Tell en-Nasbeh: Wampler 1947: 5; pl. 2:16–23, 26–28; Tell

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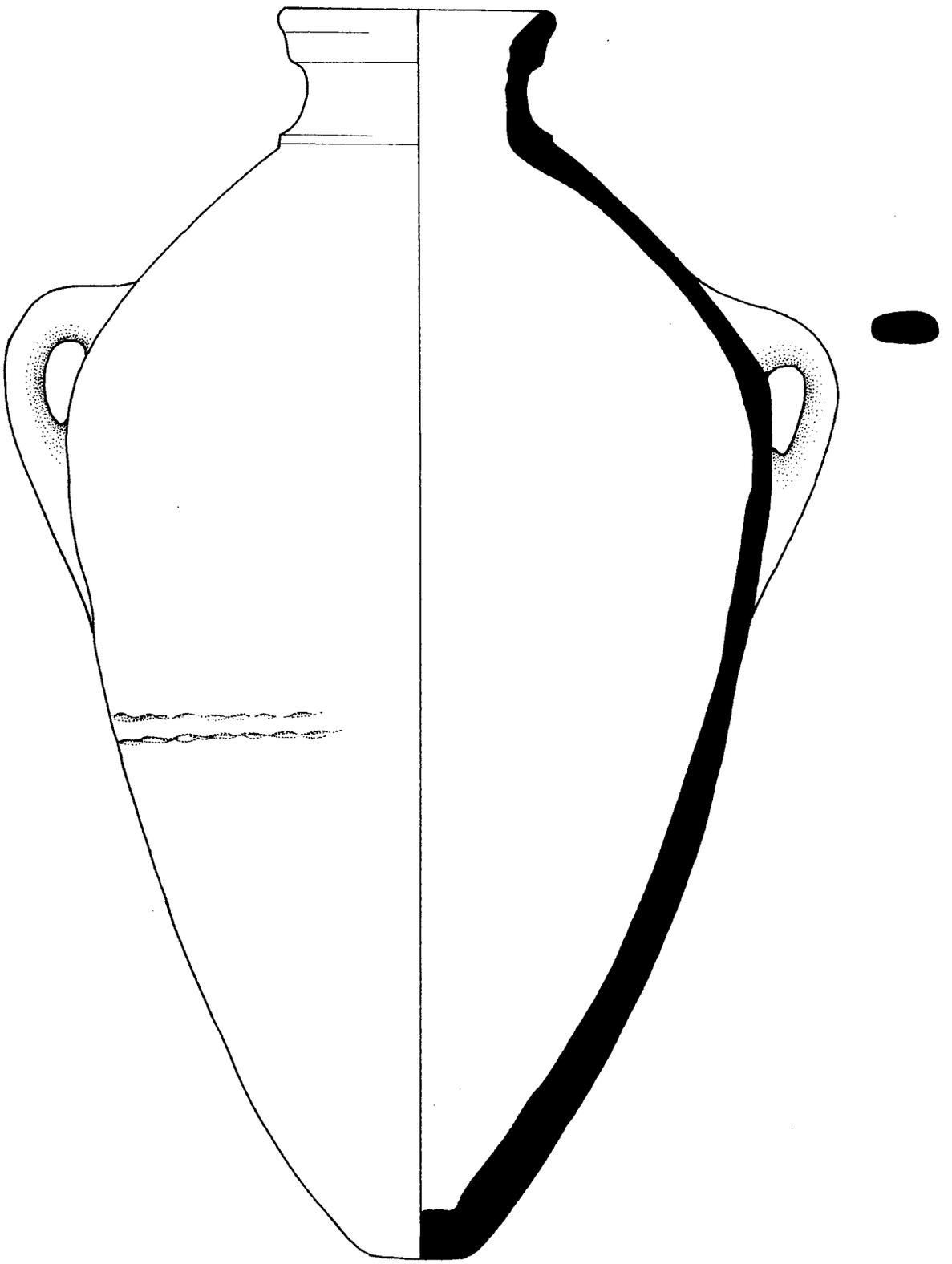

FIGURE. 20.1. Collared Pithos Type A from Beit Shean (scale: 1:5).

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large to moderate numbers in Transjordan;[3] in smaller quantities in the Upper Galilee[4] and the Jezreel Valley;[5] and only occasionally on the coastal plain[6] and Shephelah.[7] Recently, it has become clear that this jar made its debut in modest numbers already at the end of the LB IIB period at several sites along the coast[8] and in the Jezreel and Jordan Valleys.[9]

TYPOLOGY

The large storage container, or pithos, is a shape known from the LB II period in the region of Canaan north of the Jezreel Valley; until the end of the thirteenth century, pithoi are virtually unknown south of the Jezreel Valley. In southern Canaan, only the smaller storage jar—the so-called Canaanite storage jar—measuring some 50 cm in height, was used as a storage container. The collared pithos makes its initial appearance at the close of the LB. It is twice as tall as contemporary Canaanite storage jars, measuring 1 m or greater in height. The defining

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el-Ful: Sinclair 1960: 16–18; pl. 20:2–17; Khirbet Raddana: Callaway and Cooley 1971: 11; Ai: Callaway 1969: 8–9; fig. 8; 1980: fig. 154; 155:1–13; Giloh: Mazar 1981: 27–31; fig. 9; pl. 5A, B; 1990: fig. 5; Beth Zur: Funk 1968: 44–47; figs. 7, 8:21–29; pls. 21, 22a. The collared pithos appears in much smaller quantities at Khirbet Rabud: Kochavi 1974: fig. 5:12 and Izbet Ṣarṭah (on the western fringe of the hill country): Finkelstein 1986: 77–84, Type 21.

3. See, e.g., Ibrahim 1978, Ji 1995: 122–26, Wengrow 1996: 315–16 and Herr, this volume, chap. 14 for a general overview of the distribution of the collared pithos in Transjordan. Numerous fortified settlements in the Transjordanian highlands dated from the thirteenth/twelfth to twelfth centuries B.C. contained notable quantities of collared pithoi; see Herr 1991, e.g., fig. 8.9:1; Herr et al. 1991: 159 [Field B, Phase 11], figs. 5, 6, which discuss in detail collared pithoi at Tell el-Umeiri. Large pithoi similar to our Pithos Type A also appear as far south as Edom: Weippert 1982: figs. 6:9, 8:9 for two pithoi fragments that are not clearly "collared"; Bienkowski 1992: 167, who dates the pithoi from Buseirah and Tawilan to the seventh century, while Finkelstein 1992a; 1992b: 171 suggests an Iron I date.

4. See, e.g., Dan: Biran 1989: Stratum VI: figs. 4.16:8, 4.18:6–8, 4.22, 4.23; 1994: Stratum VI: Ill. 92; Stratum V: Ill. 95; Hazor, Stratum XII: Yadin et al. 1961: pl. CLXVII:1–7, 9–11 for rims that are similar in shape to the rims on the collared jars; Yadin et al. 1989: 29 note that these jars "are also related to Albright's collared type"; see Yadin et al. 1961: pl. CLXVIII: esp. 9–11 for rim profiles similar to our collared pithos Type A from Beit Shean. Sasa: Bahat 1986: 100: no. 1; Golani and Yogev 1996: 51; fig. 6:4; Stepansky, Segan, and Carmi 1996: 68; fig. 7:2.

5. See, e.g., ʿAfula: Dothan 1955: Stratum IIIA: fig. 11:25; Stratum IIIB: fig. 16:4; Megiddo, mainly Stratum VIA: see, e.g., Loud 1948: pl. 83:4; and possibly a few from Stratum VII; see Esse 1992 for a summary of the evidence; Qiri: Ben-Tor and Portugali 1987: Stratum VIII: Photos 38–41; Hunt 1987: 200; fig. 36; southern edge of the Jezreel Valley: Tanaach: Rast 1978: 9–10; figs. 4:1, 9:1, 10:1, 3, 4.

6. See, e.g., Tell Keisan: Niveau 9c: Briend and Humbert 1980: pl. 68:1, 2, 2a; Tel Mevorakh: Stern 1978: 68–69 (tenth century date); fig. 19:4; Qasile: Mazar 1985: 57–58.

7. Beth Shemesh: Grant and Wright 1939: 129; Tell Beit Mirsim: Albright 1932: 59; pl. 26:18.

8. Nahariya: Yogev 1993: 1088–89; Tel Nami: Artzy 1993; 1994: 127–28; in press; Tel Zeror: Ohata 1970: pl. 56; Aphek: Beck and Kochavi 1985: fig. 5:1.

9. Beit Shean, Stratum VII: James and McGovern 1993: figs. 23:2, 4; 32:4; Megiddo: see Esse 1992: n. 47 who states there is at least one pithos Type A attributed to Stratum VIIB; ʿAfula: Stratum IIIB: see Dothan 1955: 38–41 for a description of pottery found with the collared store jar rim including Cypriot imports; Tell es-Saʿidiyeh: Tubb et al. 1996: Stratum XV: fig. 20.

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characteristic features of this pithos with two handles include the raised ridge at the base of the neck and the wide variety of rim and body profiles.

Several attempts have been made to trace a typological and chronological development. Scholars such as Kelso (1968: 63) and Rast (1978: 9) divide the collared pithoi at Bethel and Taanach into two main types—tall-necked jars and short-necked jars. Other proposals for a typological division of collared pithoi include Callaway (1969: 8–9), who posits that the length of the folded rim has a chronological significance, concluding that the longer fold of the rim is earlier in date while the shorter folded rim is later, unrelated to the length of the neck.[10] A different approach is suggested by Finkelstein (1986: 77–78; Finkelstein, Bunimovitz, Lederman 1993: 159), who distinguishes between "thick" and "thin" rims and concludes that the thickened rim type seems to be earlier in date. However, due to the great variety of rim forms that appear contemporaneously (as noted by Mazar [1981: 28–29] at Giloh and by M. Artzy [pers. comm.] at Tel Nami), it is doubtful that a typology can be developed based on rim profiles (also see Wampler 1947: 4, who also notes the great variety of rims and the difficulty in establishing a typological sequence for these jars).

I follow the typological differentiation based on neck height, as first suggested by Kelso and Rast. I divide the collared pithoi into Types A and B, based on general morphological features of the entire rim and neck and on an analysis of their chronological and stratigraphic appearance in the archaeological evidence. These two main groups are based on a survey of published collared pithoi and use of one complete example from Beit Shean and one from Giloh to illustrate the two main types. Both collared pithoi types share basic morphological characteristics, including a piriform-shaped body profile, with two handles on the shoulder, and a raised "collar" at the base of the neck. The distinguishing feature in this typology is the length of the neck measured from the collar to the top of the rim. Collared pithos Type A has a neck measuring about 10 cm or greater in height, while Type B has a shorter neck, less than 10 cm high, usually measuring from 5.0 to 7.5 cm. This feature appears to be chronologically significant and may reflect the typological development of this pithos.

Collared Pithos Type A (fig. 20.1)

Collared Pithos Type A from Beit Shean was recovered from a large public structure in Area NA (Building B) assigned to Level VII.[11] This building was probably part of a large late thirteenth–early twelfth century B.C. New Kingdom Egyptian fortress overlooking the Jordan Valley and was destroyed by a conflagration, undoubtedly fueled by the large quantities of grain that were discovered in a carbonized state during its excavation. The complete collared pithos was found in the doorway connecting two rooms, together with several Egyptian-style bowls, an Egyptian-style cooking pot, two imported Egyptian vessels, an imported Cypriot White Slip II bowl, and several Canaanite-style kraters and storage jars. This stratum has been dated to the very end of the LB II or early Iron I period (Mazar 1993a, 1993b, 1994a, 1997a, 1997b).

10. This typology is based on Callaway's confusion with the term "collar," which he understood to refer to the folded rim rather than to the ridge at the base of the neck.

11. I would like to thank Professor Amihai Mazar and the Beit Shean Expedition for allowing me to publish this pithos from Area NA.

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The collared pithos excavated in this context is characterized by its tall neck, measuring 10 cm in height. The everted rim with a stepped molding on the container from Beit Shean is similar in concept to rims on LB northern pithoi found in great numbers at Hazor (Yadin et al. 1960: pl. CXLV:3–5; 1961: pl. CCXCVIII:8, 9; note that Rast [1978: 9, fig. 1:1] also comments that a tall-necked collared pithos rim from Taanach is reminiscent of Late Bronze II pithoi from Hazor).

The tall-necked collared pithos Type A appears in noteworthy quantities at the fortified site of Tell el-ʿUmeiri (Herr et al. 1991: figs. 5:5, 6, 7, 10; 6:1, 2, 3, 6, 7; Herr 1997: 237–38; see, e.g., figs. 4:14; 4:19:5–8; 4:20:1–3, 5–7); however, smaller numbers of short-necked collared pithoi Type B also appear together with Type A. Tall-necked collared pithoi are also known from late thirteenth century contexts at Tel Nami (Artzy, pers. comm.), Iron I levels at Hazor (Stratum XII: Yadin et al. 1961: pl. CLXVIII: especially nos. 9–11), and one possible example at Taanach (Rast 1978: fig. 1:1). Type A appears in much smaller quantities than Type B, and stratified examples date to the end of the LB and early Iron I period. It has been recovered mainly in the Jezreel Valley, northern Canaan, and Transjordan. Noteworthy is its apparent absence at central hill country sites.

Collared Pithos Type B (fig. 20.2)

Giloh, located in the modern neighborhood of that name, southwest of Jerusalem, is exceptional because of its barren, waterless terrain and remote location from the main route traversing the central hill country. It is one of a handful of early Iron I (late 13th/12th centuries B.C.) sites located in the vicinity of Jerusalem and has been interpreted as a fortified herdsman village (Mazar 1981, 1990, 1994b). I have selected Giloh as a type site because of its distinctive ceramic repertoire, consisting mainly of collared pithoi (33.7%), storage jars (16.6%), cooking pots (22.6%), open vessels (9.4%), and small closed vessels (11.8%) (Mazar 1994b: 88), which is characteristic of other small rural sites in the hill country.

All collared pithoi recovered at Giloh belong to Type B. These pithoi display a great variety of rim profiles and do not appear to demonstrate any chronological significance (Mazar 1981: n. 37 for comparative material to the Giloh rim profiles). The overwhelming majority of excavated collared pithoi belong to this general group, especially from sites in the central hill country such as Mt. Ebal (Zertal 1986–87, see, e.g., figs. 12:1; 13:1; 16:8, 13), Shiloh (Finkelstein, Bunimovitz, and Lederman 1993: figs. 6.48:1, 2, 4; 6.49:3, 4; 6.51:1, 4, 6), Ai (Callaway 1980: figs. 150:17–28; 154), Bethel (Kelso 1968: pls. 56; 57:1–5), Tell en-Nasbeh (Wampler 1947: pls. 1:1, 3–11; 2:12–22), Tell el-Ful (Albright 1924: pl. XXVIII:17–24; Sinclair 1960: pl. 20:10–18), Jerusalem (City of David: Steiner 1994: figs. 4–6); Emek Repha'im: Edelstein and Milevski (1994: 19–20, fig. 12:1–2), and Beth Zur (Funk 1968: fig. 7). It is also the most popular type at Dan Strata VI and V (Biran 1989: figs. 4.1:2–5; 4.16:8; 4.18:6), Megiddo Stratum VI (Schumacher 1908: pl. XLVI: d; Loud 1948: pl. 84:1, Jar 120 and pl. 84:4, Jar 122, which according to the excavators appear in Strata VIIB–VI; Esse 1992: fig. 3:1), Ta'anach periods IA–B (Rast 1978: figs. 4:1; 9:1; 10:1, 3, 4), ʿEn Ḥagit (Wolff 1998: fig. 3), ʿIzbet Ṣarṭah (Finkelstein 1986: fig. 9:1, 3, 4), Tell es-Saʿidiyeh (Tubb, Dorrell, and Cobbing 1996: fig. 20), and Deir ʿAlla (Franken and Kalsbeek 1969: fig. 47:1–2; 1992: fig. 5–16:26). Collared pithoi Type B also appear alongside collared pithoi Type A at Tel Nami (M. Artzy, pers. comm.) and Tell el-ʿUmeiri (e.g., Herr et al. 1991: fig. 6:5).

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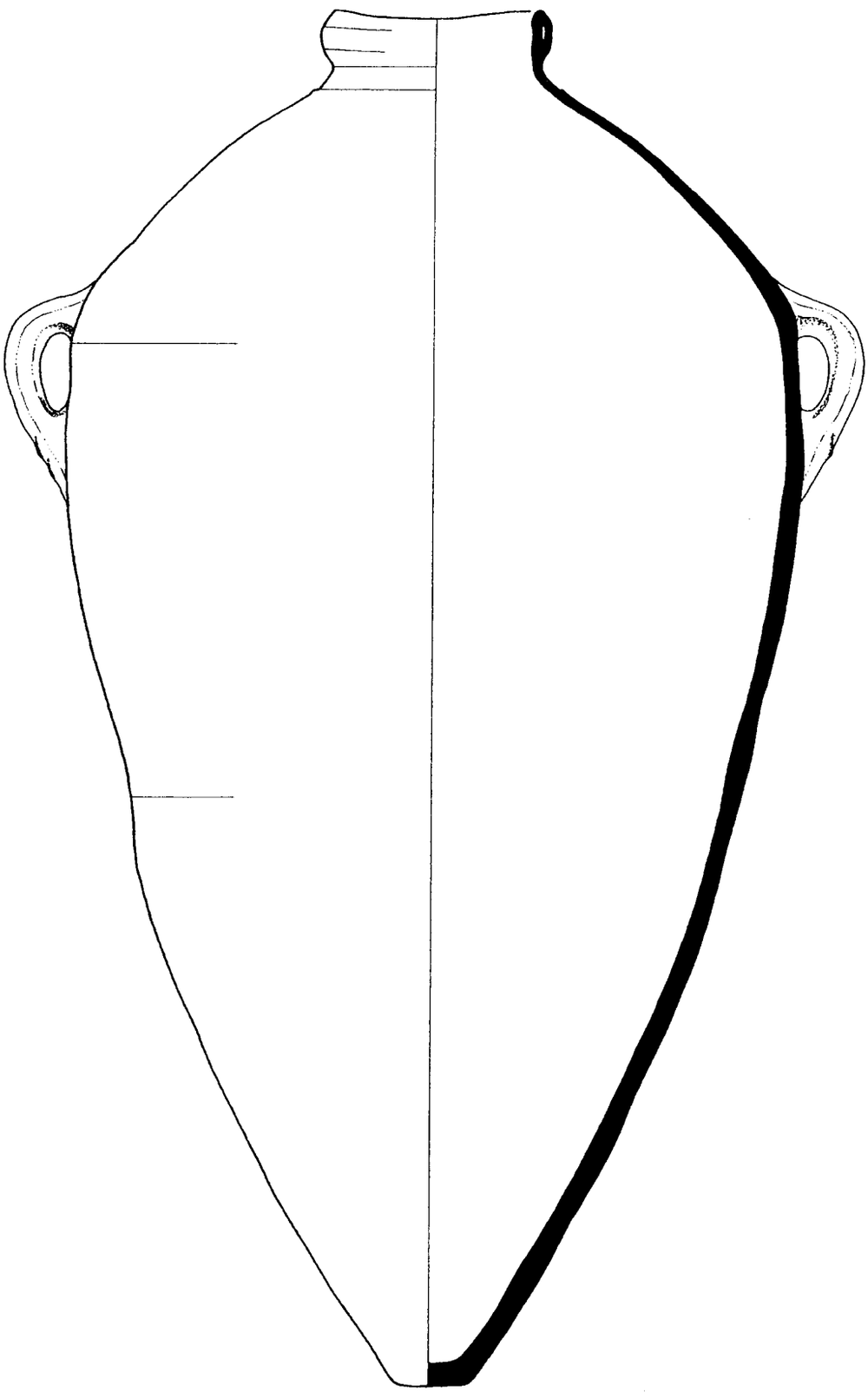

FIGURE 20.2. Collared Pithos Type B from Giloh (scale: 1:5; after Mazar 1990: fig. 5).

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Type B collared pithoi have a long life-span, appearing from the end of the LB, reaching their peak of popularity during the Iron I, and continuing into the Iron II period. They are found in large numbers in the central hill country and in several regions of Transjordan (especially the Madaba Plains), with smaller numbers appearing in the Jezreel and Jordan valleys, in the north at Tel Dan, and at several sites in the Shephelah and coastal plain.

WARE DESCRIPTION AND PROVENIENCE

Collared pithoi from these two representative sites were petrographically examined under a polarizing microscope. The petrographic thin sections were formed by affixing a small fragment of pottery to a glass slide and then grinding it with an abrasive powder until it was reduced to about 0.03 mm in thickness. Most of the minerals in the pottery are transparent at this stage and can be studied and identified under the petrographic microscope. One of the main applications of petrographic examination and the identification of minerals is the determination of the raw material source; this is most effective when minerals of a limited geological distribution are identified within the clay body. In these instances, it is a relatively easy task to pinpoint an area (or areas) from which a particular vessel is most likely to have originated. In Israel, the usefulness of this technique has proven itself and has become an increasingly essential component of pottery analysis (for recent examples see, e.g., Glass et al. 1993; Goren 1996; Greenberg and Porat 1996).

Beit Shean

Geologically, Beit Shean is located in a very diverse region. Igneous basalt outcrops appear in the eastern hills of the Lower Galilee to the north and sedimentary limestone and chalk deposits belonging to the Eocene period form the Mt. Gilboa range to the south. In the Beit Shean and Jordan valleys, calcite-rich alluvial sediments rest on Upper Pleistocene travertine and Lisan deposits. Most of these sediments are exposed within a 1 km perimeter of the tell (Nir 1989; Shaliv, Mimran, and Hatzor 1991). Most of the Beit Shean ceramics from Level VII were fashioned out of locally available clays.

Beit Shean Ware Groups

A total of three main ware groups and six additional ware groups have been defined in the Level VII ceramic assemblage found with the collared pithos in Building B at Beit Shean. Most of the vessels I examined (Killebrew 1998: 211–15) belong to the three main locally produced wares designated as Wares BS-A, BS-B, and BS-C. The single collared pithos Type A uncovered from the latest series of excavations from Beit Shean does not match any other of the vessel wares and falls into a distinctive ware group termed Ware BS-D, which is different from all other sampled wares and is defined by its non-calcareous matrix and large quantities of basalt minerals.

WARE BS-D (fig. 20.3). The collared pithos was formed from a clean, non-calcareous clay containing small amounts of silty and sandy quartz (1–3%) and traces of mica. No carbonate is visible in the matrix. Large quantities of subangular sand-sized basalt and minerals associated with basalt appear (about 10–20%). Ware BS-D originates in an area with a basaltic formation and could possibly have originated (but not necessarily) in the Beit Shean region.

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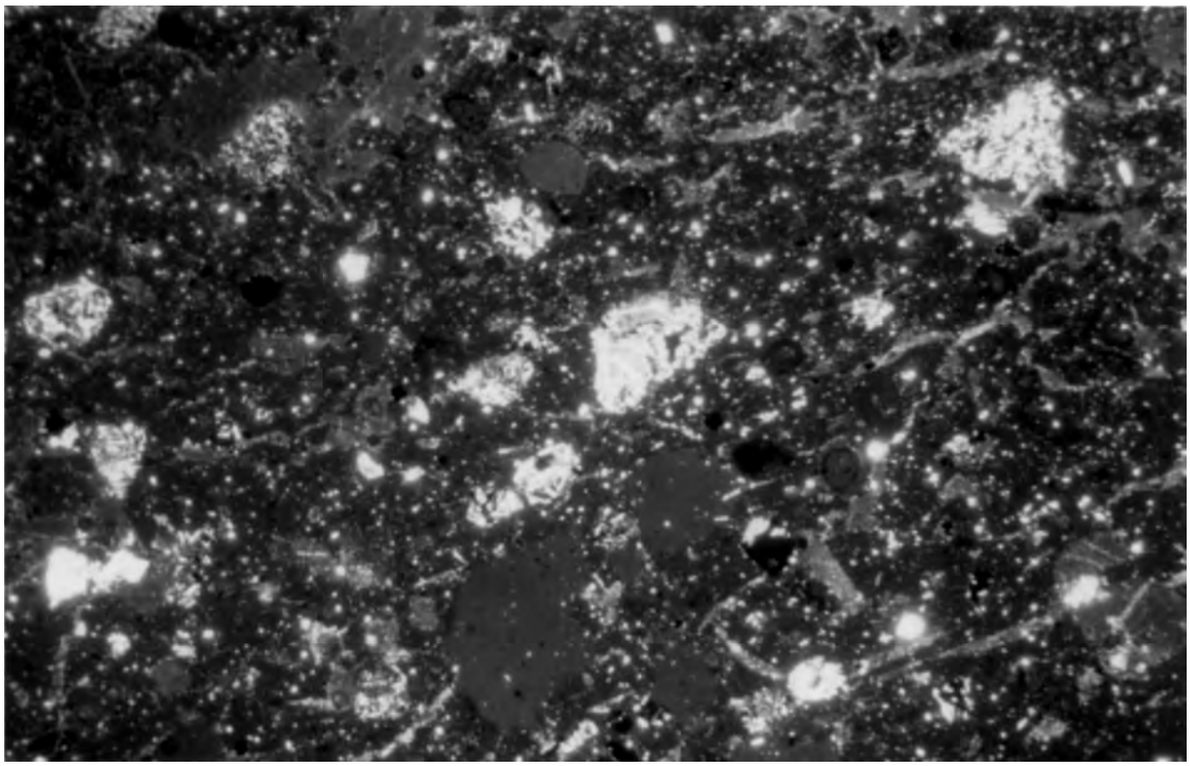

FIGURE 20.3. Ware Group BS-D (width: 3.5 mm; crossed polarizers): Non-calcareous clay matrix with small quantities of silt and sand-sized quartz (approx. 1–3%); noteworthy is the subangular sand-sized basalt (4–10%) grains (e.g., in center and upper left of photograph).

Giloh

Giloh is located to the south of Jerusalem, on a hill opposite and north of Beit Safafa. Greater Jerusalem is situated in the Judaean hills, part of the central hill country. The area of Jerusalem sits on bedrock consisting of limestone, dolomite, and chalk layers dating to the Upper Cretaceous period. Two main groups are visible: the earlier Judea Group and the later Mount Scopus Group (Gill 1996). Giloh is situated on a hill of the Weradim Formation, overlying the exposed Kefar Shaul Formation. These rest on the Aminadav Formation; all are part of the Judea Group.[12] These formations consist of dolomite (Weradim and Aminadav Formations), limestone (Weradim, Kefar Shaul, and Aminadav Formations), and chalk (Kefar Shaul Formation). In the nearby Naḥal Rephaim, outcrops of the Moẓa Formation are exposed (Arkin et al. 1976). It is noteworthy that a dolomite sand quarry, probably where sand-sized dolomite temper was obtained, was found in Naḥal Rephaim (see Edelstein and Milevski 1994 for a description of this quarry which consists of a shaft hewn 5 or 6 m into the hillside; see also Goren 1996: 51–52).

12. The Judea Group, which forms the Judean hills, comprises mostly hard limestones and dolomites. To the west, the Judea Group forms the synclinorium of the Shephelah region upon which formations of the Mt. Scopus/HaShephela Group were laid Buchbinder 1969: 3. See also Gill 1996 for further details regarding the geology of the Jerusalem area.

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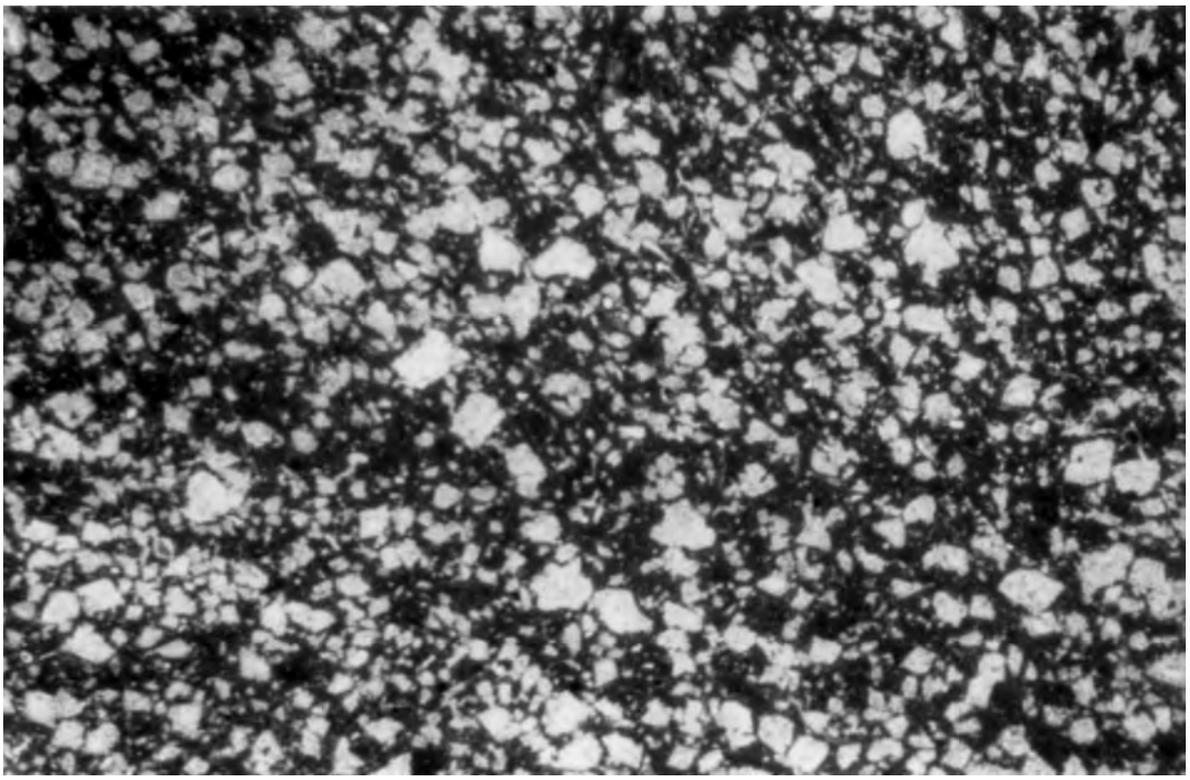

FIGURE 20.4. Ware Group GI-A1 (width: 3.5 mm; crossed polarizers): Calcareous clay matrix densely tempered with well-sorted subangular sand-sized dolomite (> 50%).

Giloh Ware Groups

Three main ware groups were defined in the Giloh assemblages (Killebrew 1998: 215–19). Two main locally available clay types were used in the production of the Giloh collared pithoi: Ware GI-A has a fine clay matrix consisting of mainly clay-sized particles with considerable quantities of sandy-sized dolomite temper; Ware GI-B has a dolomitic clay matrix and includes several types of temper in its paste.[13]

WARE GI-A. This ware group is characterized by its pure clay matrix and varying amounts of sand-sized dolomite, which is the dominant temper in vessels assigned to this fabric. Ware GI-A is a well-known and well-documented clay type belonging to the "Moẓa-Aminadav" (Glass et al. 1993: 272–76) or the "Moẓa clay-dolomitic sand" group (Goren 1996: 51–52). It is a fine, iron-rich, calcareous clay with coarse dolomitic sand and is documented from sites in the central hill country, including Tell en-Nasbeh and Raddana and its vicinity from the Chalcolithic through Iron Ages (Porat 1989a, 1989b; Gilead and Goren 1989; Franken 1990: 79–85; Goren 1996: 51–52). I have divided this major family into four subgroups based on temper.

GI-A1 (fig. 20.4). The very fine clay matrix is well prepared with densely tempered, well-sorted, subangular sand-sized dolomite (> 50%), and occasional mud balls. Quartz is very rare.

13. The third ware group, GI-C, is a non-calcareous terra rossa assigned to clay Type 3. This clay type was used mainly in the production of cooking pots (see Killebrew 1999) and occasionally bowls.

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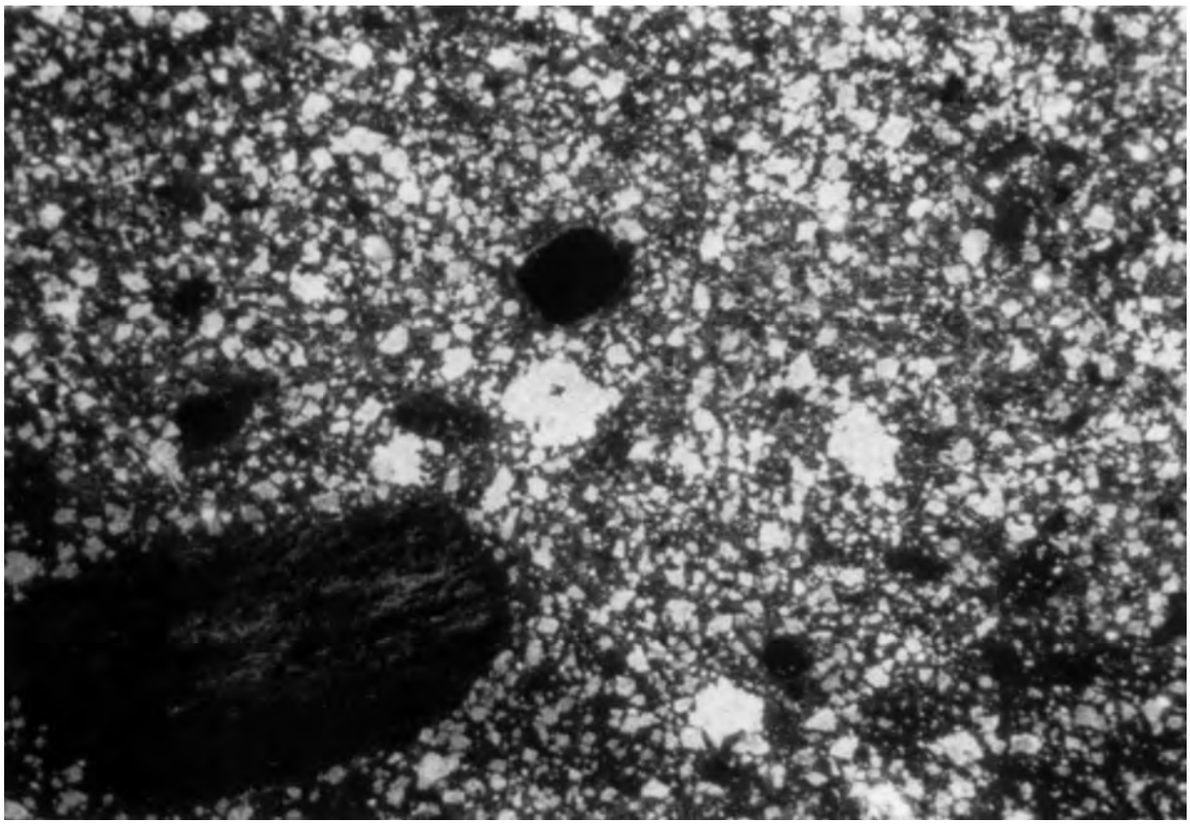

FIGURE 20.5. Ware Group GI-A2 (width 3.5 mm; crossed polarizers): Calcareous clay matrix with large quantities of well-sorted subangular to subrounded sand-sized dolomite temper (> 50%); shale fragments, visible in the lower left corner of photograph, are also common in this ware.

GI-A2 (fig. 20.5). This ware group has the same clay matrix as GI-A1 and includes large quantities of well-sorted dolomite (> 50%), a few shale fragments, and mud balls.

GI-A3 (fig. 20.6). This storage jar is formed out of a fine clay typical of Ware GI-A. It is defined by its large quantity of dolomite silt (> 50%) and small quantity of poorly sorted, subangular, sand-sized dolomite, calcite, and mud balls (1–3%).

GI-A4. A fourth subgroup includes moderate to large amounts of sand-sized temper and small quantities of calcite and limestone temper. However, the clay matrix belongs to dolomitic clay, which characterizes Ware GI-B. Ware GI-A4 includes features of both ware groups GI-A and GI-B.

WARE GI-B (fig. 20.7). This ware is similar to Group A, except that the matrix of this clay consists mainly of silty dolomite. The temper includes moderate to large quantities of calcite, limestone, chalk, and quartz, and small amounts of sand-sized dolomite and quartz temper. The inclusions are less well sorted than in Ware GI-A. This resembles the Moẓa marl-calcareous sand clay group described in detail by Goren (1995: 301).

The most noteworthy feature of the Giloh assemblage is that all the pottery sampled, including the collared pithoi, was formed out of clay available in the Jerusalem area. This is unusual at most sites and is significant because it may be an indicator of the relative isolation

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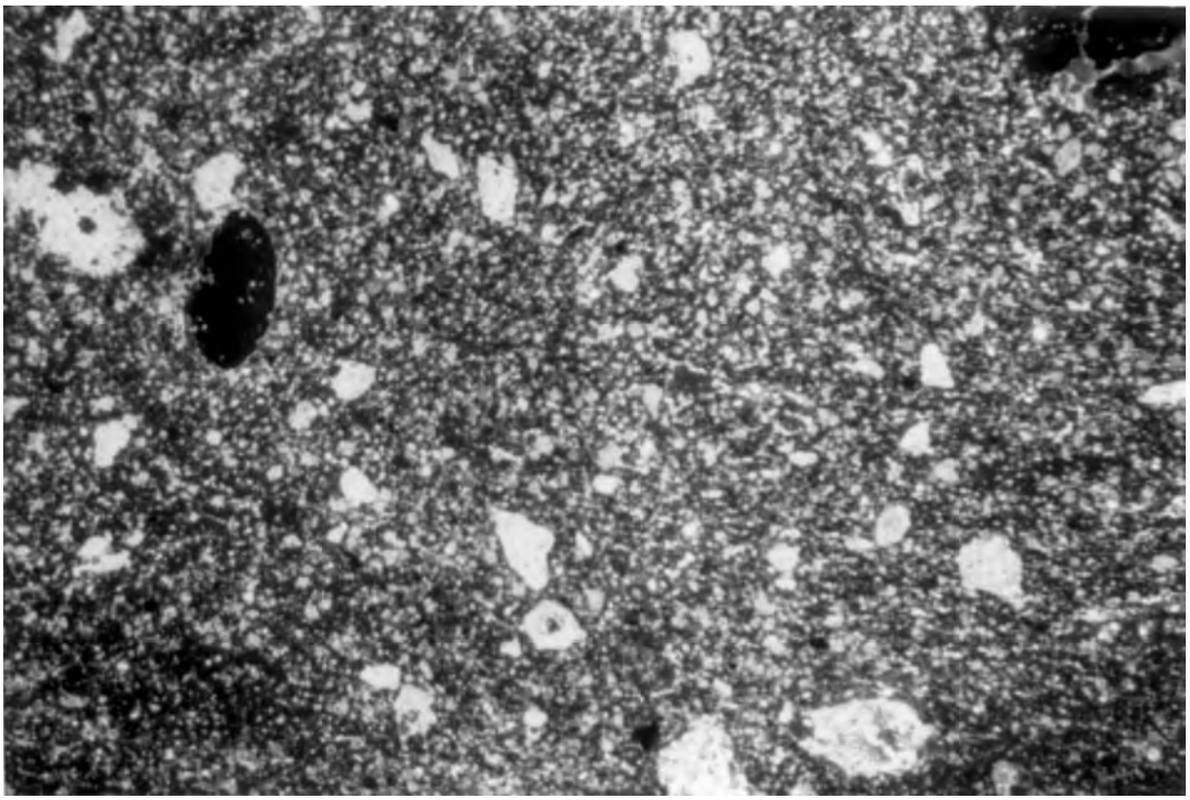

FIGURE 20.6. Ware Group GI-A3 (width 3.5 mm; crossed polarizers): Calcareous clay matrix with a large quantity of dolomite silt (> 50%) and small quantities of poorly sorted subangular dolomite and calcite grains (approx. 3%); mud balls occasionally appear.

of the Jerusalem area, especially during the early Iron I period. Pithoi and storage jars vary in their clay matrix, all local to the Jerusalem area, and are characterized by the appearance of varying amounts of dolomite temper and by the occasional presence of sand-sized limestone, quartz, and other minerals in the matrix.

Provenience of Collared Pithoi

Other investigations have dealt with studies of provenience and questions of this vessel's origin. The results of limited neutron activation and petrographic analyses at Tel Dan (Yellin and Gunneweg 1989), Shiloh (Glass et al. 1993), Tell Keisan (Courtois 1980), and Sasa (Cohen-Weinberger and Goren 1996) indicate that several clay sources were used in the manufacture of pithoi and that these large jars were not all locally produced. It is thus all the more noteworthy that all the collared pithoi examined from Giloh were produced in the general area of Jerusalem and none was imported from any distance. The lack of uniformity reflected in the results of these studies may be due to the type of site and the context of the collared pithoi. The significance of the diversity in the appearance and provenience of the collared pithoi is discussed below.

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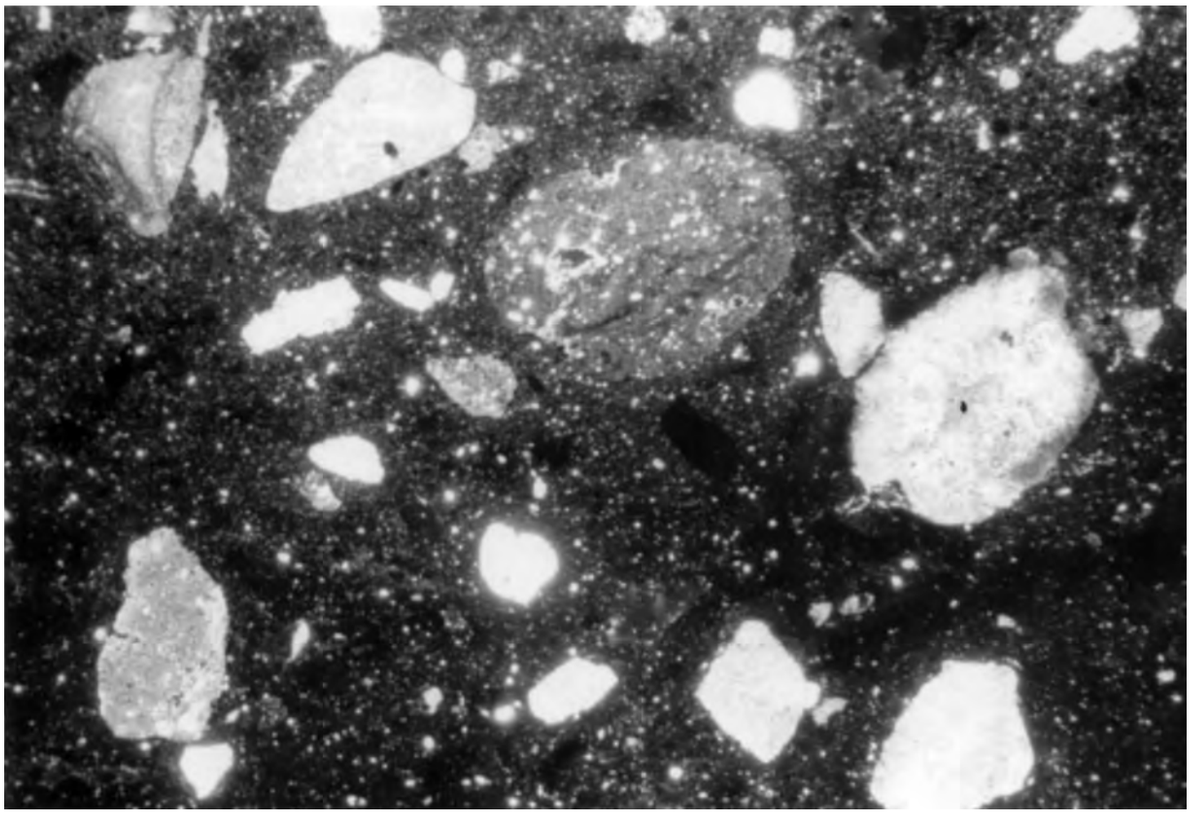

FIGURE 20.7. Ware Group GI-B (width: 3.5 mm; crossed polarizers): Dolomitic clay with a moderate amount of silty dolomite (4–10%); moderate amounts of large grains (up to 1 mm) of calcite, limestone (subangular grain on lower left), and chalk (rounded grain on right) appear; mudballs (upper half, center) and quartz sand (approx. 1–3%) are present.

MODES OF PRODUCTION

Several models, based mainly on the ethnographic record, have been proposed to describe the organization of pottery production, its distribution, and demand.[14] These models consider technological features, such as formation techniques and variability of both raw materials and products, as well as ecological, economic, and social criteria, such as frequency and seasonality of production, number of workers, their age, sex, and status, degree of labor division, kind and extent of investment in space or tools, and proximity of consuming groups (Rice 1987: 183–84).

S. E. van der Leeuw (1976: 394–98, 402–3) has divided pottery production into six different states of pottery economy that can be defined by certain technological and economic characteristics. His "states" are based on modes of production and can be divided into two basic industries: (a) *domestic production,* including (1) household production and (2) household industries; and (b) *professional production,* including (3) workshop industries, (4) village industries, (5) large-scale industries, and (6) individual industries (see Killebrew 1998: 253–57 for a detailed discussion of these modes of production). The latter industry involves pottery

14. Balfet 1965: 162–63; van der Leeuw 1976; 1984; Peacock 1981; 1982; Redman and Myers 1981: 289–90; Rice 1981; Tosi 1984: 23–24; Santley, Arnold, and Pool 1989; Costin 1991; see Pool 1992: 280–83 for a discussion of these terms and their relationship to ancient ceramics.

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manufactured by a single specialist: often itinerant potters produce pottery for an entire region from locally available materials at each village or settlement.

A mixed picture is presented regarding possible modes of production of collared pithoi at various Iron I sites. Although no workshops or kilns relating to the manufacture of pithoi have been excavated to date, owing to the quality and level of difficulty involved in the production of the collared pithos, a professional potters' craft is indicated (see, e.g., London 1989b). At Tel Dan (Yellin and Gunneweg 1989) and Shiloh (Glass et al. 1993), several origins are indicated for the collared pithoi jars, while all the pithoi at Giloh were produced in the general vicinity. The diversity of wares and origins of the collared pithoi indicate that several workshops and/or numerous potters were involved in their production. Thus, I tentatively propose that the mode of production used to produce the collared pithos, with its diverse procurement of raw materials and clay preparation, may indicate the existence of several workshops. At sites such as Giloh where all the pithoi were produced in the general vicinity but exhibit great variation in their wares, I suggest production by itinerant potters who traveled from village to village in the region, perhaps in addition to pithos manufacture in a local workshop or workshops.

This theory was first put forward by London (1989a: 43–45) and was further explored by Esse (1991: 108–9), who later rejected this mode of production in favor of the hypothesis that the collared pithoi were produced on the household level within a matrilocal society spread by exogamy (Esse 1992: 97–100). However, it must be recognized that ethnographic studies of pithoi production have revealed that this is the most difficult vessel to form and demands the skills of highly professional potters, and not a domestic household mode of production (e.g., London 1989b and references therein). In addition, ethnographic studies of exogamous marriages demonstrate that well over 90% of all marriages take place within a 15 km distance (Granquist 1931; Government of Palestine 1945; Adams and Kasakoff 1976; Lehmann in prep.), thus not adequately explaining the dispersion and distribution of the collared pithos in Cis- and Transjordan.

Ethnographic examples of itinerant potters have been described by Asboe (1946), Hampe and Winter (1962), Linne (1965), Voyatzoglou (1974), and London (1989b), including examples of itinerant potters who produce only pithoi. The relatively small number of highly trained potters producing these pithoi may in part explain their standard size and generally similar morphological features but also may reflect the diversity in detail, such as rim profile and choice of materials, within an assemblage produced in the same region. The pithoi from Giloh are a case in point. Production of collared pithoi by itinerant potters may also explain the very close similarities between some Iron I assemblages, such as those from Tell el-ʿUmeiri in Transjordan and the sites from the Manasseh region in the hill country. The appearance of similar incisions on rims or handles from sites in Transjordan and Cisjordan may also be an indication of specific, perhaps itinerant, potters or workshops (see, e.g., Ibrahim 1978: 120; 1983; Finkelstein 1988: 278–80; Zertal 1986–87: 135, 145–47; Clark 1997: figs. B.13:1, B.14:1, B.15:1).

FUNCTION, CONTEXT, AND ORIGIN

One of the keys to understanding the phenomenon of the rather sudden appearance of the collared pithos in the archaeological record is the function, context, and origin of these jars.

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Much of the interpretation regarding the function of the collared pithos is based on preconceptions that this container was used mainly by subsistence-level villagers associated with the early Israelites. Zertal (1988) has suggested that their popularity in the region of Manasseh was due to their use as water containers. Finkelstein (1988: 282–83) rebuts this, based on the appearance of collared jars in regions with abundant water. He states that these jars were used as storage containers for other types of liquids in addition to water, including olive oil and wine (see also Ibrahim 1978: 122 for ethnographic comparisons). In Transjordan, flotation of the contents of collared pithoi at Tell el-ʿUmeiri produced remains of lentils, chickpeas, wheat, barley, and spices, leading the excavators to suggest that these jars were used as containers for dry goods (Herr et al. 1991: 159).

However, it is clear from the context of a number of these vessels and from provenience studies of jars, especially from Shiloh and Dan, that the collared pithos was also used as a transport jar. The long distance transport of pithoi is well documented in the archaeological and ethnographic record (Blitzer 1990). Recently, Artzy (1994: 137–38; unpublished manuscript) presented convincing evidence that these jars could have been transported by camel over long distances in Canaan at the end of the Late Bronze II period. It is noteworthy that these pithoi first appeared in Cisjordan at late thirteenth century sites such as Aphek, Tel Nami, and Beit Shean, which are located along what were Egyptian-controlled trade routes. Preliminary studies of several of these jars from Tel Nami have indicated a number of different wares for these jars (Artzy, pers. comm.).

Collared pithoi also served as burial containers at a number of sites, such as Megiddo (Esse 1992: 88), Sahab (Ibrahim 1978: 122–23), Tel Nami (Artzy 1993; 1994: 127–28; 1995), Tel Zeror (Ohata 1970: pl. 56), and Tell es-Saʿidiyeh (Tubb 1995: 142–43; see also Druks 1966). The multifunctional use of pithoi in the ethnographic record is well documented by London (1989b) in her study of Cypriot potters.

Thus I conclude that the collared jar served a multitude of purposes. At sites along major trade routes, where these jars appear in small numbers, or at sites where several clay sources, including nonlocal, are indicated for the production of these jars, it is very likely that the collared pithos was used as a transport vessel. At sites where large numbers of pithoi were found, either at larger, sometimes fortified, settlements or at smaller villages, these vessels, often locally produced, served as long-term storage containers for a variety of goods and liquids. At several sites, pithoi, probably in secondary use, served as burial containers. A key factor in understanding the function of these jars at the multitude of sites where they appear is their relative percentage in the entire ceramic assemblage.

The function, context, and morphological features provide clues regarding the origin of this vessel type, which appears rather suddenly at the close of the LB. Various stylistic and typological origins have been suggested for this jar, including a Canaanite origin. Kempinski (1985: 401–2) and Finkelstein (1988: 283–84) have suggested that Middle Bronze Age storage jars served as the source of inspiration for the collared pithoi. Wengrow (1996: 307) claims that the collared pithoi was a larger version of the Canaanite storage jar. Kempinski (1992: 6) proposes that these jars were produced in "Canaanite centres," especially for use by Israelites in the hill country. Artzy (1994; unpublished manuscript) points out that the ridge of the "col-

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lared pithos," as a ceramic technique, is known at other sites in the Aegean and eastern Mediterranean at the end of the LB and is not unique to Canaan.

The morphological features of the collared pithoi are very closely related to the LB Canaanite storage jar, with the addition of the ridge at the base of the neck, which is doubtless a technological feature of its production lacking any real stylistic significance. The earliest appearance of the collared pithos in small numbers is at sites in Cisjordan located along LB trade routes. Large numbers of this container seem to first appear at sites such as Tell el-ʿUmeiri on the Transjordanian plateau, perhaps indicating a Transjordanian origin for this vessel type. It may have later spread to newly established villages in the central hill country of Cisjordan, perhaps hinting at a close relationship between the peoples of the Transjordanian plateau and the central hill country of Israel. The possible historical significance of this connection has been recently explored by Herr (1998).

CONCLUSIONS

During the LB, the concept of a pithos container was mainly a northern tradition. The handled collared pithos, similar in its typological features to the Canaanite storage jar but significantly larger in size, appears for the first time in small numbers in regions south of the Jezreel Valley at the close of the LB at several sites located along trade routes. The initial appearance of the collared pithos in Cisjordan at sites such as Tel Nami, Beit Shean, and Aphek was probably the result of trade relations. The presence of large numbers of collared pithoi, mainly in Transjordan and in the hill country of Cisjordan, is doubtless a result of the significant socioeconomic changes that Canaan underwent at the close of the LB and Early Iron periods. The production of the collared pithos is the result of a highly specialized potters' craft. This jar might have been manufactured at a number of dispersed workshops, but it is suggested here that professional itinerant potters may have also produced this vessel. Itinerant potters may explain the appearance of the collared pithos in very large numbers in villages of the central hill country, where it is doubtful that in such small settlements there would be sufficiently trained potters to produce these jars in large quantities. Additional provenience studies, especially petrographic analysis, may provide the additional information to test this hypothesis.

There are indications that this container, with its typological and stylistic roots in Canaan, may have developed in Transjordan, though further excavations both in Transjordan and Cisjordan are necessary to clarify the chronological and typological development of this jar. It is clear that the collared pithos served a multitude of purposes—a general storage container for numerous commodities and substances, a transport jar, and, on occasion, a burial container. The initial appearance in large quantities of the collared pithos at sites where this jar comprises some 20% or more of the assemblage in the highlands of Transjordan and Cisjordan sometime at the end of the thirteenth or early twelfth century B.C. do, in my opinion, reflect the significant socioeconomic changes that occurred in Canaan at the close of the LB. This is indicated in the resulting well-defined regionality evident in the material culture of the Iron I period.

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21

CHIPS AND SHELLS: FLOTATION AT TEL YAQUSH

Egon H. E. Lass

This paper is written in memory of Douglas L. Esse and our last ecstatic season at Tel Yaqush. Though he was suffering from his terrible disease, he was always extremely positive and grateful for everything. Now that he is gone, life can never be the same again.

METHODOLOGY

Flotation is a process of water screening by which both the light and heavy fractions of an unsifted, unsorted soil sample from an archaeological stratum are recovered. The light fraction is whatever floats to the surface when the soil sample is poured into water, consisting mostly of charred botanical remains. The heavy fraction is whatever sinks in water and is caught by a screen, allowing the silty component to escape.

Many elaborate flotation devices have been developed in areas where water is abundant (Davis and Wesolowsky 1975; Diamant 1979; French 1971; Limp 1974). The method for arid countries, used at Tel Yaqush, was developed by Robert Stewart at Tell el-Hesi (Stewart and Robertson 1973), also practiced at Bâb edh-Dhrâʿ (Richardson and McCreery 1978) and Ashkelon (Lass 1994). A round barrel is filled with water, and a round tub, having a 1.5 mm window screen for a bottom, is immersed into the barrel. The unprocessed soil sample is weighed and then poured into the tub, and the light fraction is skimmed off the top of the water with a 0.5 mm strainer. The silt is then shaken through the bottom of the tub, and the resulting heavy fraction is laid out to dry in the sun. The light fraction is taken indoors and laid out on newspapers for a slower drying process. The barrel has to be cleaned out after the processing of approximately 150 kg of soil (Lass 1994: 24).

At Tel Yaqush, Israel, an Early Bronze Age (EB) site south of the Sea of Galilee (fig. 21.1; see Esse 1990: 222–23; 1993: 1502–04), a barrel was supplied by Kibbutz Gesher, but the round tub to be immersed in water was lacking. In its stead an elongated shopping bag made of wide open plastic webbing and lined with 1.5 mm window screen was used. Because the soil at Yaqush was very dry and full of oxygen, a constant problem was the formation of foam which clogged the light fraction and had to be washed away.

Subsequently the dried heavy and light fractions were both weighed and became percentages of the original weight of the unprocessed sample. The heavy fraction was manually sorted into various categories that were counted and weighed, also becoming percentages or ratios of the original gross weight. The resulting values were computerized in a dBase IV data file created for the flotation project. The entire process was accomplished by one person.

When the material culture content of the EB loci of Tel Yaqush is compared with the variety found in the later strata of Ashkelon (Lass 1994), it becomes obvious that the cultural debris in the earlier strata is focused and scanty. In Ashkelon the categories included bone, fish

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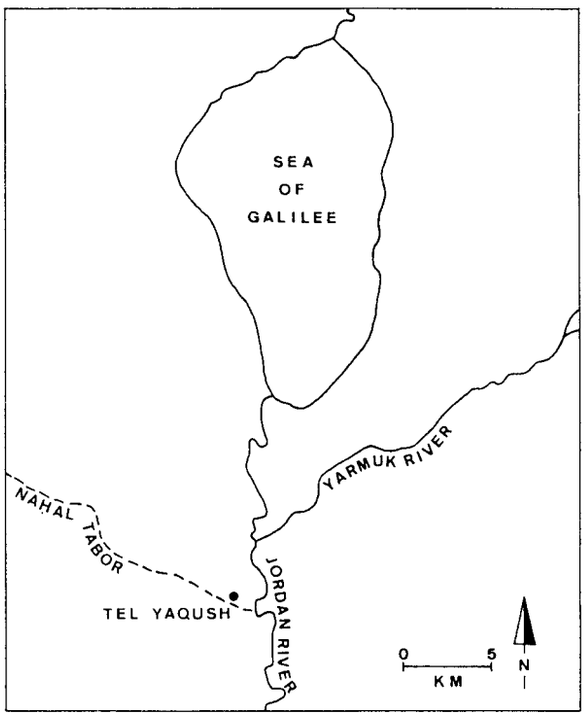

FIGURE 21.1. Map Showing Location of Tel Yaqush.

scales, shell, pottery, botanical remains, chert, metal, slag, eggshell, plaster, glass, pumice, bitumen, and red ocher. At Tel Yaqush pottery, bone, shell, chert, and botanical remains were the main categories. Red ocher was also found, an occasional eggshell, and a rare copper fragment. The botanical remains were too small to be weighed accurately, and the tiny bone fragments showed the heavy attrition of time. Since pottery was collected during excavation even from the layers that were to be sampled for flotation, a heavy bias was introduced, and pottery was not used for statistical analysis. The material was manually sorted under low magnification to insure completeness of recovery, including tiny shell and flint fragments measuring about 1 mm in diameter.

Not counting potsherds, which had been biased, botanical remains, which were too insignificant in weight to lend themselves to analysis, or chert fragments larger than 2 cm, which were excluded for reasons discussed below, from 258 soil samples weighing 1,750.5 kg, a total of 192,484 items were recovered, including 6,289 bone fragments, 62,822 shell fragments, and 123,373 chert chips.

It is axiomatic that societies leave behind the traces of patterned behavior that can be discovered in archaeological remains (Clarke 1977: 18; Butzer 1980: 419; Wood 1978: 260; Sallade 1989: 410–15; South 1978), and that smaller items are more likely to become the remaining primary refuse in activity areas (Schiffer 1983: 679; 1972: 161; Baker 1978: 291; Bradley and Fulford 1980: 85; Rosen 1986: 114; Stevenson 1985: 67). The purpose of this flotation project was to discover any patterns that might have remained in the recovered microartifacts. It did not seek to be a complement to macroartifactual finds, but to present unique and separate information in its own right (see Dunnell and Stein 1989: 39).

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Different researchers give different definitions as to what constitutes a microartifact. For Fladmark (1982: 205), Hull (1987: 772), and Vance (1987: 58), a microartifact is smaller at its maximum circumference than 1.0 mm; for Stein and Teltser (1989: 6) and Dunnell and Stein (1989: 35), it is smaller than 2.0 mm; for Simms and Heath it is smaller than 4.75 mm (1990: 805) and smaller than 6.4 mm (1990: 800); for Rosen it is smaller than 20.0 mm (1993: 141) and smaller than 30.0 mm (1989: 565). The present study arbitrarily agrees with Rosen (1993: 141) that a microartifact is smaller than 20.0 mm. The lower limit must necessarily be 1.5 mm, since that was the screen mesh used for flotation, although some smaller artifacts were always recovered that did not pass through the mesh.

Of the recovered artifactual categories, the largest by far was microdebitage. The tiny chips were ubiquitous throughout the site, and there was some doubt as to whether they were cultural debris.

Four control samples from a depth of 35 cm under the surface were taken in locations beyond the limits of the site, averaging about 7 kg in weight (cf. Hull 1987: 775). From a hill to the northwest, the sample yielded eight chert chips and eighteen shell fragments; from a hill to the west, one chert chip and eighteen shell fragments; from a hill to the south (south of the Wadi Kuraiyim, which drains into the Jordan River and runs parallel to the larger Naḥal Tabor; Esse 1993: 1502), no chert chips and fourteen shell fragments; and from the north bank of the Wadi Kuraiyim close to the southern border of the site, twenty-three chert chips and 809 shell fragments. The mean number of chert chips found in a sample from the site was 486, and the mean number of shell fragments 247. It is seen from these statistics that if there had been a component of naturally created chert chips in the layers of the site, their number would have been negligible in comparison with cultural material. It is of some significance that the sample from the bank of the Wadi Kuraiyim yielded more than three times the number of shell fragments than the mean number found in a site sample (see below).

KNAPPING EXPERIMENTS

Yet another effort to prove that the chips were debitage was an experiment in flint knapping. It was first assumed that most of the chips were from the process of retouching. In that case they had to be distinguished from natural geological specimens by the following morphological characteristics: prominent bulbs of percussion under faceted platforms; ripple lines and radial lines that radiate out from the point of impact or pressure (fig. 21.2:B, D–G); and bulbar scars located on the bulb of percussion (fig. 21.2:C, G), although these were thought to be associated only with percussion flaking (Peacock 1991: 350–52). If such features could be produced empirically, they could be compared with what had been found in the field.

One of the samples contained a stone of flint about 25 by 15 cm in size. Such stones do not occur naturally at the site of Tel Yaqush and were most probably imported in either from the Yarmuk River or from outcrops of the "Hordus" Formation to the west of the site which contains, among other things, cobbles of flint (Yaakov Nir, pers. comm. 1994). The stone was coarse grained and had fibrous and blocky fractures, for which reason it had probably been rejected as raw material for tool making (Fladmark 1982: 209). Direct percussion was used with brutal force to obtain a substantial number of edges that could be retouched with a pointed bone fragment. It was seen that direct percussion for the production of macroflakes yielded a multitude of microchips. Even the process of retouching with a fingernail resulted

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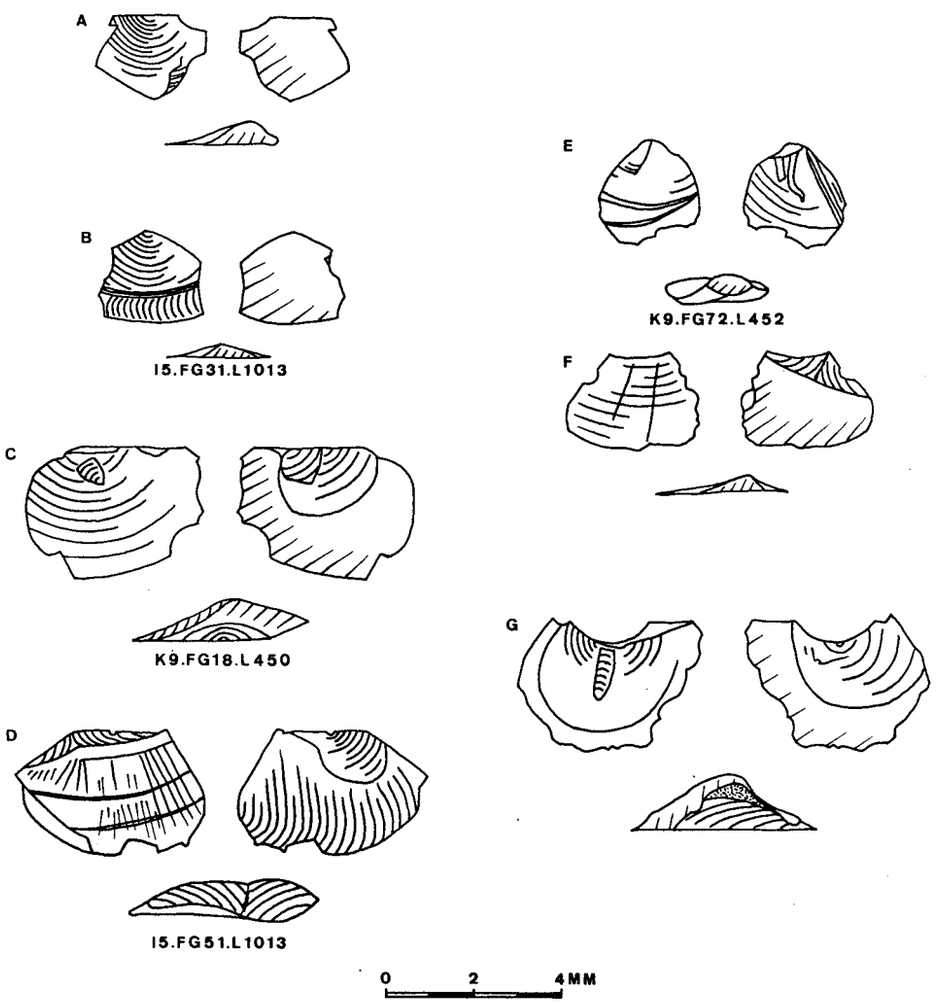

FIGURE 21.2. Tel Yaqush Microflakes. Ventral side in each figure is on the left, dorsal on the right. *B, C, D,* and *E* are artifacts from ancient strata; *A, F,* and *G* are the result of modern experimentation.

not only in flakes bearing one or more of the required morphological characteristics, but also a substantial amount of amorphous microdebitage (Stahle and Dunn 1982: 86). During the retouching process two kinds of microflakes were produced. The initial pressure of bone against chert produced a microflake that had a bulb on the ventral side and one or more of the other attendant features, whereas the dorsal side remained flat, being part of the original opposing surface against which pressure was exerted (fig. 21.2:A, F). The tool maker did not stop here, but followed through with more insistent pressure, creating a second, larger intrusive microflake that also had a bulb and various features on the ventral side, and the negative of the preceding microflake on the dorsal side, producing a characteristically curved profile when viewed proximally from above the platform (fig. 21.2:G).

When the experimental flakes had been examined, they were compared with the material extracted in flotation. Except for a few samples from small whole vessels in which not a single chip was found, all of the samples that contained chips included microflakes that had a bulb at the very least, and often one or more of the other required characteristics (fig. 21.2:B–E). These

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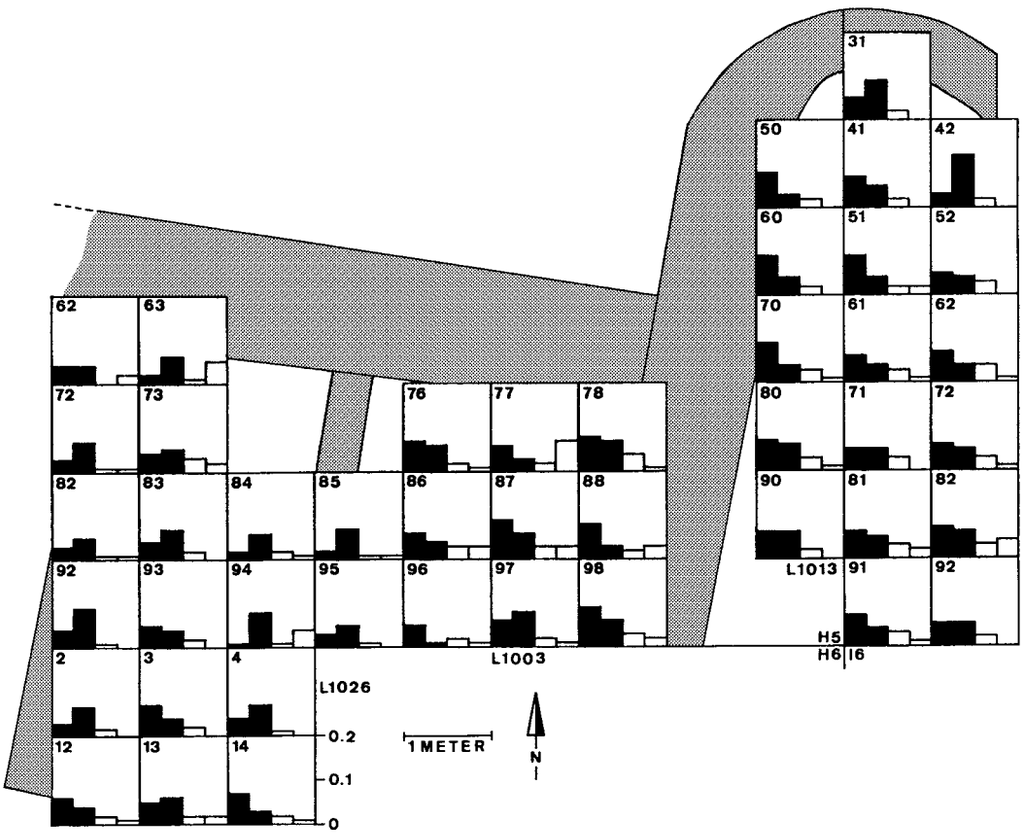

FIGURE 21.3. Tel Yaqush Square H5. Walls of two EB I houses connected by a broad wall have been darkened. In each fine grid, the first column is the ratio of flint chip number to gross weight of sample; the second is the percentage of microflakes among the debitage; the third is weight percentage of shell; and the fourth is weight percentage of bone. A broad spectrum of activities is indicated.

characteristic traits were better and more often represented in the Tel Yaqush finds than in the experimental material, probably because the stone that was used to produce the microflakes had been a reject for being too impure and too soft.

ANALYSIS

A grid was imposed on Tel Yaqush in which every 10 m square was named by letter and number. Within the 10 m square was a fine grid of 1 m squares, so that square, fine grid, and locus number were enough for object placement within 1 m^2 anywhere on the tell. Flotation samples were taken from fine gridded floors and from any other locus that showed promise for yielding microartifacts. Owing to the incomplete state of present research at the site of Tel Yaqush, this paper cannot address problems of stratigraphy or architecture. The statistical profiles extracted from floors are informative regardless of their stratigraphic position or age. It will be seen that the drastic differences of these profiles cannot be but an indication of different kinds of activities.

Figure 21.3 shows what was found across a substantial area located at the top of the tell: two buildings connected by a broad wall, and the courtyard between them. Dated to EB I, this

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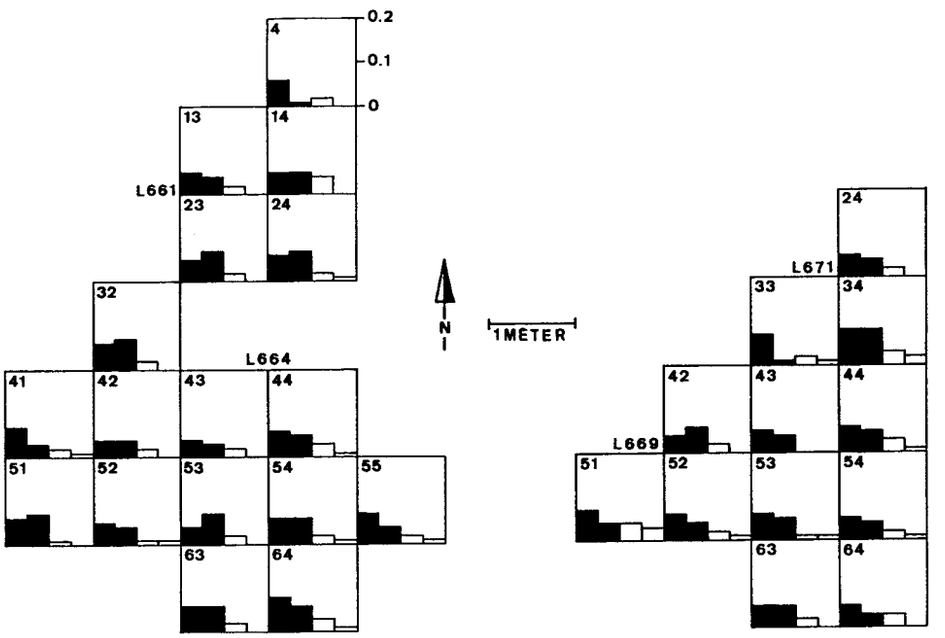

FIGURE 21.4. Tel Yaqush Square J6. Two EB I floors are shown; the left was stratigraphically later and superimposed upon the right. A broad spectrum of activities is indicated.

area went through a violent, fiery destruction and was therefore extremely rich in macroartifacts (Esse 1993: 1502–3). Comparatively, the number of microartifacts was average. Each fine grid has its own separate histogram, and though the scale is uniform, the function of the columns differ. The material was presented in this fashion in order to compare several very different kinds of remains (Rosen 1993: 142). The first column is a ratio of flint chip number against gross weight of sample. The second is the percentage of retouching flakes with characteristic morphological elements that were sorted out from the undifferentiated microdebitage. Every one of these flakes positively represents an act of retouching. The third and fourth columns are the weight percentages of shell and bone respectively. The two columns representing microdebitage have been blackened to facilitate pattern recognition. It will be seen that the relationship between the two columns is expressed in a true or reversed L shape. This is not a direct relationship since one is a ratio and the other is a percentage, but it is useful nevertheless. In the western building, the majority of L's are reversed. It means that here there were relatively few microchips of which a high percentage came from retouching. Chances are that in this area the focus was more on tool use than tool production. In the yard and building to the east, the L's are true, meaning that both areas produced relatively more of the amorphous microdebitage. Resharpening remained more or less the same as in the eastern building, except for a pronounced resharpening station at the north end of the eastern building (fine grids 31 and 42) where the L's are reversed. In these areas there might have been a broader range of activities, including tool production and use (see Wood 1978: 260, who states that an evenness in the histograms of artifact frequencies denotes an equal weighting of activities). Twenty-one whole sickle blades were found within the borders of the eastern building alone.

In the areas of Square J6 (fig. 21.4), two superimposed floors are shown in which the L shapes are either evenly matched or a mix of true and reversed. A broad spectrum of activities

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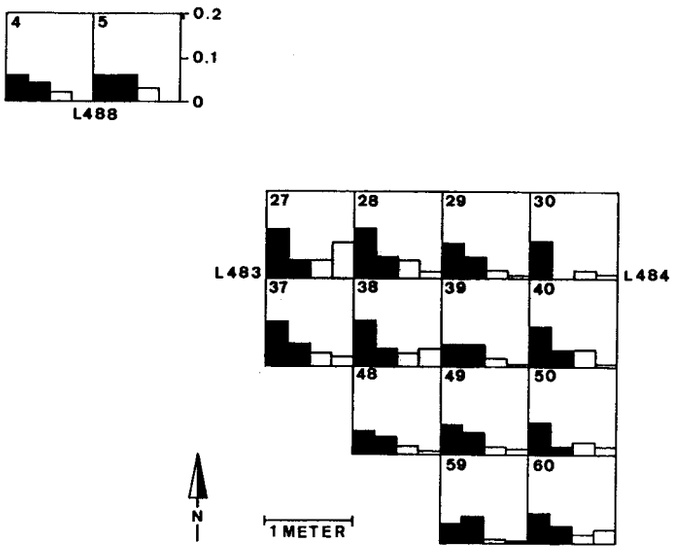

FIGURE 21.5. Tel Yaqush Square K9. An EB III floor that is stratigraphically earlier than the one shown in figure 21.6. A broad spectrum of activities is indicated.

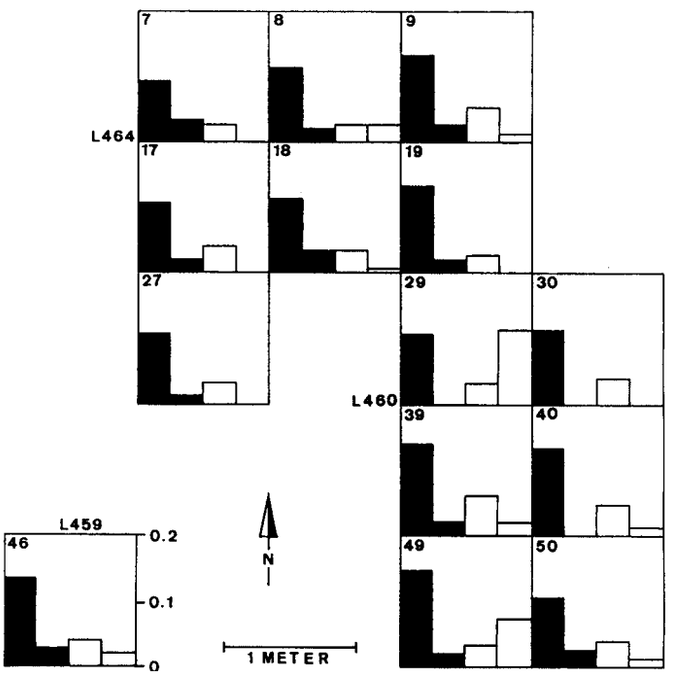

FIGURE 21.6. Tel Yaqush Square K9. An EB III floor that is stratigraphically later and superimposed upon the floor in figure 21.5. Specialized activity is indicated.

is indicated, including tool production and tool use, lasting through a substantial period in the EB I, which may be evidence for long-term occupation without change of activity.

This is not the case in the areas of Square K9 where the earlier loci (fig. 21.5) suggest a broad spectrum of activities, whereas the later loci (fig. 21.6), with their relatively high amounts of amorphous microdebitage, point to a more focused attention to the production of tools, an indication of change through time in the EB III. This specialized activity during the

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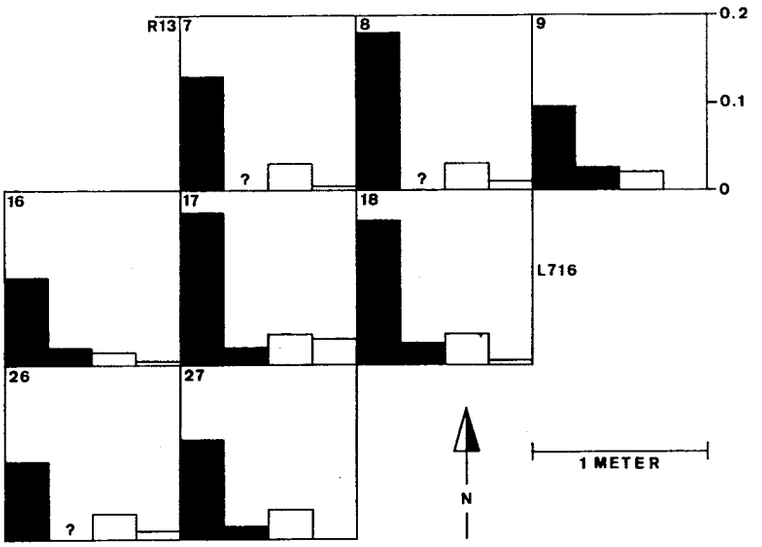

FIGURE 21.7. Tel Yaqush Square R13. An EB III floor on which specialized activity is indicated.

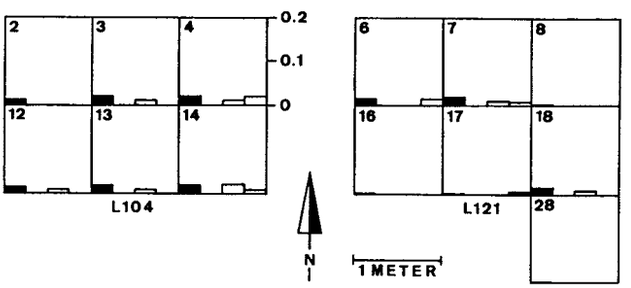

FIGURE 21.8. Tel Yaqush Square Q14. An EB II floor on which practically no activities are indicated.

same period is even more pronounced in Square R13 (fig. 21.7) where nondescript microdebitage is most voluminous, and evidence for retouching at its lowest (Wood [1978: 260] states that the greater the disparity among the different artifact frequencies, the smaller the evenness, the more limited the activities).

The loci of Square Q14, dated to the EB II period (fig. 21.8), are areas where almost no activities were represented in the microartifactual record. Located at the bottom of the tell slope, the meager finds of Square Q14 are also proof against the claim that cultural material has moved downslope through geological agents and become secondary refuse (Butzer 1982: 103; Schiffer 1972: 161).

Figure 21.9 is a summary of trends for all the loci that have been discussed. Except for Square Q14, one might think that the farther one moves downslope, the greater the amount of microdebitage as expressed in the histogram for debitage ratio. It is highly unlikely that geological factors had anything to do with this distribution. Most of the artifacts were surrounded by walls that would have prevented their migration, and almost all of them were still sharp-edged, meaning that they had not moved far from their original place of deposit. If there had

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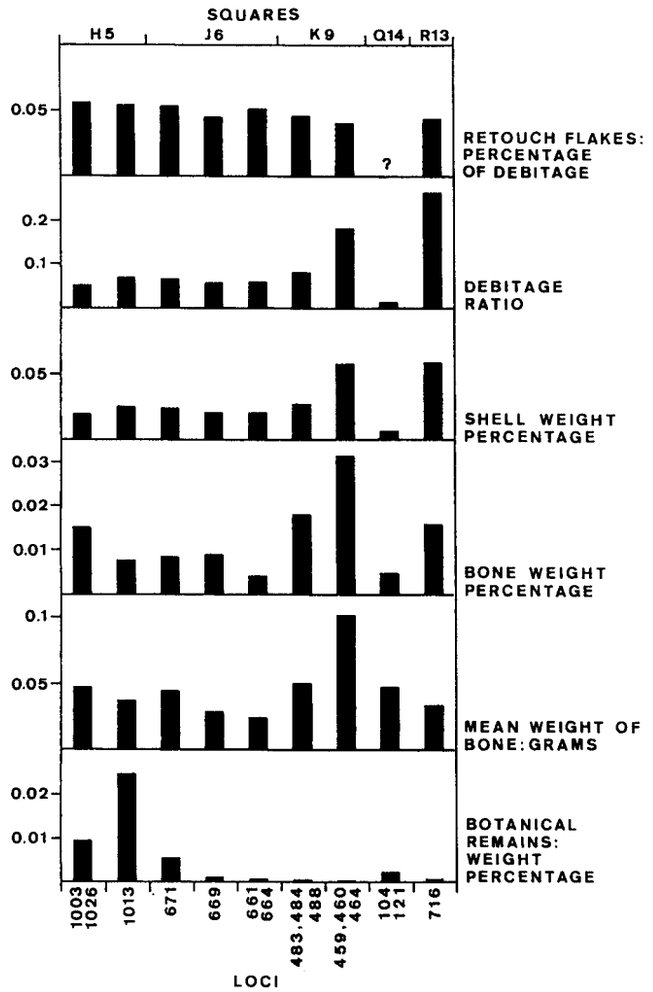

FIGURE 21.9. Summation of trends in the artifactual record at Tel Yaqush.

been a downslope movement of microartifacts, the bottommost locus, Square Q14, remained singularly unaffected by it as, indeed, did the slope of the Wadi Kuraiyim.

As can be seen in figure 21.9, there are no sharp differences in the number of retouching microflakes, although where undifferentiated debitage is highest, microflakes are lowest in number, indicating a focus on tool production. An enigmatic and fascinating relationship is the almost perfect fit between debitage ratio and shell weight percentage. Most of the shells came from snails. If geological factors must be ruled out for flint distribution, the same holds true for shell fragments. The histograms show that the amount of microdebitage determined the amount of shell within a certain locus. The reason behind this correlation can only be guessed at. The idea that something connected to the production and use of tools might have attracted the snails is not very convincing. Possibly the snails adhered to reeds that were carried in from the Wadi Kuraiyim. It will be remembered that the sample taken from its bank contained more than three times the number of shell fragments than the mean number found in a sample from the site. The question passes from one enigma to another: why would the number of reeds carried in from the Wadi Kuraiyim correlate with the production and use of tools?

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The distribution of bone weight percentage, being a function of bone size (i.e., mean weight of bone; fig. 21.9), while not a perfect fit, does accommodate itself more or less to the shell and microdebitage profiles. When these two categories are abundant, indicating areas of specialization, the bone percentage also rises. To correlate specialized tool production and minimum retouch with an accent on meat processing seems contradictory. The relationship between these various kinds of cultural remains is complex and not fully understood. The relatively large amounts of botanical remains in Square H5 (fig. 21.9) are probably due to the fiery destruction which took place there, carbonizing and preserving them more than in other areas.

CONCLUSION

The results of this study show that different activities have been detected in contemporaneous and diachronic strata. The microdebitage indicates areas in which tools (1) were both made and used, (2) were made exclusively, and (3) were neither made nor used. Diachronic development is shown to remain relatively stable in one area whereas another area bears testimony to change. Since the material is only a small sample representing a substantial site over an extended period of time, no major trends may be inferred. However, it may be indicative that all of the EB I loci show a broader range of activities, whereas all of the specialized activity areas are confined to the EB III period. More comparative material is needed to show whether this was a general trend of development. Additionally, the poorly understood relationships between different material culture categories should be an object of scrutiny for future study.

ACKNOWLEDGMENTS

Grateful acknowlegement is made to SeJin Koh and David Schloen for allowing me access to the site information that was available to this project; to Yaakov Nir and Giora Parnus for their helpful suggestions; and to Richard Saley for writing the calculation programs. Any faulty reasoning or errors are entirely my own.

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22

THE PROTODYNASTIC/DYNASTY 1 EGYPTIAN PRESENCE IN SOUTHERN CANAAN: A PRELIMINARY REPORT ON THE 1994 EXCAVATIONS AT NAḤAL TILLAH, ISRAEL

Thomas E. Levy, David Alon, Edwin C. M. van den Brink, Eric C. Kansa, and Yuval Yekutieli

This paper is written in memory of Doug Esse, a dear friend and leading light in the study of the Early Bronze Age of Israel. Doug tragically died at the young age of forty-two, and he is sorely missed as friend and outstanding colleague. Doug would have been excited by the new discoveries at Naḥal Tillah, and it saddens us that he is not here to share in the exultation and thrill of our new research.

THE RESEARCH AREA

Naḥal (Hebrew; Arabic = Wadi) Tillah is a small secondary seasonal drainage that debauches into the larger Naḥal Gerar and is located near the interface between the Irano-Turanian semi-arid and Mediterranean environmental zones of Israel's northern Negev and southern Shephelah regions. The Naḥal Tillah research project focuses on the excavation and geophysical survey of cave sites adjacent to Abu Hof, a large Chalcolithic settlement situated at the beginning of the Naḥal Tillah drainage and excavations at the Silo Site, situated on the nearby eastern slopes of the Tel Ḥalif Terrace which covers a total area of some thirteen hectares. The Ḥalif Terrace, first extensively excavated by Seger (Seger et al. 1990) is roughly three hectares larger than the average size of Negev Chalcolithic settlement centers (Levy 1995). The area is characterized by Eocene chalk hills, dissected by small secondary drainages, with many small valleys in-filled with loessial sediments. Rainfall averages around 400 mm on an annual basis. The Ḥalif Terrace rises to some 490 meters above sea level and marks the watershed between the Naḥal Gerar in the west and the secondary drainages that flow into the Biqaʾat Yaval (Yaval Valley) in the east. The area dominates an important ancient transportation/trade route east-west from the Mediterranean coast, north-south through the southern Shephelah, and northward through the Judaean mountain system.

PREVIOUS EXCAVATIONS IN THE NAḤAL TILLAH REGION

The Naḥal Tillah project grows out of earlier pioneering research in this environmental contact zone carried out under the direction of J. D. Seger of Mississippi State University and D. Alon of the Israel Antiquities Authority on the Ḥalif Terrace. The terrace is located on the

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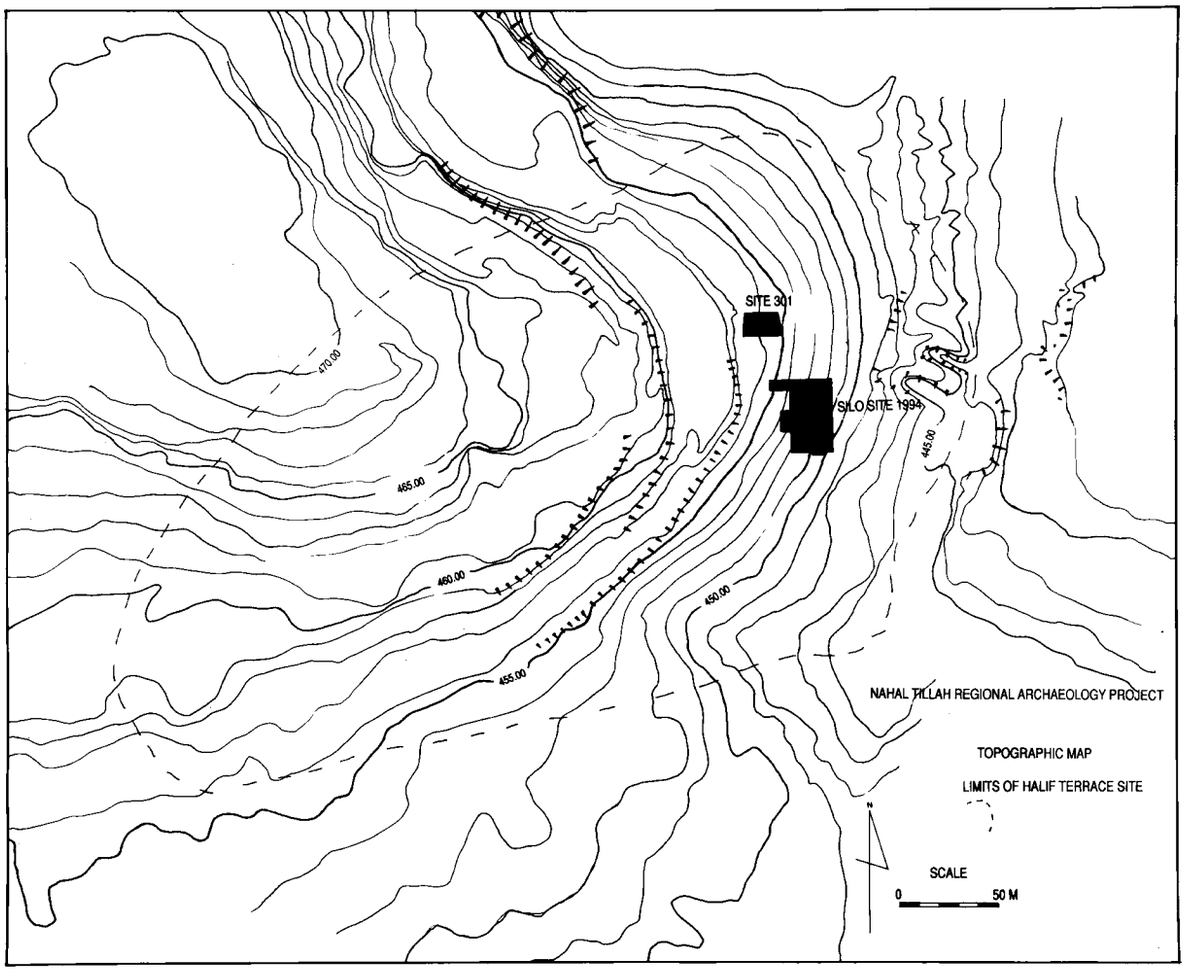

FIGURE 22.1. Topographic map of the Ḥalif Terrace.

eastern side of Tel Ḥalif (Arabic = Tell Khuweilifeh) near Naḥal Tillah on the grounds of Kibbutz Lahav (Alon 1974; 1977a; 1977b; Seger 1987a; 1987b; 1990; 1991; Seger et al. 1990; Dessel 1991; see fig. 22.1). Seger's (Seger et al. 1990) precise excavation work provides an essential stratigraphic cornerstone that demonstrates the rich evidence for the elusive Chalcolithic through Early Bronze (EB) I sequence in southern Israel. Naomi Porat (1989) was the first scholar to make an in-depth study of Egyptian–EB I Canaanite trade relations based on petrographic studies of pottery from the region. J. P. Dessel (1991) made the first systematic and in-depth ceramic analysis of material from the Ḥalif Terrace based on Seger's excavations at the site (Sites 101 and 301). Alon and Yekutieli (1995) made a similar study using data from Alon's eight probes on the Ḥalif Terrace carried out in the early 1970s. As a total of ten probes have been made on the Ḥalif Terrace, researchers have given separate names—such as Site 101, Site 301 (Seger et al. 1990), and the "Silo Site" (Alon and Yekutieli 1995)—to the different excavation operations at the site. Together, the early excavations cover an area of some 1,703 m^2.

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THE 1994 EXCAVATIONS AT NAḤAL TILLAH

Building on the work of these earlier researchers, in the summer (July-August) of 1994, T. E. Levy and D. Alon initiated a pilot excavation and survey season in the Naḥal Tillah region (fig. 22.1; Levy et al. 1995). This included a large horizontal sounding (about 800 m^2) on the Ḥalif Terrace that was labeled the "Silo Site" as it was located near an earthen fodder silo established by Kibbutz Lahav. This was also the site of Alon's original work on the terrace. Survey and excavations in 1994 have confirmed a full stratified sequence of Chalcolithic, early EB I, and late EB I occupation at the Silo Site. In addition, using geophysical survey techniques, A. Witten located a significant number of potential EB burial caves in the research area.

Most important is the widespread evidence for a substantial Protodynastic/Early Dynastic Egyptian presence on the Ḥalif Terrace that rivals Tel Erani, long thought to be the center of Egyptian activity in southern Canaan (cf. Brandl 1989). The 1994 excavations have revealed large quantities of prestige goods such as Egyptian Late Ware vessels (pl. 22.2; cf. Petrie 1901: fig. 8), a faience jar, Egyptian storage jars, and administrative artifacts such as a clay *bulla*, or cylinder seal impression, and a *serekh* with the name of King Narmer (Levy et al. 1995). These are discussed in more detail below. The discovery of the clay bulla marks the first time one of these administrative artifacts have been found in situ outside of ʿEn Besor in southern Israel (see Gophna 1995). In the following discussion, we highlight the tomb discovery, the pottery assemblage, and some of the administrative artifacts found in 1994.

A total of five archaeological strata have been identified at the Silo Site on the Ḥalif Terrace. These include

- Stratum I, a disturbed and mixed deposit with a wide range of artifacts spanning the Middle Bronze through Chalcolithic periods.
- Stratum IIA, a rather ephemeral building phase with late EB I remains. The presence of an Egyptian clay bulla (see below) most probably links this deposit to the beginning of Dynasty 1 in Egypt.
- Stratum IIB, which contains the best-preserved architectural remains on the site, dates to late EB I and has been correlated with the very end of the Proto-Dynastic period (cf. Levy et al. 1995).
- Stratum III, characterized by ephemeral pit dwellings and installations that date to early EB I.
- Stratum IV which relates to the very late Chalcolithic period.

The following discussion presents a preliminary study of the ceramic assemblage found in these strata during the 1994 excavations at the Silo Site on the Ḥalif Terrace.

PRELIMINARY CERAMIC ANALYSIS OF THE 1994 SILO SITE ASSEMBLAGE, ḤALIF TERRACE

Methodology of Pottery Analysis

Over 900 kg of pottery (approximately 50,000 sherds) were recovered from the first season of the renewed excavations at Tel Ḥalif Terrace Silo Site. Based on prior knowledge of fourth

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millennium B.C. southern Canaanite pottery in general, and at Tel Ḥalif Terrace in particular (Dessel 1991; Yekutieli 1992; Alon and Yekutieli 1995), the sherds were first classified according to time period (Chalcolithic, EB IA, EB IB, and later periods), and sherd weights and counts were taken for these categories for each locus. Diagnostic sherds were then subjected to a more rigorous analysis. The variables of vessel form, rim form, handle form, decoration application technique and decorative motif, and temper were recorded with an estimate of the minimum number represented (again for each locus). The tempers were defined visually, by the authors and by comparison with examples that had been checked petrographically, prior to our excavation, by Y. Goren. Each of these variables is extremely important and should be recorded in order to discern as many trends as possible. The mathematical quantification of all of these variables for all pottery from each locus will eventually enable more objective and sophisticated comparisons with other sites. In addition, in this way we can hope to detect changes and patterns along symbolic, economic, and technological dimensions.

The Naḥal Tillah Silo Site Ceramic Assemblage

The pottery of the Naḥal Tillah Silo Site appears similar to the general range of Late Chalcolithic to EB I pottery of southern Israel. The following presents a brief overview of the Silo Site assemblage.

Chalcolithic

For the Chalcolithic, the ceramic assemblage included some vessel forms that are fairly particular to the Chalcolithic, such as cornets and churns. The Chalcolithic sample most closely parallels that of the Patish Valley Chalcolithic tradition, in form, temper, and decoration. Evidence for ceramics of the Chalcolithic tradition is found mostly in the deepest strata, chiefly IV and III (fig. 22.2). This was a very well-developed tradition with fairly standardized and finely shaped forms. The primary decorative technique was the application of a red painted band at the rim of the vessel, and the most common types of clay inclusions were wadi sands of different sizes (small grains for open vessels, larger for closed forms; see fig. 22.3a).

EB IA

Vessels of the EB IA tradition seem crude compared with those of the Chalcolithic period. This tradition was the most prevalent in Stratum III (fig. 22.2). They tend to have more variable and less refined forms. They also differ technologically, with "grog and grit" temper (crushed pottery and sandy inclusions) and a brittle straw temper (found mostly on open forms) becoming very common (fig. 22.3b). Gone are the special forms of the Chalcolithic such as the churns and the cornets; instead the very crude straw-tempered hemispherical bowls become quite common. Ledge handles appear in this tradition, and decoration is more variable. We see more thumbed rims, plastic decoration, and the occasional application of whitewash, as well as continued use of red painted bands.

The ceramic repertoire of Stratum III places it within the early subphase of EB IA. It has parallels at Tel Ḥalif Terrace sites: Silo Site Stratum III (Alon and Yekutieli 1995); and Site 101 Stratum V, 150 meters uphill from the Silo Site (Dessel 1991: 72–73); at several dwelling caves at the Northwestern settlement at Lachish (Tufnell et al. 1958); and with some variations at Site H, lower phase, and Nizzanim Stratum V (Yekutieli 1992).

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STRATUM	CHALCOLITHIC	EBIA	EBIB LOCAL	EGYPTIAN	EBIB total	TOTAL
I	22.1%	11.5%	42.5%	23.9%	66.4%	1041
IIA	17.5%	9.0%	43.5%	29.9%	73.4%	177
IIA/B	13.3%	5.7%	47.6%	33.3%	80.4%	105
IIB	13.1%	17.6%	33.4%	35.9%	69.3%	404
III	43.4%	50.3%	6.3%	0.0%	6.3%	396
IV	75.0%	16.7%	8.3%	0.0%	8.3%	24

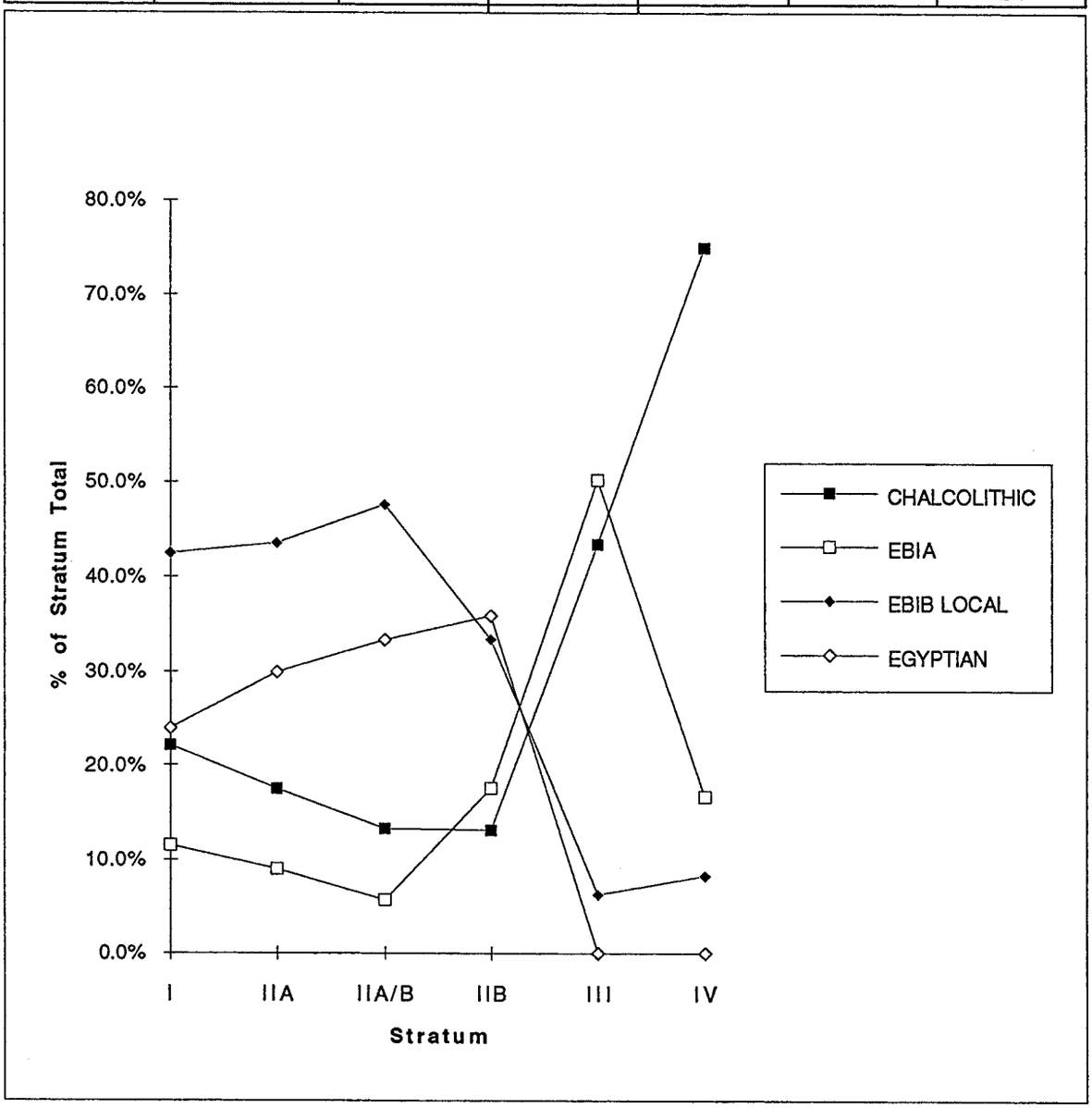

FIGURE 22.2. Naḥal Tillah: Pottery profile by stratum.

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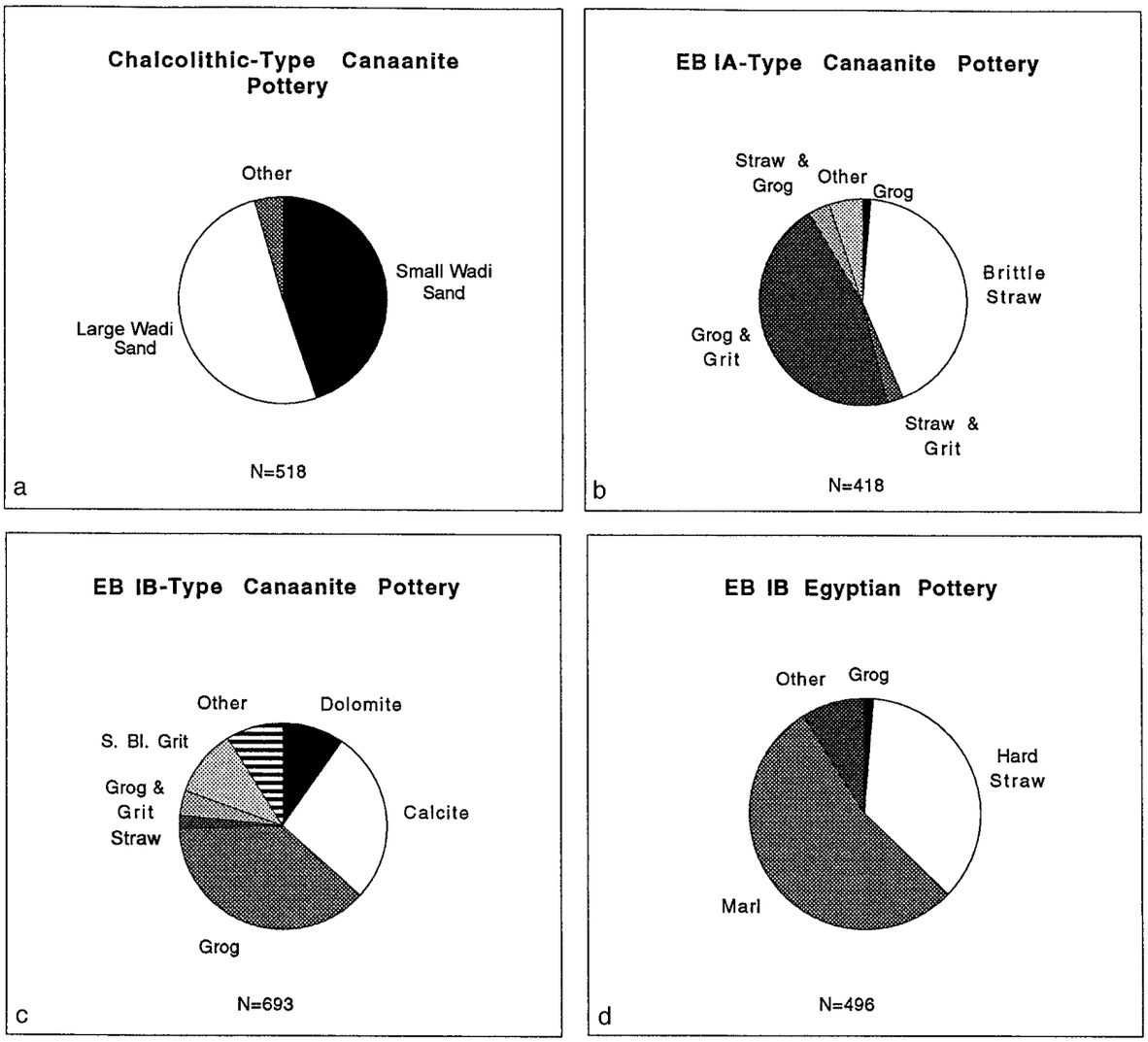

FIGURE 22.3. Clay types of different ceramic traditions: a) Chalcolithic-type Canaanite pottery; b) EB IA-type Canaanite pottery; c) EB IB-type Canaanite pottery; d) EB IB Egyptian pottery.

EB IB

In Strata I and II we see two more ceramic traditions that are generally assigned to EB IB (fig. 22.2). The first of these traditions is the local Canaanite EB IB tradition. This can be broadly characterized as having more refined forms and shaping than EB IA. It also differs technologically: grog continues to be used as an inclusion, but straw becomes less common. Crushed calcite becomes very common for some holemouth jars, probably to absorb thermal stresses from cooking fires. Dolomitic sand also becomes common, especially for some medium to small storage jars (fig. 22.3c). Ledge handles continue, and we also see the use of pillar handles on some storage vessels. Decoration also changes somewhat, with plastic rope decoration on many holemouths, and red painted band or net patterns on whitewashed storage jars (and some open forms). Of special interest are the numerous "potter's marks" on some sherds, which are well known for this time period. These marks were usually symbols made with two or three stokes incised on the base or body of the vessel. They have been found pri-

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marily on the EB IB vessels, mostly on Canaanite forms, but some were found on Egyptian forms as well. These intriguing marks invite further investigation.

The Egyptian Naqada III–Early Dynastic wares first appear in Stratum IIB (fig. 22.2). Petrographic analysis done by J. P. Dessel to similar vessels at Site 101, 150 m uphill from our excavation, indicates that some of these vessels, most commonly storage jars, were produced in the Nile Valley with hard marl clays (Dessel 1991) (fig. 22.3d). Our own petrographic analysis (done by Goren [Levy et al. 1995]) on the Narmer *serekh* sherd (hard marl-clay body sherd of an Egyptian storage jar) has further confirmed this observation. These vessels were very finely and regularly shaped, but very few of these Egyptian imports were decorated. The majority of the Egyptian vessels of this fabric belonged to the following types of Petrie's classification system (Petrie 1953; also see table 22.1):

1. Large to medium storage jars, class L (late), Petrie's (1953) types 59–63, and 75.
2. Cylindrical vessels, class W (wavy handled), Petrie's (1953) type 72.
3. Open vessels, many of which were red burnished and "lotus shaped," Petrie's (1953) types 3 and 4.
4. Globular juglets, Petrie's (1953) types 87 and 88.

Table 22.1. Egyptian Forms Produced with Marl Clays (Imported)

	Storage	*Cylindrical Jar*	*Small Globular Jar*	*Juglet*	*Bowl*	*Lotus Bowl*	*Holemouth*	*Cyl. Bowl*	*N=*
I	52.8%	8.5%	15.5%	0.7%	16.2%	4.9%	0.7%	0.7%	142
IIA	45.8%	0.0%	12.5%	0.0%	25.0%	16.7%	0.0%	0.0%	24
IIA/B	62.6%	6.3%	12.5%	0.0%	12.5%	0.0%	0.0%	6.3%	16
IIB	41.6%	7.8%	11.7%	0.0%	27.3%	5.2%	0.0%	6.5%	77
III	—	—	—	—	—	—	—	—	0
IV	—	—	—	—	—	—	—	—	0

Worthy of note are two tube handles from Egyptian D-ware (Petrie's classification) vessels with painted spiral decorations. To date, examples of these have been found only at Taur Ikbeineh (Oren and Yekutieli 1992). These finds are unfortunately not chronologically significant to the understanding of our site since they were found in highly disturbed contexts of Stratum I.

In addition to imported Egyptian wares, we also found much evidence for the local production of Egyptian type vessels. Petrographic work done for Dessel's study (Dessel 1991) has shown that the Egyptian form vessels with straw tempers were locally produced (fig. 22.3d). This is especially obvious for the Egyptian bread molds (which would have been highly impractical to import), made of a very crude mold-shaped straw temper. The majority of the rest of the locally produced Egyptian vessels were of open forms, particularly large storage basins (table 22.2). As with the imported wares, very few of the locally produced Egyptian vessels were decorated but were very regularly shaped.

In general the ceramic repertoire of Strata I and II belongs to the Southwestern Canaanite horizon of the later part of the EB IB period. It resembles that of sites such as Arad Stratum IV (Amiran et al. 1978), Erani Strata VI–V (Yeivin 1961), Tel Maʾaḥaz Stratum I (Amiran

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Table 22.2. Egyptian Forms Produced with Hard Straw-Tempered Clays (Assumed locally produced)

	Storage Krater	*Storage*	*Small Globular Jar*	*Bowl*	*Lotus Bowl*	*Bread mold*	*Holemouth*	*N=*
I	41.5%	2.4%	8.5%	13.4%	3.7%	25.6%	4.9%	82
IIA	43.5%	0.0%	0.0%	0.0%	26.1%	30.4%	0.0%	23
IIA/B	57.9%	0.0%	0.0%	5.3%	15.8%	21.1%	0.0%	19
IIB	60.7%	0.0%	0.0%	5.4%	5.4%	28.6%	0.0%	56
III	—	—	—	—	—	—	—	0
IV	—	—	—	—	—	—	—	0

and van den of Brink, chap. 3, this volume), and the Azor tombs (Ben-Tor 1975), in both local and imported Egyptian vessels. The horizon is well dated, by synchronization with Egypt through the imported vessels, to the end of Dynasty 0 and early Dynasty 1 (Amiran and Gophna 1992: 358).

Some very interesting patterns can be seen in the examination of the chronological patterns of the assemblage. Figure 22.2 shows the prevalence of the different ceramic traditions through the occupational history of the site. As expected, the Chalcolithic-type wares are more common at the earliest occupation phase, Stratum IV. The EB IA types of pottery are most common in Stratum III, while the EB IB Canaanite and Egyptian wares are most common in the latest occupation phases of Strata II and I.

An interesting point can be made concerning the nature of the Chalcolithic–EB IA transition. As seen in figure 22.2, there does not appear to be any sharp break, but a more gradual transition in the predominance of these two ceramic traditions. The EB IA type ceramics are not without precedence in Stratum III since they do occur in Stratum IV. Nor do Chalcolithic type ceramics disappear in Stratum III; they decline in prevalence but are still quite common. Figure 22.4 further illustrates these trends. Large and small grain wadi sand, which constitute the bulk of the Chalcolithic tradition, are most frequent in Stratum IV and become somewhat scarcer as the brittle straw temper and grog and grit temper (two clay types found mostly in the EB IA) become more common in Stratum III. Despite some possible mixing due to site formation processes, this can be taken as evidence that there was no complete break in the occupation of the site during the Chalcolithic–EB IA transition, something fairly rare in the southern Levant. This evidence supports observations of some continuity between the Chalcolithic and EB IA in southwestern Israel (Wright 1937; Amiran 1985; Joffe 1993; Gophna 1995). Unfortunately, our excavation sample of Stratum IV was extremely limited, and any conclusions comparing Strata III and IV must be very tentative at this stage.

It is also interesting to note that there is only one sharp discontinuity in this record, between Stratum III and Stratum IIB. Between these two occupation phases, we see a large increase in the amount of the EB IB-type Canaanite pottery, and a corresponding decrease in the proportions of the EB IA and Chalcolithic types of Canaanite pottery. As illustrated in figure 22.4, some evidence for EB IB-type Canaanite production exists in the preceding Stratum III with the use of grog, calcite, and dolomitic sand clay types. However, the use of these clay types was rare in Stratum III and may reflect some experimentation with new tempers, or

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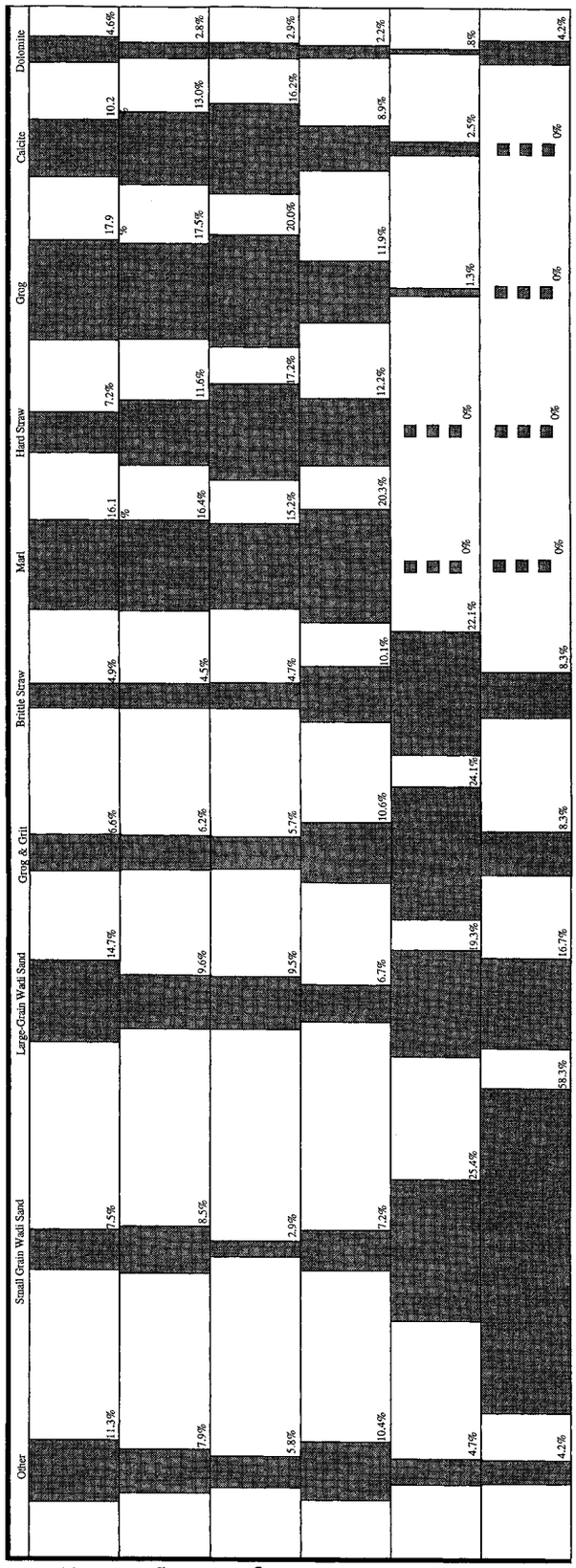

FIGURE 22.4. Naḥal Tillah Silo Site 1994: Seriograph of clay type frequencies by stratum.

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some sort sampling error (or both). Clearly, there is marked contrast between Strata IIB and III in the frequencies of these clay types. Even more dramatic is the introduction of Egyptian wares in Stratum IIB (fig. 22.2). This is clearly illustrated in figure 22.4, where two new Egyptian clay types suddenly appear. The two coinciding trends of the great increase in the EB IB-type Canaanite production and the introduction of Egyptian wares indicate a very drastic change in the ceramic assemblage of the site. This marked contrast supports the observation that the late phase of the EB IA and the early phase of the EB IB are missing at our excavated area, and that during this time technological and typological changes occurred.

Further analysis of the ceramics can shed new light on the nature of this interaction. Figure 22.5 shows the ratio of serving vessels to storage vessels over time. As seen in the graph, with the introduction of Egyptian vessels at the site in Stratum IIB, we see a reversal in the ratio of serving to storage vessels. After Stratum IIB, storage vessels become more common than serving vessels. This is true for both Egyptian-type ceramics and Canaanite-type ceramics. This ratio is rather unexpected, considering that one usually expects serving vessels to outnumber storage vessels (both because there is usually a need for more serving vessels, and that they usually have a much higher breakage rate; Orton, Tyres, and Vince 1993).

This dramatic change may reflect a shift in the demand for different types of vessels, with storage becoming more important. This evidence for more storage requirements (perhaps far beyond the household level) may be an indication of increasing economic complexity and an integration of the Silo Site into large economic systems. The mere presence of large numbers of imported Egyptian storage vessels is a further indication of this process. This evidence, in addition to epigraphic evidence of the Narmer *serekh* (fig. 22.14:10), as well as numerous potter's identification marks, may point to the emergence of a larger, more sophisticated regional economy including the Silo Site with the Egyptian periphery.

Some Spatial Interpretations

One interesting question concerns the purpose of the Egyptian ceramics at the Silo Site. Are they there as a result of trade and used for local consumption by Canaanites? Did some Canaanites use them to emulate Egyptians and Egyptian prestige symbols for purposes of social ranking? Or were there actually Egyptians living at the Silo Site, using their own ceramics and symbolically communicating their separate ethnic identity? The mere presence of Egyptian pottery at the Silo Site need not mean the presence of Egyptians—pots do not equal people—so further analysis is needed.

Figures 22.6–22.9 can be interpreted to help answer these questions. For these figures, mixed contexts such as fills, topsoil, and rubbles were not considered. The contexts that were considered include pits, surfaces, floors, hearths, and structures. These contexts better preserve information about use and especially disposal behaviors, which could be lost in those other contexts that are far more affected by other processes. Figures 22.6 and 22.7 show that the locally produced and imported Egyptian ceramics are found in generally the same places. This similar use of space may indicate that the locally produced and imported Egyptian ceramics shared some conceptual and functional similarities.

Such similarity is not at all shared between the Egyptian wares and the Canaanite wares (figs. 22.8, 22.9). Though our sample is small, we do see a dramatic difference in the distribution of these two categories, resulting from different disposal and (probably) use behaviors.

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Stratum	Local storage	Egytptain storage	Local serving	Egyptian serving	Local serv/stor	Egyptian serv/stor
I	369	167	241	57	0.65	0.34
IIA	49	25	39	20	0.80	0.80
IIA/B	30	24	17	7	0.57	0.29
IIB	106	84	94	46	0.89	0.55
III	89	0	269	0	3.02	0.00
IV	4	0	19	0	4.75	-

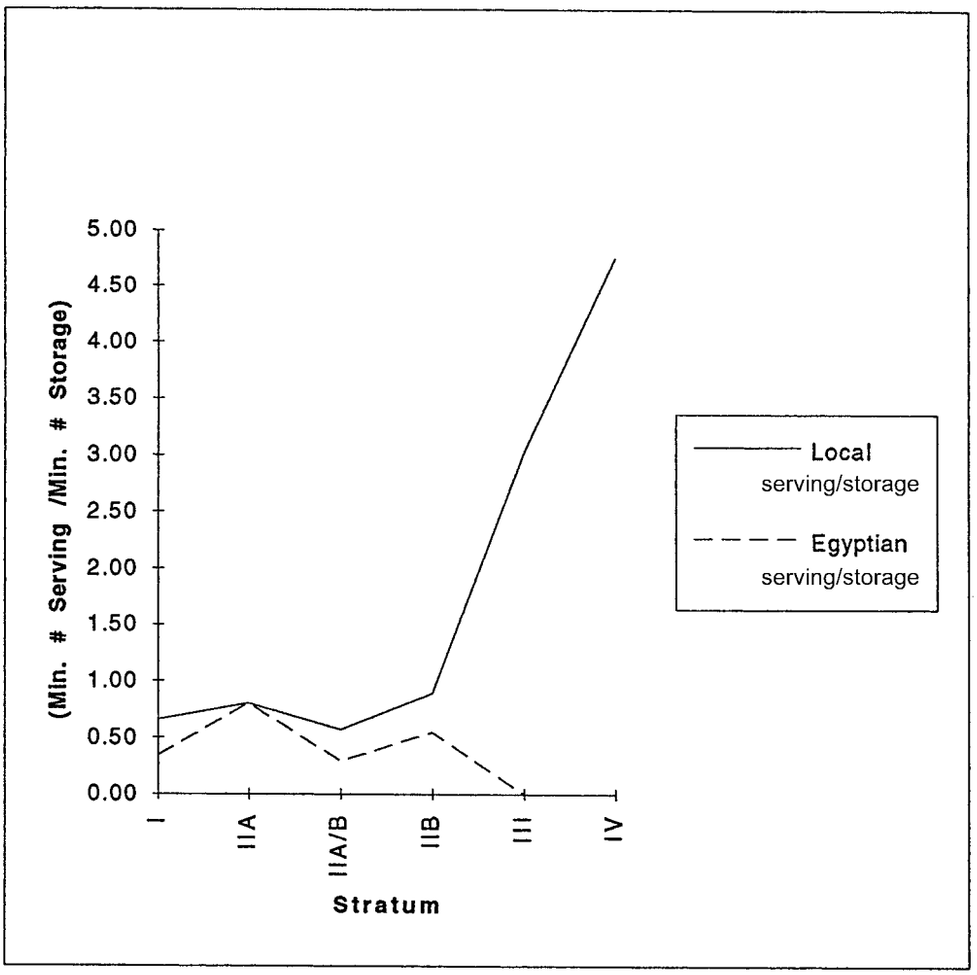

FIGURE 22.5. Naḥal Tillah, Silo Site 1994: Ratio of serving to storage vessels by stratum.

The vast majority of the Canaanite pottery concentrated toward the north of the excavated area, associated with little in the way of recognizable structures. On the other hand, the majority of the Egyptian pottery was found towards the south of the excavated area. Complete vessels were found intentionally buried in the floor of Room 1, while other pottery fragments were found associated with a large stone feature in the southernmost part of the excavated area. This spatial segregation of Egyptian and Canaanite pottery probably indicates that these two traditions served very different conceptual and functional purposes. Most probably the Egyptian ceramics were not evenly distributed among the population of the site.

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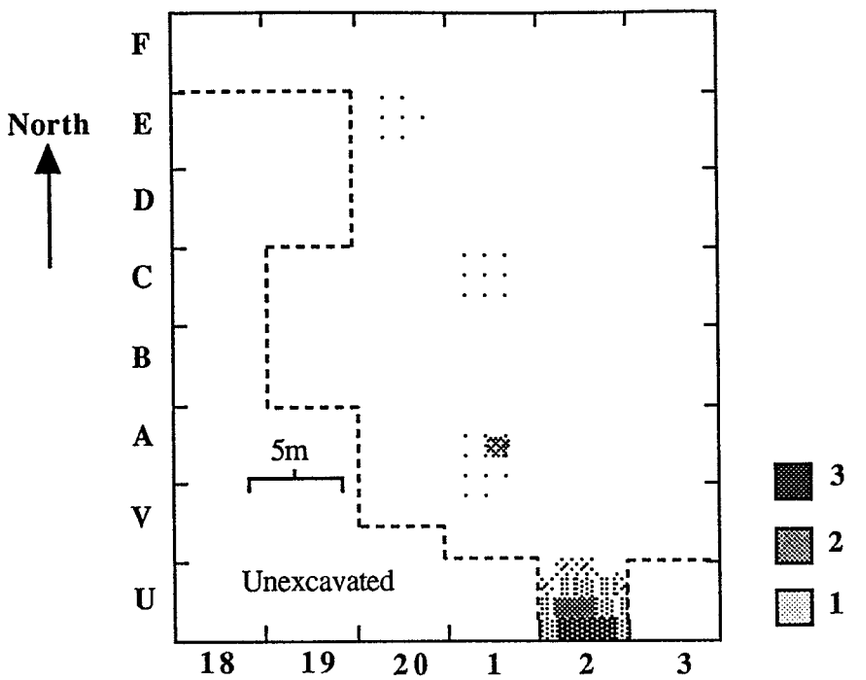

FIGURE 22.6. Naḥal Tillah, Silo Site 1994: Stratum IIB distribution of locally produced Egyptian pottery.

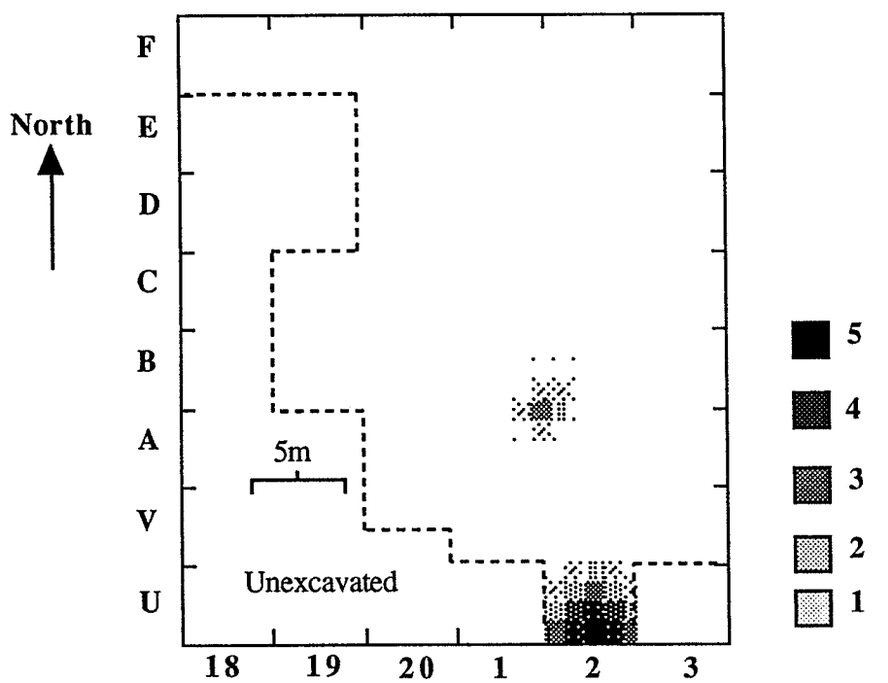

FIGURE 22.7. Naḥal Tillah, Silo Site 1994: Stratum IIB distribution of imported Egyptian pottery.

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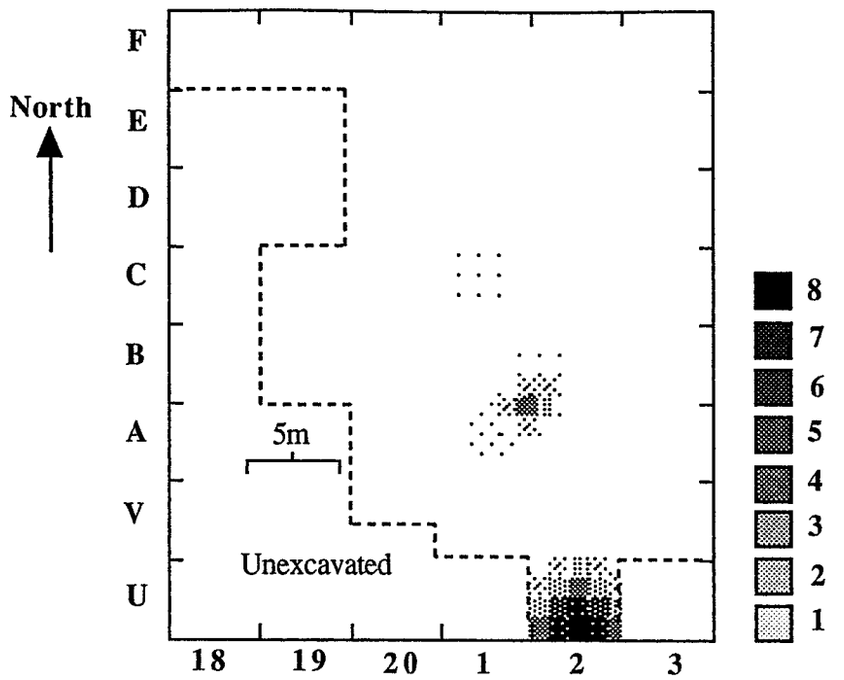

FIGURE 22.8. Naḥal Tillah, Silo Site 1994: Stratum IIB distribution of Egyptian form pottery (locally made and imported).

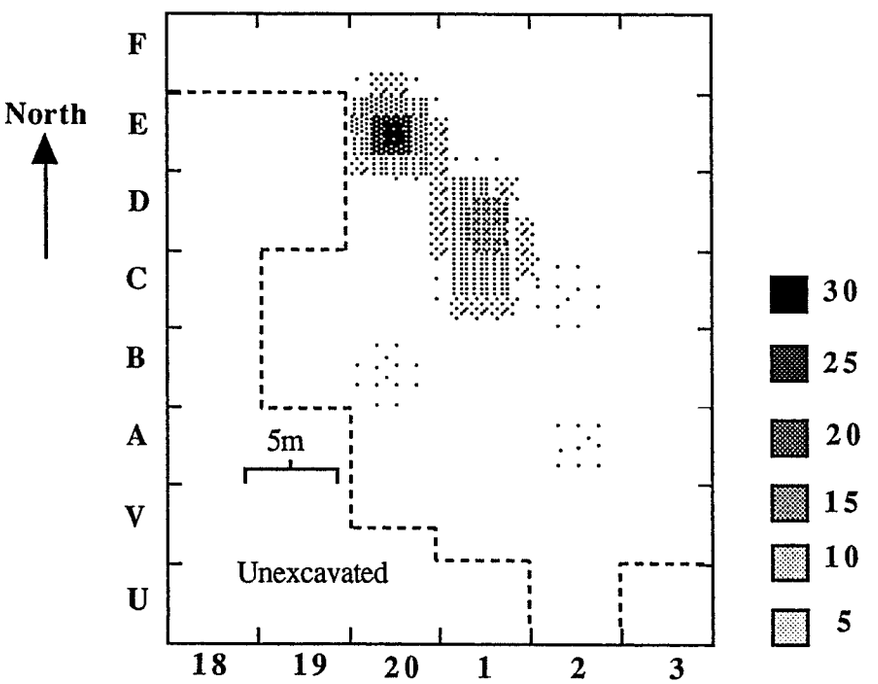

FIGURE 22.9. Naḥal Tillah, Silo Site 1994: Stratum IIB distribution of Canaanite pottery.

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But who were using these ceramics? As discussed earlier, it seems unlikely that the Egyptian ceramics were used in the same way as the Canaanite wares. Many of the Egyptian vessels served similar functions as the local wares. Storage, food preparation, and food-serving vessels appear in both the Egyptian and the Canaanite samples. The important difference between Egyptian pottery and Canaanite pottery, reflected by their spatial segregation, is more likely to be symbolic. Was this symbolic difference an attempt by local Canaanite elites to differentiate themselves by displaying Egyptian pottery? This is a possible scenario. The Egyptian pottery might have had some prestige value that local elites chose to emulate.

However, there is little evidence that the Egyptian pottery had any prestige value. It is difficult to see how an Egyptian bread mold could convey information of high status: they are too crude, disposable, and utilitarian. Egyptian wares in general, though well shaped, tended not to have decoration. This lack of decoration may mean that the bulk of the Egyptian ceramic repertoire was intended for more utilitarian ends and not primarily to communicate prestige differences. It seems more likely that their presence in Canaan, found segregated from local types, communicated ethnic distinctions. ("Ethnic" and "prestige" symbolic communication are not mutually exclusive; however, one of these dimensions might have been more important than the other.) Possibly, ethnically distinct Egyptians, maintaining their own technological traditions, were living at the Silo Site. The abundant, locally produced Egyptian pottery, although functionally similar to local wares, was distinct in form, decoration, and manufacturing technology (dissimilar temper), and thus served to communicate a separate Egyptian ethnicity from the local Canaanites. Again this interpretation is tentative, and further excavation is needed to further confirm this evidence of spatial segregation between Egyptian and Canaanite pottery.

THE TOMB DISCOVERY

Excavations at the Silo Site were divided into three fields: Areas A, B, and C respectively. At the beginning of the excavation season, a large enigmatic pile of stones appeared in Area C some 30 cm below the site surface. When the stone pile was removed, two well-built stone walls appeared which were encircled by a hard-pack plastered floor (L. 512 and L. 513) that lips up around the parallel wall structure. These two parallel walls are situated east-west; the northern one is labeled Wall 11 and the southern one Wall 12. A standing stone was carefully set on the outside of Wall 11 in association with a small circular installation of stones, all of which were set in the plaster floor. By the end of the excavation season, Walls 10 and 11 were shown to extend for about 9.45 m, with a preserved height of over 2.80 m (fig. 22.10). They were joined in their western extremity by a curvilinear stone wall which makes this feature form an elongated U-shape (fig. 22.11; pl. 22.1). After removing a large balk which traversed these walls in their western extremity, we discovered a finely crafted pair of large stone lintels 2.25 m below the height of the tops of Walls 10 and 11. The lintels (figs. 22.10, 22.12) form the doorway to a spectacular tomb structure.

This monument marks the discovery of a possible Early Dynastic Egyptian-style tomb in southern Palestine and points to the great potential of the Silo Site on the Ḥalif Terrace for providing important data concerning mortuary practices, human skeletal remains, genetic "fingerprinting," artifacts that reflect trade and exchange, and so on. As mentioned above, Walls 10

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FIGURE 22.10. South section view of Wall 11 from Tomb 1, Ḥalif Terrace. Note the large well-crafted stone block near the entrance to the tomb indicated by the location of the two lintels on the left side of the drawing.

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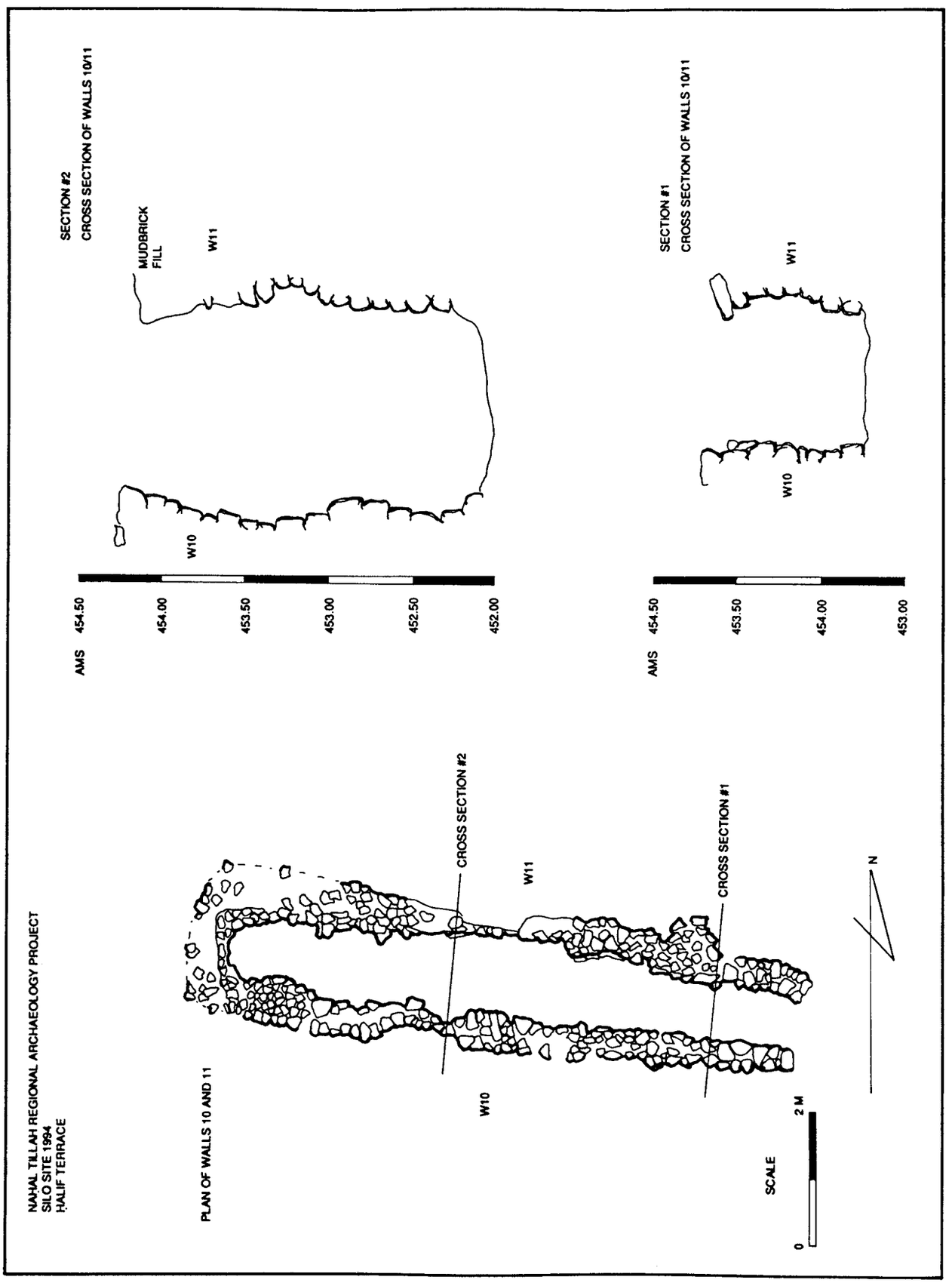

FIGURE 22.11. Plan view and sections through Tomb 1 in Area C, Silo Site, Ḥalif Terrace.

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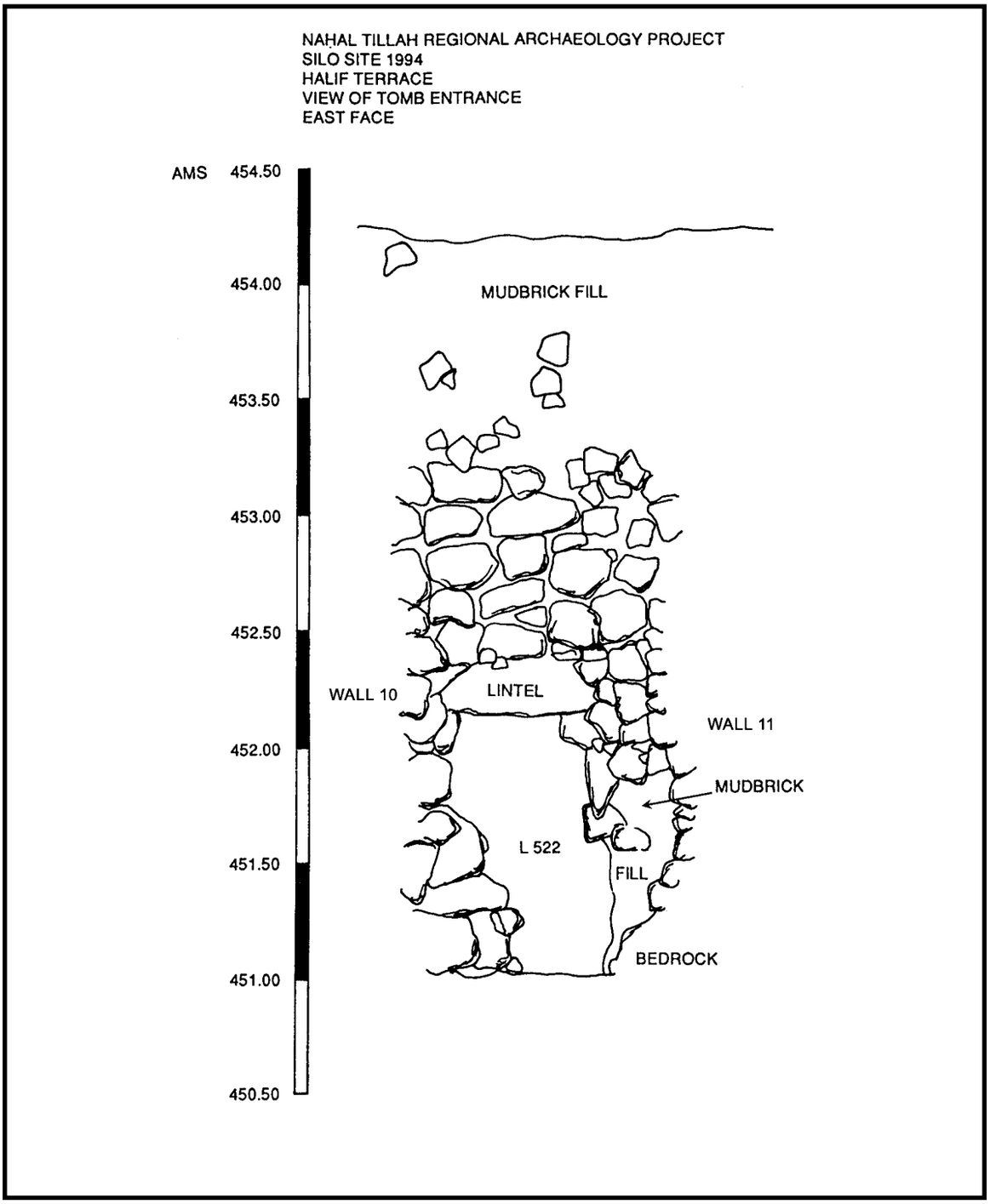

FIGURE 22.12. Section view of entrance and large lintel leading to Tomb 1, Ḥalif Terrace.

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and 11 were surrounded by a well-made plaster floor that is clearly dated to the late EB I period, ca. 3300–3000 B.C. The fact that Wall 10 cut through an early EB I storage silo provides more evidence for dating the monument to late EB I. Walls 10 and 11 form a long passageway to the tomb entrance and contain a sharp incline that appears to be made up of hard-pack earth and stones forming a stairlike entry down to the tomb entrance framed by the lintels. The lintels rest on dry masonry walls which are preserved to a height of about 1.20 m and 1.5 m in length. After passing through the lintel-lined entrance, one enters a tholos or beehive-shaped dome made of dry masonry. While the tholos is remarkably well preserved, due to its dry masonry construction, it is unsafe to work under the dome. In the center of the tholos ceiling is a large crafted stone block held in place by stone arches embedded with small chinking stones. Accidental removal of these small stone chips could cause a collapse; thus, excavation was abandoned soon after we discovered this structure.

The floor beneath the tholos was never reached during the 1994 season. However, a thick deposit of colluvial varve-like sediment with the consistency of butter was found covering the entire tomb interior. A section was cut though this fill to a depth of around 80 cm, which enabled us to stand up in a hunched position beneath the tholos ceiling. The tholos was constructed on top of the entrance to what seem to be two natural caves, some 3.5 m below the site surface. The entrance to one of these caves was exposed during our limited excavation in the tomb interior and found to be sealed by a wall made of dry masonry. This leads us to believe that here we found the actual burial chamber of the tomb which, due to the dangers outlined above, were later investigated using a substantial safety strategy (Levy et al. 1997).

Our interpretation of this structure as a tomb is based on its uncanny parallel to a few stone-built First Dynasty tombs found at Helwan in Egypt by the Egyptian archaeologist Zaki Saad (1951). Saad excavated several tombs that contain steps and lead below ground to a burial chamber. The Ḥalif Terrace example described here is unlike any late EB I tomb known from Palestine that are either burial caves (cf. Ben-Tor 1975) or shaft tombs like the ones recorded at Bâb edh-Dhrâʿ (Schaub and Rast 1989). The wealth of Egyptian imports found at the Ḥalif Terrace (cf. Levy et al. 1995, 1997; Seger et al. 1990) point to the importance of this tomb and its contextual association with these artifacts for clarifying the nature of the Egyptian presence in this part of southern Israel.

We believe that the passage leading to the tomb which is formed by Walls 10 and 11 was covered with a corbeled stone roof and visible to the late EB I occupants of the Ḥalif Terrace. A huge stone fill was found between these walls that represents the collapsed corbeled roof. That the builders of the tomb knew how to construct a corbeled roof is seen by the presence of the impressive tholos. Further evidence can be seen in the cross sections made across the passage (fig. 22.22.11). These cross sections precisely illustrated how the stone walls (nos. 10 and 11) curve inward at the top, illustrating that they supported a corbeled roof. Why the inhabitants of the Ḥalif Terrace chose to construct a monumental tomb within part of their settlement is beyond our interpretive powers. By expanding the excavations around the tomb area as well as the entire Silo Site on the Ḥalif Terrace (fig. 22.1), we hope to answer this and many other questions concerning who is buried in the tomb, whether it is an Egyptian or Canaanite burial, and what is its sociopolitical significance.

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ADMINISTRATIVE ARTIFACTS

Chronological Implications

Recent excavations at a number of settlement sites in the Nile Delta, all dating to the late Pre-Dynastic through Early Dynastic periods (ca. 3400–3000 B.C.), have provided us with a much better understanding of the final stages of the Lower Egyptian, Chalcolithic Maadi culture. The period referred to here spans the Naqada IIc–d to Naqada IIIa–c in terms of the relative chronology of Kaiser (1957, 1990). As is well known, settlement sites (as opposed to mortuary sites) are extremely rare in the Egyptian archaeological record. The new research provides the missing link concerning the mechanisms that brought about the transition from a late Chalcolithic, fairly homogeneous Lower Egyptian culture labeled by some scholars as the "Maadi-Buto culture" (von der Way 1992: 1) to the following Proto-Dynastic period, characterized by a material culture with traits shared by the people of both the Nile Delta and Nile Valley, and which culminated sometime toward the end of the fourth millennium B.C. with the creation of the early Egyptian state heralded by the so-called Unification of the Two Lands (i.e., Upper and Lower Egypt) into a single, very homogeneous Early Dynastic material culture prevalent and widespread throughout the whole of Egypt.

While it has been customary in the past, in discussing the earliest interaction between Egypt and its eastern neighbors, to lump them together under the common, nondistinctive, chronological denominator late Pre-Dynastic/Early Dynastic on the one hand, and Early Bronze I Age on the other, it is now possible to clarify and distinguish between the various stages of contact and interrelations between contemporary late Chalcolithic Lower Egypt, late Naqada IIc–d Upper Egypt, and Early Bronze IA Canaan and between contemporary Proto- and Early Dynastic Upper and Lower Egypt and Early Bronze IB respectively.

At least four distinct phases in the earliest contacts between Lower and/or Upper Egypt on the one hand and Early Bronze IA–B Canaan on the other can now be distinguished (cf. Gophna 1992; 1995; Tutundzic 1993; Hartung 1994). These phases include:

(1) The earliest contacts or exchanges occurred between the Chalcolithic Lower Egyptian Maadi Culture (Seeher 1990) and those of the Chalcolithic Naḥal Beersheva culture (cf. Perrot 1955: 186; Levy 1992: 350 ff.) as attested by the presence of subterranean buildings at Maadi in Lower Egypt and at sites such as Bir es-Safadi, Abu Matar, and Shiqmim in southern Israel.

(2) The next phase in this process of ongoing contacts was between the late Chalcolithic Lower Egyptian Maadi-Buto culture and the Early Bronze IA culture in southern Israel, indicating the beginning of some kind of Egyptian presence in southern Canaan. This is seen by the significant quantities of Egyptian or Egyptianized pottery alongside of local EB IA ceramics (e.g., Oren and Yekutieli 1992) as well as certain Egyptian types of flint tools (cf. Rosen 1988) at sites in southern Israel, and of Canaanite ceramic imports found at Maadi (Seeher 1990) and in the cemetery at Minshat Abu Omar in Egypt (cf. Kroeper 1989).

(3) The next stage—characterized by a sharp quantitative decline in Egyptian items found in Israel, but by a sharp increase in imported commodities contained in Canaanite vessels in Egypt—is more or less fixed between late Naqada IId and IIIa2 (in its later part [the early Proto-Dynastic period] identifiable with early Dynasty 0. These links have been established at cemetery sites in Egypt such as Umm el-Qaʾab, Abydos (especially cemetery U (Dreyer 1992, 1993),

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Abusir el Meleq, Amrah, Gerzeh, Minshat Abu Omar, Naqada, and Hierakonpolis (see Hartung 1994: nn. 24–32 for refs.).

(4) The apex of these early contacts is between late Proto-Dynastic Egypt (i.e., Dynasty 0) and the contemporary late EB IB culture in southern Israel. It is in this period that we again see growing evidence for the presence of an Egyptian population component among the local Canaanite settlers, apparently sometimes characterized by the establishment of their own Egyptian enclaves separate from the local EB I population. These temporal relations are highlighted in table 22.3.

Although Canaanite imports in this period are almost absent in Egypt, an Egyptian presence in southern Israel is clearly indicated by the presence of significant percentages of Egyptianized materials among the local EB IB ceramic repertoire (as shown in the discussion above of the Egyptian ceramics from the Silo Site on the Ḥalif Terrace) and in the application of Egyptian mudbrick building techniques as seen at Tel Erani, Afridar, and ʿEn Besor, Stratum III. Some local form of Egyptian administration is indicated by the finds of locally stamped, Egyptianized seal impressions at ʿEn Besor Stratum III and possibly at the Silo Site (see discussion below).

The pottery fragment with the Narmer *serekh*-sign discussed here from the Silo Site, Ḥalif Terrace, is a welcome addition to the growing body of data testifying for renewed Egyptian-Canaanite interconnections during this, the later part of the EB 1B, roughly contemporary with the Naqada IIIb–c1 period in Proto-Dynastic Egypt (cf. table 22.3) at the end of the fourth millennium B.C.

The Silo Site, Narmer Serekh *and Egypt*

A single ceramic sherd (reg. no. IAA 64994, L.14/B.259) found at the Silo Site was shown by petrographic analysis to have been made of Egyptian marl clay and bears an incised *serekh* of (Horus) Narmer. The sherd is described in detail in Levy et al. 1995. Here we describe the significance of the Silo Site Narmer *serekh* in relation to ten other known *serekh*-signs incised on pottery vessels that can be positively identified with Narmer: seven come from Egypt and three from Israel. Only two of these are preserved on complete jars (fig. 22.13:1, 5). The remaining eight are preserved on fragments. Excluded here is the incised *serekh* on the complete Tarkhan jar T. 1100, ascribed by Kaiser and Dreyer (1982: fig. 14, no. 39) to Narmer which we believe on typo-chronological grounds an invalid ascription (van den Brink 1996: no. 10).

Four of these Nar(mer) *serekh*s are surmounted by a falcon (two facing to the left, and two to the right) (fig. 22.13:1, 4, 5, 10), representing the god Horus, with which the kings of Egypt identified themselves (Barta 1969, 1990). Although fragmented, enough space above our *serekh* has been preserved, however, to exclude the possibility that it was ever surmounted by a falcon.

Not enough space has been preserved to the left of the *serekh* to positively exclude the possible presence of accompanying incised potmarks, as found on at least six other instances of incised Narmer *serekh*s (fig. 22.13:1, 3–6, 8).

Many more *serekh* fragments, all of them found in Israel, have been tentatively ascribed to Narmer. These include fragments found at Small Tel Malhata, ʿEn Besor, Tel Ḥalif (D. Alon excavations, unpublished, fig. 22.14:11), Tel Maʾaḥaz (Stratum I; Amiran and van den Brink, chap. 3, this volume), and Tel Erani (fig. 22.14:6). Due to its fragmentary state of preservation, the Small Tel Malhata fragment (reg. no. 14/29/1/1; fig. 22.14:17), one of the few fragments

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Table 22.3. General Correlation of Southern Canaan and Egyptian Stratigraphy

Period	*Lower Egypt*	*Upper Egypt*		*Southern Canaan*	*Period*
Egypt	Buto	Umm el-Gaʿab, Abydos:		Canaan	
Dynasty I	Stratum V	Tomb Z	Horus Djet	Tel Arad, Stratum III	EB II
(Naqada IIIc2)		Tomb O	Horus Djer	el Maghar	
		Tomb B10/15/19	Horus Aha	ʿEn Besor, Stratum II	
Late Dynasty 0–early Dynasty 1	Stratum IV	Tomb B17/18	Horus Nar(mer)	Tel Ḥalif Terrace, Silo Site, Stratum IIa–b	
(Naqada IIIb1–IIIc1)		Tomb B7/9	Horus Ka	Tel Erani, Stratum V	EB IB (late)
		Tomb B1/2	Iry-Hor	Tel Arad, Stratum IV	
				ʿEn Besor, Stratum III	
				Small Tel Malhata, Stratum IV	
				Tel Maʾaḥaz, Stratum I	
Early Dynasty 0	Stratum III	Tombs U/f; U/g; U/h		Tel Erani, Stratum C	EB IB (middle)
(Naqada IIIa1–2)		Tomb U/i		Azor, cave tombs	
		Tombs U/k; U/j	Scorpion I		
Naqada IIc–d2	Stratum II	Hierakonpolis:		Taur Ikhbeineh	EB IB (early)
		Tombs 100 (“painted tomb”), 101		Tel Erani, Stratum D	
		HK Locality 29A		Lachish (NW)	
				Silo Site, Stratum IIIa	
Late Chalcolithic (Naqada IIb)	Stratum Ib	Matmar: Tomb 3131		Site H	EB IA
				Taur Ikhbeineh	
				Tel Ḥalif Terrace, Silo Site, Stratum IIIb	
Chalcolithic	Stratum Ia			Shiqmim Beersheva sites	Chalcolithic
				Tel Ḥalif Terrace, Silo Site, Stratum IV	

with a sign in the *serekh*’s upper, or name compartment, which is ascribed by Amiran, Ilan, and Arnon (1983) to Narmer, could better be attributed to King *Nj-Ḥr* (for the *serekh* of this king, see Kaiser and Dreyer 1982: fig. 14:7–8). The fragmentary nature and incomplete preservation of most of the samples mentioned above prevents positive identification with any king name in particular.

Although the new Narmer *serekh* from the Silo Site is too small to reveal anything about the original shape of the vessel it belonged to, except that it was part of a vessel preserved just below the shoulder, some inferences can be drawn. For example, the preserved sherd indicates that the class of vessels on which these Proto-Dynastic *serekh*-signs were incised, usually before firing, is well known and has been the focus of a recent study concerning its typo-

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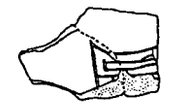
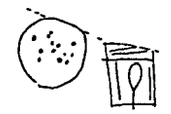
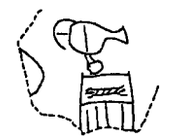
		Provenience	*Serekh-Sign*	*References*
Lower Egypt	1.	Minshat Abu Omar Tomb 44 complete jar reg. no. MAO.T 44.3		Wildung 1982, fig. 33; Kroeper 1988, fig. 141. Cf. also van den Brink 1996, no. 20
	2.	Tell Ibrahim Awad Phase 6, two fragments EAO TIA 199 (field reg. nos. B200/150/192, B200/150/165)		van den Brink 1992b: 52, fig. 83, Levy et al. 1995
	3.	Ezbet el-Tell Cemetery fragment		Bakr 1988, pl. 1, b (top row, middle)
	4.	Zaweyit el-Aryan Tomb Z486, fragment reg. no. M.F.A. 112342* *Museum of Fine Arts, Boston		Dunham 1978: 26, pl. XVIa
	5.	Tarkan Tomb 414 complete jar reg. no. UC 16083** **University College, London		Petrie, Wainwright, and Gardiner. 1913: 9, pl. XXXI, 8; pl. LVI, 76b; van den Brink 1996, no. 23
Upper Egypt	6.	Umm el-Gaʿab, Abydos Tomb B1–2 two fragments		Right: Petrie 1900, pl. XLIV, 1; Left: Kaiser and Dreyer 1982, fig. 24, 40
	7.	Hierakonpolis Surface find, fragment		Garstang 1907: 135, p. III, 1
Israel	8.	Tel Erani Stratum V, fragment Israel Antiquities Authority (henceforth IAA) 59-225, field reg. no. 59/225/303/7		Yeivin 1960: 195, fig. 2 and pl. 24a
	9.	Tel Ḥalif Terrace, Silo Site Stratum IIb fragment field reg. L. 14/B. 25/9 IAA 64994		Levy et al. 1995
	10.	Tel Arad Stratum IV fragments IAA 85-17		Amiran 1974: 5, fig. 1 and pl. 1

FIGURE 22.13. Incised *serekh*-signs of (Horus) Nar(mer) from Egypt and Israel.

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chronology (van den Brink 1996). The only published exception to this general prefiring rule is the *serekh*-sign found at ʿEn Besor Stratum III which was applied after firing.

It seems that the *serekh*-bearing sherd from the Silo Site is part of a tall storage jar with tapering body, between about 50 cm (the earliest examples from Naqada IIIa2) and the latest < 100 cm in height (from Naqada IIIc1). The earliest examples have discontinuous, pushed up (i.e., *en haut* relief), vestigial wavy handles on the vessel shoulder (fig. 22.15:a–b). Somewhat later in time, these vestigial handles disappear and are replaced by impressed crescentic decorations around the shoulder (fig. 22.15:c–d). Still somewhat later are the jars where this crescentic decoration gives way to a continuous rope decoration around the shoulders, waist, and base of the jars (fig. 22.15:e–f). They all can be either with or without incised *serekh*-signs.

Twenty-four such complete jars bearing incised *serekh*-signs have been found to date, both within and outside of Egypt. They have a time span, in terms of relative Upper Egyptian chronology, from Naqada IIIa2–IIIc1, a period that spans Dynasty 0 and the early First Dynasty.

On the basis of the *serekh*-signs and (Horus) names incised on them, they can be attributed to as many as ten different rulers or kings (some of whose names have not been identified yet), belonging either to or contemporaneous with Dynasties 0/1. Thus far, the tombs of only four of these kings have been positively identified. All four are located within the same cemetery at Umm el-Gaʿab, Abydos, Upper Egypt (Kaiser and Dreyer 1982) and relate to Iry-Hor, Ka, Narmer, and Aha. Both Dreyer (1987) and Kaiser (1987) present recent findings from the royal necropolis at Abydos with a seal impression mentioning this order: Narmer, Aha, Djer, Udimu, and Mer-Neit. This confirms Narmer's chronological position preceding Horus Aha.

Van den Brink's (1996) study of the *serekh*-bearing jars is important in that it attempts to distinguish an earlier (i.e., Type III jars) and a later (Type IV jars) phase in the use of the incised *serekh*-bearing jars of King Narmer based on the pottery typology of jars on which they appear. On the basis of a single fragment, such as the Silo Site *serekh* discussed here, it is not possible to attribute it to either one of these vessel types. However, circumstantial considerations indicate a later date in Narmer's lengthy reign which stretched for a period from thirty to sixty years (see Emery 1961). These considerations include the following.

(1) One (fig. 22.13:6; Levy et al. 1995) of two parallels to the Silo Site *serekh*-sign stems from the immediate vicinity of Narmer's own tomb in Abydos. Assuming that this particular Abydos *serekh* was incised on a vessel made while funerary arrangements for Narmer's burial were prepared—that is, around the time of his death—and that the Silo Site *serekh* (based on the close similarity to the other one) was perhaps produced around the same time in the same workshop, it can be assumed to date from the end of Narmer's reign.

(2) With regard to the palaeography of the Silo Site *serekh,* assuming that the earliest examples of Narmer's name are the fullest and most explicitly written (i.e., with both signs *N'r* and *mr*) and that only later was it felt sufficient to refer to Narmer only with the first part of his name, i.e., *N'r*, this would also point to a time later, not earlier, in his reign.

(3) We may assume, on the basis of the Narmer ceremonial palette (e.g., Fairservis 1991), that the king had to provide himself first with a strong foothold in the Nile Delta before intensive contacts could be established with more eastward regions such as EB IB Canaan.

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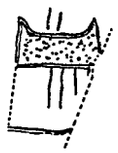
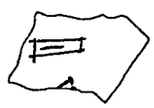
	Provenience	*Serekh-Sign*	*References*
1.	Palmaḥim Quarry Stratum 2 fragment field reg. no. 1617/2044/5221		Braun et al. (see chapter 4, this volume)
2.	Ḥorvat ʿIllin Taḥtit Stratum IV, fragment field reg. no. 1779/220/894/1		Braun et al. in preparation (see chapter 4, this volume)
3.	Ḥorvat ʿIllin Taḥtit Stratum IV, fragment field reg. no. 1179/303/1595/1		Braun et al. (see chapter 4, this volume)
4.	Tel Erani Stratum V, fragment Israel Antiquities Authority (henceforth IAA) 59-225, field reg. no. 59/225/303/7		Yeivin 1960: 195, fig. 2, pl. 24a
5.	Tel Erani Stratum V, fragment IAA 59-347/2 reg. no. D60/296/27		Yeivin 1963: 212, fig. 3, pl. XXXIX:3
6.	Tel Erani Surface find, fragment field reg. no. D60/403/30 [sic!]		Yeivin 1963: 205, fig. 2, pl. XXXIX:2
7.	Tel Erani Surface find, fragment IAA 58-142		unpublished; Brandl, 1992: 447
8.	Tel Maʾaḥaz Surface find, fragment IAA 81-193		Schulman and Gophna 1981, fig. 1, pl. 28a

FIGURE 22.14. Incised *serekh*-signs from Israel.

Other Incised Serekh-*Signs Found in Israel*

To date seventeen incised *serekh*-signs or fragments thereof have come to light in Israel. These are illustrated in fig. 22.14. Seven of these await in-depth publication, of which three could be positively identified as Narmer(s) (fig. 22.14:4, 10, 14). The *serekh* from the Silo Site

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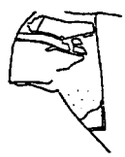
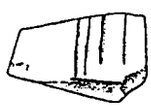
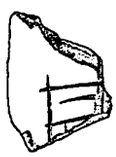
9.	Tel Maʾaḥaz Stratum I, fragment IAA 94-3328 field reg. no. 71/1		Amiran, Ilan, and Arnon 1983: 83, note 21; Amiran and van den Brink (see chapter 3, this volume)
10.	Tel Ḥalif Terrace, Silo Site Stratum IIB, fragment reg. no. 64994 (L. 14/B.259)		Levy et al. 1995
11.	Tel Ḥalif Terrace, fragment IAA 75-504 reg. no. 75/504/253/1		unpublished (van den Brink in preparation)
12.	Tel Ḥalif Terrace, site 101 Area 100, fragment IAA 86-740 field reg. no. L. 27/B. 1262		Seger 1990: 5, fig. 4
13.	ʿEn Besor Stratum III, fragment IAA 75-186		Schulman 1976: 25, fig. 2
14.	Tel Arad Stratum IV, fragments IAA 85-17		Amiran 1974: 5, fig. 1, pl. 1
15.	Small Tel Malhata Stratum 1, fragment IAA 94-3326 field reg. no. 14/79/691/1		Amiran, Ilan, and Arnon 1983: 80, fig. 7a
16.	Small Tel Malhata Stratum 1, fragment IAA 94-3327 field reg. no. 14/79/1552/2		Amiran, Ilan, and Arnon 1983: 80, fig. 7b
17.	Small Tel Malhata Surface find, fragment IAA 94-3325 field reg. no. 14/79/1/1		Amiran, Ilan, and Arnon 1983: 80, fig. 7c

Excluded from figure 22.14 are Seger 1987a, pl. 24c and Yeivin 1968: 37, fig. 2, pl. 1a–b, because the incised fragments presented there, in our opinion, do not bear connection to *serekh*-signs.

Drawings not to scale.

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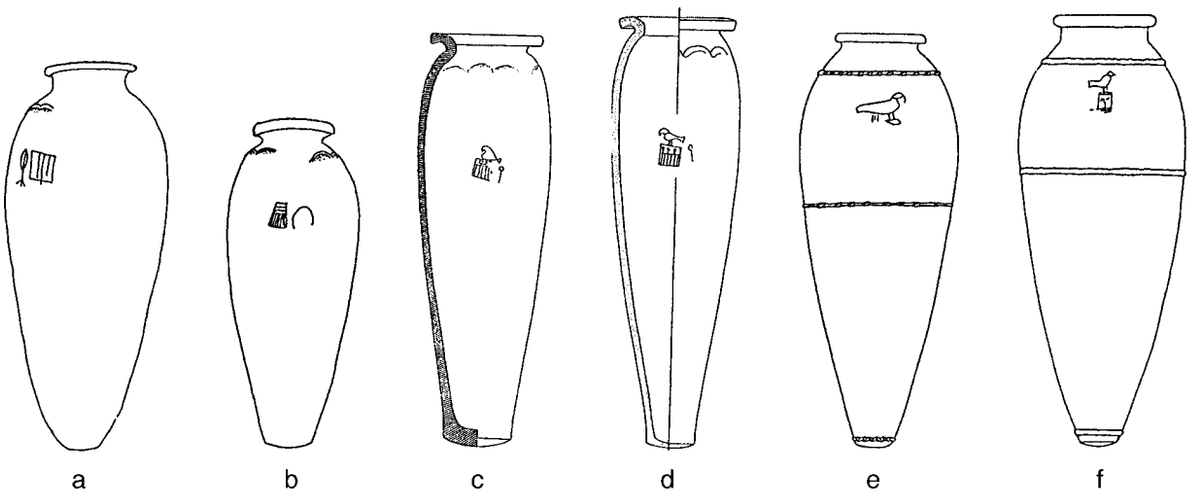

FIGURE 22.15. Egyptian storage jars with incised *serekh*-signs: a) Type I, from Abusir el-Meleq, Tomb 1144 (Berlin 19931). Ht.: 49.5 cm (after Scharff 1926: pl. 11, no. 28); b) Type IIB, from Turah, Tomb 16.g.9 (Kunst Historisches Museum, Wien AS 6808; after photograph in van den Brink 1996: pl. 4a); c) Type III; from Minshat Abu Omar, Tomb 160 (MAO 160.1). Ht.: 61 cm (Kroeper 1988: fig. 95); d) Type III; from "Eastern Nile Delta" (Metropolitan Museum of Art 61:122). Ht.: 68.5 cm (Fischer 1963); e) Type IVa; from Abydos, Tomb B1 (University College 16089). Ht.: 99 cm (Petrie 1900: 4); f) Type IVa; from Tarkhan, Tomb 414 (University College 16083). Ht.: 97 cm (Petrie, Wainright, and Gardiner 1913: 9, pl. 31, no. 68; pl. 56, no. 76b). Note that Types I, IIB, III, and IVa refer to chrono-typology of these jars in van den Brink 1996.

is not a surprise per se. However, a combination of factors makes this particular *serekh* of special interest.

First of all, in contrast to most other *serekh*-signs or fragments found in Israel (either because they are too fragmentarily preserved, e.g., fig. 22.14:2, 3, 8, 9, 11, 12, 15–17, or because they are ambiguous *serekh*-signs, e.g., fig. 22.14:5), the Silo Site *serekh* can unambiguously be attributed to a known king, (Horus) Nar(mer).

Second, contrary to some other *serekh*-signs that were not found in any stratigraphic context (e.g., surface finds: fig. 22.14:6, 7, 8, 17), the sherd under discussion here was found with a number of other complete Egyptian ceramic vessels and comes from a solid stratigraphic context in Stratum IIB. This is a clear local late EB I context. Assuming that our sherd is not an heirloom, which is highly unlikely, it provides us with a chronological peg at this point between the beginning of the First Dynasty and the late EB IB.

Thus, because of its controlled stratigraphic context and because of the apparent absence at the site of later, i.e., Early Bronze II, remains, the end of Narmer's reign can be safely postulated as having been before the beginning of the EB II period. The stratigraphic attribution of at least one of the two other positively identified Narmer *serekh*s found in Israel from Tel Erani, Stratum V (fig. 22.14:4) is perhaps less securely dated than previously thought (see Braun 1996).

Summary of Serekh's *Significance*

The Narmer *serekh* found at the Silo Site, Stratum IIB, on the Ḥalif Terrace in Israel provides a welcome, clear-cut chronological peg that links the later part of the reign of Narmer

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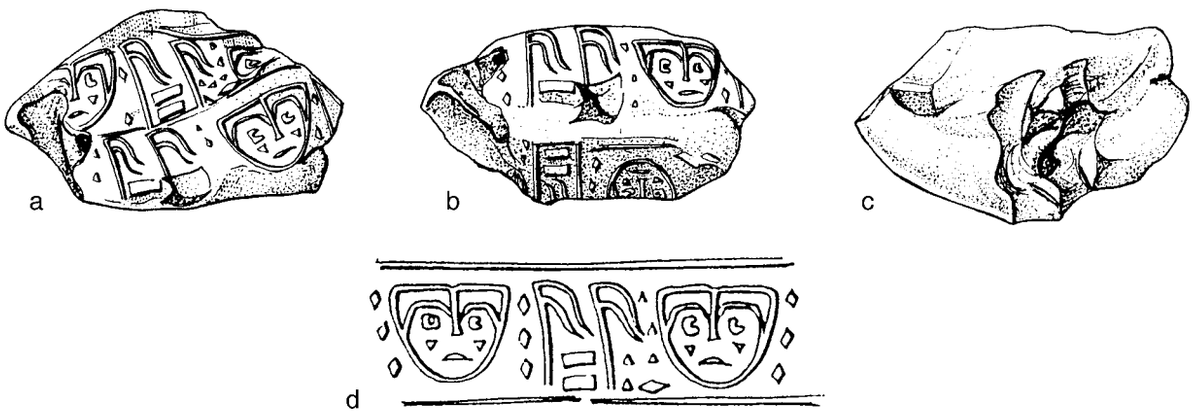

FIGURE 22.16. (*a–c*) Drawings of a clay bulla (649/94, L.19, B.266) found in Stratum IIA at the Silo Site, Ḥalif Terrace; (*d*) Reconstructed drawing of the cylinder seal impression.

with the end of the late EB IB culture in southern Israel. It also contributes to the fast-growing body of data compiled for this important period concerning the rise in Egyptian-Canaanite interaction. This newly discovered *serekh* from the Silo Site provides an important administrative artifact for examining the large assemblage of Proto-Dynastic and Early Dynastic material culture in southern Israel such as the application of Egyptian mudbrick building techniques, ceramics, stone vessels, stone palettes, and lithics. The character of Egyptian administrative activities is also seen in the use of Egyptian cylinder seals applied to local clays in order to seal small pottery containers and points to the strength of Egypt in this part of the eastern Mediterranean at this time. The following section describes an unusual clay cylinder seal impression that adds to the growing assemblage of administrative artifacts coming to light in southern Israel.

First Dynasty Clay Bulla

A clay bulla (reg. no. 649/94, L.19, B.266) was found in a stratigraphically secure fill dating to Stratum IIA in Area A of the Silo Site excavations. The cylinder seal impressions are preserved on an oval-shaped lump of fired, reddish-brown clay, some 6 cm long and 3.5 cm wide (fig. 22.16, pl. 22.3). The firing is probably accidental and was not intentionally made when the vessel was sealed. A petrographic analysis by Y. Goren indicates that the clay is of local loess clay (i.e., non-Egyptian) and therefore conforms with the findings concerning various cylinder seal impressions found at ʿEn Besor, Stratum III (Porat 1989: 60, Sub-93 and appendix 5a). Coincidentally, the Silo Site example is quite similar in shape, dimensions, fabric, and color, but not in glyptics, to the ʿEn Besor, Stratum III, cylinder seal impression no. 4 (Schulman 1976: pl. III, no. 4).

Two short, parallel imprints and a deeper one in the middle, perpendicular to the axis of the cylinder seal impressions, over the whole width of the otherwise plain backside of the bulla, indicate the original position of the knotted cord to/over which the bulla was attached (fig. 22.16c; pl. 22.3c; Kaplony 1963: I: 53–54, type VI.2).

The bulla has three elongated, cylinder seal-impressed faces: a central ridge (fig. 22.16d; pl. 22.3b) with an adjoining field on each side of it (fig. 22.16a–b; pl. 22.3a–b). The inscription

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preserved consists of a single narrow line made up by three signs. All three signs (a face [*ḥr*] and two flagpoles [*nṯr.wy*]) occupy the full height of each sealing face. Between the two flagpoles are two small horizontal strokes (the upper one slightly thicker than the lower one), possibly space fillers, or perhaps phonetic complements (*ṯ and r*) to *nṯr*. They are repeated once more after the second flagpole, although the original cylinder seal was probably slightly damaged at this particular point, resulting in four irregular-shaped "dots" instead of two clear horizontal strokes. At both sides of the face (*ḥr*), in a vertical line, there are three more tiny "dots."

The face (*ḥr*), one of the two major glyptic components in this cylinder seal impression, have been carefully executed, showing eyebrows, eyes, and nose. Even the cheeks have been indicated by two dots. The ears have not been indicated separately. Lacking neck or beard, it compares stylistically best with sealings deriving from King Djer's funerary complex at Umm el-Gaʿab (Kaplony 1963/1: no. 39; 1963/3: pl. 20, fig. 43, pl. 37, fig. 125).

Two of the three impressions on this bulla are running parallel, although starting from different points on the original cylinder seal. The third one (pl. 22.3b) has been impressed upside-down in comparison with the other two. The full inscription (face, flagpole, flagpole; or flagpole, flagpole, face) of the cylinder seal is preserved on all three sides, in two cases repeating its beginning, showing flagpole, flagpole, face, flagpole (on the central ridge [fig. 22.16b; pl. 22.3b]) and face, flagpole, flagpole, face (fig. 22.16a; pl. 22.3a). Figure 22.16d shows a reconstruction of the complete glyptic sequence and the first repetitive sign.

As for the reading of the cylinder seal impression, van den Brink suggests *Ḥr-nṯr.wy* or possibly *Ḥr.j-nṯr.wy*. We have asked Prof. P. Kaplony, without seeing the original (only photographs and drawings) to comment on the Silo Site seal impression. He kindly did so in a letter dated March 30,1995. The relevant passages are translated from the German and quoted below *in extenso*:

> Your reading *ḥr* and *nṯrwj* are without doubt right. Otherwise, I do not see any signs; only slashes/notches used as space fillers. The impression concerns a personal name *Ḥr-nṯrwj*, analogous to *Ḥr-Nt* (Kaplony 1963: I: 579ff.). A date in the early First Dynasty would fit, although the inscription in this time cannot occupy the full height of the face (*Siegelband*) of the seal. Without having seen the original I presume that the cylinder seal had been carved with a double line carrying the same inscription.
>
> What do *Ḥr-Nt, Ḥr-nṯrwj* mean? The face of the person whose name is mentioned here is identical with that of the deity, thus putting the face implicitly (as is done in the Pyramid Texts) under the protection of the deity, "My face is (the face of) Neith" c.q. (of) the Two Gods. The *nṯrwj*, written with two falcons on standards, do appear as early as on the City Palette (cf. Kaplony 1968: 65 and n. 126).
>
> The closest parallel for the new inscription is probably Petrie 1900: pl. 10, 9:13.2. I suspected already for some time that the group *nṯrw/ḥr* in that particular inscription represented a personal name *Ḥr-nṯrw:* "My face is (the face of the) gods." This assumption is now corroborated by your newly discovered seal impression. *Ḥr-nṯrw* is written in Petrie 1900: pl. 10, 9:13.2 before the Horus name and therefore should be a name of a prince. The interpretation given by Schott (1951: 27) must be refuted. The sign group to the left of the Horus name in Petrie 1900; Kaplony 1963/1: 665 is the special title of the prince *Ḥr-nṯrw*. *Ḥr-nṯrwj* of the new inscription does not have a title. This is not surprising considering the early date of the impression.

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CONCLUSION

We sincerely miss not having Douglas Esse among us to discuss the exciting discoveries we have made in the new Naḥal Tillah project. Doug's (Esse 1989) insights concerning the processes of "secondary state formation" in Israel helped shape the original research design for the Naḥal Tillah Project. The preliminary results of the 1994 excavations in the Naḥal Tillah region, in particular on the Ḥalif Terrace, point to the great potential this area has for exploring the changing nature of Egyptian-Canaanite interaction at the end of the fourth and beginning of the third millennium B.C. The preliminary ceramic analysis, the potential contribution of the newly discovered tomb, and the exciting epigraphic data all presented here point to the importance of the Ḥalif Terrace (see Seger et al. 1990; Dessel 1991) for monitoring these changing center-periphery relations.

ACKNOWLEDGMENTS

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We are grateful for permission to reproduce here for the first time *serekh*s from the collections of Ruth Amiran and Eliot Braun. Drawings and photographs of finds were kindly made by Carmen Hirsch, Alina Pikovsky, and Tsila Sagiv. Laurel Mannen of the UCSD Judaic Studies program cordially prepared the layout of many of the figures. We are grateful to Prof. P. Kaplony for sharing his expertise in reading the seal impression published here.

We would like to thank Joe D. Seger of the Cobb Institute of Archaeology, Mississippi State University, for his collegiality and support of the Naḥal Tillah project. In addition, we are grateful to Uzi Halamish, Brachah Porat, and the Joe Alon Regional Study Center and the members of Kibbutz Lahav for their great logistic support during the course of our excavations.

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PLATE 22.1. Overview of Egyptian-style tomb found in Area C, Silo Site, Ḥalif Terrace. These two walls form a passageway with an incline that leads to the tomb entrance.

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PLATE 22.2. Example of a Late Ware imported Egyptian vessel found in Area A at the Silo Site, Ḥalif Terrace.

PLATE 22.3. Series of photographs illustrating the three impressed sides of the clay bulla found in Stratum IIA at the Silo Site, Ḥalif Terrace (649/94, L.19, B.266). Plate 22.3c shows the impression of a cord.

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23

ON THE SIGNIFICANCE OF THE EARLY BRONZE III GRANARY BUILDING AT BEIT YERAḤ

AMIHAI MAZAR

In his Ph.D. dissertation (1982), later published as a book (Esse 1991), Douglas Esse combined archaeological data with environmental, economic, and social factors to reconstruct the economic basis and social structure of the Early Bronze Age (EB) communities in northern Palestine. An important part of this research emphasized the place of Beit Yeraḥ in the settlement system of the period. The present paper is an attempt to elaborate on this subject, focusing on the Granary Building at Beit Yeraḥ and its implications. The paper is dedicated to the memory of Doug, a close friend, an excellent archaeologist, and an exceptionally noble person.*

INTRODUCTION

The Granary Building at Beit Yeraḥ (Khirbet Kerak) was uncovered by M. Stekelis and M. Avi-Yonah in 1945–46 in the uppermost EB stratum (Maisler, Stekelis, and Avi-Yonah 1952: 223–28, pls. 17–19; for an updated description of the site and its exploration, see Esse 1991: 33–53). Though only a preliminary report on its excavation was published, this building can be used as a source for the reconstruction of socioeconomic and perhaps religious and political life in the largest EB Age city that has been excavated in Israel. Concerning this building Esse wrote:

> . . . the very existence of a public granary of such enormous size indicates not only town planning, but also economic and social planning. Such a structure, unmatched so far at any other EB city, indicates a high level of organization and undoubtedly reflects a strong central authority. (Esse 1991: 53)

In this paper I deal with the function of the building in light of its plan and contents and try to reconstruct its role in the economic life of the city.

As observed by its excavators, this building is unique; no similar building is known from any period in the entire ancient Near East.

THE BUILDING

Description

The brief description of the building that follows is based on the excavators' preliminary report and on a study of the 1:50 plan, prepared by I. Dunayevsky and kept in the Institute of

* A Hebrew version of this paper was published in *Shnaton*, *An Annual for Biblical and Ancient Near Eastern Studies,* ed. M. Weinfeld, 10 (1990): 123–36, Jerusalem.

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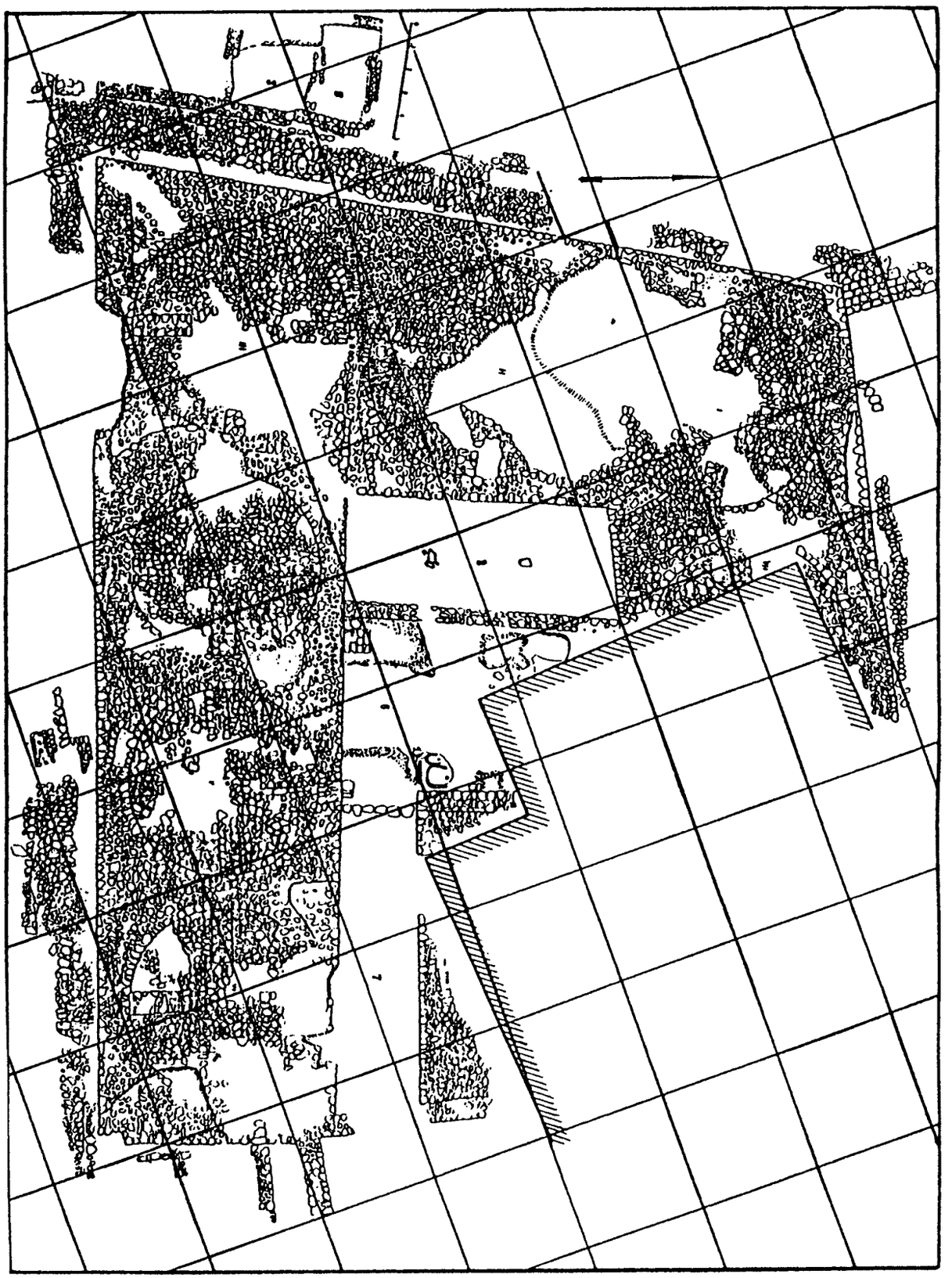

FIGURE 23.1. Plan of the Granary Building at Beit Yeraḥ.

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Archaeology of the Hebrew University. The dimensions in the following description were taken directly from this plan and differ somewhat from those given in the preliminary report.

The outer dimensions of the building are 31.25 (western outer wall) x 41 m. The eastern and northern facades were not preserved entirely, but they can be reconstructed as measuring approximately 35 m and 32 m respectively. The area of the building is about 1200 m^2 (fig. 23.1). It is well constructed, though its outer corners do not form right angles, and it is trapezoid in plan. The building was surrounded by stone-paved streets, evidence of a sophisticated level of urban planning. The entrance to the building was from the east, through a corridor 3.3 m wide and 14 m long. (This length is in fact the width of the eastern wall.) At the end of the corridor was a threshold built with a single line of rather large stones (seen in Maisler, Stekelis, and Avi-Yonah 1952: pl. 19A lower left). The corridor leads into an inner courtyard 11 m wide and 6.9 m long (76 m^2 in area). A part of the courtyard near the entrance, and a 2 m wide strip along the inner (western) part of the courtyard, were paved with pebbles (seen in the above mentioned photograph).[1] Along the southern wall of the courtyard were two stone constructions: the eastern one (1 x 1 m) was interpreted by the excavators as a flight of five steps leading to the top of the building's southern wall, which they called a "platform." In fact, only two steps can be seen in the plan, and this construction might have been a small podium. The western installation consists of two large stones. This one could have been a step leading to a short corridor, which led to the circle to its south.

Three ovens were found in the courtyard: two of them were located, one near the other, just inside the entrance, yet in such a way that they would not disturb the entrance. The area of the two ovens was deliberately separated from the entrance to the courtyard by elongated stones. The eastern of these two ovens was unusual in form: it is described as consisting of two ovens one inside the other. The larger oven had a 0.5 m wide opening divided by a "column which was joined by arches to the two side walls." In the oven was found "a pottery fragment with four holes, apparently the key-piece of the vaulted roof." Inside the oven were found fragments of a large stand of the Khirbet Kerak family (now exhibited in the Israel Museum), as well as a bowl of the same family. The third oven was located in the southwestern corner of the courtyard, in a narrow niche between the eastern stone steps and the front of the enclosed hall.

In the western part of the courtyard, a wide entrance (2.1 m) led to a broad hall with inner dimensions of 4.4 x 11.2 m. Two unworked stone slabs found along the long axis of the hall were probably bases for wooden pillars that supported the roof. The preliminary report describes a pebble floor in this hall, but such a floor is not shown in the detailed plan (though the pebbles in the courtyard are definitely shown). The two circles at the western corners of the building could be approached from this hall through 0.8 m wide diagonal corridors, entered exactly at the southwestern and northwestern corners of the hall.

The outer stone walls of the building are about 10 m wide (except the eastern facade which is 14 m wide). The tops of the walls are leveled. These wide walls contained sunken circles 7–9 m in diameter. (Out of six measurable circles, four are 8 m in diameter: one is 9 m, and one is 7 m.) The excavation revealed the remains of eight circles; a ninth can be reconstructed in the unexcavated corner of the building. The stone floor of the circles is sunken about 10 cm

1. The picture is wrongly explained in Maisler, Stekelis, and Avi-Yonah 1952: 227 as showing the eastern side of the courtyard and the entrance to the enclosed hall at its east (pointed out to me by P. de Miroschedji).

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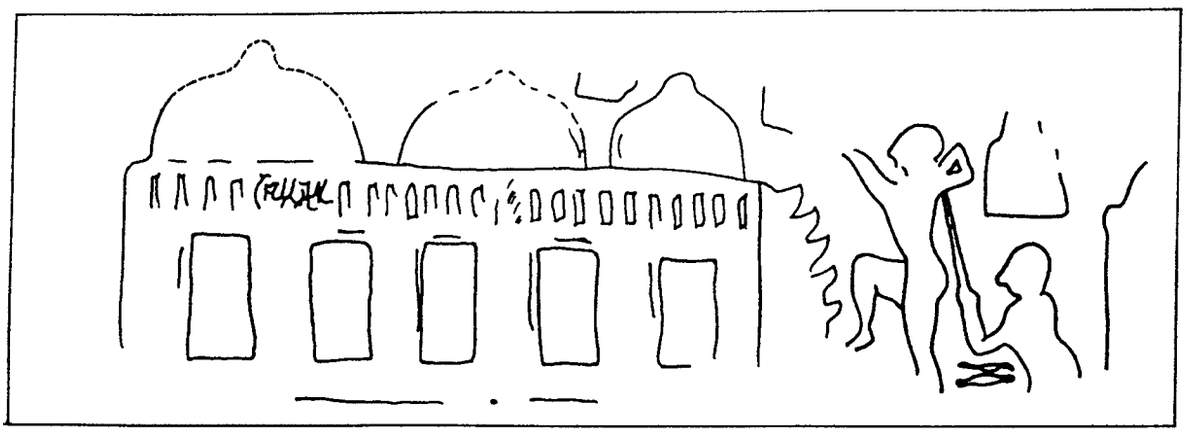

FIGURE 23.2. Susa cylinder seal impression showing granaries (adapted from Collon 1987: 146, no. 622).

below the top of the walls. Each circle is divided by four narrow partitions that do not reach the center of the circle. These walls are oriented to the points of the compass. Narrow passages led from two of the circles into the hall in the western part of the building.

The building is generally well planned and constructed with great care. The circles are exact, and the partition walls inside each of them are oriented exactly to the points of the compass, as if deliberately planned.

Reconstruction

Several attempts to reconstruct this building show each circle as a foundation for an individual cylindrical or cone-shaped silo. (Mellaart 1966: 75, fig. 28, followed by Kempinski 1992: 77, fig. 10, show free-standing conical silos, while Kempinski 1978: fig. 9, reconstructs free-standing cylindrical silos. For a general discussion of the "beehive granaries" of Palestine, see Currid 1985.) These reconstructions were probably inspired from the Egyptian depictions of free-standing conical silos in what may be defined as "beehive granaries" (Currid 1985: 105–6, figs. 2–5). Yet in these reconstructions, the role of the wide, solid stone foundation walls in which the circles were embedded (denoted by the excavators as a "platform") remains obscure. Currid claims that the "the thick foundation wall certainly served to prevent rodent intrusion, above-ground water seepage, and the influx of moisture from the ground" (Currid 1985: 104, n. 37). This certainly explains the very existence of a raised solid stone foundation. Yet this does not necessarily mean that the foundations did not carry a superstructure over the entire area. In my opinion, these wide walls with flattened upper levels were the foundations for a massive, solid mudbrick superstructure which covered the entire space between the circles, so that from the outside the building was seen as a massive structure. Each individual silo was probably cylindrical with straight sides and a flat or domed ceiling. The massive mudbrick superstructure would give the individual silos a solid outer frame. The four piers in each circle must have supported the ceiling. The upper part of each silo could have protruded above the main part of the superstructure and might have had a domed top, as is shown in cylinder seal impressions from Susa, dating to the "Proto-Urbaine" period (late fourth millennium B.C.) (fig. 23.2). There probably was an opening in the ceiling for filling the granary, and the grain was taken out through openings at the base at the structure, as shown in

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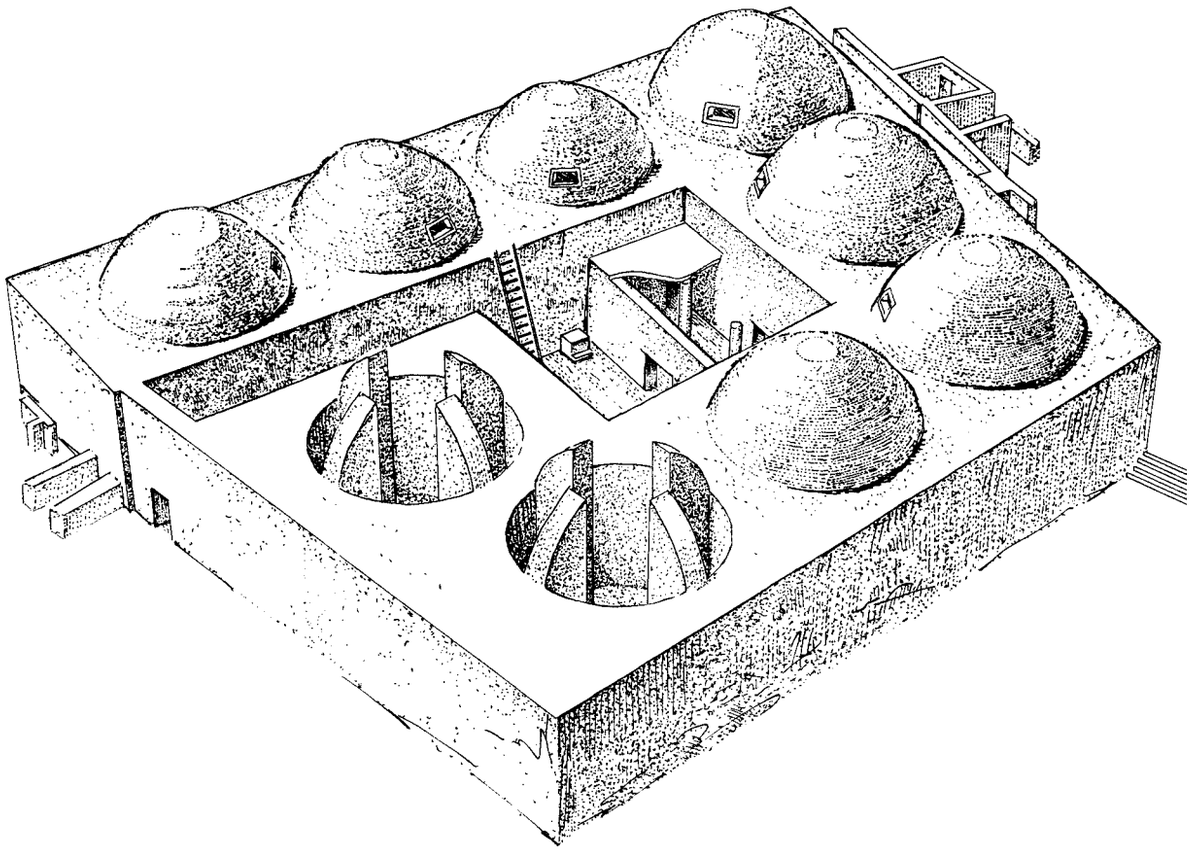

FIGURE 23.3. Suggested reconstruction of the Granary Building at Beit Yeraḥ (drawing by Anna Yamim).

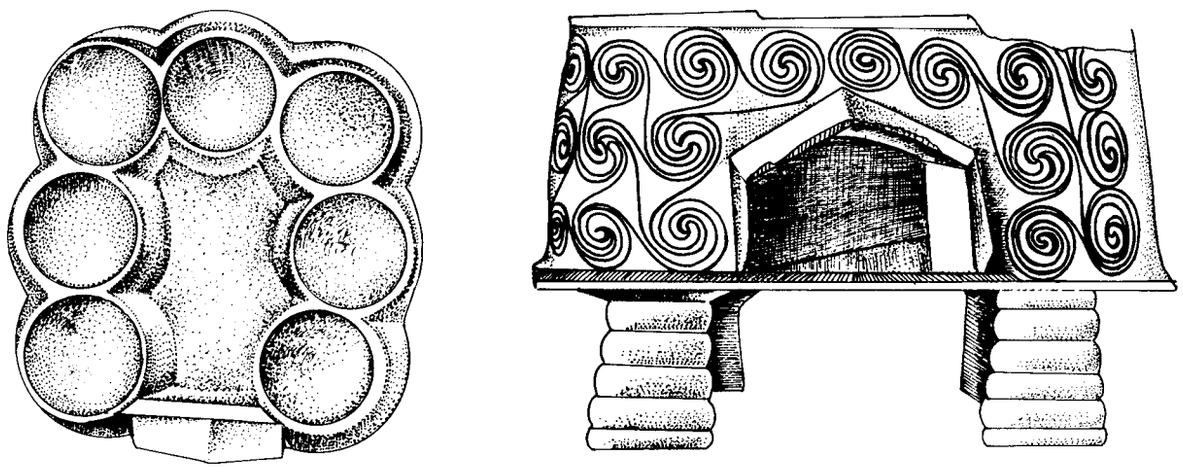

FIGURE 23.4. Early Helladic model granary from the island of Melos.

Egyptian depictions of silos (Currid 1985: 105, fig. 2). The corridors found leading to two of the circles probably enabled access to these openings through the solid superstructure that covered the entire stone foundation around the circular silos. This reconstruction suggests that the granaries rose to a considerable height, which might have been equal to or slightly below

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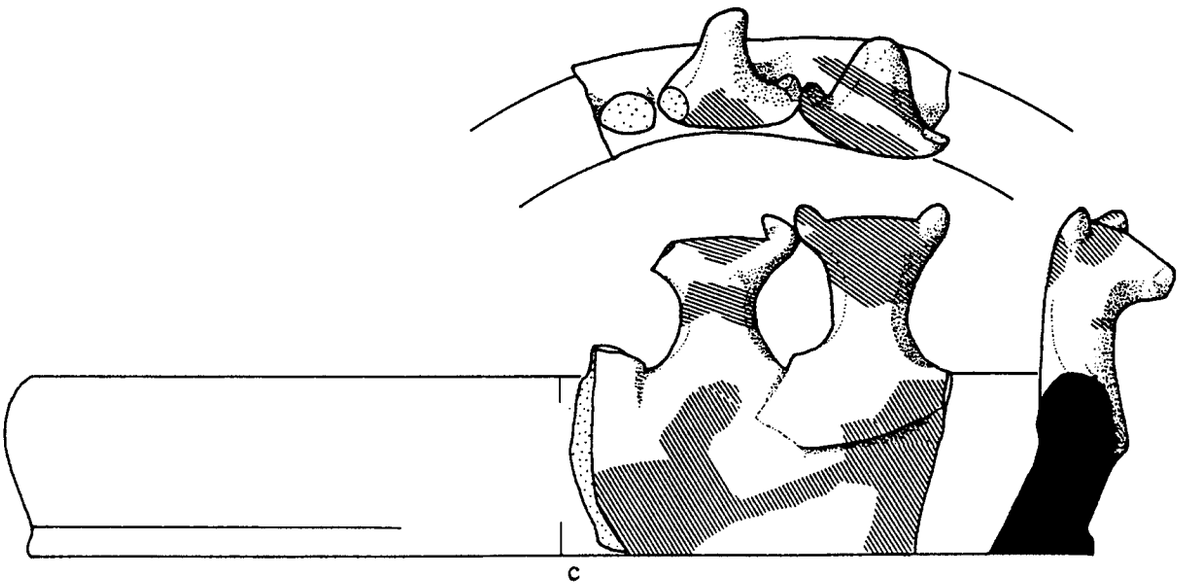

FIGURE 23.5. Pottery ring with two bull figurines found in the Granary Building at Beit Yeraḥ.

the diameter of the circles. A 6 to 8 m height for each of the silos is a reasonable estimate. (Compare the average height of 5 m for the 2–3 m diameter of Egyptian silos; Currid 1985: 104.) The thick, solid walls would have been able to withstand the pressure of the grain. (At the narrowest point the width of the granary wall was 1 m.) These considerations stand at the basis of the reconstruction shown on figure 23.3.

The Finds

A destruction layer which covered the floor of the courtyard contained many pottery sherds, including a large amount belonging to the Khirbet Kerak family. Many "broken and blackened bones of animals" are reported as having been found "in several loci, especially in the open court near the ovens, together with carbonized olive kernels, soot and other traces of fire."

The finds from this building were never published in detail, and I have been unable to locate any field diaries or other records.

Two unusual cult objects were published in the preliminary report (Maisler, Stekelis, and Avi-Yonah 1952: 227, pl. 19:B). The first (fig. 23.5, pl. 23.1b) is a fragment of a thick clay ring that bears two clay bull heads modeled in three dimensions. This object has been reexamined by Amiran (1989: 31–33).[2]

The second object (fig. 23.6, pl. 23.1) is a fragment of a zoomorphic libation vessel.[3] It is hollow, and the mouth of the animal served as a spout. The vessel was made of coarse ware, with plenty of large grits. The fragment is 10 cm long and 9.2 cm high; since it depicts about

2. I would like to thank Ruth Amiran for permission to republish the drawing of this object here. It is now exhibited in the collections of Beit Gordon at Kibbutz Deganya.
3. The object was found in the storage area of the Rockfeller Museum, among other material from the Beit Yeraḥ excavations. My thanks to J. Zias for locating it. The photograph was supplied by the Israel Antiquities Authority and the drawing prepared by Mrs. S. Helbreich.

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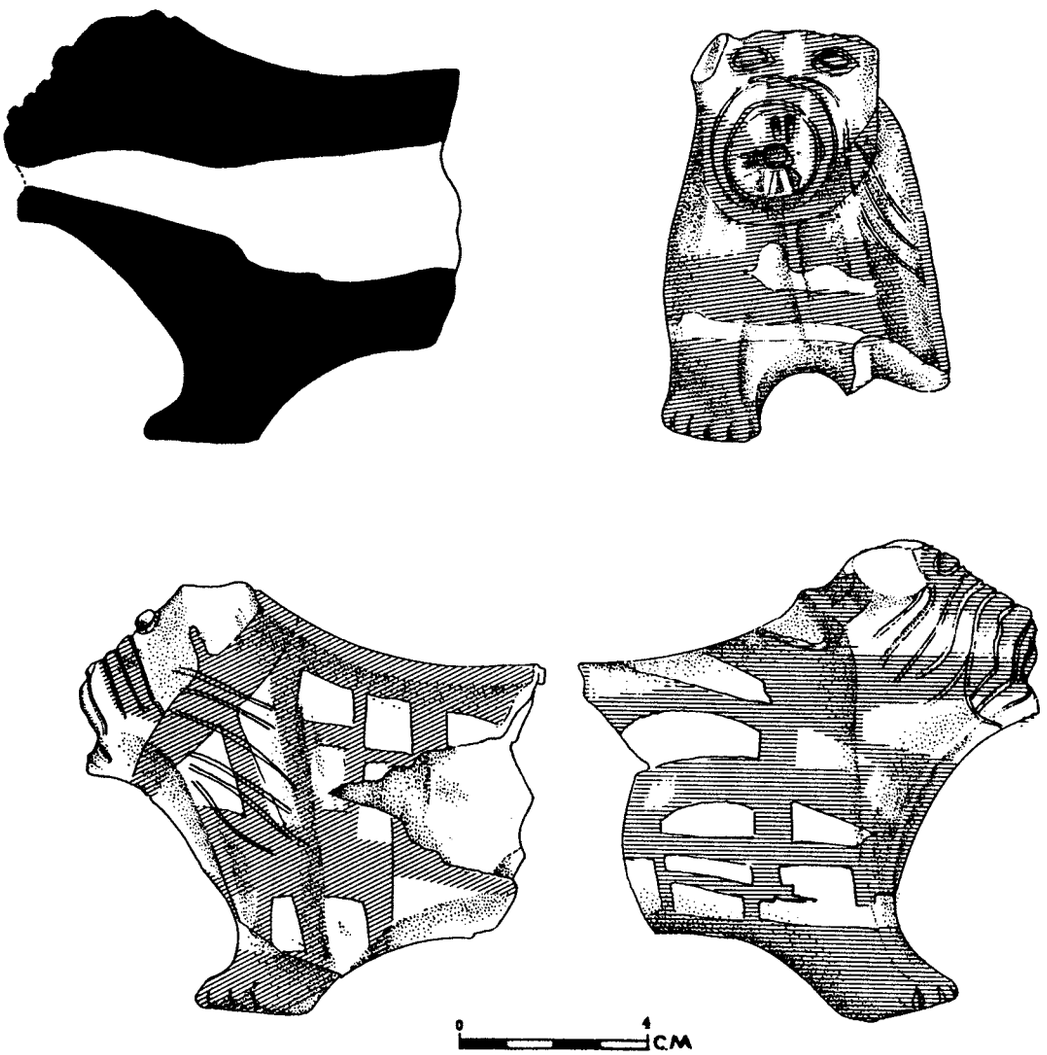

FIGURE 23.6. Lion-shaped libation vessel found in the Granary Building at Beit Yeraḥ.

half of the animal, the complete vessel was probably about 20 cm long. The animal can be identified as a lion, as shown by the shape of the head, the paws, and the delicate incisions on the head which probably represent the mane. The ears are broken. One might suggest that the broken ears were in fact horns, and thus interpret the animal as a bull. A prominent vertical ridge down the center of the animal's chest may strengthen this interpretation. Nevertheless, it seems to me that the fragments at the front of the head were originally ears, and that this animal is indeed a lion. The back of the vessel has not been preserved. The entire preserved part was painted with red stripes in a crisscross pattern. The piece is particularly important, since it is the sole EB II–III zoomorphic vessel known from the Land of Israel. Depictions of lions are well known in third millennium B.C. art of the ancient Near East, such as on Mesopotamian cylinder seals depicting lions attacking domestic animals or in representations of lions in wood carvings and seal impressions from Ebla (Matthiae 1981: pls. between pp. 80–81). In the Land of Israel, lions are a familiar motif on cylinder seals from EB (Ben-Tor

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1978: 52, fig. 15; 72–73, fig. 21). The lion motif became more common in Canaanite art in the second millennium B.C., often appearing in a ritual context.

Another object that probably came from the Granary Building is a figurine of an animal (sheep?), of a type found at other EB sites (pl. 23.1c, right).

Function

The excavators made several suggestions as to the function of the building: a public granary, a fort, a palace, or a temple. They settled on the last one. The suggestion that the building might be a granary was discounted in the original Hebrew publication because an oven had been found in one of the sunken circles (Stekelis and Avi-Yonah 1947: 60), though in fact no oven was found in the circles themselves. The unique oven in the building's courtyard was interpreted by the excavators as an installation for burning incense. In the English version of the publication, Avi-Yonah added a note (Maisler, Stekelis, and Avi-Yonah 1952: 228 n. 12) in which he presented a parallel to the building in the steatite model structure from the island of Melos (fig. 23.4), which dates to the Early Helladic period (Marinatos 1946: 342, fig. 4; Buchholz and Karageorghis 1973: 90, no. 1122). On the basis of the Melos model, which was interpreted as representing a public granary, Avi-Yonah wrote:

> This find increases the probability that the building was a granary after all and the ovens a later addition, once it went out of use. If this hypothesis is accepted, it bears striking evidence of the agricultural development and social structure of the EB settlements in the Jordan Valley. It presumes a plentiful grain crop stored in a public building connected with either a religious or secular authority.

The relevance of the Melos example was reinforced by the data on links between the Aegean world and the Land of Israel in the EB III period (Hennessy 1967: 82–83). Kilian suggested a resemblance between the Early Helladic II round building at Tiryns which he interpreted as a granary and the building at Beit Yeraḥ (Kilian 1986: 68), yet this is a very different building, much reconstructed, and its function is still elusive.[4] The identification of the structure at Beit Yeraḥ as a granary was generally accepted in the archaeological literature. R. Amiran noted parallels to third-millennium circular silos in northern Anatolia and Trans-Caucasia, at the sites of Yanik Tepe, Shengavit, and elsewhere (Amiran 1965: 165–67). However, in these examples, the round silos appear side by side and do not form part of a single building. Some of them exhibit internal partitions, formed by four piers which do not meet in the center of the circle, as in the Beit Yeraḥ building. In light of the origin of Khirbet Kerak ware in the Kura-Araxis culture, these parallels seem to be relevant, despite the fundamental difference in plan mentioned above.

Several scholars claimed that the "Granary Building" was a temple (Mellaart 1966: 74–76; Amiran 1989: 32; Busink 1970: 379–80; Wright 1985: 218). In my opinion, these two explanations do not need to contradict one another: the building can be interpreted as a temple, with the granaries serving an economic role. The single large hall inside the building is a "broad-house" structure reminiscent of the acropolis temple at Ai and the "White Building" at Tel Yarmuth. Both of these structures have been identified as EB III temples, contemporary with

4. My thanks to Sharon Zuckerman for this reference.

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the Beit Yeraḥ structure (Miroschedji 1988: 35–41; Kempinski 1992: 53–59). The inner dimensions of the broadhouse at Yarmuth (4.75 x 11.50 m) are almost identical to those of the hall inside the "Granary Building," though the Yarmuth example has four column bases along the hall's longitudinal axis, while only two were found at Beit Yeraḥ. The hall at Ai is larger (inner dimensions 6.00 x 17.50 m). Remains of a dais were found opposite the entrance to the hall at Yarmuth, but no traces of this kind were found at Ai or at Beit Yeraḥ. The unusual cult objects found at the Beit Yeraḥ building, which are rare in the EB, and the unique oven containing a large pottery stand found in the inner courtyard, reinforce the possibility that this building was indeed a temple. However, two points weaken our argument that the inner hall was a sanctuary: (a) No focal point of cult was found, such as the evidence for a dais found at Yarmuth opposite the entrance; and (b) the approach to three of the circles could only be from inside this inner hall. This can hardly be accommodated with the interpretation of the hall as a sanctuary. Despite these difficulties, I would not exclude the possibility that the inner hall was a sanctuary. Moreover, it may be suggested that the model structure from Melos represented a temple as well since it would otherwise be difficult to account for its facade, which has a pediment covered with rich spiral ornamentation. It thus may be suggested that both Beit Yeraḥ and Melos possessed temples with attached granaries, which were part of the temple's role as an economic power.

SOCIOECONOMIC INTERPRETATION

In the following section I attempt to widen the discussion of the Beit Yeraḥ structure's function into its significance for understanding the city's socioeconomic system. With this goal in mind, the following questions are considered:

1. What was its potential grain storage capacity?
2. What as the relationship between the amount of grain stored in the structure and the city's available agricultural land?
3. What was the relationship between the amount of grain stored in the building and the city's population?
4. What was the nature of the agricultural, socioeconomic, and organizational systems in which the "Granary Building" functioned?

Clear answers to these questions remain elusive. Nevertheless, partial answers can be provided and several possible hypotheses raised.

(1) The basic hypothesis that the stone circles served as foundations of granaries should be accepted. Their average diameter of 8 m implies that their superstructures were quite high, between 6 and 8 m (see above). For the purpose of calculating the volume of the granaries, I assume that they were 6 m high. This is in my view a minimal height for a round structure with a diameter of 8–9 m. Obviously, any alteration in this estimated height will affect the following calculations considerably. The average floor area of each granary, minus the area taken up by the inner piers, is 42 m^2. The volume of an average granary would thus be 250 m^3. The entire Granary Building would thus have been able to store about 2,250 m^3 of grain. The weight of 1 m^3 of grain can be calculated according to various coefficients. The most common

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for wheat is 770 kg per 1 m^3 (see references in Rosen 1986: 172; Schwartz 1994: 26, table 2), while the coefficients for barley differ from 610 kg per 1 m^3 (Rosen 1986: 172) to 714 kg (references in Schwartz 1994: 26, table 2). Thus if the building was fully utilized, its maximal capacity was somewhat above 1,700 tons of wheat and between 1,370 and 1,600 tons of barley. This capacity of the building exceeds earlier estimates, such as the estimation of 800 tons brought by Kempinksy's (1978: 29, cited by Esse 1991: 100).

(2) What was the relationship between the building's storage capacity and the city's agricultural potential? It can be assumed that the Granary Building was intended to store the maximum harvest possible, and that in bad or mediocre years the granary was not completely filled. A hectare (10 dunams or 2.5 acres) of land worked by traditional methods in the Levant yields between 300 and 1,000 kg of wheat, and the average in Arab peasant agriculture is about 700 kg (Avitzur 1977: 44–63; Rosen 1986: 172; Rosen uses an average of 650 kg per hectare of wheat and 800 kg per hectare of barley).[5] In the first year that Kibbutz Deganya was settled just south of Beit Yeraḥ, its land yielded 830 kg of grain per hectare (Avitzur 1977). This figure rose to 1,180 kg of wheat and 1,500 kg of barley per hectare in subsequent years. These numbers are in accord with figures based on Sumerian documents: 1,254 kg of grain per hectare in pre-Sargonic Girsu and 700 kg in Ur III texts (Adams 1981: 86, 146; Schwartz 1994: 28). In the Baqʿah Valley of Lebanon, where conditions are much more similar to the Jordan Valley, the estimation is just 300 kg per hectare (Marfoe 1979: 5). It may be suggested that harvests in the EB were on the average not much smaller than those obtained from Arab peasant agriculture. We can therefore calculate that in order to fill the Granary Building with 1700 tons of wheat, an area of about 2,430 hectares (6,075 acres) must have been under cultivation (based on an average yield of 700 kg per hectare). Beit Yeraḥ's best agricultural lands lie mainly to the south, in a triangle bounded by the Yarmuk River, the Jordan River, and the Sea of Galilee up to a distance of about 8 km from the city. This is the farthest that farmers would have been likely to cover on foot to reach their fields. This triangle, known as the Kinrot Valley, covers roughly 2,700 hectares (6,750 acres). This area comprises the northern end of the Irano-Turanian ecosystem of the Jordan Valley, which enjoys an average rainfall of 300–400 mm. This allows grain to be grown with maximum yields in dry farming. No other EB sites are known from this area and its periphery, except for Tell el-Hama (Hamat Gader), which extends over about 1 hectare and whose inhabitants probably worked some of the same land (see the distribution map in Esse 1991: 149, fig. 29). The closest EB site to the south is Tel Yaqush (excavated by Esse), which is far beyond the potential lands of Beit Yeraḥ. To the north, along the Sea of Galilee, there was another EB city at Tel Raqat (Khirbet Quneitra, north of Tiberias), but its people would never have competed with the population of Beit Yeraḥ for land in the Jordan Valley south of the Sea of Galilee. It thus may be assumed that the agricultural land in the triangle defined above was cultivated by the inhabitants of Beit Yeraḥ itself and not by the people from villages or satellite towns in the area (fig. 23.7). The people of Beit Yeraḥ could also cultivate land on the Yavneel plateau, just west of Beit Yeraḥ, though these were less accessible lands.

5. I thank Baruch Rosen for the time and effort he spent in discussing this subject with me. In the following calculations I utilized Rosen's methodology in analyzing the ʿIzbet Sartah silos (Rosen 1986).

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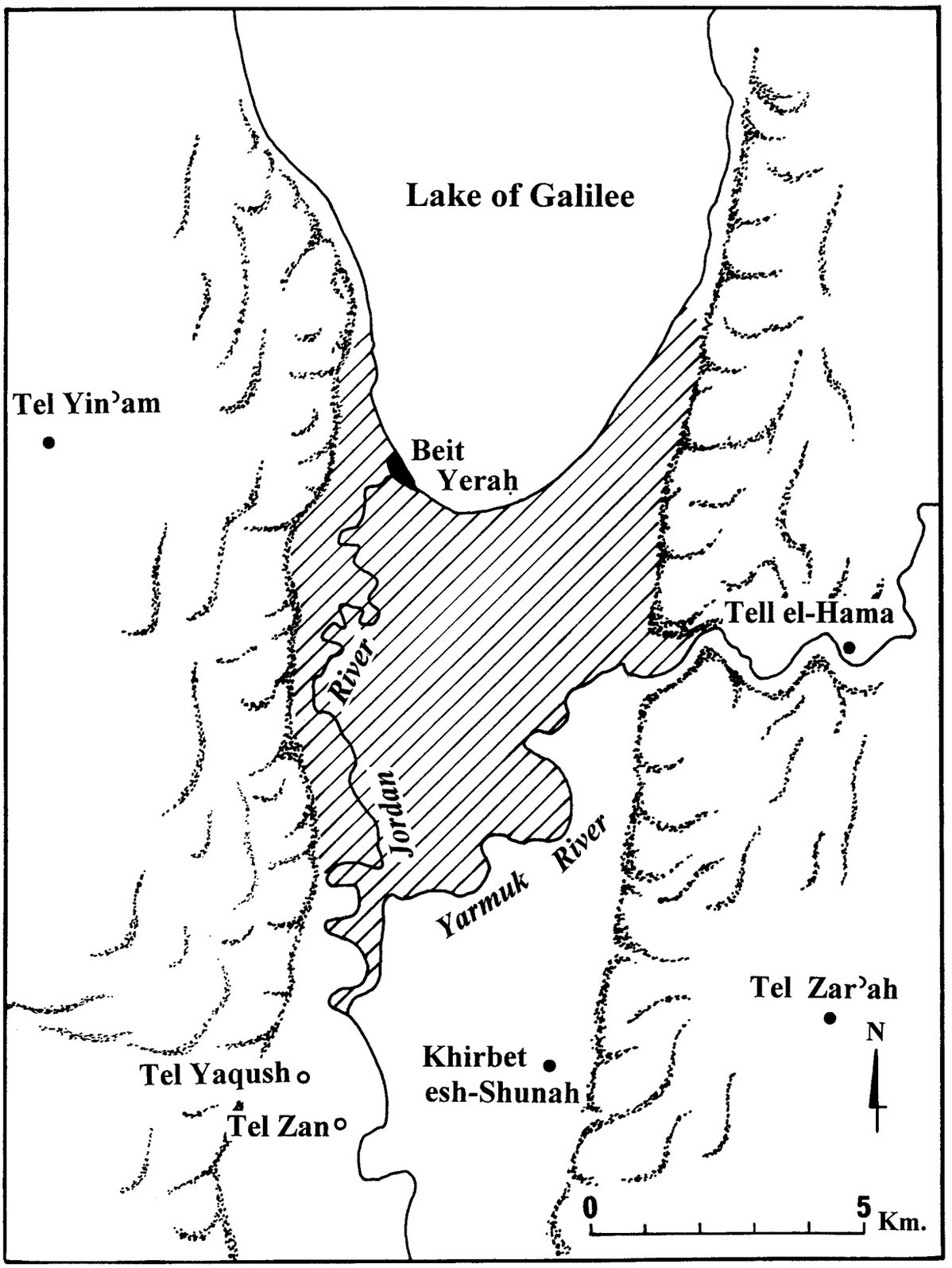

FIGURE 23.7. Map showing the agricultural hinterland of Beit Yeraḥ.

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(3) In order to answer our other questions, I make use of data and methods employed by B. Rosen and M. Broshi in their research on similar topics (Broshi 1979, 1986; Rosen 1986). The working hypothesis is that data collected in anthropological research carried out in a similar environment at a similar technological level (the Near East, especially late nineteenth-century Palestine) are valid for earlier periods.

The area of the city of Beit Yeraḥ is estimated at 20 hectares (50 acres). Studies in ancient and current traditional demography led to various estimates of density coefficients: from 100 persons per built-up hectare to 200–250 people per built-up hectare in the EB sites (as well as other periods) in the Land of Israel. A figure of 200 or 250 persons was utilized for the Bronze Age and the Iron Age (Marfoe 1979: 21; Broshi and Gophna 1984). Esse pointed out the difficulties in using a fixed constant of a number of people per hectare, due to the differences in types of sites and in their settlement density (Esse 1991: 130–35). However, Beit Yeraḥ was a densely built city in the EB III, and thus we utilize the 200 people per hectare factor and estimate that Beit Yeraḥ's population would amount to about 4,000 people (the high factor of 250 people per hectare would give a figure of 5,000). For the sake of simplifying the following calculations, we assume that the Granary Building was used for storing wheat alone; if barley was also stored there, the calculations would be only slightly affected.[6]

The average annual consumption of wheat in wheat-based cultures in general, and in the traditional economy of the Near East in particular, can be estimated as 150–250 kg per individual; the higher figure (200 kg) is more generally accepted. Higher numbers (as much as around 500 kg per person) are also cited (Rosen 1986:173; Schwartz 1994: 26, table 2, where ten different estimations are cited, the highest being 558 kg per year and the lowest 143 kg per year). Obviously, in calculating consumption, it has been taken into account that while wheat (and perhaps barley) was the basis of the population's food, they did have access to other sources of nutrition (legumes, various fruits and vegetables, fish, dairy products, beef, and mutton). A population of about 4,000 would thus consume about 800 tons of wheat per year. A loss of about 30% during storage should be taken into account, caused by the depredations of rodents and the need to provide seeds for the next year's crop. Higher figures for this loss, as much as 50%, are also cited (see Rosen 1986: 173; Schwartz 1994: 27, table 2).

Fodder for livestock has not been taken into account in these calculations since it is assumed that cheaper forms of food and straw were used for this purpose and were not stored in the central Granary Building. Broshi reckoned 300 kg of wheat per individual per annum, including loss, seed corn, and animal fodder. In order to provide 800 tons of grain, it would thus be necessary to store about 1,040 tons. This amount could easily have been stored in the Granary Building, which according to my calculations, could store up to 1,700 tons of grain. It is thus obvious that the building could store far more grain than the yearly consumption of the entire city's population.

This can be explained in several different ways. It may be that the building was designed to store bumper harvests from especially abundant years (as Rosen suggested for the silos at ʿIzbet Sartah), while in other years the building's maximum capacity was not used. Thus in a bumper year, when the granaries were full, it was possible to store grain in preparation for

6. Barley was the principal crop grown in the third millennium B.C. in Mesopotamia and was used for making bread and brewing beer (Jacobsen 1982: 38–51).

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poor years—since grain can be stored in this way for three to four years (though with an increasing rate of loss). The building could thus have served to even out the food supply for the city's inhabitants over good and bad years. Another possibility is that the surplus grain was used for trade with other cities or regions in the country, whose economies were based on different crops or products.

One of the most likely possibilities is that the people of Beit Yeraḥ traded with pastoralists living on the Golan and Issachar Heights. The EB III sites (so-called enclosures) found in these areas point to the existence of a permanent population whose economy was based on animal husbandry (cattle, sheep, and goat) as well as horticulture (Kochavi 1989: 21–25; contra Esse 1991: 156–62, who raised the hypothesis of a dimorphic society in the Land of Israel in the EB III, with reciprocal relations between the settled populations of the Jordan and Hula Valleys and pastoralists in the Golan and the Galilee).

It is also probable that the inhabitants of Beit Yeraḥ traded with the people of the central highlands of western Palestine, where horticulture was the basis of the economy (Stager 1985; Esse 1991: 100–102). Esse raised the question whether the granary building reflects a redistributive or market exchange economic system (Esse 1991: 100). A lack of written records prevents, in his view, a definite conclusion on this point. Yet he describes Beit Yeraḥ as a central site in northern Palestine: "The diversity of its resource base and the practice of successful mixed economy" (p. 100) were the basis for its economic power, as well as its

> . . . location straddling the border between two major eco-zones: the Mediterranean and the Irano-Turanian steppe . . . although Beth Yeraḥ surely participated in interregional and international trade, it is the level of intraregional trade that the city's existence comes into focus most sharply . . . the city became a true focal point, the nexus between two very diverse ecological zones with different potentials. (Esse 1991: 100)

Esse thus defined the Beit Yeraḥ granary as a center of interregional trade, a redistribution center, which is expected in a border zone between two different ecological regions.

The number of people occupied in growing this amount of grain can be very roughly estimated. In traditional agriculture in the Land of Israel, a peasant (*fellah*) family of about five people with their animals could cultivate an area of about 8–20 hectares (20–50 acres) of dry farming grain crops; the average area per family was 12–15 hectares (30–37 acres).[7] This area supplied a family with its agricultural produce. It is difficult to establish how many people were needed to cultivate grain with the technological methods and the sociopolitical organization of EB, and we do not know the division of labor in the city: Was there a degree of "specialization" and did only some inhabitants work on grain cultivation; or was it the main occupation of most of the population?

The data presented above indicate that, in order to cultivate the 2,430 hectares necessary to provide enough grain to fill the Granary Building, about 200 family units would be required, or about 1,000 people. This number gives a very general idea of a 1:4 ratio between the families who were involved in the cultivation of the amount of grain that could be stored in the Granary Building as against the entire population in the city. Other inhabitants of the

7. "The agricultural unit necessary to provide for a peasant family with the technical ability to farm was calculated at a *fadan*—the ability to work with a pair of oxen. It was usually of an area of 12 to 15 hectares. The *fadan* provided for the family at a fairly low level of subsistence . . ." (Avitzur 1977: 36–38).

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city (about three-quarters of the families) would be occupied with other agricultural activities, such as growing olives for the olive oil production, legumes, etcetera. There was also fishing in the Lake of Galilee, and perhaps also cattle, sheep, and goat breeding (Esse 1991: 98–100). Others would be professional craftsmen, military men, civil servants, priests, and so on.

If it is assumed that part of the grain needs of the inhabitants was grown on private allotments and not stored in the public Granary Building, then we may conclude that some of the grain kept in the building was used for trade even in years of average harvests. The territory calculated as necessary to provide the amount of grain stored in the Granary Building formed the greater part of the land within a reasonable walking distance of the city (the triangle bounded by the Jordan and Yarmuk Rivers, as described above). According to our calculations, about 400 hectares in this area would have been left over for harvests other than grain, or for producing grain that was not stored in the public granary. This would have been too small an area to supply the needs of those inhabitants who were not linked to the economic system represented by the Granary Building. It is therefore possible that some of the Beit Yeraḥ agricultural lands were in more distant plots, for example in the Yavneel Valley to the west or south of the confluence of the Yarmuk and the Jordan Rivers.

(4) The above calculations are evidence for a sophisticated system of centralized administration and careful planning of the agricultural-economic system at Beit Yeraḥ. The latter entailed the concentration of agricultural produce and its redistribution to all or a large part of the city's inhabitants, and most probably its use in intraregional trade (with other cities or regions in the country). Long-term storage of grain was probably also planned, in order to overcome the effects of drought years. It may be assumed that the authority which erected and managed the Granary Building had considerable political and economic power. But we have no way of knowing how the ownership of land and agricultural labor in the city were organized. Did the city possess a "specialized economy" with only a quarter of its inhabitants engaged in grain cultivation, while the rest carried on other forms of cultivation, fishing, herding, and various craft activities? Or were the different forms of agricultural work shared equally among all the city's inhabitants? Did the authority that owned the Granary Building also possess the land on which the grain stored there was grown, with the agricultural workers as serfs? Or did the building store grain that had been grown on privately owned allotments and collected by a powerful government, either by legal means or by force of religious tradition? If the suggestion that the core of the building was a temple is accepted, it is possible that most of the city's land was controlled by this temple. This phenomenon is reminiscent of the situation in Sumerian cities, where the temple had enormous economic power. However, even in the case of Sumer, where we possess written sources, scholars disagree over the extent of temple control of the city lands (Kramer 1963: 73–77; Gadd 1971: 126–31).[8] At Ebla, which is the chronologically and geographically closest archive to the period of the Granary Building at Beit Yeraḥ, economic power seems to have been in the hands of a secular authority—the king of the city (Matthiae 1981: 163–86).

8. According to documents from the temple of Baba at Lagash, tenants and hired laborers worked the temple lands at Lagash in the Early Dynastic period. The grain was stored in the temple granaries and was also ground there. The salaries of the temple staff and its various suppliers were paid mostly in grain. For detailed information on grain cultivation in Mesopotamia at different periods, see Jacobsen 1982. However, these data concern irrigation agriculture, which is very different from the dry agriculture of the Land of Israel.

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A more detailed reconstruction of the socioeconomic system related to the Granary Building would be totally speculative. Yet the building provides evidence for a complex economic system that existed in the Land of Israel at the zenith of the EB urban culture. Features such as specialization, advanced architectural planning on a large scale, concentration of food resources and their redistribution according to need and ability, long-term food storage, and interregional trade characterized this period and must have necessitated a complex bureaucratic system.[9] Whether this system was secular or related to temple administration is impossible to know.

The "Granary Building" at Beit Yeraḥ was found near the surface and definitely belongs to the latest stage of the EB city's existence. Thus the city of Beit Yeraḥ did not show any evidence for decline toward the end of the period of its existence.[10] Like at other EB III cities, it appears that the end of the city occurred at a time when the EB III urban system in Palestine was at its zenith. The demise came abruptly; however, its causes allude us.[11]

Despite the high degree of speculation and uncertainty in the above discussion, it seems to me that the Granary Building at Beit Yeraḥ can shed light on the socioeconomic structure of large city-states in the Land of Israel on the eve of the demise of urban culture at the conclusion of the EB III period.

9. The high degree of hierarchy and central authority in the EB III period is now exemplified superbly by the well-planned palace and other public buildings and fortifications at Tel Yarmuth (Miroschedji 1999: 2–19).
10. The urban architecture of EB III at Beit Yeraḥ can be seen in the complex plans of structures there, like that published by Eisenberg (Eisenberg 1981: 11–13).
11. Various suggestions were published concerning the reasons for the end of the urban culture at the end of the EB III period. I would add that a plague should be taken seriously as a possible reason for the demise of this culture when it was at its floruit. Plagues were one of the major reasons for abrupt changes in human history. The abrupt end of the EB III culture hints in my view to such a cause.

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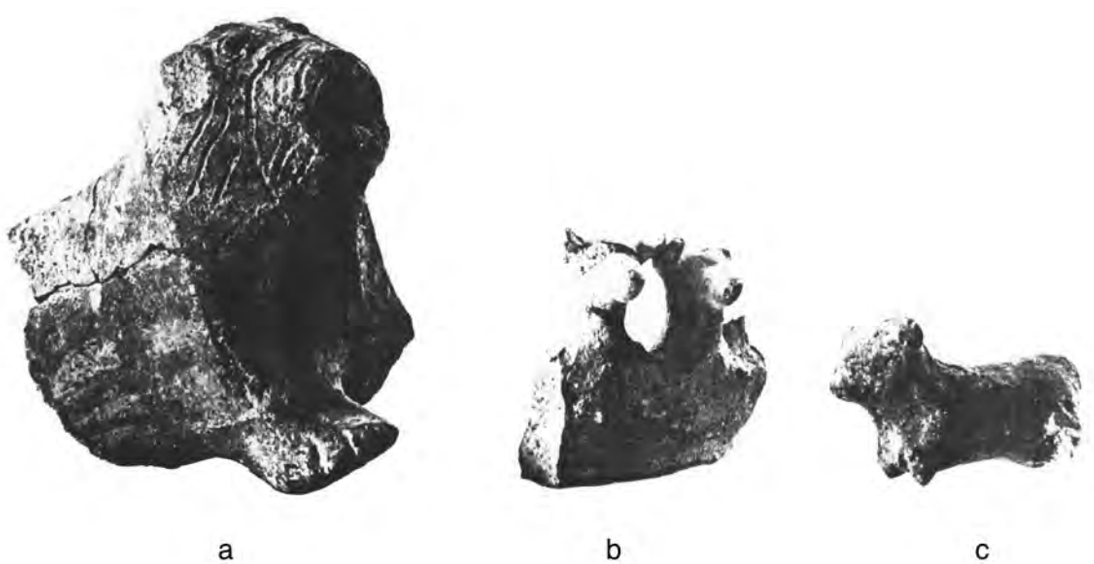

PLATE 23.1. Cult objects from the Granary Building at Beit Yeraḥ.

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23

ON THE SIGNIFICANCE OF THE EARLY BRONZE III GRANARY BUILDING AT BEIT YERAḤ

AMIHAI MAZAR

In his Ph.D. dissertation (1982), later published as a book (Esse 1991), Douglas Esse combined archaeological data with environmental, economic, and social factors to reconstruct the economic basis and social structure of the Early Bronze Age (EB) communities in northern Palestine. An important part of this research emphasized the place of Beit Yeraḥ in the settlement system of the period. The present paper is an attempt to elaborate on this subject, focusing on the Granary Building at Beit Yeraḥ and its implications. The paper is dedicated to the memory of Doug, a close friend, an excellent archaeologist, and an exceptionally noble person.*

INTRODUCTION

The Granary Building at Beit Yeraḥ (Khirbet Kerak) was uncovered by M. Stekelis and M. Avi-Yonah in 1945–46 in the uppermost EB stratum (Maisler, Stekelis, and Avi-Yonah 1952: 223–28, pls. 17–19; for an updated description of the site and its exploration, see Esse 1991: 33–53). Though only a preliminary report on its excavation was published, this building can be used as a source for the reconstruction of socioeconomic and perhaps religious and political life in the largest EB Age city that has been excavated in Israel. Concerning this building Esse wrote:

> . . . the very existence of a public granary of such enormous size indicates not only town planning, but also economic and social planning. Such a structure, unmatched so far at any other EB city, indicates a high level of organization and undoubtedly reflects a strong central authority. (Esse 1991: 53)

In this paper I deal with the function of the building in light of its plan and contents and try to reconstruct its role in the economic life of the city.

As observed by its excavators, this building is unique; no similar building is known from any period in the entire ancient Near East.

THE BUILDING

Description

The brief description of the building that follows is based on the excavators' preliminary report and on a study of the 1:50 plan, prepared by I. Dunayevsky and kept in the Institute of

* A Hebrew version of this paper was published in *Shnaton*, *An Annual for Biblical and Ancient Near Eastern Studies,* ed. M. Weinfeld, 10 (1990): 123–36, Jerusalem.

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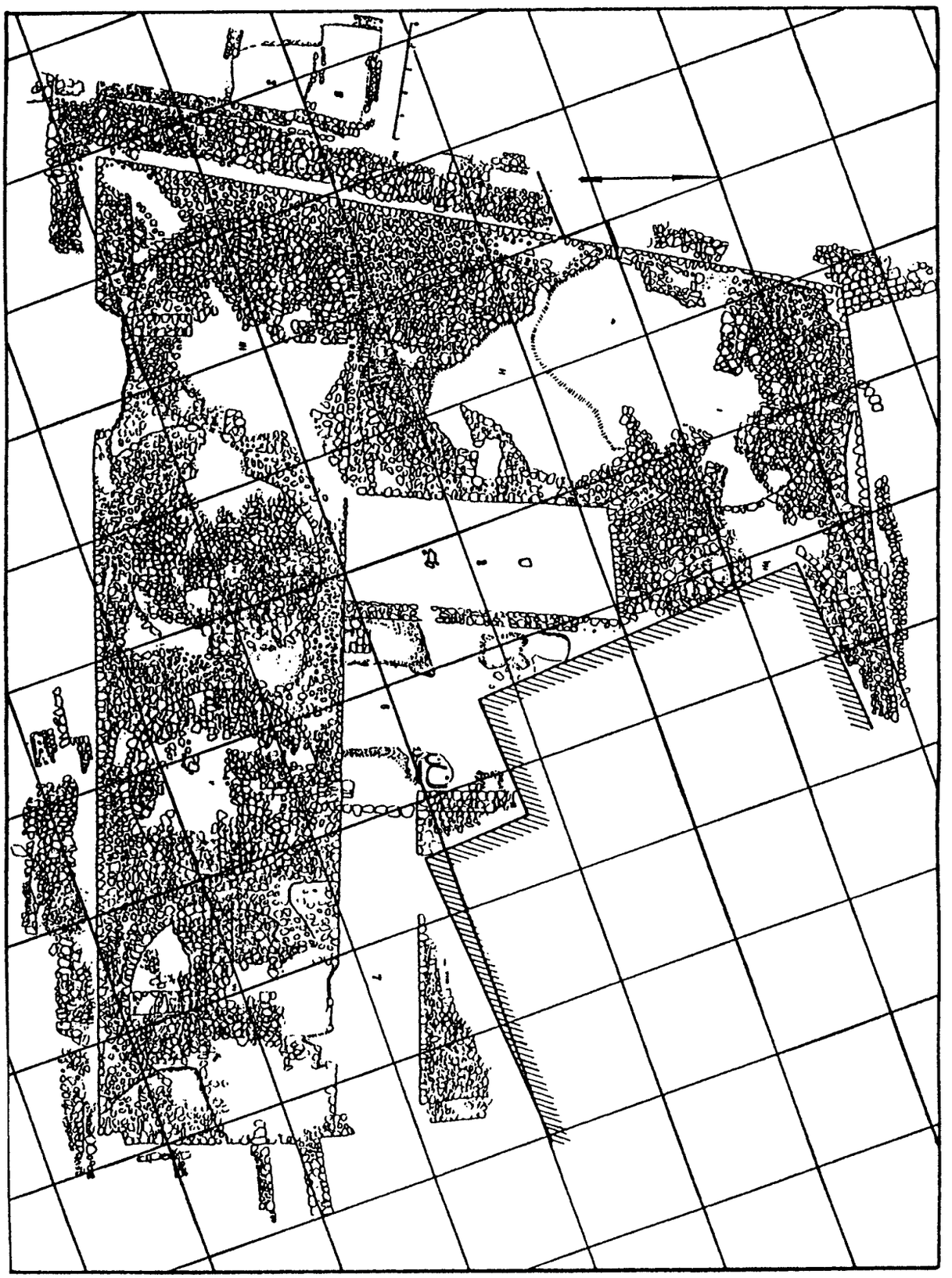

FIGURE 23.1. Plan of the Granary Building at Beit Yeraḥ.

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Archaeology of the Hebrew University. The dimensions in the following description were taken directly from this plan and differ somewhat from those given in the preliminary report.

The outer dimensions of the building are 31.25 (western outer wall) x 41 m. The eastern and northern facades were not preserved entirely, but they can be reconstructed as measuring approximately 35 m and 32 m respectively. The area of the building is about 1200 m^2 (fig. 23.1). It is well constructed, though its outer corners do not form right angles, and it is trapezoid in plan. The building was surrounded by stone-paved streets, evidence of a sophisticated level of urban planning. The entrance to the building was from the east, through a corridor 3.3 m wide and 14 m long. (This length is in fact the width of the eastern wall.) At the end of the corridor was a threshold built with a single line of rather large stones (seen in Maisler, Stekelis, and Avi-Yonah 1952: pl. 19A lower left). The corridor leads into an inner courtyard 11 m wide and 6.9 m long (76 m^2 in area). A part of the courtyard near the entrance, and a 2 m wide strip along the inner (western) part of the courtyard, were paved with pebbles (seen in the above mentioned photograph).[1] Along the southern wall of the courtyard were two stone constructions: the eastern one (1 x 1 m) was interpreted by the excavators as a flight of five steps leading to the top of the building's southern wall, which they called a "platform." In fact, only two steps can be seen in the plan, and this construction might have been a small podium. The western installation consists of two large stones. This one could have been a step leading to a short corridor, which led to the circle to its south.

Three ovens were found in the courtyard: two of them were located, one near the other, just inside the entrance, yet in such a way that they would not disturb the entrance. The area of the two ovens was deliberately separated from the entrance to the courtyard by elongated stones. The eastern of these two ovens was unusual in form: it is described as consisting of two ovens one inside the other. The larger oven had a 0.5 m wide opening divided by a "column which was joined by arches to the two side walls." In the oven was found "a pottery fragment with four holes, apparently the key-piece of the vaulted roof." Inside the oven were found fragments of a large stand of the Khirbet Kerak family (now exhibited in the Israel Museum), as well as a bowl of the same family. The third oven was located in the southwestern corner of the courtyard, in a narrow niche between the eastern stone steps and the front of the enclosed hall.

In the western part of the courtyard, a wide entrance (2.1 m) led to a broad hall with inner dimensions of 4.4 x 11.2 m. Two unworked stone slabs found along the long axis of the hall were probably bases for wooden pillars that supported the roof. The preliminary report describes a pebble floor in this hall, but such a floor is not shown in the detailed plan (though the pebbles in the courtyard are definitely shown). The two circles at the western corners of the building could be approached from this hall through 0.8 m wide diagonal corridors, entered exactly at the southwestern and northwestern corners of the hall.

The outer stone walls of the building are about 10 m wide (except the eastern facade which is 14 m wide). The tops of the walls are leveled. These wide walls contained sunken circles 7–9 m in diameter. (Out of six measurable circles, four are 8 m in diameter: one is 9 m, and one is 7 m.) The excavation revealed the remains of eight circles; a ninth can be reconstructed in the unexcavated corner of the building. The stone floor of the circles is sunken about 10 cm

1. The picture is wrongly explained in Maisler, Stekelis, and Avi-Yonah 1952: 227 as showing the eastern side of the courtyard and the entrance to the enclosed hall at its east (pointed out to me by P. de Miroschedji).

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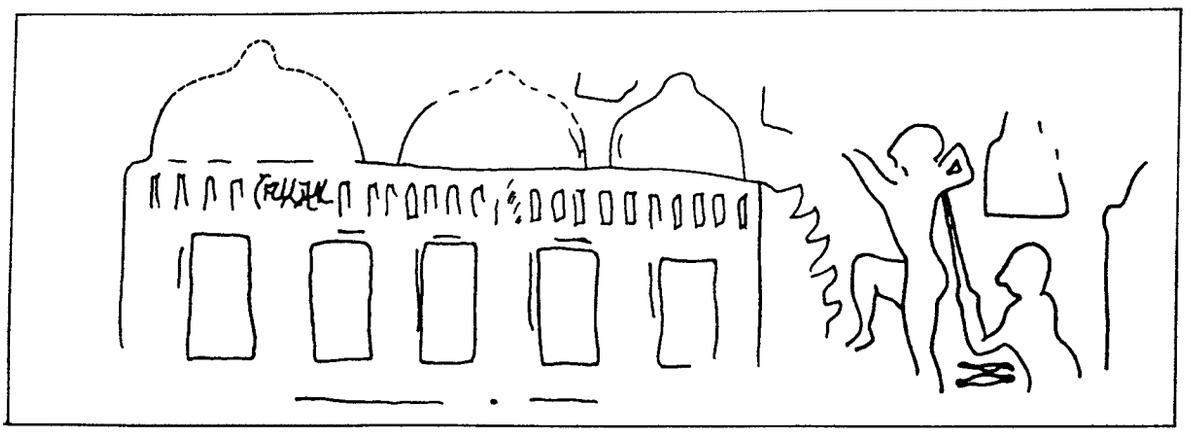

FIGURE 23.2. Susa cylinder seal impression showing granaries (adapted from Collon 1987: 146, no. 622).

below the top of the walls. Each circle is divided by four narrow partitions that do not reach the center of the circle. These walls are oriented to the points of the compass. Narrow passages led from two of the circles into the hall in the western part of the building.

The building is generally well planned and constructed with great care. The circles are exact, and the partition walls inside each of them are oriented exactly to the points of the compass, as if deliberately planned.

Reconstruction

Several attempts to reconstruct this building show each circle as a foundation for an individual cylindrical or cone-shaped silo. (Mellaart 1966: 75, fig. 28, followed by Kempinski 1992: 77, fig. 10, show free-standing conical silos, while Kempinski 1978: fig. 9, reconstructs free-standing cylindrical silos. For a general discussion of the "beehive granaries" of Palestine, see Currid 1985.) These reconstructions were probably inspired from the Egyptian depictions of free-standing conical silos in what may be defined as "beehive granaries" (Currid 1985: 105–6, figs. 2–5). Yet in these reconstructions, the role of the wide, solid stone foundation walls in which the circles were embedded (denoted by the excavators as a "platform") remains obscure. Currid claims that the "the thick foundation wall certainly served to prevent rodent intrusion, above-ground water seepage, and the influx of moisture from the ground" (Currid 1985: 104, n. 37). This certainly explains the very existence of a raised solid stone foundation. Yet this does not necessarily mean that the foundations did not carry a superstructure over the entire area. In my opinion, these wide walls with flattened upper levels were the foundations for a massive, solid mudbrick superstructure which covered the entire space between the circles, so that from the outside the building was seen as a massive structure. Each individual silo was probably cylindrical with straight sides and a flat or domed ceiling. The massive mudbrick superstructure would give the individual silos a solid outer frame. The four piers in each circle must have supported the ceiling. The upper part of each silo could have protruded above the main part of the superstructure and might have had a domed top, as is shown in cylinder seal impressions from Susa, dating to the "Proto-Urbaine" period (late fourth millennium B.C.) (fig. 23.2). There probably was an opening in the ceiling for filling the granary, and the grain was taken out through openings at the base at the structure, as shown in

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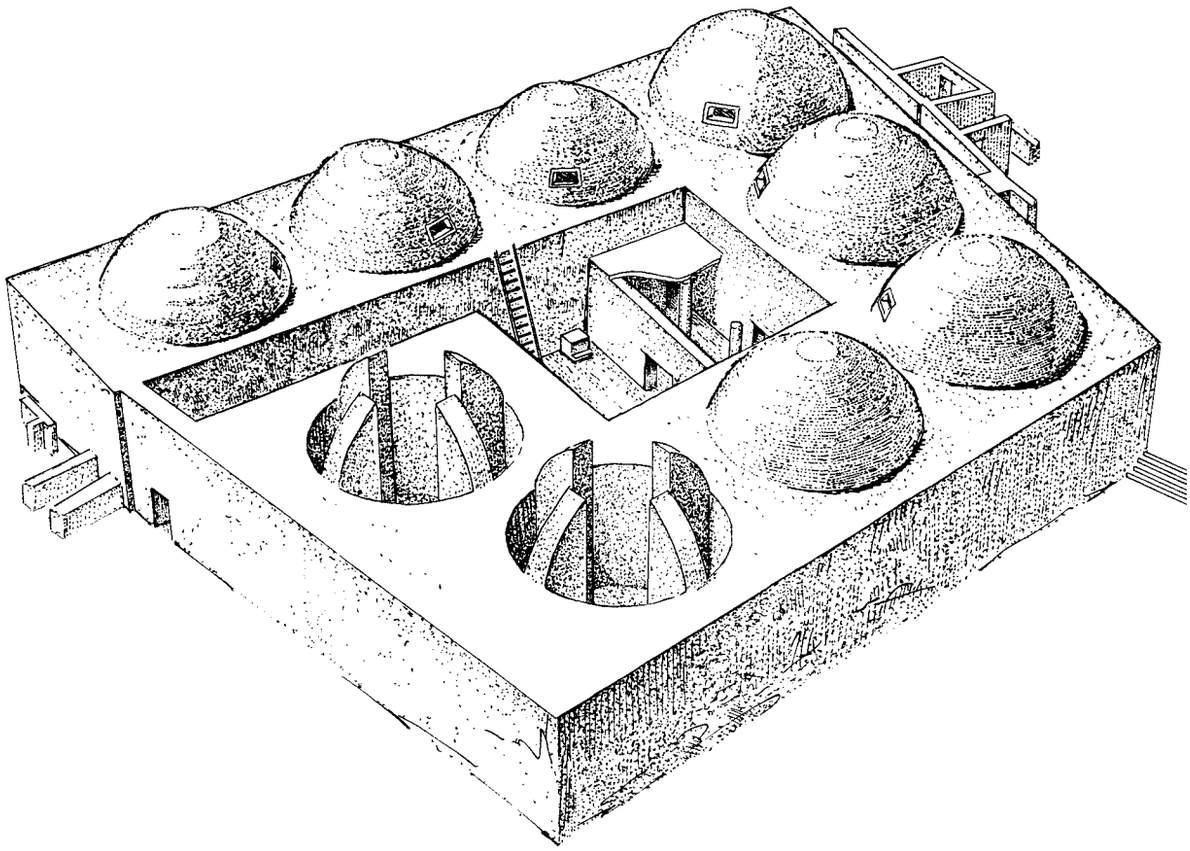

FIGURE 23.3. Suggested reconstruction of the Granary Building at Beit Yeraḥ (drawing by Anna Yamim).

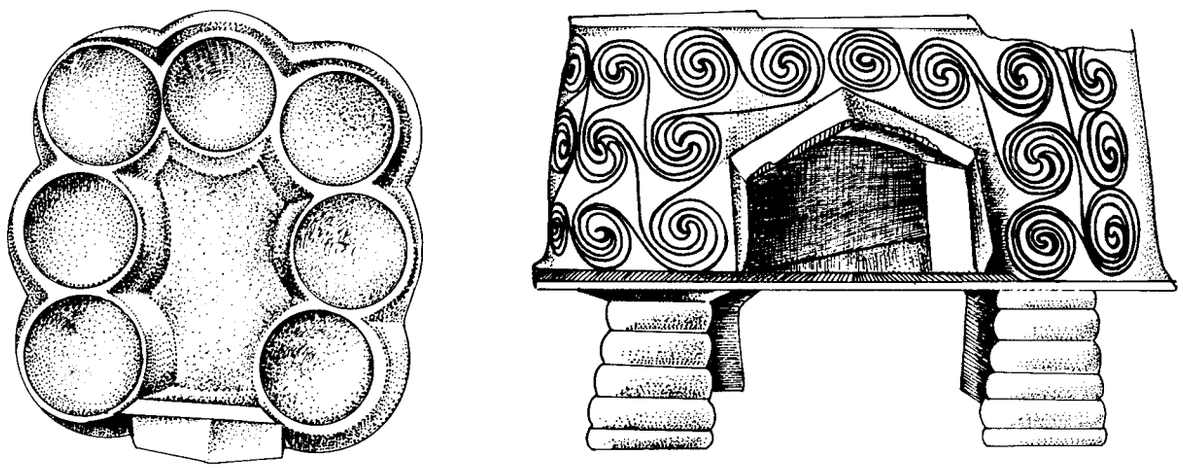

FIGURE 23.4. Early Helladic model granary from the island of Melos.

Egyptian depictions of silos (Currid 1985: 105, fig. 2). The corridors found leading to two of the circles probably enabled access to these openings through the solid superstructure that covered the entire stone foundation around the circular silos. This reconstruction suggests that the granaries rose to a considerable height, which might have been equal to or slightly below

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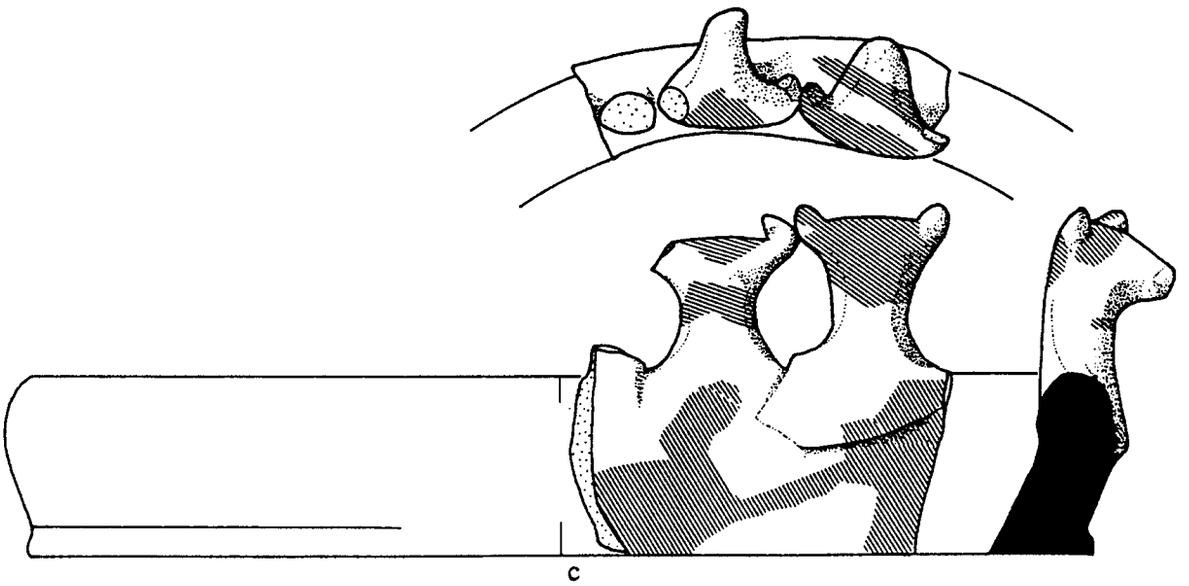

FIGURE 23.5. Pottery ring with two bull figurines found in the Granary Building at Beit Yeraḥ.

the diameter of the circles. A 6 to 8 m height for each of the silos is a reasonable estimate. (Compare the average height of 5 m for the 2–3 m diameter of Egyptian silos; Currid 1985: 104.) The thick, solid walls would have been able to withstand the pressure of the grain. (At the narrowest point the width of the granary wall was 1 m.) These considerations stand at the basis of the reconstruction shown on figure 23.3.

The Finds

A destruction layer which covered the floor of the courtyard contained many pottery sherds, including a large amount belonging to the Khirbet Kerak family. Many "broken and blackened bones of animals" are reported as having been found "in several loci, especially in the open court near the ovens, together with carbonized olive kernels, soot and other traces of fire."

The finds from this building were never published in detail, and I have been unable to locate any field diaries or other records.

Two unusual cult objects were published in the preliminary report (Maisler, Stekelis, and Avi-Yonah 1952: 227, pl. 19:B). The first (fig. 23.5, pl. 23.1b) is a fragment of a thick clay ring that bears two clay bull heads modeled in three dimensions. This object has been reexamined by Amiran (1989: 31–33).[2]

The second object (fig. 23.6, pl. 23.1) is a fragment of a zoomorphic libation vessel.[3] It is hollow, and the mouth of the animal served as a spout. The vessel was made of coarse ware, with plenty of large grits. The fragment is 10 cm long and 9.2 cm high; since it depicts about

2. I would like to thank Ruth Amiran for permission to republish the drawing of this object here. It is now exhibited in the collections of Beit Gordon at Kibbutz Deganya.
3. The object was found in the storage area of the Rockfeller Museum, among other material from the Beit Yeraḥ excavations. My thanks to J. Zias for locating it. The photograph was supplied by the Israel Antiquities Authority and the drawing prepared by Mrs. S. Helbreich.

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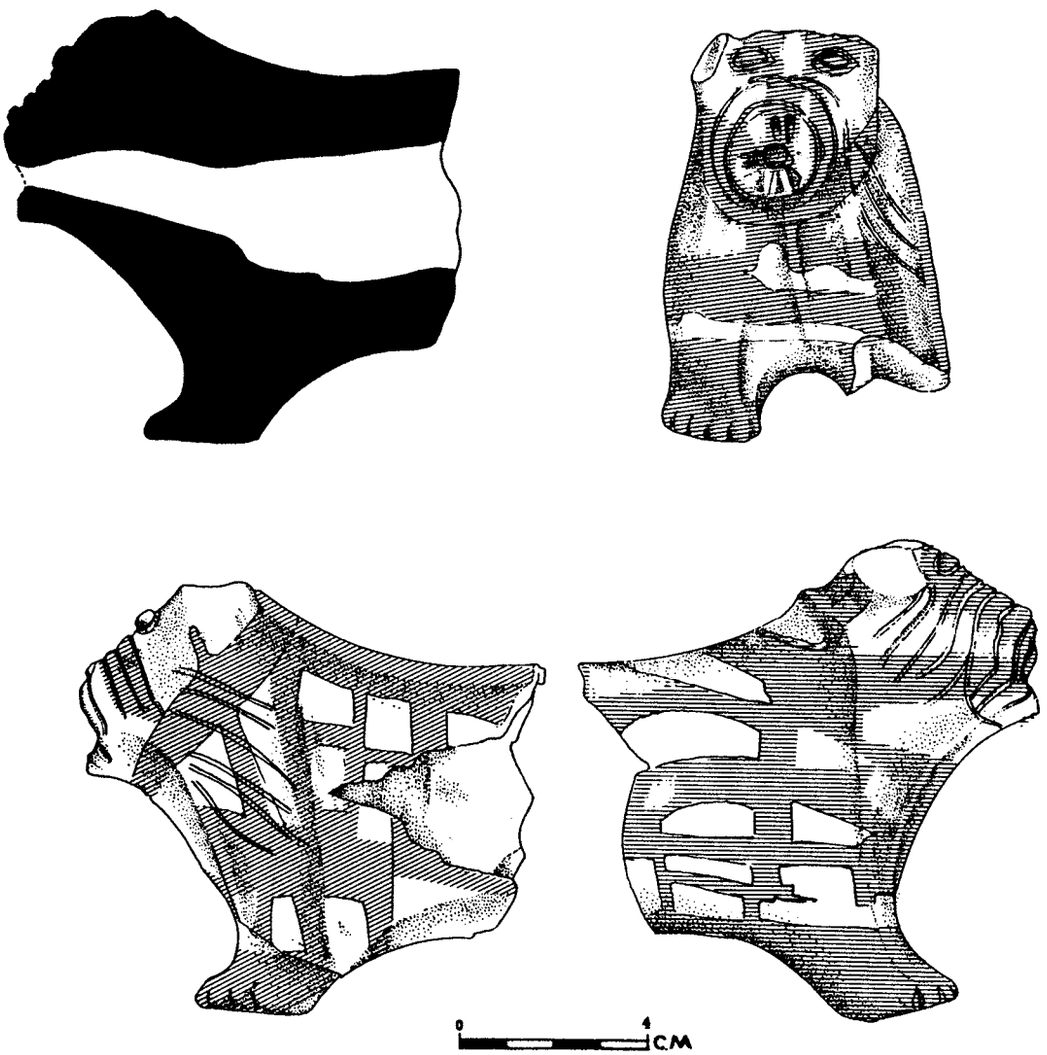

FIGURE 23.6. Lion-shaped libation vessel found in the Granary Building at Beit Yeraḥ.

half of the animal, the complete vessel was probably about 20 cm long. The animal can be identified as a lion, as shown by the shape of the head, the paws, and the delicate incisions on the head which probably represent the mane. The ears are broken. One might suggest that the broken ears were in fact horns, and thus interpret the animal as a bull. A prominent vertical ridge down the center of the animal's chest may strengthen this interpretation. Nevertheless, it seems to me that the fragments at the front of the head were originally ears, and that this animal is indeed a lion. The back of the vessel has not been preserved. The entire preserved part was painted with red stripes in a crisscross pattern. The piece is particularly important, since it is the sole EB II–III zoomorphic vessel known from the Land of Israel. Depictions of lions are well known in third millennium B.C. art of the ancient Near East, such as on Mesopotamian cylinder seals depicting lions attacking domestic animals or in representations of lions in wood carvings and seal impressions from Ebla (Matthiae 1981: pls. between pp. 80–81). In the Land of Israel, lions are a familiar motif on cylinder seals from EB (Ben-Tor

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1978: 52, fig. 15; 72–73, fig. 21). The lion motif became more common in Canaanite art in the second millennium B.C., often appearing in a ritual context.

Another object that probably came from the Granary Building is a figurine of an animal (sheep?), of a type found at other EB sites (pl. 23.1c, right).

Function

The excavators made several suggestions as to the function of the building: a public granary, a fort, a palace, or a temple. They settled on the last one. The suggestion that the building might be a granary was discounted in the original Hebrew publication because an oven had been found in one of the sunken circles (Stekelis and Avi-Yonah 1947: 60), though in fact no oven was found in the circles themselves. The unique oven in the building's courtyard was interpreted by the excavators as an installation for burning incense. In the English version of the publication, Avi-Yonah added a note (Maisler, Stekelis, and Avi-Yonah 1952: 228 n. 12) in which he presented a parallel to the building in the steatite model structure from the island of Melos (fig. 23.4), which dates to the Early Helladic period (Marinatos 1946: 342, fig. 4; Buchholz and Karageorghis 1973: 90, no. 1122). On the basis of the Melos model, which was interpreted as representing a public granary, Avi-Yonah wrote:

> This find increases the probability that the building was a granary after all and the ovens a later addition, once it went out of use. If this hypothesis is accepted, it bears striking evidence of the agricultural development and social structure of the EB settlements in the Jordan Valley. It presumes a plentiful grain crop stored in a public building connected with either a religious or secular authority.

The relevance of the Melos example was reinforced by the data on links between the Aegean world and the Land of Israel in the EB III period (Hennessy 1967: 82–83). Kilian suggested a resemblance between the Early Helladic II round building at Tiryns which he interpreted as a granary and the building at Beit Yeraḥ (Kilian 1986: 68), yet this is a very different building, much reconstructed, and its function is still elusive.[4] The identification of the structure at Beit Yeraḥ as a granary was generally accepted in the archaeological literature. R. Amiran noted parallels to third-millennium circular silos in northern Anatolia and Trans-Caucasia, at the sites of Yanik Tepe, Shengavit, and elsewhere (Amiran 1965: 165–67). However, in these examples, the round silos appear side by side and do not form part of a single building. Some of them exhibit internal partitions, formed by four piers which do not meet in the center of the circle, as in the Beit Yeraḥ building. In light of the origin of Khirbet Kerak ware in the Kura-Araxis culture, these parallels seem to be relevant, despite the fundamental difference in plan mentioned above.

Several scholars claimed that the "Granary Building" was a temple (Mellaart 1966: 74–76; Amiran 1989: 32; Busink 1970: 379–80; Wright 1985: 218). In my opinion, these two explanations do not need to contradict one another: the building can be interpreted as a temple, with the granaries serving an economic role. The single large hall inside the building is a "broad-house" structure reminiscent of the acropolis temple at Ai and the "White Building" at Tel Yarmuth. Both of these structures have been identified as EB III temples, contemporary with

4. My thanks to Sharon Zuckerman for this reference.

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the Beit Yeraḥ structure (Miroschedji 1988: 35–41; Kempinski 1992: 53–59). The inner dimensions of the broadhouse at Yarmuth (4.75 x 11.50 m) are almost identical to those of the hall inside the "Granary Building," though the Yarmuth example has four column bases along the hall's longitudinal axis, while only two were found at Beit Yeraḥ. The hall at Ai is larger (inner dimensions 6.00 x 17.50 m). Remains of a dais were found opposite the entrance to the hall at Yarmuth, but no traces of this kind were found at Ai or at Beit Yeraḥ. The unusual cult objects found at the Beit Yeraḥ building, which are rare in the EB, and the unique oven containing a large pottery stand found in the inner courtyard, reinforce the possibility that this building was indeed a temple. However, two points weaken our argument that the inner hall was a sanctuary: (a) No focal point of cult was found, such as the evidence for a dais found at Yarmuth opposite the entrance; and (b) the approach to three of the circles could only be from inside this inner hall. This can hardly be accommodated with the interpretation of the hall as a sanctuary. Despite these difficulties, I would not exclude the possibility that the inner hall was a sanctuary. Moreover, it may be suggested that the model structure from Melos represented a temple as well since it would otherwise be difficult to account for its facade, which has a pediment covered with rich spiral ornamentation. It thus may be suggested that both Beit Yeraḥ and Melos possessed temples with attached granaries, which were part of the temple's role as an economic power.

SOCIOECONOMIC INTERPRETATION

In the following section I attempt to widen the discussion of the Beit Yeraḥ structure's function into its significance for understanding the city's socioeconomic system. With this goal in mind, the following questions are considered:

1. What was its potential grain storage capacity?
2. What as the relationship between the amount of grain stored in the structure and the city's available agricultural land?
3. What was the relationship between the amount of grain stored in the building and the city's population?
4. What was the nature of the agricultural, socioeconomic, and organizational systems in which the "Granary Building" functioned?

Clear answers to these questions remain elusive. Nevertheless, partial answers can be provided and several possible hypotheses raised.

(1) The basic hypothesis that the stone circles served as foundations of granaries should be accepted. Their average diameter of 8 m implies that their superstructures were quite high, between 6 and 8 m (see above). For the purpose of calculating the volume of the granaries, I assume that they were 6 m high. This is in my view a minimal height for a round structure with a diameter of 8–9 m. Obviously, any alteration in this estimated height will affect the following calculations considerably. The average floor area of each granary, minus the area taken up by the inner piers, is 42 m^2. The volume of an average granary would thus be 250 m^3. The entire Granary Building would thus have been able to store about 2,250 m^3 of grain. The weight of 1 m^3 of grain can be calculated according to various coefficients. The most common

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for wheat is 770 kg per 1 m^3 (see references in Rosen 1986: 172; Schwartz 1994: 26, table 2), while the coefficients for barley differ from 610 kg per 1 m^3 (Rosen 1986: 172) to 714 kg (references in Schwartz 1994: 26, table 2). Thus if the building was fully utilized, its maximal capacity was somewhat above 1,700 tons of wheat and between 1,370 and 1,600 tons of barley. This capacity of the building exceeds earlier estimates, such as the estimation of 800 tons brought by Kempinksy's (1978: 29, cited by Esse 1991: 100).

(2) What was the relationship between the building's storage capacity and the city's agricultural potential? It can be assumed that the Granary Building was intended to store the maximum harvest possible, and that in bad or mediocre years the granary was not completely filled. A hectare (10 dunams or 2.5 acres) of land worked by traditional methods in the Levant yields between 300 and 1,000 kg of wheat, and the average in Arab peasant agriculture is about 700 kg (Avitzur 1977: 44–63; Rosen 1986: 172; Rosen uses an average of 650 kg per hectare of wheat and 800 kg per hectare of barley).[5] In the first year that Kibbutz Deganya was settled just south of Beit Yeraḥ, its land yielded 830 kg of grain per hectare (Avitzur 1977). This figure rose to 1,180 kg of wheat and 1,500 kg of barley per hectare in subsequent years. These numbers are in accord with figures based on Sumerian documents: 1,254 kg of grain per hectare in pre-Sargonic Girsu and 700 kg in Ur III texts (Adams 1981: 86, 146; Schwartz 1994: 28). In the Baqʿah Valley of Lebanon, where conditions are much more similar to the Jordan Valley, the estimation is just 300 kg per hectare (Marfoe 1979: 5). It may be suggested that harvests in the EB were on the average not much smaller than those obtained from Arab peasant agriculture. We can therefore calculate that in order to fill the Granary Building with 1700 tons of wheat, an area of about 2,430 hectares (6,075 acres) must have been under cultivation (based on an average yield of 700 kg per hectare). Beit Yeraḥ's best agricultural lands lie mainly to the south, in a triangle bounded by the Yarmuk River, the Jordan River, and the Sea of Galilee up to a distance of about 8 km from the city. This is the farthest that farmers would have been likely to cover on foot to reach their fields. This triangle, known as the Kinrot Valley, covers roughly 2,700 hectares (6,750 acres). This area comprises the northern end of the Irano-Turanian ecosystem of the Jordan Valley, which enjoys an average rainfall of 300–400 mm. This allows grain to be grown with maximum yields in dry farming. No other EB sites are known from this area and its periphery, except for Tell el-Hama (Hamat Gader), which extends over about 1 hectare and whose inhabitants probably worked some of the same land (see the distribution map in Esse 1991: 149, fig. 29). The closest EB site to the south is Tel Yaqush (excavated by Esse), which is far beyond the potential lands of Beit Yeraḥ. To the north, along the Sea of Galilee, there was another EB city at Tel Raqat (Khirbet Quneitra, north of Tiberias), but its people would never have competed with the population of Beit Yeraḥ for land in the Jordan Valley south of the Sea of Galilee. It thus may be assumed that the agricultural land in the triangle defined above was cultivated by the inhabitants of Beit Yeraḥ itself and not by the people from villages or satellite towns in the area (fig. 23.7). The people of Beit Yeraḥ could also cultivate land on the Yavneel plateau, just west of Beit Yeraḥ, though these were less accessible lands.

5. I thank Baruch Rosen for the time and effort he spent in discussing this subject with me. In the following calculations I utilized Rosen's methodology in analyzing the ʿIzbet Sartah silos (Rosen 1986).

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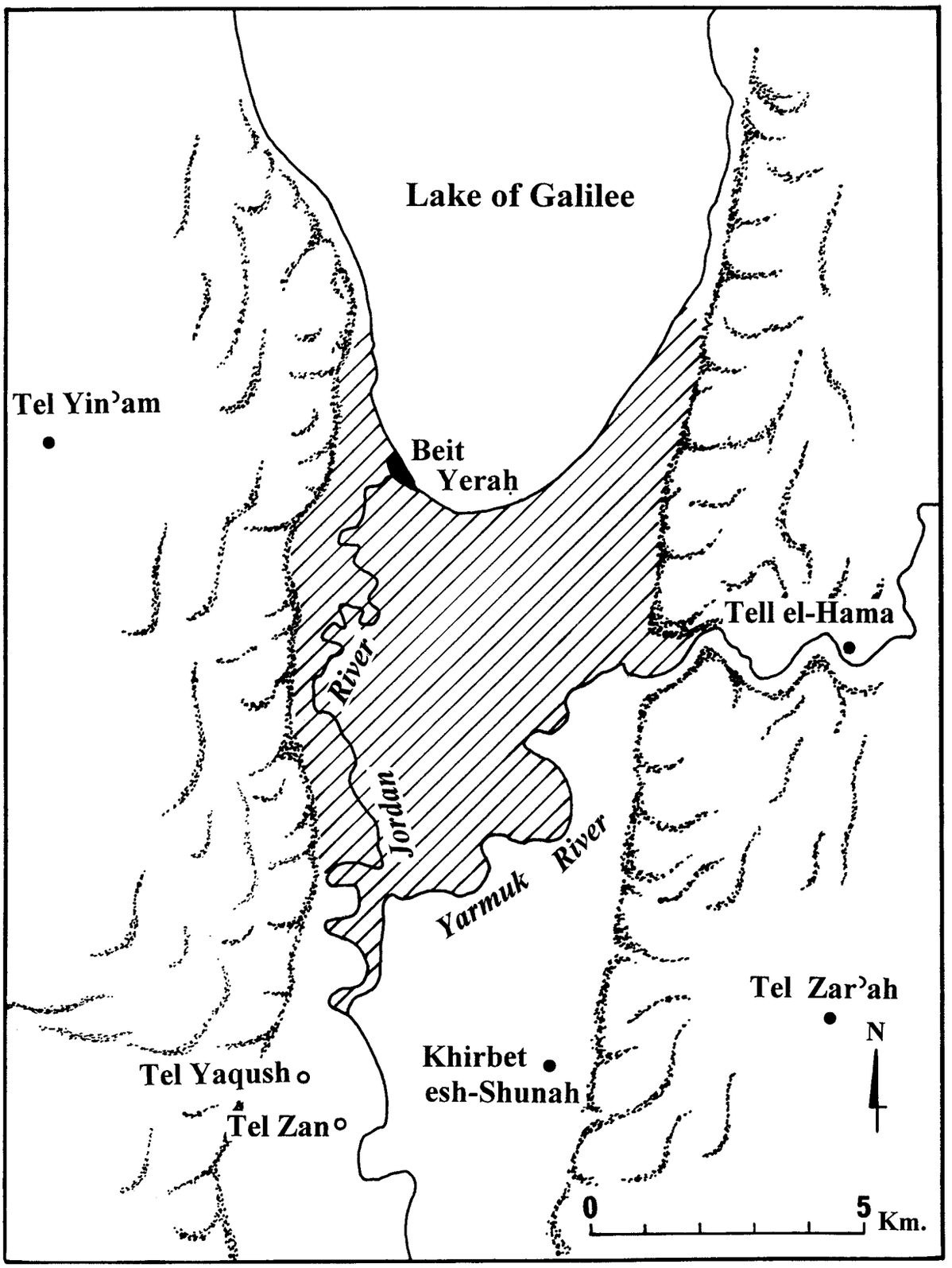

FIGURE 23.7. Map showing the agricultural hinterland of Beit Yeraḥ.

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(3) In order to answer our other questions, I make use of data and methods employed by B. Rosen and M. Broshi in their research on similar topics (Broshi 1979, 1986; Rosen 1986). The working hypothesis is that data collected in anthropological research carried out in a similar environment at a similar technological level (the Near East, especially late nineteenth-century Palestine) are valid for earlier periods.

The area of the city of Beit Yeraḥ is estimated at 20 hectares (50 acres). Studies in ancient and current traditional demography led to various estimates of density coefficients: from 100 persons per built-up hectare to 200–250 people per built-up hectare in the EB sites (as well as other periods) in the Land of Israel. A figure of 200 or 250 persons was utilized for the Bronze Age and the Iron Age (Marfoe 1979: 21; Broshi and Gophna 1984). Esse pointed out the difficulties in using a fixed constant of a number of people per hectare, due to the differences in types of sites and in their settlement density (Esse 1991: 130–35). However, Beit Yeraḥ was a densely built city in the EB III, and thus we utilize the 200 people per hectare factor and estimate that Beit Yeraḥ's population would amount to about 4,000 people (the high factor of 250 people per hectare would give a figure of 5,000). For the sake of simplifying the following calculations, we assume that the Granary Building was used for storing wheat alone; if barley was also stored there, the calculations would be only slightly affected.[6]

The average annual consumption of wheat in wheat-based cultures in general, and in the traditional economy of the Near East in particular, can be estimated as 150–250 kg per individual; the higher figure (200 kg) is more generally accepted. Higher numbers (as much as around 500 kg per person) are also cited (Rosen 1986:173; Schwartz 1994: 26, table 2, where ten different estimations are cited, the highest being 558 kg per year and the lowest 143 kg per year). Obviously, in calculating consumption, it has been taken into account that while wheat (and perhaps barley) was the basis of the population's food, they did have access to other sources of nutrition (legumes, various fruits and vegetables, fish, dairy products, beef, and mutton). A population of about 4,000 would thus consume about 800 tons of wheat per year. A loss of about 30% during storage should be taken into account, caused by the depredations of rodents and the need to provide seeds for the next year's crop. Higher figures for this loss, as much as 50%, are also cited (see Rosen 1986: 173; Schwartz 1994: 27, table 2).

Fodder for livestock has not been taken into account in these calculations since it is assumed that cheaper forms of food and straw were used for this purpose and were not stored in the central Granary Building. Broshi reckoned 300 kg of wheat per individual per annum, including loss, seed corn, and animal fodder. In order to provide 800 tons of grain, it would thus be necessary to store about 1,040 tons. This amount could easily have been stored in the Granary Building, which according to my calculations, could store up to 1,700 tons of grain. It is thus obvious that the building could store far more grain than the yearly consumption of the entire city's population.

This can be explained in several different ways. It may be that the building was designed to store bumper harvests from especially abundant years (as Rosen suggested for the silos at ʿIzbet Sartah), while in other years the building's maximum capacity was not used. Thus in a bumper year, when the granaries were full, it was possible to store grain in preparation for

6. Barley was the principal crop grown in the third millennium B.C. in Mesopotamia and was used for making bread and brewing beer (Jacobsen 1982: 38–51).

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poor years—since grain can be stored in this way for three to four years (though with an increasing rate of loss). The building could thus have served to even out the food supply for the city's inhabitants over good and bad years. Another possibility is that the surplus grain was used for trade with other cities or regions in the country, whose economies were based on different crops or products.

One of the most likely possibilities is that the people of Beit Yeraḥ traded with pastoralists living on the Golan and Issachar Heights. The EB III sites (so-called enclosures) found in these areas point to the existence of a permanent population whose economy was based on animal husbandry (cattle, sheep, and goat) as well as horticulture (Kochavi 1989: 21–25; contra Esse 1991: 156–62, who raised the hypothesis of a dimorphic society in the Land of Israel in the EB III, with reciprocal relations between the settled populations of the Jordan and Hula Valleys and pastoralists in the Golan and the Galilee).

It is also probable that the inhabitants of Beit Yeraḥ traded with the people of the central highlands of western Palestine, where horticulture was the basis of the economy (Stager 1985; Esse 1991: 100–102). Esse raised the question whether the granary building reflects a redistributive or market exchange economic system (Esse 1991: 100). A lack of written records prevents, in his view, a definite conclusion on this point. Yet he describes Beit Yeraḥ as a central site in northern Palestine: "The diversity of its resource base and the practice of successful mixed economy" (p. 100) were the basis for its economic power, as well as its

> . . . location straddling the border between two major eco-zones: the Mediterranean and the Irano-Turanian steppe . . . although Beth Yeraḥ surely participated in interregional and international trade, it is the level of intraregional trade that the city's existence comes into focus most sharply . . . the city became a true focal point, the nexus between two very diverse ecological zones with different potentials. (Esse 1991: 100)

Esse thus defined the Beit Yeraḥ granary as a center of interregional trade, a redistribution center, which is expected in a border zone between two different ecological regions.

The number of people occupied in growing this amount of grain can be very roughly estimated. In traditional agriculture in the Land of Israel, a peasant (*fellah*) family of about five people with their animals could cultivate an area of about 8–20 hectares (20–50 acres) of dry farming grain crops; the average area per family was 12–15 hectares (30–37 acres).[7] This area supplied a family with its agricultural produce. It is difficult to establish how many people were needed to cultivate grain with the technological methods and the sociopolitical organization of EB, and we do not know the division of labor in the city: Was there a degree of "specialization" and did only some inhabitants work on grain cultivation; or was it the main occupation of most of the population?

The data presented above indicate that, in order to cultivate the 2,430 hectares necessary to provide enough grain to fill the Granary Building, about 200 family units would be required, or about 1,000 people. This number gives a very general idea of a 1:4 ratio between the families who were involved in the cultivation of the amount of grain that could be stored in the Granary Building as against the entire population in the city. Other inhabitants of the

7. "The agricultural unit necessary to provide for a peasant family with the technical ability to farm was calculated at a *fadan*—the ability to work with a pair of oxen. It was usually of an area of 12 to 15 hectares. The *fadan* provided for the family at a fairly low level of subsistence . . ." (Avitzur 1977: 36–38).

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city (about three-quarters of the families) would be occupied with other agricultural activities, such as growing olives for the olive oil production, legumes, etcetera. There was also fishing in the Lake of Galilee, and perhaps also cattle, sheep, and goat breeding (Esse 1991: 98–100). Others would be professional craftsmen, military men, civil servants, priests, and so on.

If it is assumed that part of the grain needs of the inhabitants was grown on private allotments and not stored in the public Granary Building, then we may conclude that some of the grain kept in the building was used for trade even in years of average harvests. The territory calculated as necessary to provide the amount of grain stored in the Granary Building formed the greater part of the land within a reasonable walking distance of the city (the triangle bounded by the Jordan and Yarmuk Rivers, as described above). According to our calculations, about 400 hectares in this area would have been left over for harvests other than grain, or for producing grain that was not stored in the public granary. This would have been too small an area to supply the needs of those inhabitants who were not linked to the economic system represented by the Granary Building. It is therefore possible that some of the Beit Yeraḥ agricultural lands were in more distant plots, for example in the Yavneel Valley to the west or south of the confluence of the Yarmuk and the Jordan Rivers.

(4) The above calculations are evidence for a sophisticated system of centralized administration and careful planning of the agricultural-economic system at Beit Yeraḥ. The latter entailed the concentration of agricultural produce and its redistribution to all or a large part of the city's inhabitants, and most probably its use in intraregional trade (with other cities or regions in the country). Long-term storage of grain was probably also planned, in order to overcome the effects of drought years. It may be assumed that the authority which erected and managed the Granary Building had considerable political and economic power. But we have no way of knowing how the ownership of land and agricultural labor in the city were organized. Did the city possess a "specialized economy" with only a quarter of its inhabitants engaged in grain cultivation, while the rest carried on other forms of cultivation, fishing, herding, and various craft activities? Or were the different forms of agricultural work shared equally among all the city's inhabitants? Did the authority that owned the Granary Building also possess the land on which the grain stored there was grown, with the agricultural workers as serfs? Or did the building store grain that had been grown on privately owned allotments and collected by a powerful government, either by legal means or by force of religious tradition? If the suggestion that the core of the building was a temple is accepted, it is possible that most of the city's land was controlled by this temple. This phenomenon is reminiscent of the situation in Sumerian cities, where the temple had enormous economic power. However, even in the case of Sumer, where we possess written sources, scholars disagree over the extent of temple control of the city lands (Kramer 1963: 73–77; Gadd 1971: 126–31).[8] At Ebla, which is the chronologically and geographically closest archive to the period of the Granary Building at Beit Yeraḥ, economic power seems to have been in the hands of a secular authority—the king of the city (Matthiae 1981: 163–86).

8. According to documents from the temple of Baba at Lagash, tenants and hired laborers worked the temple lands at Lagash in the Early Dynastic period. The grain was stored in the temple granaries and was also ground there. The salaries of the temple staff and its various suppliers were paid mostly in grain. For detailed information on grain cultivation in Mesopotamia at different periods, see Jacobsen 1982. However, these data concern irrigation agriculture, which is very different from the dry agriculture of the Land of Israel.

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A more detailed reconstruction of the socioeconomic system related to the Granary Building would be totally speculative. Yet the building provides evidence for a complex economic system that existed in the Land of Israel at the zenith of the EB urban culture. Features such as specialization, advanced architectural planning on a large scale, concentration of food resources and their redistribution according to need and ability, long-term food storage, and interregional trade characterized this period and must have necessitated a complex bureaucratic system.[9] Whether this system was secular or related to temple administration is impossible to know.

The "Granary Building" at Beit Yeraḥ was found near the surface and definitely belongs to the latest stage of the EB city's existence. Thus the city of Beit Yeraḥ did not show any evidence for decline toward the end of the period of its existence.[10] Like at other EB III cities, it appears that the end of the city occurred at a time when the EB III urban system in Palestine was at its zenith. The demise came abruptly; however, its causes allude us.[11]

Despite the high degree of speculation and uncertainty in the above discussion, it seems to me that the Granary Building at Beit Yeraḥ can shed light on the socioeconomic structure of large city-states in the Land of Israel on the eve of the demise of urban culture at the conclusion of the EB III period.

9. The high degree of hierarchy and central authority in the EB III period is now exemplified superbly by the well-planned palace and other public buildings and fortifications at Tel Yarmuth (Miroschedji 1999: 2–19).
10. The urban architecture of EB III at Beit Yeraḥ can be seen in the complex plans of structures there, like that published by Eisenberg (Eisenberg 1981: 11–13).
11. Various suggestions were published concerning the reasons for the end of the urban culture at the end of the EB III period. I would add that a plague should be taken seriously as a possible reason for the demise of this culture when it was at its floruit. Plagues were one of the major reasons for abrupt changes in human history. The abrupt end of the EB III culture hints in my view to such a cause.

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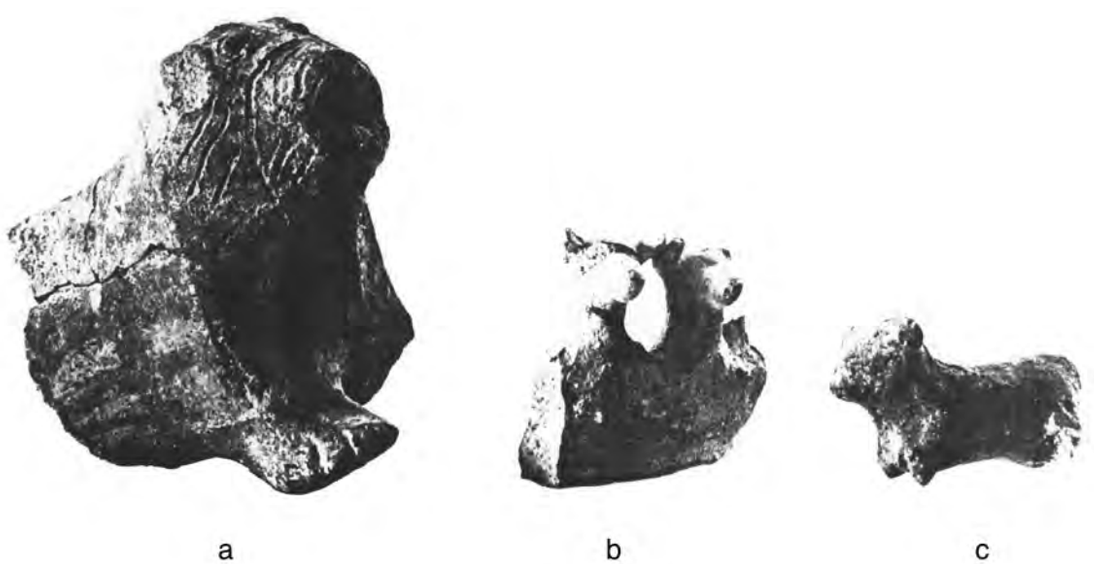

PLATE 23.1. Cult objects from the Granary Building at Beit Yeraḥ.

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NOTES ON EARLY BRONZE AGE METROLOGY AND THE BIRTH OF ARCHITECTURE IN ANCIENT PALESTINE*

PIERRE DE MIROSCHEDJI

To the memory of Douglas Esse, a superb archaeologist, a devoted colleague, a fine gentleman, and a dear friend.

INTRODUCTION

Although biblical metrology[1] is well known and has been the subject of several treatments (Barkay and Kloner 1986; Barrois 1953: 244–47; Ben-David 1978; Kaufman 1984; Paul and Dever 1973: 173–74; Powell 1992: 898–901; Scott 1958, 1959; Ussishkin 1976; de Vaux 1960: 297–301), pre-Israelite metrology in Palestine has been paid relatively little attention (see Dever 1974: 43; Milson 1986, 1987, 1988; Toombs and Wright 1961: 33, fig. 12; G. E. Wright 1965: 89; G. R. H. Wright 1985: 118–20). This weak interest is probably the result of a low confidence in the value of these studies, for in the absence of written documentation, empirical metrology relies on measurements made on the remains of buildings which, as a rule, were constructed with dry stone masonry; these measurements are obviously approximate while metrological studies aim at centimetrical, or even millimetrical precision. Moreover, it is easy to show that hazardous manipulation of the results of unsystematic measurements can lead to practically any kind of results. If the data are uncertain and the method for collecting them questionable, how can we achieve reliable results?

This pessimism is, however, excessive and should not prevent us from attempting to shed some light on early metrology, provided some clear-cut rules are posited. A large number of systematic measurements should be made on one or several buildings in order to obtain a statistical basis: even when dealing with dry stone masonry, it cannot be assumed that all stones have moved from their original positions. Also, manipulations of the numerical data gained from these measurements should be as few as possible and based on reasonable and verifiable assumptions concerning the use of subdivisions of a unit of measure. And more important, the methodology of the research should be based on a theoretical framework.

This last remark deserves emphasis. A study of early metrology should not be conducted solely with the legitimate curiosity of discovering what unit of measurement was first used, whether it was locally invented or borrowed from a neighbor. It should examine the significance of the introduction of a metrological system for a better understanding of an ancient

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1. In this paper, the word "metrology" is used conventionally to designate a system of linear measures, as only measures of length are taken in consideration—and not measures of capacity and weight.

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society. The appearance of metrology is inseparably linked to that of architectural planning which accompanies the first manifestations of monumental architecture; the latter, in turn, has long been recognized as an essential archaeological correlate of complex societies with which it is invariably associated. Now monumental architecture makes its first appearance in Palestine in the Early Bronze Age (EB). Recent discoveries at Tel Yarmuth offer impressive examples of palatial architecture and an opportunity to test, by comparison with other contemporary sites in Palestine, whether a metrological system had emerged in the third millennium together with peculiar techniques of architectural planning and a specialized builder to apply them, the architect.

These are the main questions to be investigated in the following pages. This paper begins with a sort of *status questionis* of early metrology, both theoretical and empirical, and the earliest techniques of architectural planning; it continues with an examination of the data of Early Bronze Age sites in Palestine, especially Tel Yarmuth; and it concludes with general comments on the significance of early metrology and the birth of architecture in Palestine.

PRELIMINARY REMARKS ON EARLY METROLOGY AND ARCHITECTURAL PLANNING

A Theoretical Approach

Until the modern introduction of the metrical system, all measurements were of course based on portions of the human body: palm, span, and cubit have conveniently been used from time immemorial as units of lengths, and despite their approximation have satisfied all needs. As no building can be made without measuring first, building and measuring have developed together, and this intimate association is attested, for example, in the earliest Mesopotamian myths.[2]

For a long time the builder was no specialist but the owner of a traditional knowledge inherited from generation to generation: building techniques were simple, planning rudimentary, and several members of the group shared this basic knowledge. Ethnographic studies in Iran, in Palestine, and elsewhere in the Near East have shown that in most cases, the builder traced the plan of the building on the ground with chalk or plaster at a 1:1 scale (Aurenche 1981: 95 [with refs.]). As the weight of tradition and technical constraints limited his freedom of creation, well-tried methods were endlessly repeated.

This method of "freehand planning" was convenient enough as long as simple dwellings, or small public buildings that were just enlarged versions of the domestic houses, had to be built. It became inadequate, though, as soon as larger public buildings had to be erected, especially palatial buildings where the large number of rooms and the need for easy circulation necessitate the design of elaborate plans. For these more sophisticated buildings, new techniques of architectural planning had to be introduced, involving the ability to trace right angles and to materialize guidelines for the placement of the walls on a large ground surface. This could be achieved with the help of a twelve-knotted rope, a surveying instrument in

2. See "Enki and the world order," where this god, initiator of mankind, is presented, among other things, as the patron of surveying and building: See Bottéro and Kramer 1989: 176–77 (lines 340–47).

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which the distance between each knot corresponds to a unit of length. It has been used from time immemorial as the most convenient tool to draw right angles by tracing on the ground a peculiar kind of rectangular triangle—often called the "three-four-five" or "Pythagorean" triangle—whose sides represent respectively three, four, and five units of length.

Recent research has established that these developments took place very early in Mesopotamia: J.-D. Forest has conclusively shown that from the beginning of the Ubaid period, the plans of large buildings were established on the basis of an orthogonal grid in which the side of each square corresponds to that of the unit of length used for planning (Forest 1991; see also Eichmann 1991; Forest 1993). The plan of the building was inscribed within the grid established with the help of a 12-knotted rope. The grid was not necessarily materialized on the ground, at least not completely, as it was mainly intended to serve as guidelines for the placement of the major walls, the partition walls being added in a more empirical way.

The advantages of this system of grid planning are manifold (Forest 1991: 164; 1993: 177–79). The plan of the building can be conceived and drawn on the ground at actual scale with a minimum of measurements, regularities are introduced in the proportions and the sizes of the rooms, courtyards, etc., and symmetry is easy to achieve. There is thus an appreciable difference between a plan realized in an empirical way and a plan elaborated with the help of a planning grid. A convenient way for archaeologists to identify the use of such a planning system is by superimposing on a drawn plan an orthogonal grid with a mesh corresponding to a recognized or a plausible unit of length, in order to check whether there is an adequate correspondence between the lines of the grid and the position of the main walls of the plan (see Forest 1991; and below, figs. 24.6, 8–9).

A relationship between the introduction of these new planning methods and the adoption of a metrological system is a plausible hypothesis. It is well known that following the introduction of molded bricks of standardized size (a rather late phenomenon: see Aurenche 1993), masons were accustomed to translate measures of length not only into empirical cubits (the distance from the elbow to the tip of the middle finger, i.e., about 0.45 m), but also into numbers of bricks (whose sizes were themselves related to that of the empirical cubit); this is still the method used nowadays by traditional builders. However, the planning grids identified by J.-D. Forest in Mesopotamia of the Ubaid period seem to have been established on the basis of a fixed unit of length distinct from the size of the bricks, suggesting that the plan was drawn by using a conventional and predefined unit of length and not by counting a certain number of bricks (Forest 1991: 163). Hence it is presumably among architects that the use of a cubit of a conventional and fixed length was first adopted. An indication of this is given by the fact that both in Palestine and in Egypt, cubits of a fixed value, which were longer than the empirical or "short" cubits of around 0.45 m—that is, not directly connected anymore to a part of the human body—were called "builder's" or "stone cutter's cubit" (Iversen 1975: 16; Ben-David 1978).

Architectural planning with the help of a grid is a technique especially well adapted to an illiterate society as it provides a convenient mnemotechnical system to memorize the characteristics of major plans, which could thus be transmitted orally from one specialist to another.[3]

3. It should be remembered (contra Arnold 1991: 10) that the introduction of metrology and architectural planning is independent from the invention of writing, as indicated by the Mesopotamian evidence which shows that units of measurements and grid planning were used since the beginning of the Ubaid period.

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A good experience with this system could lead ultimately to a familiarity with methods of tracing simple geometrical figures (squares, rectangles, and triangles of various proportions), especially those that can be drawn with a twelve-knotted rope. As these methods were also easy to memorize and transmit, the corresponding geometrical figures are ubiquitous in the design of early buildings.[4] In literate societies, however, the architect could draw the plan on a tablet (see Heinrich and Seidl 1967, 1968) or a papyrus (see Arnold 1991: 10). The difference between grid planning and preplanning is not simply one of literacy but of capacity of abstract conception: grid planning implies that the plan is conceived and executed on the ground at actual scale, while preplanning supposes that a plan conceived entirely in abstract is drawn beforehand and then traced on the ground after a scale translation. This represents a rather late development, restricted to few areas of the ancient Near East.

Thus metrology appears together with large-scale architectural planning at a rather advanced stage of development of the art of building, when the need was felt for the construction of buildings more elaborate than simple dwellings. This occurred at a level of sociopolitical development corresponding with the emergence of a complex society. A more specialized knowledge was then required, stimulating eventually the appearance of specialists possessing a specific competence in measuring and planning. Hence the appearance of metrology heralds both the birth of architecture *stricto sensu,* distinct from the art of building, and the intervention of a new specialist, the architect, different from the traditional builder.

Two Examples from the Ancient Near East

The validity of these general remarks can be sustained in broad terms by archaeological data derived from several areas of the ancient Near East. Mesopotamia and Egypt are by far the most informative in this respect as they shed light on the chronology and the modalities of this process.

Most significant are the data from Mesopotamia. In this area, a significant development in the art of building can be traced back to the late sixth millennium B.C., with the appearance, perhaps as early as the Samarra period, of symmetrical buildings with elaborate plans (Forest 1983, 1991). J.-D. Forest has shown that in the Ubaid period (starting in the Ubaid 0 Phase), the plans of the buildings were established on the basis of a fixed unit of length and laid out with the help of an orthogonal grid (Forest 1991; see also Kubba 1990; Eichmann 1991: 82–86). These, however, were dwelling units. Public buildings ("residences of chieftains") quite different from contemporary dwellings in size and complexity of plan are well attested in the late Ubaid period; this elaboration and the standardization of the plan manifest the emergence of specialized builders (Aurenche 1981: 295; Margueron 1986; 1987a: 15–20). By the Uruk period, monumental public buildings with a specific plan and peculiar architectural details (pilaster with niches, columns, etc.) are known from southern Mesopotamia to northern Syria, over a distance of more than a thousand kilometers, testifying to the widespread distribution

4. The interested reader will find comments on the use of these geometric figures for the design of buildings in early architecture in Choisy 1983: 51–57, 100, 136–38, 385–99. See also Badawy 1961 for ancient Egypt. Graeco-Roman examples are dealt with in Vitruvius' *De architectura* (see especially the translation with comments by Choisy 1971), while European medieval examples will be found in the notebooks of Villard de Honnecourt (see Bechmann 1993).

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of a special architectural tradition and identical planning and building techniques (Margueron 1987a: 20–32); these were evidently carried by itinerant professional architects concerned with official buildings. By then, metrological preoccupations are a well established fact (Franck 1975). In the following Jemdet-Nasr period, southern Mesopotamia witnessed the appearance of palatial architecture at Jemdet-Nasr and at Uruk (Margueron 1982: 23–34, 577–78; 1987a: 32–36). In the Early Dynastic period, several palaces were built (Margueron 1982: 35–144; Heinrich 1984) whose plan had been designed with the help of a modular grid and simple geometric figures (Heinrich 1984: 556–57). By then a sophisticated metrological system had been elaborated, whose details are known through numerous textual references; based on the cubit (conventionally assessed at about 0.50 m), it consists of its multiple, the reed (6 cubits), the rod (= 2 reeds or 12 cubits), and the rope (= 10 rods or 20 reeds or 120 cubits) (Powell l989). By the middle of the third millennium, the status of the architect emerges, linked to surveying and to mathematical knowledge and placed under the patronage of the great god Enki (see above, n. 2).

For Egypt, it is generally agreed that a formal metrological system had been already elaborated in the Third Dynasty (ca. 2649–2575 B.C.), when there is both textual and monumental evidence of the simultaneous use of a *small cubit*, used for the ordinary purposes of crafts and industries, and a *royal cubit*, reserved for cultic and official buildings and sometimes called the "the Royal Cubit measuring stones" (Iversen 1975: 16). Longer than the small cubit of about 0.45 m, the royal cubit prevailed throughout Egyptian history with more or less the same fixed value, evaluated by Egyptologists between 0.522 m and 0.525 m, the latter value usually considered the most probable (Iversen 1975: 14–19; Helck 1980; Arnold 1991: 10–23, 251–52; Powell 1992: 898; for other values, see Badawy 1954: 69 [52.4 cm]; Gardiner 1957: 199 [52.3 cm]; and Edwards 1992: 297 [52.2 cm]).

These precise measurements could be checked by scholars because measuring rods resembling wooden rulers one or two cubits long have been found in many tombs, including those of architects (Arnold 1991: 251). Longer measuring rods existed also: it has been demonstrated that the base length of the pyramid of Cheops could have been achieved most accurately by using rods with a length of 4 or 8 cubits (Arnold 1991). For measuring longer distances, surveyors used a rope. The use of knotted ropes—with knots placed at regular intervals corresponding to a conventional number of cubits—is attested in the New Kingdom for measuring fields (Arnold 1991: 252), but there is little doubt that it was used much earlier for building purposes. The "stretching of the cord" during the foundation ceremonies for temples has been frequently represented (see references in Arnold 1991: 23, n. 20): wooden pegs were hammered into the ground at the place of the knots, and Arnold mentions that "several examples of the wooden pegs that could have been used for that purpose have been found in situ" (Arnold 1991: 10–11, n. 21). The knotted rope permitted the tracing of geometric figures, especially the "three-four-five" (or "Pythagorean") triangle, which has been systematically used by architects of the Old Kingdom, in particular for the surface planning and the elevation of the funerary complexes of Djoser (Third Dynasty), Unas (Fifth Dynasty), and Teti (Sixth Dynasty) at Saqqara (Meyer-Christian 1987; Labrousse, Lauer, and Leclant 1977: 66–72; Lauer and Leclant 1972: 51–57).

It is probable that the measures of lengths used in these monuments derived from an older tradition, for royal mastabas of the First Dynasty already testify to the systematic use of a

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cubit of canonical value (Emery 1938: 3–9; 1939: 10–19; Vandier 1952 [I.2]: 613–89). Fixed measures of length might have been introduced even earlier, when large-scale monumental architecture began to appear in the Naqada III period, as suggested by the plan of some Dynasty 0 tombs in Abydos/Umm el-Qaab Cemetery B (Dreyer et al.1993: 25, Abb. 1), and by architectural representations or evocations of elaborate palatial buildings with facades decorated with niches on ivories (Vandier 1952 [I.1]: fig. 373), palettes (Vandier 1952: fig. 392), and on *serekh*-signs incised on pottery (see Kaiser 1982: 260–69). Although much later than in Mesopotamia and after a much faster evolution, Egypt confronts us again with a situation where the emergence of monumental architecture is concomitant with that of metrology and with the appearance of professional builders.

The Case of Palestine

Such spectacular and early developments as in Mesopotamia and in Egypt cannot be traced in the southern Levant. The Old Testament testifies to the use of a system of measures of length based on a cubit of approximately 0.525 m, similar to that of Egypt, and smaller units: the span (half a cubit), the palm (one-third of a span or one-sixth of a cubit), and the finger (one-fourth of a palm). Based on the testimony of Ezek. 40–48, scholars traditionally differentiate between a short "cubit of a man" with a length of six palms and a longer "royal cubit" of seven palms ("a cubit and a handbreadth" in Ezek. 40:5 and 43:13, i.e., six palms plus one); the former is an empirical cubit, measuring about 0.45 m—the actual distance from the elbow to the tip of the middle finger—and used for ordinary purposes, while the latter, whose length exceeds that of the human cubit, was later known as the "builder's cubit" (Ben-David 1978).

Although the validity of these metrological reconstructions have been put in question and considered insufficiently reliable to formulate a length estimate expressed in the metric system (see Powell 1989: 900), they seem to correspond indeed to a cubit of about 0.525 m as demonstrated by measurements of contemporary monuments, among others Hezekia's Siloam tunnel and contemporary royal tombs (Petrie 1892: 28–35; Ussishkin 1976; Barkay and Kloner 1986).

This royal cubit was also in use in Phoenicia (Ben-David 1978: 28). In ancient Israel, it was the length measure *par excellence*, used to express all distances, even very long (e.g., the 25,000 cubits of the holy district in Ezek. 45:1). But there were also longer units of length expressing multiples of the cubit, such as the reed (see Ezek. 40:3, 5–8; 42:16–19; but cf. Powell 1992: 900) and the rope (see 2 Sam. 8:2; 2 Kings 21:13; Jer. 31:39; Amos 7:17; Mic. 2:4; Zach. 2:5), and a smaller unit, the span or half cubit (see Ezek. 43:17 and 1 Sam. 17:4).

A few indications suggest that in the Levant, the antiquity of the "royal" cubit may go much beyond the Israelite period, at least as early as the Middle Bronze Age II. In Syria, the use of a cubit of about 0.525 m has been established at Ebla in the Middle Bronze Age II Building P3 (Matthiae 1993: 164b), and a study of the other contemporary Syrian palaces will probably reveal it too (although this was not stated by Margueron 1987b). In contemporary Palestine, the use of the same cubit was convincingly identified in the layout of the Fortress Temple at Shechem (cf. Toombs and Wright 1961: 33, fig. 12; G. E. Wright 1965: 89; Dever 1974: 43; contra Milson 1987), and it could probably be demonstrated also through a careful metrological analysis of Palestinian palaces of the Middle and Late Bronze Ages.

But what can be said about the Early Bronze Age? As recent discoveries have appreciably increased our knowledge of the architecture of this period, it is appropriate to investigate if

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third millennium B.C. Palestine had been left entirely out of the metrological and architectural developments that had taken place in contemporary Mesopotamia and Egypt. The first evidence to analyze is that from Tel Yarmuth.

THE DATA FROM THE EB IIIC PALATIAL COMPLEX AT TEL YARMUTH

Ongoing excavations at Tel Yarmuth have recently uncovered part of a large EB IIIC palatial complex covering about 6,000 m^2 (Miroschedji 1991, 1992, 1993a, 1993b, 1994, 1995a, 1995b. Measuring 84.20 m long and 72.10 m wide, the complex is limited by a thick peripheral wall presenting, on part of its length, square inner buttresses placed at regular intervals (fig. 24.1). These buttresses indicate the existence of two major courtyards inside the enclosed area, a large one occupying its southwestern half and a secondary one located to the northeast. The built-up area covered *grosso modo* the northeastern half of the complex. In the present state of excavations, it consists of a network of about twenty corridors, halls, and rooms, including several storerooms filled up with pithoi. In the northeastern part of the complex, which corresponds to a lower terrace (squares U-W 24–40), most of the walls have been destroyed by erosion.

A quick glance at the plan of this complex reveals two striking features in addition to monumentality: a remarkable regularity in the size of the rooms, the walls, the doors, the buttresses, and their intervals, and an overall plan unusually elaborate for an EB building, with perfect right angles and with rectilinear walls extending for distances of up to 55 m. These features immediately suggest the use of a fixed measure of length and large-scale architectural planning—two possibilities that deserve to be carefully investigated.

Measuring

At an early stage of the excavations of this complex, it was recognized that the walls fall into different categories according to their thickness. It was also assumed that the thickness of the partition walls, evaluated at 0.50/55 m, may correspond to a unit of measurement since it was apparently half of that of the standard walls. The precise value of this unit, conveniently called a *cubit*, was ultimately calculated at about 0.52 m on the basis of the measurements of the standard walls, several score of which had been uncovered (Miroschedji 1992: 269, 271; 1993b: 834–36).

Numerous measurements conducted since then have confirmed the validity of this evaluation and have provided a statistical basis so solid as to minimize legitimate doubts. Such measurements have also established the use of a half cubit—a span—and eventually led to the surprising result that an even more precise evaluation of the length of the cubit—about 0.525m—could be suggested because several measurements, especially those taken on longer distances, which are better explained by the use of a cubit of this value.

Practically all the measurements of walls, doors, buttresses, and room length and width made inside the palatial complex conform to multiples of this cubit, or of its half. Although it is not the aim of this paper to provide a full list of measurements, some synthetic information should nevertheless be presented here to justify our conclusions.

The walls have standardized thicknesses corresponding to multiples of the cubit. Four sorts of walls were distinguished (fig. 24.2):

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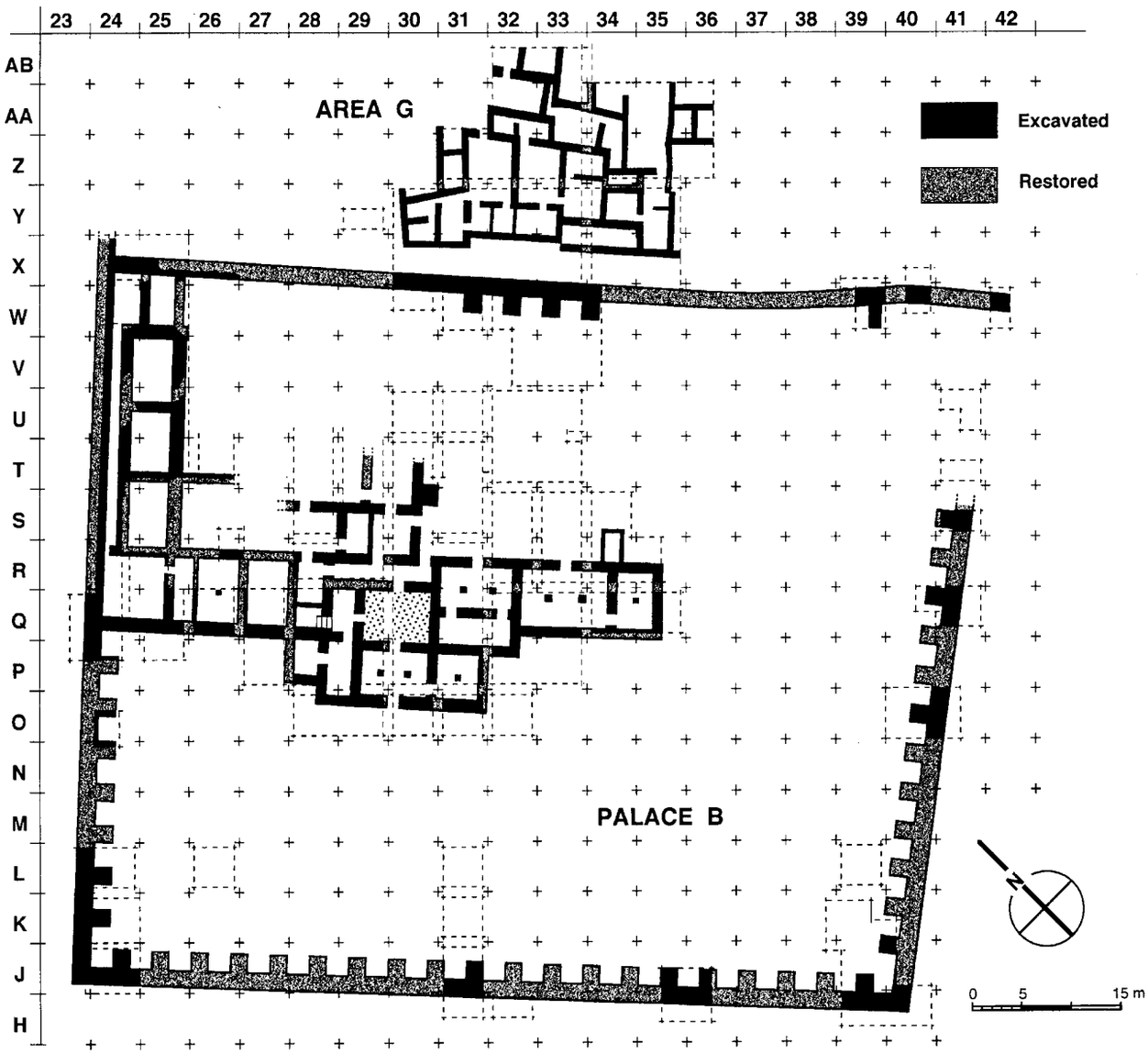

FIGURE 24.1. Yarmuth: General plan of Palace B (Area B, Stratum B-1) and of the adjacent Area G (Stratum G-2) at the end of the 1993 season of excavations.

- partition walls, with a thickness of 1 cubit only (three examples only, measuring between 0.52 and 0.55 m);
- standard walls (the large majority of the inner walls of the complex), with a thickness of 2 cubits (average thickness measured: 1.056 m);
- thick walls, with a thickness of 2.5 cubits (about 1.30 m; seven examples only); and
- peripheral walls, which enclose the complex and measure 3.5 cubits in thickness (average thickness measured: 1.85 m).[5]

5. The very thin walls (approx. 0.45 m) which delimit a small rectangular installation in Square R 34 should be mentioned only for the record, as they are not part of the structure of the palace.

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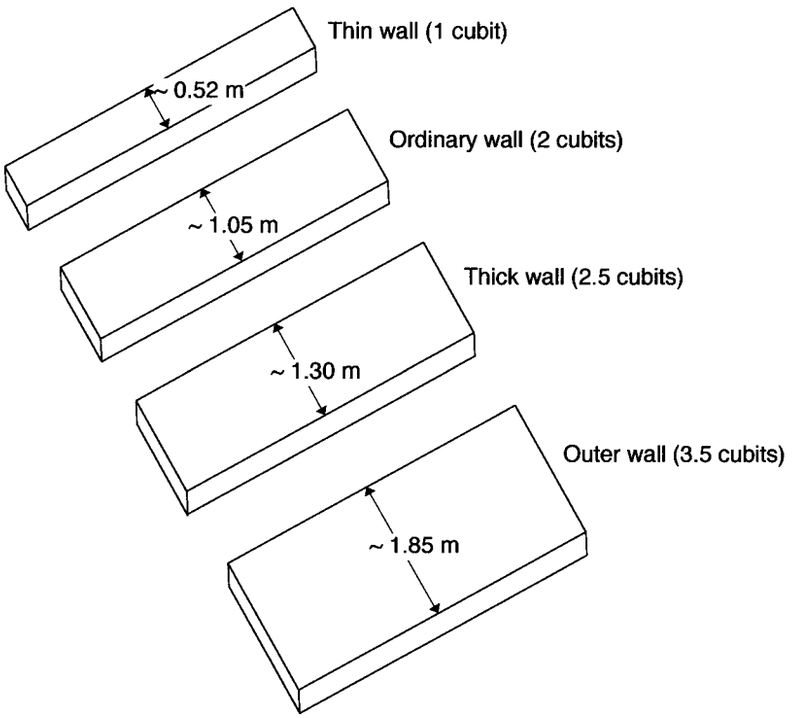

FIGURE 24.2. Categories of wall attested in Palace B of Yarmuth.

The thickness of the walls seems actually to be determined by the size of the bricks (fig. 24.3). They measure in average 0.50 x 0.25 x 0.15 m—such as one brick placed crosswise, or two bricks arranged lengthwise, gave, with the addition of intermediate mortar and lateral plaster, the thickness of a partition wall.

The width of the more than a dozen doorways cleared or studied up to now corresponds generally to that of the attached wall, i.e., two cubits (approx.1.05 m) (fig. 24.4). We know of only one example of a narrower door (0.80 m or about 1.5 cubit) and only two (?) examples of wider doors (1.30–1.34 m, i.e., 2.5 cubits). Most doors are flanked by two doorjambs made of sun-dried or baked bricks with a width between 0.25 m and 0.30 m (average: 0.27 m), i.e., half a cubit.

The regularity of the size of the buttresses of the peripheral wall and of the intervals separating them offer the best opportunity for precise measurements (fig. 24.5). Square in plan, the buttresses measure on each side about 1.82–1.84 m, i.e., 3.5 cubits. They are separated by intervals of about 2.10 m (4 cubits) along the southwest and southeast sides, and about 2.35 m (4.5 cubits) along the northwest side (for a possible explanation of this difference, see below). At the western and southern corners of the complex, the interval between the inner side of the corner and the first buttress of the perpendicular peripheral wall is, in both cases, of 4.15–4.20 m, or 7.5 cubits (3.5 + 4 cubits). The regularity of these measurements is such that the location of the unexcavated buttresses can be established with quasi-certitude, allowing substantial restoration of the plan (fig. 24.1). Thus, during the 1993 season, narrow soundings (5 m x 2 m) could be successfully excavated in Squares Q 40 and S 41 at the predicted location of a buttress.

Seven buttresses can be restored along the northwest side of the complex and twenty along the southwest side. Expressed in cubits, the length of the southwest side is of: (2 peripheral

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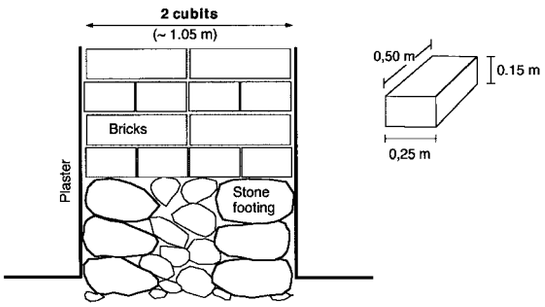

FIGURE 24.3. Typical structure of a standard wall in Palace B of Yarmuth.

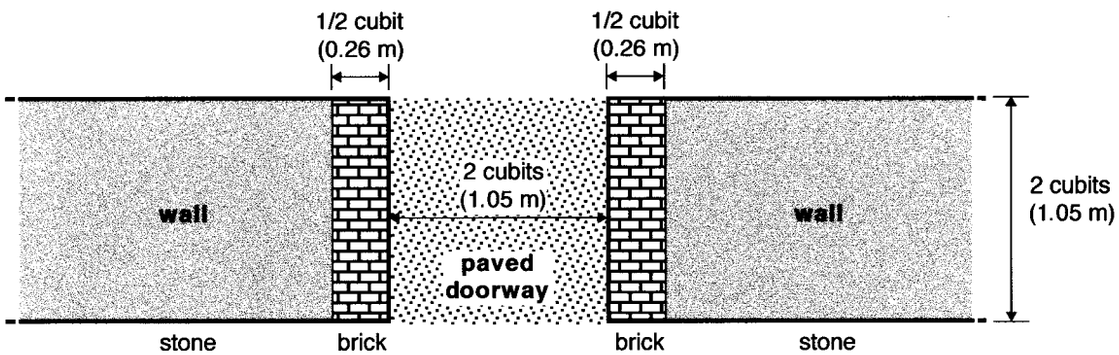

FIGURE 24.4. Plan of a typical doorway in Palace B of Yarmuth.

walls x 3.5 cu.) + (20 buttresses x 3.5 cu) + (21 intervals x 4 cu.) = 161 cu. that corresponds to 83.72 m or 84.52 m depending on a value of 0.520 m or 0.525 m for the cubit. As the measured length of this side (measured with a laser theodolite) turned out to be 84.482 m, a value of about 0.525 m for the cubit results in the smallest (and insignificant) discrepancy (0.043 m only) and obviously recommends itself as the best approximation.

The length of all rooms, without exception, conforms to measurements in cubits. Regularities in length and width could be established: for example, the width of several corridors is in the range of 3.5 cubits (approx. 1.85 m), that of some narrow, elongated rooms is about 4 cubits (approx. 2.1 m), while the lengths of the four rectangular rooms in Q-V 25 seem to be 11.5 cubits each. A possible reason why these particular measurements appear is given below.

Standardized measurements were also observed for other architectural features such as recesses, short walls flanking doorways, stone slabs used in stairs, location and spacing of pillar bases, and so on.

On the basis of these numerous measurements, it is not too hazardous to conclude that the layout of the EB IIIC palatial complex of Yarmuth has been achieved with the help of a fixed unit of length which has been systematically used by its builder. The consistency of the measurements is remarkable and leaves little doubt concerning the value of this "Yarmuthian" cubit: it is almost certainly in the range of 0.52 m, and possibly close to 0.525 m, the latter value offering the best working hypothesis to date. Hence it is conventionally retained in the remainder of this paper.

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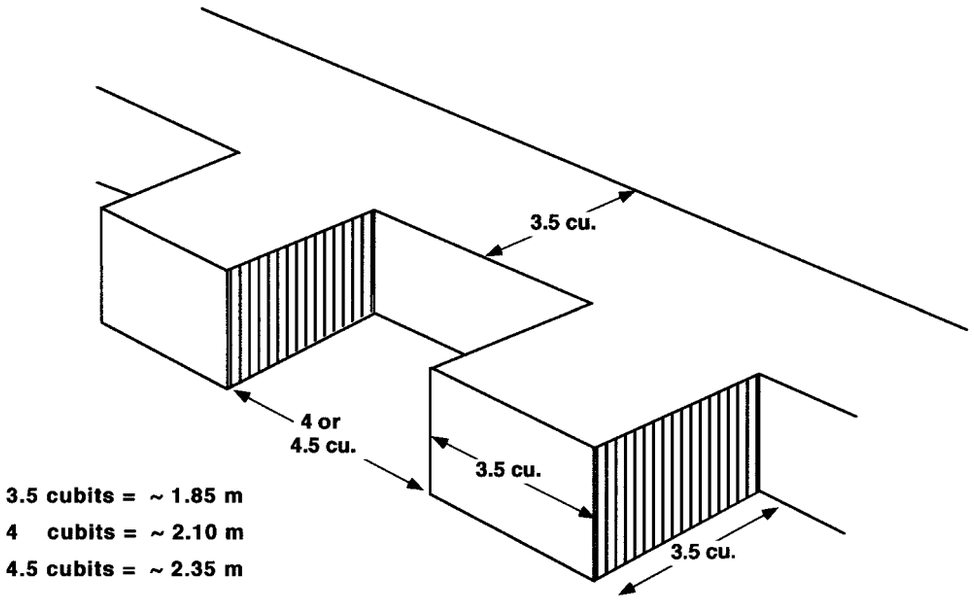

FIGURE 24.5. Size and spacing of buttresses along the outer wall of Palace B of Yarmuth.

Whether this value of the cubit is "natural" (and liable, therefore, to be found in different cultural contexts, otherwise unrelated) or "cultural" (and thus necessarily derived from one source) is a moot point. The fact that Mesopotamian cities used various cubits with local values, all of which were different from those of the Levant and Egypt (Powell 1989: 462–63), suggests that the figure of 0.520–0.525 m is culturally significant. It could be further surmised—but hardly demonstrated—that this value of the cubit used in EB IIIC Yarmuth was inspired by that of the Egyptian royal cubit, traditionally evaluated at 0.525 m (see above). In any case, it may well be that we have identified in Yarmuth the earliest evidence known so far of the use of this cubit in the Levant. Its introduction in third millennium Palestine inaugurates a metrological tradition that will last for nearly three millennia, at least until the end of the Iron Age.

Planning

Another set of data, admittedly less reliable and more speculative, should be discussed now: it concerns the planning of the palatial complex, obviously an overall and large-scale operation. Can we elicit the procedures followed by the builder in planning this complex? The orthogonality of the layout necessarily implies the use of a twelve-knotted rope: only this surveying instrument could achieve this result. The regular distribution of the main structural elements of the plan further implies the use of an overall planning method rather than the application of specific proportions to individual spaces (rooms and courtyards). A logical assumption is that the builder of the complex used a modular grid system to obtain guidelines for the placement and the orientation of the walls, a planning method already attested, as we have seen, in fifth millennium Mesopotamia (see above).

If we admit the possibility that a grid was used to plan the layout of this complex, the question is to determine the module chosen by the architect to establish such a grid. As the cubit is a measure of length much too short for convenient planning, especially in the case of an architectural complex the size of Palace B, we should look for a multiple of the cubit. The

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measurements taken up to now indicate that all lengths attested in the palatial complex are multiples and/or combinations of the following lengths: 2, 2.5, 3.5, and 4 cubits. This observation conveniently restricts the range of choice for a module. Actually, the analysis of the plan shows that only two values recommend themselves: 7.5 cubits (i.e., 3.5 + 4 cubits) or its double, 15 cubits.

The first value corresponds to the combined length of one buttress (3.5 cu.) plus an interval between two buttresses (4 cu.). Measurements indicate that while the individual length of a buttress and that of an interval between two buttresses may vary occasionally, that of their combined lengths is remarkably stable, implying that 7.5 cubits might be indeed the unit chosen by the builder for planning the complex. It is noteworthy that the length of its southwest side is precisely twenty-one such units (plus 3.5 cubits for the thickness of the southeastern wall, which is actually off-plan because of its different orientation). As a matter of fact, many other measurements can be explained on the basis of this unit. Its use results in a grid illustrated in thin lines in figure 24.6, which shows a remarkable correspondence with the plan of the building. To evaluate this correspondence, it is essential to bear in mind that grid planning was not designed to provide the builders with the plan of the building, but rather to give them guidelines for the alignment and placement of the main walls. For that reason, one should not look for an exact correspondence between the grid and all the walls, nor should the walls be necessarily positioned on the same side of the lines of the grid; they can be on either side, or even on the line itself, preferably astride when a wall is comprised of two rows of bricks. In the case of Palace B, it is clear that the placement of the main walls corresponds closely, and sometimes even exactly, to that of a grid with a module of 7.5 cubits. For example, the placement of the buttresses along the southwest side was clearly determined with the help of such a module.[6] Similarly, the layout of the rooms and of the long corridor in Squares Q-X 24–25 was probably achieved in the same way, as the lines of the grid correspond precisely with the face of the walls. The positioning of the walls in Squares Q-R 24–35 also shows a remarkable coincidence with that of the grid.

Yet this grid is not entirely satisfactory because on the northwest side, where the intervals between the buttresses are of 4.5 cubits instead of 4 cubits, the combined length of a buttress plus an interval is of 8 cubits instead of 7.5 cubits. For this reason it may be appropriate to look for a module of another value, possibly the double of the preceding one, i.e., 15 cubits instead of 7.5 cubits. Such a length permitted easier calculation, and it should be remembered that in contemporary Egypt, architects also favored modules in multiples of five (Lauer and Leclant 1972: 56–57; Labrousse, Lauer, and Leclant 1977: 71–72).

The resulting grid, illustrated in heavy lines in figure 24.6, shows of course the same remarkable correspondence with the lines of the main walls of the plan, but it also reveals several additional elements that should be mentioned despite their admittedly hypothetical character. First, the use of a grid with a 15-cubit mesh might offer an explanation of why an interval of 4.5 cubits instead of 4 cubits was applied along the northwest wall: assuming that the position of the long NW-SE wall in Q 24–32 was fixed initially, the widening of the intervals between the buttresses was necessary in order to avoid the seventh buttress being built

6. The same module was clearly used for the placement of the buttresses along the southeast wall, but the latter has a different orientation for reasons still unknown.

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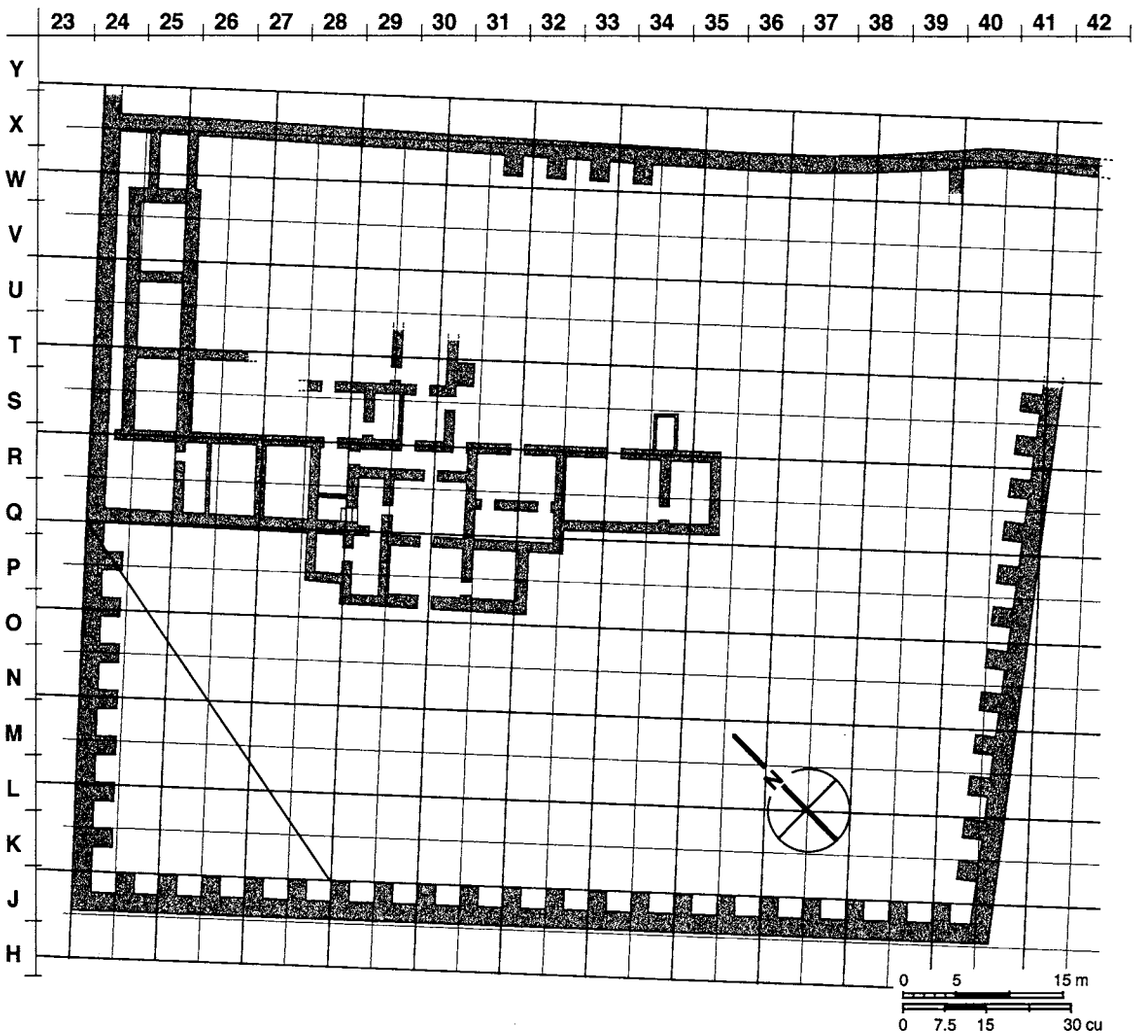

FIGURE 24.6. Yarmuth: schematic plan of Palace B with a superimposed orthogonal grid. The grid is based on a module of 7.5 cubits (thin lines) and 15 cubits (heavy lines).

right against the wall of either end. Second, it is noteworthy that the straight line of the southwest wall measures ten units of a 15-cubit length, and that five such units separate the inner face of the buttresses of the southwest peripheral wall from the 55-meter long wall in R 24–35, which is almost exactly parallel to the outer southwest wall, thus forming a large rectangle of ten by five units of 15 cubits each. Third, noting that the west corner of the complex is a perfect right angle, it could be observed that the distance between the outer wall and the wall in Q 24–32 is of four such units, suggesting that it may have served as one side of a "3-4-5" triangle. These three observations might of course be coincidental, but their convergence strengthens the plausibility of the use of grid with a 15-cubit mesh.

Public versus Domestic Buildings

In addition to size and quality of construction technique, large-scale planning and the use of a cubit as a measure of length are features that sharply distinguish the palatial complex from

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most other contemporary EB IIIC buildings of Yarmuth. These buildings are well known through excavations in other areas; especially significant are the domestic buildings of Area G, Stratum G-2 (fig. 24.1) because they are stratigraphically related to the palatial complex and have been cleared on an area of about 600 m^2. With such a large exposure, the database is large enough to confidently state that none of these dwellings exhibit architectural features comparable to those of the palatial complex. None of them, in particular, betrays the use of a unit of measurement similar to the cubit used in planning the palatial complex; as a rule, their walls are only 0.70–0.75 m thick, and their type of masonry is variable. In addition, they were not planned together with the palatial complex as shown by the fact that they present different layouts and orientations (fig. 24.1).

The difference between public and domestic buildings can be shown at best when comparing the process of construction planning. While the palatial complex is the result of one single large-scale building operation, the contemporary domestic houses were built without overall planning. They were added one to another through time, in an agglutinative process which sometimes necessitated the establishment of awkward junctions between corners of separated buildings. Two examples from Yarmuth are illustrated on figure 24.7 (see caption for comment). When compared with figure 24.1, they eloquently show the difference between the building techniques used for domestic or for public architecture. Many other similar examples can be given in Yarmuth and in other contemporary sites.

How can this difference be expressed, besides the obvious functional dichotomy of the two building types? Presumably, the EB IIIC domestic buildings and the palatial complex were planned and built by different people: in one case, we are dealing with dwellings built by their owners according to elementary building techniques transmitted from father to son; in the other case, with a public building erected on orders from a professional builder possessing a specialized knowledge in architecture. An essential aspect of this architectural knowledge—and actually a sine qua non condition to put it in practice—was the use of a fixed unit of measurement and that of specific planning techniques. In other words, the architectural data from Yarmuth in the EB IIIC period illustrate an essential dichotomy between the persistence of an art of building of immemorial antiquity and the emergence of architecture per se.

OTHER EB II–III METROLOGICAL DATA FROM YARMUTH

When did such a dichotomy appear? With several examples of public buildings earlier than EB IIIC, the Yarmuth excavations offer the possibility of at least a partial answer to this question. The use of a cubit for planning is the discriminant feature to look for in order to distinguish one building method from another. The pre-EB IIIC public constructions of Yarmuth belong to two categories, freestanding buildings and fortifications.

Freestanding Buildings

The freestanding public buildings include the remains of Building C (EB IIIB) and those of the so-called White Building (EB IIIA).

The scattered building remains ascribed to Building C cover possibly as much as 1,000 m^2 and characterize Stratum C-2 in Area C (Miroschedji et al. 1988: 42–43). The walls usually have a deep foundation trench and appear with two different thicknesses: about 1.05–1.10 m

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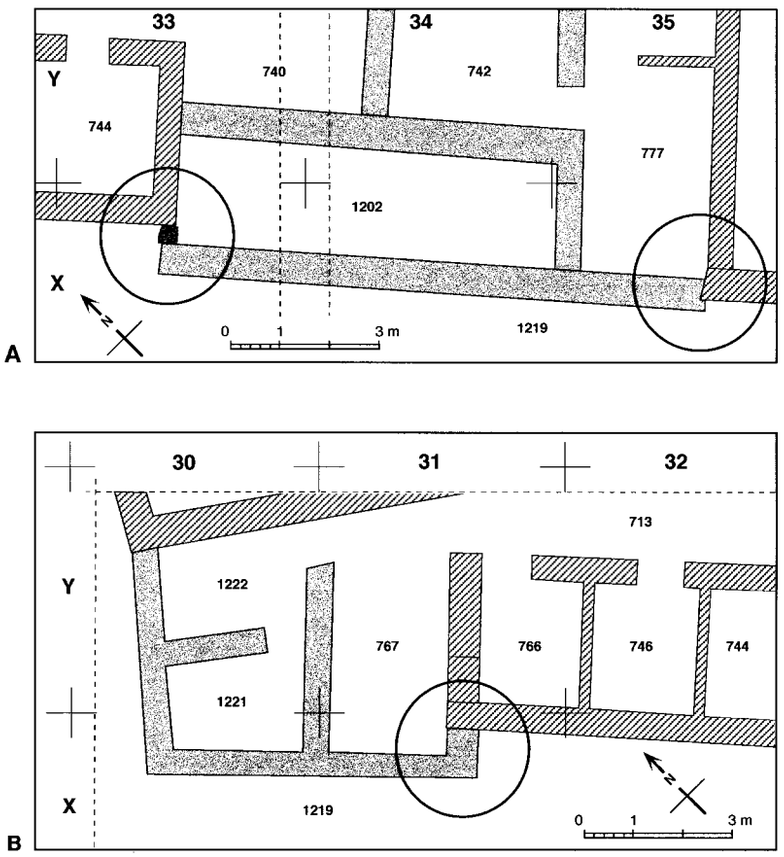

FIGURE 24.7. Two samples of domestic architecture from Yarmuth, Area G, Stratum G-2. The circles call attention to cases of awkward junctions between initial walls (in hatched lines) and later additions (in gray).

(i.e., 2 cubits), or between 1.30 m (toward the top of the wall) and 1.55–1.60 m (close to its base at the bottom of the foundation trench), i.e., between 2.5 cubits and 3 cubits. Only two rooms could be measured for size: Locus 239 is 3.00–3.10 m by 1.80–1.85 m (inner dimensions), i.e., 6 cubits by 3.5 cubits; Locus 240 has the same width and its length is uncertain (about 11 cubits). Although too few to be conclusive, these measurements raise the possibility that the metrological system applied in the EB IIIC palatial complex of Area B was already in use in the preceding phase for the construction of another large public building of palatial character. Although the plan of this building is too fragmentary to be definite, it should also be noted that the repartition of its scattered walls suggests that a grid with a module of 7.5 cubits might also have been used for its layout.

Another freestanding public building dated to EB IIIA is the so-called White Building, probably a temple (Miroschedji et al. 1988: 35–41). Its walls are a little over 1 m thick (2 cubits), the main entrance is 1.25–1.30 m wide (2.5 cubits), and the secondary entrance to the south about 0.8 m (1.5 cubits). These measurements suggest that the EB IIIB–C metrological system might have been also applied in the planning of this building. The inside measurements of the main hall are 11.60 m by 4.75 m (22 by 9 cubits), and the outside measurements are thus 26 cubits by 13 cubits. This ratio of 2:1 indicates that the planning of the building was made by

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using the outside measurements. As this building is not very large, there is no evidence here of the use of a planning grid.

Fortifications

The other public constructions of Yarmuth uncovered so far belong to the second category, fortifications, and date to the EB II and EB III periods (for details and chronology, see Miroschedji 1990). Unfortunately, fortifications do not lend themselves to easy measurements because, for reasons inherent to their nature and their method of construction, their thickness usually varies from place to place with an amplitude of a cubit or half a cubit; hence the metrological interpretation of the measurements is hazardous.

Among the striking features of the EB III fortifications are the platforms characterizing Phase III of the defense system. They remain to be precisely measured, and the few data presently available indicate that they have different measurements. The length of platform 101 in Area A could not be ascertained, and its width is 12.8 m (approx. 24 cubits). The width of platform 302 in Area D is 7.35 m (14 cubits).

The late EB II fortifications are represented by the outer city wall (Wall B) and a city gate. Due to its peculiar structure as a retaining wall, Wall B is attested with different thicknesses: 2.60 m (Area D), 3.00 m (Area A, square F 21), and 3.50–3.60 m (Acropolis). At the city gate, however, where it is a freestanding wall built with header and stretcher masonry, its thickness is 2.40 m (4.5 cubits), on both sides of the passageway, which is itself 2.40 m wide; the similarity of these three measurements may well be significant.

Finally, the thickness of the earliest city wall, Wall A, dated to EB II, is also variable: a little over 5.60 m (approx. 11 cubits) in Area A (Wall 131, measurement at top); 5.75 m (11 cubits) in Area C north (Walls 693 + 1008, measurement at base); between 3.50 m (at the base) and 2.85 m (at the top) in Area C northwest (Wall 1018), i.e., between 6.5 and 5.5 cubits; and 2.35 m (4.5 cubits) in Area D (Wall 342). The southern buttress in Area A projects 2.30–2.40 m (4.5 cubits), and the northern buttress in Area D 7.35 m (14 cubits). The length of the bastion cannot be measured precisely because of its trapezoidal shape; its width is about 13.40–13.50 m (25.5 cubits); it is limited to the east by a wall 3.20 m (6 cubits) thick (Wall 235); to the south by a wall 5.00–5.40 m (= 10 cubits) thick (Wall 188); and to the west by a wall 3.75 m (7 cubits) thick (Wall 191). The absence of right angles is a remarkable feature of these structures; and the way the bastion is attached to the rampart is also indicative of rudimentary planning methods.

These measurements are regrettably taken at random and are too variable to be conclusive. Moreover, several of them can be interpreted as multiples of an empirical cubit of about 0.45 m as well. Whether or not a cubit of around 0.52 m was already in use in Yarmuth in the early EB II is therefore an uncertain possibility that should now be tested against the data derived from other EB sites.

DATA FROM OTHER EARLY BRONZE AGE SITES IN PALESTINE

This task, however, presents considerable difficulties because other Palestinian sites of this period lack the quantity of metrological data known from Yarmuth. In most cases, the dearth of detailed measurements and the small scale of the published plans preclude any generaliza-

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tion of the Yarmuth observations. The few examples reviewed below are borrowed from those sites that have yielded the most impressive remains of EB public architecture, and which, at the same time, have been published with more details.

Early Bronze Age I

For the EB I, it seems that neither the temples of Megiddo Stratum XIX (Loud 1948: 61; Dunayevsky and Kempinski 1973: 167–68; Kempinski 1989: 170–75; 1992: 56) and of Hartuv (Mazar and Miroschedji 1993, 1996) nor the large building of Tel Erani (Kempinski and Gilead 1988, 1991; Nigro 1995: 7–11) illustrate the use of a cubit of a fixed length. At Megiddo Stratum XIX, the walls have been measured at 1.20–1.30 m (2.5 cubits ?) to the east and south, and at 3.00–3.05 m (6 cubits ?) to the west; at Hartuv, the thicker walls are about 1.00–1.10 m, but they show variations in their thickness, and other walls of the same building are thinner. More significant, the layout of those buildings is rather irregular, with few right angles, suggesting that no elaborate planning method was used. At Hartuv, though, the size of Hall 134 has a ratio of 2:1, and Hall 152 might have had the same proportions. On the whole, it appears that these EB I buildings are comparable to the public buildings of the Chalcolithic period at ʿEn Gedi (Kempinski 1992: 55) and Gilat (Alon and Levy 1989: 166–68, 176–82).

Early Bronze Age II

Observations are also inconclusive for most EB II sites. In the case of the fortifications at Ai and Arad, the use of a cubit remains uncertain for lack of precise measurements (Callaway 1980: 117, fig. 75; Amiran et al. 1978: 11–13). For those of Tell Taʿannak, Lapp has given some measurements (Lapp 1967: 3–10): the earliest city wall (Wall 58) is 4.20 m thick (8 cubits ?), the latest (Wall 28) is 3.77 m (7 cubits ?), while the later EB III rectangular tower (43) is 9.85 m thick (19 cubits ?). At Tell el-Fârʿah, detailed plans of which were available to this writer, no evidence of the use of a cubit could be established: although they were built with mudbricks, the thickness of the city walls and of the city gate's tower walls appears irregular (de Vaux 1962: 212–34). The same incertitude applies to the public buildings (temples and "palaces") of Tel Arad, which exhibit an irregular layout (Amiran, Alon, and Cohen 1976; Nigro 1995: 12–16), a priori precluding the use of a large-scale planning operation and suggesting rather that separate units were added one to another.

The situation is different with the so-called palace of Ai, actually a temple of really monumental proportions. Its original layout dates to EB II, and its reconstruction to EB III (Callaway 1965; 1969: 1993: 41–42 [with bibliography]). The walls of both phases of this complex are remarkably well built and regular, with an even thickness (on plan) of about 2.10 m, i.e., 4 cubits; it is interesting to observe here again the coincidence between elaborate building techniques (sophisticated masonry, worked pillar bases with raised top, etc.) and the manifestation of metrological concerns. The repetition of identical measurements suggests that a modular system was used for the layout of this temple. But its plan is unfortunately so incomplete that it is difficult to establish the length of the planning module. With much hesitation, I tentatively suggest that a 5.5–cubit module was applied to the EB IIIA reconstruction of this temple (as in Megiddo Strata XVII–XV; see below) because the resulting grid shows a rather good correspondence with the plan of the building.

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Early Bronze Age III

The EB III period offers more spectacular evidence of monumental architecture and more significant instances of architectural planning.

A famous EB III public building discovered in Palestine is the monumental granary of Beit Yeraḥ (Maisler, Stekelis, and Avi-Yonah 1952: 223–28; Mazar, chap. 23, this volume). Here again, only random measurements could be made with uncertain results. The inner circles measure between 7.6 m and 8.0 m in diameter (about 15 cubits), except for circles II and III, which are larger, 8.75–8.95 m (about 17 cubits). The dividing walls are approximately 1.00 m (2 cubits). The entrance passage (Locus 7) is about 3.70 m (approx. 7 cubits) wide at the entrance and about 3.15 m (6 cubits) at its end. The width of Locus 6 is about 6.85 m (13 cubits); that of Locus 2 is 4.35–4.50 m (about 8.5 cubits). None of these measurements is really precise, and their evaluation in "Yarmuthian" cubits is therefore dubious, although not impossible. Yet it remains questionable whether a grid system was used for the layout of this building because it has few right angles.

Megiddo Strata XVII–XV presents a most interesting example of the EB III public architecture because of the quality and size of the building remains uncovered and because of their approximate contemporaneity with those of Yarmuth. They consist of three temples and a palace.

The EB III temples comprise a single temple (5192) ascribed to Stratum XVII(?)–XVI and a complex of twin temples (5192 and 5269) related to Stratum XV (Loud 1948: 78; Dunayevsky and Kempinski 1973; Kempinski 1989: 175–77; Esse 1991: 83–90). These buildings can be studied at leisure as they are still standing today. Measurements, however, are at times imprecise because the walls have been partly reconstructed. Their thickness varies between 1.90 m and 2.10 m, the majority being in the range of 2.0–2.1 m (4 cubits).[7] The length of walls can also be converted in cubits, with little approximation: the size of the main building (external measurements of hall and portico) is between 17.6 and 17.8 m on each side (33.5 or 34 cubits). Precise measurements were given by the excavators for the two preserved altars: the altar of Temple 4040 measures 2.60 m x 2.20 m x 1.05 m, corresponding exactly to 5 x 4 x 2 cubits; and the altar of Temple 5192, whose full height was not preserved, measures 5.25 x 3.95 m, i.e., exactly 10 x 7.5 cubits (a ratio of 4:3). Although these data do not offer a statistical basis, they nevertheless appear coherent enough to sustain the conclusion that a cubit of 0.525 m was also used for the building of these EB III temples (contra Milson 1988).

Even more interesting is the analysis of their layout. The similarity of their dimensions and the perfection of their right angles clearly indicate that they are the result of a planning technique involving a knowledge of elementary geometry. The example of Yarmuth discussed above suggests that the characteristic elements of their plan can be explained at best by the assumption that the builders used a modular grid system for their layout. However, application

7. Here is a list of measurements taken in the field:

Temple 4040: North wall: 1.95–1.96 m; South wall: 2.00–2.05 m; East wall: 2.00 m; West wall: 1.90 m. Small wall protruding from the western ante: 0.85–0.86 m.

Temple 5192: North wall: 2.06–2.07 m; South wall: 2.05–2.06 m; East wall: 1.92 m; West wall: 1.85 m to 2.10 m.

Temple 5269: East wall: 1.82 m to 2.00 m; West wall: 1.92 m to 1.95 m.

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of the "Yarmuthian" grid with a mesh of 7.5 and 15 cubits does not give a convincing result, thus indicating that we must search for a module of another value, calculated ad hoc for these buildings. On the basis of the various measurements taken and their interrelationships, the value of 11 cubits (i.e., 5.5 cu. x 2) recommends itself as a likely possibility.[8]

The resulting grid fits tightly to the position of all the walls, especially in the case of the twin temples (fig. 24.8). It also reveals the major geometric figures possibly used by the builder to lay out the plan of each temple: the complete building (hall, portico, and adjacent room) is inscribed in a rectangle of 4 x 3 units of 11 cubits, the main building (hall and portico) in a square of 3 x 3 units, while the proportions of the main hall fit a rectangle of 3 x 2 units, in which two "3-4-5" triangles can be drawn for the construction of the right angles. Since these geometric figures fit so precisely the main elements of the plan, their conjunction can hardly be accidental, and the proposed governing grid appears as a likely hypothesis.[9]

It is noteworthy that all these figures can readily be constructed with a twelve-knotted rope and imply a very simple knowledge of geometry, such as can be expected for a builder of third millennium Palestine.

Other interesting observations can be added. The similarity in plan and proportions of the twin temples 5192 and 5269 shows that they were constructed together, the grid of Temple 5192 apparently determining the position of the southeastern wall of Temple 5269; however, the grid of the latter temple, although identical to that of Temple 5192, was slightly offset to the southwest. On the other hand, Temple 4040 is the result of a distinct building operation, as shown by the difference in orientation and proportions, and by the fact that the grid fits less precisely to its structure; this conclusion is of course sustained by the stratigraphic observations of Dunayevsky and Kempinski which have established that Temple 4040 was built before the twin temples (Dunayevsky and Kempinski 1973: 165).

Another important EB III public building of Megiddo is Building 3177 of Stratum XVI, most probably a palace (Loud 1948: 70–76; Kempinski 1989: 30, 155; Esse 1991: 84). Its publication is so succinct that it is difficult to ascertain on the basis of the thickness of the walls whether a cubit of the same value as that in Yarmuth and in the Megiddo temples was used. However, the similarities in architectural details with the palace of Yarmuth are so striking that this possibility cannot be excluded, and it is retained here as a working hypothesis.

The analysis of the layout of this palace is also difficult because the building was only partially excavated, and its builders could not design it freely as they had to adapt to the adjacent terrace walls (Walls 4114 and 4045), with the result that walls of different orientations were built on the western and southern sides of the complex. Application of a grid with a module of 11 cubits (5.5 cu. x 2), the same as for the temples, shows a rather good correspondence with most walls of the palace and gives the width of several halls, rooms, and corridors (fig. 24.9).

8. This module was calculated by dividing by 3 the length of the back wall of Temple 4040, when it was recognized that this wall constitutes apparently one side of 3–4–5 triangle.

9. This conclusion could not be formulated by Milson (1988) because of a basic methodological flaw: the wrong assumption that the layout of a building is planned on the basis of the inner dimensions of its rooms—while it is always established with the outer dimensions, using simple geometric figures which can be constructed with the help of a 12 knotted rope. For that reason, I cannot follow Milson (1986, 1987, 1988) in his attempts to explain the layout of several Early and Middle Bronze Age buildings of Megiddo and Shechem through elaborated planning techniques involving the calculation of square roots.

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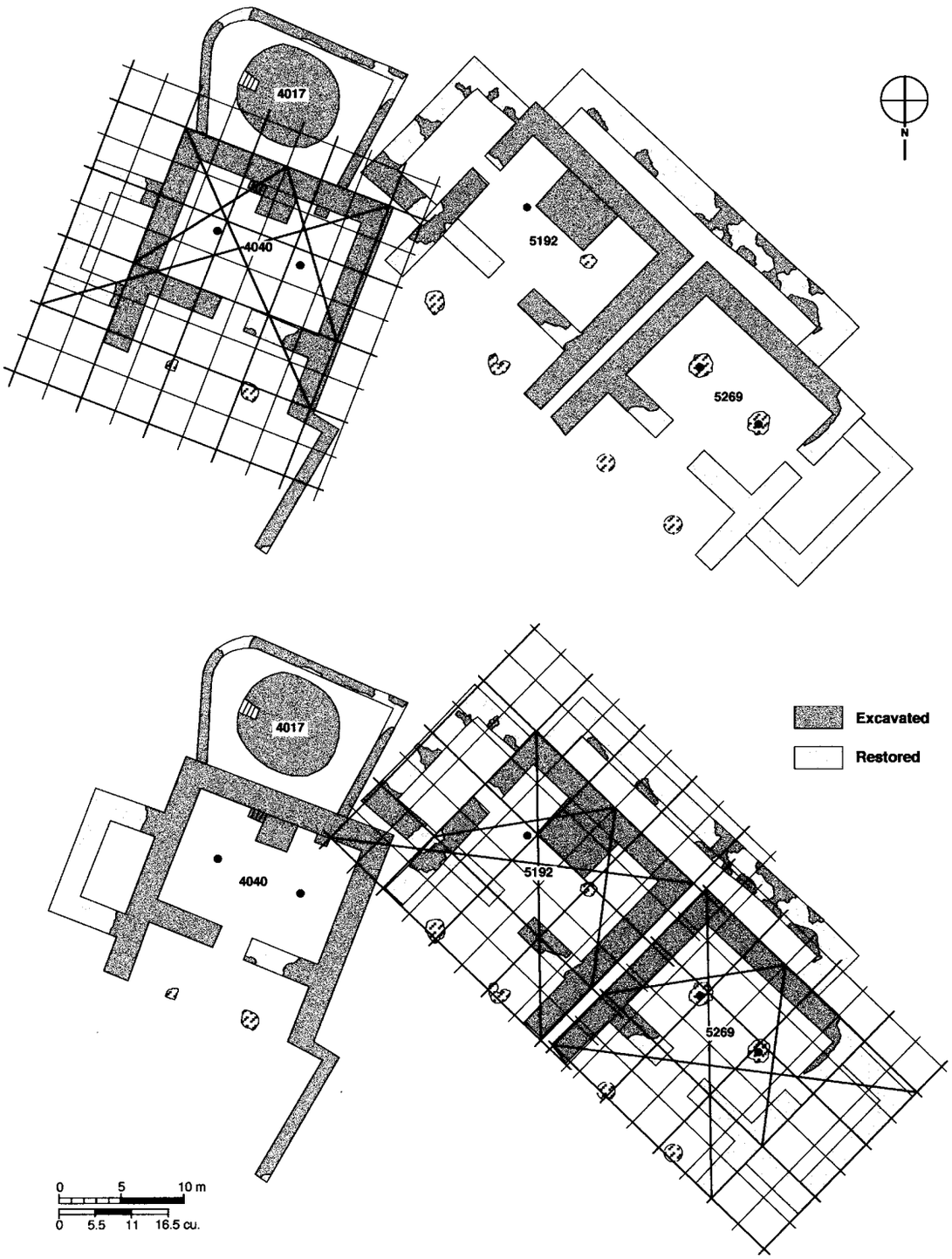

FIGURE 24.8. Schematic plan of the Megiddo Temples of Strata XVII(?)–XV, duplicated for sake of clarity. The superimposed orthogonal grids are identical in size and based on a module of 5.5 cubits (thin lines) and 11 cubits (heavy lines) (plan after Loud 1948: fig. 304).

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To assume that such a grid was used to draw the layout of the palace is thus a plausible hypothesis. It should be noted that it has the same orientation as that of Temple 4040; this observation suggests that Temple 4040 and Palace 3177 were built at the same time, as part of the same large-scale building operation.[10]

CONCLUSIONS

This brief review of the evidence of metrology and architectural planning on some EB sites is admittedly incomplete. It tends, however, to confirm and to specify the major conclusions reached in the previous sections of this paper, which are summarized here.

The first conclusion concerns the introduction during the EB of a standard unit of length that heralds the appearance of metrology. Based mainly on the data from Yarmuth and Megiddo, the evidence establishes firmly the widespread use in the EB III of a cubit of approximately 0.525 m, longer than the empirical cubit of 0.45 m and presumably borrowed from Egypt, where its equivalent is attested both earlier and on a much larger scale.

What remains uncertain is the adoption date of this long cubit in Palestine. The evidence of its use in the EB II is dubious, being based mainly on the hypothetical case of the Acropolis temple at Ai and the rather problematical measurements of fortifications at several sites. It is therefore safe to conclude, until proof of the contrary is produced, that the use of this cubit started sometime during the latter half of the EB II, and that it was well entrenched in the EB III.

The second conclusion of this study is that the appearance of a fixed unit of length was accompanied by the elaboration of new techniques of architectural design. The basic fact that modular architectural planning was employed in the Early Bronze Age can hardly be denied: the EB III data from Yarmuth and Megiddo clearly indicate the use of an orthogonal grid system based on a module corresponding to a multiple of the cubit. Earlier evidence of the use of this technique is based only on the Acropolis temple at Ai, so that the introduction of this technique can be dated again to the latter half of the EB II at the earliest. There is no reason to ascribe it to Egypt, although the data briefly mentioned in the first section of this paper indicate that grid planning is well attested in the contemporary Nile Valley, both for monuments and for works of art.

The concomitant introduction of a fixed measure of length and new techniques of architectural planning was necessary in order to erect the larger public buildings required to satisfy the ambitions of an emerging political power. A third conclusion is precisely the appearance of monumental architecture in EB III Palestine. This concept, however, needs to be qualified, because it is not based only on size. Large public buildings erected for cultic purposes existed in Palestine as early as the Chalcolithic period and grew increasingly larger in the course of the Early Bronze Age. But with the possible exception of the Megiddo temples, these buildings simply expanded the traditional broadroom plan of the earliest Chalcolithic temples, which themselves imitated the contemporary domestic dwellings (see Miroschedji 1993c: 208–11); hence, from the point of view of architectural design, these temples were not new and merely

10. This was already implied by Dunayevsky and Kempinski 1973: 169 (sub level XVI) and caption to fig. 7 (Stratum XVII); see also Nigro 1995: 19, fig. 6. Note also that a pillar base with a raised center identical in shape and technique to those found in Temple 4040 was uncovered in room 5 of Palace 3177.

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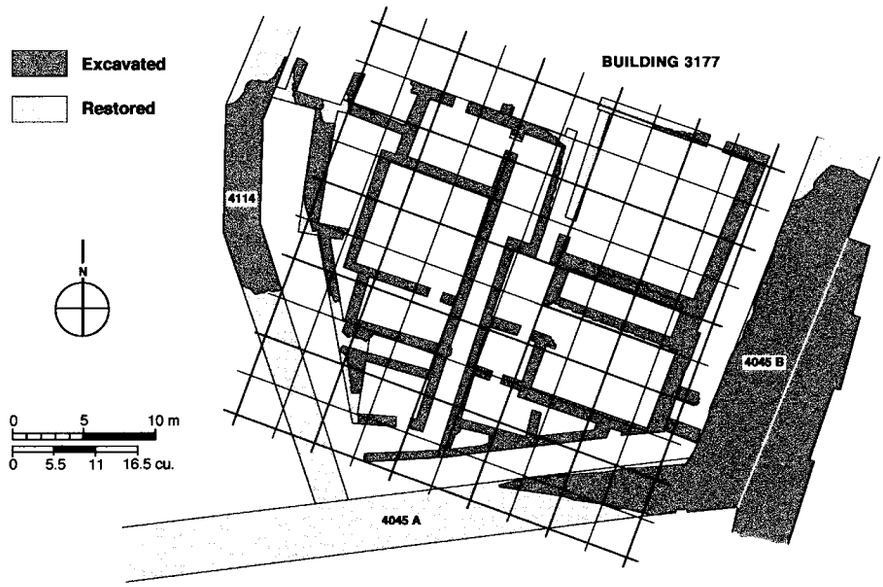

FIGURE 24.9. Schematic plan of Megiddo Palace 3177 of Stratum XVII(?)–XVI with a superimposed orthogonal grid identical in size and orientation to that of Temple 4040 on fig. 24.8 (plan after Loud 1948: fig. 304).

continued a well-entrenched building tradition. The same remark applies to non-cultic buildings of possibly public character such as the "palace" of Tel Arad (Amiran, Alon, and Cohen 1976: 37; Nigro 1995: 12–16), which consists simply in the grouping of large and well-constructed dwellings of ordinary plan.

The appearance of large buildings whose design represents an entirely new formula marks the EB III period, because nothing like the Beit Yeraḥ granary and the Megiddo and Yarmuth buildings had ever existed before in Palestine. For these buildings, modular grid planning offered the necessary tool for both the conception of the layout and its realization on the ground. The planned building was no longer the simple addition of several components added one to another to ultimately form a large complex, but rather one single complex conceived and built as a unit from the very beginning. Moreover, as the layout could be expanded at will depending on the size of the module, the building was monumental in essence whatever its actual dimensions.

These developments justify our fourth conclusion: that the EB has seen the birth of architecture *stricto sensu*, different from the traditional art of building, and the emergence of a new specialist, the architect, different from the traditional builder. This conclusion is best exemplified by the increasing dichotomy between domestic and public buildings: the differences are seen not only in the size of the buildings, the quality and nature of their construction techniques (foundation trenches for walls, particular masonry, floor and wall plastering, etc.), and several constructional details (doorjambs, thresholds, etc.); but more importantly in the use of a "specialized" cubit of 0.525 m—longer than the empirical cubit of 0.45 m and later known as the "builder's cubit"—and in new designing methods.

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These developments were ultimately the result of expanding urbanization and the growing complexity of society culminating in the establishment of city-states. The best archaeological correlate of the emergence of a stronger political power and a deeper social hierarchy is provided by the existence of palaces, side by side with ordinary dwelling areas, as can be seen clearly in Yarmuth (see fig. 24.1).

The construction of these prestige buildings necessitated a specialized knowledge. In traditional societies, technical expertise was shared by a small number of specialists who were therefore in great demand by local rulers, who used to request or exchange them like gifts (see Zaccagnini 1983 for analysis of the mobility of craftsmen in the ancient Near East, including builders). We may suppose that in third-millennium Palestine, specialized builders traveled also from place to place and transmitted their knowledge orally. Actually, very few itinerant architects might have been needed per generation to build all the public buildings ever erected in all the city-states of EB III Palestine. Their mobility presumably contributed to the spread of the new techniques for measuring lengths and for planning. This hypothesis may explain why, for example, Palace B of Yarmuth and Building 3177 of Megiddo share so many similarities in constructional details.

In antiquity, the act of measuring and planning was always embodied with a diffuse symbolic meaning. One reason is that all distances measured, because they were based on the cubit, were harmonically related to the human body, which in turn was perceived as the measure of the Universe because man had been created in God's image. Hence the canon and the proportions used in Near Eastern art for the representation of the human body were determined by the length of a cubit and related to that of an architectural unit of measure (see, among others, Iversen 1975, 1990; and Badawy 1962 for Egypt; Azarpay 1987, 1995 for Mesopotamia and Iran). These conceptions received considerable elaboration in classical Greece and provided the philosophical rationale for the Ionian urban layouts (Martin 1956).

Whether symbolic preoccupations of this nature were ever present among Palestinian builders of the EB and their sponsors is of course a moot point, impossible to document with archaeological data. But it cannot be insignificant that the first appearance of metrology and of modular architectural planning took place, in Palestine as elsewhere, when the first city-states emerged and their inhabitants had to forge a new relationship with their environment in both space and time.

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25

STANDARDIZED COLLARED-RIM PITHOI AND SHORT–LIVED SETTLEMENTS

Avner Raban

This paper is an attempt to reevaluate the actual archaeological data concerning a certain type of pottery container in its chronological, spatial, and topographic context, in order to estimate its "story." A score of publications dealing with this type of vessel and all kinds of argumentative articles have been presented since the "ethno-historic" potential of it was suggested by Albright over sixty years ago (1937: 25).

Biblical archaeologists have either embraced the appearance of the collared-rim pithoi as one of two major "objective" benchmarks which attest to "Israelite Settlement" (Albright 1949: 118; Aharoni 1970: 264–65; Garsiel and Finkelstein 1978), or refuted it (Ibrahim 1978; Esse 1992). The later "unethnic" trend is corroborated with the more recent "secular" fashion among some scholars (Finkelstein 1996; contra Dever 1995). This secular trend is rationalized by socioeconomic paradigms in which this vessel is seen to characterize the subsistence economy of horticulture-based societies on the one hand (Finkelstein 1988: 285; Zertal 1988b; London 1989; Esse 1992: 95–103) or, on the other hand, is viewed as a product used in long-range, imperially instigated trade of either spices from across the eastern deserts to the Mediterranean (Artzy 1994), or the local horticultural products of the central highland—to Egypt, by sea (Wengrow 1996). Yet, as more data become available from newly published excavations and surveys, none of these proposals truly fits the ever-growing geographical and environmental context of the collared-rim pithoi within the Iron Age I. Even the less pretentious assumptions—that these vessels were made to accommodate the demands for storing potable water in rural settlements at some distance from a stable water source (Zertal 1988b)— would not fit the spatial distribution of these vessels at urban sites such as Megiddo (Esse 1992), Dan (Biran 1989), and Beit Shean (A. Mazar 1994); or at sites located near rich water sources, such as Tel Zeror and Tel Nami, on the coast, and lowland sites, such as Tel Yenoʾam and Midrach-ʿOz (Raban 1991).

COLLARED-RIM PITHOS AND ITS PHYSICAL PROPERTIES

The type of vessel under discussion is the one known as the "Central Highland" type (Finkelstein 1988: 275), of the last quarter of the second millennium B.C. It differs in size and manufacturing technique from the less-known contemporaneous "collared-rim jar" (see, e.g., Esse 1992: fig. 3:2), which is discussed here, for reasons that are explained below. This central highland pithos has a body shape resembling contemporary and earlier local Middle Bronze Age (MB) II and Late Bronze Age (LB) storage vessels, being of basic elongated oval form that tapers toward its thickened tipped base (fig. 25.1a). It has two simple vertical handles that are attached to the body either at the shoulder level or just below it, which is the widest part of the body. The shoulders are rather high and either flattened or slightly curved. The rim is usually

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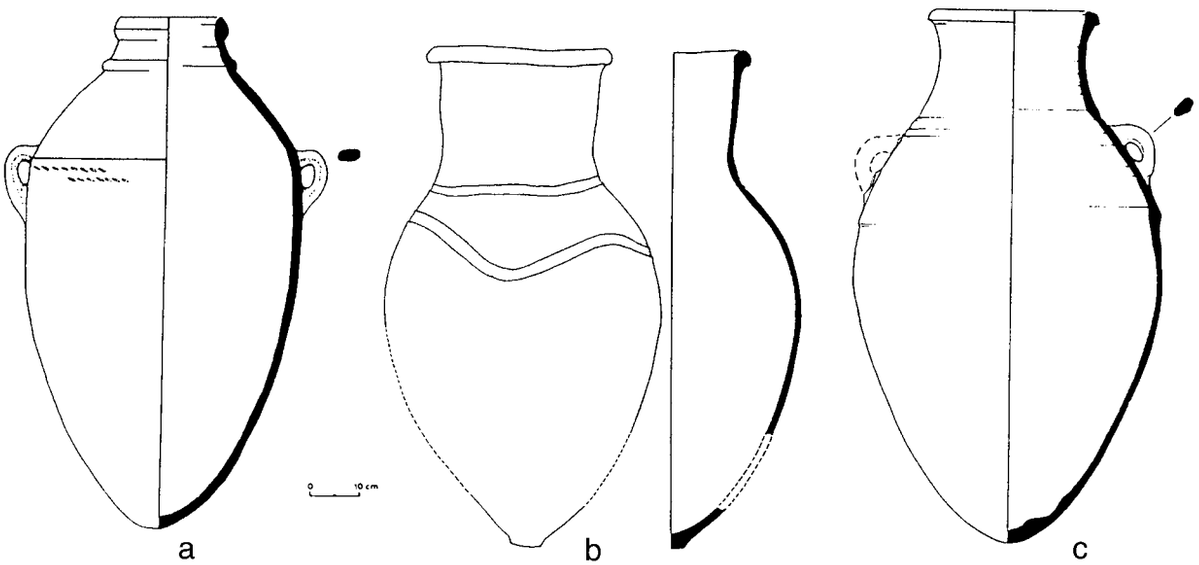

FIGURE 25.1. Typical pithoi. *a:* Central highland country, collared-rim type; *b:* "Cypro-Tyrian" type; *c:* "Galilean" type.

outfolded with a variety of cross sections, of no clear chronological significance (Finkelstein 1988: 277–78). The short, concave neck is attached to the body by a widening ridge that characterizes the vessel as a "collared-rim" one. This ridge has been considered a technical component fashioned in order to cover and strengthen the binding line between the handmade body and the wheel-thrown neck (A. Mazar 1981: 27; Glass et al. 1993: 279). Almost all specimens of this type that we have studied are made of a prime quality clay, properly levigated with the addition of carefully selected tempers (see below).

The walls of its oversize body are rather thin for such a bulky container and, in most cases, of a surprisingly even thickness. These qualities were achieved by a sophisticated, professional, and highly standardized knowledge employed by the potters who would combine the techniques of coils, built walls, on a turntable, with final modification on a fast wheel. There are a series of horizontal grooves on the shoulders, or just below, in some variants (Ibrahim 1978: 117) and the remains of rope marks in other, inferior finished specimens, indicating that the potters had to fasten the built-up body at some stage, probably to avoid distortion when the clay was still rather wet and too soft to properly sustain the final shaping on a tournette or a wheel. All in all, the selection of raw materials, the mixture of several types of clay, the selection of tempers, and the complicated process of producing the final form were rather demanding and probably more difficult to achieve than any other type of clay vessel of the period (Cohen-Weinberger and Goren 1996: 80–81; Daviau 1996: 609–12).

The other property of this pithos, which is rather unique and can be distinguished from the other two contemporary ones—the so-called Cypro-Tyrian (fig. 25.1b) and the Galilean (fig. 25.1c) pithoi—is the high rate of uniformity in shape and external dimensions. Almost all of the specimens that have been restored are 1.02–1.18 m high; with a maximum diameter of about half this size—0.51 to 0.60 m; and with the mouth's inner diameter measuring 0.15–0.19 m. These metrological data are the ones that the potter could use while building the vessel and were probably the regular means, together with the size of the clay lump, by which a certain

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standardized container was then produced (Raban 1981: 2–5; and see appendix below). It is tempting to suggest that there was a general notion, if not dictated measurements, for the potters to meet. The required demand was probably for a standard volume that could be achieved by using the basic units of the "royal cubit": one for the maximum diameter and two for the vessel's height. These units might have been measured inside the vessel (internal measurements) in order to be more accurately relevant for the desired volume. The actual volume of most restored specimens of this type of vessel have seldom been checked; or if so, they have not been published. Some scholars have casually mentioned that the capacity of "their" collared-rim pithoi is between 150–200 liters (Ibrahim 1978), or that the "total weight when loaded is 80–120 kg" (Artzy 1994: 137). Our calculation, for a specimen 1.10 m high and 0.54 m wide, is 110–20 liters.

Yet, with all due respect to the general notion of a highly standardized type of vessel, one might recall that the specimens come not only from widely dispersed locations, but also from chronological contexts that span almost three centuries. So, metrological uniformity is relative and conditional, with a trend toward reduced volume through time, as seems to be the case for every metrological standard in ancient history (Grace 1965: 12; Will 1977; Raban 1981: 195–227). There are, though, a few exceptional, oversize specimens, such as the single restorable pithos from Giloh, which is said to be 1.50 m tall (A. Mazar 1990: 88), although the calibrated drawing (A. Mazar 1990: fig. 5) does not fit! There are also smaller ones, with a height of just below 1 meter (see, e.g., table 25.1, nos. 12, 23 in the appendix).

When comparing the metrologic data of the Iron Age I collared-rim pithoi with other types of allegedly well-standardized containers, such as LB commercial jars, or even Rhodian wine amphoras, one may find the uniformity rate of this "inferior" type to be clearly higher. This fact calls into question the notion that it is a typical product of "household women" (Esse 1992), used for storage of potable water in villages (Zertal 1988b), sedentary household liquids (Finkelstein 1988: 283), and for use in the horticulture subsistence economy (Finkelstein 1996: 204). Summing up the facts, one might consider the characteristics of the collared-rim pithos of the early Iron Age period, of the central highland type, as such:

1. It is a pithos by definition—being too heavy to be carried from one place to another when filled. So it is a storage container rather than a portable one.
2. As a ceamic product, it is of high quality and rather sophisticated, with its raw material carefully prepared, the tempers properly selected, and the various stages of creating the desired form by the potter demonstrating the best professional coordination.
3. All together, shape, external measurements, and volume represent a successful, deliberate attempt to meet a specific standard of uniformity, which is quite rare in pithoi throughout history.
4. Though it is a vessel destined for storage in a fixed location, its shape resembles portable jars of the period and of the preceding ones in the region.

STYLISTIC AND CONCEPTUAL PROTOTYPES

It is almost unquestionable that the type of pithoi called "Central Highland Collared-Rim" of the early Iron Age has its closest prototypes among the pithoi of the MB II period (Finkelstein 1988: 281; Bonfil 1992). The various subtypes of these earlier pithoi were found in urban

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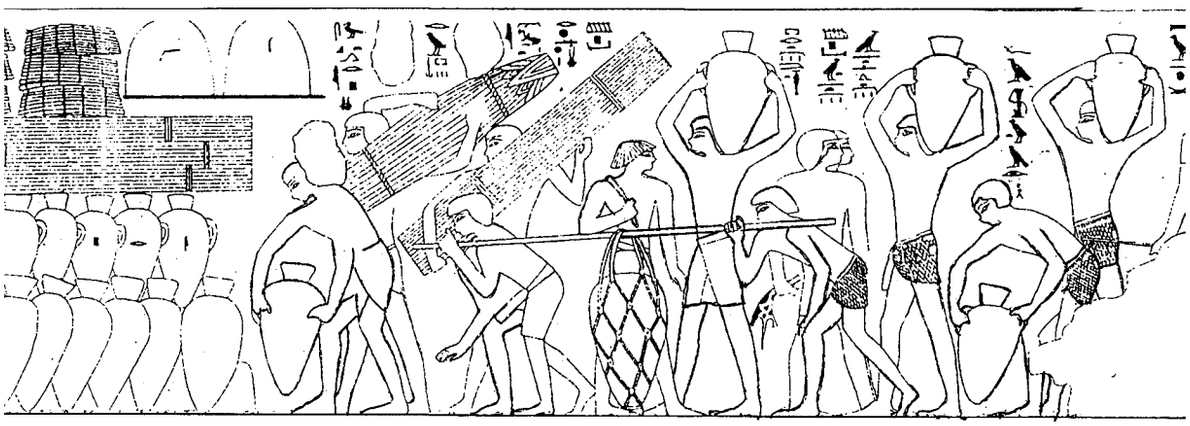

FIGURE 25.2. Canaanite jars shifted by Egyptian porters to storehouses. From the tomb of Rekhmara, late fifteenth century B.C. (after Newberry 1900, pl. XIII).

and rural sites, almost all over Palestine and in Syria, as far north as Ebla and Ugarit. It seems that there were regional variants, which quite closely resemble the geographic subdivision of the later early Iron Age's three different types of pithoi: (a) Bonfil's Type I, of the MB II period, matches the territory of the so-called Galilean Iron I pithoi, although stylistically they more closely resemble the LB II types of Hazor (Bonfil 1992: 26: fig. 9); (b) Bonfil's Types III and V were probably in vogue along the coast, in the Jezreel Valley, and in the adjacent hill country, much the same territory in which the so-called Tyrian, or Cypro-Phoenician, types of the Iron I period are to be found; (c) Bonfil's Types IV and VI are characteristic of the central highland and southern Jordan valley, much like the highland pithoi of the Iron I period. Yet, one must recall that this geographical division is in fact not definite in both periods. Foreign types have been found in each geographic unit, both in MB II contexts (Bonfil 1992: fig. 9) and in the Iron I period—as in the case of Tel Dan, in which all three variants have been uncovered (Biran 1989). The MB II prototypes are of the same high quality and of the same conceptual form of oversized jars as the early Iron Age highland collared-rim pithoi. It is true that in most cases they were of a better technological tradition—being formed on a fast wheel and furnished with a variety of well-formed rims. But these prototypes lack uniformity in size and, unlike their successor, they had either no handles or four handles—in most specimens of the highland Types IV and VI (Bonfil 1992: 28–32). For these differences one would consider the MB II prototypes as better suited for handling while full, either being lifted by two to four persons by their four handles, or being slung up in a net, as was the case of the handleless variants (fig. 25.2).

Of special interest is the similarity in contextual situations of both the MB II and the Iron I pithoi. These vessels were found mostly in storage rooms next to the fortification system of the settlement (Bonfil 1992: 32–3; and for the Iron I pithoi, see below). Others were found in what might have been temple storerooms, or other religious contexts (Finkelstein 1986: 29, 34), or in burials—either as gifts or as coffins—quite probably in a secondary use (although pithoi as coffins are known since the Neolithic era, such as in the burial ground of Karatash-Semayük, and see, e.g., Mellink 1972).

It is true that there are almost no specimens of that conceptual type (i.e., oversized, wheel-made jars) of pithoi in LB contexts at Levantine sites, but there are a few at sites such as Tell

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el-Farʿah North (de Vaux and Stève 1947: fig. 22: 2) and Aphek (Beck and Kochavi 1985: fig. 5:2), and probably the collared-rim jar Type 1018 from all three phases of the Fosse Temple at Lachish (Tufnell et al. 1958: pl. 87). Other collared-rim jars (not pithoi) were found in LB contexts, as far north as Ugarit (Courtois 1969: fig. 1:c) and as far south as Shallal in Nubia (Reisner 1910: fig. 304: 1). This type was found also in Palestinian sites such as Megiddo (Guy and Engberg 1938: pl. 56: 10) and Tel Jerishe (Ory 1940: 57, pl. XII 10). Large jars with four handles are also known from various sites in Twentieth Dynasty contexts from the late thirteenth–early twelfth century B.C., such as Deir-el Balah (T. Dothan 1979: 38–39, figs. 81, 89, 124, 130), Nizzanim (Gophna and Miron 1970: fig. 2: 5), Type 1020 from Lachish (Tufnell et al. 1958: pl. 87), Tell el-Farʿah South burials (see, e.g., Brug 1985: 121, graph 5), and ʿIzbet Ṣarṭah (Brug 1985: 133, graph 14). All these specimens clearly represent the typological and conceptual continuation of the MB II variants IV1 and IV3 (Bonfil 1992: fig. 4), although of somewhat smaller size. Most of these specimens contain ridges at the base of their short necks which resemble "collars." For that reason and for the widespread spatial distribution of both these MB II and LB prototypes and their collared-rim successors of the twelfth century B.C., it is quite unreasonable to accept the idea that "new settlers found some complete MB II vessels at Shiloh and simply copied them" (Finkelstein 1996: 204) as an explanation for the revival of the pithos as an oversized jar concept.

This is true not only because of the basic conceptual difference between pithoi with four, or no handles versus those with only two (unsuitable to be shifted when full), but because the data show quite clearly that the type called central highland collared-rim pithos have been found in clear "pre-Israelite" thirteenth century B.C. contexts elsewhere in Palestine—not in Shiloh, nor in the highland, but at coastal sites, such as Aphek, in the so-called Egyptian residency (Beck and Kochavi 1985: 34–5, fig. 5:1), Tel Zeror (Ohata 1970: 71, Pl. 56), Tel Dor (Raban 1995: 323), and Tel Nami (Artzy 1994: 127–28, fig. 9). There are others from the same late thirteenth century context at valley sites, such as Tel Yenoʾam (Liebowitz 1984: 14), Beit Shean in the Monumental Egyptian Service Building (A. Mazar 1994: 75), and at the temenos of the temple of Stratum VIIB at Megiddo (Loud 1948: pl. 64:2).

Another set of conceptual prototypes are those earlier pithoi that, like the collared-rim ones, were destined to be carried empty and then serve as fixed containers, either inside a storage building or in a hold of a merchantman. These more remote prototypes were usually handmade, with some kind of a base—either flattened or molded, with either no handles or several pairs, and almost always with applied molded decoration of horizontal bands, wavy lines, knobs, meanders, or snakes. The pithoi of that set are of various shapes and sizes and can be traced back as far as Middle Minoan Crete. Of more comparable moderate size than the huge Minoan pithoi are the Mycenean specimens from Mycenae and Tyrins, the cargo of the Point Iria wreck (Lolos 1995: fig. 8), the Cypriot ones, of late Cypriot date (fourteenth–thirteenth century B.C.), such as those from Maa-Paleokastro (Karageorghis and Demas 1988: pl. 82), Athienou (T. Dothan and Ben-Tor 1983: 113–15, fig. 52), Pyla-Kokkinokermos (Karageorghis and Demas 1984: pl. 41), and many others, including the fourteenth century B.C. wreck at Ulu Burun (cf. Bass 1986).

This set of prototypes has typological successors in the LB pithoi of Hazor (Yadin et al. 1958: pls. LXXXVIII:11–12, CIX:4; CXXXIV:8; 1960: pls. CXXII:1–6, CXLV:1–5; 1961: pl. CXII:9) and good parallels at Dan (Biran 1989: fig. 4:7), Tel Dor (Raban 1995: fig. 9:13; Stern 1994: fig. 45), Tel Sasa (Stepansky, Segal, and Carmi 1996: 68–70, fig. 7:9), Tell Keisan (Puech 1980: pls. 68:2, 69:1), Ashdod (M. Dothan and Porath 1993: figs. 34:3, 41:12),

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Tel Akko (M. Dothan and Raban 1992: 85–86, fig. 4), and the western Jezreel Valley. Although all these specimens, and the two MB II pithoi from Tel Dan (Ilan 1996: 223, figs. 4.94:l, 4.97:6), are the prototypes of locally made Palestinian pithoi of the Iron I period, they relate only to the so-called Tyrian and to a lesser degree to the Galilean types and not to the central highland collared-rim pithoi. The conceptual predecessors of this last type, with its collared-rim and features of an oversized jar, are clearly Canaanite, with possible affinities related to the imperial economy of Egypt during the New Kingdom era (Raban 1981: 89, 92).

THE SPATIAL DISTRIBUTION OF THE COLLARED-RIM PITHOI

Where have either complete pithoi or sherds (usually identified when there are pieces of the rim and the neck) of the "classical" (Esse 1992: 87) collared-rim pithoi been discovered so far (fig. 25.3)? The answer is always tentative and needs to be updated every few years. Finkelstein (1988: 281–82) and Ibrahim, ten years earlier (1978: 121–22), defined the geographical limits of occurrence of that type between the Lower Galilee, in the north, the eastern edge of the settled area in eastern Jordan, between Ajlun in the north to just south of Amman; the southern reaches of Judaea's hill country, just south of Hebron, in the south—excluding Philistia and the valley of Beersheva; and the central coast, from Tell Qasile to Tell Keisan, in the west. A few years later it became evident that this type is to be found in many Upper Galilee sites, not only at Tel Dan (Biran 1989), but more characteristically in hilltop strongholds, such as Sasa (Bahat 1986: 100, 101, 104, etc.; Stepansky, Segal, and Carmi 1996: 66–70, figs. 7:2, 8:4–7), Mount Adir (Davis et al. 1985), Horvat ʿAvot (Braun 1993) and Horvat Yavnit (surveyed by the writer, with A. Berman in 1974). This type was found also in the southern part of the Golan Heights at Tel Soreg (Kochavi 1989: 7), as far east as the southern Hauran (Kennedy and Freedman 1995: 49–51), and in other Iron I period sites farther to the north during surface surveys (Z. Maʾoz pers. comm.).

In Transjordan this type has been found in almost every site of the period, not only in the Gilead and Ammonite territories (van der Steen 1996: 61), and in a somewhat later context—as far south as Moab and Edom (Bienkowski 1992: 167). In the south the exclusion of the Beersheeva Valley seems to be somewhat biased in character: the thoroughly excavated sites of Tel Masos and Tel Esdar, in which no collared-rim pithoi have been recorded, seem to be irrelevant to the issue of a chronological base. That is to say, they were first settled in a relatively later period. We still lack a proper study of sites during the transitional LB/Iron I period (late thirteenth–early twelfth centuries B.C.) in that region. But there are some preliminary indications for the presence of this type of pithos in that area as well (Govrin 1991: 14*–15*, fig. 2:8).

The more significant new data addresses the spatial distribution of this type of pithos along the coast and at sites to the west and outside Palestine. In Israel it has been found literally in every studied site of the thirteenth–eleventh centuries B.C., either at the actual waterfront, such as at Naharia (Yogev 1993: 1089), Tel Akko (M. Dothan and Raban 1992: 87–88), Tel Nami (Artzy 1994), Tel Dor (Raban 1995: 322–39, figs. 9.17:10, 20, 21; 9.25:25), or somewhat inland, on the coastal plain and adjacent to it, such as at Tell Keisan (Puech 1980: 216–17, pl. 68:1), Tel Zeror (Ohata 1970: pl. XV: 12), El-Aḥwat (Zertal 1996: 44), ʿEn Ḥagit (Wolff 1997: 60), Aphek (Beck and Kochavi 1985: 40), Tell Qasile (A. Mazar 1981: 29), and Tel Mevorach (Stern 1978: 68, fig. 19:4). But none were found so far in Philistia proper, other than two collared-rim pithos sherds at Tel Hamid, near Ramla (Wolff, pers. comm.).

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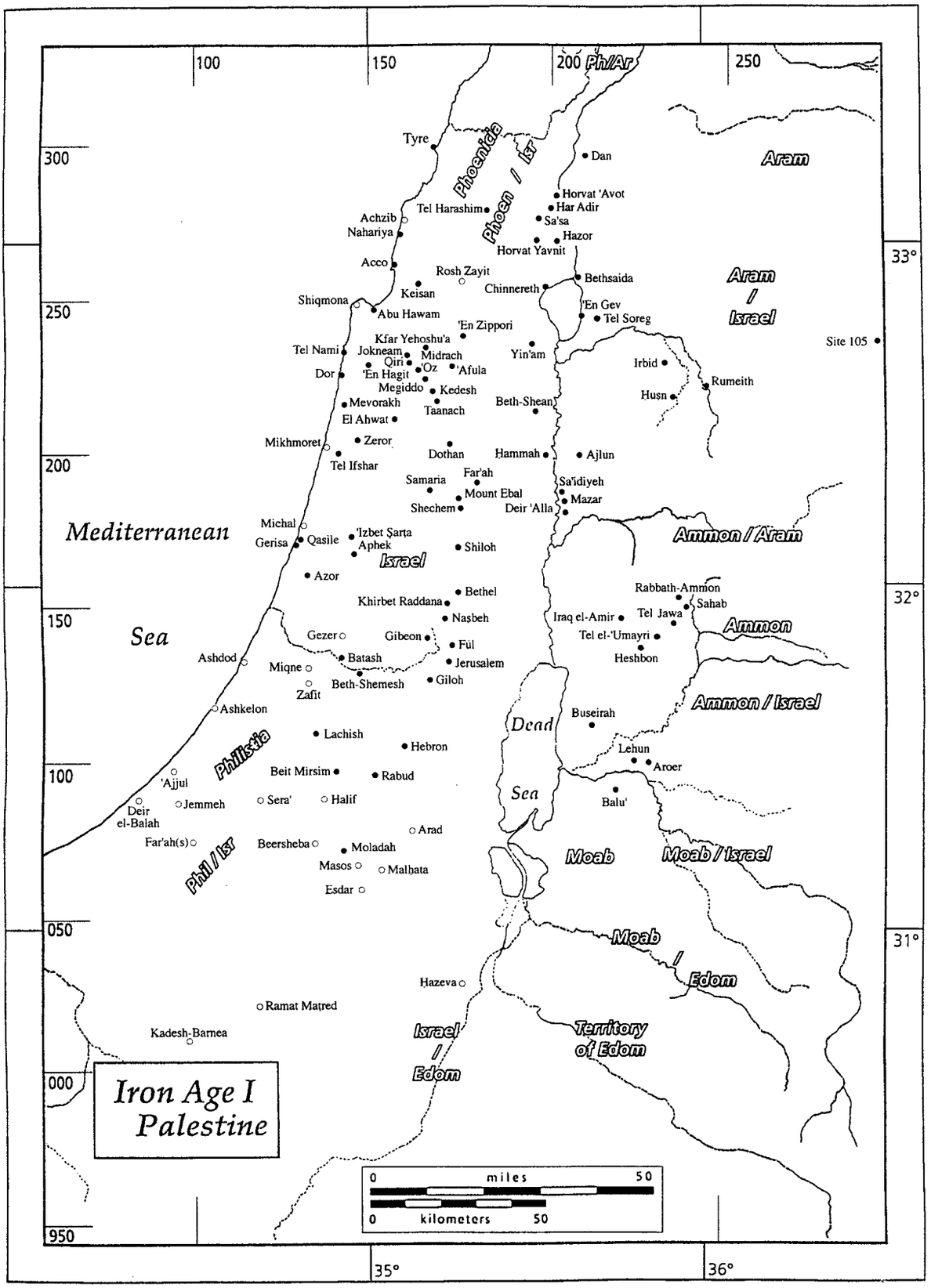

FIGURE 25.3. Map of Palestine during the Iron I period, including all the sites mentioned in this paper.

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It is important to note that this type has been found along with the so-called Cypro-Tyrian, ones at coastal sites of the late thirteenth century B.C. in Cyprus, at Maa-Paleokostro (Karageorghis and Demas 1988: pl. LXXXII:563), Kalavasos-Ayios Dhimitrios (Schuster 1984: 33–6, fig. 6:2), and Pyla-Kokkinokremos (Karageorghis and Demas 1984: 52, with refs. for other sites in n. 7).

Also of importance is the fact that in most cases, the chronological occurrence of those specimens found at coastal sites, in Cyprus, and in the valleys predate the earliest ones from the central hill country of Palestine. They came from clear pre-1200 B.C. contexts at Beit Shean (Albright 1971: 128), ʿAfula (M. Dothan 1955: 43–44, fig. 16:4), Stratum VIIb at Megiddo (Esse 1992: 87, n. 47), Tel Nami (Artzy 1994: 137), Aphek (Beck and Kochavi 1985: 34–5), and in Cyprus (Karageorghis and Demas 1984). For this reason it is hard to accept Finkelstein's notion (1988: 283) that the pithos found in Aphek was brought to the site by the new settlers who had come to the hilly hinterland, or that it was on its way to Egypt as a container for agricultural products that have been stripped off by the imperial governors of the hill country (Wengrow 1996: 308–09).

Summing up the issue of spatial distribution within its chronological context, one might say that at our present state of knowledge, the collared-rim pithoi were in use already in the thirteenth century B.C. along the Levantine coast of the Mediterranean and at sites along the major cross-country trade routes, such as the "King's Highway" in Transjordan, the "Via Maris" and the connecting routes between the two: Aphek-Jerusalem-Jericho-Amman; Yoqneʿam-Megiddo-Beit Shean-Northern Gilead; Akko-Lower Galilee-Hazor-Damascus. In this respect one might point out the relatively early occurrence of these pithoi in building complexes that have been identified as Egyptian outposts (or "Governors Palaces"), such as at Beit Shean, Megiddo, and Aphek (and see discussion below).

TYPES OF SITES

Summing up the available data concerning the geographical, topographic, and site-type context within which collared-rim pithoi have been found, one becomes confused. The geographical, or spatial, distribution does not correspond to any ethnic framework, nor to a socio-economic one (Wengrow 1996: 312–19). Collared-rim pithoi have been found at major urban sites, such as Megiddo (Loud 1948; Esse 1992), Beit Shean (see McGovern 1993: 247), Tell es Saʾidiyeh (Tubb 1993), Akko, Tel Keisan, Dor, Aphek, and Buseirah, on the border between Moab and Edom (Bienkowski 1992: 167). In many of these urban centers, the pithoi were found in a context suggestive of Egyptian administrative complexes (Wengrow 1996: 319). Other sites, such as Shiloh, Dan, and probably also Tell Beit Mirsim, Mount Ebal, Tell en-Nasbeh, Tell el-Umeiri, and Araq el-Amir, were probably centers during the early Iron I period; economic centers—such as Sahab (Ibrahim 1978: 122–23), Deir ʿAlla (Franken 1969: fig. 47: 1), Araq el-Amir (Ji 1995: 122–26), Tel Nami, ʿEn Ḥagit (Wolff 1994), and ʿAfula (M. Dothan 1993: 38–39); or political centers—such as Aphek, Beit Shean, and Tell es-Saʾidiyeh. Other less significant sites, of typical rural character, have also yielded collared-rim pithoi, as they have been found in the regional surveys of the Lower Galilee (Gal 1992: 64–71, 79, fig. 51), western Galilee (Frankel 1986: 305), the eastern valleys (Zori 1977: 8, 28, 114, 138, 144, 151), western Jezreel Valley (Raban 1991: 25–26), Transjordan (van der Steen 1996), Samaria region

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(Zertal 1988b), and almost every surveyed site of the Iron I period in the central highlands of western Palestine (Finkelstein 1988: 285) and the central plateau of Transjordan (Herr 1998).

Characteristics of the special type of site where collared-rim pithoi are conspicuous among the pottery finds include a relatively small size, fortifications, and a noncontinuous occupational sequence. On the coast this is the case for Tel Nami (Artzy 1994: 123–24), ʿEn Ḥagit (Wolff 1994, 1997), Nahariya (Yogev 1993: 1089), and the Emek-Hefer region (Porath, Dar, and Applebaum 1985: 55). In the central highlands, such single-period sites have been excavated at Giloh (Mazar 1981), Mount Ebal (Zertal 1993), Khirbet Raddana (Callaway 1993), and many others, along the fringes of the hill country, either toward the coastal plain, such as ʿIzbet Ṣarṭah and El Aḥwat (Zertal 1996); or toward the Jordan Valley (Zertal 1991). A similar picture seems to emerge from the recently published surveys and excavations in Transjordan (van der Steen 1996: 62–63; Ji 1997). A series of short-lived, hilltop fortified sites of late thirteenth–twelfth centuries B.C. date were observed by Glueck in Moab, during his surveys in the 1930s (Glueck 1939: map IIIb). Similar types of sites have been studied in the Upper Galilee at Sasa, Har Adir, Horvat Yavnit, Tel Harashim, and Horvat ʿAvot, sites that are no longer considered to be Israelite settlements (Golani and Yogev 1996: 56).

These small-scale fortified sites might be subdivided according to four different factors:

(1) Chronological: sites that had been settled already in the LB IIB period and/or continued to be settled and extended in the Iron II period. According to this factor, it seems as if the majority of noncontinuous sites along the coastline, the northern valleys, and in the Jordan Valley belong to the first group, while most of the highland sites, on both sides of the Rift Valley, belong to the second group.

(2) Fortification: hilltop fortified sites, including those with peripheral fortification lines, with a large open area in the center, of the type generally considered to represent a transitional settlement between pastoralism and agricultural societies (Finkelstein 1996: 205–06); "fortified outposts," such as the hilltop sites of the Upper Galilee, Moab, etcetera (Wengrow 1996: 319–20); or sites that include a central "tower," either round or square (Kempinski 1986; Mazar 1990: 90–93; Zertal 1995).

(3) Proximity to major trade routes, such as the "King's Highway" (Amman and its surroundings, Sahab, Umeiri, Buseirah), the "Via Maris" (Aphek, Tel Zeror, El Aḥwat; ʿEn Ḥagit, ʿAfula, etc.), other crossroads (Beit Shean, Qiri, Midrach-ʿOz, Tel Qashish, and many others), and coastal outlets (Nahariya, ʿAkko, Tel Nami, Tel Ifshar, Tell Qasile); or to territorial boundaries of political entities (Dan, Har Adir, Sasa, ʿIzbet Ṣarṭah, site no. 105 in the southern Hauran, and the Madaba Plain sites).

(4) Collaboration with ground sites and stone-paved pits of a total volume that is "clearly out of all proportion to the subsistence needs of a village" (Wengrow 1996: 320). There is also, of course, the statistical analysis, in which one might demonstrate the relative importance of the collared-rim pithoi for a single-site context (Finkelstein 1988: 281–82). However, in most cases the statistical data derive either from partly excavated or only surface surveyed sites, so that one might question the validity or even the relevancy of such data as a sound basis for either historical or socioeconomical conclusions (contra Herr 1998: 256). At best, in cases such as in extensively excavated, relatively small sites such as ʿIzbet Ṣarṭah, one may tentatively suggest that the Stratum III settlement seems to have had more pithoi and fewer pits than Stratum II.

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The transitional state of research on this subject can be illustrated by the fairly recent claim that collared-rim pithoi characterize sites in areas of "little Egyptian interest" and are absent in major Egyptian residencies in Canaan (Esse 1992: 101), while a few years later other scholars claim that "they were principally valued as export containers by the Egyptian government" (Stager 1995: 340–44; Tubb, Dorrell, and Cobbing 1996: 30; Wengrow 1996: 323).

THE ARCHAEOLOGICAL CONTEXT WITHIN THE SITES

To understand the function of collared-rim pithoi, one might survey the contextual location of these vessels within the better-excavated sites in which this type of container has been found. Ibrahim (1978: 122–24) has suggested that these vessels served two initial purposes: (1) as standard containers for olive oil, some of which would be sent off as trade goods; and (2) for storage of potable water, much like the present-day *zirs.* There are also somewhat frequent instances of these pithoi being used in a secondary manner as burial containers, both for adults and infants. Yet, this secondary use of these large storage vessels has only been found outside the central highland of western Palestine. These burials are known to us from the coastal area, which was settled at that period by Sea Peoples, at sites such as Azor (M. Dothan 1961), Tel Zeror (Ohata 1970: pl. 56), and Tel Nami (Artzy 1993). The use of collared-rim pithoi for burials of adults has been attested also from Jezreel Valley sites, not only at Megiddo (Esse 1992: 88–93), but also near Kefar Yehoshu'a, in the so-called Hittite burial (Druks 1966; Raban 1982: 43–45). In the Jordan Valley such burials were found at Tell es-Saʾidiyeh (Tubb 1993: 1299) in a context of either Sea People mercenaries or Egyptian administrators; and farther east, near the "Kings Highway," at Sahab. There is an interesting remark by Ibrahim, who claims that this type of burial was "in use alongside anthropoid coffins made of clay" (Ibrahim 1978: 123).

As storage vessels, in structures designated as warehouses or storage depots, collared-rim pithoi were found at Megiddo (Esse 1992: 88) in structure nos. 335 and 306 in Area C; at Shiloh (Finkelstein 1985: 169); at ʿEn Ḥagit, in Area B (Wolff 1997: 60; 1998: 452–53), and in Area A at Sahab (Ibrahim 1978: 117). In other instances these pithoi were found in what might have been residential units, such as in Area B at Sahab, at Sasa (Stepansky, Segal, and Carmi 1996: 64–68), ʿIzbet Ṣarṭah (Finkelstein 1983), and Tell el-Umeiri (Herr 1998: 254–55). At mountaintop sites such as Giloh and Mount Ebal (A. Mazar 1990; Zertal 1986–87), these pithoi have been found within a less coherent architectural context. It is important to recall that such pithoi were found in so-called Egyptian palaces, or administrative complexes at Deir ʿAlla (sanctuary?), Beit Shean, and Aphek.

This brief contextual survey cannot affirm Zertal's claim that these pithoi were manufactured as drinking water containers (Zertal 1988b). The fact that such vessels are found in well-watered sites (Finkelstein 1996: 204), one being next to a still-functioning cistern (Ibrahim 1978: 117), makes this most unlikely. It is likely, though, that the inhabitants might have stored water in these pithoi in certain instances, probably as a secondary usage.

Finkelstein (1988: 284–85; 1986: 204) connected these pithoi with horticulture-based subsistence economies, with no significant commercial exchange of commodities among neighboring societies. Artzy (1994) and Wengrow (1996) suggest that these vessels are typical commercial containers, either for long-range camel and seaborne incense trade (Artzy) or

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Egypt-bound exportation (or exploitation) of olive oil from the highland settlements of the Ramesside controlled country (Wengrow). The claim for a subsistence economy does not correlate with the quantities of collared-rim pithoi from Strata VIIA and VI at Megiddo, nor with the neutron activation analysis of the pithoi from Tel Dan and Shiloh. Although most of the analyzed pithoi from Tel Dan were found to be made of either local or a nearby source of clay, "five additional collared-rim pithoi were not made at Dan, but at four different sites" (Yellin and Gunneweg 1989: 140). Four of these pithoi were recovered from the same bin (Locus 4349 of Stratum VI). Three neutron activation analyzed pithoi from Shiloh are also of nonlocal provenance (Yellin and Gunneweg 1989: 139), and petrographic analysis of forty-eight rims of pithoi from that site suggests that they were made in two different locations, both at a certain geographic distance from Shiloh (Glass et al. 1993: 279–81; and see also McGovern 1997: 424).

As commercial containers these pithoi are far too heavy and bulky to be carried in quantities overland even on the backs of camels (Artzy 1994). There is not a single piece of textual or archaeological evidence to verify that the precious incense was ever transported in such heavy, fragile, and bulky clay containers, and there is no logic in doing so. Technically it would be impossible for two stevedores, each one holding a pithos' handle, to carry it when full and weighing well over 150 kg, up a gangway, from the quay to the deck of a merchantship at Tel Nami, or any other Levantine port, as has been suggested (Artzy 1994: 138; Wengrow 1996: 308–09).

The last type of data concerning the archaeological context in which collared-rim pithoi have been found is its correlation with Philistine "Bichrome" ware and/or Mycenean IIIC pottery types. As for Philistine pottery, it has been found at almost every site west of the central highlands in which collared-rim pithoi have been found, and usually in the same stratum, if not at the same single complex. This is the case at ʿIzbet Ṣarṭah (Brug 1985: 128–33); Megiddo Stratum VI; Beit Shean Stratum 6, and other sites in the Jezreel Valley (Raban 1991); at Akko and Tell Keisan (Humbert and Briend 1980: pls. 61–80); ʿAfula (M. Dothan 1955: 30–35); Tel Zeror (Ohata 1970: 67–74, pls. XV:1, LX:5); and Dor (Raban 1995: 322–28). The same correlation has been found at Dan (Biran 1989), Sasa (Bahat 1986: 89, 105), Deir ʿAlla (Franken 1969: 245; Brug 1985: 102–05), and other sites in the eastern part of the central Jordan Valley (Dornemann 1983: 79–81). There are sites near and north of Jerusalem where Philistine pottery has been found in the same occupation phase as the collared-rim pithoi— such as at Tell Beit Mirsim (Albright 1971: 118), Beth Shemesh (Grant and Wright 1939: 129; T. Dothan 1982: 50–51), Tell en-Nasbeh Stratum 4 (Zorn 1993: 1099), and Bethel (Kelso 1993: 194). Yet, it is important to note that such vessels have not been found so far at any of the Iron Age I sites within the original Philistine territory (Stager 1995: 345; Ji 1997: 32).

DISCUSSION

The collared-rim pithos is a special type of ceramic vessel. Unlike other containers, it is too heavy to be shifted while full. Yet it has the same standard shape, quality, and accuracy of production as the portable jars of the period. Typologically it is well established within the local Canaanite repertoire, with conceptual and stylistic forerunners since the early second millennium B.C. It is therefore a conceptual type of local heritage within the geopolitical sphere of the southwestern part of the Fertile Crescent. Yet, it differs from all its forerunners

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in two significant aspects: (1) It is not a true pithos—being shaped like a portable jar and possessing only two handles. So it is clear, from a practical point of view, that it had been produced for being shifted, but only when empty! (2) Unlike most of its predecessors, either jars or pithoi, it is highly standardized in size, form, and volume. Considering the fact that most samples of these vessels, among those studied so far, are of high technical quality, finished on a fast wheel, and produced in regional centers of production, rather than locally made (Yellin and Gunneweg 1989: 139–40; Glass et al. 1993: 279–81), it is obvious that these vessels represent a certain form of administrative regulation.

These well-made, properly standardized containers were fashioned to serve as a measured unit. Being fixed and idle when full, one might call these pithoi "measured, standard-unit bins." It is obvious that these containers, whether filled with liquid commodities or dry ones, had to be installed in place while empty and be filled and emptied with smaller deeper vessels (cups or juglets). The standard diameter of their mouth would permit extraction of the contents, although dry content (grains) would necessitate reclining the pithos in order to empty it properly. As mentioned above, the collar at the base of the neck might indicate that these vessels were sealed, or at least covered by some kind of detached cloth or piece of leather. Such repetitive covering and uncovering of a container's mouth would be better suited for contents such as oil rather than grain, for which a simple lid, board, or large sherd would do. For wine and beer, gradual, repetitive consumption would surely affect the quality of the commodity. Yet, having only this single type of "standard-unit bin" in many sites, one might argue that its function was not confined to only one commodity.

Only at sites where other types of pithoi were in use together with the collared-rim ones, such as Tel Dan, Akko, Dor, Tell Keisan, Midrach-ʿOz, Har Adir, Sasa, etcetera, is it tempting to consider the possibility that each type was used as a container for a specific content. But we have to recall that these sites are connected with the material culture heritage of the coastal and even maritime sphere to the west. So, it is quite likely that the so-called Cypro-Tyrian types were the conceptual and typological offsprings of the Minoan and the Mycenean pithoi, rather than the MB II Canaanite, or the LB Egyptian ones, and one might argue that the presence of several types of pithoi at one site in the same occupation level indicates a multiethnic population. But, considering the fact that they have been found together in the same locus at Dor (Raban 1995: fig. 9.17) and Tel Dan, in Locus 586 (Biran 1989: figs. 4.1, 4.7), this would make it a rather unlikely explanation. Besides the difference in shape, the so-called Galilean and Cypro-Tyrian pithoi differ from the collared-rim ones also by their wide range of sizes and by their inferior quality of production (most are handmade and finished on a turntable). Nonstandardized in volume, these types might be excluded from the putative administratively controlled system to which the central hill country type belongs.

Being a component of an organized administrative framework, in which commodities were stored at and consumed from well measured units, it is most improbable that the collared-rim pithoi had been fashioned and manufactured in order to contain potable water or mere agricultural products of substantial economy. Being too heavy, fragile, and bulky, these containers would hardly fit cross-country trade and even less so when "caravans plied no longer: men who had followed the high roads went round by devious paths" (Judg 5:6). But these vessels are found not only in urban centers (such as Megiddo, Beit Shean, Akko, and Dor) or at roadside stations (such as ʿEn Ḥagit, Tel Nami, ʿAfula, Tell Qiri [Ben-Tor and Portugali 1987: 91], and Midrach-ʿOz), but also at almost every small-scale "proto-village" site of the late thirteenth–

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eleventh centuries B.C. on both sides of the Jordan. These "proto-villages" and some of the "roadside stations" have, in most cases, a noncontinuous sequence of occupation, as have most of the summit and hilltop strongholds in the Galilee and in Transjordan (see section above *Types of Sites* and also Ji 1997: 30–32 with additional up-to-date bibliography there).

There is an interesting coincidence between the exceptional spatial distribution of these Iron Age I sites and the MB II ones. On many occasions the noncontinuous occupation does include these two chronologically departed periods. Finkelstein suggests that this repetitive, noncontinuous spatial distribution is characteristic of a "long term cyclic process of settlement oscillations and rise and fall of territorial entities in the highlands (Finkelstein 1996: 209). Yet, the same "cyclic process" is to be found also at the peninsular site of Tel Nami (Artzy 1990, 1994), the road sites of ʿEn Ḥagit (Wolff 1994, 1997) and Midrach-ʿOz (Raban 1991: 23), the southern Hauran site no. 105 (Kennedy and Freedman 1995: 49–51), and at summit strongholds facing the Jezreel Valley (Raban 1994: 20), or the northern coastal plain (sites 36, 142 in Frankel and Getzov 1997). The coincidence is also in the conceptual repetition of the use of wheel-made pithoi typologically fashioned as oversized jars in both time periods.

It is therefore not just a socioeconomical model of a long-term oscillation between pastoralism and sedentarism; some history might be factored in as well. There were Egyptian economic and commercial interests. There were the pharaonic enterprises of the Twelfth Dynasty, the Hyksos, and there were the military units, strongholds, and administration of the Twentieth Dynasty. There were the newly established Canaanite city-states of the MB II period, with their dependent rural lands, and with their military elite of *Mariannu* warriors. There were the *Habiru* (or ʿApiru) "Geust Arbeiters" and the mercenaries of the Egyptian army and the mercenaries of others, such as the "Heroes of David" (B. Mazar 1986: 83–103), or the owners of the inscribed arrowheads of the Iron Age I period (see recently, Deutsch and Heltzer 1995: 11–38; Cross 1993). The full-scale historical context of these two periods or even the much debated later one is well beyond the scope of this paper, but this much is obvious: once a discussed type of ceramic container has been recognized as illustrating an organized administrative framework, one must admit that it had its role within a particular chapter in history, very probably in a similar way that the later *lmlk* jars had (Mommsen, Perlman, and Yellin 1984).

Many short-lived settlements, such as sites with no water sources or cultivated land nearby, do not necessarily represent the first stage of a shift from pastoralism to a sedentary way of life. In fact, many such sites seem to have been selected for their strategic advantage and therefore should be understood as military outposts. One might wonder if the tower at Giloh—which has been tentatively identified as Baʾal Peratzim and is mentioned in the Bible (2 Sam 5:20) as a military outpost (A. Mazar 1990: 101)—is not the same type of military stronghold as the one at Mt. Ebal, as has been suggested by Kempinsky (1986), or at Har Adir (A. Mazar 1990: 84) and probably also the sites along the western fringe of the Jordan Valley (see Zertal 1995 for a discussion of the biblical term *migdal*).

Towers of the Early Iron Age period (and somewhat later) are well known from the vicinity of Amman, probably guarding the "King's Highway," and from other roadside and territorial boundaries. Recently, Zertal extended his study of such "military outposts," being inspired by his excavations at El Aḥwat, which he considered to be a settlement of the *Shardana* (Zertal 1996: 47–49), and has managed to locate a number of others, mainly in the Mt. Carmel region,

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all of which contain sherds of collared-rim pithoi and are short-lived settlements (pers. comm.). El Aḥwat seems to have been the short-lived base of a military unit, probably for mercenaries stationed at a convenient distance from the international highway, which led from Egypt via Aphek, through the dangerous Wadi ʿAra pass to Megiddo.

Its setting provides a view of both the western coastal part of the road and the entrance to the narrow valley to the north. Whether its fortifications were built by *Shardana* mercenaries, or by others, they have conceptual engineering elements with good parallels in second millennium B.C. sites along the European part of the Mediterranean. The location of the site, at the northeast edge of the Sharon Plain, should be associated with the *Sikils* of Dor (see M. Dothan 1986). Having no accurate date for the initial phase at that early twelfth century B.C. site, it is impossible to tell who the political masters of these mercenaries were. One is tempted to relate these mercenaries to Ramesses III, who claims in Papyrus Harris I, LXXVI, 8–10: "I settled them in strongholds, bound in my name. Their military classes were as numerous as hundreds-thousands, I assigned portions for them all with clothing and provisions from the treasuries and granaries every year" (Wilson 1969: 262).

"Their assigned portions" should be measured and stored in measurable units, being the actual salary paid to the mercenaries. Yet, salary paid in portions was due to other functionaries and employees as well: the hired hands in the fields of the city-states and of the "king's land" (see, e.g., Albright 1969: 485, n. 7; and the reference to the people of Issachar in Gen 49:15). The priests at the amphictionic "tent of the presence" in Shiloh may have received their portions from the measured contributions of the pilgrims, and these might have been stored in the collared-rim pithoi that were found there. The concept might have been Egyptian, or Canaanite, but it was easily adapted by the new Israelite settlers and was probably demanded by mercenaries who served various political entities. This might have been the case in the garrisons at Har Adir, Sasa, and Ḥorvat Yavnit which housed employees of the Sidonians, or at Dan where other Phoenician employees were stationed. One wonders whether ʿIzbet Ṣarṭah was not such a garrison settlement, either guarding the Egyptian stronghold in Aphek against the bandits in the hill country to the east, and/or employees of the Israelites against the Danai or Philistine territory of the coastal plain. The correlation with large, numerous stone-paved bins in such sites may indicate that some of these outposts were both a convenient and properly protected location for storing the surplus crop from the fields of nearby villages.

CONCLUSION

Summing up all the archaeological data and the technical facts concerning the collared-rim pithoi of the southern Levant during the early phases of the Iron Age, the following conclusions may be deduced:

(1) This container was a product of a long-lasting tradition of pottery making and was manufactured by professional potters in order to meet very specific and highly standardized administrative demands.

(2) Having its conceptual and typological forerunners in the country, since the heydays of urbanism and the introduction of the fast wheel into every potter's workshop, it was not a product of a transitional society of pastoral newcomers.

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(3) Its spatial distribution does not fit any territorial boundary, either of a single ethnic, socioeconomic, political, or topographic unit.

(4) Considering what we can learn from the biblical accounts and historical sources of the period, it seems that during that transitional period, which included the demise of Egyptian imperial control and of the Canaanite city-states and the emergence of new political units, there were still many who served as mercenaries or hired workers in the fields (Gen 49:15).

(5) The short-lived settlements, or rather the non–continuously occupied sites in which this type of vessel had been in use and which characterized that transitional period, might not be considered an indication for an initial phase of sedentarism, but rather as an attempt to gain some stability amid the upheaval—to secure trade routes, cultivation of rural land, and the guarding of existing or newly established political territories. One might compare it to the attempt made by the languishing Ottoman Empire in the second half of the nineteenth century to secure the fringes of its territories by settling the Sharkasis at the edge of the Syrian desert between Amman and Quneitra.

(6) It is suggested that the collared-rim pithoi were made and fashioned as standard measured containers for portions allocated by the hiring entity to its employees. The concept was probably Egypto-Canaanite—developed at the Egyptian controlled territories in Asia during the time of the Nineteenth–Twentieth Dynasties, to be adopted by the emerging Israelites and Phoenicians of Sidon and Tyre. In the north and along the Levantine coast (including Cyprus), other types of pithoi were used—the cruder and larger offsprings of the Bronze Age Aegean tradition, the so-called Cypro-Tyrian type, with the Galilean version as hybrid of the two. Similar adaptation was probably made by the Ammonites and the Moabites, somewhat later (Younker 1997).

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APPENDIX

BASIC METROLOGICAL DATA OF COLLARED-RIM PITHOI

The data presented below (table 25.1) augment most of the published information, and much of still unpublished samples, as measured by the author with the kind permission of the principal investigators in charge. Unfortunately no final excavation report includes proper metrological information about these pithoi, and these measurements were taken from drawings to a (sometimes incorrect) scale or from published photographs in which a scale rod is presented (marked by *). The specimens are presented in chronological order, based on the dates suggested by the excavators.

The two most significant parameters are the total height of the vessel (H.) and its maximal external diameter (D.), as these are the ones the potter could most readily control while building the vessel and are therefore most relevant for establishing standard volume to a certain typological form (see, e.g., Raban 1981: 195–227; Daviau 1996: 608).

The third measurement is the internal diameter of the mouth (M.). The significance of this is more tentative, relevant only if one surmises that standard stoppers were in use. All

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measurements are given in cm. All of the specimens visually observed by the author (marked by °) were produced in a similar manner: first the body was formed by hand, of circular coils of clay mounted one on top of the other; then, upside down, the body was shaped on a tournette and fastened over with ropes in order to prevent it from collapsing under its own weight. Finally, it was thrown on the wheel, its neck and rim attached, and the final product properly shaped.

Some Remarks

As one may notice, the vast majority of the specimens are grouped nicely within 6% deviation off the average height of 109 cm.

The average for maximum width of the body is about 55 cm, with a deviation of up to 10%. The deviations in diameter of the mouth are greater—up to 20%. Considering the relatively large chronological and geopolitical span of these specimens, the metrological deviations (table 25.2) are surprisingly meager. This conclusion might be substantiated by the statistical fact that within the eighteen measured specimens from Shiloh, fifteen of which come from the same building (Finkelstein, Bunimovitz, and Lederman 1993: 20–31), the metric deviations are not much less than in the entire corpus. Larger deviations have been noticed by the author after measuring hundreds of so-called commercial jars (Raban 1981: 195–227).

The last group, consisting of five restored pithoi from Tell Jawa, represents what seems to be the final, decaying phase in the use of this type of vessel. Although these pithoi are of a different style and of much later date and historical context, their metrological data are included here in order to illustrate the persistence of what seems to have been a rather well-established code of practice.

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Table 25.1. Metrological Data of Collared-Rim Pithoi

Site name, reference, and context in the site	*H.*	*D.*	*M.*
A. Late thirteenth century B.C.:			
°1. **Aphek**, Beck and Kochavi 1985: fig. 5:1 (Locus 1731)	C.120(?)	63	?
°2. **Tel Nami**, Artzy (unpublished) cat. no. 13/88 O-112/9	113	69	17.1[a]
B. Early twelfth century B.C.:			
°3. **Dan**, Biran 1989: fig. 4-23:1 (Pit 4349, Stratum VI)	105	56	16.5
°4. **Dan**, Biran 1989: fig. 4-23:2 (Pit 4349, Stratum VI)	105	59	18.3
°5. **Dan**, Biran 1989: fig. 4-23:3 (Pit 4349, Stratum VI)	105	56	17.4
°6. **Dan**, Biran 1989: fig. 4-23:4 (Pit 4349, Stratum VI)	?	56	16.1
7. **Giloh**, A. Mazar 1990: fig. 5 (Locus 80, No. 556)	114	60	16.4
8. **Megiddo**, Loud 1948: pl. 83:4 (Stratum VIIb–VI?)	116	63	19.2
°9. **Har Ebal**, Zertal (unpublished), L. 423, No. 3406)	104	59	15.7
°10. **Har Ebal**, Zertal (unpublished), L. 358, No. 2959)	104	55	14.6
°11. **Har Ebal**, Zertal 1988a: pl. 11:1 (Stratum B)	?	49	14.3[b]
C. Second half of the twelfth century B.C.:			
12. **ʿIzbet Ṣarṭah**, Finkelstein 1986: fig. 9:1 (Stratum III, Room 2007)	96	47	15.3
13. **ʿIzbet Ṣarṭah**, Finkelstein 1986: fig. 9:3 (Stratum III, Room 2007)	110	59	15.8
14. **ʿIzbet Ṣarṭah**, Finkelstein 1986: fig. 9:4 (Stratum III, L. 753)	108	52	?
15. **Megiddo**, Loud 1948: pl. 83:1 (Stratum VIb)	116	58	18.7
16. **Megiddo**, Esse 1992: fig. 3:1 (Stratum VI)	106	54	17.6
17. **Sahab**, Ibrahim 1978: fig. 1 (Area A, Sq. 1)	110	56	16.6
°18. **Sasa**, Stepansky, Segal, and Carmi 1996: fig. 7:2 (Destruction level, L. 5)	110	60	17.8
D. First half of the eleventh century B.C.:			
°19. **Dan**, Biran 1989: fig. 1:6 (Stratum V, L. 586)	104	57	17.3
°20. **Dan**, Biran 1989: fig. 4-1:5 (Stratum V, L. 586)	?	58	18.9
°21. **Dan**, Biran 1989: fig. 4-1:1 (Stratum V, L. 432)	?	53	18.9
22. **Sasa**, Golani and Yogev 1996: fig. 6:4 (Stratum II, L. 5, 87/1)	?	56	19.2
°23. **Sasa**, Bahat 1986: 100, fig. 1 (Stratum I, L. 20)	c. 98 (?)	52	17.6
*24. **Shiloh**, Buhl and Holm-Nielsen 1969: pl. XXII:186 (House A)	103	51	?
*25. **Shiloh**, Buhl and Holm-Nielsen 1969: pl. XXII:187 (House A)	102	53	16.8
*26. **Shiloh**, Buhl and Holm-Nielsen 1969: pl. XXII:188 (House A)	106	55	18.0
*27. **Shiloh**, Buhl and Holm-Nielsen 1969: pl. XXII:189 (House A)	107	51	17.4
*28. **Shiloh**, Buhl and Holm-Nielsen 1969: pl. XXII:190 (House A)	108	54	19.3
*29. **Shiloh**, Buhl and Holm-Nielsen 1969: pl. XXII:191 (House A)	103	56	14.9
*30. **Shiloh**, Buhl and Holm-Nielsen 1969: pl. XXII:192 (House A)	109	53	15.1

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Table 25.1. (*Cont.*)

31. **Shiloh**, Finkelstein, Bunimovitz, and Lederman 1993: fig. 6-48:1 (Area C, Bldg. 335)	110	57	17.2
32. **Shiloh**, Finkelstein, Bunimovitz, and Lederman 1993: fig. 6-48:2 (Area C, Bldg. 335)	110	55	14.3
33. **Shiloh**, Finkelstein, Bunimovitz, and Lederman 1993: fig. 6-48:3 (Area C, Bldg. 335)	111	58	18.0
34. **Shiloh**, Finkelstein, Bunimovitz, and Lederman 1993: fig. 6-49:3 (Area C, Bldg. 335)	106	51	18.2
35. **Shiloh**, Finkelstein, Bunimovitz, and Lederman 1993: fig. 6-49:4 (Area C, Bldg. 335)	114	54	17.8
36. **Shiloh**, Finkelstein, Bunimovitz, and Lederman 1993: fig. 6-51:1 (Area C, Hall 306)	114	52	17.1
37. **Shiloh**, Finkelstein, Bunimovitz, and Lederman 1993: fig. 6-51:4 (Area C, Hall 306)	110	54	16.2
38. **Shiloh**, Finkelstein, Bunimovitz, and Lederman 1993: fig. 6-51:6 (Area C, Hall 306)	105	52	16.1
39. **Shiloh**, Finkelstein, Bunimovitz, and Lederman 1993: fig. 6-56:3 (Area E, Instl. 519)	?	55	16.2[c]
40. **Shiloh**, Finkelstein, Bunimovitz, and Lederman 1993: fig. 6-56:4 (Area E, Instl. 519)	112	59	17.1[c]
41. **Shiloh**, Finkelstein, Bunimovitz, and Lederman 1993: fig. 6-56:5 (Area E, Instl. 519)	?	54	16.8
°42. **Dor**, Stern (unpublished), Area G, Phase 8, destruction level (no. 98.23.110)	112	59	16.2[d]
*43. **ʿEn Ḥagit**, Wolff 1998: fig. 3 (Area B)	107	55	18.1[e]
*44. **ʿEn Ḥagit**, Wolff 1998: fig. 3 (Area B)	105	52	17.8[e]
*45. **ʿEn Ḥagit**, Wolff 1998: fig. 3 (Area B)	106	52	17.6[e]
*46. **ʿEn Ḥagit**, Wolff 1998: fig. 3 (Area B)	104	52	17.4[e]
E. Late eleventh century B.C.:			
°47. **Tell Qiri**, Ben-Tor and Portugali 1987: fig. 31:3 (Stratum 8, L. 1817)	108 (?)	54	17.7
48. **Tel Mevorakh**, Stern 1978: fig. 19:4 (Stratum VII, L. 233)	109	57	18.4
F. Late ninth century B.C. = Iron Age II			
49. **Tell Jawa**, Daviau 1996: 608, table 1 (A. 13, 53.5)	107	52	14.0[f]
50. **Tell Jawa**, Daviau 1996: 608, table 1 (A. 13, 39.2)	111	53	16.0[f]
51. **Tell Jawa**, Daviau 1996: 608, table 1 (A. 13, 29.1)	101	50	15.5[f]
52. **Tell Jawa**, Daviau 1996: 608, table 1 (A. 13, 29.3)	107	56	15.5[f]
53. **Tell Jawa**, Daviau 1996: 608, table 1 (A. 13, 29.2)	?	51	15.0[f]

a. Beside this single restored pithos from Tel Nami (no. 2, this appendix), there are several more unrestored vessels and half a dozen complete rims with internal diameters ranging from 14.5 to 18.3 cm. I am grateful to Prof. Michal Artzy for allowing me to take these measurements. One of her research students, Yossi Solomon, is presently working on his M.A. thesis entitled "The Collared-Rim Pithoi."

b. Dr. Adam Zertal was so kind as to let me see and measure his specimens from Mount Ebal (nos. 9–11). He has published an additional ten rims of collared-rim pithoi from that site (Zertal 1988a: pl. 10, 11), which range in diameter between 14.2 and 21.8 cm. These varied more than the standard deviation of the entire corpus!

c. These two vessels are without handles and are so far the only specimens of handleless collared-rim pithoi known from publications.

d. This pithos was measured by me with the kind permission of Prof. E. Stern to whom I am most grateful.

e. S. Wolff kindly supplied the author with these measurements.

f. The measurements were taken and published by Michele Daviau (1996: 608; table 1) and drawings of four, which have been physically reconstructed, are published there as well.

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Table 25.2. Deviations of Metrological Perimiters of All Measured Collared-Rim Pithoi, Compared with Some Typical "Commercial Jars"

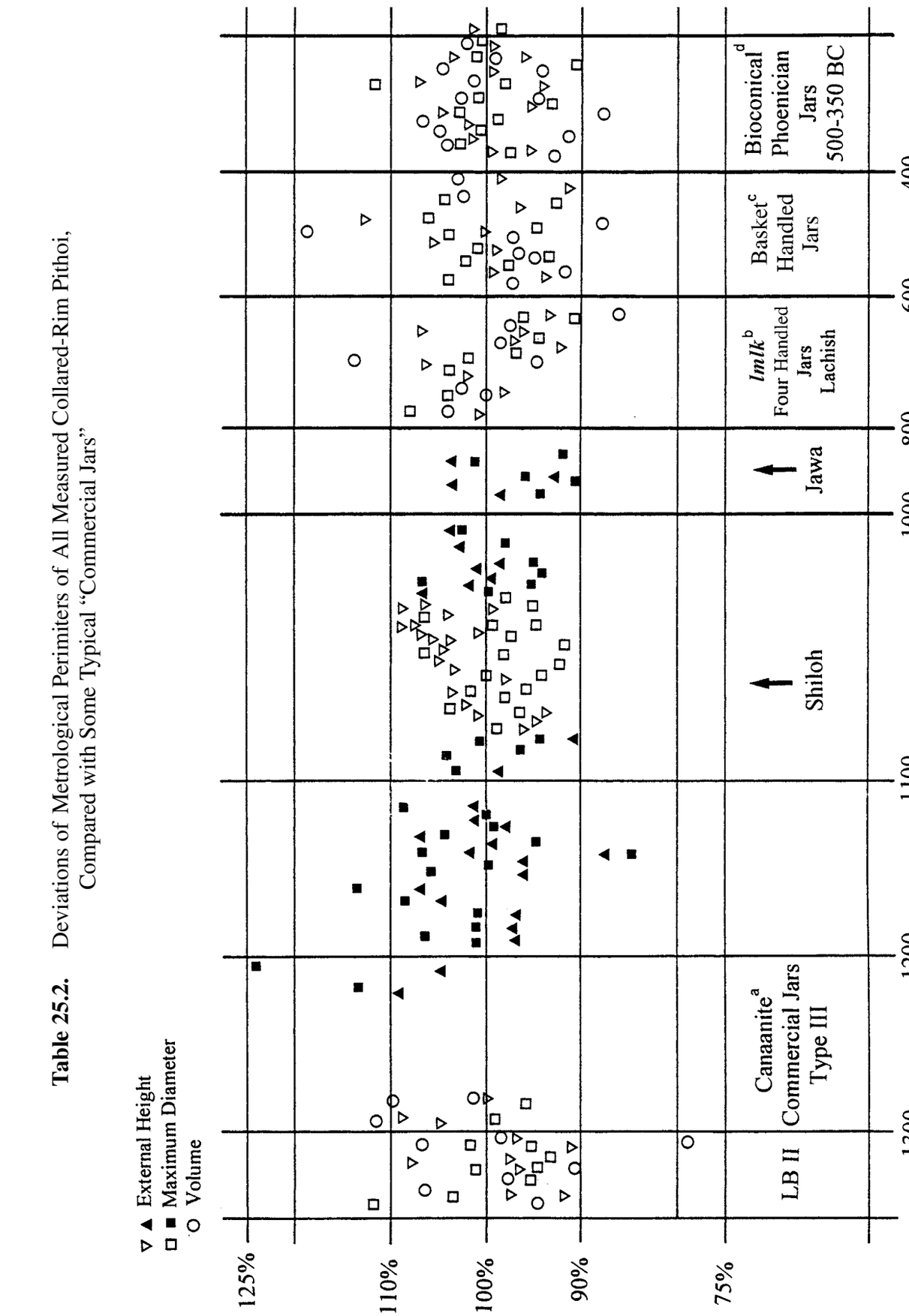

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Table 25.2 shows that the rate of metrological deviation within the chronologically and spatial well-diverted collared-rim pithoi is not greater than that of either one group of pithoi from a single, contemporaneous context (Shiloh) or from any type of wheel-made standardized commercial containers.

Notes to Table 25.2

a. LB II Canaanite commercial jars of Type III (Raban 1981: 55–58, 187 = table H.8). Total corpus of ten measured jars from various sites, dated from early fourteenth to late thirteenth centuries B.C.
b. Eight four-handled Judaean jars with *lmlk* stamps from Lachish – late eighth to mid–eighth centuries B.C. (Raban 1981: 195).
c. Nine basket-handled jars of Cypro-Tyrian types, dated from early sixth to late fifth centuries B.C. (Raban 1981: 95–98, 202–23 = table H.25).
d. Thirteen Biconical Phoenician jars from the Levant, Cyprus, Carthage, and Spain, dated from early fifth to mid–fourth centuries B.C. (Raban 1981: 91–94, 199–200 = table H.21).

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EARLY BRONZE AGE STATE FORMATION IN THE SOUTHEAST DEAD SEA PLAIN, JORDAN

WALTER E. RAST

Many archaeological sites with material remains dating to the Early Bronze Age (EB) are difficult to integrate into the study of the social organization of this period. In the case of large tells, the remains of the EB lie so far below later cultural overburden that they often can only be exposed in a limited way in comparison with the remains of subsequent periods. The excavations at Megiddo are an example of the challenges to opening up a sufficient area on which conclusions regarding settlement type can be based. Here the EB evidence was uncovered only on the eastern slope (Area BB), in what was apparently the cultic quarter (Loud 1948: 59–84). Despite the important results of Finkelstein's and Ussishkin's recent reinvestigation of the EB temples of Area BB (Finkelstein, Ussishkin, and Halpern 2000: 25–74), the remains of this period have yet to be clarified in other parts of the site. The most recent excavations by Hebrew University and Pennylvania State University may eventually reach some of this earlier material, but at this writing the work has been limited to the Iron, Late Bronze (LB), and Middle Bronze Ages (MB). Similar difficulties as those at Megiddo appeared at the excavations at nearby Tell Taʿannak. Whereas the excavations on the south slope brought to light a substantial section of the EB wall, the exposure within the city itself was too small to allow for more than a few remarks about structures (P. W. Lapp 1967: 10–13; 1969: 14–16). Consequently one would be hard put to say much about social organization at Tell Taʿannak during the EB period. Other examples of this problem abound.

Single-period sites, on the other hand, of which there are various examples dating to the EB, clearly have advantages for the study of social organization. The extensive excavations at Arad are well known for the way they have opened up new perspectives on the settlement patterns and social organization of this period (Amiran 1970: 90–95; 1986: 74–75; Amiran and Ilan 1992: 34–61). Bâb edh-Dhrâʿ and Numeira are further examples of sites limited in their occupation to the late fourth or early third millennia B.C. It might also be mentioned that many other single-period EB sites like those along the southeastern Dead Sea are found in Jordan. The extensive work sponsored by the University of Tübingen and Yarmouk University at Khirbet ez-Zeraqun in north Jordan, also a single-period site, has uncovered information of major importance for the EB settlement in this region adjacent to the Golan Heights and Syria (Ibrahim and Mittmann 1994: 13). The additions to some of Glueck's conclusions regarding the EB in Jordan have also been important for laying the groundwork for a new study of this period east of the Jordan River (Schaub 1982: 73–74; Mattingly 1983; Sauer 1986: 3–4).

Apart from Schaub's publication on EB IB (Schaub 1982), however, little has thus far been attempted in explaining the social implications of the Expedition to the Dead Sea Plain's work, although a fair amount of the raw data has been made available either in preliminary

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reports (Rast and Schaub 1978; 1980; 1981; Schaub and Rast 1984; Coogan 1984) or in final form (Schaub and Rast 1989). At the same time, a fundamental objective of the expedition has been to retrieve socially relevant data. With the results of a great amount of processing of the material remains now available and soon to appear in final volumes, some conclusions may be proposed regarding the nature of Bâb edh-Dhrâʿ and Numeira as constituting an early example of state formation.

In regard to some of the issues discussed here, two recent publications have focused on the socioeconomic and political developments of the EB as a whole. Douglas Esse's study (Esse 1991) is a significant contribution in synthesizing new information dealing with the EB period, while at the same time providing the first full discussion of the Oriental Institute's earlier work at Khirbet Kerak (Beit Yeraḥ). Esse's study has special value because of its focus on the specific region of the upper Jordan Valley and eastern end of Upper Galilee. Since EB data in general suggest significant regional differentiation, much is to be gained from spotlighting a particular area as Esse has done.

Alexander Joffe's research (1993) has produced a broader perspective on the EB since his investigation has tracked the entire country through the key transitions from the Chalcolithic to EB I, and from EB I to EB II. To accomplish this, Joffe has taken into account as much of the EB data on both sides of the Jordan Valley as could be identified. The computer-based evidence on which his study rests (organized by the Decapolis Data Base at the University of Rome) led him to divide the country into twenty subregions, each presumably with its unique cultural features. Implicit in these regional differences was the issue of interrelations between the regions, along with the trajectory of development that each followed (cf. Joffe 1993: 73–82).

The problems of the EB social organization can be formulated in several simple questions, as implied also in the two previous works. Were all settlements of this period founded on a similar political, social, and economic basis? How were the walled towns of the EB II and EB III on both sides of the Jordan Valley organized locally? Were these settlements predominantly self-supporting? That is, were they able to live mostly independently on the basis of their regional resources? On the other hand, if there was exchange between different regions, what items were shipped and how, and what is our evidence for interregional exchange? Was there a centralized power structure during the EB II and EB III periods? Overall, what type of social organization are we dealing with during the Early Bronze Age?

THEORIES OF SOCIAL ORGANIZATION: THE VIEWS OF ELMAN SERVICE AND MICHAEL COE

These questions call for theoretical definition (see the discussion of method and theory in Joffe 1993: 5–21), especially in dealing with terms like "state" or "social organization." As a prelude to considering evidence from Bâb edh-Dhrâʿ and Numeira, we look at two proposals dealing with some of the problems of explaining complex forms of social organization (Service 1971; Coe 1961). Although the models proposed in the works about to be discussed are based on areas quite distant from the ancient Near East, they can serve to raise issues and problems associated with state formation in the southeastern Dead Sea Valley during the EB, specifically during the EB III period.

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Students of early social organization are indebted to Elman Service's often-referenced study (Service 1971). Service's work, while devoted to the evolution of societies, also helpfully outlines unique features of different grades of social development, including two with which we are concerned here, the chiefdom and state. According to Service, while remnants of the social patterns of bands or tribes may be carried over into a chiefdom, the latter is marked by new strides into complexity. The higher status attained by the chief and his family in a chiefdom also means that other members of the society could take on particular roles. Within a chiefdom society there are personages who serve as craftsmen or cultic functionaries. A new level of labor management also emerges, along with an array of larger projects such as irrigation works, terraced slopes, and the construction of monumental buildings (Service 1971: 162). In contrast to the egalitarian nature of tribal or band societies, chiefdom society is inegalitarian (Service 1971: 138–40, 164).

A further stage of development (Service argues for the concept of evolution) is represented in the state, which carries on many of the advancements of chiefdom society such as management of resources, but in more complex form. Although state society is not extensively dealt with in Service's discussion, he does have some words to say about it as the next level beyond the point where his study ends, the chiefdom. The organization of the state, in comparison with that of a chiefdom, includes a greater amount of cohesion in social organization. For our concerns with the ancient Near East, this would include the fact that some sort of personage like a king would have been an important figure in the society's structure. Service also argues that a mechanism of control is a distinguishing characteristic of the state. In his words, one of the most important attributes of an emerging state is how it sets in place "a consistent threat of force by a body of persons legitimately constituted to use it" (Service 1971: 163, 165). As shown below, this point is an important one in considering the EB III data at Bâb edh-Dhrâʿ and Numeira as advances into state formation.

Michael Coe's discussion of two very different types of social organization is also valuable in considering features of the EB society in the southeastern Dead Sea Valley (Coe 1961). Coe terms the constrasting types "unilateral" and "organic" societies. A key for Coe is that a unilateral system of organization does not maintain instruments for the exchange of goods. The resources of the society are consequently used for its own subsistence, and thus trade is nonexistent. The absence of trade along with a mercantile class produces a notable lack of differentiation in the group. Artisans and other specialists are found in the service of an authoritarian control, and in that sense are either diminished in status or may be altogether invisible to the public. The result is what Coe terms a "mechanical" society, where workers primarily supply the ruling personage(s) of the group, including a priest-king and religious functionaries associated with him. Coe's examples are the classic Khmer of Cambodia and the classic Maya of Central America, both of which provide examples of societies focused on a ceremonial center. As far as the ancient Near East is concerned, Coe sees in Egypt until the Eighteenth Dynasty an example of such a unilateral society because it was not until the Eighteenth Dynasty that cities or towns began to appear in Egypt (Coe 1961: 84).

In addition, the unilateral society emerges in an area where little differentiation of environment exists, and thus regional specializations on which trade is based are minimal if not absent. This type of society witnesses a lack of incentive for building and maintaining a road system since interregional relations are negligible. Such societies exhibit a high degree of

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control, much of which is based on religious sanction. Coe's point is that these centers are thus not really urban, although they constitute an alternative type in the development of complex societies.

The antithesis of the unilateral society is what Coe terms an "organic" society. This type of society exhibits a feature of special importance when the model is applied to the EB social organization below, namely, division of labor. Concomitantly the organic society exports and imports goods necessary for the stabilization of the society, maintaining a system of transport to do so. The contacts fostered by trade require and support a variety of social roles, including merchants, traders, and specialists of various types preparing goods for trade. The mechanisms of governance also broaden somewhat since the ruler (a king or someone comparable) would not retain his authority without the support of the mercantile and artisan classes. In comparison with Egypt, Mesopotamia produced many examples of the organic type of society in its various "micro-geographical units" (Coe 1961: 81–84).

According to Coe, basic environmental differences contributed to the formation of these polar opposites in social organization. Both the Khmer and Maya civilizations appeared in regionally undifferentiated environments (Coe 1961: 85), and the same thing can be said for early Egypt. On the other hand, studies of the EB in ancient Palestine, such as those of Esse and Joffe, demonstrate the great variety in subregions that undoubtedly contributed to the emergence of a dynamic town life during this period.

BÂB EDH-DHRÂʿ AND NUMEIRA AS PRIMITIVE, ORGANIC STATE SOCIETIES

The theoretical discussions of Service and Coe are valuable for reflection on the nature of the type of society found at the two EB III sites in the southeastern Dead Sea Valley (fig. 26.1). In reference to Service, the EB III societies at Bâb edh-Dhrâʿ and Numeira are better explained as incipient state societies rather than as chiefdoms (cf. also Renfrew and Bahn 1991: 156–57 on distinctions between the two). At the same time, since the use of the term "city" for the Dead Sea sites is problematic, it is probably better to avoid the hyphenated expression city-state (cf. Mazar 1990: 140, who sees the country divided into about twenty "city-states" during EB). In earlier reports of the work at Bâb edh-Dhrâʿ and Numeira, the term "city" was used for the Dead Sea settlements (Rast and Schaub 1981: 15–23), but further consideration of this problem has led us to believe that calling them "towns" seems more appropriate (cf. Schaub 1982: 67).

Particularly important for tracing attributes of a primitive state society is the way such a society manages its resources (see Service 1971: 133–34, who sees this happening already in chiefdoms). Examining the various forms of managerial activity in relation to resources may be more promising than focusing on "scale" in attempting to discern the nature of the EB social organization (cf. Joffe 1993, passim). The question of management highlights human response and decision in relation to the needs and aims of an emerging state. For the researcher it also stresses the importance of exploring archaeological data for what they can tell us about the regulation of natural and human resources in making and implementing decisions in regard to various construction and preservation projects. To our way of thinking, the emphasis on scale imposes a nondynamic grid onto what was certainly an actively engaged community, and it may also obscure the fact that smaller settlements were at least as sophisticated and dynamic

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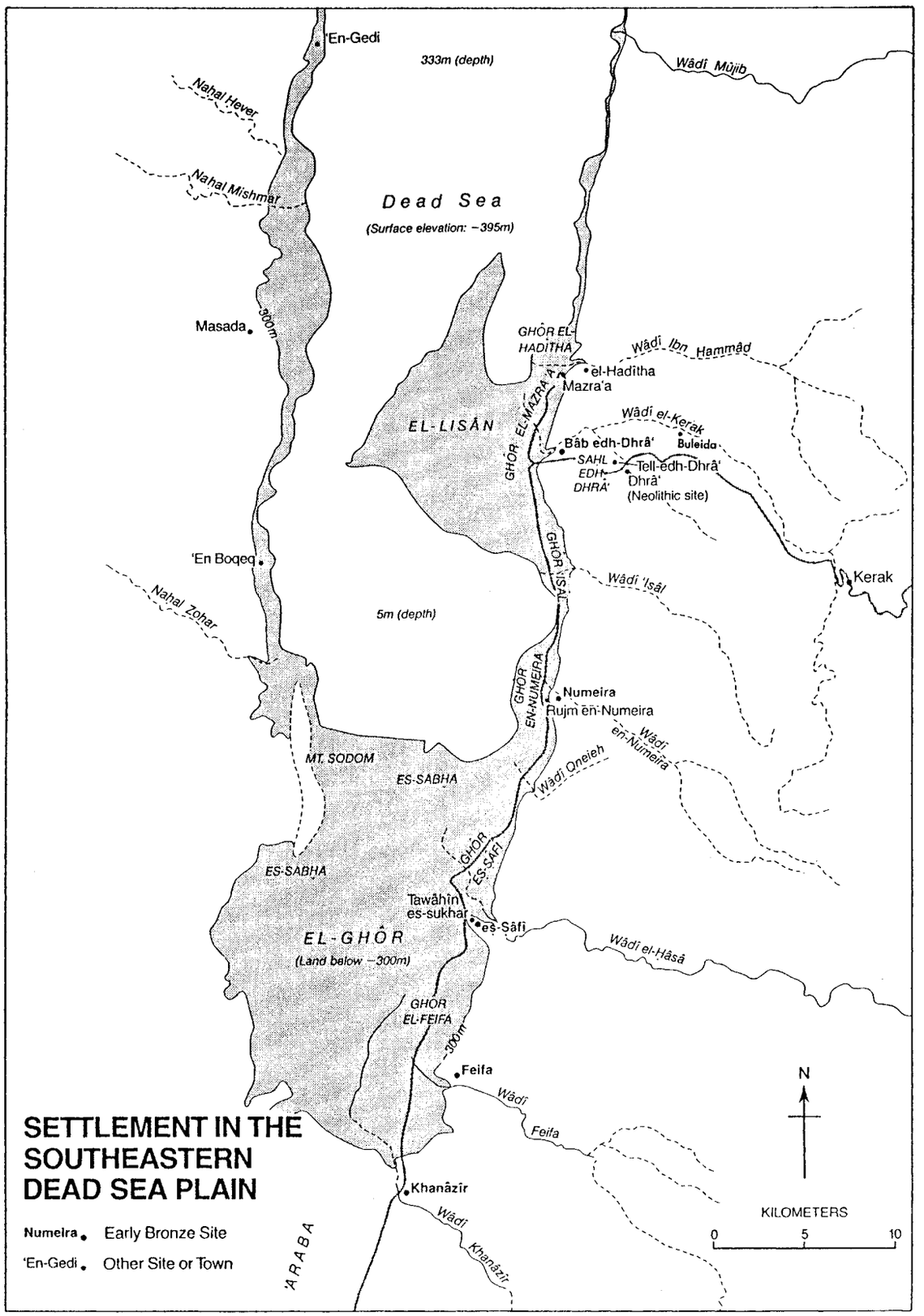

FIGURE 26.1. Map of the southeast Dead Sea plain with locations of Bâb edh-Dhrâʿ, Numeira, and Buleida (map by Jeannine Schonta).

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in their organization as those of greater size. For example, Bâb edh-Dhrâʿ and Numeira were smaller than settlements like ʿAi or Arad (Bâb edh-Dhrâʿ is a little more than 4 ha, Arad about 10 ha), and yet the cultural record shows the Dead Sea sites to have been highly progressive in their development. In that case it is questionable whether scale really makes a significant difference in delineating complexity.

Among the rich cultural data of the Dead Sea sites is the great amount of evidence from the large and continuously used cemetery at Bâb edh-Dhrâʿ. The treatment of burials dating to the EB III is a striking complement to the organizational changes occurring during this later phase of the EB. That a particular societal group enjoyed higher status during the EB III is indicated by the data from Charnel House Tomb A 22, not only the largest charnel house thus far discovered but one which also contained several luxury objects, including gold leaf jewelry, beads, and other luxury items (Rast and Schaub 1980: 34–39). More than 150 individuals were buried in Tomb A 22, and thus it had one of the largest populations of any of the charnel houses (Rast and Schaub 1980: 38). When the data of Tomb A 22 are compared with those from the EB III town of Bâb edh-Dhrâʿ, the picture of a diverse society emerges. Tomb A 22 indicates enough "assymetry" to meet the minimum requirement of what Trigger holds to be necessary for the term "state." At the same time, data at Bâb edh-Dhrâʿ speak for less elitism than Trigger sees necessary for positing the existence of an ancient state (Trigger 1978: 160).

The various metal weapons found at Bâb edh-Dhrâʿ (Wilkinson 1989: 444–50), many of which are dated to the EB III, are also best viewed in regard to their social importance. Metal weaponry has been found both in the tombs and at the town site at Bâb edh-Dhrâʿ. Why not a single such weapon, by conrast, has yet to appear at Numeira is unclear. Following Service, the metal weapons at Bâb edh-Dhrâʿ suggest a system of control or force that had implications both externally and internally. Thus these implements need to be interpreted as a mark of the state at some stage of its development (Service 1971: 163, 165; cf. Adams 1966: 14). In addition, emblems of the centralized state authority would also be evident in larger public structures such as temples or palaces (cf. Mazar 1990: 140). Although no remains of a palace have been discovered at Bâb edh-Dhrâʿ or Numeira, the sanctuaries of the EB II and EB III periods at Bâb edh-Dhrâʿ belong in this sphere (Rast and Schaub 1980: 30–31; Schaub and Rast 1984: 50–51).

Coe's use of the term "organic" is also useful for the definition of the type of state organization found in the emerging EB towns of the Dead Sea. Coe's description is put in sociological and anthropological terms, but it has similarities to what Jacobsen characterized from a political vantage point as "primitive democracy" (Jacobsen 1943, 1957). Jacobsen traced the Mesopotamian examplar of this type of more open and shared organization from its roots in early villages, and even in nomadic societies, into societies of greater complexity (Jacobsen 1957: 99–109). As shown below, this is the trajectory of the emerging EB III society at Bâb edh-Dhrâʿ and Numeira. Although on a smaller scale, the social organization of the Dead Sea sites is more along the line of third millennium Mesopotamian settlements than the specialized, "unilinear" society of Egypt in the same period. Occasional items from Egypt continued to appear at Bâb edh-Dhrâʿ during the EB III period (e.g., Wilkinson 1989: 452–56), but these were luxury pieces that only the well-off could afford, and thus they scarcely indicate any great impact from Egypt on social organization in the southeastern Dead Sea Plain during the third millennium B.C.

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THE RELATION BETWEEN BÂB EDH-DHRÂʿ AND NUMEIRA DURING EB III

We turn now to consider two specific activities at Bâb edh-Dhrâʿ and Numeira: the management of labor in constructing and maintaining these town sites and the control of the hydrology. The latter especially was necessary for successful occupation of the Dead Sea region in which the towns were established. It is proposed here that these two forms of evidence point to a high degree of social organization, and thus they are significant for tracing the development of early state formation in the Dead Sea Valley. At the same time they attest to the close relation of the two Dead Sea sites to each other.

By this time the chronology of Bâb edh-Dhrâʿ and Numeira is well known (see the table in Schaub 1993: 131). It is clear that these two towns, and the southeastern Dead Sea Valley as a whole, reached a high point in the EB III period. The destinies of Bâb edh-Dhrâʿ and Numeira were interlocked during EB III, as various data from the recent excavations show. This interrelation was evident from the fact that the population of the older settlement at Bâb edh-Dhrâʿ, having developed from its earliest EB IA phase on through to EB III, found itself pressed with needs of space and resources by at least the middle of the EB III. To mitigate the potential hazards created by overpopulation and diminishing resources, colonizers from Bâb edh-Dhrâʿ began to settle the nearby site of Numeira in the last one-and-a-half centuries of the EB (ca. 2500–2350 B.C.)

The basis for interpreting Numeira as an extension of Bâb edh-Dhrâʿ made by settlers from the mother site is found above all in results from the petrographic study of pottery found in several EB III tombs in the cemetery at Bâb edh-Dhrâʿ. The analysis of wares from the two Dead Sea sites showed that pottery made from Nubian sandy clays near Numeira was deposited in tombs at Bâb edh-Dhrâʿ, presumably accompanying burials of deceased persons from Numeira in the Bâb edh-Dhrâʿ cemetery (Beynon et al. 1986: 33; Schaub 1987: 247–48; 1993: 135). Assuming that burials of outsiders not associated in some way with the occupants at Bâb edh-Dhrâʿ would have been unacceptable, the petrographic studies support the notion of affinity between the populations of the two Dead Sea sites, and colonization would be a useful way to understand the process. We may conclude, therefore, that we are dealing with what can be termed a small, local system involving these two EB III towns situated just eight miles apart, similarly constructed and similarly positioned in respect to the Dead Sea, both based on a comparable economy, and both possessing many likenesses in their cultural record.

SITE ENGINEERING AND SOCIAL ORGANIZATION

Efforts to understand the social organization of the EB III towns in the southeastern Dead Sea Valley are best begun by focusing on Bâb edh-Dhrâʿ. Bâb edh-Dhrâʿ holds prime place because it was the larger of the two EB III sites, and its sheer endurance throughout the entire third millennium shows that it was the dominant settlement. Its local water sources were also more extensive than those at Numeira since the *ghor* adjacent to Bâb edh-Dhrâʿ (Ghor el-Mazra'a) was watered not only by outflows from Wadi Kerak, but also from Wadi Ibn Hammad, as well as the springs at Haditha and ʿAin es-Sikkin (see the data in Harlan 1981: 156–57). Thus, if Bâb edh-Dhrâʿ can be explained, the related EB III settlement of Numeira and its role in the southern Ghor social organization falls into place.

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There is, however, a more important reason why it is important to interpret from this site outward. This has to do with the unusual natural features of Bâb edh-Dhrâʿ, which at first blush are not impressive and which indeed presented great challenges to those who settled here (pl. 26.1). The native site of Bâb edh-Dhrâʿ consists of laminated white marl and gravel deposits laid down in the Upper Pleistocene period (Donahue 1981: 144–46). The decision to settle this site demanded expertise and endurance (Rast 1995), and it is in considering how the occupants dealt with the natural difficulties that we can begin to understand their efforts at communal organization. Since Numeira replicated Bâb edh-Dhrâʿ in so many ways, the data from there provide additional information on the same problems.

The foremost challenge to settling the marl site of Bâb edh-Dhrâʿ was the instability of this soil type. Consequently it is important to ask how the ancient builders of the EB III town at Bâb edh-Dhrâʿ resolved problems of building on such a location (Donahue 1981: 134). One response was the development of an extensive brick-making industry, attested in all parts of the town and cemetery, where sun-dried brick was used for the construction of tombs during the EB II and EB III periods. Such use of brick is the more remarkable given the fact that a plentiful supply of stone was available and would have saved time and effort had it been used as the main material for construction. Large rocks and boulders from the mountainous eastern slopes rolled through the Wadi Kerak below the site, and thus a storehouse of boulders was near at hand. Stones of this size were used in constructing the base of the EB III town wall and in the latest phase of the EB III were also used for the foundation of the Northeast Towers. The two superimposed sanctuaries in Field XII also made use of stone foundations, but these were quite small, round, field or wadi stones (Rast and Schaub 1981: 28, fig. 23). Apart from these examples, however, the construction employed on the interior of the town, consisting of what were domestic and in some cases small industrial buildings, was almost entirely of brick from the foundations upward.

The reason that brick was so extensively used was no doubt that it was more effective on a site so characterized by precarious marl soils. We can consequently posit groups of laborers involved in brick making—their work being to gather clay and temper, to form the bricks in molds, and to bake them to rocklike hardness under the hot sun of the southeastern valley. Potters' marks consisting of circles or crosses were commonly made, using the thumb, stick, or stone. While the bricks could have been made independently by individuals, the great number of common markings on them suggests primitive "companies" engaged in brick manufacturing. And incidentally, the local conditions promoting the need for brick manufacture would appear to consign Mesopotamian influence to a secondary level of explanation at best (cf. Yeivin 1934).

Besides being used for buildings, unfired or sun-baked brick was also used to stabilize areas of soft marl on the natural site. An extensive retaining wall made of brick was built along the marl slope of Field XIV on the interior of the town. Although over the centuries parts of this wall had slipped onto the adjacent surface, what survived showed the ingenuity of the EB III engineers in constructing this system (Rast and Schaub 1981: 23–25, fig. 17). The large court surrounding the EB III sanctuary in Field XII was also paved with brick to provide a more solid surface on the natural marl and gravel (Rast and Schaub 1981: 28).

The energies devoted to controlling the natural soils of the site thus indicate that a good number of people were involved in the construction and maintenance of the EB III town. That separate groups of laborers were also employed in the erection of the 7 m wide defensive wall

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was evident from the way this wall was laid. Its foundations were laid in sections, so that at approximately 15 m intervals a segment would be terminated with a transverse face, after which a new segment was begun. These segments are of interest because the stone foundation material in most cases was different for each succeeding segment. In some cases smoothed, rounded, wadi boulders were gathered and used. In other cases, tabular limestone blocks were collected, either from the plain near the site or from below the escarpment some 5 km to the east, where numerous limestone slabs had fractured from their beds. The entire upper part of the defensive wall, estimated to have been at least 8 m high, was made of mudbrick, requiring a massive expenditure of effort by the brick-making industry as well as those involved in the construction. Both the lower stone construction and the brick superstructure of the defensive wall, therefore, are good indicators of the social organization of Bâb edh-Dhrâʿ during its height in EB III period.

A final example of engineering techniques employed at Bâb edh-Dhrâʿ is the terraces used to construct the defensive wall around the edges of the marl hillocks on which the town was built. Especially on the east and north sides of the site, the marl slopes were particularly precarious. Had the stone foundation simply been planted on the existing surface, the wall would have given way to erosion and would have easily toppled. To counteract this, terraces were cut into the slope and the lowest courses were even plastered into place. That sections of these wall foundations survived until recent excavation testifies to the effectiveness of such a solution.

Since Numeira was a colonized site, it could be expected that techniques of construction known at Bâb edh-Dhrâʿ were also employed at the new site. Indeed, it seems probable that some of the same engineers who worked at Bâb edh-Dhrâʿ were involved in the construction of this second site. Although the defensive wall here was about half the width of that at Bâb edh-Dhrâʿ, the technique of segment construction was employed, only here the segments were placed at 7 m intervals (Rast and Schaub 1981: 37–39; Rast and Schaub 1980: 42).

Other examples of engineering ingenuity could be pointed to at both sites. At Numeira the town wall was not added until much of the interior town had been constructed (Rast and Schaub 1981: 40; Coogan 1984: 76). When the decision was made to add the fortifications to this originally open settlement, they had to be spliced into previously existing structures oriented on a different axis. At the eastern end of the site, walls of earlier buildings were incorporated into the defensive wall, giving the appearance of a solid tower without rooms (Coogan 1984: 79–80), although the main purpose here was apparently to give special strength to the wall on this vulnerable side of the site.

When examined from the perspective of people's contribution to the social systems of these EB sites, therefore, these activities of construction and maintenance open a window to how the societies were organized. The most important point is that the EB III societies at both sites were effective in solving their problems and creating conditions that led to a substantial standard of living.

HYDROLOGY IN THE SOUTHEASTERN DEAD SEA VALLEY

A second feature affecting the social aspects of settlement of the southern Ghor is found in the way the population dealt with water resources. Although data from survey showed that during much of the EB III the southern Ghor was still benefiting from a higher rainfall than in

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the latter third of the third millennium, the area was still subject to water problems and occupants had to take care to protect the natural supplies. The dual sources of runoff and perennial spring-flow through the Wadis Kerak and en-Numeira provided for the daily needs of occupants while at the same time replenishing the adjacent *ghors* for cultivation (Harlan 1981: 155–59; McCreery 1980: 216–19). These areas for cultivation were indispensable to the success of settlement in the region.

Butzer has pointed to the importance of "perception" as a way of understanding how people dealt cognitively with aspects of the environments in which they chose to locate (Butzer 1982: 252–57). In the case of Bâb edh-Dhrâʿ the question is what inducements led people to stay permanently at the site, beginning with village life in the EB IB, followed by the evolution of a more complex society during the EB II and EB III periods. One resource of undoubted importance was the availability of water. The decision to locate the EB III towns next to Wadis Kerak and en-Numeira points directly to the importance for social organization of the management of this resource. Both wadis were good providers in antiquity as they are today (Harlan 1981: 155–59), and it was the regulation and control of these water sources that spurred the growth that took place, especially in the EB III period.

Carsten Körber has added a new dimension to the study of water control in the southern Ghor in his recent explorations of the whole lower area of the Wadi Kerak. Here Körber found that the large EB site of Buleida, located several kilometers along Wadi Kerak east of the Ghor el-Mazra'a, is best explained as having served to guard the source of water near the entrance of the wadi into the southern Ghor. The ceramic evidence shows that Buleida was settled predominantly during the EB III, so that it dates to the time of the EB III towns of Bâb edh-Dhrâʿ and Numeira (Körber 1993: 551, fig. 1, and 553). Since the terrain around Buleida was poorly suited for agriculture, being located in the foothills of the Jordan plateau and along a very much incised area of the Wadi Kerak, the site's function was different from Bâb edh-Dhrâʿ and Numeira where cultivation of the plain was a principal activity. Buleida would thus have functioned as a guard post of considerable size, assuring control of water used in the agricultural production supporting Bâb edh-Dhrâʿ.[1]

Körber's researches have turned up two further fortresses east of Bâb edh-Dhrâʿ close to the eastern edge of the plain. One is on the north side, the other on the south side of the Wadi Waid'a, a tributary of Wadi Kerak. On Körber's map the sites are designated as Ḥirbet Wadi adh-Dhrâʿ N and Ḥirbet Wadi adh-Dhrâʿ S (see the map in Körber 1993: 551, fig. 1, and the discussion on 551–52). Körber has suggested privately that the positioning of these fortresses once again highlights their function as guard posts overseeing the sources of water, just as in the case

1. I discussed Körber's findings with him in Amman in March 1995, and at his suggestion visited the EB site of Buleida (to be distinquished from the Byzantine ruins by the same name north of Wadi Kerak), accompanied by Henry Cowherd. In my judgment Körber's explanation is both correct and of great interest. I wish to thank Carsten Körber for showing me the pottery from Buleida, which he dates to EB III, and for sharing with me his views on this EB site (most recently in a communication dated April 1, 1996). As best I can calculate, the site noted as er-Rishi on the map of Worschech (Worschech 1986: 286, fig. 1) is the same as that indicated by Körber as Buleda (Körber 1993: 551, fig. 1). Both authors described the site about which they were writing as lying on the south side of Wadi Kerak. Worschech estimated its size as 80 x 60 m and also listed it as his Site No. 93 (Worschech 1986: 289). In his April 1, 1996, communication Körber confirmed that his site of Buleda is the same as No. 93 of Worschech. But see also n. 2.

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of EB Buleida.[2] In modern times water has been channeled through a concrete conduit in the Wadi edh-Dhrâʿ, beginning opposite the Neolithic site of Dhrâʿ and continuing past Bâb edh-Dhrâʿ onto the Lisan peninsula (Bennett 1980: 30; Raikes 1980: 56). A similar channel runs past Buleida (Körber, pers. comm. on April 1, 1996). Some type of channeling system could have been directed through the same wadis during antiquity, even one with a plaster lining since several types of plaster material were found at Bâb edh-Dhrâʿ (cf. the plaster-lined installation in Field III excavated by Paul Lapp), although no traces that can relate to the EB have yet been found around these wadis.

The role that water control played in the socioeconomic development of the Dead Sea sites may also explain the construction of defensive walls around these settlements. Since Numeira was at first an open settlement, the placement of a defensive wall around the site in a second phase of construction was likely connected with the protection of the new industry undertaken here, that of agriculture. The latter involved the production and processing of crops like barley and grapes, both of which were found in abundance at Numeira. Bâb edh-Dhrâʿ likewise was ringed about by the defensive system referred to above, and it is interesting that Buleida was apparently also enclosed by a wall during EB III. The success of these sites in water control and cultivation thus lay them open to raids by outsiders, whoever these latter might have been.

SOCIAL ORGANIZATION AT THE DEAD SEA SITES

On the basis of these two activities of site construction/management and water control, we can make some inferences regarding social organization at these two settlements during EB III. In both cases the data point to the involvement of a great number of people. Some of these workers were skilled and were thus involved in decisions about planning at the sites. Others had proficiencies in the production of particular items used in construction, such as bricks, and still others were adept at calculating the best way to transfer water to key areas for cultivation. That irrigation was used for a good bit of the EB III cultivation in the southern Ghor has been argued by McCreery, based on his follow-up studies of botanical remains retrieved by flotation (McCreery 1980: 214–24).

When discussing water management, it is important to stress that there is no evidence in the southern Ghor of an authoritarian control of the magnitude of Wittfogel's oriental despotism, nor can it even be suggested that the EB III settlements were hydraulic societies in relation to Wittfogel's well-known discussion of this type of social organism (Wittfogel 1957). From the perspective of human choice and decision as discussed above, there were other perceived resources alongside water that contributed to the mechanisms of settlement in the southern Ghor. At the same time, the societies of the two Dead Sea sites do not fit at all the "mechanical society" of Coe, in which activities were performed for a ruling personage or

2. See Körber's discussion of these sites in Körber 1993: 551–52. Körber generously shared the pertinent information from his field notes. For the fortress on the south side of the wadi (Ḥ. Wadi adh-Dhrâʿ S), Körber recorded a date of EB III. The pottery sherds retrieved consisted mainly of ledge handles and rims of hole-mouth jars. Körber also noted that the name Jebel er-Risha was later applied to this fortress ruin on the south side, and that Worschech has mistakenly used the latter name for his site No. 93 which is EB Buleida. See the map in Körber 1993: 551, fig. 1.

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family. The segment construction of the town walls at Bâb edh-Dhrâʿ and Numeira indicates a more participatory organization of labor than the kind associated with pyramid building in Egypt at roughly the same time. The EB III society in the southern Ghor was an organic one, using Coe's other type. That is, the various activities of skilled persons or workers contributed to the common good, more along the lines of the society of the village. In fact, it is reasonable to suppose that the EB II and III "urban" societies in the Dead Sea Valley emerged from the more simple, democratic style of the preceding village societies.

This is why it seems best to conclude that in this region of ancient Palestine, at least, we may have an example of a type of social organization that corresponds more closely to the model of Jacobsen mentioned above, that of a primitive form of democracy. Other descriptions might be used for it, such as Joffe's suggestion of communally shared power, which he finds already in the EB II period (Joffe 1993: 84–86). What could be added to any of the discussions of terms and models is the notion that the EB III settlements in the southern Ghor were for the most part self-dependent. Most of what the EB III occupants needed was produced within their own subsistence parameter. While the Dead Sea sites might have exchanged with areas somewhat farther away, such as the plateau to the east, the Negev, or the southern hill country west of the Dead Sea rift, their meat supplies, fruits, vegetables, and grain could all have been produced in the valley itself.

At the same time, as the population grew it presumably became necessary to import some items. McCreery (1980: 224) and Harlan (1981: 159) have suggested that the Ghor could have provided ample supplies of grain for the population of the EB, which during EB III probably added up to not quite a thousand people. At the same time, it does not seem out of the question that some grain might have been imported from as far away as Syria since seal impressions on store jars at both sites bear Syrian motifs, indicating a connection with that area in relation to trade (cf. the seal on the fully reconstructed jar from Numeira in N. Lapp 1989: 7–9, fig. 7, which shows affinities to Syrian types).

The question whether there was some overall, centralized authority in Palestine during EB III is elusive. The many similarities in ceramics and other artifactual assemblages throughout the country during EB III are striking and certainly show cultural contact. At the same time, this does not necessarily lead to notions of centralized authority during this period, which the regional variation of the period would appear to contradict. On such questions the cross-comparisons of the EB III sites in different regions of the country may be able to offer some proposals in the future. A small amount of effort has already been made in this direction by juxtaposing material remains from Khirbet ez-Zeraqun in north Jordan with those from Bâb edh-Dhrâʿ and Numeira in the southern Ghor, and it is planned that this comparative work will be extended in the future.

In sum, we can see how greatly the picture of Bâb edh-Dhrâʿ has changed since the early days when Albright and others wrote of this site not as a town or city, but as a unique ceremonial center for peoples in the southern Dead Sea Valley (Albright 1926: 61), in their minds, of course, more accessible to the public than the unilateral ceremonial society envisaged by Coe. In any case, the conclusion of a ceremonial center has been overturned by nearly two decades of intensive research devoted to the study of the EB in the southeastern Dead Sea plain. What we rather find in the case of Bâb edh-Dhrâʿ and Numeira are examples of incipient statehood, in which organizational features deriving from the earlier villages are still present, and in which localized development is the major dynamic stimulating change. It is not necessary,

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therefore, to look to Mesopotamia and Syria to explain these developments, despite the fact that some diffusion from those areas might have taken place. Perhaps the situation is not greatly different in other regions in the country during the EB period. As more effort is put into studying the local data bases, and considering them in relation to social organization, we should see advances in our understanding of the EB culture, certainly one of the most interesting in the history of this region.

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PLATE 26.1. The town site of Bâb edh-Dhrâʿ looking northwest, seen here (center left) between the road and the Wadi Kerak. Note the two major erosional incisions that have removed large parts of the inner town. West of Bâb edh-Dhrâʿ the Wadi Kerak turns northward to empty its water first into the Ghor el-Mazraʾa and then into the Dead Sea at the northern end of the Lisan peninsula. (Photograph by Robert Johnston.)

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27

DETERMINIST OR NOT DETERMINIST?: CLIMATE, ENVIRONMENT, AND ARCHAEOLOGICAL EXPLANATION IN THE LEVANT

Arlene M. Rosen and Steven A. Rosen

INTRODUCTION: A PRELIMINARY DEBATE

At the beginning of the twentieth century, Ellsworth Huntington (1911), one of the world's then foremost geographers, concluded that climatic deterioration, in the form of aridification and desertification, was the fundamental cause of demographic and perceived cultural decline in Palestine. The contrast between (1) the rural demographic decline of the late Ottoman period and the harsh modern climate, and (2) the social and economic prosperity and abundant evidence for agricultural success (taken as a proxy for climatic amelioration) in classical times, seemed to clinch the case. Palestine was in demographic and cultural decline as a result of an environment fundamentally incapable of supporting higher populations, and by implication, higher culture.

The adoption of Huntington's thesis as official British Mandatory policy (Troen 1989) provided a rationale for limiting Jewish immigration to Palestine in the period between the world wars. This in turn stimulated a major and concerted research effort to refute it by the Jewish Agency (Ben-Gurion and Ben-Zvi 1979 [1918]), resulting in the antithesis that the decline of Palestine was the consequence of faulty socioeconomic organization, having little or nothing to do with climatic deterioration. Environmental deterioration, evidentially incontrovertible, was seen as a result of poor human management (e.g., Reifenberg 1955).

This early debate on the role of climate and environment in the historical development of the Levant is of interest for many reasons. Troen (1989) points out that it is an early and classic example of science in the service of politics. It also encapsulates the primary pitfalls in much of the recent discussion of how climatic and environmental variables fit into our conceptions of historical dynamics, foreshadowing some of the misconceptions that still plague so many discussions of historical human ecology. We classify these pitfalls into two primary categories: misapprehensions of the environmental and climatic data, and misapprehensions of the nature of cultural adaptations to environment and climate. This paper addresses these two general issues, with special reference to a case study of EB collapse, attempting to place it into a broader framework, hopefully making a case for an historical role for environment that is important, but not deterministic.

THE MISAPPREHENSION OF ENVIRONMENT

The first issue in the comprehension of environment is that of scale, both chronological and geographical (cf. Butzer 1982). Climate and environment can be reconstructed on a variety

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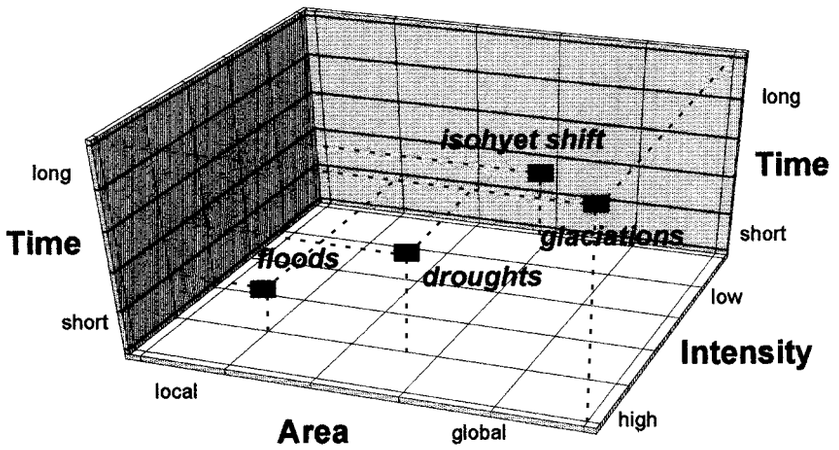

FIGURE 27.1. Graphical representation of the effects of scale on environmental conditions, over time (chronological changes) and area (geographical differences).

of scales, each of which may have significantly different meaning for human-environment interactions (cf. Butzer 1978). That is, climatic fluctuations can vary in intensity, as in greater or lesser amounts of rainfall or temperature; they may vary in length of time, from the extremely short term, in essence weather, to the long term constituting fundamental climatic belt shifts. They may vary in area affected, from the microenvironmental to the global. It is possible to view these scalar effects graphically, as in figure 27.1. Although the examples given in the figure suggest perhaps discrete categories or levels of environmental fluctuation, in fact, the axes represent graded continua of phenomena.

In addition to these axes of environmental variability, the randomness, or periodicity of phenomena must also be considered. Environmental fluctuations occurring at regular intervals, such as seasonality, are considerably different in human perception from those that occur at apparently random intervals. Phenomena that recur over long periodicities may be treated as random occurrences by societies which do not recognize the periodicity, but as regular events by those that do. Finally, random events may occur in statistically regular frameworks, allowing them to be treated as regular events, even if the periodicity is not regular. Thus, one may plan for the one-in-one-hundred-year flood, or the one-in-twenty-year drought, even if one cannot precisely predict the timing of these events. The interaction between these different scales is notable as well. Thus, low-intensity change over the short term, for example, a 10% drop in precipitation for a year, may require little social or economic adjustment, but a similar drop over the long term would clearly require adaptive responses.

Understanding these differences in scale is crucial to understanding the human response to environmental changes. All too often Levantine archaeologists conceptualize climate as simply wet/dry or hot/cold which tells us little about the impact on cultural systems. Cultural and technological adaptations to climate and environment must be keyed to these environmental scales, and it is crucial that we distinguish between phenomena operating on different axes, at different levels.

Specifically, if we categorize, perhaps trivially, the glacial advances and retreats of the Pleistocene as intense, long-term, global events, these nevertheless should not serve as a base-

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line for evaluating all later environmental change. The absence of climatic fluctuations on the scale of the Pleistocene-Holocene transition is not equivalent to a general absence of significant climatic or environmental change. Regional and local events of relatively higher intensity over the medium or long term may have major effects on societies, and even low intensity events, such as minor shifts in rainfall patterns, if extending over the longer term, may impact significantly on human settlement. Thus, Liphschitz's (e.g., 1986; Liphschitz, Gophna, and Lev-Yadun 1988) repeated claims that Israeli climate/environment was unchanged throughout the Holocene because it was consistently a Mediterranean environment should in no way indicate an absence of climatic variation capable of affecting human settlement. There is ample variation within the general Mediterranean system to allow for major environmental inputs to historical dynamics, especially in terms of intense regional shorter term episodes.

A second issue is that of the different processes and factors that constitute environment and climate, and the different means we have of reconstructing them. Although many archaeologists tend to view climate, or environment, as a kind of single variable concept, as in "climatic change," or "environmental change," these are actually comprised of a wide range of interacting phenomena. These include topography, hydrology, rainfall amount and seasonal distribution, soil types, temperature, and others. Each of these factors constitutes a dynamic system unto itself, and each exerts its own influence on agricultural production and society. Thus, topographical effects may exercise as significant an effect on water regime as rainfall, and soils may be as important as moisture amount for determining agricultural potentials. Even variations in temperature can influence effective rainfall by modifying the underlying evapo-transpiration regime, without any change in precipitation. In essence, human settlement is not affected by "environmental change," but rather by specific components of environmental change, and different subsystems within societies react to different components of the general environmental system.

The issue of the different components of environment and climate is also important in that they are reflected by different lines of evidence in the paleoecological record. Paleoenvironmental and climatic reconstruction is dependent on proxy data for periods and regions where historical records do not provide direct measures of such variables as mean temperature, precipitation, vegetation cover, etcetera. The basic problem faced by the historical ecologist is similar in this respect to that of the archaeologist, who must reconstruct ancient culture from relict information, modified by later events.

These proxy data require processual understanding of environmental phenomena in order to be integrated into a general environmental reconstruction. Different proxy data often represent disparate components of environmental systems that need not be operating in concert. Conversely, they may be the results of interacting components which may be quite difficult to sort out. Furthermore, they may reflect climatic and environmental events at significantly different scales. Thus, data sets such as terrace sequences, pollen diagrams, isotope series, and lake levels cannot simply be equated with greater rainfall or cooler temperatures. Each reflects a specific subset of interacting environmental processes. For example, river terrace sequences are affected by such variables as rainfall, vegetation cover, river gradient, geological substrate, and channel shape. Changes in pollen frequencies are affected directly by changes in vegetation patterns (although not necessarily in linear fashion), but vegetation patterns are determined by a wide range of factors, including soil types, drainage, rainfall, temperature, hydrological regime, plant

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succession patterns, shifting patterns of seasonality, and, not by any means least, anthropogenic factors.

Even apparently clear paleoclimatic indicators, such as isotopic measurement of snail shells reflecting the plant communities consumed by the snails and hence the general climatic regime under which the snails lived, require the reconstruction of a chain of environmental processes. Variation in the C3–C4 plant communities as represented in the snail shell isotope data reflect shifts of the desert margins that may have been effected by a number of factors, including fluctuations in seasonal distribution of rainfall, changes in evapo-transpiration rates caused by changes in temperature, and microenvironmental changes caused by any number of factors. Furthermore, even those shifts in the desert boundaries caused by climatic fluctuations might have been less significant in terms of human adaptations in areas farther north. That is, generalization from the snail isotope data may be as difficult as that from other types of data, depending on the specific issues of environmental reconstruction.

Belaboring the status of each type of proxy data is beyond the scope of this paper. The key point is that these data have rarely been integrated into any general climatic framework. Instead models of climatic and environmental change, especially those trotted out for use by archaeologists, have remained on the simplistic level of wet/dry cycles, with little true environmental reconstruction.

The final issue is the technical one of precision in dating and defining environmental events. Conceptually, the problem of dating environmental episodes is fairly straightforward—dating of these events is fundamentally difficult. Aside from simple problems, like standard deviations in ^{14}C dates, the proxy data often have different reaction times to the underlying environmental causes, reaction times which may be much slower than human reaction times. Goodfriend (1988, 1990) has convincingly documented shifting plant communities on the desert margin, based on snail shell isotopes, but in fact we have little data on how long it takes for one plant community to die out and another to colonize a region. Furthermore, such colonization time is surely dependent on distance from source communities, rendering simplistic single number answers inappropriate. Pollen analyses suffer from similar problems. Lag times between changing vegetation patterns and the original environmental stimuli have rarely been addressed in paleoecological reconstruction, yet may be crucial for understanding human adaptations which are presumably more quickly accomplished, at least on some levels. Even the establishment of the length of an environmental episode must be considered, especially since time and intensity may often be confused in the proxy data. It is notable that in some cases, climatic changes have been assumed to correlate with social changes, and the social changes thus used to date the climatic events.[1] The circular reasoning here is obviously problematic.

Beyond the issue of dating, the definition of climatic events in terms of the scales and factors discussed above has rarely even be addressed, let alone resolved. Most paleoecological data are qualitative or relative, suggesting directional changes in environment, rather than specific environmental reconstructions. Finally, our handy charts showing sequences of hot/cold,

1. The graph of Dead Sea fluctuations in Neev and Emery 1967: fig. 17 is a good example. The radiocarbon date is certainly not sufficient to fix all the climatic events, but they are nevertheless conveniently placed adjacent to major cultural breaks.

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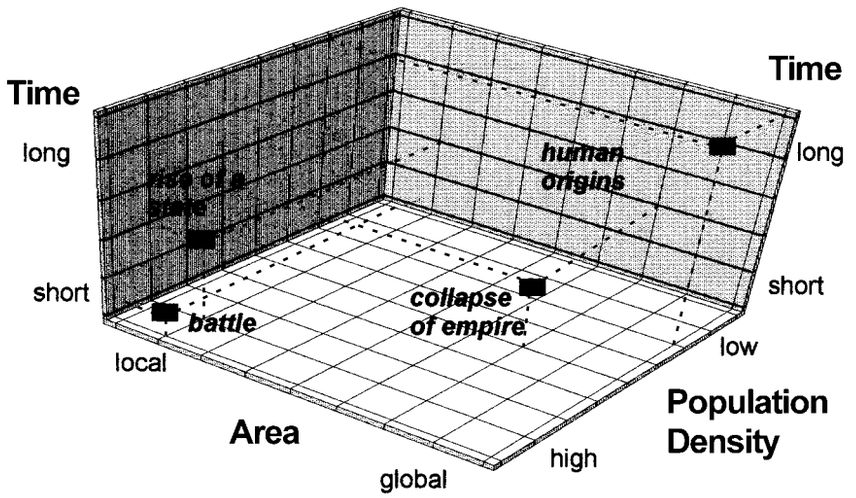

FIGURE 27.2. Graphical representation of the effects of scale on cultural phenomena, over area, time, and population density.

dry/wet, alluviation/erosion, or trees/grasses, usually modeled on archaeological periodization schemes, are fundamentally simplistic, and in fact tell us almost nothing about the real events that influenced human behavior. As above, the point is not a critique of each individual chronology of climatic events, rather that these chronologies require more critical analysis than is usually undertaken.

THE MISAPPREHENSION OF CULTURE

In much the same manner that archaeologists have tended to view climate and environment in overly simplistic ways, so natural scientists have tended to reduce history to a single variable, called perhaps "culture," or "society." As with environment, this reduction is so overly simplified as to be fundamentally wrong. Culture is so complex a concept as to defy consensus definition by anthropology. However, for the purposes of the examination of the role of environment in history, several aspects of culture require explication.

As with the scheme presented above for examining environment, so cultures can be viewed as consisting of component parts, operating on a range of scales (fig. 27.2). The scale at which one examines cultural phenomena must be explicit before any attempt can be made to link culture and environment. Again following the scheme suggested for environment, three axes can be defined: area, time, and population density. Area varies from the smallest unit of cultural-archaeological analysis, for the purposes of this discussion, usually the site, through regional analysis, and even onto global evolutionary events. For archaeological purposes, time varies from the shortest periods definable archaeologically or historically—for example, events like battles or destructions—through site occupation spans, cultural-archaeological horizons or periods, and longer civilization spans. Population densities vary from the sparse occupations of hunter-gathers in peripheral environments, through densely populated urban settings.

This issue of scale is especially important for analysis of culture-environment interaction. Single site abandonments are clearly not equivalent to regional or areal abandonments,

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short-term political fluctuations differ from major political transformations, and small technological innovations should be distinguished from principal stages of technological development. This may seem trivial to scholars accustomed to dealing with culture-historical dynamics, but environmental stimuli do not operate in equivalent ways at these different scales, an assumption which seems all too prevalent in interpretations of the relationships between culture and environment.

Periodicities and fluctuations occur in the cultural realm, as they do in the natural realm. Braudel (1972) has linked some of these to environmental variables and others to economic and political factors. Another obvious source of historical periodicity is simple generational replacement, especially among elites. Classic Hegelian and Marxist dialectics (e.g., McGuire 1992) can also be seen as patterned, if not cyclic. Of course, the underlying causes of these apparent cycles is grist for much historical debate.

Besides operating on a range of scales, over different axes, it is also useful to examine cultural systems as comprised of different component parts, interconnected, but nevertheless distinct parts of the whole. This systems approach is important since different types of stimuli on a culture need not act universally on all components equally and at the same time. Thus, while it is clear that such realms as technology, ideology, politics, and economy are all clearly interlinked in any cultural system, they nevertheless respond in different ways and at different levels to similar stimuli. Thus, political events need have little effect on technological or subsistence systems, although they may effect profound changes on social systems. Short-term intense environmental events may affect political systems more than religious symbols or technology. For example, bureaucrats, technocrats, politicians, theologians, and farmers will all have different and sometimes conflicting responses to drought. Even within the realm of one system, that of agricultural economy, there are variations in the impact of environmental change. An extended drought will result in very different responses from subsistence farmers than from cash-crop farmers. Finally, causalities are often complex. Le Roy Ladurie (1974) has suggested that the demographic catastrophe of the Black Plague stimulated major technological innovation, but only after population collapse.

The different cultural or social subsystems are also represented differentially by different types of archaeological data. It is a truism that such phenomena as religion and belief systems are less accessible to archaeological reconstruction than more material components of culture, such as technology or trade systems. However, it is a mistake to equate lesser visibility with lesser significance. Ideologies almost always act as the intermediaries, or filters, between external "physical" stimuli and cultural response, and different cultures will respond to stimuli in different ways, depending on their ideologies, especially over the short term. Corollary to this, similar archaeological phenomena may result from either different causes, or similar causes of differing intensities. For example, it is easy to conceive of a variety of causes of site or regional abandonment (e.g., Cameron and Tomka 1993; also Cordell 1984: 303–26), but it is also worth considering that cultures with differing levels of technology or social organization may react to "cultural" or "social" stress in significantly different ways. A cause for abandonment in one society may well stimulate intensification and apparent cultural florescence in another.

Finally, culture and history are not to be confused with the shorthand used by scholars which we call "periodization." The dating of cultural horizons is not the equivalent of the dating of cultures, but in fact relies on archaeological constructs whose actual links to significant

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cultural change may be tenuous. Periodization is built on time-sensitive indicators which, in the Levant, are not consistently employed over the range of archaeological time. Thus, periodization from the Neolithic though recent times has been constructed from such criteria as technological innovations, social changes, political changes, and ceramic styles. These defining criteria have not been applied equally in all times and places, although there is usually general consensus on the actual cutoff points for different periods. For example, the Iron Age (1200–586 B.C.) is defined in Israel not by the introduction of iron technology, but by an assumed historical event, the arrival of the Israelites, ca. 1200 B.C., and by the final demise of the Judaean kingdom in 586 B.C. Obviously, neither of these historical events has much relevance beyond the confines of the southern Levant.

Historical process rarely conforms precisely to archaeological periodization, which by its nature requires material reflection of that process before it can be recognized. Thus, while final abandonments or destructions of settlements and regions can often be precisely dated, the processes effecting those abandonments or destructions may precede them by centuries. Linkages between date of abandonment and external causes are thereby obviously suspect.

ENVIRONMENT AND ARCHAEOLOGY: TOWARD APPREHENSION

If the above discussions seem overly theoretical, there is nevertheless one point that should be clear: neither environment nor culture is a simple phenomenon. Neither can be appropriately characterized by univariate graphs, and both demand critical review for integration one with the other. Furthermore, they are inextricably interrelated, and integration is of the essence.

Although often simply ignored in archaeological explanation in the Levant, the role of environment and environmental change, including climatic change, is crucial to understanding ancient Levantine cultures. From the synchronic perspective, the Mediterranean zone which constitutes the heart of the southern Levant, and which is an assumed background for its archaeology, is a small and rather unique environmental patch in a much larger Near East. Subsistence practices appropriate to Egypt or Mesopotamia—for example, those utilizing large scale river irrigation—are not applicable to the Levant; nor are the terrace systems of the Levant applicable to the great river valleys. Climatically, the Levant is milder than surrounding areas as well, more appropriate to the mixed Mediterranean economy of grains, fruits (including olives and their products), animal husbandry (e.g., Stager 1985) than surrounding regions. In a very material sense, Levantine cultures are embedded in a specific ecological niche that provides a baseline for the economic, social, and political history of the region. Levantine cultures adapt, and have adapted, to fluctuations of virtually all orders in that baseline.

There are two issues here: the reality of fluctuations, and the nature of the adaptations. The first is in the realm of natural science, and the second, in the realm of the historical sciences. Herein lies the problem of integration.

There can be no question today as to the reality of environmental change within the Holocene, and within historic times, even in recent history. Events such as the Little Ice Age, or the Atlantic warm period, show up in the paleoenvironmental record worldwide. Regional events, sometimes of perhaps lesser spans, but often of greater intensity, are accepted fact throughout the scientific community.

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Within the Near East the reality of environmental and climatic change cannot be doubted. Besides the global events, which by definition would have affected the Levant, numerous scholars have demonstrated the occurrence of episodes of environmental variation, reflected over the entire span of historical times. This variation is not uniform but is reflected in a range of proxy data, representing different processes and intensities of fluctuations.

It has been suggested that this variation in the Levant was of an order too low to significantly affect social process and pattern (cf. Liphschitz 1986; Liphschitz, Gophna, and Lev-Yadun 1988). However, in the sense that the Levantine Mediterranean zone is a kind of large-scale transition from the arid subtropical belt of Arabia and North Africa to the continental zone of Anatolia, minor movements of climatic belts might have even greater effects on the Levant (e.g., S. A. Rosen 1987; Goldberg and Bar-Yosef 1982). Small shifts in the steep north-south precipitation gradients characteristic of Israel might effect major reorientation of vegetation communities, especially at the steppe and desert margins. Thus, such shifts of the 200–300 mm rainfall isohyet, the threshold for dry farming of cereals, could significantly affect the agricultural potentials of the large tracts of land between Beersheva and Qiryat Gat.

The second issue is that of social and cultural response. The first point is that abandonment and collapse do not constitute the sum total of possible responses to environmental deterioration, nor is florescence necessarily the standard response to amelioration. The concepts of collapse and florescence are, of themselves, problematic (Yoffee and Cowgill 1988). The political collapse of Rome was accompanied by economic florescence in some parts of the empire (e.g., Bowersock 1988), and technological florescence of the early Iron Age seems to have been a result of the socioeconomic collapse of Late Bronze Age (LB) systems (e.g., Muhly 1980).

However, beyond the semantic issue of defining collapse, our perceptions of collapses as sudden or as the result of a predetermined and unalterable sequence of events is a problematic view of historical causation. Given environmental or climatic input, there is a range of possible responses that a society or individual may take, any of which may result in significantly different outcomes. The decisions upon which these outcomes rest are guided by a complex set of factors, including cultural perception of the environment, and technological and social potentials for different kinds of response. From our Western perspective, a society that responds technologically to environmental pressures is more likely to survive than one that responds with temple building. Yet in the early stages of environmental stress, a society responding with temple building might well appear archaeologically to be undergoing florescence. Furthermore, although we might assume that ultimately such a temple-building response would result in famine, alternatively, it is possible to hypothesize that the centralization of power established by such acts might allow more effective utilization of resources and manpower, perhaps enabling a society to survive environmental deterioration through social adjustments instead of technological ones. Other responses, well within the potentials of a society, are also possible, such as diversification of production, intensification, or, of course, technological innovation.

The point, of course, is that historical explanation demands more than assumed causality based on mere correlation or coincidence. Social and cultural processes mediate at all levels of human-environment relations. It is this mediation which determines historical outcomes, and which, in combination with the study of environment, should be the focus of historical explanation.

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THE CLOSE OF THE MILLENNIUM: EXAMINATION OF THE END OF THE THIRD MILLENNIUM B.C.

One period that has traditionally been the subject of much of the debate concerning culture-environment interactions in the Levant is the third millennium B.C., the Early Bronze Age (EB) and its successor, the Middle Bronze (MB) I. The reason for the focus on this period is related in no small measure to the great and abrupt social changes evident in the transition, and, importantly, the characterization of these changes as "collapse." Climatic change can be attributed to period as well. However, the coincidence between sociopolitical collapse and climatic change should not be confused with perfect correlation nor with direct causality.

The reality of climatic change during the fourth–third millennia B.C. is indisputable. A wide range of proxy data strongly indicates an ameliorated climate at the beginning of the EB and a deteriorated one at the end.

Amelioration consists of the following lines of evidence: high Dead Sea levels (Frumkin et al. 1994), and increased runoff (Neev and Emery 1967; Neev and Hall 1977), wadi terrace alluviation in both the Mediterranean zone (A. M. Rosen 1986) and the arid steppe zone (Goldberg and Rosen 1987), southward extension of C3 plant communities, as indicated by snail shell isotopic data (Goodfriend 1988, 1990). Deterioration at the end of the period consists of low Dead Sea levels, wadi incision resulting in abandoned floodplains (A. M. Rosen 1991, 1997), and the northward movement of C3 plant communities.

These different lines of evidence amount to more than a simple outline of wetter/cooler or drier/warmer climate superimposed on a landscape similar to that of today. In terms of amelioration, the fine alluvial deposits of terraces associated with the EB ceramics in the south and central Israel suggest an aggrading alluvial regime, with more regular river flow and increased spring flows. Such systems would have been ideal for simple floodwater farming, and indeed evidence from plant phytoliths points to cereal cultivation in moist alluvial soils during this time period (A. M. Rosen 1995). These conditions would have been especially notable for the steppes and desert fringes, allowing more intensive agricultural exploitation of these regions. For the higher rainfall areas in the north, farming in the periodically flooded valley bottoms would have provided stability and predictability of yields even in drier rainfall years. Increased vegetation cover in the Negev highlands suggests enhanced grazing territories. Areas farther north would achieve generally greater stability in agricultural regimes.

In terms of deterioration, decreased rainfall probably affected both the southern and northern regions, although to different degrees. Erosion and downcutting of wadis would have rendered simple floodwater farming impossible, and greater instability in the rainfall regime probably rendered agriculture a more risky enterprise even in areas where absolute average amounts were still adequate for dry farming. In general, the desert boundary moved north, rendering the lower rainfall areas unusable for farming. The higher rainfall areas suffered lower yields which lowered the overall carrying capacity of the region.

Dating these episodes is problematic. Although there is rough agreement about the general climatic periods, dating the specific processes, and the thresholds associated with them, is less easily accomplished. For example, although we know that erosion replaced alluviation as the dominant hydrological process some time in the latter half of the third millennium, we cannot

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precisely date this shift in different areas. And indeed, it probably differed from north to south. Nor can we date precisely when streams ceased to flow. Similar difficulties obtain in dating the northward expansion of the desert zone and associated plant communities.

The correlation of the social collapse with the evidence for environmental change is also problematic. Although Issar (1995) ties the abandonment of Tel Arad to climatic decline at 2600 B.C., this is at least 400 years prior to the collapse of the rest of the EB system, and he ignores the rise of such southern EB towns as Tell el-Hesi and Tel Ḥalif (Lahav). Although he cites the decline in number of settlements in the Beersheva basin during the MB I period (citing Govrin's 1991 data) as the result of desiccation, he ignores the MB I settlement floruit in even more arid areas farther south (e.g., Cohen 1999; Haiman 1986, 1993).

The sociocultural picture is no less complex. The EB city-states consisted of a hierarchical society ruled by an elite class whose wealth and power most likely derived from control of trade, in part the exchange of luxury goods such as olive oil and wine (Stager 1985; Joffe 1993: 82–86). The lower classes of society who provided the necessary labor for the production of these products were probably at least partially integrated into the system by loyalties to a temple cult and its perceived influence on the fertility of crops and herds (e.g., Ben-Tor 1992; Amiran 1972; Joffe 1993: 83) as well as a system of grain redistribution in times of periodic drought. This relationship of labor in exchange for security, plus the buffer effect of floodwater farming, functioned as a successful adaptation and equilibrium in a semiarid environment with periodic droughts. The climate deterioration and resulting hydrological changes removed the buffer provided by floodwater farming, thus undermining the ability of the society to provide for its population in times of drought. This would have dramatically decreased the carrying capacity of the region without the introduction of a technological change in water management. The EB city-states were incapable or unwilling to utilize other systems of agricultural intensification. The reasons for this are unique to this particular cultural milieu and should be investigated as such.

Recent surveys and excavations in the center of the country suggest that although the urban system of the EB collapsed, in fact a village system, based on subsistence farming and animal husbandry, replaced it. Change in settlement patterns seems to reflect a shift in agricultural organization and economic realignment, and not the general collapse of farming in favor of pastoral nomadism.

The dynamics of Canaanite economic systems must also be considered, especially in the context of a larger Near East. The development of Egyptian sea trade, especially via Byblos, probably acted as an economic stimulus to northern Canaan, whereas the Egyptian withdrawal from the Shephelah during the EB I and the virtual cessation of trade at the end of the EB II may well have precipitated economic crisis. If copper was the fuel of the Aradian economy, then Egyptian access to other sources, via the sea route, may well have contributed to the Aradian decline.

On the other hand, the growth of Mesopotamian and Syrian states in the later third millennium had its effect on the Levant as well. The general Near Eastern collapse at the end of the third millennium was an economic catastrophe, even for those areas that might not have been directly affected by such primary factors as environmental decline.

It is possible to construct a model of the EB collapse that ignores the role of environment, just as it is possible to construct one that ignores social and economic processes. The point

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here is that environmental deterioration did occur, and the EB society must have reacted in some way. Even lack of reaction is a reaction, albeit an unlikely one.

The effects of the environmental changes reflected in the proxy data seem to be that rain-fed agriculture in both the more temperate and marginal zones would have become progressively less predictable with an increase in drought years and a resulting decline in carrying capacity. Floodwater farming, which previously could have acted as a buffer for drought years also would have suffered as a consequence of decreasing water flow and downcutting streambeds. Although the timing of these changes is not precise, there is a gradient of environmental effect—not all regions would have been affected equally. Agricultural collapse was not all-encompassing, but selective. This suggests a kind of cascade effect on the economic system triggered by increased pressures in the marginal zones, declining yields in the temperate zones, and decreases in the economically important tree and vine crop industries. Such an outcome is not sudden, even if the environmental effects on some regions may have been intense and relatively rapid. Furthermore, the impact on nomadic populations in the deserts and desert fringes may have been just as great. Ethnographically, Bedouin seasonal rounds in the Negev may extend hundreds of kilometers farther north in drought years than in normal years, well into the Mediterranean heartland. Long-term decline in rainfall in the Negev seems to correspond to more nucleated settlements in the MB I than were present in the EB (florescence, in a sense!). In the Negev highlands, where the largest of these settlements have been found, they are almost always located adjacent to springs. The abandonment of these settlements by the beginning of the second millennium B.C.—that is, at the beginning of the MB II—can be seen as a continuation of a process of general settlement realignment which may in fact have begun much earlier, in the EB period.

The infiltration and probable eventual settlement of nomads in the better-watered regions cannot yet be addressed archaeologically, but texts are clear in indicating the movements of what appear to be nomadic peoples—namely, the Amorites—during the end of the third and beginning of the second millennium B.C. At least in some instances, hostilities ensued. If tying these migrations evidentially directly to climatic stimuli is not possible simply because of lack of concrete evidence, surely the coincidence of events cannot be dismissed as totally unrelated one to the other.

The case of the EB collapse provides us with an effectual laboratory for examining the seeming dichotomy between environmental determinism and historical process. The facts that are readily acknowledged are the existence of a degree of environmental deterioration roughly coincident with the fall of the EB Canaanite civilization and the abandonment of the vast majority of towns and city sites. The question worthy of examination here lies in the nature of this causality. Some climatologists and archaeologists point to the strong evidence for environmental deterioration which is taken as an unquestioned given for the fall of a civilization. However, if this were the case, then why is it that later complex civilizations, such as the MB cities, were able to survive in the same dry environment that caused the demise of the EB? On the other hand, some archaeologists have completely rejected the environmental explanation based on facts such as the location of the EB sites within areas that receive adequate annual rainfall averages for dry farming, even under the modern dry regime; and also that some city-states (for example Iktanu [Prag 1974] and Khirbet Iskander [Richard 1986] in Transjordan) did continue to exist in full urban glory even after cities in western Palestine were abandoned.

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The basic misconceptions here lie in the lack of understanding of the dynamics and resilience of cultural systems in the first case, and a misapprehension of the interaction of climate, temporal distribution of rainfall, landscape changes, and agricultural economies in the second. In order to evaluate the effects of environmental change on a given society such as that of the EB III, it is necessary to open the cultural "black box" and attempt to examine the economic and social effects of a climatic change in order to postulate a probable adaptive response given the unique social, technological, economic, and political parameters of the system under study.

So the final answer, in one sense, to the question of the southern Levantine EB cultural response to climatic deterioration is, in fact, collapse. There does appear to have been environmental stress which seems to have overwhelmed some (although not all) of the civilizations of the third millennium B.C. in the Near East, and in the Levant specifically. But such an explanation is so fundamentally incomplete as to verge on being wrong. The EB society was not bowled over overnight, regardless of recent volcanic scenarios. The agricultural technologies available to the reurbanizing MB II peoples, such as better water management, wells, intensive terracing, and possible canal irrigation (cf. Miller 1980), which allowed them to adapt and flourish in the drier environmental circumstances of the second millennium B.C., were no less available to the people of the EB. These were not inventions, but adoptions. Thus, the issue of the timing of these adoptions is of the essence, and this is a question of cultural adaptations which are structured by social perceptions and receptiveness, political organization, and economics, and not merely the occurrence of climatic catastrophe (A. M. Rosen 1995).

CONCLUSIONS

The simplistic environment-culture dichotomy has deluded scholars far too long. There is no dichotomy. Ancient civilizations did not rise and fall in abrupt episodes initiated by climatic catastrophes. Rather, they were fine-tuned to environment, constantly adjusting various components of society in response to both major and minor environmental fluctuations. The view of societies as static, stable, and inflexible is based on archaeological constructs such as rigid periodization schemes which may either mask or overemphasize change through their terminologies, or may simply lack the precision to define it well.

This is not to say that social systems did not collapse as a result of environmental pressures, but rather that these collapses were the result of social failures: wrong decisions, poor investments or planning, and inappropriate responses to natural events, not merely the occurrence of the natural events. We simply do not notice the successful adaptations, or take them as natural and obvious. Yet, it is obvious that cultural response to environment cannot always be inappropriate because no society could survive even minor fluctuations were that the case.

It might be argued that cultures are able to respond only up to certain intensities of climatic or environmental deterioration, and that the most intense events leave no option but collapse. Aside from historical examples that could be trotted out in counterargument, even marked environmental events that triggered collapses have often been followed by readaptation. The issue is really response time, not the intensity of the environmental deterioration. There is no set rule for what environmental stimuli will initiate collapse. It varies with every culture and historical circumstance. The key issue must be the reconstruction of the interactions between environment and culture, and not the mere claim of causality.

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A SERIES OF RADIOCARBON DATES FROM THE LATE EARLY BRONZE AGE I SITE AT ḤORVAT ʿILLIN TAḤTIT

Dror Segal and Israel Carmi

INTRODUCTION

In December 1991 a number of samples for radiocarbon dating were sent to our laboratory from the excavation of Strata III and IV of Ḥorvat ʿIllin Taḥtit (see Braun et al., chap. 4, this volume) near Beth Shemesh, Israel. The samples, collected in the summer of 1991, were provided by the excavator from selected loci, excavated under tight stratigraphic control. A number of samples were discarded for lack of organic material and the presence of inorganic contaminants. However, ten remaining samples were found to be worthy of testing. They include two derived from short-lived plants, especially good for obtaining dates.

THE SAMPLES

A description of the samples is provided in table 28.1

Table 28.1. Radiocarbon Samples from the Late EB I site at Ḥorvat ʿIllin Taḥtit

	Lab. No.	*Description*
1	RT 1567	Charred olive stones (*olea europaea*) derived from a hearth in Locus 273, Basket 1391
2	RT 1572	Charred wood on the floor of a house with ceramic vessels, in situ, Locus 117, Basket 1065
3	RT 1573	Charcoal from Locus 174, Basket 1342
4	RT 1576	Charcoal from Locus 258, Basket 786
5	RT 1602	Charcoal from Locus 228, Basket 618
6	RT 1603	Charcoal from Locus 283, Basket 1049
7	RT 1604	Charred emmer wheat* found in a cermaic vessel, in situ, on a floor of a building; Locus 258, Baskets 813 and 976
8	RT 1660	Charcoal (*olea europaea*) from Locus 258, Basket 976
9	RT 1661	Charcoal from Locus 279, Basket 944
10	RT 1662	Charcoal (*olea europaea*) from Locus 258, Basket 965

* Thanks are due to U. Baruch (Israel Antiquities Authority) and N. Lipschitz (Tel Aviv University) for the identification of these grains.

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The measurement procedures included cleaning of the samples with hydrochloric acid, combustion in oxygen conversion to lithium carbide, acetylen (addition of water), and finally to methane (addition of hydrogen), which is the counting gas in the proportional counters of the laboratory (Carmi 1987).

The cleaning and preparation of the samples in the laboratory was done by standard methods (Mook and Waterbolk 1985: 34–42; Gupta and Polach 1985: 8–12). No special problems were encountered in this process.

The results of the measurements are shown in table 28.2.

Table 28.2. Radiocarbon Determinations from the Late EB I site at Ḥorvat ʿIllin Taḥtit

Sample	*Δ ^{14}C (‰)*	*^{13}C (‰)*	*YBP*[a]	*Calendric Age*[b]	*Probability*[c]
RT-1567	76.4 ± 5.6	–25	Modern	Modern	
RT-1572	–418.2 ± 2.6	–21.97	4350 ± 35	3029–2973 B.C.	65%
				2931–2905 B.C.	35%
RT-1573	–443.3 ± 4.0	–21.21	4705 ± 55	3616–3590 B.C.	16%
				3526–3374 B.C.	84%
RT-1576	–419.3 ± 3.8	–21	4365 ± 50	3031–2914 B.C.	100%
RT-1602	–446.7 ± 3.7	–20.4	4755 ± 55	3631–3506 B.C.	85%
				3408–3385 B.C.	15%
RT-1603	–443.7 ± 5.7	(–22)	4710 ± 80	3621–3578 B.C.	22%
				3534–3373 B.C.	77%
RT-1604	–428.3 ± 3.1	–25	4490 ± 45	3331–3092 B.C.	97%
				3053–3048 B.C.	3%
RT-1660	– 449.7± 3.7	–21.3	4800 ± 55	3648–3517 B.C.	100%
RT-1661	–391.4 ± 6.6	–23.4	3990 ± 90	2615–2337 B.C.	100%
RT-1662	–411.3 ± 3.8	–17.1	4255 ± 50	2916–2868 B.C.	55%
				2805–2703 B.C.	45%

a. Conventional radiocarbon age (1950).
b. Standard dendrochronological calibration (Stuiver and Reimer 1993).
c. The results are given at 1 sigma uncertainty, and the probability shows the confidence in percentage. When the results fall on a curve, there is likely to be more than one calendaric age indicated. In that case the results are indicated by their relative reliability by percentage. An alternate possibility is to combine the calendaric ages and get a probability of 100%; e.g., RT-1604 would be indicated as 3331–3048 B.C.

DISCUSSION

Sample RT-1567 was shown to be modern olive pips, undoubtedly related to agricultural activity on the site during this century. It should be noted that remains of an olive grove still cover most of the hillside.

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During the preparation of sample RT-1661 a number of minor, technical problems were encountered. However, they should not have affected the results. The age of this sample is less expected from an EB I occupation to which it is attributed, and it may be ascribed to either these technical problems or to the intrusiveness of the sampled material.

The remainder of the ^{14}C test results, based on nine samples, indicates two clusters of dates. The later cluster, composed of samples RT-1572, RT-1576, RT-1604, and RT-1662, indicates dates that are, more or less, in agreement with conventionally accepted dates of the EB I horizon (Mazar 1990: 92; Ben-Tor 1992: 82). When the results of these samples are averaged out, they indicate a date of 4365 ± 22 YBP which, when calibrated, yields the range of 3094–2888 B.C. (1σ).

The second cluster of dates is surprisingly earlier than expected but does not seem to be an anomaly. Included are four samples—RT-1573, RT-1602, RT-1603, and RT-1660—which give calibrated dates ranging from 3375 B.C. to 3649 B.C. These dates are several centuries too early for the generally accepted time span of the material culture of this site (a late, southern facies of EB I which is associated with the late Predynastic Period-Dynasty 0 of Egypt).[1]

This discrepancy in dates can be explained by a number of possibilities. The cluster of later dates may have included, besides the obviously seasonal grains of emmer wheat (not likely to have been stored for more than a year or two), brushwood for fires which would accurately reflect the age of the settlement from which it derived. The second cluster, which does not include any obviously seasonal, organic materials, could be composed of samples of charred wood from trees of no little age, especially if derived from inner tree rings. Another possibility is of the "recycling" of timber from earlier settlements in the vicinity (e.g., Lipschitz and Biger 1992: 19–22).

Thus, preference for samples for ^{14}C dating should be given to organic materials of a seasonal nature. Greater accuracy can also be insured by the multiplication of samples. A series of dates from the same context will invariably reflect a more accurate measure of the date of the context than will a single sample which, conceivably, could be of doubtful stratigraphic attribution.

Despite the possible shortcomings of the results of radiocarbon dating for archaeological sites, the method remains an important and independent source of dating as may be deduced from the Ḥorvat ʿIllin Taḥtit series.

1. For a discussion of the dating of this site, see Braun and van den Brink 1998 and Braun et al., chap. 4, this volume.

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PHILISTINE BICHROME PAINTED POTTERY: SCHOLARLY IDEOLOGY AND CERAMIC TYPOLOGY

ILAN SHARON

INTRODUCTION

Douglas Esse's last published works (1991, 1992) were a foray into a hotly contested question in archaeology: Can ethnic affiliation be identified on the basis of a typological corpus? In biblical archaeology this question has been most extensively discussed in the framework of the emergence of statehood in the Iron I period, when, it has been argued, at least three material cultures may be clearly delineated in the archaeological record. These may be equated with the Israelite, Canaanite (later to be Phoenician), and Philistine ethnic groups, which were competing for ascendancy at the time (see e.g., Mazar 1990: 295–357 for a general introduction to the period). These identifications are brought under increasing criticism in recent years.

Esse concentrated his attack on the use of the "collared-rim jar" as the *fossil directeur* for identifying the Israelites. This article addresses another facet of the same quandary—the identification of "Philistine pottery" with Philistine ethnicity.

Esse's work on Israelite ethnicity may be grouped within a growing body of *processual-functional* critiques of the previously established identity between the spatial and temporal distribution of given pot-types and the extent of Israelite seizure of the land of Canaan (Edelman 1991; Knapp 1989, 1993: 77–88; Finkelstein 1994, 1995a; Bunimovitz 1994; Portugali 1994; Sharon 1994). The present essay emulates the *structure* of Esse's argument, but invokes a different theoretical framework. I attempt to build a *symbolic* model to explain the birth of a "Philistine" ethnos and the appearance of the hand painted bichrome pottery style.

Several points explicitly raised or implicitly implied in Esse's reasoning are characteristic of his world-view, and will underlie the present work too:

(1) The formulation of a theory cannot be explained in terms of data alone, nor of ideology alone. Esse chose to present the growth of the database supporting (and countering) the joint distribution of typological form and ethnic identity in the context of the questions that engaged contemporary research and the ideologies which motivated the researchers at each stage of the history of the discipline of biblical archaeology. Looking through the bifocal lenses of the state of knowledge at a given time and the intellectual milieu in which it was perceived, he analyzed how the connection between the Israelites and the collared-rim jar was made, and why the model subsequently broke down.

(2) Esse was non-sectarian in his intellectual affiliation. He combined novel approaches with a healthy respect for old-fashioned scholarship. Accordingly, the model that he offered was not a total rejection of the views which had prevailed in seventy-five odd years of study,

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but rather one of qualified agreement. While accepting most of the data of previous researchers and some of the interpretations, he subtly altered the theoretical basis upon which these interpretations were based. He does perceive a correlation between the distribution of a ceramic style and ethnic identity, but the relation is not one of isomorphism.

(3) Esse's model, as mentioned above, uses functional / processual theory to explain the emergence of new ethnic identities in late second-millennium Canaan. He sees, in the thirteenth–tenth centuries B.C., the development of a "highland" economy, of which the collared-rim jar is a characteristic vessel. This economy is typical, though not restricted to, the group which would come to be called "Israelites." This economic system has extensive interaction with the entrenched "lowland," predominantly Canaanite, economic structure but remains detached (at least to begin with) from a "coastal" (Philistine) economy which is contemporaneously emerging.

Like Esse's work on the Israelites, this paper does not present any new data. It does not even, in the ordinary sense of the word, suggest a new explanation for the origins of the Philistines, but rather provides theoretical justification for an existing one. In the following pages, I trace the development of the conception equating the biblical Philistines with the "Sea Peoples" of Egyptian literature and both of these entities with a particular style of pottery decoration. The Dothans' recent work (Dothan and Dothan 1992) does this admirably, and I use it as the primary source of the narration. Next, I shall examine the criticism leveled at this view, mostly in the last fifteen years. I argue that though these critiques have undermined the factual basis of the older paradigm, the attempts to reach a new consensus are hindered by lack of theoretical backing. A semiotic view of culture and of ethnicity might provide such a background.

In the depiction of the ideological background against which the views of Philistine cultures developed over a century-and-a-half, we shall need to consider changes in the perception two concepts: The first is the significance of archaeological cultures—from a hereditary view to a normative one, and hence to functional, systemic, and semiotic definitions of "material culture." The meaning of the spatial and temporal distribution of given artifact types or attributes, in terms of historical, social or behavioral import, is a central question (perhaps *the* central question) in the discipline of archaeology, and one for which every generation of practitioners had differing answers. Describing these in detail here would be superfluous, as several textbooks (e.g., Trigger 1989, Hodder 1986) have been devoted to the subject. Some of the relevant properties of such views that have had a bearing on the definition of the Philistine material culture are mentioned *en passant*. It should perhaps be pointed out here, that despite its centralistic archaeological reasoning, this polemic is arguably an academic exercise limited to the archaeological community. Nevertheless the changes in the acceptable definitions reflect general trends in the climate in which this community operates, and the changing roles that the past was expected to play in contemporary society.

The second theme to be considered is changes in the definition of *ethnos* or nationality. What is the exact basis for declaring oneself (or others) to be "American," "Jewish" or "Palestinian?" (to mention several ethnic designations which are more than a tad problematic . . .). This question, of course, has a much wider and more immediate significance to society at large, but it is influenced by the very same trends which affect the former. The emic view of an ethnos, and of the privileges and obligations of the individual towards it, is usually con-

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ceived as an extension (actual or symbolic) of the natural notion of a family. Widely divergent etic definitions have been used for a variety of legal, moral, and political purposes, but the following four notions play a role in most: common ancestry; shared traditions or ceremonies; shared circumstances or common destiny; and self-determination. "Classic" nationalism of the mid-nineteenth to mid-twentieth century gave preference to the first two definitions, while in the post-war era one or the other of the second two are usually emphasized. This shift has also colored the connection archaeologists see (or do not see) between material culture and ethnic identity.

BEFORE 1850: BIBLICAL EXEGESIS AND CONJECTURE

Speculation about the Aegean origins of the Philistines is as old as biblical commentary itself. It is based on two passages, in Jeremiah (47:4) and Amos (9:7), that declare the origin of the Philistines to be in כפתור (*Caphtor*). The term כפתרים (*Caphtorim*) is also mentioned in Genesis 10:14, as a group related to, but distinct from, the Philistines. Deuteronomy 4:23 notes the settlement of *Caphtorim* around Gaza, overlapping the southern fringes of the Philistine littoral. There also seems to be some connection between the Philistines and the כרתים—*Crethim* (Ezekiel 25:16; Zephania 2:5). The earliest translation of the Bible to Greek, the Septuagint (probably second century B.C.), renders כפתור as Cappadocia (in Central Asia-Minor—rather strange, in view of the mention in Jeremiah, which specifically notes that *Caphtor* is an island) and *Crethim* as Crete. Stephanus of Byzantium (sixth century A.D.) relates a tradition connecting Gaza, the major city of the Philistine pentapolis, with king Minos (Dothan and Dothan 1992: 8).

In 1747 Etienne Fourmant identified the Philistines of the Bible with Homer's *Pelasgians* who were said to have inhabited Greece, Asia Minor, and Crete before the coming of the Greeks. He also was the first to claim that the biblical term for a Philistine ruler—סרן (*Seren*) is a Hebraecised version of the Greek τυραννος (*tyrannos*—tyrant). He thus initiated a long tradition of etymological gymnastics—trying to assign a place of origin to the Philistines on the basis of matching possible slivers of a putative Philistine language (a few names and perhaps a couple of words which have infiltrated into the Hebrew language) with similar-sounding words or names in Greek or other languages (cf. Singer 1988 for a recent review). In the same vein Ferdinand Hitzig (1845) claimed that the Philistines (= Pelasgians) were Aryans, drawing on some similarities between supposed Philistine words (*Goliath*, *Seren*, *Ashdod*, *Ashkelon*) and words in Sanskrit, while K. B. Stark (1852) claimed that the Philistines were none but Phoenicians and found Semitic etymologies to most of the terms that others had pronounced an Indo-European ancestry for (Dothan and Dothan 1992: 9–10).

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Some words are called for to explain the obsession about Philistine *origins*, which seems to dominate the study of Philistine culture since its inception. This fixation seems peculiar to modern European commentary, and does not necessarily emanate from the biblical source itself. True, the genealogical lists in Genesis and Chronicles do speculate about the position of the Philistines in the family of man, and some of the later prophets allude to a Philistine

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homeland in foreign parts. Such assignation of place of origin and ancestries to known peoples is part and parcel of any mythology. There does not seem to have been any mystery attached to the origins of the Philistines in particular. The above-mentioned reference in Amos, for instance, states in the same breath that the Arameans came from *Qir*; and yet *Qir* has not excited European exegetes, and one has yet to hear of any expeditions being organized to locate it.

Post-enlightenment Europe's perception of the past was warped by two great magnetic poles—the Bible and the classics (Bernal 1987: 4). An educated (or uneducated, for that matter) European's initiation to biblical literature was at baptism and continued thereafter every Sunday of his or her life. Formal schooling was largely a matter of learning Greek and Latin. Whenever one could read the classics in the original, ones' education was deemed complete. Also, prior to the archaeological revolution of the late nineteenth century, Homer, Herodotus, and the Old Testament *were* the only windows through which one could peek at a past more than two millennia old. Thus the Greeks and the Hebrews loomed larger-than-life in the European's intellectual conception of the past. The possibility that a connection could be found *between* these two poles ignited the romantic imagination of eighteenth and ninteenth century public.

There was also a more "practical" side to this concern. As the shadowy civilizations of the East took on form and history in the nineteenth century, they came to threaten Eurocentric world views at just the time that Europeans most needed self-justification for applying different moral standards abroad than they did at home. One way out of this dilemma was in theories that posited that all advances in civilization occurred as a result of the imposition of an inherent maverick creativity of the roving Indo-Europeans on the stability of servile peasant cultures in the Middle East and around the Mediterranean (Trigger 1989: 158–69; Bernal 1987: 31–33). Thus the discovery that the Hittites spoke an Indo-European language created great excitement in the beginning of this century, as did speculations as to the Indo-European origin of the Sumerians, and the supposed Indo-European (if not actually Aryan) aristocracy ruling the Canaanites. D. Hogarth, secretary of the Palestine Exploration Fund, upon commissioning an expedition to study the origins of the Philistines as late as 1920, set the terms of this commission to find out "whether it was in (*sic*) virtue of a distinctly higher apparatus of civilization that the Philistines so long terrorized the Hebrews" (*Illustrated London News*, quoted in Dothan and Dothan 1992: 43). Upon conclusion of that commission, W. J. Phythian-Adams hastened to assure his senders that "the finer arts of the Late Bronze Age (LB) were imposed on the Canaanites from outside" (Dothan and Dothan 1992: 46).

1830–1900: EGYPTIAN ART AND PALEOGRAPHY

The beginning of modern research of Egypt is usually attributed to the scientific expedition which accompanied Napoleon on his invasion of Egypt. Typically, although the evident relics of high civilization in Egypt far eclipsed anything that was known of the Bronze Age or Early Iron Age in Greece or Israel, it was possible connections of Egyptian remains to either the Bible or Greek mythology that created the greatest excitement.

The first description of the great land and sea battles between the Egyptians and foreigners wearing feathered or horned head-dresses, depicted on the walls of the great temple

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at Medinet Habu dates to this campaign. It was not, however, until Champollion's expedition to Egypt (1829), following his decipherment of the Hieroglyphic script, that the structure was correctly identified as the burial-temple of Ramesses III, the last of the great rulers of the New Kingdom.

Before his death Champollion (1836: 180) managed to read one of the names of Ramesses' foes and identified them as Philistines (literally: *prstw*). It was not until 1856 that the entire inscription accompanying the Medinet Habu reliefs was transcribed and deciphered by Emanuel de Rougé (see Rougé 1867 and Dothan and Dothan 1992: 22–23). It reads:

> Year 8 under the majesty of [Ramesses III] . . . The foreign countries made a conspiracy in their islands . . . their confederation was *prstw*, *tꜣkrw*, *skrsw*, *dnynw* and *wꜣssw* lands united. They lay their hands upon the lands as far as the circuit of the earth, their hearts were confident and trusting our plan will succeed." (trans. after Wilson 1950: 262)

Once the names of these groups of Sea Peoples (as they were later dubbed by Maspero) had been read, it was realized that some of them appear in Egyptian documents as early as the Amarna period, and Merneptah, Ramesses III's predecessor, had already fought off one attempted invasion by them (Phythian-Adams 1923: 21–22). Additional foreigners "of the sea" are mentioned in these earlier sources (*rkw*, *drdnw*, etc.)

Additional historical evidence may be found in the Harris Papyrus (Breasted 1906, IV, §403), which adds that after their defeat the Sea Peoples were settled by Ramesses III in "strongholds" and allotted rations (i.e., were used as mercenaries). Evidence for Sea Peoples in Egyptian documents postdating Ramesses III is scant. Some *tꜣkrw* are mentioned as residing at Dor, in the northern coastal plain—in the so called "Story of Wen Amon" (Papyrus Moscow 120)—a literary work of arguable historical accuracy. Even more problematic is the "Onomasticon of Amenope" (the Golenischeff Papyrus), a cryptic list of geographical and other terms, that has been taken by some to read that the *tꜣkrw* dwelled somewhere north of the *prstw*, and the *srdnw* still further north. Both of these sources are conventionally dated ca. 1100 B.C.

Rougé, like most scholars before him, immediately tried to match the names he read with names in the *Iliad*, identifying the *drdnw* as Homer's Dardanians, the *rkw* as Lycians, and so forth. A curious byline is that despite the great fondness of biblical writers for collecting ethnographic lists, none of the names of the Sea Peoples, except the Philistines, are found in the Bible (unless one chooses to accept Yadin's [1968] scintillating suggestion that the *dnyn* are actually the tribe of Dan).

Rougé could not fail to note that Ramesses' great battle against the Sea Peoples (1191 B.C., according to Rowton's [1976] chronology, 1175 B.C. according to Wente and van Scilen [1976]) took place just a few years after the traditional dating for the fall of Troy (1184 B.C., according to Thucidides). It is also just a few decades later than the conventional dating of the entry of the Israelites into Canaan. Rougé proposed in 1867 that the fall of Troy triggered a whole set of secondary ripples, where one people displaced another, causing them to push over a third group and so on, and that the end result was the Philistine's conquest of southwestern Canaan and their abortive attempts to invade Egypt (Dothan and Dothan 1992: 22–26). This is probably the earliest formulation of the "wave theory," which will follow the study of the Sea Peoples henceforward.

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This theory established a seemingly satisfying triple synchronism between the Bible, Egyptian literature, and Greek mythology. "Seemingly" should be stressed here, because out of these three dates one, at least, is completely unfounded, and another doubtful at best. It failed to account for the mentions of Sea Peoples in Egypt before Ramesses III, as well as references to Philistines as early as the book of Genesis in the biblical narrative. This did not prevent it from being widely accepted and quoted. Thus, as of the mid-eighteenth century, the equivalence of the Philistines of the Bible, the Sea Peoples of Egyptian literature, and Aegeans of the Homeric age was deemed secure. The only issue which remained in debate was which Aegeans exactly took part in the great eastward migration.

EARLY DATA COLLECTION 1899–1930: ESTABLISHING A CERAMIC TYPOLOGY

The Identification of Philistine Pottery

As the nineteenth century drew to a close and scientific archaeology got under way, more was being learned about material culture both in Israel and the Aegean. The pottery chronology of the Aegean Bronze Age, from expeditions such as Schlieman's in Mycenae and in Troy, and Evans's in Knossos was summarized by Furtwängler and Loeschcke (1886), while a preliminary chronology based on stratigraphic excavation in Palestine was being worked out by Petrie and his students. Tangible evidence of the much sought-after struggle between David and Goliath (as an allegory to the early contact between the Bible and the classics) was not yet forthcoming, however. Nevertheless, possibility of locating such was sufficiently exciting to stimulate the Palestine Exploration Fund (PEF) to commission several expeditions to excavate the *tells* of the southern Shephelah in the beginning of the century, with the specific purpose of locating such contacts (Dothan and Dothan 1992: 29–32). To aid in this enterprise the PEF contracted the foremost authorities in Aegean archaeology, such as Duncan Mackenzie, Evans's chief assistant on the Knossos excavations.

Early attempts by these expeditions to isolate Philistine material culture attributes were unsuccessful. Several tombs at Gezer, claimed by Macalister (1912: 297) to be Philistine burials, were misdated, as we know today, by some 800 years (Stern 1982: 73). Bliss and Macalister had consulted F. B. Welch, one of the foremost authorities of the day in Aegean pottery, about several Mycenaean potsherds found in their excavations. Welch verified the identification of these sherds but agreed with the excavators that their number was not sufficient to warrant the assumption of local manufacture. As it turned out, both Welch and the excavators overlooked some evidence from this very same expedition, which we commonly identify today as "Philistine" pottery.

In 1908 Hermann Thiersch proposed that a family of decorated pottery, first found at Tell es-Safi in 1899 by Bliss and Macalister (1902: 89–97) was, in fact, the pottery manufactured by the Philistines. Bliss and Macalister had actually noted these distinctive red-and-black painted potsherds, but they dated them to their "Late Pre-Israelite" period, i.e., earlier than the supposed Philistine migration. Welch had even noted their similarity to Aegean forms and decoration, ascribing them to a debased Mycenaean tradition (1900: 347–48). Thiersch argued that this painted pottery was similar to Furtwängler and Loeschcke's "fourth style"—the final phase of Mycenaean pottery (as then known)—while the Mycenaean sherds discussed by

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Bliss, Macalister, and Welch were of the earlier "third style." Therefore, it is this type of pottery, rather than earlier ones, which heralded the arrival of the Sea Peoples in the Middle East, on the wake of the Trojan war, the Dorian invasions, or some such catastrophe (Dothan and Dothan 1992: 31–32). This attribution was quickly and almost universally accepted. The common name for this ware is "Philistine Pottery" (for a detailed definition see below), or, more recently, Bichrome Philistine pottery (in order to distinguish it from its monochrome predecessor—Mycenean (Myc) IIIC/"Wheel Made White Painted"—Furtwängler and Loeschcke's "fourth style"). In order to avoid culturally laden terminology I designate this type of pottery "Early Iron Age wheel-made Bichrome Painted by hand" pottery (or BPh for short). This designation may set it apart both from the afore-mentioned monochrome style, and from the other contemporary bichrome ware, the so-called "Phoenician" bichrome, in which the decoration was instrumentally applied. By the beginning of the century, then, the identification of this pottery with the biblical Philistines, and of the latter with the Sea Peoples of Egyptian literature seemed secure.

Philistines and Achaeans

The next attempt to investigate the Philistines was Duncan Mackenzie's expedition to Beth-Shemesh and Ashkelon in 1911–1912 (Mackenzie 1912). He noted that in both of these sites the appearance of BPh pottery postdates the Mycenaean pottery. Mackenzie compared the division of the decorative field on some of the BPh pots into metopes with "panel style" pottery which he had seen in Phylakopi and which he believed to be post-Mycenaean. He thought the "panel style" was brought into Greece by "Achaean" invaders and identified the Philistines with these same "Achaeans." This attribution typically ignores the fact that division into metopes, while it does appear as a somewhat esoteric element in the Mycenaean decorative tradition, was rather commonplace in the local Canaanite repertoire. Phythian-Adams (1923) argued that the origins of the "panel style" and hence of the "Achaeans" should be sought in the Balkans, since it was supposed that they had come into Greece from the north and into Asia Minor and Palestine from the west, a theory whose main support (apart from some more name etymologies) was the almost total ignorance of LB cultures in the Balkans at the time.

The debate about the origins of the Philistines was thus early on connected to another major controversy of the times—the debate about the origins of the Greeks themselves, or more specifically, the argument about the Greekness of the Mycenaeans. Blegen and Haley's (1928) suggestion that the Mycenaeans were Greek was generally ignored. Arthur Evans saw the Mycenaean culture as a provincial offshoot of the Minoan civilization, which itself was held to have oriental origins. Thus the prevailing view was that the first Greeks (whether as Achaeans or Dorians or whatever) were northern invaders from the Balkans who had brutally put an end to Mycenaean civilization. Ventris's decipherment of Linear B, in the early 1950s, as a Greek dialect, came as a rude shock to many.

The "Achaean origins" theory for the Philistines was severely challenged when Heurtley and Wace (Heurtley 1936) found out in their excavations at Mycenae that the "panel style" was not post-Mycenaean, nor was it necessarily northern in origin. As a matter of fact, the very latest type of pottery still ascribed by Heurtley to the Mycenaeans (the so-called granary style) took on an aspect not reflected in the BPh pottery. Ergo, the Philistines had left the

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Greek mainland *before* the final demise of the Mycenaeans, and the Philistines were *part* of the Mycenaean littoral, rather then its exterminators. Moreover, Heurtley pointed out that the BPh pottery includes attributes from all of the known regional substyles of Mycenaean pottery and yet bears a close similarity to none. Hence "it is unlikely that it is the pottery of the (unknown) homeland from which the Philistines came . . . The most we can say is that it may have been made to satisfy a demand by the newcomers for something which had a Mycenaean look, and infer from its composite character that they were familiar with the whole Aegean" (Heurtley, 1936: 109).

Other Excavations

Three more excavations in the beginning of the century, which were to establish parameters for future discussion, are now discussed:

One is W. M. F. Petrie's excavations at Tell Jemmeh and at Tell el-Farʿah (S) (Petrie 1928; Petrie and Tufnell 1930; Macdonald, Starkey, and Harding 1932). Petrie accepted the attribution of the BPh pottery to the Philistines, but not Mackenzie's (1912) and Phythian-Adams's (1923) dating of it to the Iron Age, which did not concur with the biblical references to Philistines prior to the Israelite conquest of Canaan, or with references to Sea Peoples in the Eighteenth-Dynasty Egyptian texts. He conveniently found Egyptian scarabs at the same layers to date the BPh pottery he found at these sites as contemporary with the Eighteenth Dynasty, that is, to the height of the Late Bronze Age. This accorded well with his view that Tell Jemmeh was Abraham's Gerar, where dwelt "Abimelech, the king of the Philistines" (Genesis 26:1). Petrie saw the invasion of 1186 B.C. as a *second wave* of Aegean migration (Dothan and Dothan 1992: 64).

The most significant find at Tell el-Farʿah were five large rock-cut tombs, four of which had Philistine pottery in them, as well as anthropoid coffins of distinctive style. Petrie (Petrie and Tufnell 1930: 7) whimsically named these caves "the tombs of the five lords of the Philistines." Similar coffins had already been uncovered at Beit Shean (which has its own Philistine connotations: the Philistines hung Saul's body from its walls, after their victory at the battle of Gilboa). No Philistine pottery was found with the latter coffins, however (and hardly anywhere else at Beit Shean, for that matter), though one Myc IIIC cup was discovered (Hankey 1966, and see below for the significance of that find).

Petrie attempted a relative seriation of the Tell Farʿah tombs, mainly by the types of scarabs found in them. He placed Tomb 542, the richest in finds, as the earliest (dating it to 1320 B.C.) and Tomb 532, in which there is a scarab bearing the name of Ramesses XI (1113–1085 B.C.) late in the series. These dates, while perfectly in synch with Petrie's own beliefs of the antiquity of the Philistines, presented a problem to those who accepted the BPh as an Iron Age phenomenon. Thus, there was a series of attempts at redating these tombs (Starkey in Macdonald, Starkey, and Harding 1932: 31; Albright 1932; Furumark 1941b: 121; T. Dothan 1982: 29–33; McClellan 1979). Albright (1932: 299–301) accepted the sequence proposed by Petrie but modified his absolute dates. He pointed out that nowhere did Petrie find Philistine pottery associated with Mycenaean or Cypriot imports, which rules out a Late Bronze Age date. Scarabs of the great New Kingdom rulers, which Petrie set such store by, often continued to be manufactured decades (and sometimes centuries) after their namesake's death. Although Albright had no absolute dates of his own to offer, he approximated the date

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of tomb 542 (the earliest, according to both Petrie and himself) to the beginning of the twelfth century B.C., thus reinforcing the seeming connection between the appearance of the BPh pottery and the campaigns of Ramesses III.

The second significant discovery was the finding of BPh pottery at the Chicago Oriental Institute's excavations at Megiddo, arguably the most influential single excavation ever held in this country. Much of the absolute dating of the Late Bronze Age–Early Iron Age transition rests on evidence from Megiddo. The published BPh sherds from Megiddo are few in number but they will crop up in any discussion of the BPh pottery henceforward. The excavators reported BPh sherds from Strata VIA, VIB, VIIA, VIIB and even one example from Stratum VIII (T. Dothan 1982: 70–80). Stratum VIII at Megiddo is most definitely LB II. Stratum VII is problematic: architecturally it is a continuation of the LB city of Stratum VIII; typologically, it contains LB artifacts (including a hoard of LB ivories in Stratum VIIA, as well as Mycenaean and Cypriot imports), but also some types characteristic of the Iron Age I, namely the above mentioned BPh sherds. Stratum VIIA is securely dated by one of the ivories mentioned above, which bears a cartouche of Ramesses III (Loud 1939: 9–10). Stratum VIB is the earliest town that is definitely Iron Age in material culture. The clear destruction at the end of Stratum VIA is usually attributed to David, although there is no direct evidence (either archaeological or historical) for that (for a recent polemic *against* this date see Finkelstein 1996).

Thus, the Megiddo finds as published contradicted the emerging consensus, as BPh apparently preceded Ramesses III, and appeared in strata that also had Mycenaean and Cypriot, as well as local, Bronze Age artifacts. The Megiddo report, however, is notorious for misassigning artifacts (and sometimes complete structures), and the stratigraphy of Megiddo has been reworked many times since its initial publication. Thus T. Dothan (1982: 70–80) attempts to bring the Megiddo finds into line with the accepted view in a detailed critique, in which she reassigns all of the BPh sherds found in Strata VIII and VIIB into VIIA, and some of the obvious LB types from Strata VIIA into VIIB, thereby arguing that the transition between LB and Iron I at Megiddo is between Strata VIIB and VIIA. If this rearrangement is accepted, it may be argued that at Megiddo, too, there is a correlation between Ramesses III and the appearance of BPh pottery.

The third excavation to discuss is William Foxwell Albright's (1932–43) project at Tell Beit Mirsim during 1926–1932. Only a few BPh sherds were found in this inland site (T. Dothan 1982: 43–44). Its importance is due to the fact that it was the first project which attempted to implement the new standard chronological scheme for Palestine, agreed on in 1922, as well as Albright's innovations in excavation methods and pottery typology. It was used thereafter as a type site for many issues relating to Bronze and Iron Age chronology.

Stratum B at Tell Beit Mirsim covers the first half of the Iron Age. BPh pottery appears only in Phase B2. Phase B1 is devoid of any Mycenaean or Cypriot imports (this is the reason Albright judged it to be post–LB) and does not have any BPh pottery either. BPh pottery was the *fossil directeur* for Phase B2. Phase B3 was dated to the tenth century and was characterized by hand-burnished red-slipped ware.

This fitted well with Albright's historic interpretation: Albright thought that the Late Bronze Age Canaanite civilization succumbed under two waves of invasion. The first was the Israelite conquest, which he saw as a concerted attack by militant desert nomads in the second half of the thirteenth century, capturing the hill country and the inland valleys. The Israelites

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were already well entrenched, in his opinion, by the time of Merneptah's 1232 (1207) campaign. This is the culture evident in Tell Beit Mirsim Stratum B1 according to Albright. The second wave is the devastation of the coastal plain by the Sea Peoples, just prior to their attempted invasion of Egypt in 1191 (1175). While the main thrust of this invasion was the replacement of Canaanites (and their Egyptian overlords) by Philistines, they did extend their dominion over the lower foothills of Judaea, taking over sites such as Tell Beit Mirsim from the Israelites. This cultural change is evident, according to Albright, in Stratum B2. Stratum B3 exemplifies the final Judean takeover, when David squashed the Philistine hegemony.

IDEOLOGY

Archaeological thinking at the end of the nineteenth and beginning of the twentieth century was dominated by the *Kulturgeschichte* (culture history) approach, several versions of which were promulgated in Scandinavia by Oscar Montelius, in Germany by Friedrich Ratzel and Gustaf Kossina, in England by E. B. Tylor, G. Elliot Smith, and the early works of V. Gordon Childe, and in America by Franz Boas (Trigger 1989: 148–206).

The principal notions common to all of these strands were the identity of physiological and behavioral properties, and hence of biological and social genetics; an analogy of whole societies to individual organisms; and the notion that cultures and peoples diffuse or flow from point of "high culture" to "low culture." Cultural or cognitive traits, just like physiognomy, were seen as being transmitted by heredity. Specific ranges of vessel types, just like gene pools, were perceived as the property of *racial lineage groups*, the hierarchical components of which were "family," "ethnos," and "race." Moreover, the entire ethnos was regarded as a single unitary organism.

Now, a rose is still a rose whether its limits be defined by shape, color, texture or aroma. If the analogy between a rose and a culture holds, it follows that a single distinctive trait is enough to define the whole. This is the gist of the *fossil directeur* approach to archaeology.

The idea of cultural unitarianism could (and was) carried even further. It was held that a culture, just like an organism, grows, flowers, and dies. Cultural change was conceived in terms of "childhood," "adolescence," "maturity," and "decadence," as in the conventional division of artistic styles to "Archaic," "Classic," and "Baroque." By the same reasoning as above, such a process would be visible with every single facet of that culture. Thus, if a decorative style is debased (in the eye of the beholder), it would mean that the culture of which it is a manifestation was decaying, and vice-versa. H. R. Hall (1928), who saw the Myc IIIC pottery (Furtwängler and Loeschcke's "fourth style") as the product of a declining culture, characterized its style as "degenerate, vulgar and tasteless." As the BPh pottery was supposedly derivative of this style, it could not be anything but decadent.

If culture is inherited like the color of one's eyes, then the only possible explanation for similar cultural attributes appearing in two different places is physical transhumance of a lineage group from one place to another. Cultural change was, if radical enough, perforce the result of total genocide of the incumbent peoples by migrating invaders. If gradual, it was seen as the result of intermarriage between newcomers and the indigenous lineage groups. The main question to be answered, once cultural change was demonstrated in the material record, was where these newcomers came from. The methodology by which this question was ad-

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dressed was to look for some place where similar traits appear. If some sort of a connection, however tenuous, between these two cultures could be established, the conquest of one by another was as good as proven. If not, (as, say, in the case of pyramids appearing in Egypt and in Mexico), it might just mean one had not looked hard enough.

Another logical corollary of the unity of culture and of its immutability is the concept of *culture centers* and cultural periphery (Trigger 1989: 160; Harris 1968: 374). While the typical explanation of cultural change was an influx of a new population from elsewhere, one had to concede that innovation had to exist *somewhere*, or else all cultures would have been identical. At least one "authority" (von Däniken; see Epstein 1987) followed hyper-diffusionist theory to its logical end and posited that all significant innovation in human history came from outer space. Others have had to accept that evolutionary change *could* occur, but only in special places and under extraordinary circumstances. Thus the "children of the sun" theory (Perry 1923; Smith 1923, 1933) proposed that all cultural traits were diffused from Egypt, while Graebner and Schmidt argued that a hypothetical core in central Asia was periodically spewing out new cultural stimuli (Harris 1968: 382–92). These formulations were arguably extreme even for their time, but most scholars shared the conceptual view of culture spreading from cultural centers like ripples in a pond. Viewed from the periphery, cultural stimuli would appear in *waves*.

Gustaf Kossina (1911), the most influential figure in central European archaeology before World War II, combined the beliefs that cultures were a reflection of ethnicity with the racial division of peoples into *Kulturvolker*, who alone were capable of creativity, and *Naturvolker*, or culturally passive people. He promoted a view in which successive waves of Aryan invaders from the north built the various civilizations of the ancient world. Interbreeding with the indigenous populations diluted their racial purity, however, thus dooming each of these civilizations in turn to decay. Quite naturally, Kossina's teachings became (posthumously) the official version of history in Nazi Germany (Bahn 1996: 136–38).

Kossina's emphasis on (blond) racial purity as the engine for cultural change could not find much sympathy in France or England. John Myers (1911) and Arthur Evans (who was indirectly involved with the "Philistine question") as well as the early writings of V. Gordon Childe (1925, 1926, 1929) took the opposite stand: it was the interbreeding of different racial stocks (such as would have occurred following an encounter between Indo-European invaders and Semitic populations) which produced the rare episodes of cultural innovation. Note, however, that while reaching opposite conclusions, both the German and the British schools accepted the same basic premises outlined above.

It would be easy (and wrong) to identify the excesses of *Kulturgeschichte* doctrine as a shameful bunion sprouting in some concealed niche of "normal" science. Curiously enough, this scenario offered something to everyone: It was embraced by white supremacists and Jews, classicists and semiticists, scientists and clerics. Even the broadest minds of the time could be caught in an unguarded remark, such as:

> It was fortunate for the future of monotheism that the Israelites of the Conquest were a wild folk, endowed with a ruthless will to exist, since the resulting decimation of the Canaanites prevented the complete fusion of the two kindred folk which would almost inevitably have depressed Yahwistic standards to a point where recovery was impossible. (Albright 1940: 214)

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The insistence on the conservative nature of culture needs some further explanation. In the first place, it answered some deep-seated doubts many Europeans had when they confronted the "Orient": if Western European culture was as self-evidently superior to any other as they wished to believe, how is it that it was not immediately and universally accepted? For Kossina the answer was simple: "*Naturvolk*" did not change their culture because they were biologically incapable of doing so. Less crudely racist theories had to seek more complex answers.

The assumption that culture is essentially hereditary explains well the homogeneities encountered in human behavior. It runs into trouble trying to explain *variation* and change. Given an (even limited) capacity of humans to change their own behavior, and the examples of manifestly more successful modes—would not all cultures evolve to the point where they are indistinguishable? Once this point had been reached, would further development be at all possible?

On the other side of the organistic analogy (in biological genetics), this dilemma was called *the paradox of regression to the norm*, and it nearly proved the downfall of Darwinian theory in the nineteenth century, before being brilliantly solved by Mendelian genetics. One of the assumptions of the Darwinian model is that natural selection operates against a background of virtually unlimited variation in nature (i.e. that every variation that *can* happen, *will* happen, sooner or later). Yet common experience dictated that in uncontrolled breeding the offsprings of two different purebreds was a mongrel—that is, some sort of an average between the two parents. This meant that if, say, by chance a long-necked mutant is born in a herd of short-necked giraffes, her offspring (by short-necked partners) ought to be semi-long necked. The next generation would be at best semi-long necked and for the most part quarter-lengthed, and so on. It was not seen how, except in mutations that offer immediate life-or-death advantage or disadvantage, natural selection could compete against this strong normative power.

In "social evolution," and in archaeology too, many thought that this "regression to the norm" was a power to be reckoned with. I already mentioned that Kossina (and others) argued that dilution of bloods invariably led to regression to mediocrity and hence to eventual degeneration and to the downfall of cultures. The future of human civilization depends, according to Kossina, upon the existence of a pool of untainted Nordic genes.

Despite the specter of regression, observation tells us that in society (and biology) diversity seems to be the rule. An assumption that extreme conservatism is in the nature of any culture may partly explain why two cultures, upon contact, do not fuse into a "mongrel" culture within a short period of time.

Another way of solving the paradox of "regression to the norm" is the assumption of *Volksgeist.* A tenet that each culture or race has an essential spirit, a core of primal attributes and mental qualities which remains unadulterated as long as that culture survives, no matter how the outer manifestations of that culture may change with the passage of times and fortunes. Such an assumption puts a lower bound on miscegenation and ensures that diversity of cultures will never decrease (however each of these cultures may change) except in cases of actual genocide.

One archaeological manifestation of this theory is the *fossil directeur*, a single type of artifact whose appearance (and it alone) is considered diagnostic of the essence of that culture, however divergent the rest of the assemblage in which the *fossil* appears to be. Locating

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the temporal and geographical limits of this single artifact type would define the homeland and history of "a people" and hence the extent of a specific language, mythology, cuisine, and any other cultural trait. Thus, in the case of the Philistines, Phythian-Adams expressed a typical sentiment in the statement that:

> It must be stated at the outset that the data . . . are concerned almost exclusively with a *single type of vase*, the bowl fitted with a horizontal loop handle . . . [which is] *the Philistine vase par excellence* . . . We must hold, then, that as the Achaeans and their allies brought this bowl with them [to Greece] before the close of the Bronze Age, so the Philistines and their companions brought it [to Palestine] in the transitional period that followed. In other words, we must assume that the vase in question was one designed . . . by the inhabitants of the regions from which the sea rovers and their kinsmen of the Troad originally came. But we have seen in the case of the latter that the evidence points very strongly to the Balkans as being the homeland in question, *and since the whole group seems to have been bound together by ties of a common religion*, it is at least probable that the former will also be found there." (Phythian-Adams 1923: 23–24, italics mine)

This, then, was the background against which the view that the BPh pottery reflected waves of Indo-European invaders was developed. Before going back to data collection, I should like to stress again the decisive role that *theory* had in formulating this view. Contemporary archaeologists are sometimes vain enough to suppose that archaeological theory is an invention of the 1960s. We are perhaps helped in this misconception by the fact that practitioners of former generations tended to disguise their theoretical convictions. This was done because under inductive empiricism, the prevailing philosophy of the day, one was supposed to "face the facts" indiscriminately, and admitting bias, theoretical or otherwise, was as unacceptable as "lack of explicit theory" is today. That archaeology at the turn of the century consisted of data collection for its own sake and of "low level generalizations" based on these facts is as much a myth as the notion that the way we proceed today is by objective testing of hypotheses deducible from putative "laws." The Philistines are a case in point.

The equation of BPh pottery with the Philistine people, and their association with the Sea Peoples of Ramesses III, was accepted not *because* it fitted the empirical data available at the time, but *in face* of well-known evidence to the contrary, as gathered in what were generally accepted to be the best field studies of the day. At the time, the only indications connecting the appearance of the BPh pottery with the activities of Ramesses III (rather than with earlier events) were Phythian-Adams's unpublished investigations at Ashkelon and Mackenzie's observations at Beth Shemesh (an excavation not highly regarded for its method even by the standards of the day). Petrie's excavations, and most certainly the Chicago Oriental Institute's excavations at Megiddo, were generally given higher marks for reliability, and yet they uncovered information which, on the face of it, contradicted the Philistines = BPh = *prst* equation. Nevertheless, this hypothesis was hardly challenged, and elaborate schemes were devised to explain away apparent inconsistencies between it and the data. I contend that this was because it fitted deep-rooted theoretical convictions of most scholars of the day. Even the one authority who promoted a different view, W. M. F. Petrie, let his own preconceptions guide (or sway, as the case may be) his empirical findings. (For a rather similar assessment of methodological "progress" in the "hard" sciences, see Feyerabend 1978).

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DATA COLLECTION AND ANALYSIS 1930s–1970s: CONSOLIDATION OF A PARADIGM

The next period of research is characterized by several new excavations which revealed new and (for the first time . . .) reliable data about the BPh pottery, as well as several extensive syntheses, most of which served to further and flesh out the equation presented above. These were the "golden years" for large scale excavations in Israel. Of the many excavations held, quite a few produced BPh pottery, or shed light on other facets of the Philistine problem (Tel Mor, Lachish, Beth Zur, Gezer, Azor, Aphek, Tel Zeror, Afula—to name but a few). The most pertinent to our discussion were B. and A. Mazar's excavations at Tell Qasile, M. Dothan's excavation at Ashdod, and T. Dothan's excavations at Deir el-Balah.

Excavation: Tell Qasile

Benjamin Mazar excavated at Tell Qasile, a small mound on the north bank of the Yarkon River, from 1949 to 1951, and again in 1956, 1962 and 1963. This excavation is unpublished, except for a preliminary report of the first two seasons (B. Mazar 1951), and a short summary in the *Encyclopedia of Archaeological Excavations* (T. Dothan and Dunayevsky 1978). B. Mazar distinguished twelve occupations at the site, from the early Iron Age to the Arab period. The first three (Strata X–XII) were characterized by BPh pottery. Strata XII to X represent a continued period of growth of the community, from transient settlement on bedrock (Stratum XIIB) to a full-fledged town (Stratum XI). This continuity ended abruptly in Stratum X, which was destroyed by heavy fire. The following settlement (Strata IX–VIII) no longer had BPh pottery in primary contexts. B. Mazar interpreted the destruction of Stratum X as the sacking of the Philistine town by David, and the following strata as an Israelite occupation (B. Mazar 1951: 67–68; A. Mazar 1980: 9–12).

Following a salvage excavation in 1971, Amihai Mazar continued his uncle's project and excavated what proved to be a sanctuary from 1971 to 1974. Three successive sacred structures were found, corresponding to B. Mazar's Strata XII, XI, and X. The sanctuary was rebuilt after a fashion in Stratum IX (which casts some doubt on B. Mazar's hypothesis of ethnic and religious upset following the destruction of Stratum X—A. Mazar 1980: 11). A. Mazar promptly published this excavation (first as a Ph.D. dissertation and then as a final report: 1980, 1985a). To date it remains the only properly excavated quantitative sample of a BPh assemblage of sufficient size in the literature. BPh pottery typically comprises 10–25% of the total ceramic assemblage in the relevant strata at this site (A. Mazar 1985b: 105).

Mazar went to considerable trouble to search for parallels to the nature of the cult at Tell Qasile. Architecturally, he characterizes the Tell Qasile sanctuaries as belonging to a group of "irregular" sanctuaries. Such structures occur in LB in the Levant (though they present a deviation from the regular symmetrical monumental temple tradition of MB–LB). Parallels may be found in the Aegean in LB, and (in my opinion, less convincingly) in Cyprus in the thirteenth–eleventh century B.C. (A. Mazar 1980: 62–68). The cultic vessels mostly represent local types (although some display unique stylistic elements). The single vessel which may point to a foreign type of cult practices is a ceramic lion's head rhyton, which may have antecedents in metal rhytons in the Aegean (A. Mazar 1980: 119–21). Several types of BPh Mycenaean-style figurines which occur elsewhere are notably missing at Tell Qasile.

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Tell Qasile is material to the discussion of the Philistines in several respects. First, it put an end to the unilateral view of the Philistines as *destroyers of cultures*, because Tell Qasile is a Philistine foundation. This is the inception of quite an opposite view of Philistines as preservers of urban culture in troubled times. Secondly, as there was no Bronze Age occupation at Tell Qasile at all, it displayed the clear association of BPh pottery with early Iron Age contexts. Also, this was the first time that several successive BPh-bearing strata were recognized (other than at Megiddo, where at least some of the BPh finds were obviously out of context). This enabled a chrono-typological subdivision of the Philistine culture, other than its very earliest phases, which supposedly are missing, since the site was taken to be the product of an expansion from the Philistine heartland northwards. Finally, of course, it afforded a glimpse into Philistine cult.

Excavation: Ashdod

Ashdod was the first of the cities of the Philistine pentapolis to be extensively excavated (by Moshe Dothan), other than Garstang and Phythian-Adams's deep trench at Ashkelon. Unfortunately the publication (M. Dothan and Freedman 1967; M. Dothan 1971; M. Dothan and Porat 1982) is much sketchier than that of Tell Qasile. The findings have been summarized as follows: The last Bronze Age town is Stratum XIV, characterized by Late Cypriote and Myc IIIB imports. It was destroyed by fire, which the excavator attributes to an early wave of Sea Peoples during the reign of Merneptah (M. Dothan 1971: 20; Dothan and Dothan 1992: 165). The next stratum, XIIIB, contains no Cypriote import or BPh pottery, but does have significant amounts of Myc IIIC, while Stratum XIIIA has both Myc IIIC and BPh. Strata XII and XI contain "typical Philistine" (i.e., BPh) pottery in them and are thus roughly equivalent to Tell Qasile Strata XII–X. Stratum X at Ashdod marks the introduction of new "Judean" elements and the disintegration of the indigenous BPh repertoire and is thus dated by the excavator to the final days of Philistine hegemony. Its destruction is dated by the excavators either to David's conquests, or (more likely) to Siamun's campaign against Philistia, ca. 960 B.C. (M. Dothan 1971: 21). The latter possibility would place the destruction of Ashdod Stratum X somewhat later than that of Qasile Stratum X, which seems to better fit the evidence.

The prime importance of Ashdod is in the finding of large amounts of Myc IIIC for the first time (though some pieces were previously recognized at Beit Shean, as mentioned above) and demonstrating its connection with BPh. The finds at Ashdod supplement Tell Qasile in adding the early part of the sequence of the development of the BPh pottery and reinforce the latter part of the sequence as seen there. The stratigraphy is also rather close to the one observed by Albright at Tell Beit Mirsim, although Ashdod, being a coastal site, had Myc IIIC pottery in the "gap" between the end of the Late Bronze Age and the appearance of the BPh, whereas inland Tell Beit Mirsim had "Israelite" pottery in it. This is perhaps why Moshe Dothan dated his strata similarly. If Stratum XIV ended ca. 1230, then the Philistine invasion culminating in the raids on Egypt and subsequent repulsion and resettlement after Ramesses III's 8th year must have occurred sometime during Stratum XIII. It therefore seemed natural to equate these events with the appearance of BPh pottery in Stratum XIIIA. This leaves the Myc IIIC of Stratum XIIIB as evidence of the earlier wave of Sea Peoples (the ones Merneptah fought off). It has been remarked (e.g. by Sandars 1978: 171–72) that

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there is no compelling reason to attribute the destruction of Ashdod Stratum XIV to Merneptah. Attributing it to Ramesses III, for instance, would put a rather different light on things.

Synthesis: Furumark and the End of Mycenaean Civilization

Great strides were being made, too, in refining archaeological knowledge at the putative homelands of the Sea Peoples. In particular, the typology and chronology of Mycenaean pottery was much refined, as summarized by Arne Furumark (1941a, 1941b). Furumark introduced the high standard of art historical analysis to the study of Aegean pottery, breaking down the "style" to a typological facet (vessel form), an execution facet ("rude," "simple," "elaborate," etc.), a semantic facet (motifs: pictorial and geometric), and a syntactic facet (composition); and then tracing its development both on the temporal axis (chronology) and spatial ones (regional styles).

Furumark (1941b: 17) argued that Furtwängler and Loeschcke's (1886) "four style" system had no chronological value, except for the "fourth style" (about which see below). He also opposed Evans's suggestion to simply extend the Minoan designations to the mainland. Instead, he used Blegen's system of dividing the LB pottery styles to "Late Helladic" I, II, and III; together with Benton and Hutchingson's division of LH III to LH IIIA, B, and C (Furumark 1941b: 17–19). It is the last of these which concerns us here.

The Mycenaean Late Helladic IIIC (which I henceforward refer to as "Myc IIIC") comprises Furtwängler and Loeschcke's "fourth style" (Myc IIIC:1), as well as the so-called sub-Mycenaean" pottery (Myc IIIC:2). The "fourth style" had already been previously divided (by Wace) to "close style" and "granary style." I already mentioned that Heurtley had connected the BPh style particularly with the "close style," an identification accepted by Furumark (and all subsequent researchers).

Chronologically, the Myc IIIC:1 is *again* subdivided into three periods: IIIC:1a is a transition period, with late variants of Myc IIIB "open style" still appearing besides some IIIC "close style"; IIIC:1b is characterized by mature "close style" and the beginning of the "granary" class "simple style"; while in IIIC:1c the "close style" all but disappears and the "simple style" predominates, developing into the IIIC:2 "sub-Mycenaean."

Furumark characterizes the development of the Myc IIIC style by three contrasting processes—simplification and geometrization of the *motifs* on the one hand, and elaboration of the *composition* on the other, coupled with a tendency to linearize the execution. A concurrent process is the fragmentation of the relatively homogeneous IIIB style to several regional variants, each of which followed its own line of development.

As part of this process, the BPh (and the Cypro-Geometric!) are seen by Furumark (1941b: 118–20) as "Oriental derivative wares." The inspiration for most BPh motifs is from *early* (though not the earliest) Myc IIIC. He further subdivides the BPh into two chronological groups, reflecting successive deterioration of the original Mycenaean motifs, to which he added a third, degenerate group, that he called "sub-Philistine."

Synthesis: Desborough and the End of Mycenaean Civilization

The Myc IIIC pottery, and to a lesser extent other attributes of material culture, were the subject of a detailed study by Vincent R. d'A Desborough (1964). His main archaeological results seem to indicate an even greater diversity and overlap than suggested by Furumark. "Myc IIIC" is not a single style, but rather a group of different styles with complex interrela-

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tions. The "close style" and the "granary style," both of which are seen as emerging from Mycenae, are rather dissimilar in appearance, representing two divergent lines of development from a common Myc IIIB stock. An "octopus style" may have originated in Crete, where it is used together with a "fringed style," but is also found in Attica and in Rhodes (where, however, it appears together with a "sub IIIB open style" survival, no "close" or "fringe" style at all, and very few atypical "granary" vases). The "simple style" of Cyprus resembles (but is in no way identical) with the late "granary style" of Mycenae. On the temporal axis, there seem to be connections, if not actually overlap, between "close style" and "granary style"; "granary style" and "sub-Mycenaean"; and "sub-Mycenaean" and "proto-Geometric" (Desborough 1964: 9–28).

The evidence of site distribution is as confusing. Many sites were destroyed towards the end of the LH IIIB stage (Mycenae was even damaged twice). Some were abandoned, but some (including Mycenae) were reoccupied. Others (e.g., Athens, Miletus, Iolkos) were apparently untouched while yet others (e.g., Perati, the region of Achaea) were actually first occupied during the LH IIIC. Final abandonment of those LH IIIC sites that did not survive into the historical period also differs, with Mycenae itself being somewhere toward the middle of the sequence. Coupled with this evidence should be the dearth of what might be construed as foreign influences, although exceptions can be found in the first iron implements to make their appearance during this period, the introduction of cist burial and hand-made pots in the Macedonian style, which were spread (to regions where they were not already present in the LH IIIB), late rather than early in the sequence.

And yet, when considering all this evidence, Desborough (1964: 219–20) rejects out of hand the hypothesis that it essentially reflects a process of local development (or degeneration, as the case may be). Instead, he posits at least two waves of external invasions, each with several undercurrents and secondary ripples. The assumed direction of both is overland from the northwest, although the possibility of a northeast seaborne origin, at least for the first one, is considered (not least because this is, according to Desborough's belief, where Egyptian and Hittite sources place the origins of the Sea Peoples—1964: 222–23).

The first invasion put an end to the thriving "Mycenaean empire," pushing refugees into undamaged areas (Achaea and Kephallenia on the west, and as far as Cyprus on the east). It also created the diversity of Myc IIIC styles, inasmuch as it broke the (preconceived) political hegemony of Mycenae over the rest of the Helladic "kingdoms," which was the reason for the uniformity of the IIIB "koiné" style to begin with (Desborough 1964: 218–20; 225). In explaining the lack of evidence for any sort of external contacts at this time he considers two explanations: First, that the "archaeologically rather elusive invaders" did not leave "a single object or custom . . . in any of the areas through which they passed" because "the culture of the invaders was probably primitive, and anyway far inferior to that of the Mycenaeans; their artifacts may for the most part have been of perishable materials, such as wood and leather, and thus no trace would be left of them" (Desborough 1964: 224). To his credit, he rejects this possibility, and concludes that the invaders simply did not stay to enjoy the spoils of their conquest (*in which case why the need for the extensive relocation of refugees?* [I. S.])

The second wave started, according to Desborough (1964: 230–32) about a century later, and was perhaps less violent, though more prolonged of duration and even more influential in its aftermath. It consisted of migrations of peoples from the Balkans into central mainland Greece, and later into the Peloponnese, causing a fresh surge of displaced persons to set

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sail across the Mediterranean, this time bearing late "granary style" pottery with them. The fusion of the newcomers with the few remaining Mycenaean descendants would, in the fullness of time, produce Greek civilization.

After pondering over the confused and conflicting mythological traditions about "Dorian," "Thessalian," "Ionian," "Dryopian," and "Eolian" migrations, Desborough (1964: 246–48, 255) concludes that "at many stages the traditional account is not supported by the archaeological evidence. The dates may be questioned, the interrelation of the stories is open to doubt, even the facts may not stand up to examination." With these limitations in mind, he proposes that these stories reflect the second, and not the first "wave" of invasions, because the first wave was not followed, in his opinion, by colonization and because of the traditional dating of the Dorian invasion (60–80 years after the fall of Troy, which in Desborough's opinion can be dated "at no other time" than 1250–1230 B.C., on the basis of Herodotus and a Hittite reference to a "king of Ahiyawwa" present in person on the Asian mainland at this time).

What does all of this have to do with our Philistines? Desborough begins his discussion of them by stating:

> It is a *fact* that the Peleset, an important group of the raiders who were defeated by Ramesses III on the borders of Egypt in the eighth year of his reign, are the Philistines of the Bible, and it is also true that they settled in the southern part of Palestine *after* their defeat. (Desborough 1964: 209)

To this he adds the "virtual certainty" that it was they who destroyed Ugarit just a short time before (1964: 207). Note how tenuous identifications coalesced, after being repeated for sixty years (without much addition of data), into unshakable truths. Desborough points out that the Philistines could not have come into Egypt with their Philistine pottery already at hand, for that pottery is derived from Myc IIIC:1b, and no Myc IIIC or BPh was found at Ugarit. It is curious that a lack of any finds attributable to the invaders did not stop Desborough from positing a Balkan invasion of Argolis. Perhaps this is because it was unthinkable that in the case of a Mycenaean "invasion" of Canaan, too, the "the culture of the invaders was probably primitive, and anyway far inferior" to that of the Canaanites, so that "no trace would be left of them."

Be that as it may, Desborough assumes that the Philistines who sacked Ugarit and raided Egypt were, or at least

> . . . had been joined by a powerful group of Mycenaeans . . . who fled after the catastrophic invasion of the Mainland at the end of LH IIIB . . . the best organized force [of the refugees] took to their ships and sailed eastwards, making common cause with other disturbed groups . . . [They] will have been responsible, together with non-Mycenaean ethnic groups, for the first of the two destructions at Cyprus. At this stage, either the whole Mycenaean group or part of it decided to establish itself at Cyprus, perhaps to be followed shortly after by other Mycenaean groups. . . . The rest of the raiders than moved on to Syria (where it was quite natural for LH IIIB pottery still to be current) and joined forces with other groups coming overland from Asia, thus creating the formidable body which went southwards, by land and sea, towards Egypt." (1964: 238–39)

Thus, Desborough concludes that the Philistines adopted the BPh style in pottery only some years *after* they were already settled in Canaan. Support for this statement is sought

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from the fact that anthropoid coffins at Beit Shean (which he assumes must belong to Philistine mercenaries) *do not* have BPh pottery associated with them. At this point he invokes a suggestion previously made by Benson (1961), that the entire BPh repertoire, except the "decadent" sub-Philistine ware, was produced by one man, or a single family of potters. He proposed that this potter arrived from Cyprus at about 1165 B.C., some fifteen years after the initial settlement of the Philistines.

Obviously, many of the assumptions underlying this line of reasoning are open to objection. Two points from it, however, will crop up again. One is the chronological discrepancy engendered by the assumption that BPh pottery was already being produced at the beginning of the twelfth century. Also, this is the first of several suggestions that seek to resolve this discrepancy by dissociating the BPh pottery, in one way or another, from the Philistines.

Synthesis: Dothan and the Origins of the BPh Style

Trude Dothan's synthesis (1967, and a revised English edition in 1982) undoubtedly marks the high point of the "Sea Peoples = Philistines = BPh pottery" paradigm. It is by far the most detailed analysis of BPh pottery extant and, whatever the changes in interpretation of the evidence, it forms the basic text for all subsequent critiques, present one included. It is curious that, although people had been talking of "Philistine pottery" for some sixty years before this study, the term was never before formally defined. Following Dothan, this is perhaps an appropriate point to formally define the BPh ceramic family:

Typology

The BPh is a family of decorated tableware. It includes bowls, small kraters and small closed vessels (stirrup jars, pyxides, jugs, and bottles). Dothan identifies seventeen forms, of which eight, in her opinion, have Mycenaean prototypes, two are borrowed from the Cypriote repertoire, one is an Egyptian form, four follow local Canaanite traditions, and two are late forms, one of which has no known antecedents and one which appears in the contemporary Israelite culture (1982: 96).

Decoration

The BPh pottery is decorated by painting, usually in two colors (red/brown and black) on thin white wash. The painting is always linear and done in freehand (unlike the "Phoenician" bichrome, which is probably instrumentally applied and favors thick bands). Bichrome painted decoration has a long history in Canaan, from the end of the Middle Bronze Age and throughout the Late Bronze Age. The BPh, as well as other decorated groups of the Iron I (such as the aforementioned "Phoenician" bichrome) actually form the tail end of this tradition. Bichrome decoration is totally foreign to the Mycenaean tradition, though it does appear in Cyprus.

Technology

The BPh vessels are manufactured in the local Palestinian tradition (which suffered successive loss of quality throughout LB). The white wash is possibly a crude attempt to emulate the very light, well-levigated ware typical of the Myc IIIC.

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Motifs

The motifs painted on the BPh pottery are either geometric or pictorial (of which the bird motif is by far the most common). Dothan recognizes fourteen motifs, of which twelve appear in the Mycenaean repertoire, one (with four variants) is typically Egyptian, and one has purely local Canaanite antecedents (T. Dothan 1982: 198).

Function

The BPh class does not form a complete assemblage, as it contains only fine table wares (and possibly some cultic vessels). For other functions (storage, cooking, trade) the Philistines seemed to have used local-tradition coarse wares. (One exception which does not materially change this picture are recently-identified cooking vessels in the Mycenaean tradition, which were used at Tel Miqne/Ekron together with the Myc IIIC and perhaps briefly thereafter—Dothan and Dothan 1992: 241; Killebrew 1998: 397).

Geographic Distribution

The distribution of BPh pottery, as noted by Dothan (the * marks additions to the corpus since Dothan's 1982 survey, which are included here for the sake of completeness) is as follows: Excavated sites in the core area where BPh pottery appears in high frequencies (although quantitative data is unavailable for any site other than Tell Qasile) are Tell Farʿah (S), Deir el-Balah*, Tell Jemmeh, Tel Seraʾ, Ashkelon, Ashdod, Tel Mor, Tell es-Safi/Gat, Tel Miqne/Ekron, Azor, Tel Jerishe, and Tell Qasile. These sites are all located within "classical" Philistia (the southern coastal plain, between Wadi Ghazza [Naḥal Besor] and the Yarkon River) and include all of the "five cities of the lords of the Philistines" (except for Gaza, which was not excavated). A secondary zone where significant amounts of BPh pottery occur is the foothills between Judea and Philistia, at sites like Tel Batash (Timna)*, Beth Shemesh, Tel ʿEitun*, Gezer, and Aphek. Groups of BPh vessels were also found at other places, namely Beth Zur, Bethel, Tell Beit Mirsim, Lachish, and Tell en-Nasbeh in the highlands of Judea; and Acco, Megiddo, ʿAfula, and Dan in the north. Quantitatively these sites contrast sharply with the two former groups inasmuch as the BPh pottery from them form a minute percentage of the total assemblage. Handfuls of BPh sherds were found in many other Iron I sites and are not mentioned here (cf. Brug 1985: 66–96, fig. 18 for a fairly up-to-date list).

Dothan followed Furumark's methodology, as well as, to a great extent, his stylistic conclusions about the BPh pottery, which she attempted to bolster with stratigraphic evidence. At the time of the publication of the Hebrew edition of her book this evidence rested on the (then unpublished) stratigraphy of Tell Qasile, Petrie's seriation of the Tell el-Farʿah (S) tombs (as redated by Albright) and the Megiddo evidence, which had to be extensively reworked to confirm to the supposed sequence, as we have noted above. Dothan divides the BPh into three chronological substyles, which denote progressive deterioration of the decorative elements and increasing variation from the Mycenaean prototypes. These parallel Furumark's division to two substyles plus the "Sub-Philistine" phase.

Thus (at least as of 1982, but see second thoughts in Dothan and Dothan 1992: 258, and what amounts to a retraction in Dothan 1998: 159–60) Dothan saw the Philistine pottery as appearing suddenly, in its fully developed form, and then progressively regressing to the

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Levantine average. While she correctly stresses the affinities between the BPh pottery and the Mycenaean (especially the IIIC "close style") her careful survey illuminates also the many affinities of this group to non-Mycenaean styles. Perhaps the most important implication of this study is that the BPh pottery can no longer be passed off as another local Myc IIIC variant but is an entirely different phenomenon. Dothan saw in the appearance of BPh pottery clear evidence of migration and the many non-Mycenaean elements in it as reflecting the route which these newcomers took:

> It appears that Philistine pottery was one of the local ramifications that developed after the collapse of the Myc IIIB pottery *koine* style of the Late Bronze Age. It can be stated with confidence that this pottery was not the product of a people coming directly from their country of origin with a homogeneous tradition, but rather reflects the cultural influences picked up along the way in the long, slow, meandering migration from their Aegean homeland. (T. Dothan 1982: 217)

Synthesis: Sandars and the Sea Peoples

One more attempt at a broad popular synthesis of the Sea Peoples and the crisis of the beginning of the first millennium, by Nancy K. Sandars (1978), should be mentioned last, for in the theoretical facet it invokes both the hitherto favorite culture historical/diffusionistic explanation framework, and the functionalistic mode of explanation to which the next section is devoted.

Sandars's analysis is based primarily on historical references (primarily, again, name etymologies) to Sea Peoples in Egyptian literature, Ugaritic, and Hittite sources, and Greek mythology; and the dress code and physical characteristics of Sea Peoples or possible Sea Peoples in the artwork of the Near East and the Aegean. Archaeological considerations (mainly bronzes; Sandars 1963)—and only then pottery—are secondary.

Sandars paints a very volatile picture of "nations on the move" at the end of the Bronze Age, hurling peoples across the Mediterranean at the slightest provocation. Thus the *srdnw* are identified (mainly by their horned headdress) as originally coming from Syria (as are the *dnynw*), more specifically from the region of Ugarit. They emigrated first to Cyprus (on the basis of ashlar construction at Early Iron Age Enkomi and the horned "ingot god" from the same site—Sandars 1978: 151–55) and elsewhere at the end of the Late Cypriot period (= our early Iron Age I) and later they emigrated to Sardinia, to which they gave their name (based mainly on the eighth century bronze figurines of "horned warriors"). The *prstw*, in her opinion, were not primarily a maritime nation either, but uprooted Anatolian farmers (according to the depiction of their ox-drawn carts in the Egyptian monuments and admittedly slender linguistic etymologies which point, in her opinion, to Luwian rather than Greek antecedents—Sandars 1978: 166). They settled mainly harbor-less sites on the southern coastal plain of Israel. The *t3krw* who later inhabited the ports of northern Israel (based on the Wen-Amon story) have more right to the title "People of the Sea." She favors their identification with the Teucri of Homer's Troy, rather than the Sikels who inhabited southeastern Sicily in the eighth century. The latter, she proposes, are the descendants of the *skrsw*, who also came there from Anatolia. Coupled with all of these is a southward movement of Danubian peoples, into the Balkans, northern Italy, and the Troad.

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As for BPh pottery, Sandars believes it should be renamed "Sea People" pottery, because, in her opinion, it was not specific to the Philistines. On the contrary, its Mycenaean antecedents point away from the (in her opinion) landlubber *prstw* and towards other groups (1978: 166–67). Sandars emphasizes the non-Mycenaean aspects of the BPh pottery, and its eclectic nature:

> What we find is evidence for an intermingling of peoples from the north among whom an Anatolian element was very strong (*?—I. S.*). . . . This whole phenomenon is of mixed Aegean, Anatolian and native Canaanite elements, and the product of a settled people who had, at least for a time, found a homeland. Further than this I do not think it is safe to go." (Sandars 1978: 169)

This, then, is possibly the "wave theory" at its most elaborate, with cross currents washing both west to east *and* east to west. The methodology followed in tracing these hypothetical movements, too, is reminiscent of diffusionism at its heyday. However, Sandars was also much impressed by Braudel (1972, 1980) and the *Annales* school of social history, which sees, behind the intricate tapestry of historical minutiae, a shadowy but constant materialistic determinism.

Based upon the infrastructure of traditional mixed Mediterranean subsistence economy, the LB elites in Egypt, Syria, Anatolia, and the Aegean, and even further north up to the Danube, built a fragile superstructure dependent on long-range trade in metals and luxury items. To facilitate this trade a class of merchants and sea captains was formed, and to protect their trade routes and their luxurious lifestyle, the princes increasingly depended on a warrior class of fighting nobility and/or mercenaries. Once a link in this precarious structure broke, the luxury goods stopped flowing, and these privileged classes would revert to piracy and freeboot warfare to obtain their share of the suddenly scarce luxury goods. Thus local stresses on each one of the Mediterranean powers threatened, and eventually brought down, the entire edifice (Sandars 1978: 197–98). This theory is a harbinger of processual-functional explanations, which is considered next.

IDEOLOGY RECONSIDERED

After World War II, no scholar of repute would endorse Kossina-type theories. Many settled for a less virulent version of the culture-history paradigm, commonly known as *normative theory*, and a related world view—*historical particularism*. Perhaps the best definition of normativism was given by Childe (1964: 15–26; 1965: 25–27): A *culture* is seen as a set of *norms* or rules governing the "proper" way for a member of the cultural group to behave in any given domain. Thus the difference in pot type between two different cultures reflects the difference between what "we" think is the proper utensil to eat from, cook in, or whatever; and the way "they" do. An individual is born into a culture and internalizes its value system as part of the process of socialization. Once assimilated, these norms form part of one's subconscious and are rarely, if ever, subject to introspection, much less revision. The "culture shock" attendant upon the changing of norms is traumatic to the individual (Childe 1965: 22), and therefore culture is passive and conservative in its nature (Childe 1964: 30)—it will stay static unless change is forced upon it.

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The basic model of a culture is still genetic, that is, a "culture" is the attribute of "a people" and "a people" are conceived of as an extension of the family or a subdivision of the biological species. The culture is still regarded as an organic unit: Once the "cultures" are defined, the object of research is to explain the similarities or differences between them, rather than the components of the individual culture (Watson, LeBlanc, and Redman 1971: 62). The main difference between the normative paradigm and racist views of culture is that the bonds between individuals and their culture are seen as *social* ties. The organic or genetic model is seen as an *analogy* rather than a literal description of physical reality.

Almost all the tenets of *Kulturgeschichte* live on, in expurgated versions. Thus in describing his methodology, Furumark strongly rejects the theory of Montelius's "Swedish typology" school, which equates cultural development with organic growth, and yet claims that "in order to ascertain the relation between morphological elements [of pottery types and] . . . human activity, we must apply a principle of arrangement that corresponds to the general *psychological* factor constituting that relation. This factor is the *inertia of the human mind*, manifesting itself in conservatism" (1941a: 3, italics mine).

Desborough, while rejecting the racial interpretation to the demise of the Mycenaean culture (1964: 242) equates stylistic homogeneity with *political* adhesion (and hence, by default, the spatial distribution of a style with national borders):

> The effect of [political] disaster following on disaster and of conditions of major unrest will probably be reflected in the degeneration of the LH IIIB style in the Argolid; and in so far as this is happening, and as the political dominance is removed, the style is likely to disappear. . . . It is under these conditions that a gradual change from one style to another is probable, and also that homogeneity will be seriously affected. Something new will arise, presuming there is not simply a progressive degeneration . . . . Any new style, unless there are racial changes, is likely to be founded on the preceding one, but [with the authority of the Argolid now fundamentally shaken] several new and distinct styles could emerge." (Desborough 1964: 5)

Furumark considers Hall's (1928) judgment that Myc IIIC style is "degenerate, vulgar, and tasteless" to be too harsh, but he pronounces the Myc IIIC:1 to be "a 'baroque,' which is a natural successor of the 'Classicism' of Myc IIIB style" (Furumark 1941a: 571) while in the succeeding "sub Mycenean" IIIC:2 style "standard motives (*sic*) had attained their simplest possible form. Some of them are mere survivals . . . others are highly conventionalized, degenerate, and muddled" (Furumark 1941a: 576). In a similar vein Desborough declares that "In the normal way, the continuation of a style will depend on its vitality, and after some time there will come a period of stagnation" (Desborough 1964: 4).

A peculiarity of the BPh pottery style, which is derived from this theoretical outlook, is that it is *all* progressively "degenerate." Since the BPh is supposedly a derivative of the Myc IIIC style, which is itself already a "baroque" to the "classic" Myc IIIB, all its "development" is of necessity downhill. Thus in the chronological subdivision of BPh pottery the first phase is designated as possessing the highest artistic quality, and succeeding phases are characterized by progressive degeneration (Furumark 1941b: 120; T. Dothan 1982: 96). When elaborate examples are found in late contexts (as is the case with the "Orpheus vase" in Megiddo Stratum VIA (Dothan 1982: 78) or several lavishly decorated pieces in Qasile Stratum X (A. Mazar 1985: 104) they are regarded as anomalies which need to be explained away.

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I have already noted that for Pythian-Adams the bell-shaped krater (which he calls "bowl fitted with a horizontal loop handle") was a *fossil directeur* to the *Volksgeist* of the Sea Peoples—but so is Sandars's (1978: 88–100) *Naue Type IIa* sword.

One way of addressing the paradox of regression to the norm, without assuming either that [some] people were biologically incapable of improvement or the existence of an irreducible *Volksgeist* to every ethnos, is an assumption of (random) *partial* reception of cultural traits. This is exactly how Mendel solved the regression paradox in genetics. This is also the assumption made by Franz Boas and other promoters of *Historical Particularism*. If it is not "culture" as a whole which is diffused from the "cultural center" to the "periphery," but rather *individual cultural traits.* If such traits can only be "exchanged" at a point of contact between two cultures, and at each such "exchange point" only a small random selection of traits passes from the donor to the recipient, then given a wide enough list of traits, an almost unlimited mosaic of cultures can be created. Each culture will have its unique combination of traits, most of which it has inherited from its forefathers and some of which it has acquired from its neighbors (Harris 1968: 376–79).

If one accepts the assumptions above, then by cataloging the trait lists of various cultures and studying the diffusion maps of individual traits, one can recreate the genealogy of each individual culture in terms of what other cultures it had been in contact with (direct, or *n*-times removed). The question *why* trait *x* was adopted at a given point of contact, and not trait *y* is not, however, deemed answerable. This is the type of reasoning behind the attempts to trace the route which the Philistines traveled from their unknown homeland to Philistia by enumerating the "source" of individual decorative motifs on BPh pottery, as is very apparent in the works of the Dothans, Desborough, and Sandars.

While historical particularism could provide a liberal alternative to the excesses of *Kulturgeschichte* and to unilinear evolution, it had the effect of reducing the *nomothetic* nature of archaeological explanation. Whatever the moral odium of the racial approach to anthropology, it was "scientific" in the sense that it held that there are immutable *laws* which shape the course of human history, and that one could *predict* the direction in which a culture would develop at any given point of time, given its past record and the state of the world at that point. According to historical particularists one might be able to show *how* a given culture arrived at a certain point (i.e., came to possess a given trait list) but not *why.* Detailed study might *map out* the course of development of a single culture, but that knowledge will not aid us in promulgating any general rules which would apply to other cultures at other points in time, nor will it enable us to predict what would befall this culture in the future.

Another drawback of historical particularism can be illustrated by the fortunes of the Philistine "wave theory." When each change in the material culture at a given spot is explained away by a contact with another culture, explanations tend to dissolve into incredibly intricate pseudo-histories.

In the case in point, we started out with a seemingly elegant account, linking events across the Mediterranean—a two-pronged "Achaean" invasion from the Balkans into Greece on the one side and Anatolia and the Levant on the other. It soon becomes clear, however, that the new arrivals in the Levant are not post-Mycenaean "Achaeans" and so a domino-effect gambit is used ("Achaeans" displacing "Myceneans" and pushing them overseas). To account for biblical and egyptological descriptions we need, however, not one, but at least

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two invasions, and so an additional wave is now posited (one bringing Myc IIIC in its wake and the other the BPh). The first wave needs to be divided into at least two ripples if we wish to account for the development of a local "simple style" of *after* the initial arrival of Myc IIIC-bearing peoples. Soon, even these are not enough and Desborough needs to invent a roving band of potters settling in Philistia after both these "waves" to account for the appearance of BPh pottery. Meanwhile, in Greece, it is clear that one invasion is not enough to account for both the change from Myc IIIB to IIIC and from IIIC to proto-Geometric. We need two (or even three) separate invasions, each of which presumably pushed fresh "waves" of displaced persons in an outward-bound course. These *cannot* be equated with the two "waves" which presumably washed out on the shores of Palestine, because no "granary style" or proto-Geometric ever arrived here. Accepting Finkelstein's "ultra-low" chronology means positing *another* wave of pre-Myc IIIC-manufacturing marauders (Falkenstein 1998: 143, see discussion below); not only are changes in material culture symptomatic of a wave of peoples but there are invisible waves, too. And we have not even begun to account for at least two waves in Cyprus (a wave of destructions by Sea Peoples at the end of the Late Cypriot II period and colonization by "Achaeans" during the LC III [e.g., Hood 1973, Desborough 1964: 238–39]); we'll need an additional "wave" to account for Cypriot "granary style" (Kling, 1989: fig. 26) and perhaps another one for the beginning of Cypro-Geometric (Karageorghis 1992, 1994); and what about Sandars's westward-bound cross currents?

A point which becomes clear when we review the above is that if we allow the positing of a new "wave" in response to any anomaly in our data, we soon reach what is called a "vacuous explanation" in logic or a "saturated model" in statistics. The wave theory is vacuous not because it is necessarily untrue, but on the contrary, because it can never be *disproved*. Any new evidence at all (and even lack thereof) might be accommodated within it.

DATA COLLECTION AND ANALYSIS 1970s–1990s: BREAKDOWN OF CONSENSUS

The publication of Trude Dothan's synthesis in 1967 might be seen as the high point of the "normal science" period (to use the well-known "Kuhnian" terminology) in the study of the Philistines. Up to this point, almost all the evidence supported (or at least was taken to support) the basic equation introduced in 1908:

Prstw (of Egyptian literature) = Philistines (of the Bible) = BPh pottery

There were, however, some cracks in this monolithic view (which were already hinted at before, see Desborough's chronological reservations). From the late 1970s onward a trickle of critiques started to appear, which by the mid-1980s had become a torrent. Some of these were dependent on the results of new excavations (some of which recovered new evidence of BPh pottery and some of which by rights *should have* but did not). Other critiques were based not on new finds, but on reexamination of old data, that is, looking at the same things through new ideological glasses.

Excavation: Deir el-Balaḥ

BPh pottery was found in the final phase of the Egyptian border post at Deir el-Balaḥ, excavated by Trude Dothan in 1972–1982 (T. Dothan 1979; Dothan and Dothan 1992:

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205–8). The significance of this excavation, however, is not in locating further attributes defining Philistine culture, but rather those which do not. The excavation started as a result of finding a cemetery containing anthropoid coffins of the type previously attributed to the Philistines. The evidence from both the cemetery and the settlement is that, at least at Deir el-Balaḥ, the anthropoid coffins are *not* associated with the early Iron Age settlement, but with the previous LB Egyptian fort. This effectively lays to rest long-standing speculation about the association of this Egyptian type of burial rite with Philistines. It apparently was reserved to Egyptian garrisons at the end of LB and (perhaps) the beginning of the Iron Age (which is not to say that occasionally a Philistine mercenary might not be buried in this manner, nor that an Egyptian official's tomb might not occasionally contain some BPh pottery). Thus anthropoid burial can be removed from the "Philistine equation" (Bunimovitz 1990: 217; Stager 1995: 341–42).

Excavation: Ekron

By far the most significant excavation for the "Philistine question" in recent years is Trude Dothan's and Seymour Gitin's excavation at Tel Miqne/Ekron, the third city of the Philistine pentapolis to undergo systematic excavation. The data here can be briefly summarized as follows.

The most complete sequence of the relevant phases was obtained in a section on the northeastern corner of the mound. A modest Canaanite settlement (Stratum VIII) is replaced by a huge fortified enclosure in Stratum VII. This new town is characterized by the massive appearance of Myc IIIC "close style" pottery, making up as much as 50% of the contents of typical assemblages. The Myc IIIC of the next phase (Stratum VI) is not as elaborate, and can perhaps be best characterized as a "simple style" (though whether it is the same as the Cypriot or Greek mainland "simple" styles is an open question). BPh pottery makes its first appearance in Stratum VI but does not completely replace the monochrome Myc IIIC until Stratum V (T. Dothan 1992: 94–95). Stratum IV is coeval with the final, degenerate, phase of BPh pottery (i.e., roughly equivalent to Qasile Stratum X). The city lost its prominence and was severely limited in its area at the beginning of the Iron II period (Ekron Strata III/II). It was not reoccupied, in its full extent, till the end of the Iron Age (Stratum I).

An additional area, in the middle of the tell, confirms the sequence as described above as well as the fact that the entire enclosure was occupied in the Iron I period. Also, a public building was found, with several unusual architectural elements that are possibly Aegean in origin (Dothan and Dothan 1992: 236–38, Dothan 1998: 155–57, cf. also Karageorghis 1998).

The picture at Ekron thus serves to confirm the one previously obtained by Moshe Dothan at Ashdod and to fill in more details. The implications of these finds are deferred until the end of the next subsection.

Compositional Analysis: Myc IIIC Pottery at Ashdod and Ekron

Two neutron activation analysis studies of Myc IIIC sherds from Ashdod (Asaro, Perlman, and Dothan 1971) and Ekron (Gunneweg et al. 1986) have conclusively shown that the Myc IIIC pottery at these sites was, like the later BPh pottery, *locally made*. On the other hand, petrographic analysis of several Myc IIIC sherds from Mazar's excavation at Beit Shean (see below) indicated that these sherds are not local to Beit Shean, nor are they similar to the Ash-

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dod-Ekron group (Mazar 1997: 159). Neutron activation analysis of a Myc IIIC vessel from Tell Keisan, a Phoenician site in the Akko valley, shows that it was made in Cyprus (Humbert 1993: 864).

Compositional analysis of pottery in Cyprus indicates that the Myc IIIB wares of the LC II period (our LB), *including* the so-called "Levanto-Helladic" styles, were manufactured in Greece. On the other hand, the Myc IIIC of the LC III (our early Iron Age I) are made of different clays, and are probably by-and-large locally made (Kling 1989: 91–93). This has not laid to rest the long-standing debate about Mycenaean potters at Crete in LB, for some Myc IIIC-type vessels, with matt-colored finish unlike the glossy Myc IIIB, already do appear in late LC II contexts.

At this juncture the question naturally arises whether we should keep calling what we now know to be a local ware by the name "Mycenaean." In Cyprus, the tendency in recent years has been to group the local "Myc IIIC-like" wares *together with other wares* subsumed under the technological definition of "Wheel Made White Painted" III wares. Obviously, the very terms we use to describe empirical observations are theoretically laden. Other proposals, like "Monochrome Sea Peoples Ware" (Stager 1995) or "Monochrome Philistine" are just as loaded, so I will keep using "Myc IIIC" in this work.

The difference between Myc IIIC and BPh is not, then, the result of different provenance, or even of lack of knowledge (on the part of "Philistine" potters) of the technique of making "true" Mycenaean IIIC ware. It is a *deliberate* change in technology, decorative technique, and range of motifs; the Myc IIIC (imported as well as local) being still a pure Aegean style, while the succeeding (and partially contemporary) BPh style incorporates non-Mycenaean elements.

The implication from this find, and from the typological sequence as revealed in Ashdod and Ekron is that the Sea Peoples did not come with an already developed "Philistine" pottery from abroad; but its entire development took place locally, with its stages being: a) imported Myc IIIC pottery brought by the first settlers; b) locally made Myc IIIC; c) Myc IIIC and "incipient" BPh; d) BPh. Such a reconstruction means that the non-Mycenaean elements in the BPh pottery (except for Canaanite ones) could not have been "picked up along the way" by the wandering Sea Peoples. It also introduces some serious problems of chronology but these are described below.

The evidence indicates that Myc IIIC pottery from Beit Shean and Phoenicia *is* genuinely imported and that the sporadic appearance of this ware in the north is part of an entirely different phenomenon, one which arguably has nothing to do with the settlement of Sea Peoples.

Other Excavations with BPh Pottery

One other project that is potentially crucial for the understanding of the Philistines is the renewed excavation at Ashkelon, by Lawrence Stager, in which Doug Esse served as associate director and as director of the laboratory in Jerusalem at the beginning of these excavations during 1986. Reaching the Philistine strata at that site has proven a formidable task. While some Iron I levels and BPh pottery were found during this excavation, exposure of the relevant strata thus far has been limited. The two material amendments to the rudimentary sequence established by Garstang and Phythian-Adams in the twenties are that at Ashkelon, too, there is a Myc IIIC Monochrome phase, which succeeds the LB destruction and precedes

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the introduction of BPh pottery. Also, inasmuch as the limited exposure is indicative of the whole site, then at Ashkelon, too, the transition from the Late Bronze Age to the Iron Age is accompanied by a burst of urban activities, exemplified by the erection of public buildings (Stager 1995: 345–46). Another city of the Philistine Pentapolis, Gat, identified by most scholars as Tell es-Safi, is currently being excavated by Aren Maeir and Carl Ehrlich. The last season has revealed, under a vast destruction layer dated to the Iron II period, an Iron I phase with considerable amounts of BPh. The preceding phase seems to be of Late Bronze Age already, and no Myc IIIC was found thus far (Maeir and Ehrlich in press).

At the southeastern edge of the Philistine littoral, Eliezer Oren has been excavating the two nearby sites of Tel Seraʾ and Tel Haror. In the late Bronze Age Tel Seraʾ was an Egyptian administrative center (Oren 1984). The last Egyptian stronghold, Stratum IX, has *no* Cypriot or Mycenaean imports of any kind but does have several Egyptian hieratic ostraca. One bears a fragmentary date (in regnal years) of 20+. The only probable candidate who reigned that long is Ramesses III. In the following stratum, VIII, there are both BPh and "Ashdodian" black-on-red pottery. It thus represents a somewhat late Philistine phase, comparable to Qasile Stratum X and/or XI. The following occupation, Stratum VII, contains typical tenth century Judean pottery (Oren 1993b: 1331). At Tel Haror, on the other hand, there are several pits, allocated to phases B4–B2, which contain both Myc IIIC and BPh. These, then, are probably contemporaneous with Miqne Stratum VI and Ashdod Stratum XIIIA (Oren 1993a: 582–83). The big question is whether Haror Stratum B4–B2 are contemporaneous with Seraʾ Stratum IX, or are later—that is, whether they fit into the hiatus between Seraʾ Strata IX and VIII. Oren (1984) is inclined towards the latter answer. The problem of the absolute chronology of the beginning of local Myc IIIC and of the BPh styles are discussed further below.

"Sea People" Sites Without *BPh Pottery?*

Philistine Bichrome pottery appeared in several other recent excavations, which are not discussed here as they do not change the picture as presented thus far. Perhaps more revealing to the structure of this picture are a number of excavations where the *lack*, or scarcity, of BPh pottery is surprising:

Dor, identified with *Tell el-Burj* on the northern Sharon coast, is associated with the *tꜣkrw* according to the "Tale of Wen Amon" (see Scheepers 1991 for a recent review and full bibliography). Limited exposure, due to the great overburden of later strata, has plagued Ephraim Stern's excavation at this site. After great efforts during the last few seasons, however, fairly wide extents of each of the several Iron I strata at that site were cleared in several areas, and abundant samples of the local Iron I assemblage was collected (Stern 1994: 85–104). It includes a single complete jug which might be a rather atypical BPh or some other Myc IIIC derivative, and only about a score of BPh sherds (mostly tiny fragments from unstratified contexts), a miniscule proportion within the Iron I collection. On the other hand, at Dor, as in Ekron, Ashdod, and possibly Ashkelon, the Iron I is a period of urban *flourit*, rather than urban decline, as in most other sites in Israel. (However, the Phoenician littoral north of Dor also flourished during the Iron I period.) A cautious assessment of the results thus far would indicate that if any significant *tꜣkrw* population was present on these strata, it did not manufacture BPh pottery or use it to a higher degree than would be expected by normal trade.

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The new excavations at Megiddo (Finkelstein, Ussishkin, and Halpern, eds. 2000) have uncovered new exposures of the Phase VIA destruction. For the first time, quantitative data is available for that site, confirming that the proportion of BPh at this site is small.

Renewed excavations at Beit Shean, first by Yadin and Geva (1986), and then by Amihai Mazar (1993), have revealed more of the Early Iron Age strata, which are crucial for the dating of the Bronze Age–Iron Age transition because of the abundance of dated Egyptian finds from that site. No BPh pottery was found by either of these expeditions, although several sherds of Myc IIIC (in addition to the pot found by the Pennsylvania excavators in the 1920s) were found by Mazar in phases probably parallel to "early Stratum 6" and "late Stratum 7" in the original excavators' terminology (Wolff 1994: 493; Mazar 1997: 159). It is hard to assess the chronological significance of these finds until well-stratified, absolutely datable finds are published by the new expedition, as the spectacular finds of the 1920s' excavation were notoriously misascribed.

Another excavation where BPh pottery is significantly lacking is David Ussishkin's excavation at Lachish (1985). Lachish was first excavated in the late 1930s by Starkey and subsequently published by Olga Tufnell (Tufnell, Inge, and Harding 1940 and Tufnell 1953). The final LB stratum at that site, Stratum VI, ended with a violent destruction, after which there was a gap in occupation. The excavators dated this destruction to the reign of Merneptah, although Tufnell argued that it could actually be as late as Ramesses III. The following phase, Stratum V, did not have any BPh pottery in it, though some was found in a cave on the slope of the tell (Tufnell et al. 1958: 292–93). T. Dothan had argued, based on this pottery and two anthropoid coffins found in Cemetery 500, that there was *some* occupation of the town during Iron Age I, but it had not been located by the excavators (1982: 86–87, 276–79).

The renewed excavations reaffirmed, in the main, the results of the previous one, specifically that Stratum VI dates to the very end of LB, and that Stratum V is not any earlier than the tenth century. The notable new find was a bronze trapping of the Stratum VI city gate, which was found in the destruction debris of the gatehouse and that had a cartouche of Ramesses III on it. Moreover, other written objects (unfortunately with no royal name on them) from the same destruction layer make it unlikely that this destruction occurred early within Ramesses III's reign.

On the basis of the new Lachish information Ussishkin (1985) concluded that the date of the end of LB is not 1230 B.C. (Merneptah) or 1200 B.C. (Tewoserat), but well into the reign of Ramesses III, if not even later—that is, 1150 or even later. This is especially significant in view of the fact that Lachish is located just a few miles southeast of Tel Miqne/Ekron. The entire sequence of development of the BPh from Myc IIIC must have occurred *after* the destruction of Lachish Stratum VI, during the gap of occupation at Lachish, for no trace of it is visible there. This means that the first appearance of BPh pottery must well postdate the eighth year of Ramesses III.

Reworking Old Data: The Tell Farʿah Cemeteries and the "Low Chronology" for BPh Pottery

A very similar conclusion had already been reached by Thomas McClellan some years before (1979). As part of his Ph.D. dissertation McClellan ran computer seriation on Petrie's data from Tell Farʿah (S), which is discussed above. Contrary to the order accepted until then—which was Tomb 542 (earliest), Tombs 552, 532, 562 (latest); see, e.g., Dothan 1982:

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29–32—McClellan put Tomb 552 as earliest, and then Tombs 562, 532, and 542 as latest in the series.[1]

This new order has several implications. First, it undermines the "successive degeneration" model of the relative chronology within the BPh sequence, as it is generally held that Tomb 542 has the most elaborate BPh examples in it (Dothan 1982: 30–32). Moreover, McClellan (1979: 66–67) claims that Cemetery 900, as a whole, *precedes* the Cemetery 500 series of tombs. This would mean that the appearance of BPh pottery at Tell el-Farʿah is later than the reign of Ramesses VIII, as scarabs ascribed to Ramesses III, IV, and VIII were found in Tombs 934 and 984.

McClellan (1979: 73) argued, based on these findings, that BPh pottery was not really introduced until the second half of the twelfth century. Therefore, he maintained, it really had nothing to do with the Philistines, who fought Ramesses III and were settled by him in the southern coastal strip. Rather, the BPh pottery was brought by yet another, hitherto unknown "wave" of immigrants, who came from Cyprus 30–40 years *after* these events, and were not Philistines at all.

Reworking Old Data: The "Ultra Low Chronology"

As we have seen above, the basic reasoning behind the "low chronology" (Mazar 1985a, 1985b, 1988; Stager 1985, 1995; Oren 1984, 2000) is that the pottery manufactured by the original Sea Peoples at the time of Ramesses III was the Myc IIIC and that it took at least a generation for the BPh to develop from that. A series of articles in the 1990s (Ussishkin 1995, 1998; Finkelstein 1995b, 1998) argues for an even lower date for the entire sequence. The gist of the dispute is whether contemporanity is possible between late "Late Bronze Age" Egyptian strongholds and "Iron Age" strata with Myc IIIC (Singer 1994: 290–94). T. Dothan (1989) argues for a "coexistence" between Miqne Stratum VII and Lachish Stratum VI. Finkelstein (1998: 141) maintains that the fact that not one Myc IIIC sherd has traveled from Miqne to Lachish (a distance of only 25 km) or from Tel Haror to Tel Seraʾ (less than 10 km), precludes such coexistence. Indeed, he notes that contrary to pap. Harris (which states that Ramesses III settled the vanquished Sea Peoples in Egyptian strongholds) Myc IIIC pottery is never found in conjunction with evidence of Egyptian occupation. Therefore, Lachish Stratum VI and Seraʾ Stratum IX, both of which postdate the last Myc IIIB imports, are earlier than Miqne Stratum VII and Haror Phases B2–4. Now, according to the cartouche of Ramesses III from Lachish Stratum VI and a hieratic inscription "year 22+"

1. Some years ago, this author undertook to recheck McClellan's results. I ran his numbers through several seriation techniques different from the ones he had used, under several different distance functions, and consistently got the same order McClellan obtained. It has to be pointed out, however, that McClellan used Petrie's (or, rather, Duncan's) century old typology. It is certainly possible that reclassifying all of the vessels (now in the British Museum) according to current typological criteria will produce substantially different results. Another possibility, that had not been considered by either Petrie or McClellan, is that at least some of these tombs had a considerable chronological range. Serious consideration should be given to this possibility in view of the current trend to date all anthropomorphic coffins to LB. If these tombs were used from LB and into Iron Age I then quantitative seriation might mean nothing more than an indication of the amount of LB pottery (vs. Iron Age pottery) in each tomb (see also a very similar critique in Brug 1985: 138–39).

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[presumably of Ramesses III, since no other monarch in the Twentieth Dynasty exceeded that] in Seraʾ Stratum IX (Goldwasser 1984) the Egyptian administration in Palestine was still active in 1160 (using the low chronology of Wente and van Siclen 1976: 217–61). The first Myc IIIC-using immigrants could not have settled prior to that date, and the BPh could not have started until at least a generation later.

Evaluation of *negative* evidence is always problematic. There are any number of late Late Bronze Age and early Iron Age sites where Myc IIIC *was not* found. Were they all abandoned at the time? The alternative would be to argue that Myc IIIC pottery was produced strictly for self consumption. Indeed, Bunimovitz (1998: 107) sees this as the result of a deliberate "containment" policy on the part of the Egyptians—the first ever use of boycott as an economic weapon to reach political goals(?)—since he sees both the Egyptians and the Sea Peoples as ruling elites, one must wonder whether the Egyptians forbade "their" Canaanites *any* interaction with the "Philistine" Canaanites, or just banned the visible display of seditious decorative elements.

T. Dothan (1998: 151) counters with two arguments: a) Miqne Stratum VIII has Cypriot as well as Anatolian "gray Minian" imports (and is therefore earlier than Lachish Stratum VI and Seraʾ Stratum IX) and there is no occupational gap between Miqne Strata VIII and VII (and hence Stratum VII must be contemporary with Lachish Stratum VI). This assertion is belied by her own statement that the constructional fill *beneath* the Stratum VII floors contains Myc IIIC and "transitional forms" which are lacking in the Stratum VIII destruction debris (Dothan 1998: 151). This means, on the face of it, that some time must have passed between the destruction of Stratum VIII and the construction of Stratum VII. There seems, moreover, to be some disagreement within the excavation team on the factual merits of this position (see Killibrew 1998: 383).

Be that as it may, the phenomenon of extensive manufacture and use of Myc IIIC at Tel Miqne and Ashdod (and probably Ashkelon, too) is, by and large, highly localized and crisply delineated, isolated examples of Myc IIIC in sites outside the core area of the Philistine pentapolis notwithstanding (see Finkelstein 1998: 142 for definite and putative instances).

Finkelstein runs into an even bigger problem in reckoning this theory with documentary evidence: if Myc IIIC was not produced at the southern coast until ca. 1130, who were the Sea Peoples subjugated by Ramesses III in 1175? He is forced at this point, like many before him, to posit yet another, "invisible" wave of marauders, the only indication for which is a wake of vandalism (Finkelstein 1998: 143). He further surmises that the subsequent settlement of these "invisible sea peoples" was not in Philistia but in some hitherto unexplored parts elsewhere.

All of these limitations and more apply to Ussishkin's (1995, 1998) attempt to lower the arrival date of the Philistines according to the finds of Stratum VII at Megiddo. The contention is that Megiddo was an Egyptian stronghold until ca. 1130 B.C., and, as such, would have prevented the southward advance of the Sea Peoples had it occurred prior to that date. The scenario offered by Ussishkin is highly precarious. All that may be said is that *if* the statue-base of Ramesses VI is indeed to be associated with Stratum VII (the excavator, for one, says it was found *beneath* a Stratum VII wall, Loud 1948: 135, note 1); and *if* the incursion of the Philistines took the form of an overland military invasion from the north, and *if* all by-passes to the ʿIron valley were impassable at that precise point in time, and *if* the Egyptian garrison

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at Megiddo took this invasion to be hostile to Egyptian interests in Canaan, than yes, this script is not outside the bounds of possibility.

Reworking Old Data: The Tell Qasile Temple and the Nature of BPh Pottery

Two additional critiques which appeared in the mid-1980s propose different views of the Philistines and of their connection to the BPh pottery.

Shlomo Bunimovitz (1990, 1998) proceeds from an assumption that the Philistines were a ruling elite, governing a population which was predominately Canaanite. In order to identify a material attribute as "Philistine," one must demonstrate that it was brought by the Sea Peoples from abroad and was used by the Philistine sub-culture, rather than by other cultures which shared the same chronological and geographical space with it. The local Myc IIIC is, according to Bunimovitz, a distinctively Philistine product. The BPh, on the other hand, is a copy of the Myc IIIC by local potters. It was used indiscriminately by all of the population and so is not exclusively Philistine (though it is, of course, probable that it was used by Philistines too). It was distributed along the coast and occasionally inland by the usual mechanisms of trade and imitation.

A case in point is the sanctuary at Tell Qasile. There is nothing in its cultic furniture, and precious little in the architecture, to suggest that the cult practiced in it is any other than Canaanite. On the contrary, the few indications that we posses of what might be termed true Philistine religion (e.g., "Ashdoda" type figurines) are conspicuously missing at Tell Qasile. Here is a clear case, claims Bunimovitz, of a Canaanite revival, possibly under Philistine political hegemony. The BPh vessels found in this temple (together with quite a number of "Phoenician" bichrome vessels and even "Israelite" collared-rim jars) simply reflect the choice of "exotic" wares available to the population at that time.

Reworking Old Data: Amihai Mazar on Megiddo, Tell Qasile, and the Nature of Philistine Culture

As we have seen above, the chronological framework of the BPh pottery is heavily dependent on the Tell Farʿah cemeteries, Megiddo, and Tell Qasile. McClellan undermined one of the foundations of this framework, and Ussishkin produced independent evidence in support. Amihai Mazar (1985a, 1985b, 1988) proceeds to demolish the other foundations of this framework. In his final report on the pottery from the temple at Tell Qasile, Mazar (1985a: 104–5) contradicts some of the previous claims about the subdivision of the BPh repertoire into chronological phases. While conceding that, in general, the earlier phases of Philistine culture show greater affinities with Aegean prototypes, and a higher percentage of lavishly decorated pieces, he does not agree that Stratum X is a "degraded" or "sub-Philistine" phase. There are several examples of elaborately decorated vessels that belong to this stratum. Conversely, some types previously claimed to start only in the "sub-Philistine" phase, such as the "Ashdodian" style of painting black bands on *red* background (usually interpreted as some sort of amalgamation of Philistine technique with the red slip tradition of Judea), actually already appear in Stratum XI.

Restudying yet again the stratigraphy of Megiddo, Mazar (1985b: 96–97) claims that *all* of the BPh sherds recovered from Strata VII and VIII are intrusive (and not just the ones

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from Strata VIII and VIIB, as previously claimed by T. Dothan). This leaves Stratum VII, which in his opinion is securely dated to Ramesses III, as earlier than the appearance of BPh pottery, in line with the findings at Lachish and elsewhere.

Reworking Old Data: Brug's Literary and Archaeological Study of the Philistines

The year 1985 seems to have been a turning point in the assessment of Philistine culture. In addition to Ussishkin's (1985) chronological conclusions and Mazar's (1985a, 1985b) reassessment of Tell Qasile and Megiddo, that same year saw the appearance of John Brug's (1985) study of the Philistines based on his doctoral dissertation which appeared a year earlier. Brug essentially reviews the same material that Trude Dothan did only three years before, but his conclusions are rather different.

Trude Dothan ascribes a Mycenaean source to a BPh pot type or decorative motif whenever its original provenance could be traced to a Mycenaean prototype, whether or not that type had already previously existed in the Canaanite repertoire. Brug, on the other hand, limits "Mycenaean" types only to those which could not possibly have been picked up by the Philistines in Palestine itself. Thus, whereas Dothan sees eight BPh forms (out of eighteen) as descendant from Mycenaean types, Brug classifies only four as having definite Mycenaean roots, and four as "doubtful" (Brug 1985: 113). The origin of even these four forms is not *necessarily* Mycenaean, because by the time they arrive in Israel they are also "naturalized" in Cyprus (vs. Dothan's ascription of only three forms to Cypriot prototypes). Also, having defined the BPh group on the basis of form, technique, colors, and motifs, Dothan tends to take a maximizing or inclusive view, classifying as "Philistine" vessels that have only two or three, and sometimes even only one, of these traits. Brug takes a rather restrictive view, that is, any vessel which is not one of the eighteen "classic" forms, and/or does not have one of the distinctively Philistine motifs drawn in red and black on a white background, is *not* deemed Philistine. Thus the percentages of "true" BPh within total assemblages according to Brug are much depressed (1985: 55–57). The same methodology is followed elsewhere. Brug (in agreement with Bunimovitz) sees little of the Mycenaean, or none at all, in Philistine cultic practices, architecture, and the like—not because there are *no* shared traits with the Aegean in these facets, but because parallels can also be found in the local, or Cypriot, littoral.

It is therefore hardly surprising that Brug concludes that the Philistine culture is composite (in which he and Dothan are in complete agreement), but that the *Canaanite* element is predominant. As for the sources of the Aegean elements in this complex, one need go no further than Cyprus. These foreign elements, though naturally the most distinguishable, are also the most transient. It is the Canaanite elements of Philistine culture that endure into the Iron II Age. Brug stresses that "migrations" can (rarely) take the form of mass population movements, like that of Slav peoples into the Balkans, but more commonly are small scale settlement of individuals or of families, establishing independent colonies or carving out vassal fiefs. Brug points out an apt analogy for the latter kind in the settlement of Norsemen in England (and other coastal parts of Europe) in the Middle Ages; bringing a short period of radical change in the material culture of these regions, but quickly assimilating into the local culture, blending into it a few names, decorative motifs, and myths (Brug 1985: 201–5).

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An Assessment of the Critiques

Absolute chronology is quite central to the debate about the character of Philistine culture, as several additional critiques which support the late dating of the beginning of BPh (Oren 1984: 55–56; Stager 1985: 62) also point out. A brief discussion is therefore merited. Although it is generally agreed that Myc IIIB was still being produced during the reign of Merneptah (ca. 1236–1223 / 1212–1202 B.C.), many tend to lower the *terminus post quem* for the end of Myc IIIB to ca. 1200 / 1185 B.C., due to the recent finding of a cartouche of queen Tewosret (1209–1200 / 1186–1175 B.C.) at Deir Alla᾽ in a LB context with Myc IIIB pottery. Assuming that BPh pottery was being manufactured during the eighth year of Ramesses III, or even shortly thereafter, would leave barely a decade for Myc IIIC:1a to appear in Mycenae, evolve into the mature "close style," cross the Mediterranean and get established in local workshops in the Levant, and after a period of congruence develop into BPh. A period of at least half a century seems more appropriate for this sequence.

One way out of this quandary is to assume a period of chronological *overlap* wherein Egyptian-dominated LB culture at some sites or regions co-existed with Philistine (and Israelite) sites displaying Iron I cultural attributes (T. Dothan 1993: 97; Stager 1995: 344). In order to corroborate such a hypothesis some evidence which unequivocally demonstrates such contemporaneity (e.g., *some* Myc IIIC from an "LB" site) will have to be forthcoming. Stager (1995) points out that another long-held belief, that of the settlement of Philistines as Egyptian mercenaries, is also incompatible with this view. Most recently excavated assemblages with distinct Egyptian presence (Lachish Stratum VI, Tel Sera᾽ Stratum IX) *do not* have either Myc IIIC or BPh in them, and vice-versa.

Lest it be thought that all this fiddling with a decade here or two decades there is quibbling, it has to be pointed out that if the BPh pottery did not appear until thirty or forty years *after* the documented appearance of the Philistines, than one is justified in questioning its "Philistinicity." This is indeed what McClellan and Bunimovitz, and, to a lesser extent, Mazar and Desborough, have done.

A. Mazar (1985a: 119–20; 1988: 257) also proposes to slightly change the definition of "Philistine culture," but not exactly in the same sense as Bunimovitz. He sees the BPh pottery as a hybrid of Aegean and Canaanite influences, which came into being on Palestinian soil only a generation or two *after* the initial settlement of the Philistines in the days of Ramesses III. Mazar, Brug, and Bunimovitz actually present two views which are quite close. The essence of the difference between them is that Bunimovitz sees Philistine culture as a composite entity, in which (at least) two sub-cultures can be delineated, while Mazar (1985a: 120) sees it as a single atomic "Philisto-Canaanite" culture.

Taken together, all of these critiques point to dissonance in the factual basis of the previously accepted paradigm. In one way or another all of them also express doubt as to the basic tenability of the equation of pottery types with an ethnic identity. In this, they reflect a general trend in the ideology of archaeologists in the last decades, as I attempt to demonstrate in the next section. They do have two glaring drawbacks—they do not explain *why*, if it did not appear immediately, did a unique pottery style evolve a generation *after* the Philistine settlement in Canaan; and while they seem to reject the normative explanation of culture, they do not offer a coherent alternative. In the last section of this work, I try to build such a theoret-

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ical defense to the model suggested by Mazar. First, though, a survey of the main ideological stances in archaeology in the last decades is in order.

PROCESSUAL EXPLANATIONS

Functional Explanations of Culture

Several different (and sometimes contradictory) developments promoted the "new archaeology" revolution, several strands of which developed from the late 1960s and onwards. The "price" for adopting a normative, particularistic view of material culture was the loss of generality and of a nomothetic framework for human development. As prestige (and economic superiority) became a matter of "high tech," and academic disciplines were either sciences or nothing at all, these came to be seen as intolerable defects. Such pressures were felt worst in North American archaeology, which was traditionally located in departments of social studies rather than in the humanities. It was patently clear that historical particularism would never be able to "predict the past." An "explicitly scientific" alternative, it was hoped, might be able to do that. Incompatible definitions of just what is "explicitly scientific" were being offered at the time by Hempel (1965), Popper (1959, 1969), and Kuhn (1962). So as not to seem inhospitable, archaeologists tended to agree with them all (Wylie 1985: 483).

Another concurrent development was the rise of *environmentalism* to a position of dominant paradigm. The threat of atomic holocaust, dwindling resources, and rising pollution eroded the faith in "progress" as a panacea for the human condition. The lessons that the past was supposed to teach us had shifted from how "progressive" civilizations eradicate "primitive" ones (to the general glory of mankind), into lessons of how to live in harmony with nature and that upsetting the equilibrium leads to catastrophe. Archaeologists increasingly find themselves enlisted into the "green militias," by inclination and by guild affiliation. As salvage and conservation come to dominate the archaeological work market, operating within park services or financed by environmental impact projects, it is only natural that archaeologists adopt the prevailing idiom in their theoretical discourse.

Yet another source of distaste with the "old archaeology" was its myopic view of the world through *ethnic* or racial glasses. The civil rights movement in America in the 1960s, the economic rise of the far east, increasing multi-culturalism at both edges of society, the academic and corporate elites on the one side and migrant workers on the other, as well as more recent developments, such as the rise of the communication age and the European union movement, had all served to blur the definition of what ethnic or racial identity is, and undermine the notion that it is a useful (much less singular) classificatory criterion. Ethnic strife has become a deplorable third-world phenomenon, hardly Byron or Shelly's romantic ideal. Racial bias is reserved for rednecks and skinheads. In lecture halls or boardrooms you mess with these subjects at your peril (except, of course, to condemn *others* of hypocrisy).

A completely new definition of the essence of "material culture" seemed called for. In particular, devastating critiques were being leveled at the view of culture as a set of norms, at the view of "cultural traits" diffusing from privileged "cultural centers" to passive "peripheries," and at the view of "cultures" as atomic units.

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The definition of "culture" which most "new" archaeologists adopted was that of the functionalistic school in social anthropology (Harris 1968: 514–26, 635–50). It is really a revival of the evolutional schemes which were popular in seventeenth and eighteenth century worldviews, in a new pseudo-Darwinian guise. The most often quoted definition is Leslie White's (1959: 9) "man's extra-somatic means of adaptation." "Culture," and material culture in particular, is conceived of as a *toolkit*, developed by man to help him survive and exploit his environment in an optimal fashion. This simple enough definition has far reaching implications:

(1) In the first place, the task of the anthropologist is not deemed to document the contacts between "cultures," but to *explain* how each culture is uniquely fitted to its particular environment, and why new cultural attributes (whether acquired by diffusion or by internal development) are accepted or rejected, on the basis of their suitability to that environment.

(2) Culture is basically seen as *adaptive*. Society will tend to change its culture to suit its physical and social environment. Societies which ignore the environmental directive and are behaviorally or organizationally inefficient will not be able to survive in the long run.

(3) The boundaries of an observed material "culture" define an ecological niche (White 1959: 284), or a *subsistence system* rather than an "ethnos" or "a people." Although it is possible (indeed probable) that in the long run, a shared way of life will also define the boundaries of the "us," and hence provide the base for the definition of social groupings.

(4) *Cultural change* is usually taken to be indicative of *environmental* (ecological or economical) transformation, or of *evolutional processes* affecting that society and altering its relationship with its environment, hence the name "processual archaeology" which was given to this school.

(5) The *model* or analogy at the base of the functional paradigm is taken from neo-Darwinism and from biological ecology (Watson, LeBlanc, and Redman 1971: 88–107). "Culture" is seen as a direct continuation of biological evolution.

Under such a paradigm, it is understandable that cultural diffusion in general, and migrations in particular, fell into disrepute as explanations for cultural change. "Blaming" the appearance of each material attribute on an arbitrary trajectory bringing one "culture" into contact with another and the stochastic "borrowing" of cultural attributes in these contacts was seen as begging the question of causative explanation of material culture phenomena.

The essentially synchronic (or, rather, a-chronic) outlook of the functional school in anthropology led to the dethroning of the apt *historical literary reference* as the *sine quo non* of valid archaeological inference. Pride-of-place was accorded, instead, to *ethnographic analogies*. The tacit reasoning being that particularistic historical trajectories are not as relevant as the environmental imperative which dictates similar survival strategies in similar circumstances.

The processual paradigm became very popular in the 1970s and 1980s, in some places (northwestern Europe and North America, for instance) to the exclusion of other paradigms. In the archaeology of the Levant, due to its traditionally close ties to the humanities, it came rather late, and apart from programmatic statements (e.g., Dever 1981), did not make much of an impact on the actual agenda of archaeology until the mid-1980s. Since then, however, there has been a growing body of processual explanations. These include several radically new approaches to the enigma of the "Sea Peoples."

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The "Nomads of the Sea"

The model proposed by Michal Artzy (1997, 1998) is essentially an elaboration upon the one introduced by Sandars (1978) some twenty years earlier. Artzy argues that the Late Bronze Age lifestyle depended on overseas trade in luxury goods. This promoted the establishment of a caste of deep sea-going sailors, freebooting traders, mercenaries, and itinerant artisans who had only transient allegiance to the powers-that-be. They would be the first to be injured at any recession. Being but marginally attached to the nuclear commonwealth they would be most inclined to switch from safeguarding its lifelines to preying upon them, thus initiating a negative feedback cycle that would sever more webs of commerce, further weaken the established order, and add deflationary pressures to the economy. This is the process which she sees at the root of the "thirteenth century crisis." Esse (1991, 1992) suggested that a very similar dis-equilibrium was concurrently evolving between the urban lowland civilization and highland pastoralists and farmers, a model further developed by myself several years ago (Sharon 1994).

In seeking to establish ethnographic parallels to such a situation, however, Artzy's theory suffers from mixed metaphors. She offers several completely different (to my mind) corollaries to the hypothesized phenomenon. The first are pirates, from the so called "Cilician pirates" of the first century B.C., to Anglo-American piracy of the eighteenth century, or even latter-day boat-jackers in Malaysia or off the African coasts. This is a hopelessly wide and amorphous designation, perhaps because "piracy" is largely in the eyes of the beholder.

If we are to believe Appian's description that the "Cilician pirates" (Artzy 1997: 6, after Rauh 1997), had permanent fortified ports and far-flung marketplaces, could and would mobilize fleets 20–30,000 strong, made and broke treaties, and were ruled by *tyrannoi*; they were, for all intents and purposes, independent polities that resorted to priveteering. Indeed, these descriptions would fit to a tee the appearance and activities of some of the Italian maritime republics in the Middle Ages, or those of the "Robber Barons" of the same times. Had not the "Cilician pirates" attempted to take the *Nostrum* out of the *Mare* . . . and lost, they might have been quite differently described. Would Sir Francis Drake qualify as a "Sea Nomad"? Needless to say, people for whom "the boat . . . was not necessarily their home" and whose "womenfolk, children and others . . . remained behind, continuing their diverse economic pursuits" (Artzy 1997: 7) can by no stretch of the definition be called "nomads."

While it may be true that high-seas pirates of the early modern period were in a sense outcasts from the establishment, they were by no means a nomadic society, or even a society at all. As Rediker (1987: 285) says "They produced nothing, and had no secure place in the economic order . . . they were unable to create reliable mechanisms through which they could either replenish their ranks or mobilize their collective strength." The facts quoted by Rediker belie his romantic depiction of eighteenth century piracy. In the "golden age" of piracy, the single decade between 1716 to 1726, there were, at any point in time, between ten and twenty pirate ships, manned by some 1,000–2,000 men, plying the Atlantic between the West Indies and the coast of Africa (Rediker 1987: 256). Though pirate ships sporadically sailed in consort, and they occasionally vowed to avenge captured comrades, no effective long-term alliances were ever formed (Rediker 1987: 268). They never, despite the contemporary scandalizing reports and the romantic aura of later times, posed a serious threat to

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established maritime powers. (The Royal Navy, whose demobilization after the Spanish Wars caused this outbreak of piracy in the first place, was never depleted below 10,000 seamen [Rediker 1987: 281–82]). Moreover, within that decade, some 4,500–5,000 men are estimated to have sailed under the skull and crossbones (Rediker 1987: 256) and very few survived into the second quarter of the century. These two statistics, taken together, mean that the average life expectancy of a pirate (or at least the length of his career as a renegade) did not exceed a couple of years.

Things are confused even further when an analogy to desert nomads is made. Despite the fact that they are dependent upon sedentary states and a market economy for the purchase of many staples, nomadic pastoralists do form stable societies (Khazanov 1983: 119–23, 148), perpetuating themselves and their customs. As such, they *are* ethnic entities. While *Hakka*-like "boat people" do exist in the orient (though whether they are "nomads" is debatable), it has not been shown that such subsistence has ever been , or even could possibly be, practiced on the Mediterranean.

The most serious defect in Artzy's intriguing conjecture, however, is its rather slender empirical basis. While the written records can be read so as to fit the proposed scenario (just as they have been interpreted to support ethnic migrations), there is little archaeological evidence in favor of it. We really do not know enough about LB trade mechanisms at all. Overseas contacts may have been affected by a class of specialized intermediaries, as Artzy supposes, but then again they could have been accomplished by "direct marketing" expeditions by the primary producers themselves, or by indirect local barter and short hops up and down the coast. If "Sea Nomads" ever existed, they left little if any material traces. (The same is true, I would have to admit, with hypothesized Late Bronze Age pastoralists in the hill country and that is certainly a glaring defect in my own reconstruction of the establishment of the "Israelites" [Sharon 1994: 126]). The bronze treasure-trove in tiny Tel Nami (Artzy 1995: 26–29; 1998: 440) is an exciting find, but had it not been for it, there would have been little to distinguish Nami from dozens of other, large and small, Late Bronze Age sites. The idea of the innocuous Nami anchorage as a notorious pirate cove is romantic and novel but is hardly the only (or even the simplest) explanation for the facts.

Artzy confines her discussion to the Bronze Age. It is not clear what relation (if any) her "Nomads of the Sea" had with the Philistines of the Iron Age. At any rate, this theory does not offer an explanation as to why these nomads (if indeed they are the same people) suddenly established urban centers, some far away from the sea, started to produce a distinctive material culture, and ceased all visible signs of maritime activity and overseas trade. While this model makes arguable assumptions about ephemeral archaeological phenomena, it fails to account for the *prima facie* empirical evidence.

The "Decentralized Trade" System

A comprehensive economic model, developed from one introduced for Greece (Sheratt and Sheratt 1991; see Dickinson 1994 for a recent overview of current processual theories to explain the collapse of Late Bronze civilization in Greece) has been recently "transplanted" to the Levant by Susan Sheratt (1994, 1998) and embellished by Alexander Bauer (1998).

True-to-form of standard functionalistic critiques of the culture-history genre, Sheratt censures previous theories as

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> . . . a kind of quasi-politico-military history, elaborated beyond recognition . . . in which short term events rather than long term processes are seen as the most significant and decisive factor. Thus, mass invasions of migrants sweeping in . . . are held to account like *deus-ex-machina* for a whole package of changes. (Sheratt 1998: 296)

> . . . the ostensibly "ethnic" similarities . . . [of] "Sea People" settlements . . . are as likely to arise directly from this [natural evolution and expansion of international trade] as from any deep-seated racial or linguistic relationships. (Sheratt 1998: 294)

The Late Bronze Age–Iron Age transformation in the entire Mediterranean is seen by Sheratt as a transition from a centralized "palatial" monopolist exchange system, which she thinks was typical of the Bronze Age to "decentralized" private entrepreneurship, characteristic for the Iron Age in her opinion. This transformation is affected by three complementary processes, all of which start in the Late Bronze Age and culminate in the Iron Age. The first is the widening of the exchange market from prestige goods bartered between rulers to commodities intended for general consumption. The second is a shift from trade in scarce materials (e.g., gold, silver, tin), high in primary value, to manufactured goods, in which the added-value component is especially high (e.g., ornate pottery, textiles), the third is a substitution of the economic center of gravity from inland producers to coastal "gateway communities" chiefly concerned with distribution.

The motor which jointly runs all of these processes is the growth of a merchant class. The procurement of exotic goods for the Late Bronze Age elites scattered around the Mediterranean promotes the formation of groups of specialists concerned with moving these goods around. To supplement their income, sailors add low value, high value-added "trinkets" to their primary cargo. These cheap products command a wider market than the "primary" goods, and offer a wider margin of profit for the intermediaries. Increasing concentration in the moving-around of "secondary" cargoes, and consequently the increase of wealth in the hands of the merchant class, increasingly undermines the *ancien regime* of resource-based aristocracy, and shifts the balance of power from inland centers controlling the resources to "gateways" concerned with distribution. The final chapter of this struggle is the switch to commodities self manufactured by the merchant communities because this way they retain 100% of the price, and/or because the original product can no longer be obtained, due to the collapse of the production system.

It is this final chapter which results in the locally-produced Myc IIIC appearing in Cyprus and Philistia. The reasons for why these wares should share an Aegean style are, in Sheratt's opinion, peripheral: The consumers are used to viewing this style as "exotic," and it is cheaper to manufacture than the hand-made Cypriot-style products.

Now, whatever the merits of this quite elegant theory in the Cypriot sphere, it simply does not fit the bill for Canaan. What it would have us believe is that what seems to the naked eye like a catastrophic collapse of the Late Bronze Age importation and a major setback in the higher apparatus of civilization which would last for centuries, is in reality nothing but an *expansion of international trade* (Sheratt 1998: 294; Bauer 1998: 160). While there is some truth to Muhly's (1998: 320) claim that the term "dark age" has suffered erosion in the last decade, does this mean that it was in actuality the opposite?

The facts are that as against *tens of thousands* of items imported from Cyprus and Greece to Canaan in the Late Bronze Age, we can, at present, establish perhaps several scores of

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items definitely imported in the Iron Age I period (almost all of them towards the end of the period, and almost all from non-Philistine sites [see Gilboa 1989: 216–18]). Sheratt (1998: 304–5) counters with some not-quite-testable hypotheses, such as that the trade had switched from pottery to textiles or that the many metal remelting installations typical of the Iron Age I in Israel (*not only, or even primarily, in Philistine sites*—I. S.) and in LC III Cyprus (Sheratt 1998: 300) indicate a trade in scrap-metal (see also Bauer 1998: 160, but would not a simpler explanation be that recycling was made necessary by the *cessation* of trade?)

The reasons for perpetuating Aegean prototypes are not valid for Canaan, neither the local Myc IIIC nor the BPh are any more "industrialized" or easier to manufacture than the local products (probably quite the opposite). That the merchants provided consumers with copies of products they were used to is belied by the fact that the range of popular shapes in both Myc IIIC and BPh groups is quite different than those of Myc IIIB imported in the previous age. Some (e.g., cooking pots) had never even been seen in Israel before. In any case, where are these "consumers"? Myc IIIC pottery was *never* (or almost never, if we are to believe Finkelstein 1998: 142) used outside the towns where it was manufactured, and while BPh traveled a little further, it still was primarily a domestic ware.

These shortcomings do not faze Bauer (1998: 150), who judges Sheratt's version to be "the most compelling conceptualization of the nature of the Sea Peoples to date." He proposes to test this theory with the following hypothesis: "If this is the case, one might expect that . . . the material culture of these sites would primarily reflect mercantile activities, rather than being simply "cultural" indicators and in any event would reflect the multi-cultural traditions of those involved in the maritime trade network."

The settlements bearing Myc IIIC pottery show *no* mercantile activities and no involvement in any maritime networks at all. If the purpose of making this pottery was to market "their own imitation of Mycenaean wares throughout the eastern Mediterranean" (Bauer 1998: 160) then this venture ended in abject failure.

Does this mean that the hypothesis, that the demise of the Bronze Age was hastened by competition between the established aristocracy and a growing merchant class, has no merit at all? Not necessarily, but I believe that any valid explanation of the Late Bronze Age collapse will have to include the collapse of the trade networks (and hence of the merchant class) as well.

The Systemic Approach

The functional view of culture has some obvious drawbacks. First, functional explanations all too easily fall into the trap of naive environmental determinism, and hence into eighteenth-century style unilinear evolution. Also, there are many aspects of culture that seem, on the face of it, to offer no functional advantage, and some that are positively counter-productive. Granted that changing the shape of projectile points may offer some added efficiency to the Indian's hunting technique, but what about changes in the headdress of the chief? In order to rescue processual archaeology from these pitfalls "new archaeology" combined functionalism with systems theory (Hodder 1986: 18–33).

Clarke (1968: 43) defined culture as a *system* of subcultures with interactions between them. The systemic approach views culture as a structure, composed of smaller units (subcultures). It does not, however, attempt to directly define either the system or its components. This is typical of the "black box" approach of systems theory.

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Systems theory (like mathematical "theories" in general) is not a theory at all, in the usual scientific sense, inasmuch as it does not have a subject matter, or a *domain*. Rather, it is an abstract vocabulary, or a set of analogies which can be used (in this case) to describe the way various components might interact to produce a total output in a composite entity (whether this entity is a car, an institution, or a plant community). Which analogies (if any) might be usefully invoked in a specific case depends on how we define the "system" being studied and on the nature of its components. In the case of anthropological or archaeological use, the *system* is, of course, the culture. The *subsystems* can be of several kinds. They can be *groups* within the culture (e.g., "young males," "itinerant craftsmen") or *institutions* ("the court") or they can be *facets* of culture ("art," "mythology").

Systems theoretical terminology has been used in processual archaeology first of all as an antidote to the normative assumption of the atomicity of cultures. In the second place it has been used to explain away apparently non-productive subsystems (e.g. mythology). The windshield wiper on a car can serve as a crude but effective analogy (I have an aversion to the system theorists' fondness of defining concepts of systems theory in system theoretical jargon): no one would be able to guess, from looking at the wiper alone, that it has anything to do with getting people or commodities from point A to point B. It is only when viewing it in the holistic context of a working car that it becomes apparent how it does, in fact, aid the entire system (the car) to achieve its output (move from A to B). Thirdly, systems theory has been used to explain cultural diversity (i.e., why cultures in similar environmental straits are not of necessity similar). Any system expends resources in two ways: one is to get its primary function done (the resources spent in turning the wheels of the car) and the other is the use of resources to get all secondary functions running smoothly (keep the battery full, the engine cool, the ball bearings lubricated, etc.) In human organizational systems the first task is often defined as "work" and the second as "activity." Now, it seems perfectly sensible that structurally different systems will use different activities to get the same work done.

What, if anything, has the systemic approach contributed to the discussion of the Sea Peoples? Beyond some terminology ("system collapse" is a favorite on both sides of the Mediterranean, as are "negative feedback loops" and "interactions")—not very much. Some of Renfrew's models for the demise of the Mycenaean culture are inspired by systems theory or by catastrophe theory—another mathematical idiom that I do not discuss here. Bunimovitz's view of Philistine culture consisting of a Sea Peoples aristocracy and a Canaanite "proletariat" is to a certain extent a systemic view. Note, however, that his view of the nature of each of these sub-cultures remains strictly normative. The two subsystems must have been inordinately conservative if even after cohabiting for two centuries (the span of time between the assumed initial disembarkation of the Sea Peoples to the end of Qasile Stratum X) the Qasile "Philistine" stratum is still assumed to possess a uniquely Aegean culture, at least inasmuch as anyone making obeisance at a Canaanite-styled sanctuary is assumed to be "Canaanite" by definition.

Bunimovitz's approach might be contrasted with a somewhat similar attempt at synthesis of the Cypriot aspects of this process by Iacovou (1998). While not straying far from the normative view, she points out that the basic happening behind the various epi-phenomena of the Late Bronze Age to Iron Age transition is the *forging of new ethnic identities*. The cornerstone of her argument is that "notions like that of a national identity . . . had no meaning for the . . . [Late Bronze Age] . . . societies. They are the fundamental novelties of the new

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world of the Iron Age." Of special significance is her observation that even non-Greek groups (on linguistic and historical evidence) participated in the Aegeanizing *koiné*.

An Assessment of the Processual Approaches to the Sea Peoples

The advent of "new archaeology" certainly brought a fresh breeze (and quite a few ruffles) to the stagnant pool of archaeological theory in the investigation of the nature of the Sea Peoples as in other areas of the profession. If we expected, however, that an "explicitly scientific" archaeology would pay more than lip service to such notions as "theories not directly grounded in phenomenology have no cognitive meaning" or "a notion which does not increase the testability of a theory should be ruled out of the field of science," we were sadly mistaken. The "nomads of the sea" hypothesis explains away some minor anomalies but begs the question on the main phenomenological issues, while the "decentralization of trade networks" theory, in a neo-Platonic twist, would have it that the "truth behind the phenomena" is actually the opposite of what meets the eye. As we have seen in the case of the "wave theory," which was widely accepted *despite* being ill fitted to the facts as then known, archaeologists are still creatures of the prevailing ideology. Theoretical elegance is a better key to acceptance then empirical adequacy.

The processual paradigm never took the field in Near Eastern and Mediterranean archaeologies as completely as it did in the archaeology of northern Europe or North America. Several explanations have been offered for that (e.g., Trigger 1989: 174). I think the problem is the basic a-historical and non-humanistic stance of the "new archaeology." Such a stance is bound to lack appeal in regions where still (and with good reason) the study of the Bible and/or classics forms the backdrop for archaeological research.

At any rate, the culture-history, or diffusionistic approach to the settlement of the Sea Peoples is still quite alive today. Lawrence Stager seems well aware that he lacks the home-court advantage when addressing a congress on "The Archaeology of Society" in Los Angeles in 1993, as his preamble (1995: 332) clearly shows. Nevertheless, he professes his confidence that the Sea Peoples "established beach-heads all along the shores of the eastern Mediterranean" (Stager 1995: 336) and that "the Sikils, who settled at Dor, also sailed west and gave their name to Sicily, and the Sherden, who probably established a beachhead in Akko, bequeathed their name to Sardinia." Indeed, some of the most militant (in form and content) formulations of the "invasion theory" are the most recent. Whether it is Stager's D-Day Scenario quoted above; Ussishkin's (1998) Monte-Cassino premise, where Megiddo acts as the bulwark against Sea Peoples' land offensive, or Bunimovitz' (1998) Maginot-line hypothesis, where the distribution of Sea Peoples' pottery was "contained" by a line of Egyptian forts.

POST-PROCESSUALISM AND THE PHILISTINE QUESTION

Deconstructing the Philistines

The "post-processual" critiques of the now mainstream processual archaeology are not a monolithic "school." The ideological background for post-processualism is the so-called "post-modernism" which, again, is more of an expression of vague discontent than a crystallized world-view. Two main substreams within post-processualism (and within post-modern-

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ism), however, are the relativistic view of science (or at least the view of archaeology as a relativistic discipline) and a semiotic view of culture.

Positivistic view of science, the philosophy which processual archaeology attempted to emulate, argued that science has a privileged position in the quest for truth, by virtue of its rigid separation between *observation* and *interpretation*. Theories are subject to change, but so long as they are firmly rooted to the immutable database of observed facts, each succeeding theory will be a better approximation of the truth. Relativistic approaches challenge this view (for the entirety of science or for limited fields within it) by arguing that the *observer* cannot be separated from the observation. The observer always operates within an ideological or theoretical framework that conditions what he thinks is worthy of observing, which observations he holds valid, what mental pictures he uses for conceptualizing his observations, and what vocabulary he is going to use to describe them.

If we hold that all scientific activity is interpretive to a certain degree, then no point of view is entirely objective, and no cosmology can hold an *a priori* privileged position. Post-modernists hold a jaundiced view of the prerogative of science in modern western society.

Perhaps the deadliest weapon in the relativistic arsenal is the technique of *deconstruction*, following the history of a theory, and showing how, at every step, proponents of that theory were swayed by ideological bias (preferably by ideologies the readers no longer share . . .), and how they fitted their facts around their convictions rather than vice-versa (e.g., Feyerabend's 1978: 69–143 treatment of Galileo). It should be stressed that the difference between the positivist and the relativist frame of mind is not in admitting that scientists are influenced by the intellectual climate of their times. Most positivists would readily agree that many (perhaps most) scientists are prejudiced. Still, their position is that "Science" with a capital S is unbiased. Relativists, on the other hand, argue that bias is not a weakness or a failing, but goes with the territory. No theory can be free of it.

Though I doubt Esse would have described himself as a post-processualist, his "Scholarly Ideology and Ceramic Typology" (1991) and "Ceramic Distribution and Ethnicity" (1992) deconstruct the normative paradigm for "Israelite" ethnicity. One need not, of course, go any further than this present essay to find a virulent example of deconstruction in the case of research into the origins of the Sea Peoples; Neil Silberman (1998) furnishes another. Silberman's treatment of the subject parallels the first chapters of his work, though his subdivision of the era into ideological "schools" is slightly different than mine.

The relativist philosophy operates within an obvious paradox. If no point of view is privileged, why should the critique enjoy any superiority over what is being criticized? The honest post-modernist must admit that one is as influenced by one's own ideology and preconceptions as are any other subjects. While shooting indiscriminately all around, the deconstructionist cannot avoid hitting a foot.

The Symbolic Approach

Deconstructionism is (as its name implies) a purely negative tool. A positive alternative to the normative or the processual definitions of "material culture" is a semiotic view. Like the two others, it really has been around for a long time. Symbolism has been a subject of research in the social sciences and the humanities (e.g., psychology and literature) almost since their inception. The meaning of symbols used by ancient societies has, of course, been

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a matter of speculation to archaeologists ever since Hieroglyphs were interpreted as devices of sorcery. This raises an obvious practical limitation for the use of semiotic approaches in archaeology: while the symbol itself, or the *signifier,* is usually obvious enough to the archaeologist, its meaning (*signification*) is often a matter of guesswork. The *structural* approach to symbol systems (Levi-Strauss 1963) might offer a way out because its basic premise is that there is an isomorphism between the *structure* of symbol systems and the structure of the social entity which uses it, and that this isomorphism is not dependent on the specific signification of these systems. Such an approach is more amenable to archaeological application, and indeed there is a growing body of such applications (Renfrew 1982: 12–13; Hodder 1986: 34–54) as well as voluble objections.

In the symbolic view a culture is a *language* by which an individual transmits to him- or herself and to others an identification with a social group. The most obvious example is the realm of dress and fashion. We all can, on the evidence of someone's dress, assess gender, age, social status, religion, and the like. Corollaries from this definition of culture are:

(1) The *connection* between an individual and his culture is *active* (Hodder 1982: 12). The individual does not *absorb* his culture, but *transmits* it. Also, this connection is *cognitive*; it is a matter of *choice*. An individual may choose to move from one culture to another. Such a move will usually be accompanied (if not actually accomplished by) a change in material culture attributes—such as dress code.

(2) The message that one transmits using material culture is usually quite complex (Hodder 1982: 75–84); as individuals usually identify themselves with several social groupings simultaneously (e.g., a sex group, an age group, an ethnic group, etc.). Still in the facet of dress, young people (of both sexes) will usually adopt certain fashion attributes which distinguish them from their elders, while other attributes serve to distinguish males from females (regardless of age).

(3) Cultures are by nature *dynamic*, they change constantly, even without any external stimulus. A social elite (in any definition of the word) will define itself by adopting "stylish" behavioral or material characteristics. Groups identifying with such an elite will emulate that attribute. Once that has happened that attribute will be widely distributed but will lose its property of being a signifier for the elite. That group will then have to adopt a new "fad" (possibly from a completely different facet) to signify who is "in." This is exactly the process by which slang changes formal languages.

(4) Unlike changes in the symbolic *format*, changes in the *structure* of symbolic systems are evidence of organizational change in society. A structural change in society will compel individuals to transmit a different set of messages.

(5) An "ethnos" is defined here as a social group which defines itself with a set of symbols (flag, national cuisine, national dress, etc.).

(6) The model, or analogy, at the base of the semiotic view of cultures is *linguistic*. Language is, of course, the most basic and most complex symbolic system known to man. It is customary therefore to refer to other symbol systems (including material culture) in linguistic terms. Thus one can refer to syntax, composition, or semantic contents of a material culture. This has actually been quite common in art history for a long time and was used by Furumark in his analysis of Mycenaean pottery.

It is interesting to note that the symbolic paradigm returns to the normative definition for the meaning of the spatial and chronological extent of a "material culture." That extent marks

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the boundaries of a "social entity," usually interpretable in ethnic terms (Hodder 1982: 75–84). There are, however, several important differences between the two paradigms.

A change of material culture is conceived under the symbolic paradigm as a conscious act of self-determination. This means that immigration, or even conquest, do not in themselves cause material culture change, unless they are accompanied by conscious effort to transplant a new social order or a new set of symbolic messages. For example, the emigration of a small number of English and Dutch colonists wrought far-reaching material changes in North America. Vast numbers of north, central and east Europeans were then absorbed by that culture with hardly a trace. This was because the expressed purpose of these immigrants, as individuals, was to be integrated into the American "melting pot" and not to change it. Similarly, one would be hard put to point out specifically "Turkic" material attributes of the Turkish conquest of Palestine, but the British occupation will be easy to identify.

Some years ago (Sharon 1992) I resorted to some elements of semiotic theory in order to explain away the appearance of the bichrome "Philistine" pottery (as well as the appearance of "Philistines" as an entity in the biblical narratives) at least a generation *later* than the postulated settlement of Sea Peoples in Canaan. I return to this explanation below.

A Comparison of the Different Definitions of Culture

Before coming back to the Philistines let us briefly review the differences between the different definitions of "culture":

(1) The functional approach does not see a connection between ethnic identities and material culture while the normative and the symbolic approaches do.

(2) The normative paradigm sees the connection between the individual and his/her culture as passive, while the functional and symbolic see it as active.

(3) Under the normative paradigm, the ties between an individual and a culture are *rigid.* An observed movement of the culture is taken to mean the physical transhumance of its participants. Both other paradigms can accept cases where the participants remain static but change their material culture.

(4) The normative view sees culture as basically conservative (i.e. it tends to resist change); the functional view sees culture as elastic (it adapts itself to external pressures); while the symbolic view sees it as dynamic (it changes even without external impulses).

(5) Normative archaeology concentrates its research on the interaction *between cultures*; functional archaeology concentrates on the interaction between a culture and its environment; and systemic archaeology is mainly interested in the interaction of various components *within* the culture.

(6) The analogies behind the normative and the functional paradigms are taken from biology: one from the systemic paradigm in engineering and the one underlying the symbolic paradigm from linguistics.

(7) The general motivation for human behavior under the normative approach is psychoanalytical (cultural taboos are located in the deep subconscious); the functional approach is behavioristic (e.g., Schiffer 1976); and the symbolic approach is related to cognitive psychology.

(8) The definition of "ethnicity" most often used by the normative paradigm is the genealogical one. This was also the definition used by "classic" nationalism of the nineteenth century. The definition used by functionalists (if they use any at all) is based on common

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destiny or circumstances and the one favored by the symbolic paradigm is based on self-determination. In this (as in other things) archaeological theory fits itself into the accepted ideology of the second half of the twentieth century.

A SYMBOLIC JUSTIFICATION FOR THE ADOPTION OF THE BPh STYLE

A Reexamination of the "Philistine Equation"

As argued above, the definition of Philistine culture as established at the beginning of the century and consolidated until the 1970s set the "basic equation" as:

prstw (of Egyptian literature) = Philistines (of the Bible) = BPh pottery

Criticisms of this view (Desborough 1964; McClellan 1979; Bunimovitz 1990) tended hitherto to concentrate on the right part of this equation—the identity of the BPh pottery with the Philistines. I suggest leaving this part of the equation intact. I see no reason to doubt that the Philistines of the Bible, the ones Saul and David fought (historically or figuratively), were indeed the people who manufactured the BPh pottery. Both chronological and geographical parameters seem to fit. Moreover, I would tend to dispute the amalgamation of the Myc IIIC and the BPh styles, and the view of the latter as the "true" Philistine pottery (Bunimovitz 1986), or of both as representing the same phenomenon (Stager 1995), hence the disinclination to use the term "Philistine Monochrome." Instead, I intend to take a closer look at the left identity in that equation and ask, are the Sea Peoples really the same as the Philistines of the Bible?

So as to remove doubt at the outset, I am not trying to argue here that there is *no* connection between BPh pottery or its manufacturers and the Sea Peoples. The question is, is this connection one of isomorphism, or is it something subtly different? In reviewing material culture in Early Iron Age Philistia, it seems to me that we are dealing with two different entities:

Some time after the beginning of the reign of Ramesses III (and after the destruction of Lachish Stratum VI) Aegean immigrants settle among the Canaanites at some sites in the southern coastal strip. They manufacture local Myc IIIC pottery. This pottery is exclusively Aegean in its technique and symbolic contents and is quite limited in its geographical distribution. Except for the occasional stray, it is confined to a few core sites where the new immigrants have settled. Even in these sites, regular Canaanite pottery is being manufactured along with Myc IIIC. Up to this point, the model offered by Bunimovitz seems to be operative. We have two cultures coexisting. The new immigrants identify themselves as foreigners (whether as *prstw* or *w3ssw* or *t3krw* or whatever) and they bolster that self-determination by exact emulation of the Mycenaean pottery. Meanwhile, the Canaanite population goes on making its own local pottery and displaying its own symbolic array.

At the end of the Twentieth Dynasty Egyptian control of southern Palestine is relinquished with it, the Bronze Age social order comes to an end and local populations go into an acute identity crisis. Out of this period of turmoil emerges a new ethnic identity. It calls itself (if we are to believe the biblical account) "Philistine." It is no longer *prstw* or *w3ssw*

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or *t3krw* nor is it "Canaanite." It displays its colors (pun intended) by a new bichrome pottery, which retains an Aegean flavor but is equally consciously not Mycenaean. It is much wider both in its geographic extent and in the semantics of its symbol set. The fact that this new symbolic array appears at this very point in time is thus neither due to the culmination of a long process of assimilation, nor to a new "wave" of settlement, nor yet to itinerant potters from Cyprus or elsewhere setting up shop in Philistia.

The appearance of BPh pottery is not coincidental with the end of Egyptian domination of Canaan (as it would be under any of the above explanations) but is *a response* to it (or both of these happenings are symptoms of one underlying process, which is much the same thing). In other regions of Canaan, the same crisis promotes the self-determination of other new ethnic identities, calling themselves (or being called by others) "Israelites" or "Arameans." The conjoint appearance of these ethnic identities is nothing but fortuitous. For this part of the process I can agree with Iacovou's (1998: 338) assessment that the new material dialects constitute a "systematic rejection of the Late Bronze Age" (and hence the insistence on a "foreign" origin, real or mythic) on the one side, and that on the other "the Philistines constitute the 'other' against which the Israelites came together and asserted their ethnic identity." In her recent writings Gilboa (see chapter 9, this volume) argues for a transformation in *Phoenician* material culture at the same time (as against the common view of them as merely "Iron Age Canaanites"). Interestingly enough, that evolution also constitutes the adoption of a "foreign" (Cypriot) stylistic idiom.

If this, or any similar, reconstruction is at all correct, than the search for a "Philistine" language, "Philistine" religion (Dothan and Dothan 1992: 156–57), or "non-Philistine Sea Peoples" (Dothan and Dothan 1992: 153, 186–87, 258) is futile at the outset. The true Sea Peoples are a phenomenon only one generation long. Aegeans (of Mycenaean, Cypriot, or other descent) had come into Canaan, together perhaps with immigrants from other places, seeking their fortune in the cosmopolitan climate of Canaanite city-states at the end of the Late Bronze Age. It is highly unlikely that they traveled in large hordes, much less in disciplined military complements. They more likely came individually or in families, as traders, sea captains, itinerant craftsmen, mercenaries, or pirates. A good many of them doubtless tried all of the above at one time or another. By the beginning of the Iron Age, their daughters or grandsons, most probably by mixed marriage, identified themselves (to their own and to their neighbors, including the biblical narrator) as a new polity—the Philistines.

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THUNDERING HORDES: THE IMAGE OF THE PERSIAN AND MUSLIM CONQUESTS IN PALESTINIAN ARCHAEOLOGY

Neil Asher Silberman

Throughout his brief yet highly productive career, Douglas Esse skillfully showed all of us—friends, colleagues, and students—how powerful the intellectual weapons of gentle common sense, good-humored skepticism, and unshakable ideological independence can be. Esse entered the profession at a time when old formulations of biblical archaeology were crumbling. Yet it was also a time when the critics of the traditional order had not yet formulated a fully workable alternative. Esse's aim was not sloganeering or rhetorical one-upmanship; he was deeply fascinated in understanding the *processes* of ancient history. In his important, path-breaking on the Early Bronze Age and the "problem" of the Israelite settlement, Esse demonstrated that it is possible to combine new field data with that collected by earlier generations, once the older material data is reanalyzed and reshaped by new theoretical frameworks for understanding social and cultural change (Esse 1991, 1992). As many of the contributors of this volume acknowledge in connection with their own contributions relating to various historical and archaeological periods, Esse effectively challenged conventional wisdom about the mechanics of cultural transmissions and transitions. He offered us all compelling evidence that discontinuities observed in the ancient material records need not simply be ascribed to sudden invasions or migrations of extraregional ethnic groups.

As Esse was well aware, this ethnic hypothesis of culture change has far-reaching modern implications and subtle social side effects. It has become increasingly clear that in retrojecting modern perceptions of ethnicity and nationhood onto the material remains of premodern societies, archaeological interpretations can sometimes become unwitting instruments of present-day ethnic politics (see, e.g., the recent essays in Kohl and Fawcett 1995). As potent, pseudo-scientific metaphor, this kind of archaeological thinking has had far-reaching implications all over the world for the understanding of every historical period. And even though the Early Islamic period was not among Esse's primary areas of interest, I would like to take this opportunity to examine possible social and political aspects of the study of the Persian and Muslim conquests of Palestine, which may have some illustrative relevance. For like the traditional understandings of the Early Bronze Age and the Early Iron Age that Esse worked so hard to render more complex and sophisticated, the interpretation of the Early Islamic period can be seen as an aspect of wider intellectual trends. Thus in this paper, in tribute to Esse's memory, I attempt to place the history of archaeological research on the "problem" of the Persian and Muslim conquests into ideological and political perspective—by briefly surveying the evolution and transformation of Western images of the fall of Byzantine rule over Palestine and of the rise of Islam.

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In recent years, scholars in many branches of the humanities have devoted considerable attention to studying the mechanics of image making, ideology, rhetoric, and narrative and on the importance of image making, rhetoric, and narrative as powerful tools for communicating social understandings (of many, see Berger and Luckmann 1967; Lincoln 1989). The study of narrative in archaeology, in particular, has proved useful for understanding the implicit messages and social biases of scholarly work—of both the unwitting and premeditated kinds (Landau 1991; Trigger 1984; Silberman 1995). Faced with the fragmentary remains of ash layers, collapsed walls, and diagnostic pottery types, archaeologists have often uncritically applied modern cognitive categories of gender, ethnicity, and political action to otherwise highly ambiguous archaeological remains (Leone, Potter, and Shackel 1987; Patterson 1995). As I will argue below, this has been a particularly influential process in the accepted historiography of the Early Islamic period, which has been seen since the beginnings of modern archaeology in Israel as one of the liminal periods of the country's history, in a sense distinguishing that which is important and worthy of intensive study from that which is not (Silberman 1989, 1990, 1991).

To be sure, long before archaeology ever entered the picture, ideologically based images of the Persian and Muslim conquests of the Holy Land were vivid and influential throughout the Christian world. From the seventh century onward, those images served as powerful societal narratives (Wilken 1992: chaps. 11, 12). The sudden loss of Byzantine political control over the Holy Land—in its painful contradiction to the belief in the inevitable triumph of Christianity—required certain fundamental explanations that did not challenge the Christian society's basic ideology. So the earliest and most immediate of the responses, typified by the works of the monk Antiochus Strategos of Mar Saba about the Persian conquest (Baras 1982: 300–13; Clermont-Ganneau 1898) and the patriarch Sophronius about the Muslim conquest (Constantelos 1972), devoted little energy to understanding the conquests as symptoms of secular political change or social interaction as modern anthropologists might do. They framed the events in purely metaphysical terms.

Like other plagues sent down on the world in other ages—be they Amalekites, Philistines, or Babylonians—the arrival and victories of the Persians and the Muslims were seen as both a divine punishment and a challenge to the righteous to regain possession of the Holy Land. And over the subsequent centuries, as this religious interpretation was ultimately marshaled to support the conquests of the Crusaders, the earliest European commentaries on the Quran and speculations on Islamic history maintained the character of polemics. Focusing primarily on the character of the founder of Islam, they provided vivid details of Muhammed's idolatry, black magic, and sexual promiscuity that make the latter-day descriptions in Salman Rushdie's *Satanic Verses* actually seem quite tame. In fact, medieval Christian polemic in the form of literary narratives was highly influential in the conduct of East-West interactions both before and after the Crusader period (Southern 1962; Daniel 1975; B. Smith 1977: 1–15; Rodinson 1987: 11–13). And these early images of Arabs and Islam have struck deep roots in the Western consciousness. Some of Western society's most basic stereotypes of Arabs and Muslims—as still seen in films, cartoons, and popular novels (Terry 1985)—can be traced back to stock characters in medieval troubadours' ballads—characters such as the terrifying "Saracen Giant," the pitifully emasculated "Defeated Sultan," and the superficially Christianized (yet still despised) "Converted Saracen" (Daniel 1984; Metlitzki 1977: chap. 6).

With the Renaissance, however, the focus of Western historiography shifted. As various European merchant nations sought to negotiate with the rulers of the eastern spice routes,

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purely legendary elements of early Muslim history began to give way to more factual accounts. Polemics were less useful than reliable information that might offer commercial advantage (Rodinson 1987: 23–40). And while most of the added European information pertained to *contemporary* Muslim communities and to some extent perpetuated earlier theological hostility, new historical insights were also developed. Vast numbers of antique manuscripts were collected, and the pursuit of the historical and linguistic study we now call "Orientalism" began (Rodinson 1987: 40ff.; Said 1978: 49–73).

Yet changes *within* European society were ultimately even more instrumental than international commerce in changing the focus of western historical study. By the time of the Enlightenment, older theological and political concepts were being called into question as European scholars sought to construct a "universal" history in which stages of human progress replaced earlier biblical concepts (Rossi 1984). Early Islam beckoned to some as an illustration of primitive religious power, which was preferable in certain respects to more advanced (and more corrupt) ecclesiastical hierarchies. Among the early works revising the traditional European attitude toward Islam and Islamic history were the anonymous *Mahomet no imposter, or a Defense of Mahomet (*1720) and Count de Boulanvillier's *Vie de Mahomed* (1730) which represented a far wider intellectual trend (Daniel 1960; von Grunebaum 1966). Typical of this new approach was the history of the early Muslim conquests included in the fifth volume of Edward *Gibbon's Decline and Fall of the Roman Empire* published first in 1772. In Gibbon's estimation—and in that of the scholars whom he followed—it was only inevitable that the corrupt and decadent Christian Empire of Heraclius would give way to the forces of the vigorous lawmaker and non-priestly prophet Mohammed, who represented (in true Enlightenment fashion) a Rousseau-like vision of the "Natural Man."

Propelled by the fire of true faith, rather than wickedness, Mohammed led a charge out of the desert to conquer the world. This new view of the early Muslims as primitive, alluring, and ultimately noble was far removed from the image of the horned satyr that Europeans had initially seen (Porter 1988: 129–32; Lewis 1977). And a pattern was set for a new understanding of early Islamic history that would continue throughout the nineteenth and twentieth centuries—in the works of Robertson Smith on early Arabian religion (1880, 1885, 1889), and of Wellhausen on Islamic political structures (1902; English translation 1927). It should be noted that Julius Wellhausen turned his attention to the historical problem of the early Islamic conquest as a continuation of his earlier studies of religious evolution in the biblical period. The assumption of the early Arabs' "primitiveness" is implicit in the work of both Wellhausen and Robertson Smith (Kuper 1988: 83–86). This idealized image of noble primitiveness reached its most elaborate and pervasive versions in the romantic ethnography of Doughty, Burton, and T. E. Lawrence (see Said 1978: 226–54) and in the later political romances of John Bagot Glubb (1963). Yet there was also a clear element of continuity with earlier images. The Western world still saw the Muslims as basically primitive and antagonistic to settled society (Kuper 1988; Stocking 1987). And their conquests—whether frightening or alluring—were still seen as the sudden eruption from the desert of thundering Muslim hordes.

Through the centuries of polemic and contact, the religion and customs of the Arabs were the main elements of attention, but toward the end of the eighteenth century, a more concrete racial element entered the historical debate (Stepan 1982; Poliakov 1974). In the dawning age of the great European empires in Asia and Africa, the tentative probing of individuals gave way to an imperative to *rule* non-European people—rather than simply convert, exterminate, or

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conciliate. The expansion of European ambition into the world of Islam required scientific rationalization, and this was found in the peculiar and unchanging racial characteristics of the Arabs themselves (Rodinson 1987: 89–90; Said 1978: 206–7). Using such now discredited indications as brain size, skull features, and genetically inherited "national character" (Gould 1981), European physiologists found an appropriate place for the Arabs in a rigidly hierarchical scale of human ability. As a particular branch of the Semitic "race" (delineated on both linguistic and anatomical grounds), the Arabs were classified for their violence, asceticism, and sexual promiscuity—all elements, it should be noted, that were adopted from the earlier mythic images (Said 1978: 231–34). And as these racial characteristics were seen as biologically inherited and unchanging, they played a part in historical and linguistic speculations on the role of the "Semitic" peoples throughout the millennia.

As one influential example of racial determinism, one may note the first chapter of Philip K. Hitti, *History of the Arabs* (1949), "The Arabs as Semites: Arabia the Cradle of the Semitic Race." In it, Hitti notes that Arabian Arabs are "the best representatives of the Semitic family, biologically, psychologically, socially, and linguistically" and that "ethnic purity is a reward of the most ungrateful and isolated environment, such as central Arabia affords" (Hitti 1949: 8). Modern population genetics, however, has shown the concept of ethnic or racial "purity" to be devoid of any scientific basis (among recent works, dealing with this issue, see Kelves 1985: 129–47 and Gould 1981: 322–33).

Archaeology, in a sense, initially served to illustrate this mistaken understanding. In 1990, the academic community marked the 100th anniversary of modern archaeology in Palestine, and although its "founding father," W. M. F. Petrie, did not contribute directly to the archaeological study of the Muslim conquests, his intellectual impact was nevertheless profound. As generations of archaeology students have been taught, at Tell el-Hesi in 1890, Petrie developed the most basic modern tools of excavation: stratigraphic analysis and pottery typology. Yet as I have attempted to show elsewhere (Silberman 1993), the way he used those tools was not ideologically neutral. Petrie's work must be assessed in the light of his life-long interest in the question of race and racial warfare as the primary element in human history (Petrie 1906, 1907, 1911). In associating stratigraphic levels with episodes of ethnic dominance, represented by the appearance of ethnically identified pottery types (arranged rise-floruit-fall cycles), Petrie precisely echoed a popular turn-of-the-century colonialist dogma of the inevitable ascendancy of "superior" or more ''vigorous" races over more passive ones. The eugenical theories of Francis Galton (1869) clearly influenced Petrie, and through him the impact on Palestinian archaeology was clear (see Silberman 1999, with bibliography). And it was the subtle power of those conceptual tools, I would argue, that has furthered until fairly recently an antagonistic and racially based archaeological interpretation of the beginning of the Early Islamic period.

Through the 1920s and 1930s, the first significant archaeological light was shed on the Persian and Muslim conquests, as excavators encountered destruction levels at Byzantine churches and Byzantine sites throughout the country. There was, of course, earlier archaeological interest. Robinson, Warren, Conder and Kitchener, Clermont-Ganneau, Bliss and Dickie, and Lawrence and Woolley all noted apparent evidence of the seventh century conquests in visible archaeological remains. I am more interested here, however, in stratigraphically based discoveries. And in virtually every case where those levels could be even roughly dated to the early seventh century, the excavators interpreted them as ample evidence of a bitter racial con-

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flict between the Desert and the Sown. A brief review of the material presented in Ovadiah (1970) indicates the extent of these conclusions. Ovadiah himself goes even further, stating that "most of the churches in Palestine were destroyed by Chosroes II in the Persian invasion of 614" (Ovadiah 1970: 218).

Through the matching of military dates with ash layers, toppled frescoes, columns, and chancel screens, the violent reality of the Persian and Muslim conquests was seemingly confirmed. It was clear that some churches and settlements had survived the invasions (Kraemer 1958; Colt 1950; Crowfoot 1941: 161; Kraeling 1938: 68), but the dramatic changes observed elsewhere provided ample justification for an image of thundering hordes. Of course this potent archaeological image was not restricted to the seventh century A.D. During the 1920s and 1930s, other archaeologists—applying Petrie's basic ethnic conceptions on other levels—unhesitatingly found evidence of similar conquests of the country by invading peoples: Hurrians, Hyksos, Sea Peoples, and Israelites. However, the history of diffusionist racial and ethnic interpretation in the specific case of Palestinian archaeology has not yet been fully studied (see the suggestive analysis of W. D. Smith 1978).

Yet even as archaeologists in other parts of the world began to recognize the shortcomings of this fixation with race and racial warfare—at least partially caused by political revulsion toward the excesses of Nazi racism (Barkan 1988)—and began to suggest new explanations for sharp discontinuities in material culture, the theories of the thundering hordes in Palestine at the end of the Byzantine period proved exceedingly difficult to eradicate. Studies of the Roman *limes* in the Negev and southern Transjordan suggested a clear and hostile separation between settled and nomadic peoples (for conflicting evaluations of recent scholarship, see Parker 1986, and Mayerson 1986). That hostility, though itself unexplained, may be the result of the Arabs' inborn hostility to settled populations or environmental pressure forcing massive migrations from the Arabian peninsula. In the early twentieth century, environmentalist explanations were particularly popular (see Huntington 1911, and for a brief survey of similar theories, see the introduction of Donner 1981). Thus determinist solutions were seen as the cause of the early seventh-century destructions—no matter how vaguely or imprecisely dated they were.

Similar thinking led some scholars to see marching Persian armies as the culprits in other destructions, although this contention was supported by only the roughest of chronological correspondences. Needless to say, ceramic chronology is still not refined enough to distinguish 614 from the 630s, but on the basis of the presumed route of the Persian invasion, the destructions of the church at Shavei-Zion and, more recently, at Nahariya were ascribed to the earlier event (cf. Prausnitz, Avi-Yonah, and Barag 1967 and Edelstein and Dauphine 1975). The ascription of the destruction of the acropolis of Avdat to the Persians is even more tenuous (see Negev 1993: 1155, but see Mayerson 1964: 193–96 for another view.) And it is striking how the basic belief in the sudden, violent invasions was used to support even more sweeping theories. In the late 1960s, wide-ranging surface surveys, based on only a rough knowledge of Early Islamic pottery, were combined with the evidence of destruction to suggest that a centuries-long process of "nomadization" began with the Muslim conquest (Tsafrir 1984; Sharon 1976). According to this theory, the fate of the country was sealed with the arrival of nomads who brought the mentality of the desert and refused to settle in cities—and with the mass exodus of peaceful (and civilized) Christian peasants who fled in terror from the thundering hordes (Tsafrir 1984: 74). Such images, I would argue, drew their emotional power

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as much from turn-of-the-century racial dogma and traditional negative western images of Arabs as from textual sources or archaeological evidence alone.

Of course that was not the final version of the story. In recent years, a more sophisticated and careful analysis of early seventh-century levels has profoundly challenged the notion of general chaos and widespread destruction, replacing it with a more complex conception of cultural reorganization (for a wide-ranging review of the latest evidence, see Whitcomb 1995). Recent finds at the churches of Umm er-Rasas and at other sites in Jordan have underlined the persistence of the architectural and religious aspects of what had long been identified as "Byzantine" (i.e., pre-Islamic) material culture far beyond its traditional chronological boundaries (Piccirillo 1988; Schick 1987, 1988). The recognition of the uninterrupted urban stratigraphy of Jerash, Umm al-Jimal, and a number of other sites on both sides of the Jordan has cast doubt on the geographical extent of violent destruction connected with the Muslim conquest (Zayadine 1986; Sauer 1982; DeVries 1981). Recent reconsideration of the sequence of pottery forms at Pella, with its clear A.D. 747 earthquake destruction level (Walmsley 1988; McNicoll and Walmsley 1982); from Khirbat al-Mafjar (Whitcomb 1988); and from the City of David in Jerusalem (Magness 1992) have offered new correctives to traditional pottery chronology.

The vibrant urbanism at sites such as Tiberias (Harrison 1992), Ramla (Rosen-Ayalon and Eitan 1969), and Jerusalem (Ben-Dov 1975), and in the reconstructed baths at Hammat Gader (Green and Tsafrir 1982: 94–96; Hasson 1982) has further challenged earlier theories about nomadic loathing of cities and has replaced them with far more wide-ranging hypotheses about the gradual transition of the classical *polls* to the Islamic *madina* (Kennedy 1985a, 1985b). Moreover, the recognition that elaborately constructed, isolated sites such as Khirbat al-Mafjar and the "desert castles" of Jordan may have served as administrative centers for a new system of intensive irrigation agriculture (Conrad 1981) suggests that the transformation from "Byzantine" to "Islamic" periods was characterized not so much by ethnic migration as by far-reaching economic and technological change.

At the same time, a more sophisticated understanding of the close interrelation of settled and pastoral peoples has also undercut the basic premises of the sharp Desert/Sown dichotomy. Anthropological studies of modern nomadic lifeways throughout the Middle East have suggested to archaeologists working in a number of historical periods that settled and pastoral peoples are actually components of a single, dimorphic community (among the many ancient and modern studies, cf. Rowton 1977; Marx 1978; Dever 1980; and Finkelstein 1988). That nomads—or "Saracens"—were an element *internal* to Byzantine society in Palestine is becoming increasingly clear in the extensive Negev surveys of Steven Rosen (1987); the studies of E. B. Banning in Jordan (1986); and the discovery of the still enigmatic cultic center near Sde Boker (Rosen-Ayalon and Nevo 1982; Nevo n.d.). These finds suggest that pastoralists were an important component of Palestinian Byzantine society, and that some of the most far-reaching changes of the early seventh century might have been less the results of mass invasion than internal social change. An additional factor in this reassessment has been a widespread refutation of earlier theories of climatic change or population pressure moving outward from the Arabian peninsula to more fertile regions (summarized in the introduction of Donner 1981)—which was long regarded as the *real* impetus for the Muslim conquests.

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In fact, as early as 1964, Philip Mayerson suggested that the earliest Muslim attacks on southern Palestine were the result of cooperation between an outside Islamic elite and the indigenous pastoralists of the Negev and Sinai (Mayerson 1964). Other scholars—Crone and Cook (1977), Wansbrough (1978), Bashir (1984), Sharon (1988), and Koren and Nevo (1991) subsequently went much further in dismissing the historical reliability of the Islamic traditions, proposing quite different (and completely internal) reconstructions of the events (but see the cautionary note against extreme revisionism in Whitcomb 1995: 500–501). In this connection, it is interesting to note how far Sharon's historical thinking has come since his earlier article (Sharon 1976). Less far-reaching in its speculative reconstruction, but more influential within the discipline is Fred Donner's recent analysis of Islamic textual sources for the Early Islamic conquests (1981). In his section dealing with Syria, he demonstrates the complexity of the developments, beginning with an initial confederation of an Arabian elite with indigenous pastoral tribes, a period of brief but intense conflicts with Byzantine forces (relatively far from urban centers), and a relatively peaceful incorporation of cities into the structure of the expanding Islamic state (see also Hill 1971). Migration or massive population change, Donner argues, played no significant role in the conquest. And in light of the emerging evidence of continuing urban life throughout the country, the evidence of the extent of violent outside intervention becomes more and more restricted. The complex data of historical sociology has come to replace the once-vivid image of the thundering hordes.

Certainly no one can argue that these new approaches to understanding an admittedly important period of cultural transition are quite different from those employed by Western scholars who studied the Persian or Muslim conquest in the Middle Ages, in the Renaissance, or even in the early days of archaeology. We can now see that many of the changes observed in the archaeological record were not solely due to sudden, external invasions. Complex factors such as long-range economic trends, superpower conflict, internal social tensions, and the political strategies of ethnic minorities must now be taken into account. But can it be just a coincidence, however, that these new areas of historical interest are also of particular concern to late twentieth century industrialized Western society? This possible correlation between modern perception and historical interpretation is precisely the theme that I want to stress. Because the archaeology of every period is more than a purely objective analysis of fossilized material culture. Its larger social significance may lay in its ability to craft *modern* historical metaphors and myths of creation—myths in the older, religious sense of acceptable explanation by vivid analogy (Doty 1986).

There is, of course, a wider context in which these new interpretations must be seen. Over the last few decades, the human and natural landscapes of the Middle East have undergone unprecedented changes. With the incorporation of Middle Eastern peoples and economies into the Western industrial world system, cities have grown up, fellahin and bedouin alike have been transformed into workers, and the sharp distinction between the Desert and the Sown has been significantly blurred. For centuries the scholars of the West turned toward the East with the overtly hostile perspective of their societies, concentrating on fundamental distinctions between settled and pastoral peoples, between Christians and Muslims, between Indo-Europeans and Semites. Yet those distinctions have now lost much of their power in an era when the representatives of Western nations have sought—to greater or lesser degrees—to integrate the peoples

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of the Middle East into a single, developing world economy. And I would argue that this modern world view has influenced—if not completely determined—the way archaeological finds are now interpreted as evidence of complex social interaction and economic development (Miller 1980; Patterson 1987).

The Muslim and Persian conquests have a particularly potent metaphorical significance in an era when Middle Eastern conflicts among Arabs, Persians, Israelis, Europeans, and Americans slowly give way to the beginning of an era of coexistence, if not peace. As citizens of the end of the twentieth century and the beginning of the twenty-first we cannot help but reflect the perceptions of our own society. The modern scholarly recognition that there is some sort of a "problem" with our understanding of the Persian and Muslim conquests should itself be placed in historical context. For as in the Middle Ages, the Renaissance, the Enlightenment, and the age of the great European empires, our current interpretations of the seventh century Muslim and Persian conquests cannot help but reflect our society's evolving relationship to contemporary Middle Eastern peoples—and to the many-faceted reality of social change.

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31

PORT POWER IN THE EARLY AND THE MIDDLE BRONZE AGE: THE ORGANIZATION OF MARITIME TRADE AND HINTERLAND PRODUCTION

LAWRENCE E. STAGER

Coastal societies in the Levant developed a distinctive set of characteristics when linked to long-distance maritime commerce. Integration with the interior regions, the secondary networks oriented east-west along the natural drainage, wadi, or transport systems, was essential for the international trade network to have anything worthwhile and profitable to offer at the end of the line. These arteries of raw materials and manufactured products supplied the heart of the system, the eastern Mediterranean seaports, with a lifeline that connected hinterland with overseas emporia. By integrating diverse domains into the "port power" economic system, import-export merchants could reap sizable profits and exercise more economic power than the harbor princes who protected them or the rulers of the interior whose authority and power were largely circumscribed by territorial limits.

The port power model I propose for the Early Bronze Age Levant (EB I–III) may apply equally well or better to other parts of the Mediterranean in the second and first millennia B.C. I have borrowed heavily from a model developed by Bennet Bronson (1977) for Southeast Asia, which was then applied to that region in greater detail by S. R. Hall (1985). From the outset it should be said that "no model completely and perfectly fits real life" (Braudel 1984: 63). It is a heuristic device for organizing data into an intelligible whole. It must be in constant interaction with empirical data, reinterpreted according to new information, and discarded when anomalies can no longer be incorporated. It is suggestive and, at its best, predictive, but never sacrosanct.

I

In Bronze Age Palestine we find at the base of the port power network local village clusters ("communities of exchange") in the highlands, which periodically converged on a regional market. The few highland marketing centers (for example, Shechem, Jerusalem, and Hebron in the Middle Bronze Age [MB]) were then integrated with intermediate markets in the foot hills and the interior coastal plain. These, in turn, were connected with a major seaport, the highest scale entrepot, which then integrated the intermediate and local spheres of commerce with international trade realms represented by seafaring merchants (figs. 31.1, 31.2 for EB; fig. 31.3 for MB II).

Thus we might find highlanders responding to coastal or regional demands by supplying wool, meat, and dairy products from the pastoral sector, grapes (wine) and olives (oil) from

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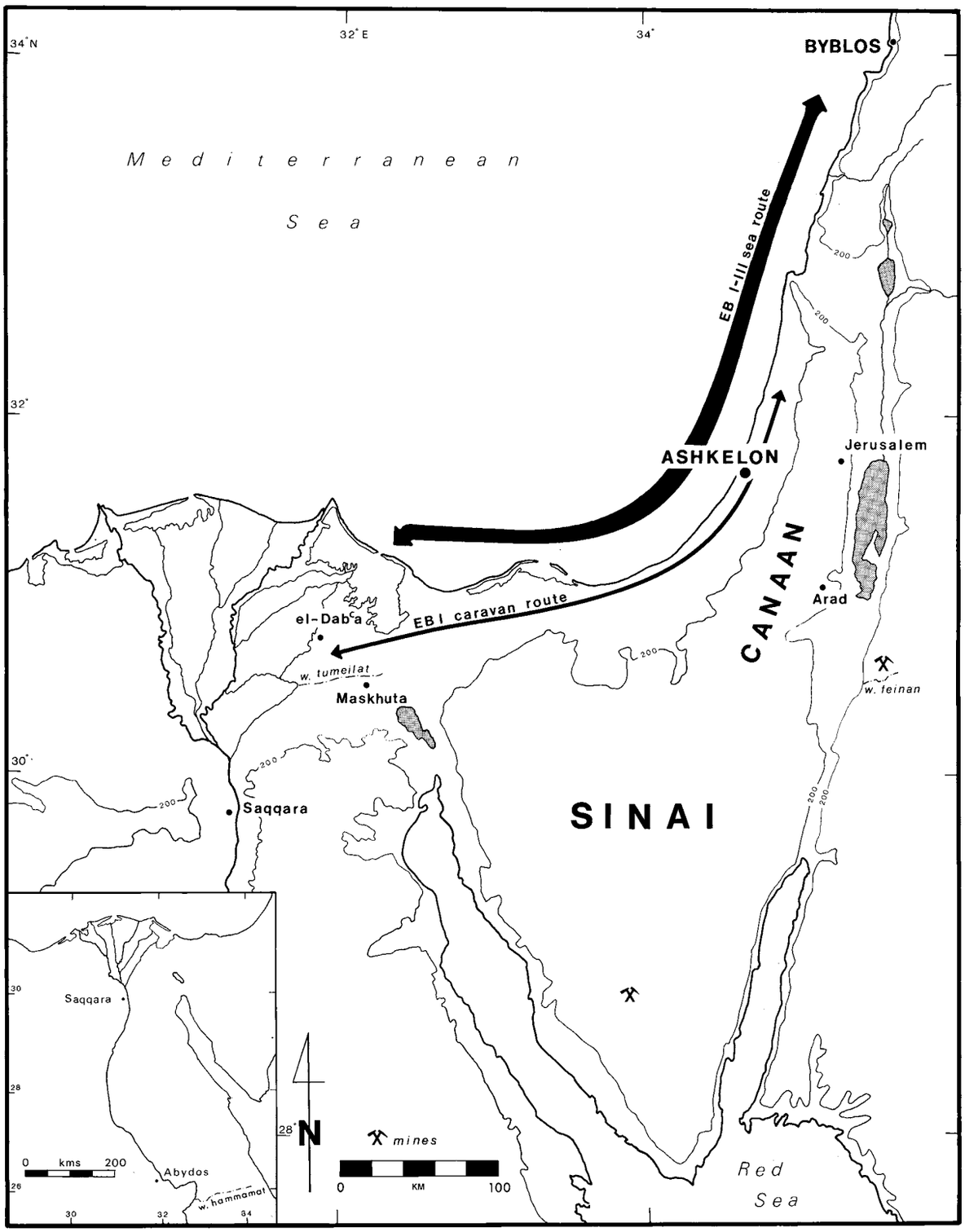

FIGURE 31.1. Map of port power networks in the Early Bronze Age (note: The Egyptian sites el-Dabʿa and Maskhuta belong to the Middle Bronze Age).

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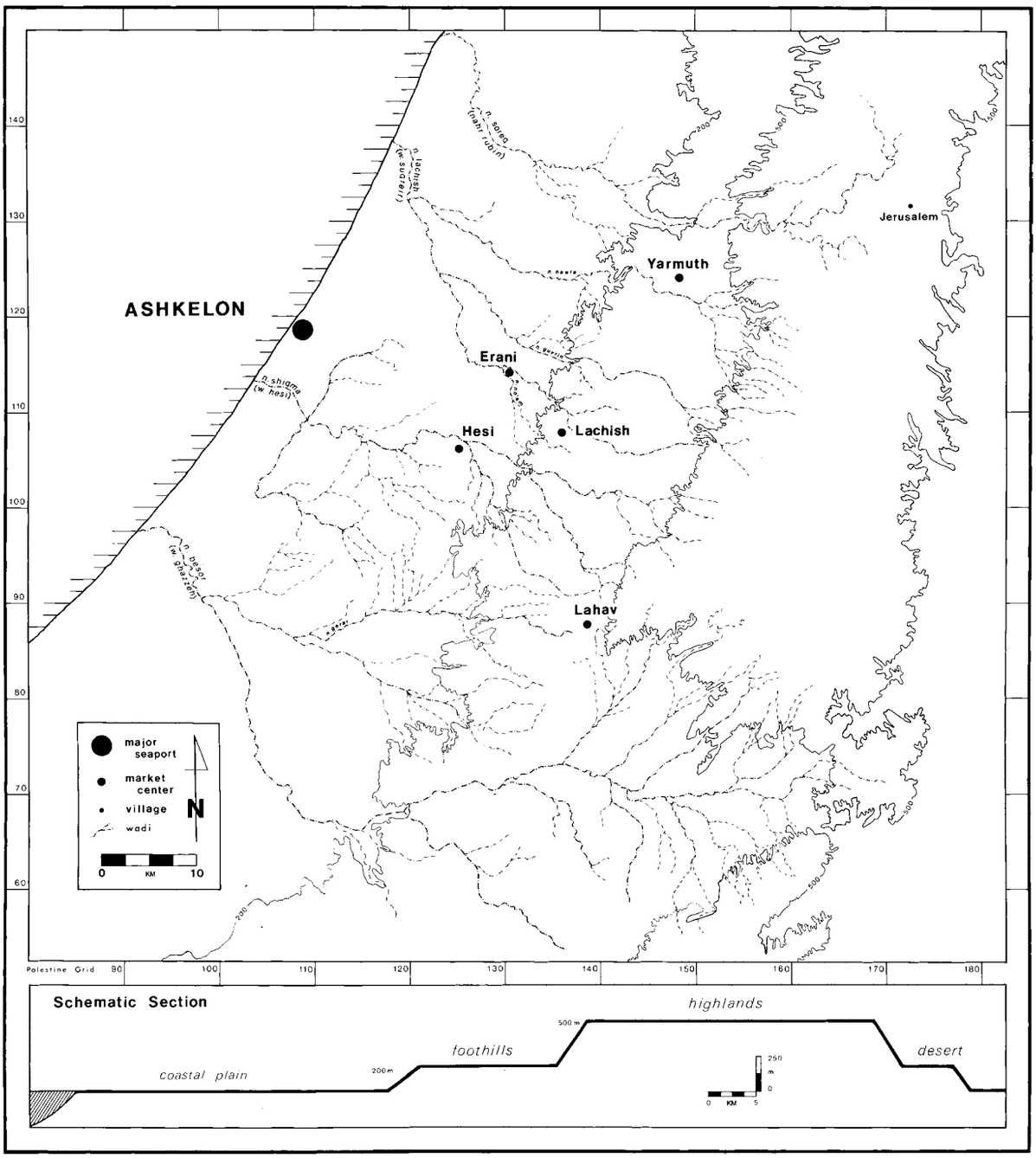

FIGURE 31.2. Map of port power networks in the Early Bronze Age.

the horticultural sector, stone from the hard limestone mountains, timber and charcoal from the oak and pine forests, and resin (or "turpentine") from the terebinth and pine tree. These are products within the catchments of the east-west wadi networks (for highland settlement patterns, see Finkelstein and Gophna 1993; Harrison 1997). And, of course, there was serious production of olive oil and wine, beginning in the latter half of the fourth millennium, in the lowlands as well. Farther afield there was salt, sulfur, and bitumen from the Dead Sea, some

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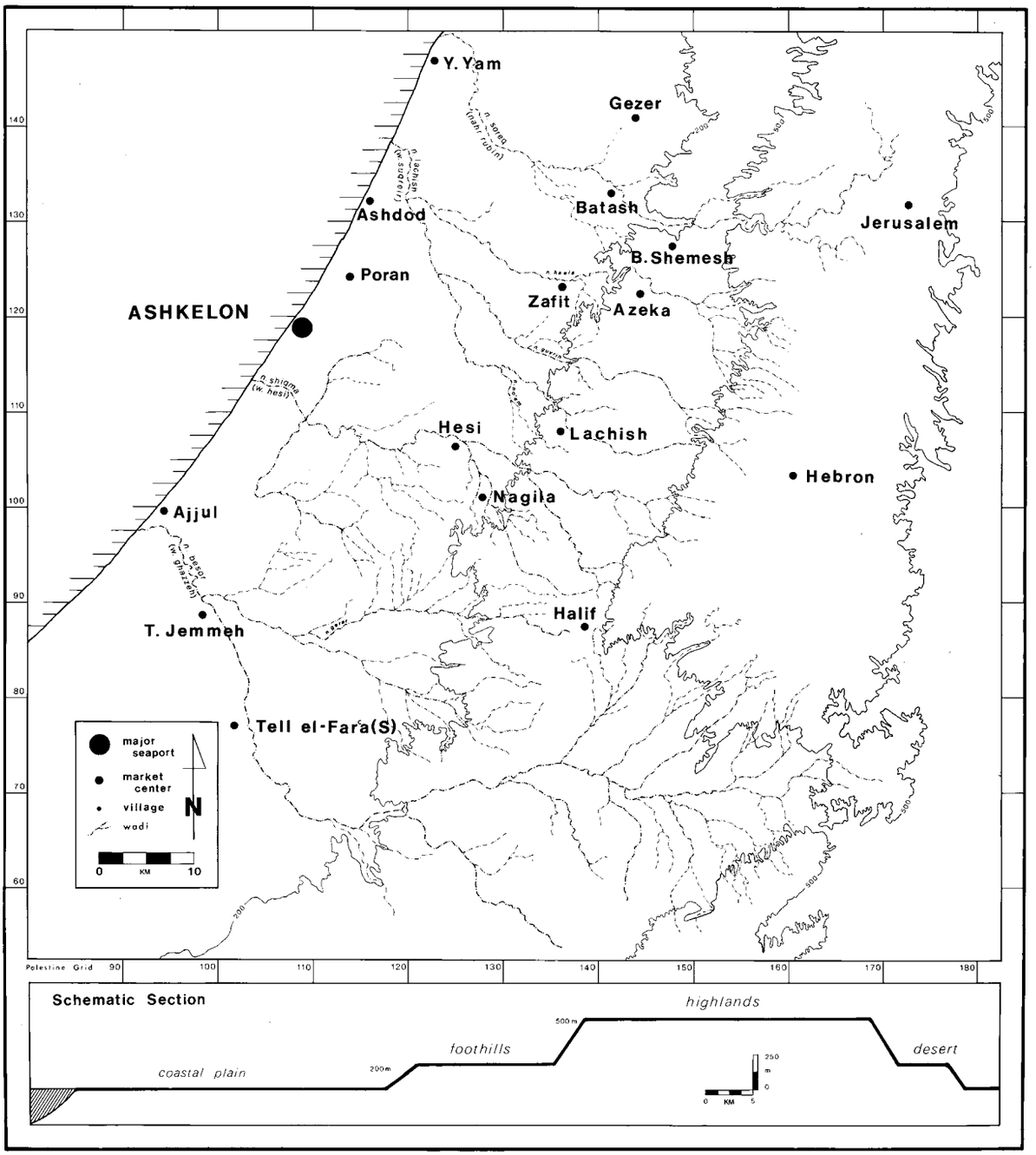

FIGURE 31.3. Map of port power networks in Middle Bronze II.

of which was transported by donkey to western ports. Among the most precious products of Palestine in great demand overseas was copper, extracted from the mines in Wadi Feinan near the Arabah during Chalcolithic and EB times as well as from the Sinai during the EB II period. This archipelago of more distant trade is dealt with below.

I am assuming that power was exercised through economic ties and that this integrated, hierarchical network can and often did develop outside of or beyond a state exercising coercive

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political-military force over the hinterland. In fact, direct control over mobile populations such as that represented by the pastoralist sector or heavy-handed measures taken against other hinterland sectors could be counterproductive as well as expensive.

Asymmetrical relations of economic advantage can be seen almost from the start because of the system of exchange which operated from the larger underdeveloped hinterland to the major commercial center, the Mediterranean seaport, the command center of information and decision making, which translated into real economic power. Power in this decentralized system was not necessarily wielded by an overarching political (state) or military force. Relations between the commercial port were less coercive than if the commercial center and the centers of production and wholesaling were integrated parts of a single state system. The effectiveness of port power accrued from the capability of the economic system to penetrate diverse ethnic, cultural, and political boundaries and to interconnect them with a minimal use of force. This seems to be especially applicable to the ecological diversity and cultural mosaic of the Levant throughout the EB, in contrast to the ecological homogeneity and tendencies toward autocracy of Egypt. The port power model which may explain the network of production and sale of commodities at one node of the international transaction, such as the Levant, is indifferent to, and can easily accommodate very different economic systems at the other end, such as Egypt, where royal authority at the port of entry dominated distribution during periods when kingship was paramount and trade monopolies prevailed (for a superb study of this complementariness between Egypt and Palestine, see Butzer 1997).

In the Levant more modest means than outright political control or dominance could be used to manipulate dependent economies. Implicit in the hierarchy of trade and market exchange were chains of subordination along the network, involving at points inland and upland patron-client and trade-partner relationships, and the ultimate advantage over producers in the highland "communities of exchange," where non-market or bartering economies can be expected to dominate trade. In this decentralized system of market exchange, it would be unlikely for indigenous export-import merchants to involve themselves in direct contact with the hinterland producers. And if foreign merchants were to invade this area, or even that of intermediate market centers, it would be a sign that the ultimate consumers had taken rather tight control of the international network as well. There are signs of this during the late EB I period, when Egyptian trading posts and mercantile colonies occupied important nodes along the overland trade routes of southern Palestine (Stager 1992).

Usually, during times of less extreme international asymmetries, foreign merchants, if present at all, were confined to the ports themselves, as we find in EB II with the Egyptian mercantile colony at Byblos and perhaps at Ashkelon, when indigenous Levantines were in control of the ports of power. The enduring sources of power, then, were not those exercised by political or military means from the ports, whether controlled by indigenous or foreign sources, but by those import-export merchants, usually an oligarchy, who exercised indirect economic power through the integrated and hierarchical system of market exchange. In other words, the Phoenician model of trade operative in the central and western Mediterranean during the first millennium B.C. is also applicable to the eastern Mediterranean system of the third and second millennia, except that the geography of trade was much more limited in scope during the earlier period.

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From the intensive surveys made by Ram Gophna in the southern Levant, it is clear that sites there proliferate along the wadi basins during EB. Valerie Fargo (1979) was the first to recognize that the pattern of settlement along these transport and drainage systems was congruent with a dendritic form of marketing system known from the works of E. A. J. Johnson (1970) and Carol Smith (1976). By ranking sites by size Fargo was able to suggest a regional or catchment center for each of the wadi systems in EB III and hypothesize that there might even be a seaport at Ashkelon.

Examples of the EB III inland centers which dominated their respective wadi systems and "catchment" basins include Tell el-Hesi in the Wadi Hesi/Shiqma basin; Tel Erani (now known to have been more than 25 ha in EB III) in the Lachish basin to the north; and in the basin even farther north, the heavily fortified city of Yarmuth, with its impressive palace and temple complex (Miroschedji 1993). These places would then qualify as intermediate trade centers in the model I have outlined above (fig. 31.2).

What was missing from this network was the port itself from which, for example, olive oil and wine were shipped to more distant places (Stager 1985, 1992). Fortunately vestiges of the EB seaport have been discovered by the Leon Levy Expedition to Ashkelon, a site located right on the sea and between the major wadi systems we have been discussing: the Wadi Hesi basin to the south and Naḥal Lachish basin to the north. Already known as "Ashkelon" in Egyptian texts from the early second millennium B.C., the place name is derived from the same West Semitic root as "shekel" and probably means the "place of weighing"—very relevant nomenclature for a seaport (Stager 1991).

Large quantities of residual pottery indicate substantial occupation over much of Tel Ashkelon from EB I–EB III (ca. 3500–2250 B.C.) before Canaanite or Amorite builders dug it up and threw it into deep fills in and behind the MB IIA city gate and ramparts. The same range of the EB residual pottery has been found in later fill deposits (the occupation layers have not yet been reached) near the center of Tel Ashkelon. Oil jars of metallic combed ware and oil separator vats (indicating production at the site) predominated in EB II–III.

The early EB I ceramic evidence suggests that there was occupation at Tel Ashkelon contemporary with the extensive so-called trough settlement(s) a kilometer to the north. Botanical evidence from there indicates that olive orchards were being grown in the vicinity, and cedar of Lebanon (*Cedrus libani*) was being shipped to Ashkelon as early as the mid-fourth millennium (Gophna and Liphschitz 1996; Stager 1993). Kay Prag had already recognized the likelihood of maritime trade between Byblos and Egypt at this and an even earlier period (Prag 1986). In his analysis of the interaction between Mesopotamia (Uruk IVa) and Egypt (Naqada II), beginning ca. 3500 B.C., P. R. S. Moorey (1990) proposed active sea lanes between coastal Syria (the Amuq Plain) and the Egyptian Delta, as part of the larger "Uruk network," or what Philip Curtin (1984) might call a "trade diaspora." Ashkelon would have been a probable intermediate port of call at that time.

Firm evidence for shipping between Egypt and Palestine later in the EB I comes from the royal cemetery of Abydos. Just 100 m north of the tomb of Aha (first king of the First Dynasty), Tomb U-j, belonging to an earlier king of Dynasty 0, whose name is not known, was filled with mortuary offerings, some time ca. 3150 B.C. (according to radiocarbon determinations). At least 207 wine jars were stacked in two of the chambers of the multichambered tomb. Impressions of another 150 wine jars were left in the floor of an adjacent chamber. It is estimated that as many as 700 wine jars once filled these rooms. Forty-seven of the jars

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contained grape pips, others, completely preserved grapes. Neutron activation analysis of the two types of wine jars indicates that they were imported from Palestine (McGovern and Harbottle 1997; McGovern 1998), where the grape had been domesticated and grown long before it was transplanted in Egypt (Stager 1985, 1992). Such a cargo of wine destined for the tomb of one ruler is not likely to have reached Egypt from Palestine via the EB I overland caravan route, later known as the "Ways of Horus." It is most likely that this was just one of many cargoes of wine shipped from Palestine, probably from the port of Ashkelon, and destined for the elite of Egypt (Stager 1985). At that time when wine was still a scarce commodity in Egypt, the Egyptian rulers as far away as Abydos had probably begun to exercise rather strict control over imports shipped into the Delta seaport and siphoned those luxury items into their coffers. By the First Dynasty in Egypt and EB II in Palestine, maritime trade had triumphed over overland trade (see below). As I suggested above, port power can be exercised in various ways. For the Egyptian rulers it must have been a much easier task for them to control and regulate large-scale maritime trade entering a single port in the Delta than small-scale overland operations entering at a number of points.

I now examine the port power model against a more distant network than the east-west wadi systems and also examine a trade archipelago, which penetrated deep into the Arabah and Sinai desert in search of copper.

II

During the floruit of early urban settlement in EB II Palestine and of early dynastic rule in Egypt, new settlements sprang up in the Sinai and Negev deserts in response to developments, particularly the demand for copper, in the core areas of Palestine and Egypt.

Because of the excavations of Ruth Amiran at Arad and the survey and excavations of Itzak Beit-Arieh in the Sinai, it is possible to identify certain nodes in the economic network that linked Arad with the Sinai, over a distance of more than 300 km, and ultimately with other parts of Palestine and even Egypt (Stager 1992).

It is usually argued on the basis of some shared material culture that the actual miners and producers of Sinai copper were "Canaanite colonists," who settled the Sinai during the EB II period in order to exploit the copper resources there. I have argued elsewhere that this was the same indigenous population that had always lived in the Sinai (Stager 1992). Although they might have adapted some aspects of their culture from southern Palestine (such as the so-called Arad house), their arid-zone settlements, in both layout and orientation, resemble modern Bedouin encampments in the Sinai and elsewhere. In addition to their mining activities, the EB II Sinai tribesmen continued to hunt gazelle and mountain goat and to herd flocks of sheep and small desert goats as they had been doing in earlier eras.

It seems preferable to view these people not as outsiders who colonized the desert and adapted very quickly to its constraints, but as part of the indigenous population who adjusted its strategies to the needs and economic demands of core areas. In profit-motivated trade, it was not that profitable to control the actual production; profit lay in the price differences between resource area and the marketing center and most of all between markets very far apart.

During EB II, when large quantities of Levantine pottery containing olive oil, wine, and tree resins were reaching Egypt during the First Dynasty, turquoise and especially copper were

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in greater demand there than ever before. Nowhere is this increase in wealth and status among the early pharaohs better exemplified than in the turquoise and gold bracelets from Djer's tomb at Abydos and in the huge cache of copper objects from his mastaba at Saqqara. Most likely this copper came from Wadi Feinan and the Sinai; however, there is no evidence that it was being transported directly to Egypt across the Sinai or by way of the Red Sea.

Trade with Egypt was probably not being carried on directly between the Egyptian court and the desert miners. The Sinai producers had trade links to the north. Arad served as a "gateway" to the Sinai and to the central and northern areas of Palestine, where cereals, olive oil, wine, and wood could be traded for the resources of the Sinai and the Red Sea.

All of this changed, however, during the Old Kingdom. The economic position of Arad as a gateway to the south was dealt a fatal blow from which the city never recovered. Lucrative trade with the Sinai came to an abrupt end when the Egyptians took control of the copper and turquoise mines during the Third Dynasty. By then the Egyptian state had intervened and taken over direct control of production, depriving both the Sinai tribesmen and the Levantines of their profitable roles as long-distance merchants.

Why did the Egyptians not do this earlier? I think it may be due to the fact that the transport system had changed and there was now an opportunity to link the Sinai and its copper to Egypt via the Red Sea. Egyptian personnel stationed at the mines included scribes, stone cutters, scorpion charmers, coppersmiths, interpreters, and naval officers among others (Stager 1992). Why else were these Egyptian mining expeditions under the supervision of the navy?

Before this time, copper was being extracted from Wadi Feinan and the Sinai and transported by donkey caravans to intermediate or "wholesale" markets such as Arad. That transaction involved the ultimate producers, the Sinai tribesmen, and donkey caravaneers who served as the initial set of risk-taking entrepreneurs. The goods might then be traded to an intermediate center such as Arad. Although the merchants of Arad could have transported the copper directly overland to Egypt via the Ways of Horus, a route in use during the EB I, Eliezer Oren's survey along the north Sinai coast indicates that it had ceased to be used as a caravan route during the EB II and EB III. Probably the overland route, with its small donkey caravans in the EB I, could not compete with maritime commerce that began in mid-to-late EB, as the volume, variety, and price of goods delivered by the large merchantmen on the Mediterranean route known as the Byblos Run transformed international trade. Only ships carrying timber, oil, copper, and wine could meet the ever-growing demand of the powerful elite of pharaonic Egypt. These Byblos ships, named after the most important EB port, transported goods, animals, and people between Egypt and the Levant. To build and outfit such a fleet of Mediterranean vessels required an outlay of capital that only large companies, merchant houses, or the state could provide.

We still have not solved the question of what happened to Feinan and Sinai copper once it reached Arad but was not transported overland to Egypt. I would suggest that it was probably sent to Ashkelon from where it was then shipped to Egypt. In addition to copper there were many other trade commodities exported to Egypt through this port. Unlike Arad, which collapsed after it no longer had access to copper once the Egyptians took over the Sinai mines, Ashkelon continued through the EB III period and Old Kingdom Egypt because it was more diversified and not restricted to a single commodity and resource area for its prosperity. The nodes along the exchange system varied with the changing conditions, although the seaport remained the same from the EB I to EB III periods. It was more directly linked to the maritime network with Egypt, which thrived during the First through the Sixth Dynasties. With the First

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Intermediate Period, which coincides with EB IV/MB I in Palestine, the seaport at Ashkelon was abandoned and not reoccupied until the resumption of urban life there during the MB IIA period, when once again a strong Middle Kingdom arose in Egypt; this provides another example of complementariness between Palestine and Egypt (Butzer 1997).

Thus we should not confuse the small-scale donkey caravaneers of the EB I—whose links to resource-producing peripheries were steadily attenuated by Egyptian trading posts and mercantile colonies, which penetrated far into the interior of south Palestine and balanced the "extra military expense with savings on the otherwise excessive exactions of local traders (Bronson 1978: 46)—with the large-scale seafaring merchants of the EB I and II periods, who inaugurated a pattern of maritime trade that was to endure for millennia.

With the development of the Palestinian system of city-states in the EB II and the advent of shipping as the primary means of transport in conducting long-distance trade, the situation changed dramatically. Shipping transformed trade among the indigenous entrepreneurs of the Levant, as they themselves were gradually transformed from a "vagabond trading class largely isolated from local cultures and polities" to a group of "larger and smaller magnates under the protection of politically competitive harbor princes" (cf. Geertz 1989), engaged in shipping bulk produce of oil, wine, timber, and resin from the more distant interior highlands as well as grain, oil, and wine from the foothills and coastal plain. Through connections with Sinai copper, they held the keys to power during EB II.

In the seaports of the eastern Mediterranean, we can imagine that import-export merchants sat in their counting houses, enriched by profitable trade from abroad. These shipping and trader barons had acquired the keys to long-distance trade. In most cases only they possessed a communication system rapid enough and extensive enough to relate supply to demand, as they interposed themselves between finished products and marketing them in distant places (Braudel 1982: 404). They could strive for and maintain monopolies over lucrative commodities not so much by force of arms but by their control of information and its flow.

Price differentials between far-flung markets and ports must have been quite sizable for certain products. As Fernand Braudel expressed it for Medieval Europe, "Long-distance trade certainly made super-profits: it was after all based on the price differences between two markets very far apart, with supply and demand in complete ignorance of each other and brought into contact only by the activities of the middleman" (Braudel 1982: 405).

Since we have no economic texts for third millennium Palestine and Egypt, we can only speculate about the price copper brought when it eventually reached the court of the pharaohs, having passed from the producers to the caravaneers through the middlemen at Arad (perhaps being processed somewhere in between), transported to Ashkelon, where the import-export merchants then sent it on its way to Egypt by ship.

The port power model that I have outlined for the third millennium could be applied to many other periods with some modification, of course, for different cultural, social, and political milieus.

III

After nearly three centuries of rural life, cities were once again founded in Palestine, then properly called "Canaan," during the latter half of the twentieth century B.C. Its founders came from a West Semitic background, probably part of the "Amorite" culture that dominated Syria

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after 2000 B.C. During the latter half of the twentieth century, they settled first along the coast of Canaan and began to establish seaports from Akko to Ashkelon. By about 1800 B.C., Ashkelon, the largest seaport in Canaan, supported a population of around 12,000–15,000 inhabitants within its ramparts. These fortifications, punctuated by elaborate city gates with arched entryways, extended for 2.2 km to enclose a settlement of 50–60 hectares.

The MB IIA kingdoms of Canaan and Syria were of sufficient strength to attract the attention of Egyptian foreign intelligence during the nineteenth century B.C., when the Middle Kingdom was at the height of its power (for salient features of the MB IIA culture in the Levant, see Dever 1993). In the Egyptian Execration Texts, dating to the Twelfth Dynasty (from roughly the reigns of Sesostris II through Amenemhet III), pharaohs cursed, among many others, two rulers of Ashkelon in the earlier series (the Berlin bowls; Sethe 1926) and a third ruler in the later series (the Brussels figurines; Posener 1940). The notion of W. F. Albright (1960: 82–85) that these texts reflect an evolution in Canaanite society from the MB I to MB IIA periods, from nomadism to urbanism, from sheiks to kings, is untenable. The seaport of Ashkelon was not occupied at all during the EB IV/MB I period and had become the largest city in Canaan early in the MB IIA period: thus if any of the rulers of Ashkelon were "kings," then all three were.

Contemporary with the MB IIA Levant and Middle Kingdom Egypt was the Old Assyrian trading colony located at Kanesh in central Anatolia. Two items from the vicinity of that emporium reached Ashkelon: a ceramic shoe rhyton and an Old Cappadocian cylinder seal, of a type best known from Karum Kanesh II. From a rich array of cuneiform texts found in the merchant quarters of Kanesh, scholars have been able to put together a fairly detailed portrait of the merchants living there and their family-run firms headquartered in Ashur, some five to six weeks away by donkey caravan (Veenhof 1972; Larsen 1976). These merchants were operating in a competitive, entrepreneurial environment, not in the Polanyianna world of "marketless trade" (Adams 1974; Holladay 1997; cf. Polanyi 1977). Some of their dealings in textiles and metals reaped profits of 100% or more. The Old Assyrian colony in Kanesh is the best documented of what were surely many more "trade diasporas," where merchants and investment firms operated for profit, in the ancient Near East and in the eastern Mediterranean (Kuhrt 1995: 90–95). There may be even older examples going back into the third and fourth millennia, such as the Uruk colonies and their trade diaspora, as well as other networks outlined above.

In her doctoral dissertation Susan Cohen (2000) has carefully periodized the various phases of the MB IIA culture in Canaan, which first appeared along the coast and gradually penetrated eastward along wadi systems into the interior foothills and highlands. By the seventeenth century B.C. Canaan reached its zenith as an economic and political power (Dever 1987; Ilan 1998; Oren 1997). During that time masses of Canaanites moved from southern Palestine into the Delta, from which their leaders known as the "Hyksos" ("foreign rulers") dominated much of Egypt between ca. 1640 and 1540 B.C. (Redmount 1989; Bietak 1996, 1997).

With a steady growth in overall population, the foothills and highlands of Canaan became densely settled. The highland population increased tenfold from the MB I through MB II periods (Finkelstein 1993; 1998: 355), as a hierarchy of settlement, from fortified centers such as Jerusalem and Shechem to villages and hamlets, shaped the interior. Israel Finkelstein made the insightful observation that this "impressive population growth [led to] an expansion into the inhospitable regions which were conducive only for horticultural activity. . . . Demand for

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these commodities in the sophisticated lowland centers must have played a role in the process" (Finkelstein 1998: 360–61). To this I should add a further stimulus: the demand for wine and olive oil from abroad, especially from Egypt.

By the late twelfth or early thirteenth Dynasty (1786–1640 B.C.) jars and boxes bearing clay sealings stamped with Egyptian scarabs were being sent to Ashkelon from Egypt (tentative dating provided by Lanny Bell, who is studying some three dozen sealings discovered in MB IIA Ashkelon). At the same time and somewhat later, large consignments of Canaanite wine and oil were being shipped to the prosperous seaport of Avaris (Tell el-Dabʿa) in the Delta, where enclaves of Canaanites resided (Bietak 1996: 21–48; Holladay 1997). The shipping containers, commonly known as "Canaanite jars," are amphoras with a capacity of approximately 25–30 liters. One of the amphoras that reached Avaris is made of clays from the Levantine coast. Stamped on its handle is the name of a Canaanite or Amorite municipal official (*ḥ3ty-ʿ*; commonly translated "mayor"), named Shimu (Bietak 1996: 60–62, fig. 51, pl. 25A–B). The amphora with everted, folded rim is far and away the most common type found in MB IIA Ashkelon as well as in other parts of the Levant. From Avaris several Canaanite jars of this type were transshipped some 150 km up the Nile to Lisht, the Middle Kingdom capital (Arnold, Arnold, and Allen 1995).

Manfred Bietak, who has so successfully directed the excavations of Tell el-Dabʿa, has extrapolated from the imported amphoras to estimate that about two million Canaanite jars, containing olive oil and wine, arrived at the seaport of Avaris during the MB II period. Although the overland route via the "Ways of Horus" was in use then (Oren 1997), clearly shipments of this magnitude must have arrived by sea. With this volume of exports from the Levant, it is no wonder that port power played a dominant role in the configuration of settlement patterns and economic networks from the lowlands to the uplands of Canaan. The demand for highland produce—timber, resin, wine, and oil—along the coastal Levant had never been greater.

In another paper I will try to demonstrate how the port power model helps in understanding Phoenician colonization throughout the Mediterranean, where Phoenician seafarers went in search of precious metals and other resources but settled mainly on the seacoasts. Only very rarely do we find traces of Phoenician material culture beyond the seacoast, leading into the hinterland to the mining and other resource areas. They realized that port power—control over export abroad—was sufficient for the economic goals they had. In fact it was only during the Industrial Revolution, when machines made control of production profitable, that we find merchant capitalists venturing into that sector of the economy in a big way.

In these early mercantile ventures, we see noncoercive power exercised in varied and subtle ways. So much so that Fernand Braudel's remarks about a much later period resonate with the more distant past:

> Capitalism inserts itself into the chain leading from production to wholesale trade, not seeking to take over entire responsibility for them, but to occupy the strategic points controlling the key sectors of accumulation. (Braudel 1984: 3: 65)

An expanded version of this study, including Phoenician colonization in the Mediterranean, will appear in a collection of my essays entitled *A Heap of Broken Images: Explorations in Biblical Archaeology,* to be published by John Knox/Westminster Press.

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PRODUCTION CENTERS OF COLLARED-RIM PITHOI FROM SITES IN THE CARMEL COAST AND RAMAT MENASHE REGIONS

ANAT COHEN-WEINBERGER AND SAMUEL R. WOLFF

INTRODUCTION

Much attention has been centered in past decades of research on the typology, function, provenance, chronology, technology and ethnic association of Iron Age I pithoi, especially of the so-called collared-rim variety (e.g., Ibrahim 1978; Finkelstein 1988: 251–62; Biran 1989; London 1989a; Zertal 1991; Esse 1992; Artzy 1994; Cohen-Weinberger and Goren 1996; Clark and London 2000: 104–06 Wengrow 1996). Petrography and neutron activation analyses on collared-rim pithoi from Shiloh, Sasa, Tel Dan, Tel Mevorakh, Tell Qasile, and Tell Keisan have contributed to these debated issues (Courtois 1980; Yellin and Gunneweg 1989; Glass et al. 1993; Cohen-Weinberger and Goren 1996). The present study concentrates on the collared-rim pithoi type from several sites in an area bordered by the ʿIron Ridge (Wadi ʿAra) to the south (El-Aḥwat), Wadi el-Milḥ to the north (ʿEn Ḥagit), the Carmel coast (Tel Dor and Tel Mevorakh) and ridge (Ramat Hanadiv) to the west and the Jezreel Valley to the east (Tell Qiri, Tel Qashish, ʿAfula) (fig. 32.1).[1] We also include six pithoi from Tel Dor with "wavy-band" decoration (see Gilboa, chap. 9, this volume), previously termed "Phoenician" or "Tyrian" pithoi (e.g., Biran 1989; Finkelstein 1988). Thus, the collared-rim pithoi analyzed here come from a relatively wide geographic area. Most scholars would agree that the sites dealt with in this study, lying inside the area described above, are located outside the area traditionally associated with the Israelites; if anything, these sites are within the Sea Peoples and/or Canaanite spheres of influence (e.g., Mazar 1994: 41–45; Singer 1994: 318–22). The samples date from the end of the thirteenth/beginning of the twelfth century B.C. to the end of the eleventh century B.C. (table 32.1). Our aim is to identify the place(s) of manufacture of the pithoi by means of petrographic analysis and to shed light on some technological aspects of these pithoi. The results contribute to a better understanding of economic activity and trade patterns in the early Iron Age.

METHOD

The petrographic method identifies the clay and temper (non-plastic components) minerals. Thin sections of the pithoi samples were examined under a petrographic (polarizing) microscope. The samples were divided into petrographic families. A petrographic family encompasses vessels that share similar petrographic affinities in both clay and temper. The classification is an independent technical criterion for a comparative assortment of ceramic assemblages.

1. Two samples were taken from Beit Shean which is located outside the area that we are dealing with.

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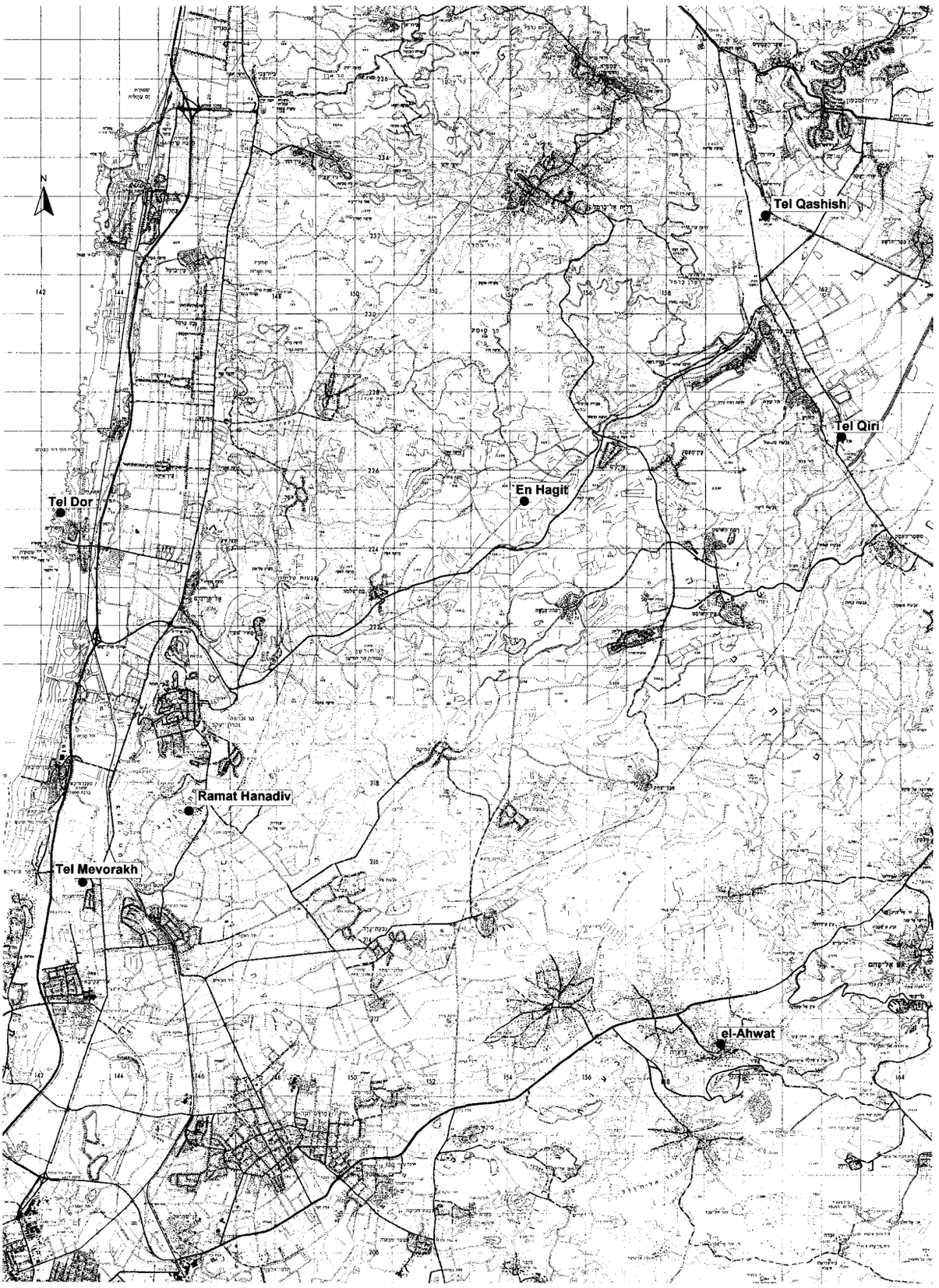

FIGURE 32.1. Map showing sites with collared-rim pithoi.

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Table 32.1. Chronology of the Sites (According to the Excavators) and Number of Samples

Site	*Date*	*Number of pithoi examined*
ʿEn Ḥagit	Mid–eleventh century B.C. (Wolff 1998: 453)	32+14*
El Aḥwat	Thirteenth–twelfth century B.C. (Zertal 1996: 5, 39)	6
Tel Dor	Late twelfth or early eleventh century B.C. ("Sikil city" = destruction phase), post "Sikil city" until ca. 980 B.C. (Gilboa 1998: 413)	20
Tel Mevorakh	Late eleventh/early tenth century B.C. (Stern 1978: 66,70)	1
Tel Beit Shean	Late thirteenth–beginning of the twelfth century B.C. (A. Mazar excavations, unpublished)	2
Tell Qiri	Eleventh century B.C. (Ben-Tor 1992: 1396)	5
Tel Qashish	Twelfth century B.C. (R. Bonfil pers. comm.)	2
ʿAfula	Twelfth century B.C. (Dothan 1955: 51)	1
Ramat Hanadiv	Unstratified (Wolff 2000)	11

* These samples were analyzed by magnifying glass.

For this study, ninety-four pithoi from seven sites were petrographically examined (table 32.1). Fourteen pithoi from ʿEn Ḥagit were examined with a magnifying glass (marked by * in table 32.2). Their petrographic families were determined by comparing them with the petrographically analyzed pithoi.

GEOLOGICAL SETTING OF THE SITES

The area under investigation is characterized by several different geological units. The Carmel and Umm el-Fahm regions are anticlines characterized by Cenomanian and Turonian carbonatic rocks (limestone and dolomite) accompanied by some volcanic intercalations (basalts and tuffs; Picard 1956; Sass 1968: 115–16). Senonian rocks are exposed in the flanks of these structures along Wadi ʿIron and Wadi el-Milḥ. Ramat Menashe is a syncline between the Carmel and Umm el-Fahm anticlines and is characterized by Eocene chalk and rendzina soils, which is generally developed on chalky rocks. There are some Pleistocene basalt hills in the eastern part of Ramat Menashe and in the Jezreel Valley (Picard 1956; Sneh, Bartov, and Rosensaft 1998). The Carmel coast is characterized by a Pleistocene *kurkar* ridge (Picard 1956; Ravikovitch 1970). The coastal sand was mostly derived from the Nile, but some components were derived from the valleys that are draining the Carmel and Ramat Menashe (i.e., Naḥal Meʿarot and Naḥal Daliya). Quartz is the main component of the Israel coastal sand. The carbonatic percentage in the sand between Hadera to Atlit is usually low, around 8%, whereas that between Atlit and Haifa is exceptionally rich, comprising up to 90% of the sand (Nir 1989: 14–15).

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Table 32.2. Distribution of the Petrographic Families According to Sites

Petrographic family/site	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*A/E*
ʿAfula	—	—	—	1	—	—	—	—
Tel Beit Shean	—	—	—	1	1	—	—	—
ʿEn Hagit	11+7*	11+2*	—	7+4*	2	1	—	1*
El Ahwat	2	1	—	3	—	—	—	—
Tel Dor	2	12	4	1	—	—	1	—
Tel Mevorakh	1	—	—	—	—	—	—	—
Tel Qashish	1	1	—	—	—	—	—	—
Tell Qiri	1	—	—	3	1	—	—	—
Ramat Hanadiv	1	4	—	5	1	—	—	—

*These samples were analyzed by magnifying glass.

RESULTS

Petrographic Families (table 32.3)

Family A

The clay of this family is carbonatic with some foraminifera that are often silicified, and about 5% silty quartz. Some clay lumps that were not mixed well in the matrix appear in the Tel Mevorakh sample (table 32.3:73). Some vessels are made of noncarbonatic clay. The non-plastic components of this family (10% of the paste) are mainly coarse chalk (3–4 mm), basalt, and flint (fig. 32.2). The basalt fragments appear in various degrees of weathering. Some of them are vesicular basalts having an opaque appearance and inclusions of chlorite.

The silty quartz points to an eolian material. The foraminiferous carbonatic clay and the chalk fragments suggest a provenance rich with rendzina soil. The chalk fragments are probably remnants of the source material. In some samples the carbonate of the clay decomposed due to a high firing temperature. That some vessels are made of noncarbonatic clay suggests that the rendzina soil source was highly weathered. The silicified foraminiferas indicate an Eocene chalk source. Eocene formations are exposed in Ramat Menashe (Sneh, Bartov, and Rosensaft 1998), and in some parts of this area rendzina soils were developed (Ravikovitch 1970). The appearance of basalt fragments suggests an area of contact between the exposed basalt and rendzina soils. The same basalts are well known in vessels from the Carmel coast (e.g., Tel Nami; E. Marcus pers. comm.). Basalt is exposed in the eastern part of Ramat Menashe, in the ʿIron and South Carmel ridges, and in the Jezreel Valley (Sneh, Bartov, and Rosensaft 1998). Pithoi belonging to this family are found at ʿEn Ḥagit, El Aḥwat, Tel Dor, Tell Qiri, Tel Qashish, and Ramat Hanadiv. Thus, the petrographic results strongly suggest that the raw material of this family was derived from Ramat Menashe and the Carmel or Umm el-Fahm

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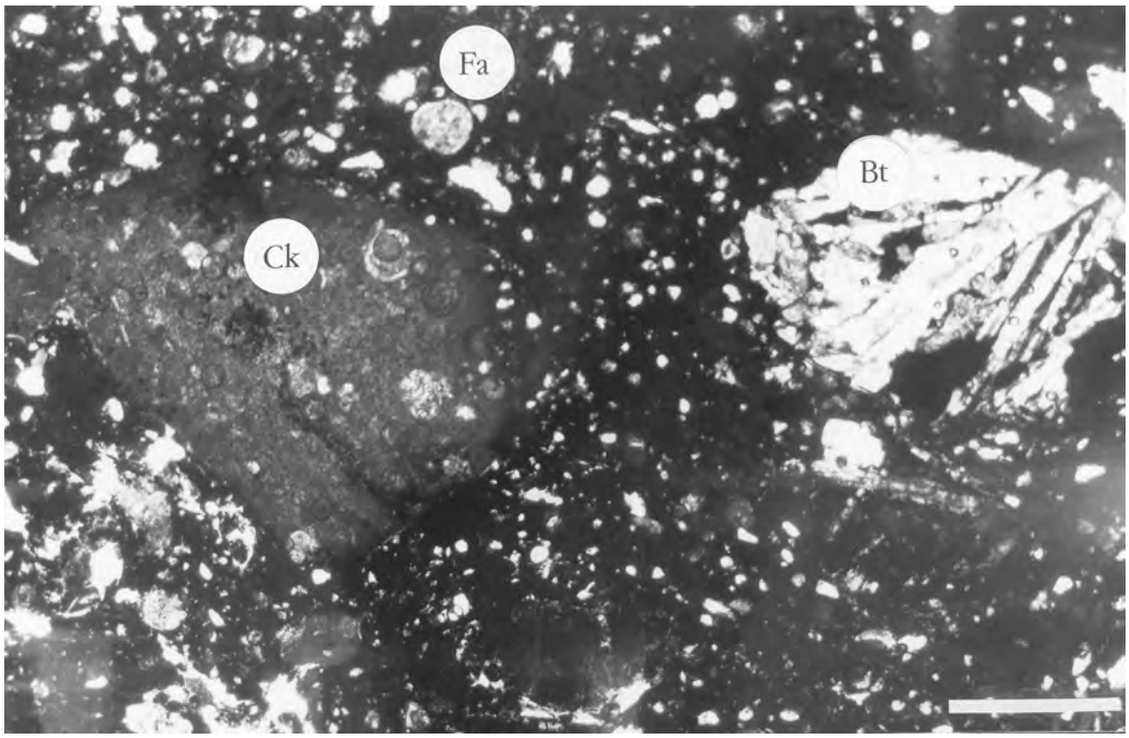

FIGURE 32.2. Photomicrograph of pithos from ʿEn Ḥagit (table 32.3:6), family A. Chalk and basalt fragments embedded in rendzina soil. Ck = chalk; Bt = basalt; Fa = foraminifera. XPL. Scale (white bar) = 0.5 mm.

basalts. The distance from each of these sites to the clay and the non-plastic components as well indicates that they were made somewhere in the vicinity of these sites.

Family B1

The clay of this family is carbonatic with some foraminifera, often silicified, with up to 5% siltic quartz grains. In some samples the clay was mixed with terra rossa soil appearing in the form of mud balls. The non-plastic components (20% of the paste) consist of mainly fine quartz grains (0.5 mm) and coarse chalk fragments (3 mm), some fine limestone fragments, chert and, rarely, feldspar (fig. 32.3).

The clay is the same as the clay of family A and is most probably rendzina soil. Soils in different degrees of weathering were used for making the pithoi as indicated by the range of carbonatic to noncarbonatic matrixes. In some samples the carbonate of the matrix decomposed due to the firing in a high temperature. Pithoi of this family were found at ʿEn Ḥagit, Tel Dor, El Aḥwat, Tel Qashish, and Ramat Hanadiv.[2] For the same reasons mentioned above, the source of the clay for this family is most likely Ramat Menashe. The source of the non-plastic components is in the Mediterranean coast. Thus, the production center could have been in Ramat Menashe or in a coastal site.

2. For the Iron Age pottery from Ramat Hanadiv see S. Wolff (2000).

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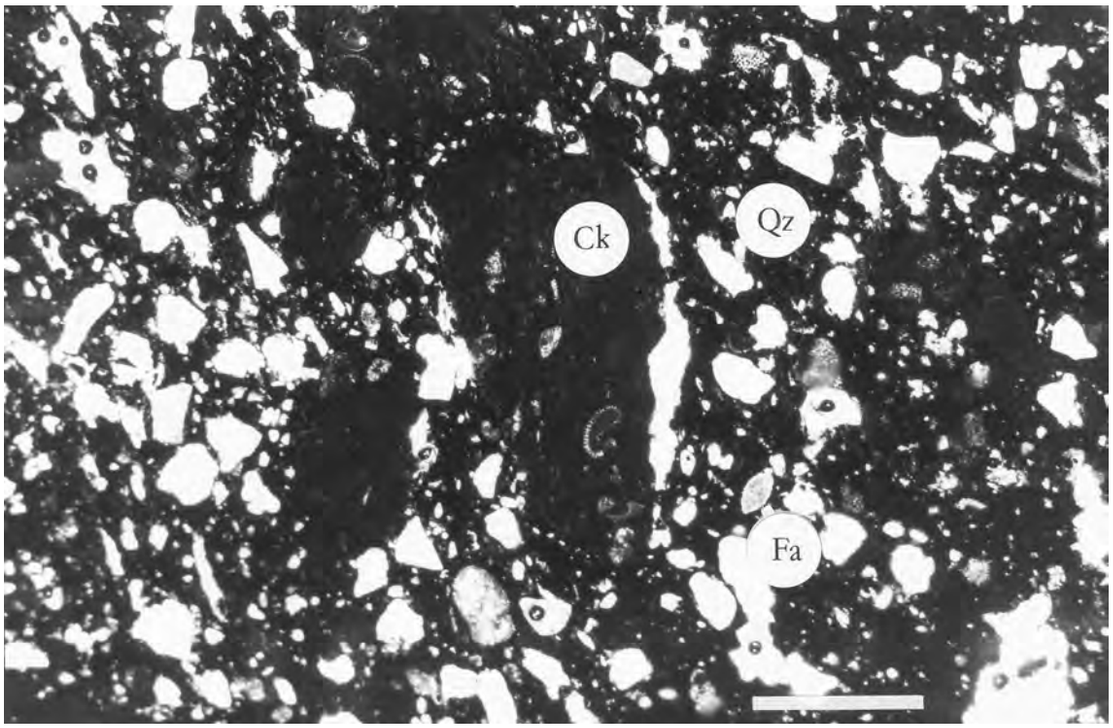

FIGURE 32.3. Photomicrograph of pithos from ʿEn Ḥagit (table 32.3:20), family B. Coarse chalk and fine quartz embedded in rendzina soil. Ck = chalk; Qz = quartz; Fa = foraminifera. CPL. Scale (white bar) = 0.5 mm.

The introduction of terra rossa soil into the clay of this family may be linked to its high iron content, which enabled the clay to achieve a sufficient degree of sintering, even at relatively low firing temperature, due to its fluxing activity (Edwards and Segnit 1982). Traditional potters in the Hebron hills claim that adding terra rossa to the paste reduces the plasticity of the clay and prevents the collapse of the vessel when wet or its excessive shrinkage during drying (Krispil 1987). Terra rossa soil was also added to the paste of some Iron I pithoi in the Galilee (Cohen-Weinberger and Goren 1996: 78, 81).

Family B2

The clay of this family is carbonatic with up to 5% siltic quartz grains. The non-plastic components (about 15% of the paste) consist mainly of fine quartz grains and coarse limestone fragments, some feldspar and, rarely, basalt fragments.

The silty quartz points to an eolian source material. The non-plastic components indicate a coastal source. The basalt fragments were probably washed down to the coastal region via one of the Carmel wadis. Only one pithos from Tel Qashish belongs to this family. The production center could have been Ramat Menashe or the coastal Carmel region, like family B1.

Family C

The matrix consists of ferruginous clay. The non-plastic components of this family, which comprise about 20% of the paste, are characterized by well-sorted inclusions of generally rounded quartz and limestone (fig. 32.3), as well as some chert particles. Feldspar, orthopyroxene, and hornblende appear in small quantities. *Amphiroa* sp. algae appear as well.

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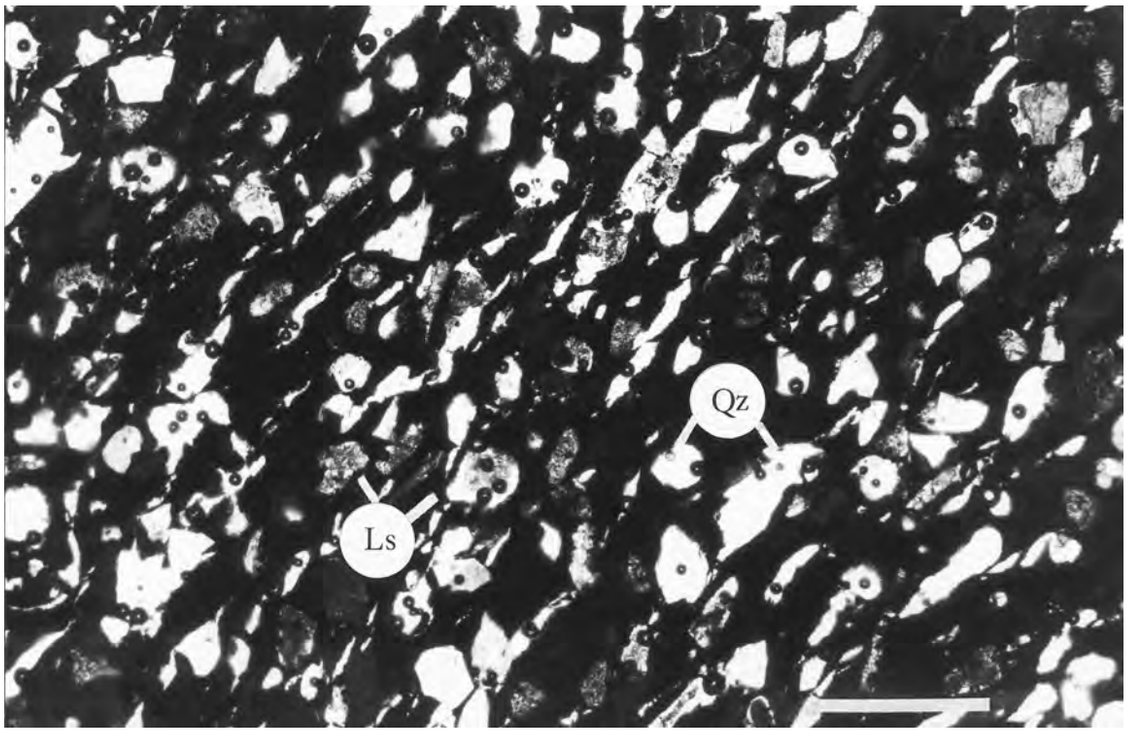

FIGURE 32.4. Photomicrograph of a "wavy-band" pithos from Dor (table 32.3:63), family C. Rounded quartz and limestone embedded in ferruginous clay. Ls = limestone; Qz = quartz. CPL. Scale (white bar) = 0.5 mm.

The petrographic appearance of the matrix is very similar to that of the *hamra* soils. This is in accordance with the appearance of most of the non-plastic components, especially with the *Amphiroa* sp., a *fossile directeur* of the Quaternary coast. The calcareous components suggest a moderately weathered soil, which is typical of the *hamra* along the northern coast of Israel and Lebanon. Pithoi of this family were found at Tel Dor and related to the type with the wavy-band decoration. Some pithoi of this type from the Upper Galilee were made from the same raw material (Cohen-Weinberger and Goren 1996: 78–79).

Family D

This family is characterized by the use of diversified shale fragments, some of which are ferruginous, while others tend to be more clayey. Some ferruginous oolites also appear in the clay. The matrix contains up to 5% silt. The non-plastic components (up to 5%) including mainly quartz and siltstone and some limestone and sandstone (fig. 32.4).

A large bank of comparative data (Goren 1996: 49) shows that the lower formations of the Lower Cretaceous lithological section were the sources of both clay and non-plastic components. These formations outcrop extensively between the southern part of the Dead Sea and Wadi Zarqa in Transjordan as well as in the Upper Galilee and southern Lebanon. Smaller outcrops appear in eastern Samaria, in Wadi Maliḥ and Wadi Farʿah (Mimran 1969; Shaliv 1972; Bender 1974). Pithoi of this family were found at ʿEn Ḥagit, El Aḥwat, Tel Dor, Tell Qiri, Tel Beit Shean, ʿAfula, and Ramat Hanadiv. Similarly, pithoi belonging to this family were found at Shiloh (Glass et al. 1993: 276–77, 279–82, n. 4), and at Iron I sites in the southern Samaria

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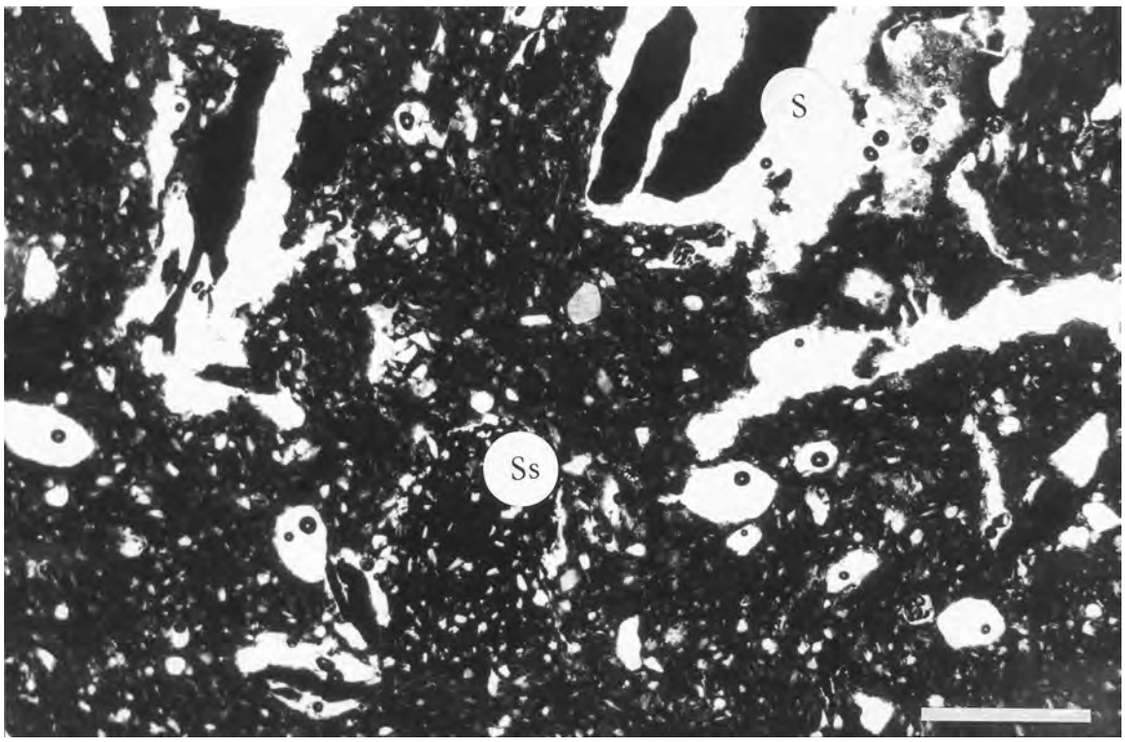

FIGURE 32.5. Photomicrograph of pithos from El Aḥwat (table 32.3:71), family D. Ferruginous shales and siltstone fragment. Ss = siltstone; S = shales. PPL. Scale (white bar) = 0.5 mm.

survey (N. Shacharon unpublished data). The Lower Cretaceous lithological section was also the source of some Iron I Age "Galilean" pithoi from Dan and Horvat Avot (unpublished, analyzed by Cohen-Weinberger).

Family E1

Both carbonatic and non-carbonatic clays occur in this family. The non-plastic components (15% of the paste) include mainly rounded limestone and alkali-olivine basalt with alterations to iddingsite (fig. 32.5).

The roundness of non-plastic components indicates the use of wadi sand as temper. A wadi that drains a region of basalts and carbonatic rocks might be the source of this family. The raw material of this family was utilized throughout the centuries at sites in the Jezreel Valley (Goren 1991: 129–30; Cohen-Weinberger 1998: 58–59). The Jordan River, Qishon River, and wadis that cut the Carmel ridge are also possible sources for the wadi sand. Pithoi of this family were found at ʿEn Ḥagit, Beit Shean, and Ramat Hanadiv. One pithos from Tell Keisan, petrographically examined and described by Courtois (1980: 356, table 1), most probably belongs to this family as well.

Family E2

This family is similar to family E1. The clay is carbonatic with foraminifera. The non-plastic components include rounded basalt and limestone fragments and also quartz grains. It is the presence of these quartz grains that distinguish this subfamily from Family E1.

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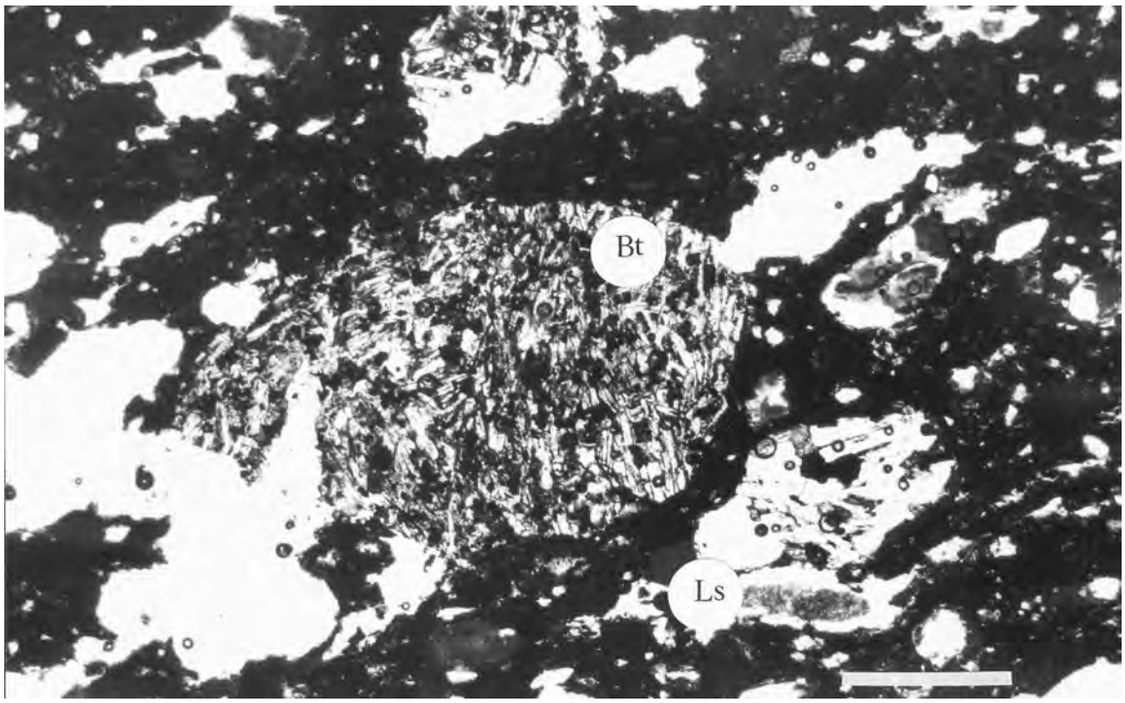

FIGURE 32.6. Photomicrograph of pithos from ʿEn Ḥagit (table 32.3:4), family E1. Rounded basalt and limestone. Bt = basalt; Ls = limestone. CPL. Scale (white bar) = 0.5 mm.

The source of the quartz is the Nubian sandstone that drained into the Jordan River. Only one pithos, from Tell Qiri, belongs to this family.

Family F

The clay is carbonatic with foraminifera. The non-plastic components are diversified and (≅ 15% of the paste) contain limestone, *kurkar*, quartzolite, several types of feldspar, red algaes, miliolids, and vesicular basalt with inclusions of chlorite (figs. 32.6, 32.7). The chlorite is an alteration of pyroxene or olivine, and it has a fibrous appearance bearing anomalous colors.

The source of the non-plastic components is mixed. The origin of the *kurkar*, feldspar, red algae, and miliolid is coastal. The origin of the basalt and the quartzolite is in the vicinity of Zikhron Yaʿaqov and Shefiyah (E. Sass, pers. comm.). A single pithos of this family was found at ʿEn Ḥagit. The petrographic results suggest that this family was produced in this region, probably not far from ʿEn Ḥagit.

Family G

This family is characterized by a micaceous clay. The non-plastic components are mainly quartz (0.5 mm), elongated biotite (up to 1.5 mm), and minerals of the pyroxene group (fig. 32.8).

This mineralogical assemblage points to Cyprus or the Aegean zone as the source. Only one "wavy-band" decorated pithos from Tel Dor belongs to this family.

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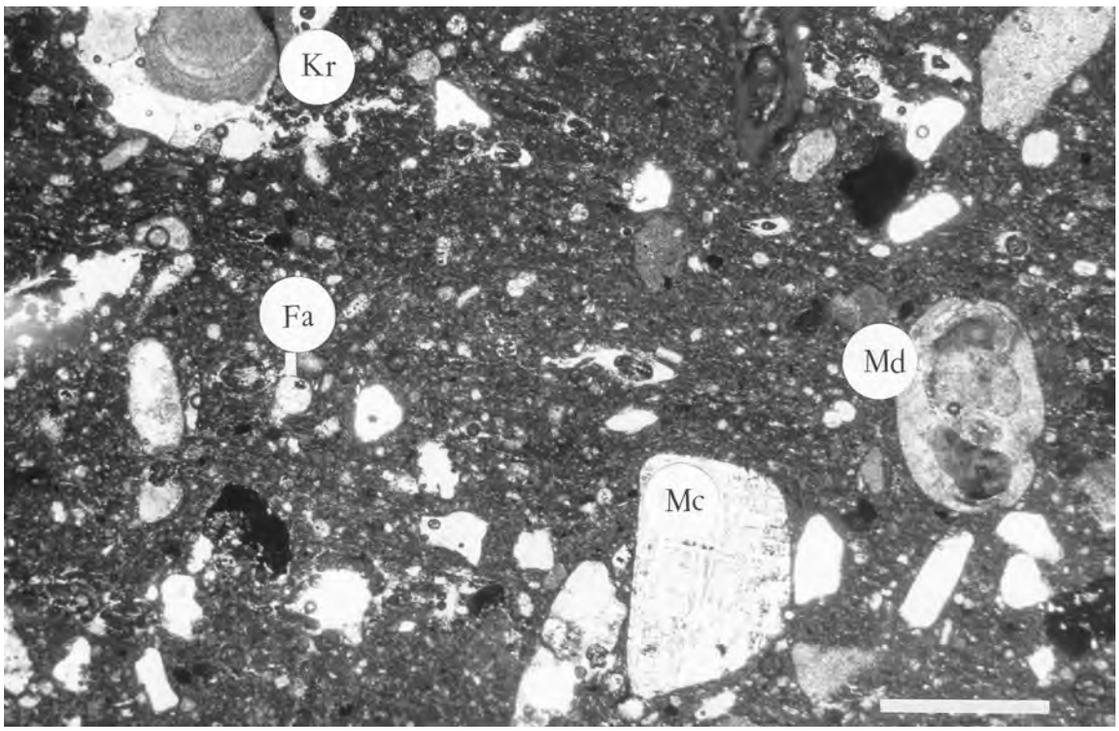

FIGURE 32.7. Photomicrograph of pithos from ʿEn Ḥagit (table 32.3:31), family F. Coastal non-plastic components embedded in carbonatic clay. Mc = microcline; Md = miliolid; Kr = kurkar; Fa = foraminifera. CPL. Scale (white bar) = 0.5 mm.

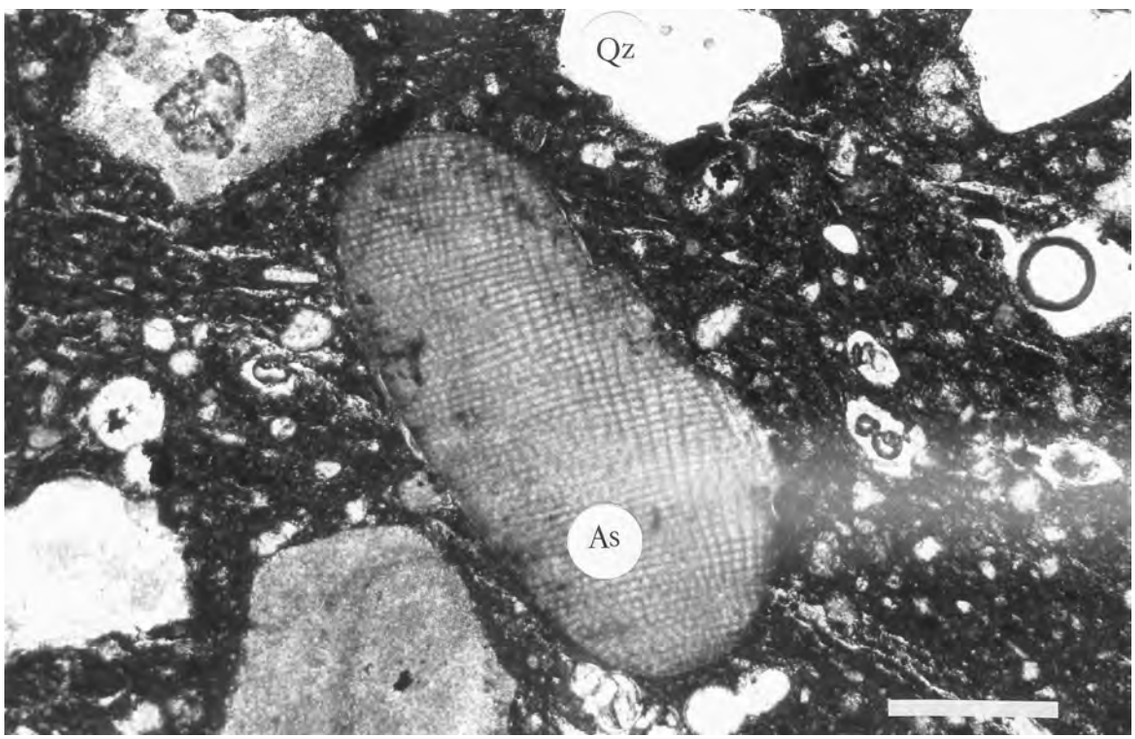

FIGURE 32.8. Photomicrograph of pithos from ʿEn Ḥagit (table 32.3:31), family F. As = *Amphiroa* sp. Algae; Qz = quartz. CPL. Scale (white bar) = 0.2 mm.

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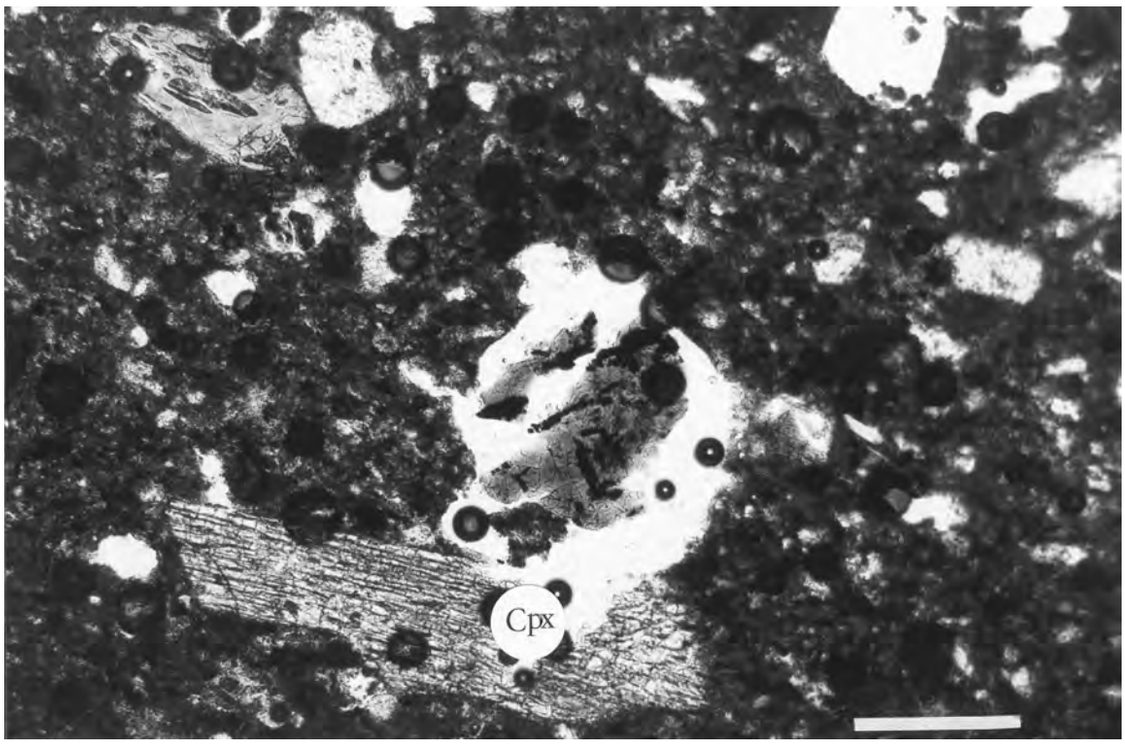

FIGURE 32.9. Photomicrograph of a "wavy-band" pithos from Dor (table 32.3:66), family G. Clinopyroxene (Cpx) embedded in micaceous clay. CPL. Scale (white bar) = 0.2 mm.

DISCUSSION

Our main results, which serve as a basis for the following discussion, are as follows. Every site includes pithoi made of several different raw materials (tables 32.2 and 33.3). Conversely, almost every petrographic family is represented at a variety of sites. Collared rim pithoi made of Families A, B, and D were found at sites located in the northern and southern borders of Ramat Menashe, Carmel Ridge South, Jezreel Valley, and coastal sites. One pithos from Tel Beit Shean belongs to family D (table 32.3:74), along with thirty pithoi from Shiloh (Glass et al. 1993) and a considerable number collected from sites in the southern Samaria survey (Nurit Shacharon, pers. comm.). This petrographic family was used to manufacture pithoi found in the Upper Galilee as well (e.g., at Dan, unpublished). "Wavy-band" pithoi made of family C were found at the coastal site of Tel Dor (table 32.3:61–66) and in the Upper Galilee (Cohen-Weinberger and Goren 1996). Pithoi belonging to family E were found at ʿEn Ḥagit, Tel Beit Shean, Tell Qiri, and Ramat Hanadiv. Only one pithos of family F was found at ʿEn Ḥagit, and one pithos of family G at Tel Dor. The later is related to the wavy-band decorated pithoi and is the only pithos from those examined that was found to have been imported from overseas, most probably from Cyprus.

Among the sampled collared-rim pithoi from ʿEn Ḥagit (table 32.2), there was a preference for the raw material of family A (rendzina + basalt: 40%) over family B (rendzina + coastal sand: 28%) and family D (Lower Cretaceous clay: 23%). On the other hand, at Tel Dor a greater number of collared-rim pithoi belonged to family B (80%) over family A (12.5%). These results may imply that the pithoi belonging to family B were manufactured at coastal site, perhaps Dor itself, or another site near the coast.

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Table 32.3. Inventory and Results of the Petrographic Examined Pithoi

No	*Site*	*Basket*	*Locus*	*Level*	*Petrographic family*
1	ʿEn Ḥagit	105/11	101		A
2	ʿEn Ḥagit	512/1	207		D
3	ʿEn Ḥagit	534/5	218		A
4	ʿEn Ḥagit	534/10	214		E1
5	ʿEn Ḥagit	554	224/5		B1
6	ʿEn Ḥagit	551	223		A
7	ʿEn Ḥagit	572/6+7	230		B1
8	ʿEn Ḥagit	581/1	224/5		A
9	ʿEn Ḥagit	584/5	231		A
10	ʿEn Ḥagit	585	224/5		A
11	ʿEn Ḥagit	587/2	231		D
12	ʿEn Ḥagit	587/15	231		D
13	ʿEn Ḥagit	591/13	231		A
14	ʿEn Ḥagit	601/7	234		B1
15	ʿEn Ḥagit	607/1	232		B1
16	ʿEn Ḥagit	612/4	232		A
17	ʿEn Ḥagit	618/10	237		B1
18	ʿEn Ḥagit	632/2+3	242		A
19	ʿEn Ḥagit	643/2	243		D
20	ʿEn Ḥagit	686	253		B1
21	ʿEn Ḥagit	689/1	253		A
22	ʿEn Ḥagit	695/6	253		A
23	ʿEn Ḥagit	711	224/5		B1
24	ʿEn Ḥagit	719/1	230		B1
25	ʿEn Ḥagit	740/1	250		B1
26	ʿEn Ḥagit	804/7	403		D
27	ʿEn Ḥagit	815/2	403		D
28	ʿEn Ḥagit	872/3	422		D
29	ʿEn Ḥagit	872/5	422		B1
30	ʿEn Ḥagit	882/4	422		E1
31	ʿEn Ḥagit	883/7	412		F
32	ʿEn Ḥagit	912/6	424		B1
33	ʿEn Ḥagit*	652/1	250		A
34	ʿEn Ḥagit*	640/4	248		B1
35	ʿEn Ḥagit*	909/4	415		D
36	ʿEn Ḥagit*	856/6	415		A/E
37	ʿEn Ḥagit*	876/2	417		D
38	ʿEn Ḥagit*	801/1	401		A
39	ʿEn Ḥagit*	803/4	402		A
40	ʿEn Ḥagit*	911/3	415		A
41	ʿEn Ḥagit*	678/1	242		A
42	ʿEn Ḥagit*	830/2	403		D
43	ʿEn Ḥagit*	613/4	237		A
44	ʿEn Ḥagit*	587/12	231		B1
45	ʿEn Ḥagit*	591/16+22+4	231		A
46	ʿEn Ḥagit*	872/2	422		D
47	Tel Dor	—	12000	Post Destruction	B1

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Table 32.3. Inventory and Results of the Petrographic Examined Pithoi (*Cont.*)

48	Tel Dor	—	12003	Post Destruction	B1
49	Tel Dor	—	3269	Post Destruction	B1
50	Tel Dor	—	3097	Post Destruction	B1
51	Tel Dor	—	3097	Post Destruction	B1
52	Tel Dor	—	2298	Post Destruction	B1
53	Tel Dor	—	3256	Post Destruction	A
54	Tel Dor	—	2694	Post Destruction	B1
55	Tel Dor	91156	9902	Post Destruction	B1
56	Tel Dor	—	9903	Post Destruction	B1
57	Tel Dor	—	3245	Post Destruction	B1
58	Tel Dor	182033	18263	Destruction	B1
59	Tel Dor	181189	18033	Destruction	D
60	Tel Dor	181974	18237	Destruction	B1
61	Tel Dor (“wavy band” pithoi)	—	9829	Destruction	A
62	Tel Dor (“wavy band” pithoi)	—	9829	Destruction	C
63	Tel Dor (“wavy band” pithoi)	—	9985	Destruction	C
64	Tel Dor (“wavy band” pithoi)	—	7926	Destruction	C
65	Tel Dor (“wavy band” pithoi)	—	9813	Destruction	C
66	Tel Dor (“wavy band” pithoi)	—	7914	Destruction	G
67	El Aḥwat	—	34273/32		A
68	El Aḥwat	—	?		D
69	El Aḥwat	—	34275		B1
70	El Aḥwat	—	34246		D
71	El Aḥwat	—	33076		D
72	El Aḥwat	—	34248		A
73	Tel Mevorakh	971	6204		A
74	Tel Beit Shean	187221/80			D
75	Tel Beit Shean	184237	18411		E1
76	Tell Qiri	662/1	690		D
77	Tell Qiri	506/17	579		D
78	Tell Qiri	3034	1817		D
79	Tell Qiri	2052/1	1011		A
80	Tell Qiri	2271/6	690		E2
81	ʿAfula	Dothan 1955: fig.16:4	—		D
82	Tel Qashish	2466/7	374		B2
83	Tel Qashish	2466/6	374		A
84	Ramat Hanadiv	3642	546		B1
85	Ramat Hanadiv	6161/1	582		D
86	Ramat Hanadiv	9138	943		D
87	Ramat Hanadiv	6164	681		D
88	Ramat Hanadiv	3698	524		D
89	Ramat Hanadiv	3649	501		E1
90	Ramat Hanadiv	9006/1	A904		A
91	Ramat Hanadiv	3941/1	—		B1
92	Ramat Hanadiv	6714/1	—		B1
93	Ramat Hanadiv	3130/4	311		D
94	Ramat Hanadiv	3189	325		B1

* These samples were analyzed by magnifying glass.

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For the present discussion it is important to describe the petrographic families of the Samaria region (Nurit Shacharon, pers. comm. and Glass et al. 1993). The examined pithoi from the southern Samaria survey and Shiloh excavation belong to three different petrographic families: one made of the Lower Cretaceous formations (family D); one made of Moẓa clay and tempered by rhombic-shaped dolomite sand of Aminadav Formation (for a detailed description of this family, see Goren 1995); and one made of Taqiye Marl Formation.

Pithoi made of the Lower Cretaceous formations (family D) were made in the northern Samaria region (in Wadi Farʿah and Wadi Maliḥ), or in Transjordan. These pithoi were exported to the southern part of the Samaria hills, and to the more distant regions of Ramat Menashe, Carmel Ridge, Jezreel Valley, and the Carmel coast.

Pithoi made of a coastal raw material (families B and C) were mainly found at coastal sites. Among the pithoi from the Jezreel Valley that were sampled, only one, from Tel Qashish (table 32.3:82), was made of family B2. For comparison, petrographic results of pottery from the southern Samaria survey and Shiloh do not indicate the presence of pithoi made of coastal components in the region of Samaria.

Most of the southern Samaria survey sites, as well as Shiloh, contain pithoi belonging to at least two petrographic families. Thus, it is significant that pithoi of the second and third families (those made of Taqiye and Moẓa formations) are not found outside of the Samaria region. Two possible interpretations of these observations are offered here. (1) If the provenance of family D pithoi was Samaria, then we would expect to find pithoi made of all three families at sites investigated in this study. Since this is not the case, the production center of family D pithoi may be sought in Transjordan. (2) Pithoi were manufactured in several central workshops in the Samaria region, as suggested previously by Glass et al. (1993: 279). Thus, one might assume that the inhabitants of the coast and the northern valleys were for some reason in contact with the central workshop in northeastern Samaria and not with workshops in other parts of Samaria.

The Relationship Between Typology and the Petrographic Families

Several typological subdivisions of collared-rim pithoi have been suggested in the past (e.g., Sinclair 1960: 16–18; Kelso 1968: 63; Callaway 1969: 8–9). Finkelstein (1988: 276–77) concluded that these typological divisions are not chronologically significant. The collared-rim pithoi from Shiloh were divided into two different types, with each one assigned, on the basis of petrographic analysis, its own production center, as described above (Glass et al. 1993: 279–80).

At ʿEn Ḥagit the picture is more complicated. Most of the collared-rim pithoi belong to one type, a short outfolded rim with short upright neck. Typologically, this type is very similar to Group A from Shiloh. Vessels and sherds of this subtype grouped with families A, B1, D, E1, and F, suggesting a multiplicity of sources. A less common type at ʿEn Ḥagit (only three examples) has a rim that is similar to the first type but with a long upright neck (table 32.3:26, 28, 30). The findspots of these sherds may suggest that this type is earlier than the first type (Wolff forthcoming). When analyzed, two of these sherds grouped with family D and one with family E1, suggesting dual sources for this type.

The collared-rim pithoi from Ramat Hanadiv are very similar in shape to the majority from nearby ʿEn Ḥagit. The collared-rim pithoi from Tel Dor, most belonging to family B, exhibit a diversity in rim morphology.

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The following conclusions can be drawn:

1. Of the six analyzed sherds of "wavy-band" pithoi from Tel Dor, three sources were determined: Cyprus (family G), the region of Ramat Menashe (family A), and the northern Phoenician coast (family C). Previously examined pithoi of this type from the Upper Galilee add at least two more petrographic families: one made of the Lower Cretaceous formations (family D), and one made of Cenomanian formations, particularly Deir Hana Formation, of the Upper Galilee (Cohen-Weinberger and Goren 1996: 78–79).
2. The most typical "central hill country" type of collared-rim pithos was manufactured in a variety of localities: the central hill country, Ramat Menashe, Galilee (Cohen-Weinberger and Goren 1996: 79–80), Carmel coast, Jezreel Valley, Transjordan, and Jordan Valley.
3. One sherd from ʿEn Ḥagit with a double ridge (table 32.3:19) is associated with family D (Wadi Farʿah or Transjordan source). A similar vessel was found at Tell el-ʿUmeiri, Jordan (Herr, Geraty, and Younker 1991: 162, fig. 6:3–4). The distribution and petrographic analysis suggest a Transjordanian source for this subtype.

Relations Between Chronology and Petrography

It seems that the same raw materials were employed by the potters during the thirteenth, twelfth, and eleventh century pithoi. The earliest samples analyzed here, from El Aḥwat and Tel Beit Shean, grouped with families A, B, D, and E1. The same can be said for the latest samples (postdestruction levels from Tel Dor, ʿEn Ḥagit, Tel Mevorakh). The sources of families C and G ceased to be exploited after the destruction phase at Tel Dor (late twelfth or early eleventh century B.C.). This is not so much a chronological phenomenon but rather a typological one; that is, these sources were utilized for the production of "wavy-band" pithoi, whose floruit is earlier than that of collared-rim pithoi.

The earliest pithoi analyzed here, both of the long-necked and short-necked variety, grouped with several families. The majority, however, grouped with families D and E1, whose proveniences are found in the eastern part of Cisjordan or even in Transjordan. Thus, the contention that the earliest pithoi are coastal in origin (Artzy 1994: 138) is put into question. The analysis of the pithoi from Tel Nami will be crucial in determining the reliability of this observation.

Petrographic Analysis and Neutron Activation Analysis

The pithos from Tel Mevorakh (table 32.3:73) was previously analyzed by means of neutron activation analysis by Yellin and Perlman (1978). They compared the elemental components of this pithos to those of some presumed local pottery (two bichrome and two coarse ware sherds) from Tel Mevorakh, a presumption that needs to be proven analytically, and to a reference collection from Tel Megadim (Ariel et al. 1985: 150–51; Yellin and Perlman 1978: 90, 94, table 7) that contains samples from several periods and several vessel types (unpublished list in Tel Megadim archives). They concluded that its chemical composition was local to the coastal region of Tel Mevorakh (Yellin and Gunneweg 1989: 139). According to our petrographic analysis, the sample that they defined as being local to Tel Mevorakh belongs to our family A and therefore seems to have been produced in the Ramat Menashe region, which

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is not so far from Tel Mevorakh but has a petrographic fingerprint that clearly distinguishes itself from the Carmel coast.[3]

Petrography and Trade

Previous studies of Iron Age I collared-rim pithoi have also suggested considerable variability in the production localities in each examined assemblage. As mentioned above, petrographic analysis of the collared-rim pithoi from Shiloh indicates that they were produced in two different, relatively distant, regional workshops (Glass et al. 1993). Petrographic analysis of "Galilean" and "Tyrian" pithoi from Sasa indicates the existence of two separate, contemporaneous production centers for each of them (Cohen-Weinberger and Goren 1996). Neutron activation analysis of the collared-rim pithoi from Tel Dan indicates that nearly one-third of the analyzed samples were locally made, whereas the rest were imported from seven different geographical regions (Yellin and Gunneweg 1989). At a manufacturing site, one would expect to find pithoi made of the same raw material, which is not the case. In our opinion these results imply that pithoi were not manufactured at any of the sites that were sampled until now (with the possible exception of Tel Dor; see above).

The heterogeneity of sources causes us to reject a model according to which the collared-rim pithoi were manufactured by itinerant potters (London 1989a: 44) and were marketed in nearby settlements, as ethnoarchaeological research conducted in Cyprus, Crete, and Jordan suggests (London 1989b: 68–69; Voyatzoglou 1974). For example, it makes no sense that a vessel produced in northeastern Samaria was shipped to the coastal region (where identical vessels were also manufactured) when the same itinerant potters could have produced them there as well. Rather, they were manufactured in independent, specialized potters' workshops. The heterogeneity of sources have been interpreted by some as an indication that the pithoi were used as *vases-récipients*, that is, pottery whose value was in the product it contained and not in the vessel itself (e.g., Artzy 1994; Wengrow 1996). The extraordinary weight of pithoi filled with produce leads us to reject this theory. Rather, collared-rim pithoi were used first and foremost as *vases-marchandises* (pottery traded not for the value of its contents but for its own value). A pithos, in comparison to present-day concepts, was an expensive item since it demanded high technical skill to produce. We offer two explanations regarding the heterogeneity of sources at one site. (1) Purchasers of pithoi sought the maximum combination of high quality and reasonable price. Because of the price and quality, which are subject to fluctuation, the consumer changed preferences according to the situation and times. Shifts in preferences are reflected in the heterogeneity of sources. (2) Pithoi had a long life (London 1989a: 44), so much so that an assemblage of pithoi could have been purchased during a stretch of several years.

The results of our petrographic analysis strengthen the hypothesis that there is no connection between the place where pithoi were manufactured and a specific ethnic group (as argued by earlier researchers), rather that they were manufactured and used by a variety of ethnic groups.

3. J. Yellin (Hebrew University) conducted neutron activation analysis on the same collared-rim pithoi from ʿEn Ḥagit that are described above, but the results are still unavailable. A comparision of his results to those reported in this paper will provide complementary information.

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33

THE EARLY BRONZE AGE IA OF SOUTHWESTERN CANAAN

YUVAL YEKUTIELI

The following paper focuses on a certain time and space within the Early Bronze (EB) I framework—its early part—the EB IA of southwestern Canaan. It describes its attributes, reconstructs some of its socioeconomic aspects, and discusses its contribution to several related issues.

The most accepted chronological scheme for southwestern Canaanite EB I argues for its division into two phases: early—EB IA, and late—EB IB (Amiran and Gophna 1992; Stager 1992: 28). For a summary of researchers' opinions see table 33.1. Since S. Yeivin's (1961) excavations at Erani, the EB IB of southwestern Canaan became relatively well documented and defined (Gophna 1990b). Its remains were recorded in many sites within the research area (fig. 33.1) such as ʿEn Besor, Tel Ḥalif Terrace, Maʾaḥaz, Erani, and Afridar (see also Porat 1992: map 1), and it has been found that its most characteristic feature is an abundance of Egyptian, or Egyptian-inspired finds. However, the phase preceding it, the EB IA, is poorly understood, and needs further clarification (Dessel 1991: 93).

THE ENVIRONMENT

The area dealt with in this paper (fig. 33.2) is bordered on the south by Nahal Besor (Wadi Ghazzeh) and its large tributary Naḥal Beersheva. The valleys separating the southern Shephelah (the inland plain) from the Hebron mountains border it on the east. Its northern limit is the course of Naḥal Lachish to its point of debouchement. This region is considered, in this paper, as a single unit, defined as "southwestern Canaan" (others who have treated more or less the same geographical entity as a distinguishable unit in the EB I include Porat 1992; Kempinski 1992; Brandl 1992). Three geographical subregions are located within the research area (fig. 33.3):

> "Pleshet" (biblical Philistia) is a lowland coastal plain covered by sand dunes near the shore and, farther to the east, by *hamra* and *qurqar* (calcareous sandstone) soils. The "northern Negev" is notable for its plains and low hilly areas covered by loessy soils. The "southern Shephelah" is one of rounded, chalky limestone hills covered by a harder top layer, known locally as Nari. (Dan 1988: 51)

The soils in the research area are fertile, and at present wheat is grown in this region by the dry fall method. Irrigation enables the cultivation of additional crops including vegetables and fruit (Dan 1988: 56). A transition between two major natural vegetation zones occurs within the limits of the research area. The northeast lies within the Mediterranean zone, while the southern part is included in the more arid Irano-Turonian zone (Danin 1988: 59). Rainfall occurs in southwestern Canaan from October to May (Zangvil 1988: 45). Average rainfall in

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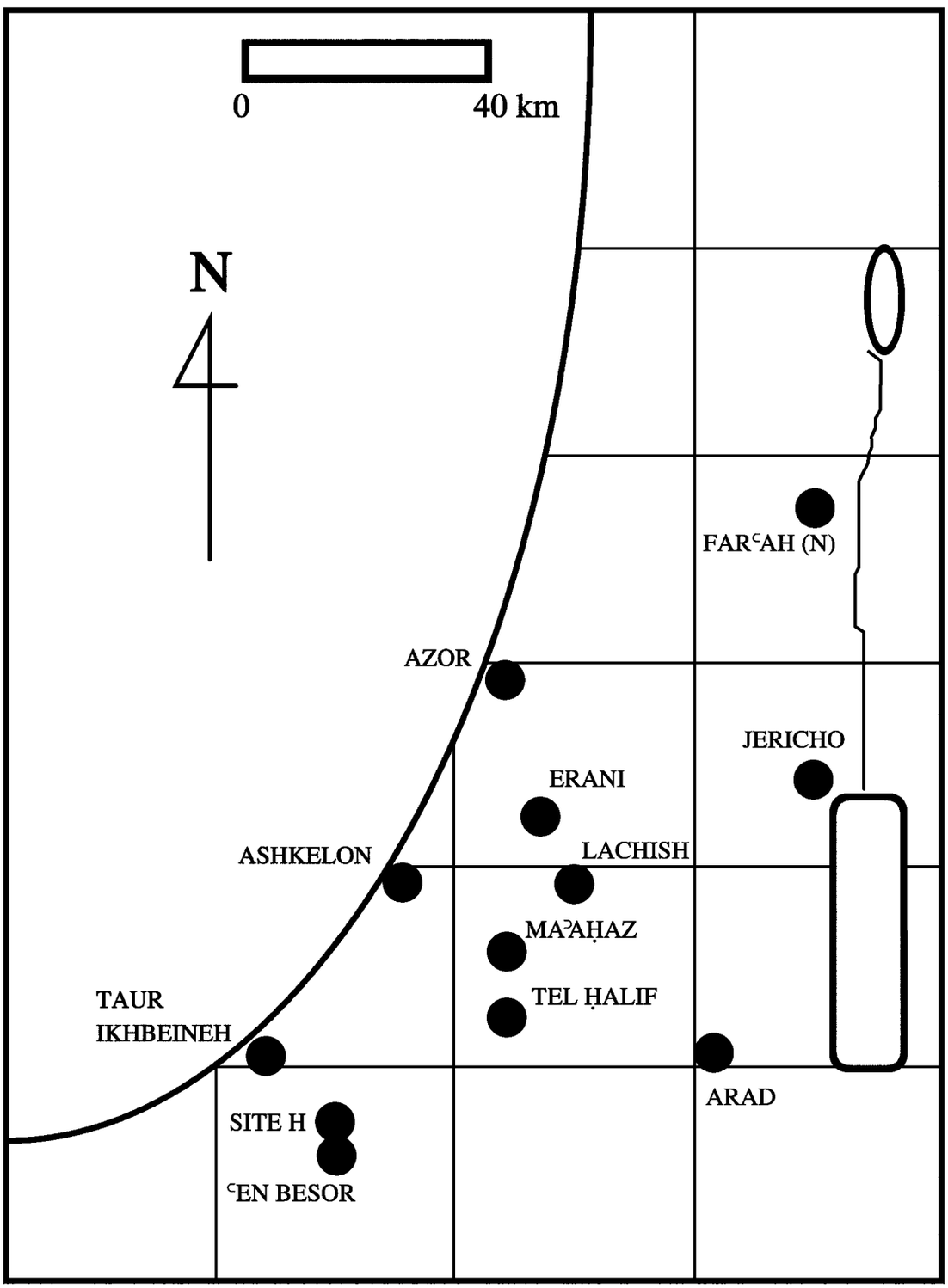

FIGURE 33.1. Map of EB I sites mentioned in the text.

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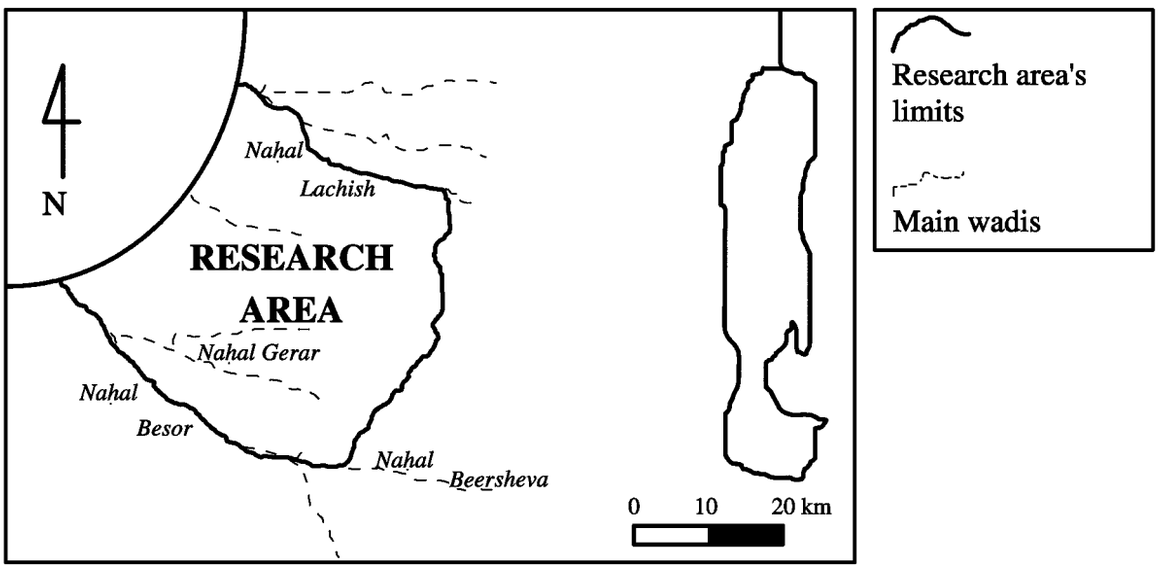

FIGURE 33.2. The research area of Southwestern Canaan.

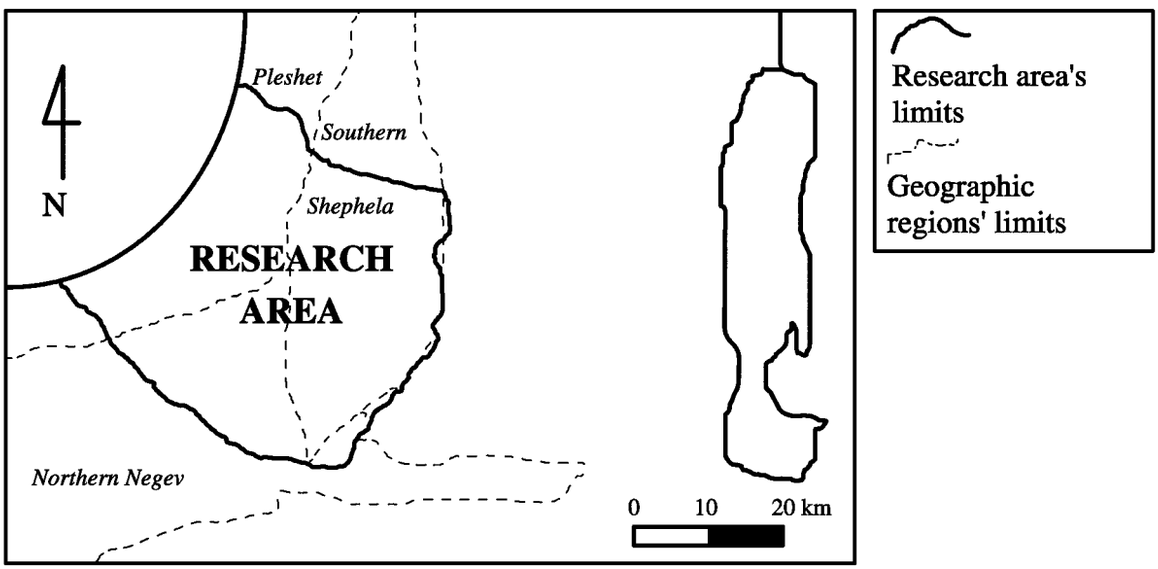

FIGURE 33.3. Geographical subregions within the research area of Southwestern Canaan.

the northern part of the research area is 400 mm per year, and in its southern part less than 200 mm. The fluctuations of the 200 mm isohyte, the so-called aridity line, passes within the research area's limits (Meigs 1953). An area with less than that average is usually defined as a desert zone (Stern 1988: 15). Recent interdisciplinary research concerning the ancient climate of Canaan, based on different methods and environmental aspects, has determined that in the fourth millennium B.C., which includes the latter half of the Chalcolithic period and the EB I, the climate of Canaan was moister than today (Copeland and Vita-Finzi 1978; Horowitz 1974: 407–11; 1979; Neev and Emery 1967; Govrin 1990: 108; Frumkin et al. 1991;

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Table 33.1. Terminology, Inner Division, and Absolute Chronology of EB I

DATE B.C.	2800	2900	3000	3100	3200	3300	3400	3500
Wright 1937	EB II		EB IB		EB IA	Late Chal.		
Wright 1958	EB II	EB IC	EB IB		EB IA	Ghassulian		
Albright 1960	EB II		EB I		Late Chal.			
Kenyon 1960	EB II		EB I		Proto Urban		Ghassul	
Hennessy 1967	EB II		EB I		Proto Urban			
Lapp 1968: 70	EB IC		EB IB		EB IA	Late Chal.		
de Vaux 1970	EB II		EB IB		EB IA	Ch. Superior		
Amiran 1970: 78	EB II		EB IB		EB IA	Late Chal.		
Callaway1972	EB II	IC	IB		IA	Late Chal.		
Gilead 1993	EB II	Late EB I		Middle EBI		Early EB I		
Amiran and Gophna 1992	EB II			Late EB IB	Middle EB IB	Early EB IB	EB IA	
	2800	2900	3000	3100	3200	3300	3400	3500
Egypt	Early Dynastic Period			Dyn. 0 \ Naq. 3		2D	2C 2B	2A

Goldberg and Rosen 1987; Goldberg 1983: 147). The evidence further shows that at the end of the fourth millennium B.C. (end of EB I), a decrease in rainfall occurred, which brought about climatic conditions close to those prevailing today (Govrin 1990: 108; Frumkin et al. 1991; Neev and Emery 1967; Baruch 1986).

THE SITES

In the research area eight EB IA sites are presently known: Nizzanim, Afridar (within the modern town of Ashkelon), Erani, Gat-Guvrin, the Northwestern settlement of Lachish, Tel Ḥalif Terrace, Taur-Ikhbeineh, and Site H (fig. 33.4). For the purposes of the research, the known sites were approached in the following way:

1. Sites that were excavated in the past were analyzed using the data published in the excavation reports: Lachish (Tufnell et al. 1958), Site H (Macdonald 1932; Gophna 1976, 1990a), and Tel Ḥalif Terrace 101 (Dessel 1991).[1] Where possible unpublished material was also studied.[2]
2. At sites known from surveys only, trial excavations were initiated: Nizzanim (Yekutieli and Gophna 1994) and Taur-Ikhbeineh (Oren and Yekutieli 1992).
3. The finds from sites excavated but not published were processed, researched, and prepared for publication. These include the "Silo" site at Tel Ḥalif Terrace (Alon and

1. The author wishes to thank J. P. Dessel and the Lahav Research Project for allowing use of drawings of finds from Tel Ḥalif Terrace Site 101.
2. The author wishes to thank Ram Gophna for making material from his excavations at Site H available for this study, and for allowing use of drawings of some finds from that site.

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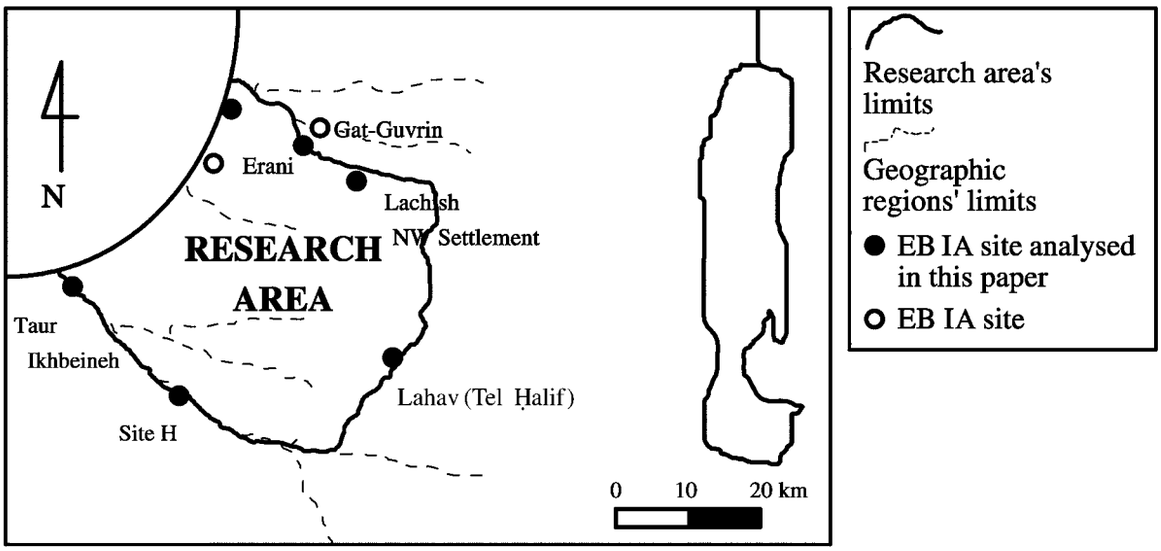

FIGURE 33.4. EB IA sites in the research area of Southwestern Canaan.

Yekutieli 1995), and the renewed excavations at Tel Erani[3] (Area DII: Kempinski and Gilead 1991).

4. The unpublished material from Gat-Guvrin (Perrot 1961) was not available for study, and the EB IA site of Afridar was only revealed and excavated just as this paper was being written. Therefore, these sites were not investigated in this study.

Most of the excavations treated here are of limited size. For the set task of defining a regional culture, data from large-scale excavations at major sites would have been preferable. However, even in the absence of such material, it was possible, from the available evidence, to identify such a chronological, regional entity and further distinguish within it two subphases—early and late EB IA (EB IA1 and EB IA2).

Features of the EB IA Settlements

A typical EB IA settlement in the research area is a small, sparsely populated, unfortified village. Within its confines, between the dwelling units, are many open courtyards, probably reserved for household activities. Proximity to water resources and arable land seem to have been the attractions for settlers; none of the settlements seem to have been located for strategic purposes. The size of a typical EB IA settlement in the research area is between 5 to 20 dunams. After consulting the relevant literature on ancient demography (Johnson 1973: 51–70; Broshi and Gophna 1984: 147–57; Rollefson and Kohler-Rollefson 1989; Marfoe 1980: 320; Gophna and Portugali 1988: 11–28; Hassan 1980), a coefficient of fifteen people per dunam was chosen for estimating the EB IA sites' populations. Accordingly the largest site's population is calculated to be of approximately 300 people. Within the settlements two main types of dwellings are encountered: caves and free-standing structures. The first type is confined to the hilly, rocky region in the east of the research area (Lachish, Tel Ḥalif Terrace). In

3. The author wishes to thank Aharon Kempinski and Isaac Gilead for the opportunity to study the pottery of their excavation at Erani.

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that region people learned to cope with and utilize their environment. Irregular-shaped dwelling caves are carved out of the layers of soft limestone, leaving the harder Nari layer above as a roof. Similar practices are known from the local Chalcolithic culture as well (Govrin 1987; Alon 1991) and therefore imply a continuity of traditions. Free-standing structures, built from either stone, mudbrick, or a combination of the two, appear all over the research area. Such structures were excavated at Site H, Tel Ḥalif Terrace, Nizzanim, Afridar, and some remains hint at the existence of free-standing structures at Lachish as well. Rectangular broadroom plans (Site H) link them to local (i.e., southern Canaanite) Chalcolithic traditions (Porath 1985: 14); rectilinear structures with rounded corners at Site H imply northern late EB IA influences (Braun 1985, 1989a); and curvilinear structures at Afridar (Braun and Gophna 1994) suggest connections with northern EB IA.

Features within the sites included many storage and refuse pits, silos, and unidentified installations. The recurrence of installations for grain storage is especially noteworthy. A pottery kiln was excavated at Lachish Northwestern settlement, at Cave 1525 (Tufnell et al. 1958: fig. 11).

Stratigraphy of the Sites

The majority of the sites mentioned above had more than a single EB IA stratum. A correlation, made through the use of similar attributes of the material culture between the several sites, has proven the existence of two phases of southwestern Canaanite EB IA—henceforth labeled EB IA1 (the earlier) and EB IA2 (the later). The two-tiered, chronological structure of EB IA was first attested at Nizzanim during the analysis of the pottery assemblage of that period. The pottery of Stratum V was noted to have different attributes from the pottery of Strata IV and III (Yekutieli and Gophna 1994). Macdonald's (1932) notes accompanying the published pottery of Site H, indicating the elevation in which it was found, enabled a reconstruction of the site finds' stratigraphical order with a reasonable degree of assurance. The organization of pottery vessels according to their elevations revealed, at Site H, the same attributes which differentiate between the early and late EB IA pottery at Nizzanim, in the same sequence (Yekutieli 1992). A final confirmation of these observations came from Tel Ḥalif Terrace Site 101. A rearrangement of the many pottery drawings in Dessel's (1991) thesis, according to their strata, produced yet again the same pattern (although with local variations), in the same sequence (Yekutieli 1992). Following the newly revealed pattern, it could be determined that EB IA1 remains are found at Nizzanim Stratum V, Tel Ḥalif Terrace Site 101 Stratum V, the Tel Ḥalif Terrace "Silo" site Stratum III, the lower levels of Site H, and in certain caves at the Northwestern settlement of Lachish. The EB IA2 material culture is found at Nizzanim Strata IV–III, Tel Ḥalif Terrace Site 101 Stratum IV (and perhaps Stratum III as well), at Site H in the upper levels and in the dwellings at Taur-Ikhbeineh Stratum IV, at Tel Erani (Kempinski and Gilead's excavation) Layer D, and certain caves of the Northwestern settlement of Lachish (table 33.3).

It is important to note that—excluding Gat-Guvrin and Afridar, from which data are unavailable yet—only at one site in the research area, Tel Ḥalif Terrace, were remains of the Chalcolithic period encountered ("Silo" site Stratum IV). There, an EB IA1 stratum is superimposed directly on the Chalcolithic stratum (Alon and Yekutieli 1995), thus ruling out the suggestion of a Chalcolithic–EB IA overlap (see table 33.2 for various opinions about the chalcolithic–EB I transition). Another conclusion from this observation is that all other sites were newly established in EB IA.

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Table 33.2. Chalcolithic–Early Bronze I: Nature and Degree of Continuity

Long time gap	*Sequential character*	*Overlap*
Elliott 1978	Wright 1937	Kenyon 1960
Gilead 1993	Albright 1954, 1957	Contenson 1961
	Lapp 1970	Hennessy 1967
	Amiran 1985	Miroschedji 1971
	Joffe 1993	Chapman 1990

Table 33.3. Synchronological Sequence of Strata at Some Fourth Millennium B.C. Sites

← EB II →	← EB IB →	← EB IA →	← Chalcolithic →
3000	3050 3300	3400 3450	3650 3900
Egyptian terminology	Dynasty 0 /Naqada 3 2d	Naqada 2c 2b	2a 1
Nizzanim[a]	III	IV	V
Tel Ḥalif 101[b]	II	III	IV V
Tel Ḥalif "Silo"[c]	I–II		III IV
Site H[d]		Late	Early
Lachish NW settlement[e]	1520	1509	1517, 1540
		1534	1528, 1550
Taur–Ikhbeineh[f]	II	III ^{14}C: 3370	IV V?
Erani DII[g]	C ^{14}C: 3331	D	
Erani[h]	V, VI–XI ^{14}C: 3307 (Str. XI)	XII	
Maadi[i]	← Settlement →		
	Dynasty 0 /Naqada 3	Naqada	
	0 / 3 2d	2c 2b	2a 1
3000	3050 3300	3400 3450	3650 3900

a. Yekutieli and Gophna 1994
b. Dessel 1991
c. Alon and Yekutieli n.d.
d. Macdonald 1932
e. Tufnell et al. 1958
f. Oren and Yekutieli 1992
g. Kempinski and Gilead 1991
h. Yeivin 1961
i. Rizkana and Seeher 1988, 1989

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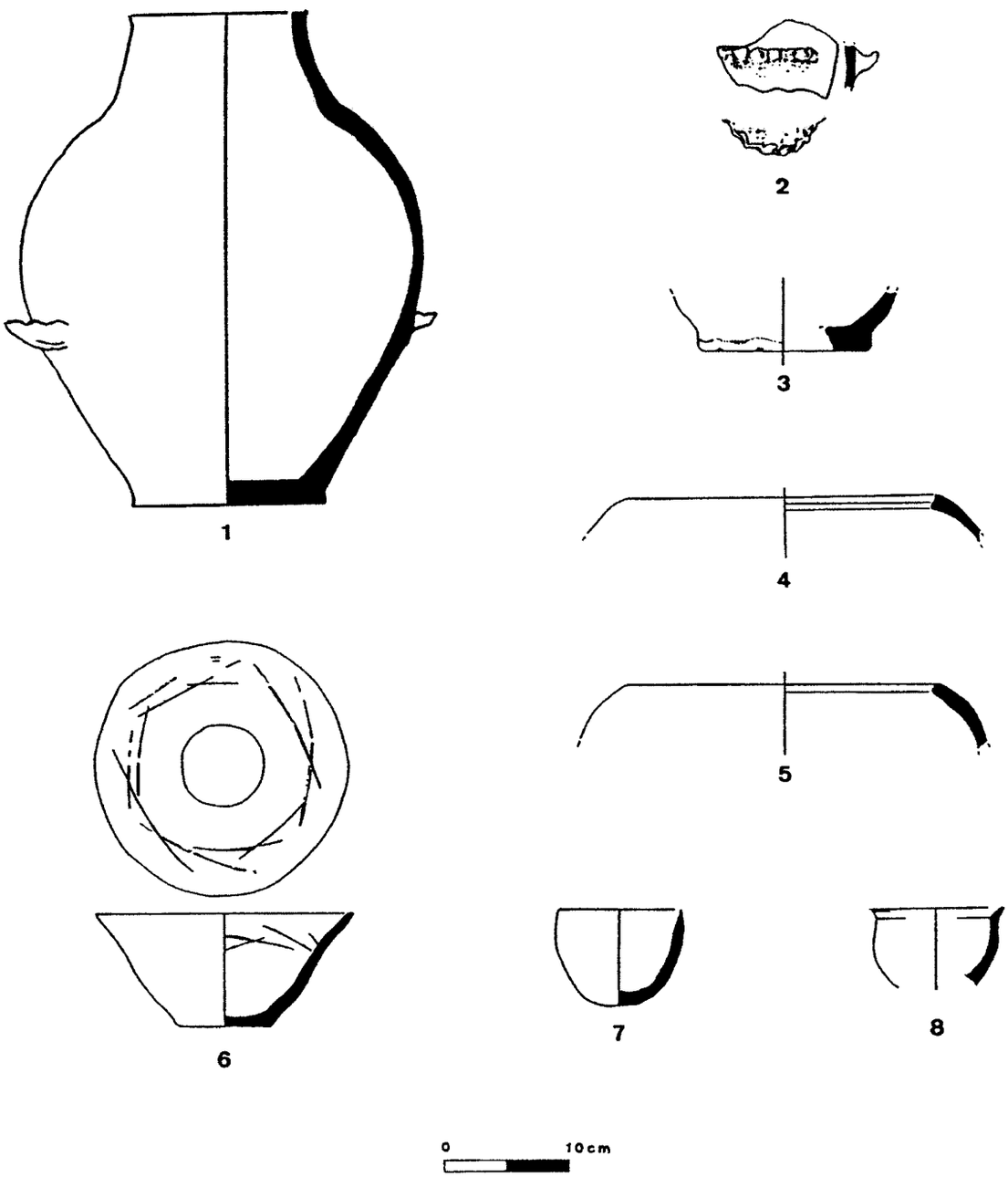

FIGURE 33.5. Pottery forms of EB IAl.

Type	*Site*	*Stratum/Locus*	*Reference*
1. Storage jar	Lachish NW settlement	Cave 1503	Tufnell et al. 1958: pl. 56:26
2. Storage jar	Lachish NW settlement	Cave 1517	Tufnell et al. 1958: fig. 7:5
3. Storage jar	Tel Ḥalif "Silo" site	Stratum III	Yekutieli 1992: pl. 22:5
4. Holemouth jar	Tel Ḥalif "Silo" site	Stratum III	Yekutieli 1992: pl. 22:10
5. Holemouth jar	Tel Ḥalif "Silo" site	Stratum III	Yekutieli 1992: pl. 22:11
6. Bowl	Nizzanim	Stratum V	Yekutieli 1992: pl. 36:10
7. Bowl	Tel Ḥalif Site 101	Stratum V	Dessel 1991: pl. 40:9
8. Bowl	Tel Ḥalif Site 101	Stratum V	Dessel 1991: pl. 41:11

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SMALL FINDS

The small finds at the sites include vessels and tools made of pottery, flint, and a variety of stones, copper, and organic materials. Four aspects of these finds are important to discuss: form, material and its provenance, technology and manufacture tradition, and function.

POTTERY (For a detailed study of this pottery see Yekutieli 2000.)

Form

The repertoire of ceramic forms of both EB IA phases distinguished in the research area is presented in figures 33.5 and 33.6. Forms of EB IA1 (fig. 33.5) show a great resemblance to local Chalcolithic forms. These include V-shaped bowls, sometimes with a delicate carination on the rim's edge, thin-rimmed holemouth jars, and high-necked storage jars, sometimes with an indented rim. Chalcolithic forms missing from the EB IA1 assemblage include churns and perhaps cornets as well. The new introductions that appear in the EB IA1 are ledge handles and small, crude, globular bowls. It is worth noting that the ledge handles appear usually on storage jars, below their widest part, and have many indentations. The EB IA2 forms (fig. 33.6) are different. Innovations include small loop-handled storage jars, vessels with folded and thumb-indented rims, and globular or drop-shaped juglets.

Material and Its Provenance

Petrographic studies concerning the ultimate origin of pottery from the research area were conducted by Yuval Goren and Naomi Porat, who describe in detail their results and conclusions (Goren 1987, 1991a; Porat 1989). They indicate that both local (southwestern Canaanite) and imported wares were recognized. The imports originated in the Judaean mountains area and Egypt. Porat (1992: 433–35) has shown and stressed the fact that within southwestern Canaanite EB I (in general), one encounters pottery vessels made of local clays shaped in Egyptian forms or made with Egyptian techniques (= Manufacture Traditions, see below); they are the so-called Egyptianized vessels (term coined by Brandl 1989). Within the time span dealt with in this article, her observation is relevant mainly in regard to the EB IA2 pottery. EB IA1 pottery seems much more unaffected by any Egyptian influence. Among the ware types found in the research area and worthy of note is the straw tempered ware. Its use is confined mainly to the EB IA1 globular bowls. It was so common in the EB IA1 strata of Tel Ḥalif Terrace, Lachish Northwestern settlement, and Site H, that it is useful as a *fossil directeur* of that period.

Technology and Manufacture Traditions

Five well-defined pottery traditions, manifested in manufacturing techniques and surface treatment, were noted in southwestern Canaan during the EB IA period:

1. Chalcolithic tradition: Distinguished by the appearance of Chalcolithic ceramic manufacturing techniques such as indented rims, wheel-made V-shaped bowls, and "streaky wash" (Hennessy 1969), a burnish of widely spaced horizontal lines made when the clay was still soft (Goren 1987: 13). It is important to note that some Chalcolithic traditions ceased, such as painting on vessels' surfaces.

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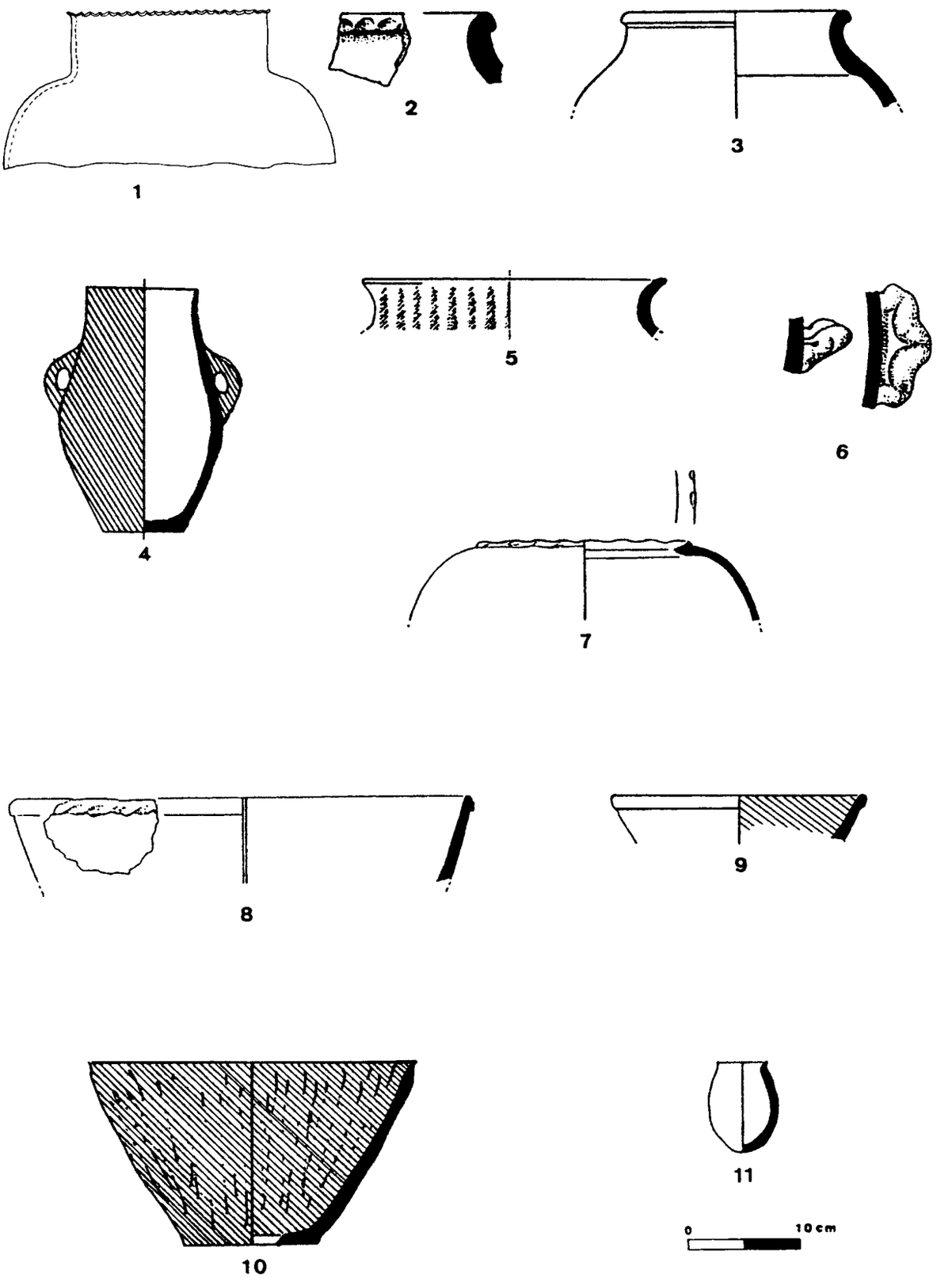

FIGURE 33.6. Pottery forms of EB IA2.

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2. Red on White painting tradition: Irregular red patterns or red vertical stripes painted on top of a white wash.
3. Folded and thumb-indented rims tradition.
4. Red slipped or red slipped and burnished tradition.
5. Egyptian tradition: Distinguished by use of silty sediments with a small amount of temper, organic tempers, and firing temperatures of over 800 degrees C (Porat 1989: table 9.7b), and sometimes by a treatment that leaves straw impressions on the vessel's surface, as in contemporary Egyptian wares.

Tradition number 1 was attested mainly in EB IA1 contexts, while numbers 3–5 were encountered in EB IA2 associations. Tradition number 2 began in EB IA1 as irregular red patterns on top of a white wash, but in EB IA2 the irregular patterns were replaced by red vertical stripes on top of the same white wash. Pottery traditions 1–3 are local southwestern Canaanite. Numbers 1 and perhaps even 3 have a Chalcolithic origin, while tradition 2 is an EB IA innovation. An Egyptian influence, often regarded as a major factor in southern Canaanite EB I pottery (Porat 1989; Brandl 1992), is discerned in pottery traditions 4 and 5. A few spatial distinctions exist as well; tradition 2 is more common in the hilly parts of the research area, while tradition 3 occurs more in the plains and on the coast. Pottery traditions 4 and 5 intensify as one moves southwest within the research area (toward Egypt).

Function

At the functional level, different sizes were noted for storage vessels as well as cooking and serving vessels. Of special note are two kinds of storage jars, ledge handled and loop handled, which were used as transport vessels along the trade route to Egypt, as finds from southwestern Canaan, north Sinai, and Lower Egypt (see below) attest.

STONE INDUSTRY

The chipped stone industry (fig. 33.7) shows mainly local, and a few Egyptian-inspired, traditions. Some of the local traditions indicate continuity with the Chalcolithic period. This influence is found in the inclusion of fan scrapers, backed sickle blades, as well as a relatively high percentage of retouched bladelts (Gilead and Marder in Oren and Yekutieli 1992; Gilead 1984; Roshwalb 1981: 278; S. A. Rosen 1989: 214).

FIGURE 33.6.

Type	*Site*	*Stratum/Level*	*Reference*
1. Storage jar	Site H	Upper level	Macdonald 1932: pl. 40:67
2. Storage jar	Taur-Ikhbeineh	Stratum IV	Oren and Yekutieli 1992: fig. 10:13
3. Storage jar	Taur-Ikhbeineh	Stratum IV	Oren and Yekutieli 1992: fig. 11:6
4. Storage jar	Site H	Dwelling 1	Roshwalb 1981: fig. H7:1
5. Storage jar	Tel Ḥalif Site 101	Stratum IV	Dessel 1991: pl. 24:8
6. Storage jar	Taur-Ikhbeineh	Survey	Unpublished
7. Holemouth jar	Nizzanim	Stratum IV	Yekutieli and Gophna 1994: fig. 11:14
8. Bowl	Nizzanim	Stratum IV	Yekutieli and Gophna 1994: fig. 11:17
9. Bowl	Taur-Ikhbeineh	—	Oren and Yekutieli 1992: fig. 9:4
10. Bowl	Lachish NW settlement	Cave 1503	Tufnell 1958: pl. 56:28
11. Juglet	Site H	Dwelling 1	Roshwalb 1981: fig. H6:14

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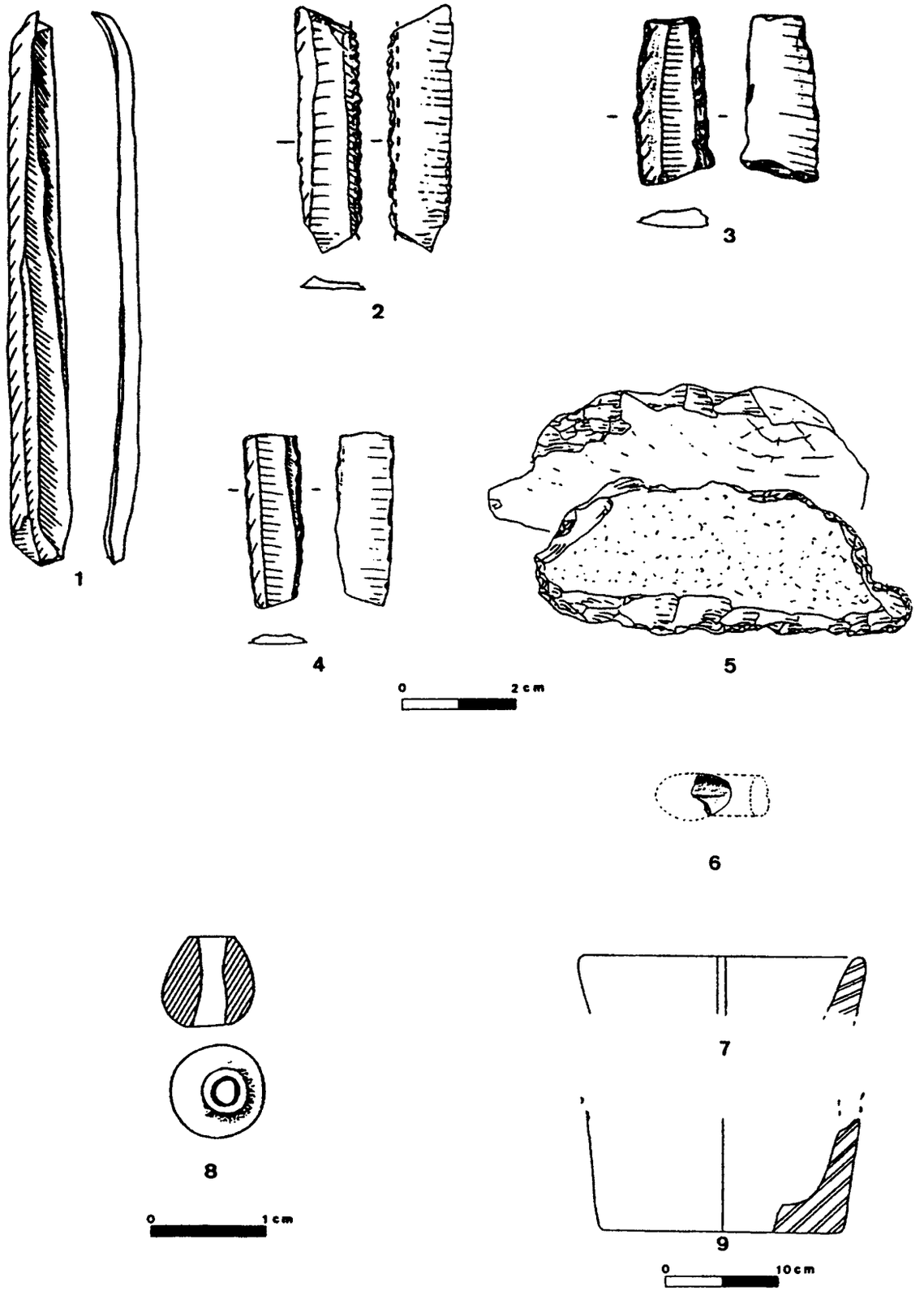

FIGURE 33.7. Chipped stone industry, stone mace-head, and basalt bowls.

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Other EB IA developments are the "Canaanean" blade (S. A. Rosen 1989) and a regional version of a "toothed" sickle blade (Friedmann and Gophna 1990). The Egyptian-inspired tradition is manifested in tools such as twisted bladelets (Roshwalb 1981: 278).

The raw material for the manufacture of simple, ad hoc tools was usually collected in the immediate vicinity of each site (Gilead and Marder in Oren and Yekutieli 1992; Kempinski and Gilead 1991), while more "elaborate" tools, such as fan scrapers and Canaanean sickle blades, were probably imported to the sites from certain manufacturing centers (S. A. Rosen 1983, 1989).[4]

The ground stone tools and vessels repertoire (fig. 33.8) includes examples fashioned of basalt (e.g., Braun 1990) and limestone. Bowls, mortars, and grinding stones were made from this array of stone types and were encountered at all the sites within the research area. Pear-shaped mace-heads of limestone were recovered at Nizzanim (Yekutieli and Gophna 1994) and at Lachish (Tufnell et al. 1958: 71). Grooved stones, probably used as arrow straighteners, were encountered at Lachish (Tufnell et al. 1958 pl. 21:4) and at Site H (Macdonald 1932: pl. XXVI: 52); and basalt or phosphorite spindle whorls were associated with Nizzanim (Yekutieli and Gophna 1994), Lachish (Tufnell et al. 1958: 71), Erani, Tel Ḥalif Terrace, and Site H.

It is important to note that basalt bowls and spindle whorls, similar to those from the research area which proved to be Canaanite in origin (Porat and Seeher 1988; Rizkana and Seeher 1988: 53, 57), were found at Maadi. The phosphorite spindle whorl (from Nizzanim) is worth noting, too, since our only knowledge of spindle whorls in stone resembling basalt is confined to Chalcolithic contexts (Goren 1989, 1991b). This new information gives the implication of a continuing tradition. The shapes of basalt bowls (fig. 33.7:7, 9), the mace-head (fig. 33.7:8), and spindle whorls indicate a continuation of Chalcolithic forms as well. Most of the stone tools and vessels (chipped and ground stone) were used for domestic activities. Only a minority of them, such as the pear-shaped mace-heads and the fan scrapers, is considered by some scholars to have had ceremonial or cult functions (Beebe 1989: 294; McConaughy 1979: 304; S. A. Rosen 1989: 202). Simple tools, such as grinding stones, mortars, and ad hoc flint tools, were produced in a way indicating a domestic, nonspecialized mode of production.

4. Circumstantial evidence reaffirming this theory includes a cache of eight Canaanean blades found in Nizzanim—probably still in their original packing, as imported to the site (Yekutieli and Gophna 1994).

FIGURE 33.7.

Type	*Site*	*Stratum/Locus*	*Reference*
1. Blade	Nizzanim	Stratum III	Yekutieli 1992: pl. 10:1
2. Sickle blade	Nizzanim	Stratum III	Yekutieli 1992: pl. 10:2
3. Backed sickle blade	Nizzanim	Stratum III	Yekutieli 1992: pl. 10:3 fig. 11:6
4. Sickle blade	Nizzanim	Stratum III	Yekutieli and Gophna 1994: fig. 14:5
5. Tabular fan scraper	Nizzanim	Stratum V	Yekutieli 1992: pl. 10:4
6. Arrow straightener	Lachish NW settlement	Area 1500	Tufnell et al. 1958: pl. 21:4
7. Basalt bowl	Nizzanim	Stratum IV	Yekutieli 1992: pl. 10:8
8. Mace-head	Nizzanim	Survey	Yekutieli 1992: pl. 10:5
9. Basalt bowl	Nizzanim	Survey	Yekutieli 1992: pl. 10:9

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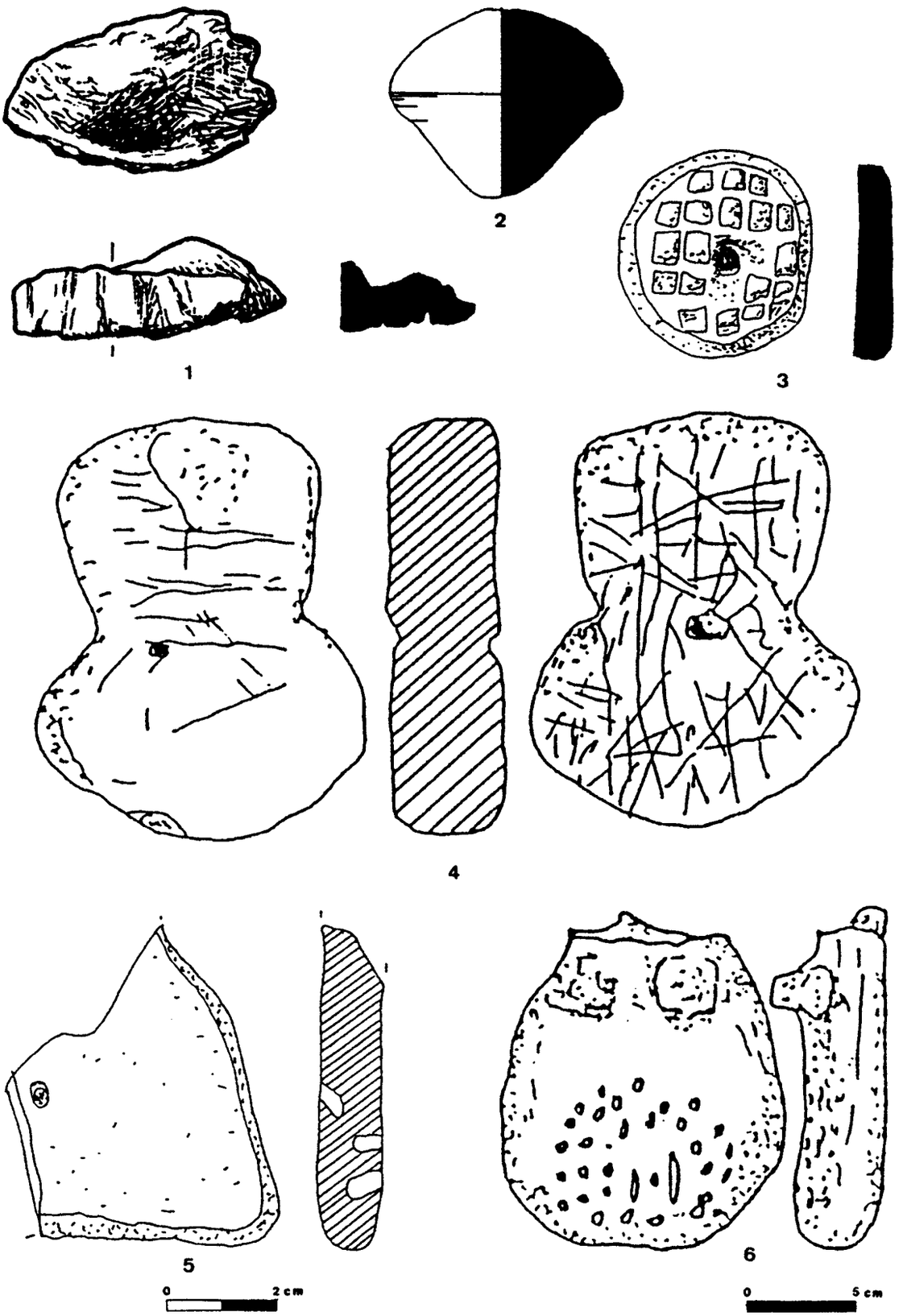

FIGURE 33.8. Mud stoppers, clay stamps, stone figurines, and clay figurine.

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However, the quality of the raw materials and the manufacturing skills attested in the more "elaborate" tool types (e.g., fan scrapers, Canaanean blades, basalt bowls, spindle whorls, and mace heads) indicate the existence of specialized manufacturers and even manufacturing centers (S. A. Rosen 1989: 217; Braun 1990: 95). The wide distribution of those items, within the research area and beyond, indicates the existence of an efficient distribution system. It also emphasizes the value attributed to these Canaanite products "abroad" as far as Lower Egypt.

COPPER INDUSTRY

The common copper tool in the research area was the square-sectioned awl found at Nizzanim (Yekutieli and Gophna 1994) and at Site H (Macdonald 1932: pls. 24:47, 26:56, 28:2–3). Parallels are known at Maadi (together with specimens with rounded sections; Rizkana and Seeher 1989: 14, pl. 3). A fishing hook was recovered at Site H (Macdonald 1932: 13, pl. 28:8) and is paralleled at Maadi (Rizkana and Seeher 1989: 14, pl. 3:1–5). Until some years ago, some scholars estimated that fourth millennium southern Canaanite copper originated somewhere in the north (i.e., Armenia; Key 1980: 243). In recent years copper mines of this period were located much closer in the cliffs of the Arava segment of the Great Rift Valley. These mines are presently considered to be the main sources of copper in both the Chalcolithic and EB I periods (Rothenberg 1978; 1985: 124; Raikes 1980: 55; Hauptman, Weisberger, and Knauf 1985; Shalev and Northover 1987: 362, 366; Goren 1989; Ilan and Sebanne 1989), together with a less possible source in the southern Sinai (Beit Arieh 1977, 1980, 1983; Ilan and Sebanne 1989). It should be noted that an analysis of the copper artifacts, and copper ore lumps from Maadi, indicates that there is a great probability that they, too, originated in the Arava (Rizkana and Seeher 1989: 17, 78). Ilan and Sebbane (1989) noted that contrary to the rule in the Chalcolithic period, in the EB I the manufacture of copper tools moved out of the settlements into the mining areas. A comparison between the Chalcolithic and the EB IA copper objects also reveals a change in forms and in manufacturing techniques (Ilan and Sebbane 1989), as well as a complete cessation of artistic endeavors in the EB I copper industry. All the known EB IA copper objects belong to the domestic tool kit. Thus a shifting balance in the "category" of copper tools is discernible—from items that primarily express power and ideology (in the Chalcolithic period) to those of necessity and daily use (in the EB IA). Since copper tools were probably imported into the research area, such a shift in consumption patterns is not just an internal southwestern Canaanite affair but has to do with a change on a larger scale than that of the research area.

ADDITIONAL FINDS

Some few remains of ornaments (especially beads) and domestic industries associated with organic materials (i.e., weaving and basketry) indicate certain additional skills practiced

FIGURE 33.8.

Type	*Site*	*Stratum*	*Reference*
1. Mud stopper	Taur-Ikhbeineh	Stratum V	Yekutieli 1992: pl. 12:6
2. Mud stopper	Site H	—	Yekutieli 1992: pl. 12:5
3. Clay stamp	Tel Ḥalif Terrace "Shaar-hakibbutz"	—	Yekutieli 1992: pl. 12:4
4. Stone figurine	Tel Ḥalif Terrace Site 101	Stratum IV	Seger 1989: fig. 58:3; Dessel 1991: fig. 13:4
5. Stone figurine ?	Nizzanim	Stratum III	Yekutieli 1992: pl. 13:3
6. Clay figurine	Site H	—	Gophna 1990a: fig 3:7

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during the EB IA period. The evidence for the latter group is, however, mostly secondary, (e.g., mat and cloth impressions on clay objects) and does not allow for any elaborating research, although they must have been major industries which are, unfortunately, archaeologically invisible (cf. Stager 1990).

In summarizing the small finds category, a clear distinction can be made between two levels of the EB IA industries—that of the household level and that of the specialist. Simple industries not requiring special skills include the production of ad hoc flint tools, some grinding stones, and a few types of pottery vessels. Perhaps basketry and simple weaving belong to the first level, too. These kinds of industries were probably practiced at the sites within the research area. The copper industry, special chipped and ground stone industries, and certain types of pottery, on the other hand, belong to a specialized industry level. Presumably specialized industries were located at a few, as yet unknown manufacturing centers (Braun 1990: 95; S. A. Rosen 1989: 217; Ilan and Sebbane 1989) probably near the sources of raw materials and thus out of the research area. Southwestern Canaan was one of a few markets consuming these industries' products and probably was not the main market.

CULT AND RELIGION

No cult places have been identified in the research area, although a few cult objects have been found. Two kinds of figurines, closely related to local prototypes, are dated to the EB IA (fig. 33.8:4–6). One found at Tel Ḥalif Terrace, fashioned from stone, is best defined as a highly schematic evolution of a Chalcolithic violin figurine (Seger 1988: fig. 58:3; Dessel 1991: fig. 13).

A piece, probably of another figurine of the same kind, was found at Nizzanim (Yekutieli and Gophna 1994). The second kind, of which an example was found at Site H (Gophna 1989: 40), is made of pottery and is slightly more naturalistic, with breasts indicated and punctations on the pubic region emphasizing its feminine gender.[5] Cemeteries of the EB IA period have not yet been found within the research area. The only burials excavated were intrasite, child inhumations, either directly in pits in the ground or within whole or portions of pottery vessels, below living floors (Nizzanim: Yekutieli and Gophna 1994; Afridar: Braun and Gophna 1994). This practice is also known in the north in the EB I at Tel Teo (Eisenberg 1989: 38, fig. 8), Kabri (Kempinski and Niemeier 1991: 76), and Beit Yeraḥ (Maisler, Stekelis, and Avi-Yonah 1952: 229). Intrasite child inhumations are known in the research area also in periods earlier than the EB IA at Neolithic Qatif (Epstein 1984: 210) and at the Chalcolithic sites of Shiqmim, Gilat (D. Alon pers. comm.), Neve Noy (Eldar and Baumgarten 1985: 138), Bir Safadi (Perrot 1959: 141–2), Grar (Gilead 1989: 383), and Tell Abu-Matar (Perrot 1955: 13–174). Such practices are not confined to Canaan; they are well documented throughout the Levant in the fifth and fourth millennia B.C. on the Syro-Lebanese coast[6] at Sidon-Dakerman (Saidah 1979: 42, figs. 14–15), Byblos (Dunand 1973: 246–65), and Ras Shamra (Courtois

5. See Gophna's (1989: 43 n. 26) suggestion for an alternate date for a similar looking figurine from Tel Ḥalif Terrace (Dessel 1988: 13).

6. Braun (1989a; 1989b; 1991) has indicated some sort of connection between this culture and the northern Canaanite early EBI.

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1962), and farther north in Mesopotamia and Anatolia, and south in Egypt (Hole 1989; Rizkana and Seeher 1989: 67, 8). Thus, it is an old and well-rooted tradition in the Levant, manifested in the research area as well.

AGRICULTURE ANIMAL HUSBANDRY

At Nizzanim (analyzed by J. Klenck) and the Tel Ḥalif Terrace "Silo" site (analyzed by L. Kolska Horwitz and R. Rabinovitch Goren), the following animal species (listed in descending quantitative order) were found: sheep and goat, cattle, pig, and equid. In Nizzanim's assemblage the presence of large quantities of fish bones indicates this coastal site's likely dependence on marine resources (Yekutieli and Gophna 1994). At Tel Ḥalif Terrace deer was additionally identified. Donkey remains were recorded at Site H (Gophna 1976), and fish bones were found at Erani in Stratum D (A. M. Rosen 1991: 199). Recent research indicates that in the EB I, sheep and goats were milked much more intensively than in the Chalcolithic period (Smith and Horwitz 1984; Horwitz and Tchernov 1989: 286). A number of representations of donkeys in the EB I (Macalister 1912: I: 9; III: pl. 75:18; Kaplan 1993: 521; Eitan 1969: 51; Arnon 1984: 100; Gophna 1974: pl. 13:19), together with remains of these animals, both at Canaanite (Nizzanim, Tel Ḥalif Terrace, Site H) and Egyptian sites (Maadi: Rizkana and Seeher 1989) suggest their use as pack animals both in Canaan and along trade routes to Egypt. It is highly plausible that cattle were used as plow animals already in the EB I (Amiran 1992). According to this evidence it is safe to assume that the "secondary products revolution" (Sherratt 1981, 1983) was completed in southwestern Canaan by the EB IA. Products derived from nondomesticated animals were also found to be a part of the material culture at the EB IA sites, although these are probably trade items not necessarily gathered by the southwestern Canaanites themselves. Shells from the Mediterranean were found at all sites under study, as were shells from the Red Sea at Lachish (Baden-Powell 1958). Shells and specialized bones from the Nile were found at Site H (*Aspatharia* Nile shells and spikes of Nile catfish; Macdonald 1932: 14, pls. 23:33, 34; 26: 61). Also recovered were ostrich eggs, which were used as storage vessels. Some of these eggs both from the research area and Egypt, had incised decorations (Taur-Ikhbeineh: Oren and Yekutieli 1992; Site H: Macdonald 1932: pls. 25:60, 28:13; Maadi: Rizkana and Seeher 1989: 19–20, pl. 5:1, 2, 4).

Field Agriculture

"Mediterranean agriculture" (Ben-Tor 1990: 5) was already practiced in southwest Canaan in the EB IA. Its main markers—olives and grapes—were a part of the diet of the EB IA peoples of Nizzanim (Liphschitz 1989), while remains of different grains and cereals were found at other sites in the research area (Hubbard 1981; A. M. Rosen 1991: 202; Oren and Yekutieli 1992). Some scholars noted a change in agricultural patterns, from pastoral to field oriented, between the Chalcolithic and the EB I periods (Gophna 1974; Hanbury-Tenison 1986: 88). In trying to explain this change, they suggested technological progress in the EB I involving the introduction of a better plow and new irrigation methods (Miroschedji 1971: 128), a change in social values (Hanbury-Tenison 1986: 88), or a mere preference for field agriculture in the EB I (Gophna 1974). An interpretation of such a change should take into consideration too the

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abandonment of the Chalcolithic settlements of the northern Negev steppes[7] and the demographic shift that followed this event in the EB I, toward the Mediterranean zone of Canaan (Finkelstein and Gophna 1993: 9). Since agricultural patterns depend on an environment's characteristics, it is but logical to expect a preference of a pastoral mode in the semiarid Negev steppes and of field agriculture in the Mediterranean zone. Thus the change might have happened due to spatial reasons as well.

TRADE

From the EB IA onward, stable, permanent, and planned trade activities are discernible in southwestern Canaan. The intensification of trade, through the different subphases of the EB I, seems to be the major stimulator of socioeconomic development of southern Canaan during that period. The main trade routes crossed or criss-crossed the Levant connecting sources of raw materials to the major centers of the day—Mesopotamia and Egypt—and perhaps even connected the two through some intermediaries (Kantor 1965; Prag 1986; Moorey 1990; Von der Way 1987; Algaze 1989). Southwestern Canaan is located at the junction of three trade routes, leading southwest to Egypt, east to the Arava copper mines and the Dead Sea bitumen sources (Nissenbaum, Serban, and Amiran 1984), and north to northern Canaan/Syria. Southwestern Canaan in this scenario is more a corridor than a destination in itself. Remains of traded goods, some originating from the Dead Sea-Arava area, and of their storage and packing facilities have been found at sites in the research area and along the trade routes all the way to Egypt. Dead Sea (most probably) bitumen is associated with Nizzanim (Yekutieli and Gophna 1994), Tel Ḥalif Terrace, Lachish (Tufnell et al. 1958: 71), Afridar Area G (Braun and Gophna pers. comm.), Site H (Gophna 1976), and Maadi (Rizkana and Seeher 1989: 71, 72). Arava (most probably) copper ores, either for copper manufacture or to be used (when ground) as cosmetics, were found at north Sinai EB I sites (Oren 1973: 205, although which phase of EB I is not indicated), and at Maadi in Egypt (Rizkana and Seeher 1989: 17, 78). A phosphorite spindle whorl, probably originating around the Jordan Valley (Goren 1989), was found in Nizzanim (Yekutieli and Gophna 1994). In addition to raw materials, complete vessels and tools were traded as well. Canaanite copper, flint, wood, and basalt vessels and tools were recorded at Maadi (Rizkana and Seeher 1988; 1989: 14, 24, 25, pl. 3; Porat and Seeher 1988). Other, archaeologically invisible goods considered to have been transported from Canaan into Egypt include olive oil (Lev-Yadun and Gophna 1992) and wine (Ward 1991; Lev-Yadun and Gophna 1992). Archaeological evidence for Egyptian items that were probably exchanged for those goods include Nile catfish *(Synodontis schall)* spikes, *Aspatharia* shells (apparently prized for their mother of pearl interiors), as well as a few alabaster mace-heads that were found in an EB IA tomb at Bâb edh-Dhrâʿ (Beebe 1989: 293) and probably reached that destination via southwestern Canaan. The traded items listed above suggest a flow of many "necessity" items (flint, basalt, wood, and copper tools, bitumen, copper ores, oil, and wine) from Canaan to Egypt, contra some, seemingly more "luxurious" items (mace-heads, shells, and spikes) flowing in the opposite direction. This observation might be wrong since there is a whole range of necessity items invisible in the

7. Any discussion of reasons for this abandonment are beyond the scope of this paper.

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archaeological record which might have been traded too, in either direction. These include grains, textiles, leather products, dried fish, and dates. Contemporary records of trade transactions in Mesopotamia testify that the main volumes traded from Mesopotamia toward its periphery were primarily these products, all of which are almost untraceable today (Algaze 1989: 573; Edens 1992: 127). It is highly plausible that such items also moved on the EB IA trade routes in whatever direction, thus making the present picture only fragmentary.

The transport vessels are an important testimony to trade as well. Canaanite EB IA pottery vessels have been found in Lower Egypt (Maadi: Rizkana and Seeher 1989; Heliopolis: Debono and Mortensen 1988), and Egyptian vessels have been found in the research area (Taur-Ikhbeineh: Oren and Yekutieli 1992; Site H: Gophna 1992).

Of special note are stamps, and stamped unbaked clay lids and bullae, which were used to close and seal ceramic vessels and other containers. A net-patterned seal (fig. 33.8:3) and several stamped bullae were found at Tel Ḥalif Terrace (Alon and Yekutieli 1995; Seger 1989; Dessel 1991: 80). Similar parallels in Jordan, and in the Jordan Valley (Helms 1987: 59–60; Glueck 1951: pl. 84:10; Mabry 1989: fig. 15, 14:5), hint at their connection with that region. Other, locally manufactured mud bullae and stoppers (fig. 33.8:1–2) were found at Erani (Kempinski and Gilead 1991: 187, figs. 14–16), Site H (Yekutieli 1992: fig. 12), and Taur-Ikhbeineh (Oren and Yekutieli 1992). Stamped items as such suggest a beginning of formal control on storage and exchange transactions (Tosi 1984: 45) during the EB IA.

Internal Canaanite trade should not be dismissed—it was responsible for the dissemination of such items as fish (A. M. Rosen 1991: 199), flint tools (S. A. Rosen 1989: 203), pottery vessels (from the Judaean mountains into the research area),[8] copper tools (Ilan and Sebbane 1989), and basalt bowls (Braun 1990: 95).

The intense trade suggests the development of a social group of specialized traders, who might have been "freelance middlemen" (Harrison 1993), independent entrepreneurs (Stager 1992), agents of local rulers, temples, and the like. Whatever their definition, the important point is that the intensification of trade increased social complexity in southwestern Canaan during the EB IA period.

CHRONOLOGY

Beginning of EB IA

On the basis of radiocarbon determinations Levy (1992) has estimated that the collapse of the Beersheva Valley Chalcolithic system occurred around 3700 B.C. radiocarbon dates from the Chalcolithic Naḥal Mishmar Cave cover a range of 4243–3389 B.C. (five samples; Gilead 1993: table 1; Levy 1992: fig. 4), thus perhaps indicating even a somewhat later date for the end of the Chalcolithic period. Having established that the EB IA follows the Chalcolithic period and does not overlap with it (see above), it may be safely stated that a date around 3600 B.C. for its inception is indicated. As has been shown above (description of pottery, copper, basalt, flint, shells, fish spikes, raw materials analysis, etc.), there are many similarities

8. In this way northern vessels such as the "Gray burnished ware" bowls might have reached southern sites such as Ala'yik (Pritchard 1958[Pritchard 1958 not in Refs]) and Palmachim (Gophna 1974).

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between the material culture of southwestern Canaan during the EB IA and that of Maadi, indicating at least a certain period of contemporaneity. Maadi is considered by many scholars to have been deserted by Naqada 2c at the latest (Rizkana and Seeher 1989: 81; Von Ulrich 1994), that is, 3400 B.C. (Von der Way 1993: fig. 21). Radiocarbon dates from Maadi range slightly earlier, from 3985 to 3515 B.C. (seven samples; Rizkana and Seeher 1989: 82). Since Maadi and the southwestern Canaanite EB IA sites were contemporaneous, at least in part, it can be safely suggested that the EB IA had begun around 3600 B.C.

End of EB IA

A radiocarbon sample from Taur-Ikhbeineh Strata III–IV, which represents the end of the EB IA2, indicates a date of 3370 B.C. (Oren and Yekutieli 1992). Another, from Stratum C at Tel Erani, which fits according to its material culture remains to the very beginning of the EB IB, and covers an EB IA2 layer (Stratum D), is dated to 3331 B.C. (Kempinski and Gilead 1991: 171). A third radiocarbon date of 3307 B.C. (Gilead 1993) is derived from Stratum XI of Yeivin's excavations at Erani. This level has a pottery assemblage, as far as can be identified from Yeivin's (1961) plates, similar to that of Stratum C of the Kempinski and Gilead's (1991) excavation—Early EB IB. Therefore the end of the EB IA period can be determined at circa 3350 B.C.

A REVISION OF THE CHALCOLITHIC–EB IA TRANSITION IN SOUTHWESTERN CANAAN

Settlement patterns in southwestern Canaan during the fourth millennium B.C. show extreme contrast between the Chalcolithic period and the EB IA. More than 120 Chalcolithic sites, of different sizes, were scattered in the northern Negev plains (Gazit 1986: 61), in contrast to only one site (Site H) that existed during EB IA in the same area. Besides the drastic change in quantity, magnitude, and location of sites, other changes were noted as well, such as the lack of any artistic endeavors, and presentations of power and ideology, in EB IA, compared with the Chalcolithic period; thus a major collapse is attested. A phenomenon as such, of a flourishing society reaching a peak never achieved before in its region, and then collapsing in a way that combines a desertion of sites, a decline in wealth, technology, art, and power is not unique. It has been noted in the archaeological records of many places around the world. Such collapses have marked the end of the Mycenaean culture of Greece (Renfrew 1979), the Maya culture of Central America (Adams 1973), the Pre-Pottery Neolithic B culture of the Jordan Valley (Kohler-Rollefson 1988), and the EB II–III Canaanite culture (Dever 1989), to mention but a few. Collapses as such led Renfrew (1978) to use the "catastrophe theory" (Thom 1975), and Dever (1989) to use the "systems theory" to explain some of these events noted in the archaeological record.

The catastrophe theory predicts that a cultural change will follow a system's collapse (Renfrew 1978). The EB IA material culture, and especially the pottery assemblage, indeed reflects such predicted cultural change. Analysis of the pottery assemblage even makes it possible to be more precise and detect its inner fluctuations during the process. At first (EB IA1: fig. 33.5) the ceramic repertoire is mainly a direct continuation of southern Chalcolithic traditions, while later (EB IA2: fig. 33.6) new traditions, which fully represent the cultural change, join in.

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It is therefore suggested that the Chalcolithic population of the northern Negev sites did not disappear after the collapse, but rather dispersed throughout Canaan. It is likely that the resulting turmoil may have caused further population movements within the region of the Canaanite cultural milieu, from which the EB IA culture, described above, emerged.

This emerging EB IA culture was distinguished not only in the research area, but at northern Canaan as well (Braun 1989a), and at both places it combines local indigenous and new traditions. In southwestern Canaan the indigenous components of the new culture appear as an evolutionary continuation of the local Chalcolithic culture. These include dwelling methods, burial customs, and types of pottery vessels, chipped stone tools, ground stone vessels, copper tools, and cult figurines. The innovations of southwestern Canaanite EB IA culture include new economic strategies (i.e., emphasis on trade), new technologies (e.g., copper metallurgy), new settlements' locations (from the eight EB IA sites in the research area, six were established where no earlier Chalcolithic sites existed before; only at Tel Ḥalif Terrace and Gat-Guvrin were Chalcolithic remains found as well) and some foreign (to southwestern Canaan) architectural ideas (i.e., structures with rounded corners at Site H). The testimonies of evolutionary continuation on the one hand, and the stratigraphy at Tel Ḥalif Terrace on the other hand, preclude the possibility of either a significant time gap, or an overlap between the Chalcolithic and the EB IA periods in the research area (see table 33.2 for various opinions on this issue).

A REEVALUATION OF THE EGYPTIAN ROLE IN SOUTHWESTERN CANAAN IN THE EB IA

Some scholars emphasize the Egyptian role and impact on the culture of southwestern Canaan in the EB I regardless of its internal subphases. In the EB IA there were indeed trade contacts, exchange of goods, and some cultural imitation on both sides of the Canaan-Egypt trade route, but an Egyptian colony in southwestern Canaan during the EB IA as suggested by Brandl (1992: 442, 447) is not evident. The intensive Egyptian activity occurred during the late EB IB. The magnitude of Egyptian involvement in southwestern Canaan in the EB IA was smaller than in the late EB IB in terms of quantity of Egyptian imports, adaptation of Egyptian technological traditions, and spatial distribution of both. The zone of Egyptian influence in the late EB IB, according to the above-mentioned parameters, stretched farther northeast into Canaan than that of the EB IA. A second observation in regard to Egypto-Canaanite relations within the EB IA is that they were minor in the EB IA1 and intensified, again in terms of quantity of Egyptian imports, adaptation of Egyptian technological traditions, and spatial distribution of both, in the EB IA2 period.

Reconstruction of the EB IA System of Southwestern Canaan

Viewing the ancient landscape as sets of cores and peripheries (Algaze 1989) sharpens and clarifies the differences between the Chalcolithic and the EB IA of southwestern Canaan. During the Chalcolithic period the regional core was at the northern Negev—expressing itself in wealth, technology, art, power, and religion and exerting gravitational forces that affect a wide peripheral zone (i.e., see Gilat sanctuary's centrality and influence in the southern Levant: Alon and Levy 1990). After the collapse of this system in a negative-feedback loop (Dever

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1989), the regional core shifted, in the EB IA, toward the Nile Delta, changing southwestern Canaan's status from core to periphery. In this manner southwest Canaan found itself in the EB IA period at a trade route's junction on the periphery of a strengthening Egyptian core, on the eve of its turning into a pristine nation-state. This situation together with the intensifying trade, channeled through the research area, triggered a positive-feedback loop (Dever 1989). It activated a flow of new ideas and innovations into southwestern Canaan which, as a direct consequence, aroused its social complexity and economic prosperity through the EB IA to EB IB. This scenario is not unique. A parallel of a more or less similar situation—a peripheral society channeling foreign resource input into a large core, and benefiting from it—is Bahrein's (Dilmun) case in the Mesopotamian Early Dynastic period (Edens 1992).

The described process, initiated in EB IA in southwestern Canaan, culminated in an early form of urbanization as soon as early EB IB (Erani Layer C: Kempinski and Gilead 1991), earlier than elsewhere in the southern Levant.

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34

WEDGE- AND CIRCLE-IMPRESSED POTTERY: AN ARABIAN CONNECTION

JEFFREY R. ZORN

In his 1982 *The Material Culture of the Land of the Bible in the Persian Period 538–332 B.C.,* Stern summarized what was then known about a class of decorated pottery characterized by rows of impressed wedges and/or rows of impressed circles which was generally dated to the Persian period (1982: 133–36).[1] This is an extremely valuable resource as Stern was able to examine and briefly describe specimens from excavations that were then, and the majority of which still are, unpublished, as well as those published up to that time. Since Stern's work, other examples have come to light, including one piece from the Persian period at Tel Poleg (Herzog, Rapp, and Negbi 1989: fig. 35:2.16); four examples from Tell el-Fûl from Stratum IIIB deposits of the sixth century from Cistern 1 (N. L. Lapp 1981: pl. 65:5–7, 13); eight pieces from late sixth to early fifth century contexts at Shechem (N. L. Lapp 1985: fig. 6:1–8); three pieces from the fifth century at Qadum are listed, of which two pieces are illustrated (Stern and Magen 1984: 10–14, figs. 4, 9.1); six pieces from Ramat Raḥel not published in the two later formal site reports (Aharoni 1956: pl. 13B); five pieces from pre-Herodian fills in Jerusalem (Tushingham 1985: fig. 15:15–16, 18–19, 21, p. 35); five pieces from Hellenistic and Roman strata at Tell Anafa (Berlin 1997: pl. 71:565–569); two examples from fifth to fourth century contexts at Gezer (Gitin 1990: pl. 28:27, 29, pp. 230–31); one example from an uncertain context at Ashdod (Dothan and Porath 1982: pl. 25:4); one piece from a sixth to fifth century context at Jabel Nimra, near Hebron (Hizmi and Shabtai 1994: 78, pl. 2:10); one piece from a generally Persian fill at Tell el-Sumeiriya (Feig 1988–1989: pl. 13:6); seven pieces, of which four are illustrated, are known from Jericho (Kenyon and Holland 1982: figs. 210: 12, 19, 212: 13–14). Unfortunately the Jericho pieces come from erosional washes, destruction debris exposed to erosion and later pitting, and an uncertain phase of burnt material (see the convoluted presentations in Kenyon 1981: 17, 111–13, 524–25). Kenyon and Holland (1982: 455–56) correctly note that erosion has likely removed occupation levels of the Late Iron Age and possibly the Persian period from the mound. So far only one, perhaps two, examples are published from Jordan, from Tell el-ʿUmeiri, in contexts described as Late Iron II or Early Persian (Lawlor 1991: 27, fig. 3.12.34; Herr 1991: 241–42; Lawlor 1997: 46, fig. 3.22.12; Herr 1997: 245). Unpublished fragments include: four examples from Tell Erani; one piece from Pisgat Zeʾev D; an unspecified number of sherds from the City of David in Jerusalem; fragments of at least four vessels from a cave near the Holyland Hotel in Jerusalem (Ben-Arieh 2000, figs.

1. Other brief treatments are those of Wampler (1940) and P. W. Lapp (1970: 185–86).

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8–9);[2] and four pieces from recent excavations on Mt. Scopus, Area E. Finally, the example cited by Stern from Macalister and Duncan (1926) is in Annual of the Palestine Exploration Fund Annual, volume 4 (pl. 19:3), not volume 5.

Since Stern's publication, some additional information on this decorative style has come to light. It is also possible to make a few observations on its geographic distribution.

The most common types of pottery on which this decoration occurs are deep kraters (Wampler 1947: pl. 67:1510) and holemouth jars (Wampler 1947: pl. 7:96). These can either have no handles or two–four handles which can be either horizontal or vertical (vertical handles usually, though not always, reach the rim). Fewer examples are known from deep bowls, and fewer still from jars or pyxis forms (Stern 1982: 133).

The decoration itself most often takes the form of impressed wedges, usually linked to each other at their bases, arranged in one or more rows along the rim of the vessel (Aharoni 1964: fig. 13:9; Pritchard 1964: fig. 48:17), below the rim (Wampler 1947: pl. 66:1497), at the base of the neck (Tufnell 1953: pl. 91:405), on the shoulder (Wampler 1947: pl. 67:1521) or some combination of the above; rarely they occur on a raised band on the neck of a krater (Wampler 1947: pl. 20:349). Sometimes the wedges are smaller and more widely spaced (Sellers et al. 1968: fig. 20:6). One example bears a line of inverted "U"s (Stern and Magen 1984: fig. 9:1). At least one example has two bands of incised wedges along with a row of impressed wedges (Wampler 1947: pl. 66:1495; possibly Crowfoot, Crowfoot, and Kenyon 1957: fig. 12:17). The pyxis form seems to be the only vessel type ever to be almost completely covered with wedges (Pritchard 1964: fig. 33:13; Lamon and Shipton 1939: pl. 43:6; Mazar and Dunayevsky 1964: pl. 28: top center). Rows of circles are less common and usually accompany rows of wedges (Wampler 1947: pl. 67:1510); only rarely do they occur on their own.[3] Occasionally other stamped designs accompany the wedges, either rosettes or squares within squares (Stern 1982: fig. 218; Mazar and Dunayevsky 1964: pl. 28: bottom right) or lozenges with checkerboard patterns (Wampler 1947: pl. 20:348). An example from Samaria has a raised modeled ram's head (Crowfoot, Crowfoot, and Kenyon 1957: fig. 32:9A–B). There is one example of the use of drops of clay set in rows (Stern 1982: fig. 227; Mazar and Dunayevsky 1964: pl. 28: top left). A holemouth form with painted human, animal, and floral decoration, as well as a one-word graffitto, was found at Qadum (Stern and Magen 1984: fig. 4). In his corpus Stern also includes vessels stamped with floral motifs, but his example from Mevorakh contains neither wedges nor circles, and so should be excluded from this body of material (Stern 1978: fig. 8:21, pl. 26:5).

Excavations at the site of Qasr al-Hamrāʾ at Taymāʾ in northwestern Arabia have produced seven examples of wedge decoration on kraters or deep bowls, four of which have been illustrated (fig. 34.1 = Abu-Duruk 1986: 86:47; fig. 34.2 = Bawden, Edens, and Miller 1980: pl. 64: 15; figs. 34.3 and 34.4 = Abu-Duruk and Murad 1985: pls. 59:1, 60:2; also Abu-Duruk and

2. I am grateful to Sam Wolff (Israel Antiquities Authority) for the information on the Tell Erani pieces, to Yonatan Nadleman (Israel Antiquities Authority) for reference to the Pisgat Ze'ev example, to Sam Wolff and Alon DeGroot (Israel Antiquities Authority) for the City of David reference, to Sarah Ben-Arieh (Israel Antiquities Authority) for the pieces from the Jerusalem cave, and to Sam Wolff, David Amit, Jon Seligman, and Irina Zilberbed for the Mt. Scopus specimens. I thank all of these colleagues for permission to cite these pieces here in advance of their publications of this material.

3. Most often they appear alone on handles (Macalister 1912: pl. 182:8; Sellers et al. 1968: fig. 20:1), or on sherds too small to be certain that the lack of wedges is not accidental (Sellers et al. 1968: fig 20: 6; though see N. L. Lapp 1981: pl. 65:13).

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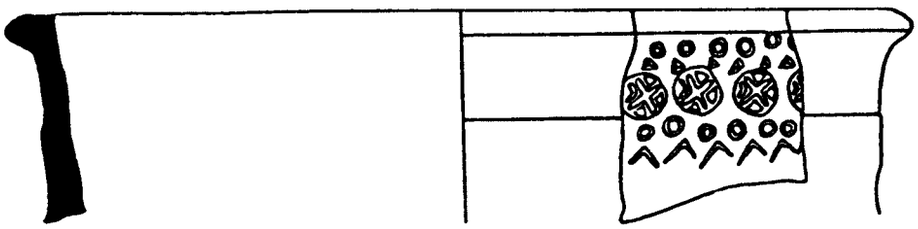

FIGURE 34.1. Krater from Taymāʾ. Scale 1:2.

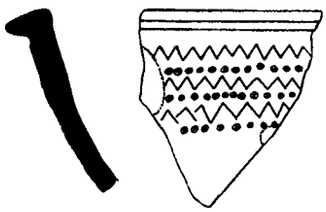

FIGURE 34.2. Bowl from Taymāʾ. Scale 1:4.

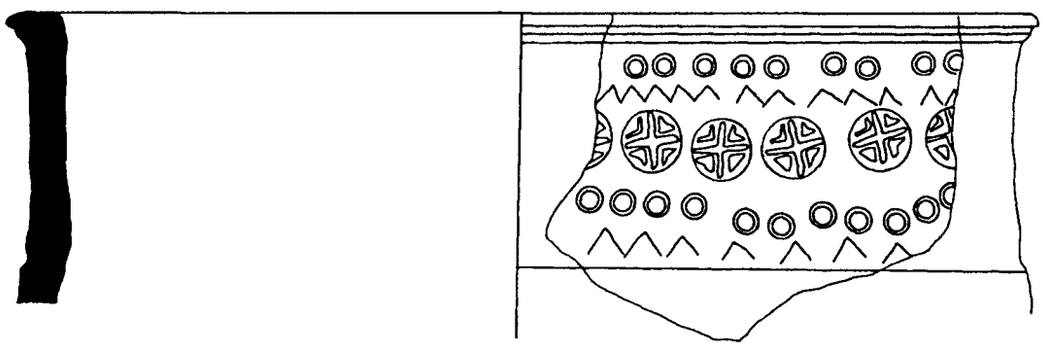

FIGURE 34.3. Krater from Taymāʾ. Scale not given.

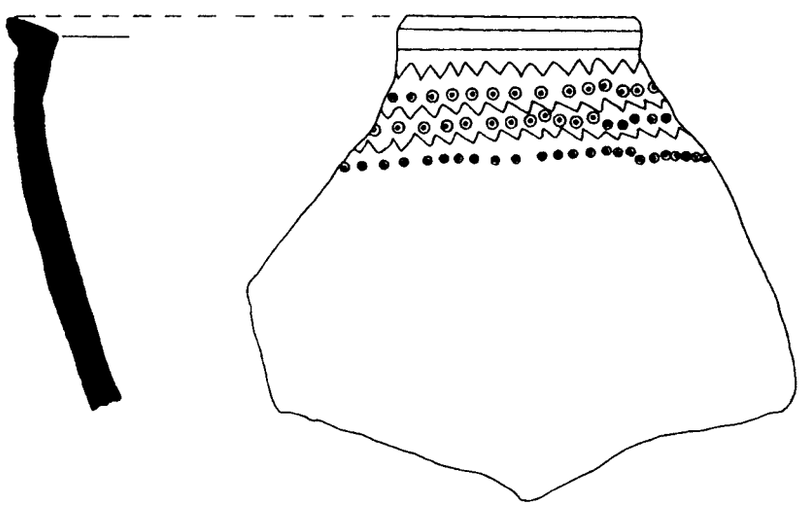

FIGURE 34.4. Bowl from Taymāʾ. Scale not given.

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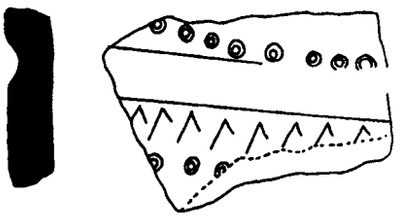

FIGURE 34.5. Bowl from al-Hijr. Scale not given.

Murad 1986: pl. 54). Figure 34.1, a krater, is decorated first with a row of circles below its rim, followed by a row of small wedges, a row of rosettes, a second row of circles, and finally by a row of wedges. This piece thus contains almost all the decorative devices found in this style. All seven pieces were found in what appears to be a palace/temple complex on the small mound of Qasr al-Hamrāʾ. After the first season of excavation it was believed to be a single-period occupation site which dated to the ten years (ca. 550–540 B.C.) when Nabonidus, the last of the Neo-Babylonian kings, made his base at Taymāʾ (Abu-Duruk 1986: 54, 96; Abu-Duruk and Murad 1985: 61–64). Remains of a stone table and a stela decorated with Babylonian motifs were found in this complex (Abu-Duruk 1986: 56–66, figs. 7–8, pls. XLIX–L; Bawden, Edens, and Miller 1980: 83–84, pl. 69). However, subsequent excavation, discussion, and evaluation have determined that there are two periods of occupation at the site and that the period from which the wedge-decorated vessels originate (the earliest occupation phase) begins in the sixth century and probably extends to the end of the fifth (Parr 1989: 53–61). Another wedge-decorated deep bowl, published without a context, is known from al-Hijr, also in northwest Arabia (fig. 34.5 = Ibrahim and Al-Talhi 1989: pl. 14:5)

In his summary Stern traces the discussion of the dating of wedge-decorated vessels (1982: 135). After an initial assignment to the Hellenistic period, the dating of this decorative style has gradually crept backward into the Persian period generally, and since Stern's work, to the end of the sixth–beginning of the fifth centuries.[4] Aharoni published six fragments of wedge-impressed pottery from Ramat Raḥel which are said to come from the floor of the courtyard of the Stratum VA citadel and its surrounding casemate wall (1956: pl. 13B:142–43). If so, these pieces would be the earliest examples yet excavated, dating no later than the beginning of the sixth century. However, no subsequent report provided details as to their precise find-spots, making an evaluation of their archaeological contexts impossible. Unfortunately the new evidence from Taymāʾ and al-Hijr does not allow for any more precise dating than that arrived at for the specimens from ancient Israel.

It has been assumed that the original inspiration for wedge-decorated pottery was Mesopotamian cuneiform (Stern 1982: 136; Wampler 1940: 15).[5] Although wedge-decorated pot-

4. Yadin et al. (1961: pls. CLXXIII:3, CCCL:15) show a fragment of a vessel of uncertain type decorated with incised wedges and impressed circles from Stratum X of the tenth century B.C. This may represent the earliest example of this general style of decoration in the Iron Age. However, the 400+ year gap between this example and those pieces with impressed wedges of the sixth and fifth centuries makes a direct connection difficult to accept.

5. Stern (1982: 136) suggests that another possible origin for wedge decoration derives from motifs on Assyrian and Persian metal vessels, but he provides no examples. Zertal (1989) discusses the nature and dating of late Iron Age bowls whose bases on the interior are covered with impressed wedges bounded by an incised

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tery is known from Mesopotamia from as early as the Hassuna period (Zertal 1989: 81), its use as an external decorative device is relatively rare and does not seem to occur on large kraters or holemouth jars. A few shallow bowls are known from Nippur, but they could be either Neo-Babylonian or Persian (McCown and Haines 1967: 71, pl. 103:16). A bowl from Nimrud is from a Hellenistic grave (Mallowan 1966: fig. 295). If cuneiform, as observed by potters in sixth century Israel or northern Arabia, did provide the inspiration for external wedge-decoration, it is just as possible that Israel or northern Arabia was the original source for vessels so decorated, and that the style spread east to Mesopotamia, rather than from the east to the west.

It is not surprising that identical decorative styles on similar vessel types should be found in both ancient Israel and northern Arabia. Contacts between the two areas would have begun to intensify with rising Assyrian intervention in the west. Tiglath Pileser III and Sargon II made efforts to control the movement of Arab herdsman and caravans along the periphery of their empire and used Arab leaders to control the border with Egypt, where Sargon established a trading center (Ephʿal 1982: 83–100, 108). Sargon also settled some Arabs in Samaria (Ephʿal 1982: 105–08). Sennacherib campaigned in northern Arabia (Ephʿal 1982: 118–23). Assyrian military and political intervention brought at least some of the tribes of northern Arabia within the Assyrian orbit certainly by the reign of Esarhaddon who relied on them to supply his army with water when he invaded Egypt in 675 B.C. (Saggs 1984: 107–08). Assurbanipal (Ephʿal 1982: 114), and later Nebuchadnezzar of Babylon (Roux 1980: 349), both campaigned in northern Arabia. Nabonidus, the last Babylonian ruler, moved his court to Taymāʾ and used it for ten years as a base of operations in Arabia, reaching even as far as Medina in the south (Roux 1980; Ephʿal 1982: 179–82). Assyrian forts and administrative centers dot the area from the south coastal zone around Gaza, extending inland across the northern Negev to Edom (Finkelstein 1995: 147), and Assyrian Palace Ware is common at most sites in the same region (Finkelstein 1995). Assyrian campaigns and building activities seem aimed at linking northwestern Arabia with southern coastal Palestine.

One of the reasons for this interest in Arabia might have been a desire to control the spice trade routes which threaded through the region. A number of biblical texts, mostly from contexts of the seventh and sixth centuries, refer to Arab traders and their activities, including the trade in frankincense (1 Kgs 10:1–13 and 2 Chron 9:1–12; Isa 21:13, 60: 6; Jer 6:20; Ezek 27:22, 38:13; Job 6:20; Ps 72:10). The increasing number of small, cuboid limestone incense altars (Stern 1982: 182–95; Gitin 1992: 46; Stern 1973: 52–53) found in ancient Israel from the seventh century onward attest to the importance of spices, and the trade which brought them, in this region. An increase in the relative quantity of camel bones from Tell Jemmeh in the seventh century and the recovery of south Arabian inscriptions from southern Israel and Edom may also be connected with the rising importance of this trade (Finkelstein 1995: 148; Shiloh 1987).

Although Stern notes that this type of decoration is known throughout ancient Israel and is not limited to Judah and Samaria, as had been thought earlier, there is some patterning to its

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circle. He suggests that the inspiration for the wedges derived from the experience of Mesopotamian deportees exiled to the region of Samaria in the eighth–seventh centuries B.C. with the cuneiform writing system. What is unclear is why these exiles would adopt a decorative scheme in their new settlements which was relatively rare in their homeland. Perhaps the use of wedges in these bowls was not decorative but served some now-obscure utilitarian role today (see London 1992).

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distribution. The total number of published examples comes to approximately 160. Of this total about 130 come from the area of Judah (including Jericho), while the remainder come from the north (including Gezer).[6] Of the 130 from Judah, sixty-two come from Tell en-Nasbeh, with most of the rest coming from Jerusalem, Ramat Raḥel, En-Gedi, Tell el-Fûl, Beth Zur, and Jericho, mainly from sites that continued to be occupied after the fall of Jerusalem, or that were resettled soon after the return from the Exile.[7] The northern sites that have yielded the largest number of examples are Shechem and Samaria. It thus seems that this form of decoration was most popular in the south, showing up at many relatively small sites, while in the north it is most often found at major population centers.

If the Ramat Raḥel sherds do date to the seventh–early sixth centuries, the rise and spread of the wedge- and circle-impressed pottery may be connected with the suggested increase in Mesopotamian interest in exerting some control over Arabian trade, which began under the Assyrians and continued under the Babylonians and Persians. At this stage of research, however, it remains uncertain if the perceived overlap of the generally southern range of this form of decorated pottery and the distribution of Assyrian forts, pottery, and south Arabian inscriptions is fortuitous, or in some way related. The two specimens from ʿUmeiri may be a forerunner of future discoveries in Jordan that will provide the crucial link between northern Arabia and southern Israel.

The high incidence of such decorated vessels at Tell en-Nasbeh/Mizpah should not be surprising. The floruit of Mizpah's development, when it served as the administrative center for Judah under the Babylonians, was in the wake of the Babylonian conquest in 586 B.C., and it continued as a major administrative center down into the fifth century.[8] One would naturally expect such an important southern center to have some connection with the rising Arabian trade. A fragment of one of the limestone cuboid incense altars was found at Tell en-Nasbeh in a wall of Stratum 2 of the Babylonian to Persian period and helps underscore the importance of the spice trade in ancient Judah (McCown 1947: 236–37, fig. 61A, pl. 84:14).

Archaeological exploration of northern Arabia is still modest compared with the intensive research carried out in Israel and, to a lesser extent, in Jordan. For this reason it is not certain if the relative paucity of wedge-impressed pottery in northern Arabia is due to the vagaries of excavation, or if it truly reflects a concentration of such material in ancient Israel. It is also

6. See Stern 1982: 133 and n. 1 (above) for the distribution of this material in Israel.

7. Stern 1982: 135, refers to some 140 vessels decorated with wedges and/or circles at Tell en-Nasbeh; however, the records in the Badé Institute of Biblical Archaeology in Berkeley, California, contain references to only approximately seventy-five vessels with this style of decoration, not all of which were published in Wampler's 1947 report. See Neh 3:1ff. and 7:6ff. for a list of those who helped rebuild the walls of Jerusalem and those towns settled after the return from the Exile. Ezek 47:10 suggests that En-Gedi was settled during this time as well.

8. The two largest clusters of wedge-decorated sherds at Tell en-Nasbeh are found in the southwest side of the tell, from AD20 southwestward to AG17 (25 total), and in the intergate area from X12 south to AA24 (eleven total). These two areas contain extensive building remains from Stratum 2, which this author has suggested was constructed in the Babylonian period and continued down to the end of the fifth century B.C. See Zorn (1993a: 163–85; 1993b: 1098–1102) for a discussion of the stratigraphy and architecture of Stratum 2. See 2 Kgs 25:23ff. and Jer 40:6ff. for Mizpah in the Babylonian period. See Neh 3:7, 15, 19 for Mizpah in the Persian period.

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unclear if the vessels themselves, or their contents, were the object of the trade. Until a source analysis is performed on the Arabian and Israelite material, it will be impossible to say in which direction the trade in these vessels flowed, or if these vessels were locally produced and this form of decoration was common to both regions.

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In 1978 Douglas Esse wrote a seminar paper on "Settlement Patterns in the Persian Period." In an appendix to this paper he briefly discussed "The Stamped Impressed Ware" which is the subject of the present article. Though the paper was never published it showed a clear grasp of the issues involving this decorative style and contained useful insights. It is fitting that in a volume honoring Doug Esse's memory there be a piece which hearkens back to his formative years as a student. Much of this paper was prepared during my time at the Albright Institute of Archaeological Research, Jerusalem, as a National Endowment for the Humanities Fellow. I would like to thank Sam Wolff for inviting me to contribute this article, for helpful comments during its preparation, and for bringing several wedge-impressed specimens to my attention. Any errors or omissions are mine alone.

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