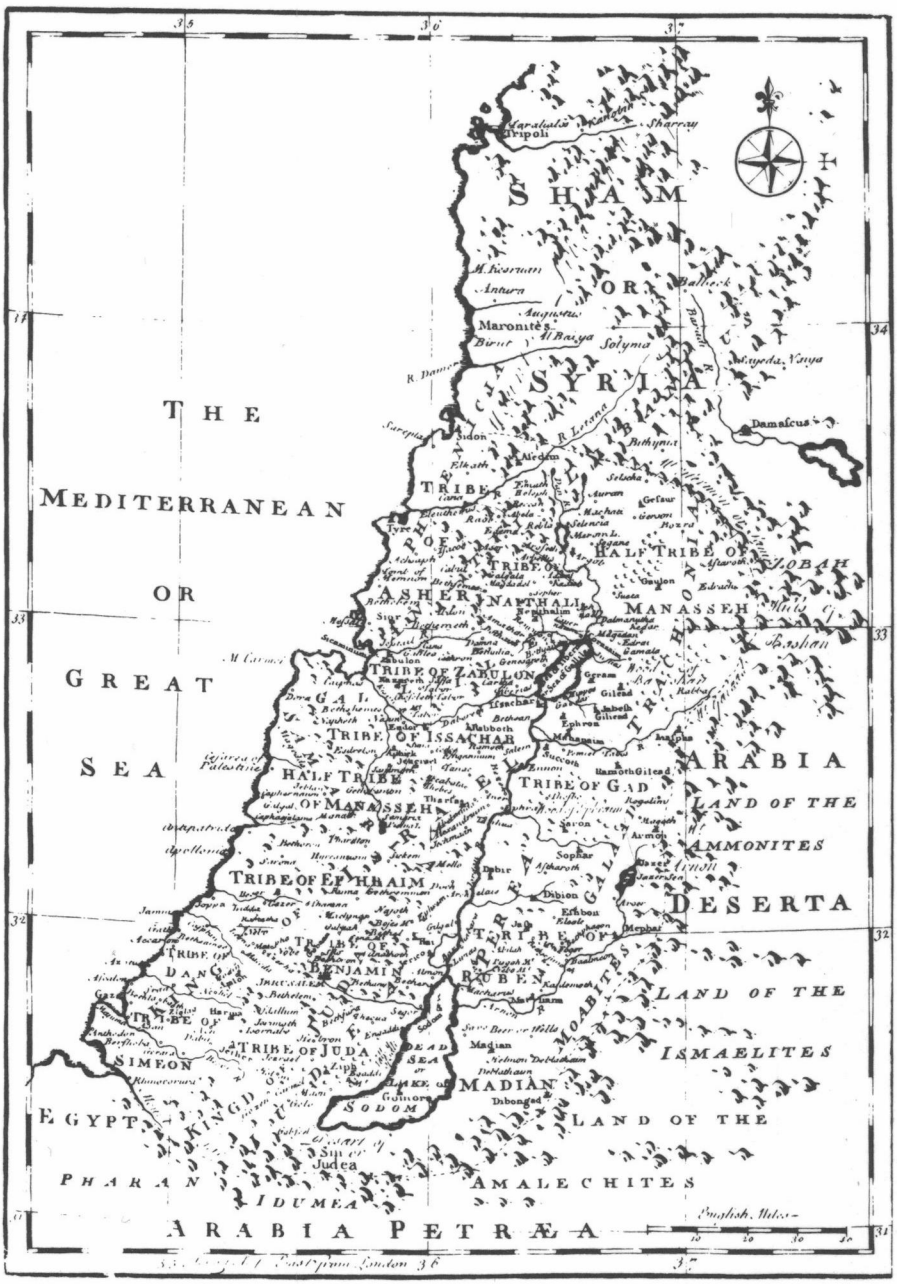
Bulletin of the Anglo-Israel Archaeological Society



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Bulletin of the Anglo-Israel Archaeological Society

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* 40th Anniversary Issue *

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On the cover: an 18th-century map of
the Holy Land, by Eman. Bowen.

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Editorial

This issue celebrates the 40th anniversary of the Anglo-Israel Archaeological Society (AIAS). The Society is based in London and has played an important role over the years ensuring that its members are provided with a rich programme of lectures on the most recent archaeological discoveries being made in Israel and the Near East, as well as publishing a *Bulletin* with scholarly articles of high calibre and substance. The *Bulletin* has now a wide distribution and appears in all the major archaeological libraries. I shall always be grateful to one of the founders of the Society, Dr Richard Barnett, for inviting me to join the Committee of the Society at a time when I was still only a student at the Institute of Archaeology in University College, London. I was later asked to serve as the editor of the *Bulletin*, following in the footsteps of the first editors, Roberta Harris and Jeremy Schonfield. Barbara Barnett, who is an extremely active member of the Committee of the Society, has contributed an excellent history of the Anglo-Israel Archaeological Society, from its beginnings in 1961 and to the present day.

This special issue opens with a brief note by the Rt. Hon. The Viscount Allenby of Megiddo, who is the Honorary President of the Society, and is related to General Edmund Allenby, commander in chief of the Allied Expeditionary Forces that conquered Palestine from the Ottoman Turks in 1917. By doing so, Allenby ushered in a period that saw the beginnings of scientific archaeology in the Holy Land, with the establishing of a Department of Antiquities, a new antiquities law, an archaeological museum, and the founding of archaeological schools from different parts of the world. Major excavations were initiated during the Mandate period at important biblical sites, including Megiddo, a site that is currently being re-excavated by Professor Israel Finkelstein and Professor David Ussishkin (see the grant report by Rachel John).

There are five research articles in this issue. The first, by Dr Eliot Braun, the Israel Representative of the Society and an archaeologist on the staff of the Israel Antiquities Authority, relates the sad story of what happens when modern bulldozers move in and begin devastating an archaeological site. The pain that Braun feels over the loss of an enormous amount of archaeological data at Palmahim is apparent throughout his article. 'Our loss,' he writes, 'is incalculable; what we will lose in the future, in a rapidly shrinking archaeological record, is a tragedy about to happen.' The second article, by Professor Amihai Mazar, a Vice-Chairman of the Society and a Senior Lecturer in the Hebrew University, deals with the interesting idea that the circular installation in the courtyard of the

Chalcolithic period shrine at En Gedi, was not used for water ablutions as has previously been thought, but served as a pit for a sacred tree instead. Anyone who has visited the site will have noticed that there are few shady spots there and so a tree at this location would make absolute sense even if it were not a sacred tree. The third paper, by Ilya Berelov, a graduate student of the Institute of Archaeology of La Trobe University in Melbourne, deals with the implications a fascinating site may have for the reconstruction of the character of the human presence during the Middle Bronze Age in the plains on the eastern side of the Lisan peninsula of the Dead Sea in Jordan. The site is called Zaharat edh-Dhra (ZAD1 – not to be confused with ZAD 2 which is a Pre-Pottery Neolithic site). The Chairman of the Society, Professor Hugh Williamson, has contributed a short paper dealing with the light that a recent epigraphic find from Tel Miqne (Ekron) has now shed on the text of Isaiah 8:21. Dr Sean Kingsley, a Committee member of the Society and the managing editor of *Minerva*, has contributed an article in which he summarizes the current state of affairs regarding 'shipwreck archaeology' in Israel and reaches the conclusion that the prevailing intuitive archaeological approach to underwater fieldwork needs to be replaced by a more analytical one open to new methods. Lastly there are articles by Dr David Jacobson, the Honorary Treasurer of the Society, on the interesting phenomenon of the inverted anchor symbol that appears on Hasmonaean coins and its significance; and Avi Sasson, of the Department of Land of Israel Studies at Bar Ilan University, on a large lime-kiln plant at Ali-Muntar in Gaza that reflects a combination of modern and traditional methods of lime-burning.

The final part of this *Bulletin* includes book reviews (by Dr Kay Prag and Dr David Jacobson), the obituaries of the late Claire Epstein and Jerry Vardaman, the summaries of four lectures given to the Society, and a grant report. I would like to thank Mr Ashley Jones for his enormous help in getting this issue of the *Bulletin* ready for publication.

Shimon Gibson

(*Correction*: The figures in the article 'Geometrical Planning in Monumental Herodian Architecture' by David Jacobson, in *BAIAS* 17 (1999), 67–76, were published in the wrong order. What should have been Figures 1–3 appeared in the order of Figures 3, 1 and 2. Figure 4 is correctly presented.)

Preface

I write to commend this special 40th anniversary issue of the *Bulletin* to the readers.

One of my forebears, General Edmund Henry Hynman Allenby, had an avid interest in the archaeology and history of the Holy Land. Indeed, not long after he entered Jerusalem with his troops on 9th December 1917, he proclaimed martial law and posters were put up on the walls of the city in which he made it clear to the inhabitants that 'since your City is regarded with affection by the adherents of three of the great religions of mankind, and its soil has been consecrated by the prayers and pilgrimages of devout people of those three religions for many centuries, therefore do I make known to you that every sacred building, monument, holy spot, shrine, traditional site, endowment, pious bequest or customary place of prayer, or whatsoever form of the three religions, will be maintained and protected according to the existing customs and beliefs to whose faiths they are sacred.' In February 1918 Allenby appointed two Egyptian archaeologists, with Professor Frederick Bliss as their archaeological advisor, to make a report on the condition of the ancient ruins in Palestine. This concern for the antiquities of the land eventually led to the setting up of the Department of Antiquities of Palestine, from 1920, under the watchful eye of Professor John Garstang.

Though not an archaeologist myself, like General Allenby I have been greatly interested in the archaeological work in that part of the world. In recent years I have been fortunate to visit on a number of occasions the excavations at Megiddo mounted by Tel Aviv University under the direction of Professors David Ussishkin, Israel Finkelstein and Baruch Halpern. The question relating to Megiddo and Solomon's Stables has always fascinated me.

I regard our *Bulletin* as an excellent source of information and in the past interesting and well-researched articles never failed to please. I am certain that this edition will not be the exception.

Allenby
House of Lords

Bulletin of the Anglo-Israel Archaeological Society 2000 Volume 18

The Anglo-Israel Archaeological Society – Forty Years On

BARBARA BARNETT

The idea of providing some encouragement from Britain for archaeological activities in Israel began to develop in 1958. There was a growing interest at that time in Biblical Archaeology and in the exciting discoveries being made in the Holy Land. This led to the founding of the *Anglo-Israel Archaeological Society* (AIAS) in 1961.

The founders of the Society were Dr Alec Lerner, Leon Shalit and Dr Richard Barnett. Lerner was at that time on the staff of Marks and Spencer and had close ties with Israel. Shalit, who had served in the British Army as well as in the Israel Defence Forces, had extensive experience in industry, commerce and administration and was also with Marks and Spencer at that time (see obituary in *Bulletin of the Anglo-Israel Archaeological Society* (*BAIAS*) 15: 84–86). Barnett was an archaeologist with an extensive knowledge of the history and art of the Middle East and was the Keeper of Western Asiatic Antiquities at the British Museum (see obituary in *BAIAS* 5: 4–6). They discussed what role could be played by British enthusiasts and initially set up a small group called the *Anglo-Israel Exploration Society* (a title perhaps inspired by that of the long-established Egypt Exploration Society and the Palestine Exploration Fund). Minutes of a meeting they held in 1959 show that the aim was to assist existing Israeli excavations by raising funds on their behalf in Britain. Suggestions were made for paying for such things as equipment and travel expenses and for preserving the sites after excavation. According to the minutes a report was made by the Treasurer of the Society, Thomas Gueritz, indicating that a number of philanthropic trusts and individuals had been approached and a substantial donation had already been received from Charles Clore.

Towards the end of that meeting the Chairman, Dr Lerner, suggested that the scope of the Society be extended beyond the limited number of generous individuals then involved and membership be opened throughout Great Britain. He proposed, too, that a number of archaeologists of standing be invited to join the Executive Committee. Those present readily responded. They recognised the need to provide a forum where those archaeologists active in the field could present reports on their work to the British public, as well as to have an organization that would encourage and sponsor excavations and scholarship in Israel. Consequently, the existing officers resigned and the organization was reconstit-

uted. Lerner was elected as Chairman of the new Society with Barnett as Chairman of the Executive Committee. When in 1967 Lerner emigrated to Israel, Barnett was elected in his place, a position he held for the next 18 years.

The founders of the Society were all personal friends of General Yigael Yadin, a man of charisma and enthusiasm, who became a driving force behind the fledgling Society. He had lately retired as Chief of Staff of the Israel Defence Forces and returned to civilian life as Professor of Archaeology at the Hebrew University of Jerusalem, the chair previously held by his father, Dr E. L. Sukenik. Yadin later became well known for the important finds he made in the Bar Kokhba caves in the Judean Desert and for his excavations at Masada (see the obituaries by David Astor, Richard Barnett, John Kane and Geza Vermes in *BAIAS* 4: 9–23). Since 1955 he had been in charge of a major archaeological expedition digging at Tel Hazor in northern Israel with spectacular results. This site served as a training ground for younger generations of field archaeologists, many of whom later became remarkably able and successful archaeologists in their own right. Richard Barnett wrote:

> The Hazor expedition, as we know, was brilliantly successful as far as it went. It uncovered four Canaanite shrines and large sections of the Bronze Age and of the Iron Age cities. Support was received from James de Rothschild and from many English friends. In the British Museum an excellent loan exhibition of the finds was mounted by Yadin with the aid of his restorer, Dodo Shenhav. This brought Yadin's achievement to the notice of the wide British public. It was a turning point for us. For in the wake of the interest stirred by that exhibition, our Anglo-Israel Archaeological Society was set up in 1961. Its task was to be that of making known what was being done by current archaeologists in Israel, and of course notably, but not exclusively, by Israeli archaeologists. (*BAIAS* 4: 12).

Yadin's impressive discoveries and his talent for presenting them to a lay public led to widespread enthusiasm in Israel and abroad. Archaeology rapidly became a national hobby in Israel and volunteers flocked there to participate in the digs. The scope for finding relics of the past in this tiny stretch of land seemed endless. Yadin would relate how he used to find potsherds in his garden as a boy and Leon Shalit would tell how he picked up ancient coins on a golf course! The academic year of 1961–62 Yadin spent on sabbatical leave in London. He was preparing to take an expedition to excavate at Masada, the fortified mountain overlooking the Dead Sea, and discussed the logistics with his friends. The proprietor of *The Observer*, David Astor, relates how he

> met him first when he came to London in 1961 looking for support for his greatest project, excavating the hilltop of Masada. He lunched with my colleagues and me at *The Observer* and from then onwards we became part of his empire. (*BAIAS* 4: 9)

Yadin also took an active part on the Executive Committee of the new Society during that year and gave the inaugural lecture to an audience of some seven hundred at its launch in November 1961.

A constitution was drawn up and a membership leaflet was prepared. The aims of the Society were set out and these have varied only very slightly over the past 40 years:

(1) to provide up-to-date information on recent developments in the archaeology of Israel and surrounding countries;
(2) to provide illustrated lectures by specialists on recent finds and new thinking on the region's ancient and later history;
(3) to make travel grants to selected students of Middle Eastern archaeology from Israel and from Britain.

In addition it was made very clear from the beginning by successive Chairmen that the Society held no religious or political affiliation and that membership was open to all those who were interested, whether amateur or professional.

Through Yadin's influence the Society became affiliated with the Friends of the Hebrew University and their London office from the outset generously provided the Society with full administrative facilities. The early exploratory meetings that gave rise to the Society took place in Leon Shalit's office at Marks and Spencer's headquarters in London. Shalit arranged that Marks and Spencer provided for all the printing requirements of the Society for many years. Registration with the Charity Commissioners ensured that no tax was due on any revenue. The basic annual membership fees rose from 2 guineas in 1961, to £5 in 1976 and are now £15. The policy has always been to keep them low so as to attract maximum membership and that is why there has never been an entrance fee to lectures. Membership numbers reached a peak at 265 in 1981. Income from fees, however, was insufficient to meet the Society's aims so the Committee has always had the increasingly challenging task of raising additional funds particularly for student grants. Over the years many individuals and several trust funds have made generous contributions to further the aims of the Society. This has been achieved by the diligence and zealous determination of successive Honorary Treasurers and able accountants.

The Society has been developed and led by a succession of energetic and capable officers. The First President of the Society (from 1974) was Lord Segal of Wytham, who qualified as a doctor of medicine and later did much work on public health as an active member of Parliament (see the obituary in *BAIAS* 4: 84). The son of a noted biblical scholar, Lord Segal was deeply interested in the subject of ancient Israel. Richard Barnett once described him as 'a man of culture, charm and kindness who gave of much worldly wisdom and practical experience.' The present President of the Society is Viscount Allenby of Megiddo, a great-nephew of the Field Marshal whose title he inherited. He has himself had a distinguished career in the British Army and is today an active parliamentarian. He has been a Deputy Speaker of the House of Lords since 1993. Professor David Ussishkin of Tel Aviv University – was one of the first lecturers to the Society when he spoke about the Ein Gedi excavations in 1962 – when excavating at Megiddo a few years ago he met Lord Allenby who was visiting the

site. When approached by today's Chairman, Professor Hugh Williamson, Lord Allenby readily agreed to be appointed President of the Society. Soon, after he arranged a delightful reception for members of the Society at the House of Lords.

As a founder member and as Chairman for many years (1968–1985), Richard Barnett steered the Society towards an involvement with only the highest levels of professional endeavour. He firmly believed that the Society should appeal to younger generations of archaeologists and students. Following him in office and with the same high standards came Professor J.B. Segal, a brother of the first President. He has in turn been succeeded by Hugh Williamson, now Regius Professor of Hebrew at Oxford University. The influence of all three can be seen in the calibre of the professionals who have addressed the Society on their archaeological and scholarly work, and of the students selected for grants who have since become eminent in their fields. The work of the chairmen was promoted with the help of a number of strong vice-chairmen, notably Anthony Lewison (see an obituary in *BAIAS* 13: 61) and Ashley Jones, and an active Committee of scholars, archaeologists and dedicated individuals.

The appeal of the Society's subject matter is evident from the membership list. That shows how people of widely different interests and occupations joined from far and wide, with many academics among them. Richard Barnett arranged for many years that the Society should meet in the rooms of the Society of Antiquaries in Burlington House and later, when the cost increased, to the very suitable venue at the Institute of Archaeology of University College, London. It was Barnett, too, who encouraged informal socializing after lectures with a glass of sherry and direct discussion with the lecturers. Attendance at lectures has always fluctuated according to the subject of the address and the season of year. However, there has always been a small but loyal core group that attends regularly. After a few years the time of the main London events was changed from 8 pm to 6 pm to suit people preferring to come at the end of a working day. Others come to hear lectures on particular subjects or to hear specific speakers and these tend to attract the colleagues of the speakers, students, friends and relatives. For many years there was a regular following of former Masada volunteers who had formed their own group under the leadership of Dr Gilliland, who joined the Society's Executive.

A cursory survey of the subjects of the Society's lectures and of the specialist interests of the lecturers over the past forty years indicates to what extent changes have occurred concerning the overall understanding of the ancient past in the Near East. This applies not only to the uncovering of many more ancient sites by field archaeologists but also in regard to the development of more sophisticated excavation techniques and to the use of refined scientific methods such as radiocarbon dating, DNA procedures, and so forth. Today archaeology can truly be said to be a multi-disciplinary profession. A current subject providing wide debate is the validity of using Biblical sources as evidence in archaeological interpretation. Arguments such as these have helped promote lively exchanges that stimulate and attract varied audiences to the lectures. An example of such a

lecture was the one given by Professor Avraham Biran about his work at Dan and the discovery of the Aramaic 9th century BC inscription alluding to the 'King of Israel' and the 'House of David'. This was held jointly with the Institute of Jewish Studies of University College in London in 1994. There have been so many outstanding Society occasions that it is possible to mention only a few. The late Claire Epstein (see the obituary in this issue of *BAIAS*) spoke in 1969 of her discovery of a previously unknown people from the Golan of Chalcolithic times. The Society has also been able to benefit from up-to-date reports on current work at major archaeological sites in Israel, notably at Ashdod, Akko, Beer Sheva, Lachish, Dor, Hazor, Ekron and many others. Prehistoric subjects have also been dealt with: Yosef Garfinkel spoke last year about Neolithic art at Sha'ar Hagolan, and this year Na'ama Goren described her research on prehistoric materials.

One subject that has always attracted bumper audiences has been the city of Jerusalem. In 1965 Kathleen Kenyon spoke to the Society on her digs in and around the city; later came reports from Nachman Avigad on the Jewish Quarter excavations, Benjamin Mazar on the Temple Mount excavations, and Magen Broshi on the Mount Zion excavations. Then there was also Yigal Shiloh's work on the City of David excavations, and a number of lectures on the differing theories about the buildings on the Temple Mount and the location of the Jewish Temple. Shimon Gibson and more recently Martin Biddle have presented detailed studies of their work on the Church of the Holy Sepulchre. Several lectures were held jointly with the British-Israel Arts Foundation and the joint lecture with the Palestine Exploration Fund has now become an annual event. Perhaps the most dramatic example of popular appeal was the lecture given by Yigael Yadin on Masada in October 1984 when the hall was besieged by hundreds of people keen to be present. So great was the throng that the police were called in to help control the situation and someone managed to procure a microphone to relay the lecture to those congregated outside.

The Society has also been connected with tours to Israel and with exhibitions of artefacts. In 1967 a tour of Israel was organised by Hilary Grainger, when Secretary of the Society. Sixteen members returned full of enthusiasm. She also arranged for an unusual exhibition at the Edgware Reform Synagogue of antiquities loaned from collections at the British Museum, the Institute of Archaeology and other institutions. Several events have been given in the name of the Society at different places in Britain and a few lunch time talks by members of the Committee at London colleges. There continue to be tours of current archaeological exhibitions often led by professionals from the Committee, such as Stephen Rosenberg, the present Honorary Secretary. In 1984 a special meeting was held in the memory of Yigael Yadin, a founder of the AIAS (see *BAIAS* 4), which included an address by David Astor, of *The Observer*, who was a sponsor of the Masada excavations. It was Astor who set up the highly successful Masada Exhibition at the Festival Hall in London in 1966. The Society also took part in setting up several special events such as the Symposium of leading scholars

attending the Dead Sea Scrolls Conference in 1986. In 1987 a Jubilee Tour of Israel was organised and led by Roberta Harris, then Honorary Secretary, and an Appeal Fund was launched to finance students with grants in memory of Richard Barnett who throughout his career had always made himself available to advise and encourage students.

In the early years of the Society members were provided with complimentary issues of *Christian News from Israel* a magazine published in Jerusalem that had occasional articles on archaeology. Later this was replaced with the *Israel Exploration Journal* published in Jerusalem by the Israel Exploration Society. By 1978 this had become too costly for the AIAS to cover within the membership fees and so it was offered on request at a reduced price. In 1982 there was a major development with the launching of the bulletin of the Society – the *Bulletin of the Anglo-Israel Archaeological Society* (*BAIAS*) as an annual publication. It began as an 'in house' journal to provide summaries of the programme of lectures and reports from the field. The idea originated from members who were sometimes unable to attend meetings. The *Bulletin* is now recognised as a leading archaeological journal that publishes peer-reviewed research articles by leading scholars, as well as book reviews, summaries of lectures (an important feature) and the occasional obituary. Volumes 1–7 were edited between 1982–1988 by Roberta Harris and Jeremy Schonfield. Shimon Gibson joined the editorial board in 1985 with a responsibility for book reviews. From Volume 8 and to the present Volume 18 (1989–2000) the chief editor has been Shimon Gibson, assisted by an Editorial Board with the practical assistance of Ashley Jones, and with the secretarial help of Judith Littman and later of Carole Maraney. That it has become recognised today for the high academic quality of its contents is entirely due to the expertise and enterprise of the co-editors who launched it, and the hard work and perseverance of the present editor. The Society can be justifiably proud of the *Bulletin*'s standing. Despite its youth it has earned a place of high repute among the many other learned journals with related interests that appear worldwide.

Throughout the forty years of its existence the Anglo-Israel Archaeological Society has been led by a number of dedicated and outstanding personalities. They have produced ideas and strategies that have developed the aims of the Society. But one must not forget a succession of capable and enthusiastic organising Secretaries who put these aims into effect, as well as dealing with matters of membership, subscriptions to the *Bulletin*, and organising the lecture programme. This they have done by using their own initiative, working irregular hours from their own homes on a meagre honorarium and always tied to a tight budget. It is their loyalty and determination that has kept this modest Society alive and to whom special recognition is due. Members of the Society will have observed the hard work of Judith Littman and presently that of Carole Maraney.

The present Committee, under the guidance of its chairman Professor Hugh Williamson, continues to do its best to ensure that the Society serves as a firm platform, through its lecture programme and *Bulletin*, for the presentation to the

British public of the very latest archaeological discoveries being made in Israel and neighbouring countries. In these uncertain times the Society is always seeking new ways of exciting the interest of discerning members – academics and laymen – as well as to provide encouragement and stimulation for future generations of archaeologists in keeping with the original vision of Richard Barnett and his friends.

Acknowledgements

I am grateful to Professor Ben Segal and Carole Maraney for their comments on an earlier draft of this paper. All the factual information used has been derived from the Annual Reports, Minutes of the Executive Committee and from material published in the Society's *Bulletin*.

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and members of the Executive Committee

* = presently serving

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1986 Prof. J.B. Segal
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Daniel Sperber
*Fanny Vitto
Dr Michael Weitzman
Prof. Yigael Yadin (*while based in London, 1962*)
Claire Epstein (*while based in London, 1962*)

Bulletin of the Anglo-Israel Archaeological Society 2000 Volume 18

Post Mortem: A Late Prehistoric Site at Palmahim Quarry

ELIOT BRAUN

In memory of Aharon Sadeh

The road to Kibbutz Palmahim, just south of Tel Aviv, turns off from the highway linking Rishon le-Zion and Yavneh. Here the coastal plain is flat and wide and the road to the kibbutz, heading west towards the beach, winds its way through citrus groves, flat fields and occasional sand dunes covering low hills. As one approaches the coastline huge outcrops of calcareous sandstone (known locally as *kurkar*) obscure the view of the Mediterranean Sea. Before reaching the beach, the road crosses the Soreq Brook on its way to debouch into the surf of the sea about a kilometre away. Just across the newly constructed bridge, on the right hand side, is a large, open-field factory for making concrete spans; a little further along is the entrance to the kibbutz itself.

In fine weather most people will continue on for another kilometre or so to the beach, anxious to pass quickly by the foul smelling, noxious effluents flowing sluggishly in the narrow streambed. By stopping just a few score metres beyond the bridge and passing through a gate in the chain-link fence on the left, one would be on the way to see what now remains of the late prehistoric site of Palmahim Quarry. It is hardly worth a visit nowadays. What you do see, as you walk into the abandoned quarry is a massive pit gouged out of one of several *kurkar* ridges that parallel this segment of the coast (Orni and Efrat 1980: 41).

By climbing a sand-covered slope on the left one will reach the rim of a ridge that still rises more than a score of metres above the streambed. Here and there are some large clumps of reeds and grasses growing amidst the dunes and the ridge provides a good panoramic view of the surrounding area. Looking towards the west one can see the entire expanse of coastline from the giant smoke stacks of Ashqelon in the south to the skyscrapers of Tel Aviv in the north – set against the azure backdrop of the Mediterranean Sea. Nearby, to the southwest, are the massive outlines of the Middle Bronze Age ramparts of Yavneh Yam (Kaplan 1993) and a little further the promontory of the later classical *tell* is also visible. In closer proximity, across the road to the north, are sprawling fields filled with equipment, immense yellow cement pourers on rails, giant hoppers, and enormous *behemoth*-type bulldozers, all accoutrements of the concrete span factory where massive steel cables are inserted into moulds for concrete slabs. To the northwest is the green oasis of the kibbutz with its rambling buildings and protruding silos.

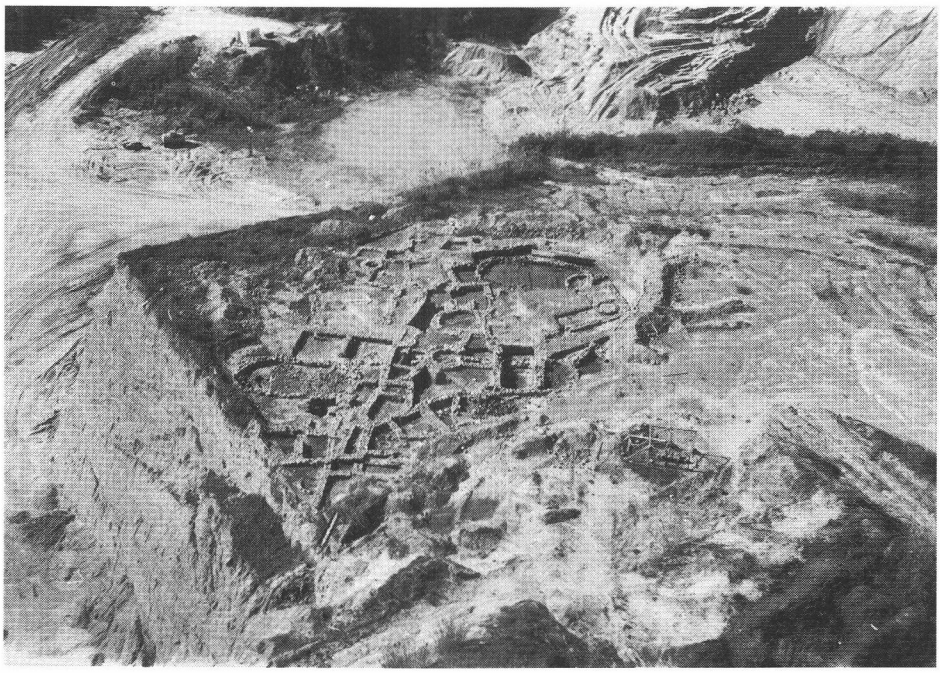

Fig. 1. An aerial view of Area B.

Looking down to the foot of the ridge, to the east and west, are deep and broad pits, with almost vertical walls cut in some parts to a height of more than 20 metres. The bottoms of the pits are stained with large patches of soil in places where bulldozers have cut down below the *kurkar* ridge into the rusty, red *hamra* subsoil below (Orni and Efrat 1980: 43). In winter large pools of fresh water are sometimes to be seen in which giant reeds and other plants grow; in the summer these same hollows may be totally desiccated. A decade ago the deeper portions of the quarry were visibly filled with rainwater and seeping groundwater that formed a small pond frequented by a variety of aquatic birds seeking shelter and food in this tiny oasis. When the warmth of the sun warmed them sufficiently, frogs croaked noisily and early every morning packs of jackals howled their atavistic responses to the reverberations of the eerie sounds of a factory whistle.

Those responsible for the enormous quarrying operations that transformed the *kurkar* ridge that originally towered over the flat, sandy littoral into an enormous artificial hollow with a seasonal pond, were not content to leave this place as an unofficial bird sanctuary for kingfishers and other aquatic fowl. Instead they have been filling this place with massive piles of cracked and broken segments of reinforced concrete spans, with their twisted, rusting cables protruding out of long grey slabs. These look as if they are the remains of collapsed buildings

resulting from a particularly violent earthquake, but in reality they are factory rejects; the quarry has become merely a convenient dumping ground.

What, you might ask is so special about a *kurkar* ridge that brings a field archaeologist like myself to bemoan its loss? Well, first of all, Israel is rapidly running out of its *kurkar* ridges. This sandstone is supposedly excellent as gravel material for road construction and it is particularly easy to quarry. Enormous bulldozers with massive steel blades and giant claws can easily rip across the face of this rock, with the rubble pushed into piles, loaded onto trucks and then hauled off to be steamrolled into the beds of roads. Such was the fate of much of this particular ridge but before this occurred it had first to be denuded of the immense sand dunes covering it. It was at this point in time that someone discovered that the top of this ridge had originally been home to ancient settlers in the region. The destruction of the *kurkar* ridges therefore also means the destruction of the archaeological sites on them.

It was during the early days of the quarrying operations at Palmahim, when much of the ridge still stood above the surrounding plain, that a large cavity was noticed in the side of the crumbling slope. Within was found evidence of a burial cave with material dating from the Chalcolithic and Early Bronze I (henceforth EB I) periods. Hence, for at least two decades before I came to work at the site, this particular *kurkar* ridge was clearly known to be not merely a pristine geological formation but also an antiquities site that was under the full protection of the law. Eventually, at least ten more tombs from these same periods were discovered, reported on and summarily destroyed through continued quarrying. No attempt was made to halt the destruction of the site.

A total of eleven tombs was reported and salvage operations were carried out within some of them by Ram Gophna (Gophna and Lifshitz 1980). However, we have no way of knowing how many others there might have been and were not reported to the Israel Department of Antiquities and Museums, which was then the statutory body responsible for the protection of archaeological sites. *Kurkar* was much needed and nothing was done about saving the site, although legal recourse was quite possible at the time. As a sop to archaeology a minimal budget was allotted for a minuscule sondage that indicated the existence of a succession of settlements dating to the Early Bronze Age in addition to the cemetery. The location of the site was duly noted on a plan (Gophna 1974: 115–117, Pl. 9–13) and then ignored by the operators of the quarry.

For a long time after that quarry operations were suspended with destruction concentrating on other *kurkar* ridges, but late in the 1980s business improved and the quarrying of the Palmahim ridge was renewed. On a serendipitous visit with students to the site, Gophna noted that in the process of clearing off more of the massive dunes that covered large parts of the ridge, a thin layer of dark brown soil, replete with potsherds, marine shells, animal bones, flint tools and ground-stone objects was exposed. This was a major portion of the settlement that he had previously documented in his sounding years earlier. Prompt notifica-

tion to the Israel Department of Antiquities and Museums finally brought a response that led to a small-scale salvage project.

The site and its environment

Several narrow ridges of *kurkar* run parallel to the coastline and form long sandy troughs along the edge of the Mediterranean littoral near Kibbutz Palmahim.[1] One of these, *ca.* 1 kilometre inland, is cut by the Soreq Brook. The Palmahim quarry site occupied a sizable area atop this commanding ridge on the south bank of the stream.

In ancient times water was probably plentiful in this area. At present there are no obvious springs near the *tell*, but it is likely that one or more water sources are now masked by the sewage that flows ceaselessly in the stream bed (Orni and Efrat 1980: 43). In addition, ground water is easily reached in the neighbourhood of the site (Orni and Efrat 1980: 43; see also above). There is also adequate rainfall in the area to ensure at least one winter crop.

When the site was inhabited the sand dunes that now cover large tracts in this broad littoral were far less extensive (Orni and Efrat 1980: 46).[2] The fields that surround the site and cover the wide plain to the east are eminently suitable for agriculture, as they must have been in ancient times. Thus, there is a clear economic basis for the succession of villages that capped this hill in late prehistoric times.

History of excavations

With the renewal of massive quarrying at the centre of the ridge Roni Reich (1988–9) conducted soundings in the worst mauled part of the site (later denoted as Area C). Although he was able to note evidence for several superimposed strata, the damage to this area was so extensive that its antiquities were beyond the point at which salvage work was possible. At his instigation salvage operations were initiated in a contiguous area where destruction was not so great.

It transpired that the surviving parts of the site to the west (one on each side of a great pit that had already been quarried), that had been denuded of their cover of sand, had not yet been ploughed by the giant teeth of the bulldozer and had only suffered from being artificially levelled by its massive blade. These areas were temporarily saved from quarrying and were subsequently investigated during several seasons of salvage work directed by the present author. The excavation of these areas provide us with some idea of the archaeological profile of this *kurkar* ridge.

Human utilization of the Palmahim quarry site

Three non-contiguous precincts of the site, labeled Areas A, B and D respectively and are described below. In addition, some minimal investigations were carried out in Area C.

Area A:

This was a large tract on the west side of the ridge that was denuded of a massive overburden of sand dunes and most of its archaeological deposits prior to the brief period allotted for its exploration. Only limited patches of a thin layer (up to 30 centimeters) of soil of high clay content, *nazaz*,[3] containing occupation debris above the *kurkar* bedrock had remained. Poorly preserved sherds, many of which had been literally smeared[4] into the bulldozer-burnished surface of the soil,[5] could not be dated with any accuracy. Some simple diagnostics suggest they derive from either Chalcolithic and/or Early Bronze I activities at the site.

Area B:

This was a large, rectangular area bounded on two sides by precisely cut, bulldozed cliffs, the result of modern quarrying (Fig. 1).[6] It proved to have the best preservation of remains at the site, with evidence of a number of occupational levels buried within a matrix of two distinct layers of soil. The upper, the same layer of *nazaz* encountered elsewhere, capped another, thicker layer of dark grey, friable soil (obviously with little clay content) in which preservation, especially of potsherds, proved to have been excellent.

Area C:

This large area was badly mauled by the bulldozer and most of the evidence of the settlement, known from contiguous Area A, was removed prior to our work. Amidst the crumbled sandstone debris, several pits were encountered in the underlying *kurkar* formation. They were excavated during a very brief season and are the earliest evidence for the utilization of this part of the site.

Area D:

This area was the continuation of Area C and was located at the far eastern side of the ridge. Prior to its excavation it was largely covered with a thin level of *nazaz*, while at least one pit was visible in the upper portion of the newly quarried bulldozer section. Bulldozer removal of the sand dune above had also badly mauled the remaining archaeological deposits of Area D. Notable in the crumbled debris was substantial evidence of mudbrick that appears to have been *in situ*. The better preserved patches of this area were excavated and yielded evidence for a number of poorly preserved walls with associated pottery that suggests they date to an early phase of EB I (see below).

The chronological and stratigraphical profile of the site

Three occupational levels and evidence for additional utilization of the site were encountered. They are discussed below, beginning with the earliest period.

A Late Neolithic presence:

The earliest evidence for human presence on the hill is found in a small number of flint tools of distinctive types that may be dated to the Late Neolithic period (i.e. the Pottery Neolithic; approximately fifth millennium BC). These artefacts were recovered from scattered fills in no particular concentration. They may be attributed to casual human activities on the hill in the remote past. So far, there is no contemporary pottery from this site, which suggests a relationship to another, nearby settlement (Perrot and Gopher 1996) dated to this same horizon that also lacks evidence for pottery. The suggestion is that these remains represent seasonal encampments rather than permanent settlements. In addition, there is a possibility that some pits cut into the underlying *kurkar* bedrock of the site may be associated with these early activities (see below).

Activity in the Chalcolithic horizon:

Evidence for considerable activity in the Chalcolithic horizon (i.e. Ghassulian-Beersheva facies; ca. late 5th to end of the first half of the 4th millennium BC) has been found in: 1) a number of tombs quarried into the bedrock (Gophna 1974: 38, 47, 50, 115, *passim*; Gophna and Lifshitz 1980); 2) small pockets of deposits containing material of this period encountered at the interface of bedrock and overlying soil layer; 3) stray finds, residual material, within the three occupational strata of the EB I period (see below). These last include flint tools, especially celts, sickle blades and potsherds, all typical *fossiles directeurs* of the Ghassulian-Beersheva horizon of the Chalcolithic period.

To date no direct evidence of a Chalcolithic settlement has been found at the site. However, the presence of eleven tombs with material from this period and not inconsequential quantities of artefacts strongly suggest a settlement must have existed either on the ridge or somewhere within its immediate proximity. Since such large areas of the site have been destroyed without any archaeological investigations, it is eminently possible that all non-portable traces of the Chalcolithic settlement have been obliterated.

The enigma of the pits:

Our first excavation was in Areas C and A during a few days of trial soundings. Walking over Area C, with its masses of piled chunks of bulldozer debris, the result of summarily halted quarrying, brought our attention to a number of dark patches of soil within the buff, bedrock matrix (Fig. 2). Clearance of the newly bulldozed surface of several of these discolorations proved them to have had regular, round plans, indicating they were deliberately quarried pits. Excavation of several of them showed them to be filled with soil replete with artefacts.

Eventually, throughout the entire excavation area that came under our scrutiny, scores of pits of different sizes and shapes cut into the *kurkar* were observed.

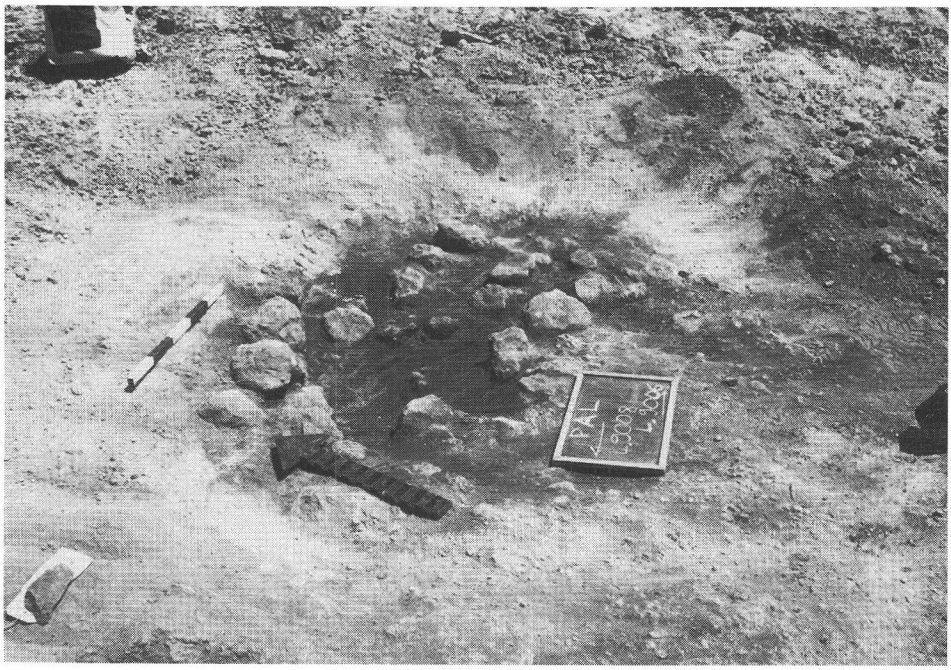

Fig. 2. A pit found in Area C.

Unfortunately, due to conditions beyond our control, only one pit was actually discovered in a proper excavation in a probe down to bedrock from the overlying archaeological layers; the remainder were exposed by bulldozers, after occupational strata had been sheared off to facilitate the quarrying of the *kurkar* beneath. In these last instances it was impossible to associate these pits with the overlying archaeological deposits.

The single pit discovered through proper excavation was bell-shaped, about 3 metres across. It was encountered next to a house of Stratum 3 (see below) and below a house of Stratum 2. It proved to be filled with soil containing material from the Chalcolithic and Early Bronze I periods. Neither its association with the house, nor anything of its function could be determined; thus, it remains, as with the rest of the pits excavated (see below), an enigma. When was it quarried and what was its function?

More than 10 additional pits were also encountered and excavated in Areas A and D. Some were obviously deeper than others, but none was fully preserved; the levels from which they had been quarried in ancient times had also been removed (i.e. bulldozed) prior to our work. Several pits were marked by only dark stains or shallow hollows filled with dark soil in the buff bedrock; others, better preserved, were bell-shaped or cylindrical in section. The best preserved proved to be almost 2 metres deep, with a narrow opening that extended out to

almost 3 metres in width, and then tapered to a narrower, rounded bottom. One shallow, cylindrical cavity, about 2 metres in diameter, had four small, round hollows at the bottom, similar to shallow cupmarks.

Most of the pits proved to have been filled with debris suggesting that they silted up after having been abandoned and left open. A non-primary utilization of one pit served for the interment of a single individual in a flexed position (Fig. 3). There was no evidence of accompanying grave goods. This burial appears to have been a fortuitous utilization of a pre-existing cavity; it lay on approximately 0.90 m of earthen fill above the bottom of the pit. Its dating is unknown; nothing in the fill below indicates even a *terminus post quem* for it. The options for its derivation are Neolithic, Chalcolithic or Early Bronze I. Although such burials are more common in the earlier horizons (e.g. Koeppel 1940: Pl. 27; Galili 1993: 122) they are not unknown in the Early Bronze I (e.g. Scheftelowitz 1992: 1*).

Several other pits appear to have been utilized for storage, as is indicated by the large portions of Early EB I pithoi found in them (Fig. 4). Unfortunately, they could not be definitively associated with the settlement above, because it had already been completely razed.

Stratum 3 – the early EB I village:

Area A produced the only reliable stratified sequence for the site. Although probed only in limited areas because of lack of time and resources, it indicates

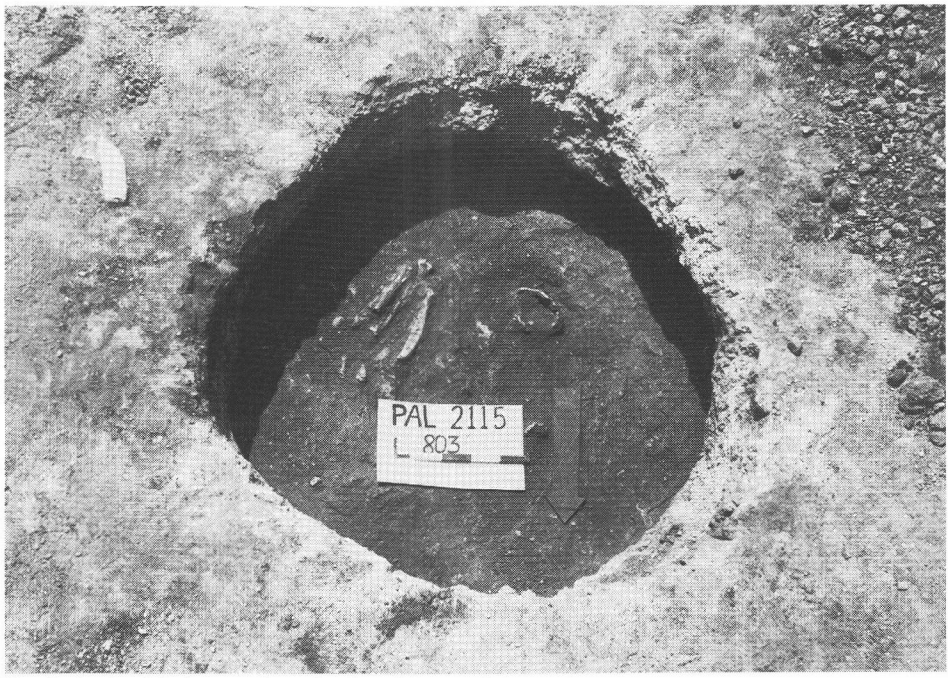

Fig. 3. A pit with the remains of a flexed human interment.

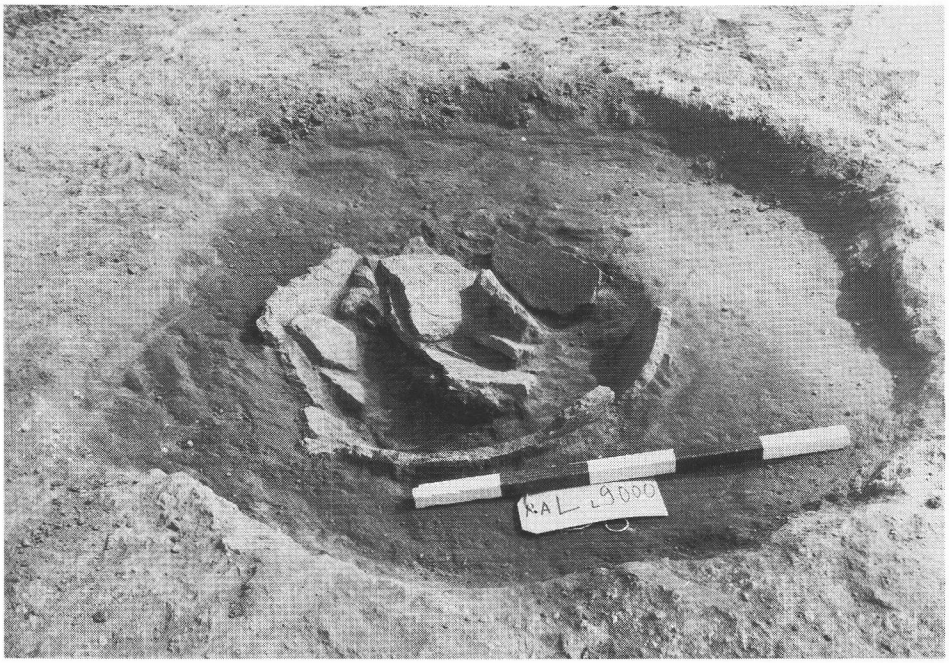

Fig. 4. A pit containing fragmentary EBI pithoi.

the existence of a village in an early phase of EB I. Two complete plans of sausage-shaped houses, typical of this period were unearthed. They are associated with deposits including ceramics that are crucial for an understanding of chronological and regional relationships within this time span (*ca.* 3500 BC).

The ceramic assemblage includes examples of Grey Burnished or 'Esdraelon Ware' (Wright 1958), pithoi of a type known from sites such as Yiftah'el II (e.g. Braun 1997: Figs. 9.15–9.20) and early southern region EB I pot-types that have a clear typological relationship to Chalcolithic potting traditions (Braun 2000). Examples of these two disparate traditions were found on floors within these structures. They are part of a missing link that allows us to correlate between initial phases of EB I in the south and its northern counterpart. In addition, this site provides important information on curvilinear architectural traditions in this early phase of EB I (Braun 1989) in a region in which they were hitherto unknown.

A Gap in Occupation:

Stratum 3 appears to have been abandoned and there seems to be no evidence for human activity in the middle phases of EB I on the ridge in the areas investigated. A distinctive pottery from the southern type-site of Tel Erani C (Kempinski and Gilead 1991) that marks this phase has, so far, not been encountered any-

where at Palmahim Quarry. Thus, given the radical change in architectural traditions between Strata 3 and 2, and the lack of evidence for pottery from a middle phase of EB I, the suggestion is that there is likely to have been a gap in occupation at the site within the horizon.

Strata 2 and 1– a late Early Bronze I village:

Two strata, representing continuity of a late EB I occupation, were unearthed wherever the bulldozer had not destroyed the archaeological layers. Close to 120[2] of these strata were exposed within the heavy layer of clayey *nazaz*. Budgets for these seasons were minimal and the strenuous task of digging in this rock-hard soil was done entirely by volunteers under rigorous conditions. The archaeological community owes a major debt to them for helping to expose these important remains. While the structures of these levels were well preserved, the pottery was in a considerably lesser state of preservation because of the salt and moisture that had penetrated this layer.[7]

The late EB I architecture of Stratum 2 (see below), following rectilinear precepts, appears to represent a wholly new settlement at the site after Stratum 3 was abandoned. What was obviously a village of sizeable proportions was represented by a densely inhabited quarter notable for the organization of its buildings into large compounds of small, mutually accessible rooms. These composite structures had only limited access from without, through a single doorway, indicating they were somewhat self-contained units; perhaps dwellings of extended families or other social groupings.

Narrow lanes wound their way through this village. One extends to the edge of what was then a newly cut cliff that abruptly truncated the plan of this 5000-year old settlement on the east side. Now the cliff is much further to the west and the exposed portion of the site no longer exists, it has been completely quarried away. Quarrying did not only remove the excavated portion of this village, but also took away a further ten-metre wide strip of the contiguous, unexcavated precinct of the site, in express contravention of the excavator's recommendations. Today, a narrow strip of this settlement still survives on the extant rim of the ridge, but if ever there are renewed excavations, no direct associations could be made between the plans of houses that were unearthed and those that may be found in the future. We may always wonder what was lost in this unexplored ten-metre strip of land.

Artefacts associated with this village include typical flint tools (e.g. Canaanean blades: Rosen 1983) and ceramics that date it to the final phases of EB I. Ceramic vessel types are typically southern, with parallels at a number of other sites including Arad, Stratum 4 (e.g. Amiran 1978: Plates 7–11) and Jericho (e.g. Kenyon and Holland 1983: Figs. 79,89).

One special find, on the floor of a Stratum 2 broadroom, is a large fragment of a storage jar that was locally made. Its rim is of a type apparently modelled after Egyptian wine jars of the Proto-Dynastic period. This particular vessel is

unique at Palmahim Quarry and has a *serekh* (a stylized Egyptian royal symbol) incised into it before firing. E. C. M. van den Brink (Braun and van den Brink 1998) dates it early within Dynasty 0, on the basis of style and the lack of name in the upper register.[8]

An intricate web of data enables us to link this find and chronologically to correlate these phases of Strata 2 and 1 (i.e. Late EB I) in the south with Egyptian relative chronology. In addition, Palmahim Quarry is one of a series of sites exhibiting overwhelmingly indigenous EB I material culture that stands in marked contrast (Braun in press a; in press b; in press c) to sites such as 'En Besor (Gophna 1995) and Tell es-Sakan (de Miroschedji and Sadek 2000a; 2000b) that appear during this same time span to be Egyptian colonies, probably mostly populated by people from the Nile Valley. Notably, there are perhaps one or two Egyptian imports and a mere handful of Egyptian related artefacts in a substantial assemblage that may best be described as overwhelmingly local in character.

Stratum 1, the very latest settlement on the ridge, continues the material culture traditions of Stratum 2 and, if anything, seems to have been even more crowded. The picture we have of this village is one with houses encroaching on even the narrow lanes as well as additions to earlier structures with slightly raised floor levels. The settlement appears to have been abandoned sometime before the onset of EB II; there is not even one sherd of pottery from this latter period (e.g. Amiran 1969: 58–66) reported from anywhere on the site.

A Site Abandoned:

The end of the Stratum 1 settlement saw the *kurkar* ridge completely abandoned. Later settlements in the region are positioned closer to the shoreline. With time the dunes came and covered the ridge and much of the surrounding area. This brief episode in late prehistoric settlement remained forgotten until its rude discovery through quarrying in the middle 20th century.

Palmahim Quarry – an archaeological tragedy

Today Areas A-D of Palmahim Quarry and a strip of at least 10 metres that still remains of the site after the area was released for quarrying, represent enormous gaps in the skeleton of this once massive ridge. The sprawling site, many times larger than the maximal exposure of *ca.* 2000^2 metres of the archaeological record is now lost forevermore. We will never know how large it originally was. The invaluable and irreplaceable information that is lost could have shed enormous light on the late prehistory of the coast south of Tel Aviv, of the southern littoral of the Mediterranean and of the southern Levant in the 5th and 4th millennia BC. What remains is an immense gap in a natural feature, scarred and defiled with

modern debris and an even more enormous gap in our understanding of the archaeological record.

This ridge once contained extensive remains of an EB I village and more ancient deposits with important information on lifestyles, subsistence economies, architectural traditions, burial practices, artistic tastes and the intricacy of early connections and correlations with the Nile Valley. All that, and more were bulldozed away so as to provide material on which to lay modern asphalt roads!

Very little of the site remains, and nothing is visible on its surface, but if one visits the museum at Kibbutz Palmahim, Beit Miriam, you will see a small display of artefacts from the several excavations of the site, alongside displays on additional sites in the region. Moreover, S. Lifshitz has created models of some of the better-preserved and more interesting houses of this village that will be eventually placed on permanent display. The museum, the fruits of a labour of love by a small group of dedicated kibbutz members who see a value in preserving reminders of the past, is in itself something of an anomaly, for this same kibbutz also has a controlling interest in the company that runs the quarry and the cement span factory. Their profits provided the infrastructure, support the staff and maintain the museum.

The case of the site of Palmahim Quarry reflects the dilemma of modern (over?) development versus the protection of the environment, its natural and its man-made heritage. It is only one of hundreds of sites that have been erased, partially and sometimes even completely from the archaeological record in Israel. It is a trend that is repeated the world over and for the writer of these lines, a dedicated field archaeologist, it represents a tragedy that in large part could have been avoided. Our loss in this instance is incalculable; what we will lose in the future, in a rapidly shrinking archaeological record, is a tragedy about to happen.

Notes

1 This is part of a much larger, geological formation visible along lengthy segments of the coast of Israel and the Gaza Strip (Orni and Efrat 1980: 41).

2 At the time of excavation (1988–1991) an overburden of dunes shrouded a generally thin (less than 1.0 metre) layer of dark brown soil blanketing the *kurkar* ridge.

3 *Nazaz* is the local name for a dark brown soil formed by clay precipitating from sand and mixing with topsoil (Orni and Efrat 1980: 43; Ravikovitch 1981: 27) to form an almost impervious layer (see note 7).

4 The deleterious action of this water-logged soil layer with high salt content caused most of the sherds to lose their cohesion. When wet they were merely orange and brown stains within the harder soil matrix and could not be removed without totally disintegrating. When dry they had to be removed in rock-hard clumps of soil and often they crumbled into minuscule pieces of unrecognizable morphology.

5 The smooth metal of the blades created shiny burnished surfaces on the soil with its high clay content.

6 The quarrying process is simple. The bulldozer, one of the larger types with monster blade, traverses the *kurkar* ridge over and over again in swaths, taking approximately 40 centimeters in depth each time. This rock is basically little more than compressed sand and it crumbles easily against such a *behemoth*-creature that sheers it off almost cleanly,

leaving a stable, almost vertical cliff. In this quarry these cliff faces are sometimes more than twenty metres high.

7 Pottery in the earlier EB I remained better preserved because the *nazaz*, with its clay content effectively sealed off the percolation of salt and moisture (Orni and Efrat 1980: 43).

8 This upper register is often called the 'name compartment' because in later examples the hieroglyph Horus name of the king appears within it.

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A Sacred Tree in the Chalcolithic Shrine at En Gedi: A Suggestion

AMIHAI MAZAR

Sacred trees were always an important component of religious practice in the ancient Near East, as well as in other cultures world-wide, as is apparent from a wealth of iconographic and textual sources. In the Bible, for example, sacred trees are frequently mentioned as one of the foreign, non-Israelite symbols of worship that are condemned (Deut. 12:2; 28:36; 1 Kings 14:23; 2 Kings 17:10; Jer. 17:2; Ezek. 6:13; 20:28). Numerous studies have been devoted to the iconography of the sacred tree in the ancient Near East and many scholars relate it to a fertility goddess, more specifically, to Asherah, although this identification is under dispute (for a recent discussion referring to previous literature see Keel 1998: 16–57; Keel and Uehlinger 1998 *passim* [see index under 'tree']); on the debate concerning the identification of the tree with Asherah see specifically Keel 1998: 16–17). Sacred trees continued to constitute an essential component of sacred places in this region until recently, as demonstrated by the numerous sacred trees in Islamic Palestine found in association with holy tombs and other sacred shrines or as isolated sacred trees, unrelated to a shrine (Canaan 1927: 30–38; 69–73). Sacred trees are well known in all other cultures of the Mediterranean and Near Eastern world, as well as in ancient and contemporary cultures of the Far East. They have been and continue to be one of the most basic features of human religion in many cultures and periods.

The actual remains of ancient sacred trees at cultic sites have been found on rare occasions, but their identification as such remains dubious (e.g., in the Lachish Stratum V sanctuary, Aharoni 1975:30). Nevertheless, it can be surmised that sacred trees stood in the spacious courtyards in front of Canaanite temples, as well as in open-air sanctuaries.[1] In the publication of the 12th century BC 'Bull Site' (Daharat et-Tawileh), I suggested that a sacred tree stood at the centre of the 21 m diameter stone circle that comprises this sacred site (Mazar 1982; 1999b; see also Zertal 1992). The location of a standing stone (*masseba*) within the circle, but not at its centre, hints that it was placed beside a tree that stood at the centre of the circle (for an imaginative reconstruction based on this line of argument see Zwickel 1999: Taf. 3b). In other cases, the location of sacred trees can only be conjectured, for example, in the centre of the Iron Age II sacred area located on a ridge southeast of Samaria (Crowfoot, Kenyon and Sukenik 1942: 23–24).

The following proposes the possible presence of such a sacred tree in the Chalcolithic sanctuary at En Gedi, one of the most extraordinary and enigmatic structures from the Chalcolithic period found in Israel. The sanctuary was excavated in 1962 in the framework of the En Gedi expedition directed by B. Mazar. The excavation was supervised by D. Ussishkin, who subsequently published the final report (Ussishkin 1980).

I propose an alternative explanation for one of the most prominent features of this complex: the circular installation at the centre of the courtyard. The installation (Ussishkin 1980: 5, Fig.3; 11, Pl. 4:2–3) was interpreted by the excavators as a basin associated with a water ritual (Ussishkin 1980: 11, 34–35) (Figs.1–2). They assumed that the installation was drained by a channel leading to a drainage opening in the outer perimeter wall of the courtyard. Such a channel was inserted with a dotted line in an isometric reconstruction of the sanctuary that is often reproduced (Ussishkin 1980: 6, Fig. 4), but according to the report, the remains of a channel were never in fact found. Several visits to the site have convinced me that the basin theory has no reliable basis. The installation is three metres in diameter and its inner hollow part (Locus 405) is 0.85–0.90 m in diameter. No plaster was found on the inner surfaces of the installation and thus there is no indication that it served as a basin for holding liquids. The inner part of the installation is lined with seven large, flat stones standing on their narrow sides. Close observation reveals that the seven inner stones creating the inner circle

Fig. 1. Circular installation at En Gedi (photo by author taken in 1999).

Fig. 2. Circular installation at En Gedi (Photo by author taken in 1999).

lean somewhat towards the centre. It appears to me that these stones were constructed around something that is now missing. The circular platform around these stones gradually descends outwards, with ca 0.25 m difference in elevation between the top of its innermost and that of its outermost edge. In my opinion, this installation is not a basin at all, but rather, a raised platform constructed at the highest point of the sanctuary, encircling something that stood at the centre, which could well have been a sacred tree. Thus, it can be suggested that a sacred tree with a stone platform built around it stood at the centre of the sanctuary (Fig.3). Stone platforms built around sacred trees are a well known cultic feature in many cultures. In the Middle East, there are many such platforms surrounding sacred trees often associated with *welis* – the Islamic shrines related to tombs of holy people – or in other sacred places. One example is the old oak tree located north of Hebron that is identified in Moslem tradition with Abraham's oak (Hepper and Gibson 1994: 99, Fig. 3; 101, Fig. 4). In other Mediterranean countries, sacred trees encircled by stone platforms are common in various Christian and Islamic holy places. In the Far East, such platforms are found around sacred banyan ('Bodhi') trees, and serve as places for Buddhist worshippers to make offerings. In the archaeological record, it is rare to find such platforms. The trees have long disappeared, and the platforms are barely preserved or recognizable as such. A closer examination of various sacred sites, however, may reveal such platforms.

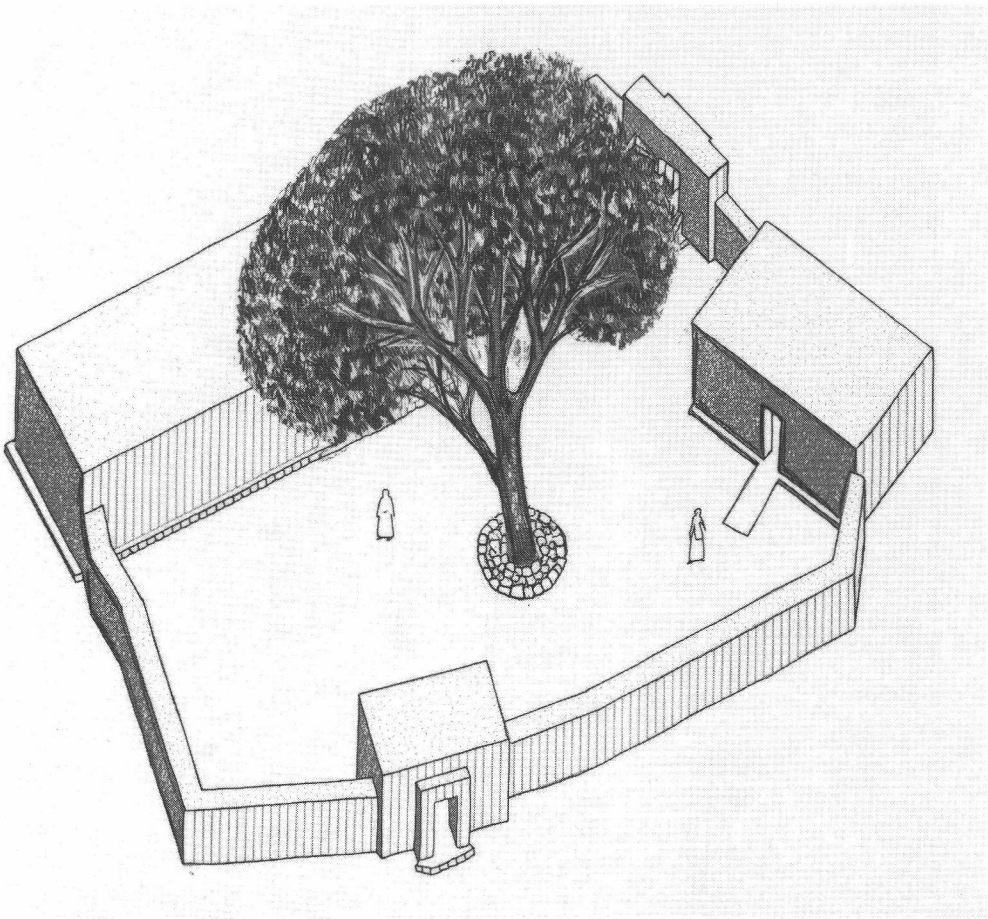

Fig. 3. Reconstruction of the En Gedi sanctuary with a sacred tree (drawing: Sarah Halbreich).

Today, the rock scarp and slopes in the vicinity of the En Gedi Chalcolithic temple are arid and bare of trees. However, 150 m to the south of and 30 m lower than the temple is the En Gedi spring, one of the most important water sources in the En Gedi oasis, and large trees grow around the spring. It is possible that the somewhat more humid conditions during the Chalcolithic period enabled trees to grow at a higher elevation than that of the present-day spring. The En Gedi oasis is one of the rare enclaves of a specific vegetation type defined by Zohari as 'Sudanian-Decanian' (1955: 438–441). It can be conjectured that, like today, rare trees grew in this area, and that a particularly large tree located on the high rock plateau close to and just above the spring of En Gedi and overlooking the entire oasis became sacred to the Chalcolithic population. The tree

perhaps constituted the focal cultic point of the sanctuary, with the temple building to its north serving for rituals, ceremonies, making offerings, etc.

One problem with this suggestion is the almost complete lack of tree depictions in Chalcolithic art, which may reduce the validity of my argument. One exception is a schematic tree painted on a pottery vessel from Tepe Gawra Strata XI-IX (the Uruk period), which appears beside a painting of ritual dancers (Tobler 1950: Pl. CXLV:398).[2]

If my interpretation is correct, the En Gedi sanctuary would be the earliest example of a sacred tree associated with a shrine in the ancient Near East. This interpretation, together with other considerations, rule out the comparison between the En Gedi temple and the Sin Temple at Khafaje as proposed by Kempinski (1972). At Khafaje, a ritual basin was indeed located in the courtyard, but the installation at En Gedi is not an acceptable parallel for this basin. Kempinki's comparison must also be rejected on the basis of the completely different architectural concepts of the main building plan at the two sites (a bent axis building at Khafaje, as opposed to a broad room temple at En Gedi).

Thus far, no Chalcolithic settlement has been found in the En Gedi area, despite the long ongoing excavations in various parts of the oasis. Chalcolithic remains were found in numerous caves in the Judean Desert, which were probably inhabited by shepherds. The sophistication of the sanctuary's plan and the possibility that the Nahal Mishmar hoard was related to this sanctuary (Ussishkin 1980: 38–41) suggest that the En Gedi temple was not constructed by the poor local community of scattered desert dwellers. Rather, the site should be seen as a pilgrimage sanctuary, that is, an isolated temple at a sacred site (Ussishkin 1980:34). The builders of and worshippers at this sanctuary could have come (on foot or by boat) from as a far away as Teleilat Ghassul, close to the northeastern shore of the Dead Sea, and pilgrims could also have come from Chalcolithic settlements in southern Palestine, such as those in the Beersheba region.

Notes

1 In two sanctuaries that I excavated we found postholes, about 0.15 m in diameter, in the tops of raised platforms which constituted the most sacred parts of the sanctuaries. The first was in a shrine in Stratum R2 at Tel Beth Shean (Late Bronze I) and the second in a raised platform with standing stones at Tel Rehov (10th–9th centuries BC). See Mazar 1993: 608–610, Figs. 2–4 (the wooden pillar has been reconstructed in Fig. 4); Mazar 1999a: 4–26 (yet the posthole was not mentioned in this report). In these two cases the postholes might be evidence for vertical beams symbolizing Ashera.

2 My thanks to Y. Garfinkel for this reference.

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Problems of Identifying Social Regimes in the Dead Sea Basin – When Sites Become 'Visible'

ILYA BERELOV

The recognition and interpretation of non-sedentary activity in the archaeological record has been the subject of fierce disagreement for some time (Cribb 1991). Since non-sedentary social regimes are common to the ancient and modern Near East, this issue has received frequent attention from archaeologists working in the region. The marginal areas of the southern Levant are particularly relevant to these discussions by providing archaeological illustrations of the non-sedentary phenomenon in the form of both seasonal settlements and tombs. There remains a substantial challenge in the correlation of this material with models of non-sedentary behaviour founded on both archaeological praxis and ethnographic data. This paper will attempt to briefly discuss some of these problems in special reference to the Dead Sea basin in south Jordan during the Bronze Age.

The theoretical background

Non-sedentism as a distinct social regime from sedentism has been traditionally equated with nomadism. In recent times several authors have revised this approach in view of the restrictions of the earlier definition. There are in fact very few examples of 'pure' nomadism, with most non-sedentary groups practising a combination of pastoralism with seasonal agriculture (Bar-Yosef and Khazanov 1992). This is especially true of the southern Levant, where perennial springs have made seasonal agriculture and dry farming possible since the beginnings of agriculture and the domestication of animals in the Neolithic period (Levy 1992; Prag 1992). Furthermore, it is argued that the conditions of the southern Levant make the survival of non-sedentary groups in isolation from sedentary societies, almost impossible. The interaction between the two systems is almost seen as a necessary condition for the survival of non-sedentary groups, which supplement their dietary requirements with produce obtained from the sedentary villages and towns. In return they provide these settlements with meat and secondary products such as milk and wool (Khazanov 1984). It would therefore be more accurate to refer to these non-sedentary people as pastoral nomads. The extent to which these pastoral nomads practise agriculture on the one hand, or content themselves

mainly with pastoralism on the other, varies considerably between regions, the prevailing environmental conditions, and the periods in question (Finkelstein 1995). All of this, together with the problem of the variable visibility of such activities, makes the archaeological investigation of these themes difficult, particularly with respect to definitions and interpretations.

On the basis of their inter-dependence, sedentary and non-sedentary groups were cast into an oppositional model, which Rowton termed Dimorphism (Rowton 1977). This model envisaged the existence of non-sedentary groups practising pastoralism on one extreme, and sedentary settlements practising agriculture on the other. This encouraged the segregation of archaeological investigations into two categories: those interested in urbanism in one camp, and those interested in nomadic-pastoralism in the other. Banning recognised this problem, especially as it related to surveying methods and techniques (Banning 1986). He reasoned that pastoral nomads were often overlooked in the archaeological record because their 'signature' was ignored by archaeologists mostly concerned with the study of permanent, settled towns. On the basis of his participation in a survey conducted by Burton Macdonald south of the Wadi Hasa in south Jordan (Macdonald 1992), Banning argued that pastoral nomads were indeed archaeologically present in places where they were not supposed to be. Banning's 'mutualism' – which suggested that there were two groups responsible for the evidences seen in the archaeological record – contended that the continued belief in a segregated society where hostile nomads traversed the marginal lands, and Roman garrisons guarded the boundaries to the settled lands, was untenable. By showing that nomadic pastoral groups resided amongst the settled boundaries enclosed by Roman forts, Banning in effect called for a refutation of Rowton's strict dimorphic model.

Banning's paper was soon followed by a response from S. T. Parker. Parker argued (Parker 1987) that there was considerable epigraphic evidence from the period, which supported the old settlement model of nomads on the margins and agriculturalists in the fertile areas. Interestingly, Parker also correctly reasoned that in all probability, more than two groups were responsible for the evidences seen in the archaeological record. This point was taken by Banning in his subsequent response to Parker (Banning 1987), and was re-emphasised in terms of the problem of correctly interpreting the exact nature of the activity. Settlements and their material remains could in fact be a combination of these two social regimes.

These observations set the scene for another set of exchanges, but this time between Israel Finkelstein and Steven Rosen. Finkelstein and Perevolotsky extended the boundaries of the debate by suggesting that it was naive to think that 'gaps' in the archaeological record amounted to human 'voids' (Finkelstein and Prevolotsky 1990). This observation was made in reference to the marginal regions of the Negev and the Sinai, which show such hiatuses, particularly in the Middle and Late Bronze Ages. The authors argued that people were always present in those parts of the Levant, but were made archaeologically invisible by

their more extreme form of nomadism. It is reasoned that material culture will increase as the social regime moves further away from pure nomadism in the direction of sedentism and agriculture in accordance with a polymorphous society (Lemche 1985) that is neither strictly nomadic nor sedentary. These fluctuations are dependent upon changing economic, political, social, and environmental conditions. This idea was supported by ample historical evidence, which records the existence of nomadic groups that are absent in the archaeological record.

This view precipitated a response from Rosen, who partially chose to take a position similar to Banning's (Rosen 1992). Rosen argued that if correct survey methods are used, that even hunter-gathers could be identified in the archaeological record. This suggests that in all probability, the regions concerned were in fact empty of human life, or at the very least, represented a significant decrease in the human population. A series of exchanges followed in the same vein (see for example Finkelstein 1992, 1995; Rosen forthcoming).

The problem of identifying non-sedentism is treated from an ethnographic perspective by R. Cribb (Cribb 1991), who follows in the tradition of Hole's work in Iran (Hole 1978). Cribb argues that it is certainly not impossible to identify nomadic activity in the archaeological record, but warns against simplistic interpretations. Ethnographic observations show an apparent overlap in the material culture of nomadic and settled groups, which makes the interpretation of these extremely problematic. This is especially the case with sites that are subject to conditions of poor preservation where faunal remains cannot help the archaeologist in their interpretation of social regimes. Various suggestions have been advanced in a bid to minimise the reliance on faunal analysis, but these must be treated carefully and as a case-by-case proposition (Chang and Koster 1986).

The Dead Sea basin in the Middle Bronze Age: a case study

The Dead Sea plain (Fig. 1), located on the eastern side of the Dead Sea, experienced an acute depopulation during the latter part of the Early Bronze Age. Early Bronze III and some Early Bronze IV (MB I) remains are in evidence at Bab edh-Dhra', but are lacking at other Early Bronze Age centres such as Numeira, and Feifa (Broshi and Gophna 1986). A general desiccation in the region (Frumkin 1994), political turmoil, or social upheaval (Richard 1987) variously explained this. Early Bronze IV (2250–2000 BC) was seen as an intrusive non-urban element in the southern Levant that was concentrated in marginal zones such as the Negev desert and modern Jordan (Dever 1970). Recent excavations at Tell abu en-Ni'aj (Falconer and Magness-Gardiner 1989), Iskander (Richard 1987), and Iktanu (Prag 1989), together with the discovery of several small village sites in the north of Palestine (Dever 1998), has added complexity to the notion that there was not a complete depopulation of the fertile areas, but rather a change in social organisation. Early Bronze IV is now viewed as a rural period of transition generally in the southern Levant (Dever 1970). However, it is then

Fig. 1. Location Map.

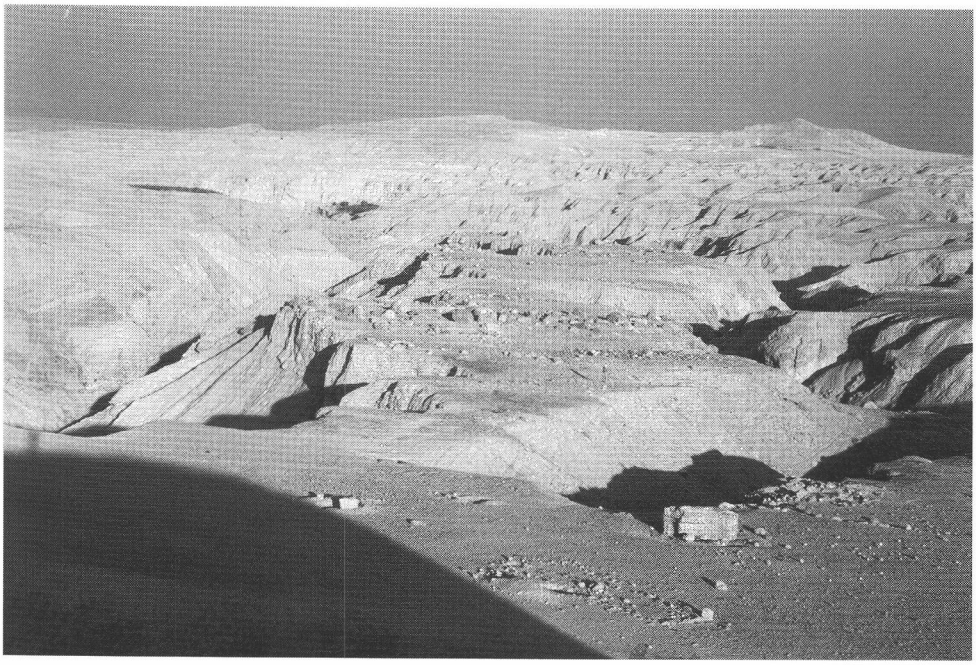

Fig. 2. General view of Zahrat adh-Dhra 1 looking west.

still difficult to explain the relative absence of this cultural horizon in the Dead Sea Plain (excluding Bab edh-Dhra') even though there is some evidence of it on the plateau to the east (Miller 1979). Middle Bronze II (2000–1500 BC), a period of regeneration of urban life in the southern Levant, was also absent in the region, which shows virtually no settlement until the late Iron Age (Broshi and Gophna 1986).

In 1989, K Politis began excavating at the monastery of St. Lot at Dayr Ayn-'Abata' near modern-day es-Safi, and discovered an extensive arrangement of cairn tombs on the slope of the hill below his Byzantine site (Politis 1997). The tombs were largely dated to the Middle Bronze Age on the basis of the ceramic material. No accompanying settlement was ever discovered. The discovery of these tombs raised two major possibilities. They either belonged to a settlement that was not visible, or they were the products of a non-sedentary group that returned seasonally to bury their dead. The latter assumption is based on an idea that was largely propounded by W. G. Dever in the 1970s in reference to Early Bronze IV tombs (Dever 1970). Since many Early Bronze IV cemeteries lacked clearly associated settlements Dever assumed that the tombs, which contained the remains of predominantly disarticulated human skeletons, belonged to a non-sedentary population. The idea was easily applied to large village mound sites such as Lachish, Ajjul and Megiddo where Early Bronze IV tombs were found but a settlement was lacking, and was later posited as a cultural norm. For

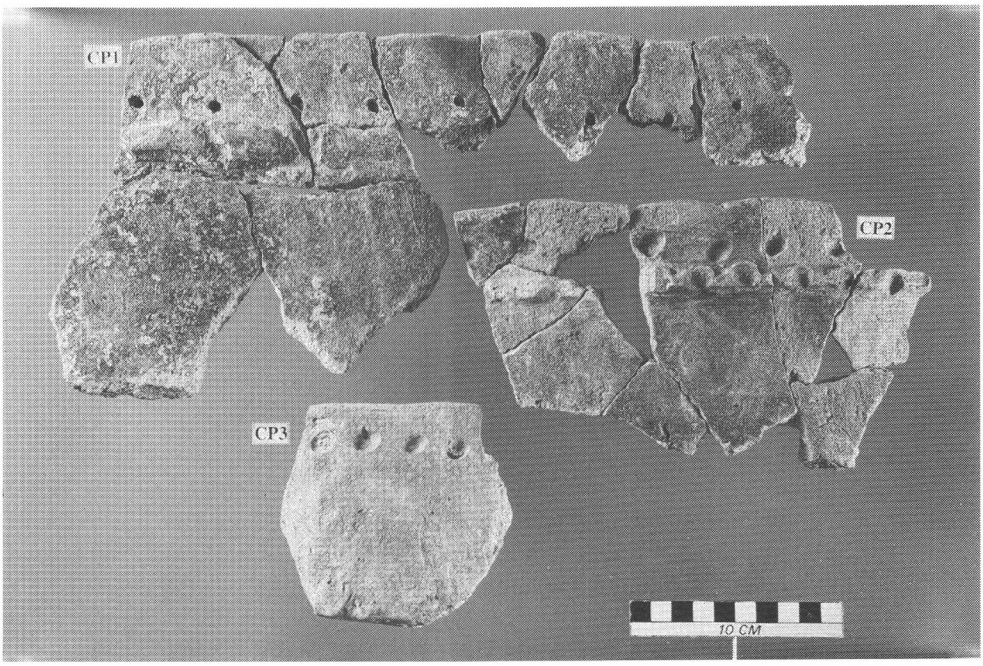

Fig. 3. Middle Bronze II cooking vessels.

instance Dever used it to explain the tombs he discovered in the Hebron Hills in order to relate it typologically to Beir Resisim in the Negev highlands (Dever 1980).

In 1989 hydro-geologist Philip Macumber discovered a settlement covering an area of twelve hectares in the plain of Dhra' (Edwards et al 1998). Like Dayr Ayn-'Abata' (DAA) the site was dated to the Middle Bronze II, but no accompanying tombs were found. The site – later named Zahrat adh-Dhra' 1 (ZAD 1) – was thought to have been a non-sedentary agro-pastoral settlement on the basis of its shallow cultural deposits and the unagglomerated arrangement of its architecture (Figure 2). Excavations revealed one or two phases of use, and an impoverished ceramic assemblage consisting predominantly of cooking wares. The spatial distribution of artefacts showed no distinction of social rank, and these features seemed to confirm the notion of a short period of occupation by a non-sedentary group (Edwards *et al* forthcoming; Falconer *et al* forthcoming).

Discussion

The discoveries of ZAD 1 and DAA transformed the established spatial model of the Middle Bronze Age in the southern Levant. Surveys in the Dead Sea Basin from the time of Nelson Glueck did not identify any Middle Bronze II remains (Glueck 1970; Rast and Schaub 1974; Worshech 1985). But the discoveries of

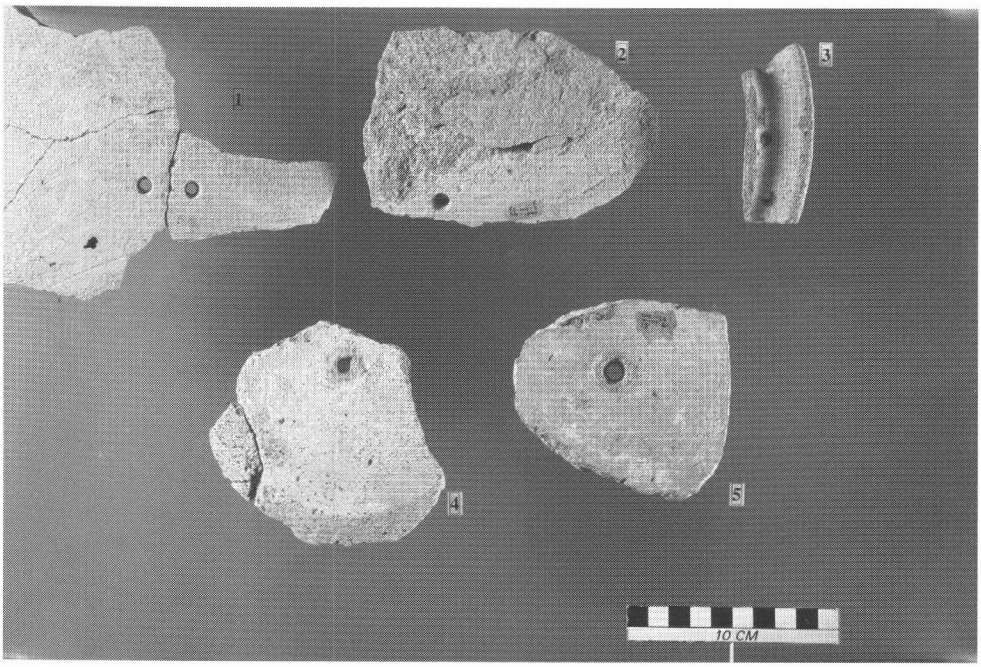

Fig. 4. Jar bases with perforations (lower two).

ZAD 1 and DAA also raised some theoretical questions. Namely, just how invisible are archaeological settlements? And how can we confidently interpret sites as non-sedentary; what is the logical basis for this assumption? In other words, in a 'polymorphous' structure of society, what space does ZAD 1 occupy? And does its discovery support Rosen and Banning's improved survey methodology, or Finkelstein's notion that the idea of a completely depopulated region at any one time is false?

A comparison between the two sites is revealing on two fronts. Firstly we may say that they are culturally related on the basis of the ceramic material. Specific mention must be made of the classic Middle Bronze II cooking vessels, which at both sites preserve the same shape and decoration (Figure 3) (Edwards *et al* forthcoming; Politis forthcoming). Neither site contains examples of vessels with completely pierced holes below the rim common to the first part of the MB II, nor rope decoration, which sits on the rim as one finds in late Middle Bronze IIB onwards (Gerstenblith 1983). Also both sites contain examples of jars with a perforated base (Figure 4). Such vessels are known at other sites in the Levant during the Middle and Late Bronze Ages (Curvers and Schwartz 1997; Dornemann 1981), but their exact function is still debatable, and they can still be said to be relatively rare.

Secondly, in contrast with the first point, the composition, or relative proportion of vessels at the two sites is quite different. The settlement site is composed

predominantly of cooking vessels, with jars making up the rest of the assemblage, whilst bowls are virtually non-existent (Edwards *et al* forthcoming; Berelov 2001). The reverse is true of the cemetery site, which contains only a few examples of cooking vessels found outside the tombs, but is abundant in bowls, whilst jars are not over-represented (Politis forthcoming; Collins – personal communication). It is therefore clear that whilst we may relate the two sites by typological means, it is another thing to relate them conclusively. This is borne out by the fact that although abundant cooking ware is common at seasonal settlement sites but not so in tombs (Gitin 1975), vessels that are found in tombs but are totally absent in the settlement is an unusual scenario. This point is particularly relevant to EB IV tomb assemblages, which are mostly composed of utilitarian vessels (Dever 1987). Although this raises questions over the exact nature of cultural connections between these two sites, we can be reasonably confidant that both sites represent some form of cultural intrusion or innovation in the region. Not wishing to enter into the debate on Early Bronze IV and Middle Bronze II migrations, it is still reasonable to say that ZAD 1 and DAA represent a cultural break with the preceding Early Bronze III and IV culture of the Dead Sea basin. This is asserted on the basis of a complete absence of Middle Bronze II material at the Bab edh-Dhra' cemetery which is predominantly of a rock-cut type. Middle Bronze II re-use of Early Bronze IV tombs is known at Jericho, Megiddo, Gibeon, and Jebel Qa'aqir (Dever 1975), and the lack of this practise in the basin is conspicuous. Furthermore, the cairn tombs at DAA follow a general increase in built tombs during the Middle Bronze II in direct contrast to the Early Bronze cave burials, particularly in the cave of St. Lot (Politis 1997). Built 'Charnel Houses' for the dead were excavated at Early Bronze Age Bab edh-Dhra', but they constitute a minority and are of a different design (Schaub and Rast 1989). Burial customs are traditionally seen as one of the most conservative and inflexible aspects of a society (Ilan 1996), and do not usually change but for a serious reorganization of other social practices (Binford 1971).

It is interesting to note that whilst much has been written about Early Bronze IV settlements and tombs (Dever 1987), the author is unaware of any serious attempts to compare the relative occurrence of vessels in tombs that also appear at settlements. This point is made in special reference to seasonal sites, which should show some difference when compared to sedentary examples. In other words, is it reasonable to assume that non-sedentary people carried vessels that are never part of their archaeological 'signature' except in tombs? Early Bronze IV tombs show a fairly restrictive repertoire that may imply a need for portability (Dever 1975). This phenomenon, however, does not appear to be supported by the medium, handless jars and large elaborate bowls at DAA (Politis forthcoming), in contrast to the generally smaller vessels found in EB IV tombs (Dever 1987). This raises the possibility that there is another settlement site near DAA, to which it is related, but due to modern building or other factors, it remains invisible. This scenario was exemplified by the discovery of Manahat (Edelstein *et al* 1998) in the Rephaim Valley on the outskirts of Jerusalem, whose

extensive Middle Bronze Age I and II remains were not visible in any form above the colluvium. The discovery of Middle Bronze Age tombs in the Rephaim Valley fulfils most criteria in being connected to the settlement of Manahat. And yet if the tombs were found in isolation, a non-sedentary group would probably have been suggested as their cause.

Ethnographic data certainly confirms the notion that Bedouin travelled seasonally to a permanent cemetery (Prag 1992, 1991), and it is therefore not inconceivable that people travelled the twenty-five kilometres from ZAD 1 to DAA in order to bury their dead. However, one would expect the cemetery site to be near one of the seasonal sites and not somewhere in between, an issue casually side-stepped in many discussions of Early Bronze IV cemeteries. The problem with this scenario is that horizontal migrations are not common to this area. Tribes normally migrate vertically to find food for their flocks on the plateau during the summer and to the valley in the winter following a transhumance model (Levy 1992; Lewis 1987; Prag 1992). This would lead to the suggestion that the inhabitants of ZAD 1 either moved between the plateau and the Valley below, and used the DAA cemetery as their regular burial ground, or lived at ZAD 1 permanently and travelled to DAA for burial. It is important to add at this point that there are reports of Middle Bronze II remains on the Kerak plateau to the east (Miller 1979), but the present author did not encounter anything definitively Middle Bronze II when he visited relevant sites in the area in January 2001.

Historical accounts of travels in the Dead Sea plain during the nineteenth century testify to extensive agriculture on the plain by 'Ghaurnay' inhabitants living in houses made of reeds and thistles (Irby and Mangles 1823; Lynch 1850; Tristram 1873). In fact Lynch and Tristram report agricultural work during both winter and summer seasons respectively. In considering the possibility that this sort of activity has endured for centuries it is not surprising that no remains are visible of either ancient settlements or of the relatively recent ones made of the perishable materials. The notion that ancient settlements will always be found is false, whilst seasonal encampments are even more susceptible to destruction and problems of preservation.

Conclusions

The problem of identifying non-sedentary sites is linked directly to the definitions one will adopt for this social regime and its archaeological 'signature.' There are sufficient reasons for accepting that locating non-sedentary sites is a combination of sound survey techniques, favourable conditions for preservation, and, finally, the interpretative model that is being employed. ZAD 1 and DAA are testimony to the existence of some form of Middle Bronze II culture in the Dead Sea basin. At present they are the only two Middle Bronze II sites in the area. The character of the ZAD 1 artefact assemblage (in the absence of representative faunal evidence), the site's relative isolation within an arid environment, and the absence

of tombs in its vicinity, strongly support its identification as a seasonal settlement. Similarly, the existence of DAA as an isolated cemetery also would seem to support the non-sedentary hypothesis. However, although there are grounds for connecting both sites on the basis of some ceramic typological similarities, there is also good reason for believing that they were not at all connected. Instead, they may merely represent a fraction of a 'polymorphous' Middle Bronze II society in the Dead Sea basin, which has hitherto been invisible through a combination of factors as discussed in the first part of this paper. These factors involve a problem of preservation, visibility, a shift in social regimes, and a lack of comprehensive survey goals and techniques. Regarding this last point it would be fair to add that no survey team specifically concentrated on the investigation of the hinterland of ZAD 1 until the La Trobe University team visited the area in 1993/1994 (Edwards *et al* 1998), nor has anyone specifically focused on the discovery of seasonal sites. However, we must accept the restrictive nature of the archaeological record even within the scope of excellent survey methods, and attempt to formulate a hypothetical model even on the basis of absence. It is unreasonable to think that the inhabitants of ZAD 1 were the sole human representatives of south Jordan for the duration of about a thousand years. The possibility that DAA and ZAD 1 relate to two distinct populations during the same period of time suggests that there are either more sites waiting to be discovered or that most human activity in the region for the Middle and Late Bronze Ages is invisible for various (unknown) reasons. Petrographic analysis will go some way towards establishing the nature of the connections between ZAD 1 and DAA, if any existed. However, the fact remains that in the absence of more concrete models of non-sedentary behaviour we must assume that the record is subject to all the difficulties that scholars such as Finkelstein and Rosen describe. It appears that one must therefore consider and incorporate them all.

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Isaiah 8:21 and a New Inscription from Ekron

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Isaiah 8:21 is part of a brief passage which poses a number of severe challenges to commentators. Quite apart from the linguistic and textual difficulties in verses 22–23*a*, the opening words of verse 21 are so abrupt that it looks as though we are dealing with the fragment of what was once a more extended discourse. In the nature of the case, modern English renderings tend to smooth over the difficulties. A somewhat more literal translation therefore follows: 'And he will pass through it, distressed and hungry; and when he is hungry he will become enraged and curse (by) his king and (by) his God'.

The first word, the verb '*br*, 'to pass over/through', lacks a subject, and there is no obvious third person masculine singular reference in the previous verses to whom this 'he' might refer. In addition, the next word *bāh*, '(through) it (feminine singular)' lacks an antecedent. In these circumstances, it is difficult to believe that these words were written specifically for their present context, or that they have been added by a later scribe or redactor with a view to amplifying what precedes; even someone introducing an addition to a passage would be expected to make his composition fit the context and not introduce unattached verbs and suffixes. Nor is there any evidence to support the conjecture that something has dropped out between verses 20 and 21, as implied by the row of dots in Wildberger's commentary at this point (1980: 355; 1991: 376). The only conclusion that we can draw is that these words have been secondarily transferred as a fragment to their present position from their original context where their purport was presumably clear. It may be assumed that their original location was somewhere else in the early form of the collection of Isaianic material, though it would clearly be one speculation too far to suggest just where this might have been. For proposals notwithstanding, see Skehan (1960) and Jeppesen (1982); in addition, Høgenhaven (1988: 105) speculates about what the points of reference might originally have been.

There have, it is true, been some attempts to evade this problem by arguing that the unity of verses 19–22 can be defended as a whole (e.g. Driver 1967; Vermeylen 1977: 228–32; Whitley 1978; Sweeney 1996: 175–87; van der Woude 1997). None has commanded broader support, however, and the words of Gray nearly a century ago remain apt for these more recent proposals as well. After drawing attention to the variations in style in 19–23 as an argument against their unity, he continues, 'And this is still more strongly suggested by the inability of

interpreters, who assume their unity, to establish a probable as distinct from an ingenious connection between the verses themselves, or between the verses and what precedes or follows them' (Gray 1912: 157; against the particular attempt of Barth [1977: 153–54] to get round the problem, see my remarks in Williamson [1994: 139–40]).

If it is the case, then, that Isaiah 8:21–22 is a somewhat discontextualized fragment, it will be obvious that it is difficult to establish with any certainty what specifically is being referred to. Any illumination, however slight, from other sources should be welcomed, and it is the purpose of this short article to suggest that such may come from a recently published brief dedicatory inscription from Tel Miqne (Ekron) (Gitin and Cogan 1999).

The two-word inscription was incised on the side of a store-jar and came to light only during the post-excavation process of restoration. Its provenance was Room P of the temple complex 650, located immediately south-west of the pillared sanctuary itself. On the basis of other finds in this room, the excavators have concluded that it was used for the production of olive oil for sacred purposes. The fact that the inscription was incised before firing (as opposed to the more usual use of ink to indicate the contents of this type of jar in associated finds) suggests that 'the jar had been designated as a sacred dedicatory vessel prior to its completion' (p. 197).

The text of the inscription reads *lbʿl wlpdy*, 'for Baʿal and for Padi'. Baʿal is, of course, a well-known West Semitic deity, and indeed occurs as one element in the name of the god of Ekron in 2 Kgs 1:2–3. Although the names of several goddesses have been found on inscriptions from Tel Miqne, this is the first example of the name of a male deity.

Padi is well known from the Assyrian annals relating to Sennacherib's 701 BC campaign (Luckenbill 1924: 31–33), from an administrative text (Fales and Postgate 1995: 42) and from a royal dedicatory inscription (Gitin, Dothan and Naveh 1997) as a king of Ekron. It is suggested (p. 199), therefore, that the inscription should be dated to the first quarter of the seventh century (though the jar may have continued in use for a considerable period after this), a time only shortly after Isaiah's own ministry during the last half of the eighth century.

What is new about this inscription is that, as the editors point out, it is 'the first instance in a West-Semitic inscription in which a god and king are joined in a single dedication' (p. 197). They go on to suggest that, since it dates from a period when Assyrian influence was at its height in Philistia, it may perhaps be a calque on the Assyrian phrase *palaḫ ili ú šarri*, 'to revere god and king'. It is indicative of the fact that the one making the dedication was religiously and politically loyal to the mainstays of local society.

As the editors also point out, this combination of God and king is known from several passages in the Hebrew Bible, as evidence for which they appropriately cite Exod. 22:27; 2 Sam. 15:21; 1 Kgs 21:13; and Prov. 24:21. I suggest that Isa. 8:21 should be added to this list, with the following consequences.

First, the inscription adds some support to the traditional vocalization of the

word *mlk* in our verse, meaning 'king', against those who have proposed that it should be changed in such a way as to introduce a reference to the deity Molek (Whitley 1978: 31–33; Heider 1985: 328–32; it may also be noted that Heider's proposal further involves the conjectural deletion of the suffix on *mlkw*). The objection to the traditional text, namely that 'the primary sense of king, ''temporal ruler,'' is clearly out of place here', is itself misplaced.

Secondly, those who join verse 21 closely with verses 19–20 sometimes argue that *'lhyw* does not mean 'his God', but rather 'his (underworld) gods/shades/ghosts' (Heider 1985: 330; Schmidt 1996: 147–54). However, if we are correct in comparing the verse's formulation with that now attested in the inscription from Ekron, then a reference to the country's principal deity is to be expected.

Thirdly, it has occasionally been suggested that king and God should not be differentiated in this verse, 'king' being rather a divine title here, so that the two words are effectively in apposition (e.g. Gesenius 1821: 347; Knobel 1861: 71; Delitzsch 1894: 236). While the context makes clear that this is the case in a passage such as Ps. 5:3, it has already seemed to most commentators that this is less likely here, and the parallel from the Ekron inscription adds further weight to the argument.

Finally, if the adoption of formulaic language lies behind the wording of the verse, then the force of the curse comes into clearer focus. By substituting a curse for the usual blessing implied in a dedication, the frustrated subject of the verse is effectively pronouncing a rejection and overthrow of the twin pillars of society. This is not simply a case of someone cursing their misfortune, but an act of supreme treachery in both of the closely entwined spheres of politics and religion.

At this point, however, a difficulty arises, for in the text as it stands the king and God are not the direct objects of the verb 'to curse', as might be expected (and as many English versions render it), but they are each preceded by the preposition *b* (rendered by a bracketted 'by' at the start of this article). Other ancient testimony is of little help in deciding how best to understand this. MT is supported substantially by 1QIsa[a], but the verse is not preserved in any of the recently published fragments from Cave 4. The ancient versions render somewhat variously, though they do seem broadly to take the words as the object of the verb.

Not all commentators attend to this point, and those who do differ in their assessment. Delitzsch 1894, for instance, insists, on the basis of usage elsewhere, that the king and God cannot be the direct object of the verb, and that the only legitimate rendering is 'curse by'. In response, however, Gray 1912 observes that this would be awkward in leaving the object cursed unnamed and also that the notion of cursing by the king would be unparalleled; he therefore thinks that it is easier to postulate an otherwise unattested usage whereby *b* can introduce the direct object after this verb. Clearly, therefore, neither solution is free of difficulty. Similarly, Driver's comparison (1967: 46) of *qll b* with Akkadian *qullulu ana* to justify the translation 'offend' seems unsuitable in the present context.

In this situation, the alternative proposal of Jeppesen perhaps deserves closer consideration (1982: 152–54). He draws attention to the fact that in several other passages where the context clearly points to the sense 'curse God', later scribal tradition has substituted some alternative wording in order not to have to write something that would have been theologically deeply offensive. Thus at 1 Kgs 21:10 and 13, which is conceptually close to our verse, instead of 'curse God and the king' the text actually says 'bless God and the king'. Similarly, at Job 1:5, 11; 2:5, 9, forms of the verb *brk*, 'bless', have been substituted for the obviously intended *qll*, 'curse'. Finally, as was recognized already in ancient times by the rabbinical list of *tiqqune sopherim* ('corrections of the scribes'), and as is supported by the straightforward translation in the Septuagint, 'curse themselves (*lāhem*)' at 1 Sam. 3:13 is a substitution for 'curse God (*'ᵉlōhîm*)' (cf. McCarthy 1981: 76–79 and 191–95); elsewhere (1985), I have myself speculated that a similar substitution may have occurred at Neh. 3:34, though this is admittedly less certain. In the light of this regular practice, Jeppesen suggests that the same kinds of consideration may have led to the scribal addition of *b* in our verse.

A supporting argument for this position comes from the unexpected order of the words king and God against the order anticipated on the basis of other biblical passages, and now additionally the inscription from Ekron, of God and the king. Although Jeppesen is able to refer to some extra-biblical parallels for this in a general way, his solution in what looks like a formulaic expression is surely preferable, namely that this is also part of the same scribal tendency 'to separate the words ''curse'' and ''god'' as much as possible'.

It is appropriate that a discussion of a find from Ekron should be included in this celebratory volume of the Anglo-Israel Archaeological Society's *Bulletin*. The excavators have lectured regularly to the Society on the progress of their work, and our current Honorary Secretary served as architect to the excavations for some seasons. It is also characteristic of the Society's academically outward looking stance that it has accepted a contribution which allows the Philistines to take further our understanding of one part of the Hebrew Bible.

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Shipwreck Archaeology in Israel: an Undeveloped Historical Resource

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Marine archaeology enjoys a relatively high profile within Israel. Although a late contributor to the 'mother discipline', the fascination with unusual technology and the generally good level with which metallic artefacts (and frequently organic matter) tend to be preserved within a marine environment have ensured that the potential of marine archaeology is widely acknowledged. Popular archaeology magazines feature underwater projects alongside vivid photographs, which appeal to the public's sense of adventure and romanticism. Entries presenting results of port and shipwreck surveys and excavations appearing within highly respected encyclopedias, such as *The New Encyclopedia of Archaeological Excavations in the Holy Land* (Linder 1993; Raban, 1993a; 1993b; Raban and Linder 1993; Raveh and Kingsley 1993) certainly represent a coming of age.

After forty years of developing operable 'field' methodologies and collating primary data, and at the turn of a new millennium, it is an opportune time to examine marine exploration's contribution to archaeology. Developments will be discussed against the background of Byzantine history (AD 330–641), and, due to length restrictions, will be confined to shipwreck archaeology.[1]

Marine archaeologists traditionally date the birth of wreck studies in Israel to the late 1960s, when the Underwater Exploration Society of Israel selected a well-preserved site in the Sinai for excavation (see below). Although technically correct (this was indeed the first time a ship was recorded underwater using modern scientific techniques), it is important to acknowledge that the origins of 'wreck spotting' date back to the 19th century when various antiquarians, 'romantics' and learned individuals published an estimated 5000 travelogues containing detailed and invaluable descriptions relating to the circumstances surrounding the act of shipwreck.[2]

For instance, after asserting that the nautical hazards in the vicinity of Jaffa's anchorage must have caused Phoenician, Egyptian, Syrian, Roman, Crusader, and modern fleets alike to have been wrecked in large numbers, Cunningham Geikie (1887: 4) stated that 'about thirty years ago the remains of a galley of great antiquity were dug up in some excavations on the shore.' Behal Ed-Din's *Life of Saladin* (PPTS 1897: 249) contributes important information about the, as yet, unidentified location of a Crusader-period ship by describing how 40 English galleys attacked a large Islamic vessel transporting engines of war, arms, provi-

sions, and a large body of troops from Beirut to Acre on the 16th June 1191. Rather than capitulate, the ship's captain, Yakub, declared 'By God! We will die with honour, nor shall they get anything from this ship!' and sunk his own vessel.

The numerous comparative accounts from a period when maritime travel remained the predominant means of long-distance communication are essential sources for enabling archaeologists to step outside their inherently biased environment and to comprehend ancient maritime culture in a less subjective context. These primary sources are, however, very rarely used in Israel (but for Dor see Wachsmann and Raveh 1980; for Palestine in general, see Kingsley 1999: 81, 83, 100–105, 117–18), although the author fails to comprehend how a regional underwater survey strategy can be formulated to obtain maximum results without the archaeological director being aware of a site's maritime history.

In this writer's opinion, shipwreck analysis and interpretation in Israel are poorly developed and three specific reasons for this state of affairs can be identified: (1) a misunderstanding of how shipwrecks form on the seabed and, hence, negativism about the quality of data preserved in the archaeological record; (2) an absence of research strategies formulated sufficiently analytically to extract the maximum data from a shipwreck survey or excavation; and (3) exceedingly low publication rates.

Shipwreck Formation Analysis

Shipwreck studies in Israel suffer from an assumption that the quality of archaeological data preserved is inherently poor. While remains of artificial harbour structures protruding above the sea-bed and strung along shorelines proved relatively easy to locate in the pioneering years of marine archaeology during the early 1960s (Caesarea: Fritsch and Ben-Dor 1961; Atlit: Linder 1967; Akko: Flinder *et al.* 1993), the search for shipwrecks encountered less success. Influenced by the wooden hulls and cargoes of a 4th century BC ship excavated at Kyrenia off northern Cyprus (Katzev 1972), and a 7th century AD ship off Yassi Ada, Turkey (Bass and van Doorninck 1982), early research inevitably defined a wreck as a well-preserved entity with a coherent hull containing the greater majority of its cargo. Because no such site could be located within Israel's territorial waters, the first ship scientifically examined by Israeli marine archaeologists was the substantial hull and cargo of a merchant vessel of the second quarter of the 18th century excavated off Sharm el-Sheikh in the Sinai in 1969 (Raban 1971). Although well-preserved hulls with largely scattered cargoes have been excavated subsequently at Dor (6th–9th centuries AD: Wachsmann and Kahanov 1997; Wachsmann *et al.* 1997; Royal and Kahanov 2000; Kingsley 2002), Ma'agan Michael (*c.* 400 BC; Linder 1993), and Caesarea (late 1st century BC; Fitzgerald 1994), shipwreck analysis in Israel is still characterised by a lack of analytical perception in the absence of coherent wrecks. The assumption that only such sites contain data capable of enabling a ship's economic history to be

reconstructed has long been proven to be a myth (Parker 1979: 10–11; 1980; 1992: 5; Gibbins 1990: 378).

An estimated 200 wreck sites have been identified off Israel, dating from the Late Bronze Age onward, and are typically located at depths of one to six metres, 60 to 200 metres offshore (Galili 1992: 23, 26). The Israel Antiquities Authority (IAA) have stated that five of these are wooden hulls, another five comprise incoherent hull sections sealed under cargo or ballast, 27 are clusters of stone or metallic anchors, deep-sea concentrations of amphorae raised in fishing trawlers nets account for ten sites, and concentrations of artefacts, cargo and piles of ballast (all without planking) comprise 150 known shipwreck sites. More than 1000 individual ancient stone, lead and iron anchors have been recorded off the coast of Israel (Galili and Sharvit 1992: 292).

The above sample is actually remarkably varied in date and site type, and it is essential for the future of marine archaeology in Israel that the study of what is mainly envisaged to be a qualitatively limited data base is maximised. Comparative sources lend credence to the reality that researchers must come to terms with the inevitability of not locating well-preserved cargoes within Israel's territorial waters. The most significant causal factor is the shallow character of the continental shelf, which slopes east-west with a mild gradient of 2–8.5 degrees (Emery and Bentor 1960: 28). Unlike much of the Mediterranean basin (S. France, Italy, Greece, Turkey, Cyprus), where the continental shelf descends sharply to depths of 20 m and greater very close to shore, and where most wrecks examined in detail are located, the majority of ships wrecked off Israel in antiquity were lost after being propelled landward during adverse climatic conditions and grounding on sand-banks, or foundering on offshore or coastal sandstone ridges. In such shallow locations shipwrecks tend to be subjected to extreme post-depositional disturbance. It is usually presumed that hulls were rapidly broken apart (Misch-Brandl and Galili 1985: 5; Galili 1992: 23), with planking widely scattered and cargoes (mainly ceramic amphorae) destroyed in the course of a single storm episode.

Comparative sources actually suggest that this hypothesis is inaccurate. For example, at Haifa Tristram (1866: 95) observed

> the grim skeletons of many a coaster, driven high on shore, stripped of all but the main timbers, which still stood erect, in black groups here and there, the favourite perches of the osprey and the cormorant.

Kelly's comments about the bay of Acre (1844: 316), which he considered the most dangerous spot for shipping in the whole of Palestine and Syria, are even more informative. Vessels running in toward the bay to seek shelter were often stranded close to shore because their anchors could not establish a firm hold in the loose sandy sea-bed. Consequently, the

> whole beach is strewed with melancholy and picturesque monuments of the sea's destructive power. Tall shattered prows, in which the sea-birds build their nests, project

above the sands; some hulls, completely buried, show only their masts, looking like the crosses scattered over a Roman-Catholic graveyard; a few still retain their yards, from which the mildewed cordage and canvas flap idly on the breeze.

This account clarifies that many ships commenced the degeneration process not as a collection of a few durable items lost during a single storm once the hull had been obliterated, but with a considerable component of the hull intact. Just how long it took for a ship's timbers to be dispersed must have depended on the ferocity and length of the initial storm responsible for the wreckage, and exposure to subsequent storms and human scavenging.

While this site formation pattern does offer a far greater opportunity for future hull analysis than is currently appreciated, the study of cargoes is not promising. This is explained partly by pottery's vulnerability in the breaker zone from high-energy wave motion (Raban 1973: 32). The preservation of metallic shipboard items is again dependent on how quickly a hull was breached and objects concealed by the thick sand blankets that characterise the offshore zone of Israel (these sediments derive from the Nile river and delta and are transported northwards by the anti-clockwise Mediterranean gyre and long-shore currents; Carmel *et al.* 1984: 1282). The weight of metallic shipboard objects, however, does tend to cause their downward dislocation into sand blankets (when elements of the domestic assemblage and cargo have been dispersed), a factor that does favour preservation.

The majority of ships wrecked in shallow waters off Palestine could have been relatively easily salvaged in antiquity. The practicalities of salvage are again proven by comparative sources. In 1664 Greek mariners recovered part of a cargo of Cypriot wine and cheese at Dor (Labat 1717: 91–2). Stephens (1838: 354) reported watching a wrecked schooner at Rosh Hanniqra whose

shivered sails [were] still flying from the masts, and the luckless mariners were alongside in a small boat, bringing ashore the remnant of the cargo.

Moreover, the prevalence of salvage in Late Antiquity is evident from a passage in the 7th century AD Rhodian Sea-Law, which stipulated that where nautical material was raised from 8 fathoms (about 15 m) the salvor received one-third of all objects recovered. Wrecked objects cast from the sea onto the land, or found at a depth of one cubit (about 50 cm), entitled the finder to one-tenth of what was recovered (Ashburner 1909: 119). According to this law, it would seem that cargoes lost in depths of 1–6 m off Palestine would have entitled salvage teams to 10% of the value of objects raised (at least in Late Antiquity).[3]

Not surprisingly, details of intact amphorae have only been published from a wreck of *c.* AD 600–640 in the south bay at Dor (Raveh and Kingsley 1991: 203), a concentration of cargo amphorae of the 13th century BC from the same site (identical to examples manufactured in an industrial zone at Sarepta in Lebanon, which specialised in purple-dye production: Kingsley and Raveh 1996: 57–8), a late 4th century AD site off Hof HaCarmel in Haifa (Raban 1969–71: 67–9), and

a Byzantine site at Neve Yam (Galili and Sharvit 1999a: 100). Contrary to current opinion, it is argued that salvage activities explain the absence of amphora cargoes off Israel to a far greater extent than is acknowledged. A large proportion of fragmentary amphorae often recorded on wreck sites is actually material that was intentionally discarded during the salvage operations because they had already become broken with the spilling of their contents at the time of the wreck.

Research Rationale

In view of the levels of wreck and cargo preservation encountered in Israel it is pertinent to question what agenda ought to be established for shipwreck archaeology in the 21st century. The rationale underlying wreck analysis may seem obvious, but behind the basic assumption that ships are tools for studying trade patterns exists an extremely poorly evolved set of research goals. Except for Linder's long-drawn, yet successful, quest for a Phoenician-period shipwreck (realised at Ma'agan Michael by the discovery of a 13 m long hull of *c.* 400 BC; Linder 1993), wreck studies have proven pluralistic in the sites selected for analysis, and limited in strategy formulation.

It is striking that nowhere else beneath the wide panorama of archaeology are the principal researchers defined by the medium with which they interact. Archaeologists studying cities, villages, landscape evolution, water systems, churches, or villas usually specialise in a clearly defined historical period. This is obviously partially explained by the cumbersome artificial-breathing equipment required to operate underwater, which tends to exclude and restrict personnel in this field of study.

The usual excuse for the pluralistic approach to wreck studies (which typifies much marine exploration throughout the Mediterranean) is the necessity to build up a solid data-base of sites of varied date. While a reasonable explanation, it is nevertheless problematic since the sample generated is susceptible to chance and bias, under-representing wrecks from some historical periods at the expense of others (generally the best preserved). Moreover, given the solid data-base of 200 sites identified in Israel it ought to be possible to synthesise the information currently recorded and to impose more demanding questions on the sample.

At present, most shipwrecks are located off Israel during underwater surveys conducted along the entire coast. Most sites recorded by the IAA since 1976 between Tel Aviv and Haifa within a Cultural Resource Management framework were necessitated by severe changes to sedimentological patterns. The erosion of Israel's beach sands and offshore sediments in the wake of large-scale modern coastal development programmes initiated since 1965 is a well-documented phenomenon (even though recommendations for resolving this ecological and archaeological 'time-bomb' remain ignored). An estimated one-third of beach reserves were quarried prior to 1964 as raw material for the building industry; the construction of more than 30 detached breakwaters, groins, sea-walls, marinas and small ports near urban centres subsequently dammed the northerly trans-

ported sand derived from the Nile (and Nile Delta) and has accelerated the erosion of coastal zones (Nir 1982: 1839; 1990: 211, 215), exposing the sea-bed and overlying ancient maritime deposits. This trend is particularly acute between Tel Aviv and Haifa, where four times less sand is deposited naturally by the northerly sand drift than in southern Israel (80,000 m^3 reaches Atlit annually, compared to 400,000 m^3 conveyed to Gaza; Carmel *et al.* 1984: 1287).

IAA representatives have also explained the necessity to record all ancient wreckage irrespective of date, because the country's 30,000 certified divers have free access to most territorial waters. This is believed to pose a huge threat to the easily accessible underwater heritage. According to the IAA the combination of coastal erosion and wreck pillaging has resulted in 60% of all wreck-related artefacts lost off the Mediterranean coast of Israel throughout antiquity having been plundered. The IAA estimates that within 10–20 years very little archaeological material will remain undisturbed underwater for study (Galili and Sharvit 1992: 273).

While the detrimental impact of coastal erosion is extremely real, in this writer's opinion the threat of treasure-hunters is manageable and has become a convenient cause providing political muscle for the IAA to justify rapid and inadequately detailed wreck surveys (and limited publication; see below). Analyses of wreck densities off Israel vary. Wachsmann's work as an Inspector for the Israel Department of Antiquities and Museums (forerunner to the IAA) suggested that one wreck is located every 50 m along the coastline (1984–85: 25). Recent observations have suggested a density as high as one site every 25 m (Galili 1992: 23).

While based on respected experience, these opinions are misleading unscientific estimates: wreck deposition is based on a web of inter-related factors (beyond the range of this paper), including a coastal zone's geographical orientation in relation to incoming wind, proximity to natural hazards, anchorages and ancient settlements, and the composition of the sea-bed. Most wrecks are not systematically located all along the coast, but are mainly concentrated in 'ships' graveyards', such as those at Ashkelon (Galili and Sharvit 1998: 101), Sedot Yam (Galili *et al.* 1993: 680), two clusters in the south bay at Dor (including nine wrecks in an 85 m long zone; Kingsley and Raveh 1996: 55–75), Atlit (Ronen and Olami 1978: 36; Ullmann and Galili 1994), and Haifa (Galili and Sharvit 1999b).

Moreover, comparative sources suggest that the sample of shipwrecks known in Israel actually only represents the tip of the iceberg. In the midst of *A Summer Ramble in Syria* (1835: 56), the Reverend Monro counted ten wrecks in the course of a mile around the Kishon River (including Turkish warships). Even if we conservatively estimate that Monro's ten ships met their fate in the course of the preceding 100 years, then 230 other possible ships might have been lost in this area alone from 500 BC onwards (when the Phoenicians first created an artificial harbour at Acco; cf. Flinder *et al.* 1993). The proposition that Israel will

lose all its ancient shipwreck heritage within little more than one generation is unjustifiable.

Dor D: a 6th Century AD Merchant Vessel

In light of the above comments, the writer implemented a research strategy at Dor in October 1999 with the aim of extracting maximum information from a seemingly unimportant wreck. Underwater surveys conducted at this harbour site between 1976 and 1991 revealed a dense collection of Byzantine anchors and amphorae imported from the Greek Peleponnese, Cyprus, Syria, Cilicia, Egypt and Tunisia, as well as six wrecks dating to the 6th and 7th centuries AD (Kingsley and Raveh 1994; 1996: 60–72). Fieldwork conducted at Dor has established that this small city (Dauphin and Gibson 1994–95), located around a large episcopal basilica (Dauphin 1993), was an important transit point for imported and exported commodities. The latter would have included purple-dye processed in the North Bay (Raban 1995: 301) and wine produced in 30 presses associated with nine farmsteads on a sandstone ridge surrounding the ancient agricultural hinterland 1 km inland (Gibson *et al.* 1999: 89–91). The writer has quantified over two tons of pottery excavated in the city's Byzantine episcopal basilica to examine what types and percentages of material comprised imported or locally manufactured wares (at the invitation of the site's director, Prof. Claudine Dauphin). The latter information had been synthesised with other results concerning the role of maritime exchange in Byzantine Palestine in this writer's doctoral thesis (Kingsley 1999).

On the basis of this comprehensive data, a Byzantine ship first identified during surveys in 1991, 25 m offshore and at a depth of 1.5 m, was selected to test specific hypotheses (cargo composition, decline in late Byzantine trade, the prevalence of amphora re-use in Late Antiquity, and the extent to which the history of a poorly preserved ship may be reconstructed). When initially surveyed, wood was detected at several locations across the site, protruding from beneath a dense veneer of ballast stones measuring 6.0 × 4.5 m. Based on a comparison with the Ma'agan Michael ship of *c.* 400 BC (also sealed by a layer of ballast stones and partially sheltered on the lee side of a *kurkar* ridge) the possibility of locating coherent sections of hull seemed promising. In addition to a radiocarbon date calibrated to AD 539–621, the wreck was sherded in 1991 in 1 m^2 sections (for the first time in Israel), which suggested that the completely fragmented cargo had comprised LR4 amphorae from Gaza/Ashkelon (Majcherek 1995) and locally manufactured bag-shaped LR5 amphorae (Kingsley 1994–95) tentatively dated to the first half of the 7th century. Substantial quantities of sherds trapped in crevices between ballast stones offered an opportunity to assess the cargo's character in greater detail at a later date (although the surface sherd density was as low as 8 amphora fragments per m^2).

Dor D was excavated jointly during a two week period in October 1999 by Somerville College, Oxford (Sean Kingsley), the Center for Maritime Studies, Univer-

sity of Haifa (Yaacov Kahanov), the Dor Maritime Archaeology Project, Israel (Kurt Raveh), and the Nautical Archaeology Society, Portsmouth (Chris Brandon). Clearance of the perimeter of the site revealed about two tons of tightly packed blue-grey schist ballast stones cut with crystalline calcite veins extending over an area of 6 × 7 m. Trenches two metres wide were systematically excavated on the east (Trench A), south (Trench B), and north (Trench C) flanks of the wreck to locate cargo and hull remains. A sample of 87 kg of amphora sherds was recovered.

After the removal of the overlying ballast, two sections of hull planking were identified across an area of 3.7 × 3.0 m. Numerous informative carpentry features were found along the preserved Cypress wood (*Cupressus sempervirens*), which provided clues about when and how the ship had been constructed. After the hull remains were recorded, a 1.5 m deep trench was cut in the centre of the wreck in an attempt to ascertain whether other hull sections had settled more deeply. This sounding produced negative results. The absence of the keel and other large, robust timbers amongst the wreckage (especially futtocks and frames) may be explained by the way the ship foundered: if she had run aground on a sand-bank and listed heavily, the ballast would have shifted onto the side planking leaving the majority of the hull exposed to storm waves, which destroyed it. The season finished in the confidence that the wreck's excavation was complete.

Dor D may be characterised as a partly coherent shipwreck (as defined in Gibbins 1990: 379). Visible cargo was negligible; most of the hull had been destroyed. Despite the inauspicious preservation, sufficient data was procured to reconstruct its macro-economic history within the eastern Byzantine Empire. By initiating a strict policy of total sherd recovery, and by quantifying all the pottery (for the first time on a wreck off Israel), the site's date and cargo composition were established. Rim profiles date the wreck to the second half of the 6th century AD (earlier than was initially suggested), which is compatible with the spacing of the mortise-and-tenons at distances of 17–44 cm apart along the edges of the outer planking. (The ship is the second 6th century example known from the Mediterranean.) Dor D was built using a transitional ship construction method: although mortises-and-tenons were used to connect horizontal outer planks (strakes) on top of another in classical Roman tradition, other features are indicative of skeletal construction techniques. Tenons were loosely set within mortises simply as a means to align planks before they were attached to inner frames using iron nails and wooden treenails. No wooden pegs were used to tightly lock tenons within mortises. The hull's analysis will contribute to the on-going debate of whether the shift away from classical tenon-built ships toward more cheaply built vessels in Late Antiquity is related to a commercial revolution.

How does Dor D relate to historical developments in the wider Mediterranean world? An important observation is that despite the appalling Justinianic plague of AD 542, which is thought to have depopulated the Mediterranean by one-third and impacted heavily on the Palestinian countryside where 'like beautiful grapes, [the villagers] were trampled and squeezed dry without mercy,' according to John of Ephesus (Frg. II F, 231, 24–26; Allen 1979: 9, 12), the excavation of Dor D

forces the question of whether the plague's impact was the turning point in the collapse of Byzantine civilisation to be re-assessed. Pitched LR4 (Gaza/ Ashkelon) and LR5 (bag-shaped) amphora sherds from Dor D, as well as grape pips embedded in pitch residues, prove that the ship was involved in Palestine's lucrative wine trade. But was she an independent trader or a government-commandeered vessel involved in transporting taxes in kind for the State (*annona civica*)? Although a difficult question to resolve, the available data strongly favours the former hypothesis. Analysis of pottery fabrics indicates that the cargo of LR5 amphorae derived from three (or possibly four) different kiln sites from central or northern Palestine. There is also good reason to argue that the assortment of amphorae was being returned to Palestine empty for refilling: the ship's ballast, indigenous to north-west Cyprus (pers. comm. Dr E. Morisseau, 2000), suggests a provenance in the north-east Mediterranean as the place of embarkment for the final voyage. Moreover, one LR5 amphora sherd was identified amongst the wreckage with a lead plug sealing its vent hole (required to prevent carbon-dioxide build up within the newly filled container). This is certain evidence of re-use amongst the cargo.

Finally, none of the amphora sherds bear *graffiti*, or *dipinti*, such as were used on other Mediterranean amphorae by state officials to monitor their transport (LR1 from Syria, Cyprus and Cilicia; LR2 from the Greek Peleponnese: Derda 1992; various Tunisian containers: Keay 1984). The absence of such control marks would have made monitoring villagers' payment of taxes impossible. All the evidence suggests that Dor D was operating to meet the on-going demand amongst overseas communities for Palestine's famed wines, a tradition that first became widespread in the 5th century AD (Kingsley 2001). While it would be understandable to interpret the necessity to re-use amphorae as indicative of economic decline (caused by the closure of pottery workshops in Palestine), the study of bag-shaped amphorae overseas proves that this is incorrect: LR5 were imported as far as Naples (Arthur 1985: 255), Marseille (Bonifay 1986: 303–304), Spain (Reynolds 1995: 182, 264–5) and Carthage (Riley 1981: 103) beyond the last quarter of the 6th century and into the first half of the 7th century AD. Neither the Justinianic plague, nor the impact of the Samaritan revolts on the agricultural landscape of the Carmel and Sharon plain (Dar 1995), resulted in economic dislocation between *Palaestina Prima* and the wider Mediterranean. Amphora re-use needs to be appreciated within a broader ideological context: in many ways Byzantine society was a minimalistic one, as evidenced by widespread urban spoliation and natural approaches to port operation (characterised by a lack of new artificial harbours).

Although a fuller discussion of the role of Dor D within the economy of the East Mediterranean and its political institutions is discussed in the final site report (Kingsley 2002), it is hoped that the above case study provides an indication of how the data available from a poorly preserved shipwreck may be maximised using site sherding, detailed pottery analysis and quantification, and by considering a site within its historical context.

Palestine's Shipwrecks: Lost in Archives

A large quantity of the 200 wreck and cargo sites identified off Israel's coast almost certainly date to the Byzantine period. Barag's study of amphorae brought to shore in deep-sea trawlers' nets (1963: 17) revealed that the majority dated from the 4th–7th centuries AD (almost three times more numerous than Roman amphorae). This peak in levels of trade coincides with Palestine's 'Golden Age' of agricultural production, which is vividly reflected by the 365 oil presses and the 900 Byzantine wine presses published from Israel (Kingsley 1999: 62–75). Various features of 22 Byzantine shipwrecks from ten different sites have been published in Israel (Kingsley 1999: 119). These vary in character from a fragment of a fishing boat found at Ginosar in the Sea of Galilee (Steffy 1990: 42–44), to a site containing Gaza/Ashkelon amphorae at a depth of 40 m off Givat Olga (Edgerton *et al.* 1980: 7, 13), and fascinating wrecks at Hahotrim (Wachsmann and Raveh 1985) and Atlit (Ullmann and Galili 1994) associated with cargoes of masonry and metallic fittings respectively, possibly intended for a church and removed from a synagogue.

Except for the wreck complex at south Dor, none of the 22 known Byzantine shipwrecks have been published in sufficient detail (even in preliminary articles) to help reconstruct their cargo character, ship size or provenance. (The actual figure of sites dating from the 4th-7th centuries AD amongst IAA archives must be far higher.) Other than sites surveyed at Dor (Kingsley and Raveh 1996: 55–75), no final Byzantine wreck report from the Mediterranean coast of Israel has been published. Apart from the late 1st century AD merchant vessel wrecked off north Caesarea (Fitzgerald 1994), and the Atlit ram (Casson and Steffy 1991), no final report of a wreck of any other date has been published. Thus, only 2.5% of the 200 sites identified off Israel are accessible in final analysed form.[4]

Particularly worrying is the absence of adequate reports of sites surveyed by government-funded teams. Not one detailed analysis of a wreck of 4th–7th century date has been published by the IAA, which stipulates that any survey or excavation license holder must produce a preliminary report within two years. Available information usually superficially lists the most salient attributes from a wreck. For example, a recent survey at Tell Hreiz recorded

> . . . a cargo of large bottle-green glass lumps and nearby a wooden ship keel, a cargo of *c.* 50 loaf-shaped iron-bars and a two-armed iron anchor attributed to the Byzantine period (Galili and Sharvit 1999: 98).

It can only be hoped that the final IAA site reports will include more comprehensive details than the survey report series published by the Archaeological Survey of Israel. If forthcoming volumes do not include detailed catalogues of fragmentary pottery and site size it may never be possible to reconstruct the economic histories of these surveyed shipwrecks.

Conclusion

The threat of treasure-hunters destroying sites is often considered the most serious challenge to shipwreck archaeology in the Mediterranean today (Gould 2000: 316). As a proactive response to a diminishing heritage archaeologists must nevertheless still assume the responsibility for collating data sufficiently systematically to enable future generations to reconstruct a shipwreck's character. On the whole this seems not to be the case in Israel, although the contents of the IAA's archives admittedly remain an unknown entity. The writer believes that in terms of the retention of unpublished primary data, which could enable the history of ancient trade in Palestine to be radically rewritten, the current situation is certainly worse than the acknowledged general publication problem within Israeli archaeology (Shanks 1999) and more extreme than the non-publication of the controversial Dead Sea Scrolls.

The future of shipwreck archaeology in Israel requires a prevailing intuitive approach to fieldwork to be replaced by a more analytical one open to new methods (such as the use of comparative sources). It seems remarkable that no archaeologist specialising in one historical period has attempted to formulate a research strategy geared toward examining a specific trade-related issue. The present famine of information may only be overcome in the future by a more intense approach to the study of partly coherent and incoherent, scattered shipwrecks.

The excavation of Dor D was concluded in two weeks of work at a relatively cheap cost and demonstrates how work on poorly preserved sites within a dense ships' graveyard can yield significant new data (as argued elsewhere in Parker 1979: 21–22; 1981: 314; Gibbins 1990: 382). The combination of survey work on Byzantine wrecks at Dor during the early 1990s, complimented by the detailed 1999 excavation, has proven beyond doubt that Palestinian wines were exported in large quantities as commodities. Research into wreck and anchorage sites within the Mediterranean has enabled the trade-routes this commerce followed to be examined; the quantification of Palestinian amphorae in Carthage and Rome has provided numerical data concerning how many shipments reached specific cities in Late Antiquity (Kingsley 2001). Such a holistic approach to shipwreck archaeology, whereby a wreck is related to regional agricultural production and wider macro-economic structures, is the only justifiable way forward for the discipline if marine archaeologists wish their work to be fully appreciated by the wider scientific community. At present, most marine exploration in Israel is directed as though ships sail in a cultural vacuum.

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Notes

1 As discussed elsewhere in this article, the writer has chosen the 4th–7th centuries AD as a basis for a case study specifically because this is his period of expertise. However, the comments discussed are equally relevant to all other periods dating between the Late Bronze Age and the 19th century. It should be emphasised that the comments in this article are not relevant to harbour archaeology, which is generally far more developed.

2 This figure includes articles, books and travelogues published between 1800 and 1878 (Ben-Arieh 1979: 15). Comparative sources are particularly applicable to Israel because the coastal geomorphology has altered minimally since antiquity. Travellers to Palestine before 1950 encountered precisely the same sets of nautical hazards (winds, currents, low-lying reefs and sand-banks) as the ancient mariner whose *periploi* (nautical maps) have not survived from antiquity. Naturally many of these sources have to be assessed for accuracy against the writers' cultural milieu. Romantics inspired by unusual sights, for example, were susceptible to exaggeration. Multiple references in different works to the same features (wrecks, nautical hazards, port operation) help to validate their accuracy.

3 Although historical evidence is unavailable for most of antiquity, shipwreck salvage must have always been prevalent. The work of *urinatores* is known to have been a specialised pursuit at Ostia during the late Republic and Imperial periods (Oleson 1976: 22–3).

4 This figure excludes the Atlit ram because although important timbers were still attached to it, available evidence suggests that it had been cut away from its hull in recent years. It is thus strictly speaking not a shipwreck.

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The Anchor on the Coins of Judaea

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This article examines the significance of the anchor on ancient Jewish coins and further shows how coins minted in Judaea and elsewhere in the Middle East, bearing this symbol, provide vivid testimony of the disintegration of the Seleucid Empire.

The anchor makes its debut in Judaea on the coins of Alexander Jannaeus (103–76 BC; = *BMC Palestine*, Alexander Jannaeus, no. 67, Pl. XXII.3; cf. Meshorer 1982a, Alexander Jannaeus, A series, pp. 198–99; C series, pp. 207–11) (Fig.1). Certain scholars, including B. Kanael and Y. Meshorer, have seen a connection between this anchor and the conquest by Jannaeus of the coastal plain, and considered these issues to commemorate Judaea's rise as a naval power in the Mediterranean (Kanael 1963: 44; Meshorer 1982a; 62).

Their case is a rather powerful one. We are told by the author of I Maccabees and by Josephus that Simon the Maccabee captured two important ports, Joppa and Jamnia, in *c.*143 BC, providing the hill state of Judaea with its first outlet to the Mediterranean in over 600 years (I Macc. 13.11; 14.5; Jos. *AJ* xiii 215). Moreover, according to I Maccabees, the imposing family mausoleum that Simon erected at Modi'in was embellished with a frieze of panoply and ships, perhaps in commemoration of some forgotten naval victory.

This renewed contact with the sea finds an echo in Jason's Tomb in Jerusalem (Rahmani 1967). This sepulchre (now heavily restored) is topped by a pyramid and thus belongs to a group of monuments that derive from the famous Mausoleum of Halicarnassus (Fedak 1990: 140–41). It is dated by the grave goods, which include imported wares from Asia Minor, to the Hasmonaean period, and probably to the reign of Alexander Jannaeus (Rahmani 1967: 75–94). Charcoal

Fig. 1. Bronze coin of Alexander Jannaeus (103–76 BCE). Anchor with inscription, from lower left, ΒΑΣΙΛΕΩΣ ΑΛΕΞΑΝΔΡΟΥ (of King Alexander). Diameter approximately 15 mm.

drawings were found on the walls of the tomb porch, which include sketches of ships. They appear to indicate that a member of the family interred in Jason's Tomb was engaged in seafaring (*ibid* 69–73; Fig. 5; Pl. 20 and 21A).

The maritime interpretation of the anchor on the Hasmonaean coins received a blow when A. Kindler demonstrated that the anchor on at least one coin type by Jannaeus was meant to be seen inverted (Kindler 1968; cf. Meshorer 1982: 79-80). He observed that better-preserved specimens show the date beside the anchor that way up. The letter 'L' appears to the left of the anchor stem and 'KE' to the right. 'L' is a dating letter first found on coins of Ptolemy IV (222–204 BC), while 'KE' are Greek numerals for 25 (i.e. the 25th year of Jannaeus' reign = 78 BC) (Kindler 1968: 189–91; Pl 20B, 1–5).

The anchor on these coins takes a distinctive form, with a central cross-bar or knob. It is reasonable to assume that it should be seen inverted on all of them. Note too, that Greek inscriptions accompany the anchor on these coins. More particularly, the inverted anchor can be readily identified as the dynastic emblem of the Seleucids. At first sight, this connection might appear strange, considering that the Seleucid kings came to be regarded as the arch-protagonists of the Hasmonaeans.

The inverted anchor appears on the coins of successive Seleucid kings, starting with those minted by the founder of the dynasty, Seleucus I (305–281 BC); see Fig. 2 (= *BMC Seleucids*, Seleucus I, Nicator, no. 41, Pl. II.1; cf. no. 47, Pl. II.6; *ESM* no. 45, Pl. VII.8; no. 46, Pl. VII.9; pp. 43–44 [Seleucia on the Tigris Mint]) and by his son, Antiochus I (281–261 BC); see Fig. 3 (= *BMC Seleucids*, Antiochus I, Soter, no. 40, Pl. IV.8; cf. *WSM* no. 945, Pl. XVIII.19; pp. 80–81, 109 [Antioch Mint]). The anchor has the characteristic knob already noticed in its depiction on the bronze coins of Alexander Jannaeus. The Nike (winged victory) shown next the anchor on a coin type of Seleucus I leaves no doubt about the intended orientation of this symbol on the Seleucid coins; see Fig. 4 (= *BMC Seleucids*, Seleucus I, Nicator, no. 44, Pl. II.3: cf. *ESM* nos. 294–96, Pl. XXII.14–19; p. 112 [Susa mint]; Kindler 1968: 190 and Pl. 20B.7–8). Its depiction at the centre of a Macedonian shield in Fig. 3 shows that it was used as a heraldic device of the Seleucids.

The anchor continued to be employed on the coins of the later Seleucid kings. One bronze issue bearing this image was minted in Judaea by John Hyrcanus I,

Fig. 2. Silver coin of Seleucus I (305–281 BCE). Inverted anchor with ring at either end, bunch of grapes to the left, between inscription ΒΑΣΙΛΕΩΣ ΣΕΛΕΥΚΟΥ (of King Seleucus). Diameter approximately 13 mm.

Fig. 3. Bronze coin of Antiochus I (281–261 BCE). Macedonian shield with Seleucid anchor on the boss. Diameter approximately 14 mm.

on behalf of his overlord Antiochus VII Sidetes (138–129 BC) (Meshorer 1982a: Suppl. 2 nos. 1–4; p. 39). Kindler has suggested that this piece served as the prototype for the anchor on Alexander Jannaeus' coins (Kindler 1968: 190; Pl. 20B.9).

Different accounts have been handed down about the origin of this royal Seleucid emblem, which are recorded by two historians of the Roman imperial period, Pompeius Trogus and Appian of Alexandria (Justin *Epit. Pompeius Trogus* xv 4, 2–9; App. *Syr.* 56 [284–87]; cf. Hadley 1974: 60–61; Fischer 1983: 10 and n. 6). According to the tradition transmitted by the Augustan historian, Pompeius Trogus, through the epitome of Justin (probably in the third century AD), Laodice, the mother of Seleucus I, dreamt that Apollo had given her a signet ring engraved with an anchor as a reward for lying with the god. Just such a ring was found in the bed the next day, which Seleucus always wore. He and his descendants also bore a birthmark in the form of an anchor on their thigh, as enduring proof of their divine extraction. According to the Alexandrian historian, Appian (second century AD), Laodice was told in the dream that whatever ring she found, she should give her son to wear. Furthermore, he should become king at the place where he should lose that ring. She found an iron ring with an anchor engraved on it, which Seleucus subsequently lost. Subsequently, while en-route to Babylon, he stumbled on a stone near where he had lost the ring. Underneath, he found an anchor. Appian also records that Ptolemy son of Lagus, another of Alexander the Great's generals (who established himself in Egypt as Ptolemy I), insisted that

Fig. 4. Bronze coin of Seleucus I. Winged Nike facing left, holding a wreath. Before her an inverted anchor. On either side an inscription ΒΑΣΙΛΕΩΣ (right) ΣΕΛΕΥΚΟΥ (left). Diameter approximately 17 mm.

an anchor was a sign of safety and, for this reason, when he became king, Seleucus, bore a signet ring engraved with an anchor.

The affiliation of the Seleucid royal house to Apollo was rooted in prophecy made by the oracle of Apollo Didymaeus that Seleucus would become king (Diod. Sic. xix 9, 4; Walbank 1984: 85; Hadley 1974: 58). By the reign of Seleucus' son Antiochus I, the legend that the Seleucids were descended from Apollo had gained currency (*OGIS* 219 = Austin 139). Apollo themes, including representations of the deity and his attributes, including the Delphic tripod and the anchor, occur with considerable frequency on Seleucid coins minted throughout their domains (Hadley 1974: 57–58; Newell 1938, *passim*; Newell 1941, *passim*).

So much for the depiction of the anchor on the coins. Next, we need to consider the reason for its use by Alexander Jannaeus. The explanation offered here is that it was intended to emphasize the legitimacy of their rule, especially to the large non-Jewish population that was included within the borders of the Hasmonaean and Herodian kingdoms. In this connection, it must be said that the royal court was, by the reign of Alexander Jannaeus, hellenised to a considerable degree. His Greek name refers to the greatest of all the Macedonian kings, Alexander the Great, and his elder brother and predecessor, Judah Aristobulus (104–103 BC), had acquired the title *Philhellene* = 'friend of the Greeks' (Jos. *AJ* xiii 318). The use of the Greek formula 'of King Alexander' on Jannaeus' 'anchor' coins attests to his emulation of Alexander the Great.

The political successors of Alexander (*Diadochi*) were faced with a major common problem. They had usurped power from Alexander's natural heirs and tried to bolster their claim to authority by linking themselves with their illustrious predecessor. Thus, for example, we find Ptolemy I (305–282 BC) bringing Alexander's body for ceremonial burial in Alexandria and establishing a cult to him in his new capital city (Leschhorn 1984: 204–212). He and other *Diadochi*, including Lysimachus of Thrace (305–281 BC), displayed Alexander's image on their coins (Fleischer 1996: 29–30). It is significant in this regard that Alexander was reputed to have given Seleucus a clear sign of his future rule in a dream (Diod. Sic. xix 4).

As the Seleucid Empire disintegrated, the new rulers of the dismembered portions, likewise, promoted themselves as legitimate heirs to the older dynasty, and this aspiration is expressed in their coinage. The single event that triggered the dissolution of the Seleucid Empire was the defeat of Antiochus III Megas (223–187 BC) by the Romans in 190 BC at Magnesia-on-the-Sipylus in Lydia. In consequence, Antiochus III, was forced to cede his territories in Asia Minor to Rome and Pergamon. Moreover, Antiochus III was forced to pay a crippling war indemnity to Rome, and this liability was passed on to his successors (Livy xlii 6).

The reign of Antiochus IV Epiphanes (175–164/3 BC) saw the breaking away of several outlying regions. In 166 BC, the Maccabean Revolt broke out in Judaea. At about the same time, the kingdoms of Greater and Lesser Armenia and adjacent Media Atropatene threw off their allegiance to Antiochus. Meanwhile, the

Parthians were encroaching south-westwards from their homeland to the east of the Caspian Sea, onto the Iranian plateau, under their kings Phraates I (*c.*176–171 BC) and Mithradates I (171–138 BC). Antiochus IV died while campaigning in Persia against Mithradates.

Coins provide vital and in some cases unique evidence about the break-up of the Seleucid Empire (see Fig. 5). For our purposes, the sequence of events will be briefly summarised. After Antiochus IV's death, it is known that a certain Ptolemaios, who was apparently the Seleucid governor of Commagene in the Upper Euphrates, rebelled and asserted his independence in about 162/1 BC. The Parthian conquests gained momentum during the 150s and 140s, under the energetic leadership of Mithradates I, at a time when the Seleucid monarchy was rent by civil war between Demetrius I Soter (162–151/0 BC) and the pretender Alexander Balas (153/2–145 BC). The latter are well known personalities from the Books of the Maccabees.

During this period of civil strife, there were successful rebellions in Mesopotamia and the adjoining territories. In 148/7 BC, the mountain region of Elymais (ancient Elam), east of Susa, seized its independence. So did Media, but this region was shortly afterwards taken by the advancing Parthians. The Elymaean leader Kamnaskires I Nikephoros (*c.* 147–140 BC) seized the once illustrious capital of Darius I, Susa, and struck coins there in his own name (Sellwood 1983: 306–307; Strauss 1971: 109–40; *SSP*: 349–58). Some of these coins bear the inverted anchor of the Seleucids, while others represent Apollo and his tripod (*SSP*, no. 85 [Apollo]; no. 86 [anchor]; no. 87 [tripod]; cf. p. 397, n. 5).

About two decades later, Hyspaosines (*c.* 125–121/0 BC), the Seleucid satrap of Mesene, also called Characene ('charax' means palisaded camp or fort in Greek), at the head of the Persian Gulf, declared his independence, taking advantage of the warring between the Seleucids and the Parthians (Sellwood 1983: 310–11). He refounded one of Alexander's foundations at the mouth of the Tigris as his capital, renaming it Charax Spasinu, after himself. A bronze coin of his bore the inverted anchor (Newell 1925). Examples of this coin type are so heavily overstruck that the original designs can scarcely be seen. Therefore, an example of this issue is shown drawn in outline in Fig. 6 (Newell 1925: Pl. II.7). The overstriking was carried out in the name of Mithridates II of Parthia (*c.* 124/3–90 BC), who briefly occupied Charax Spasinu (*SSP*: 387–88).

With the Parthians invading from the east and an intermittent civil war between rival claimants to the Seleucid throne debilitating the kingdom, local leaders exploited the turmoil and established a patchwork of independent states. But from the coins minted by the newly created kingdoms, we find their rulers endeavouring to establish a connection with the Seleucid dynasty, through the use of the same royal emblems and Greek inscriptions.

Following the defeat of Antiochus VII Sidetes in Media in 129 BC, Hyspaosines briefly occupied Babylon in 128/7 BC but was displaced shortly afterwards by the Parthians (*SSP*: 368). The Parthian king, Mithridates II, struck coins at Susa between 123/2 and *c.* 92/1 BC, bearing well-known Seleucid motifs, includ-

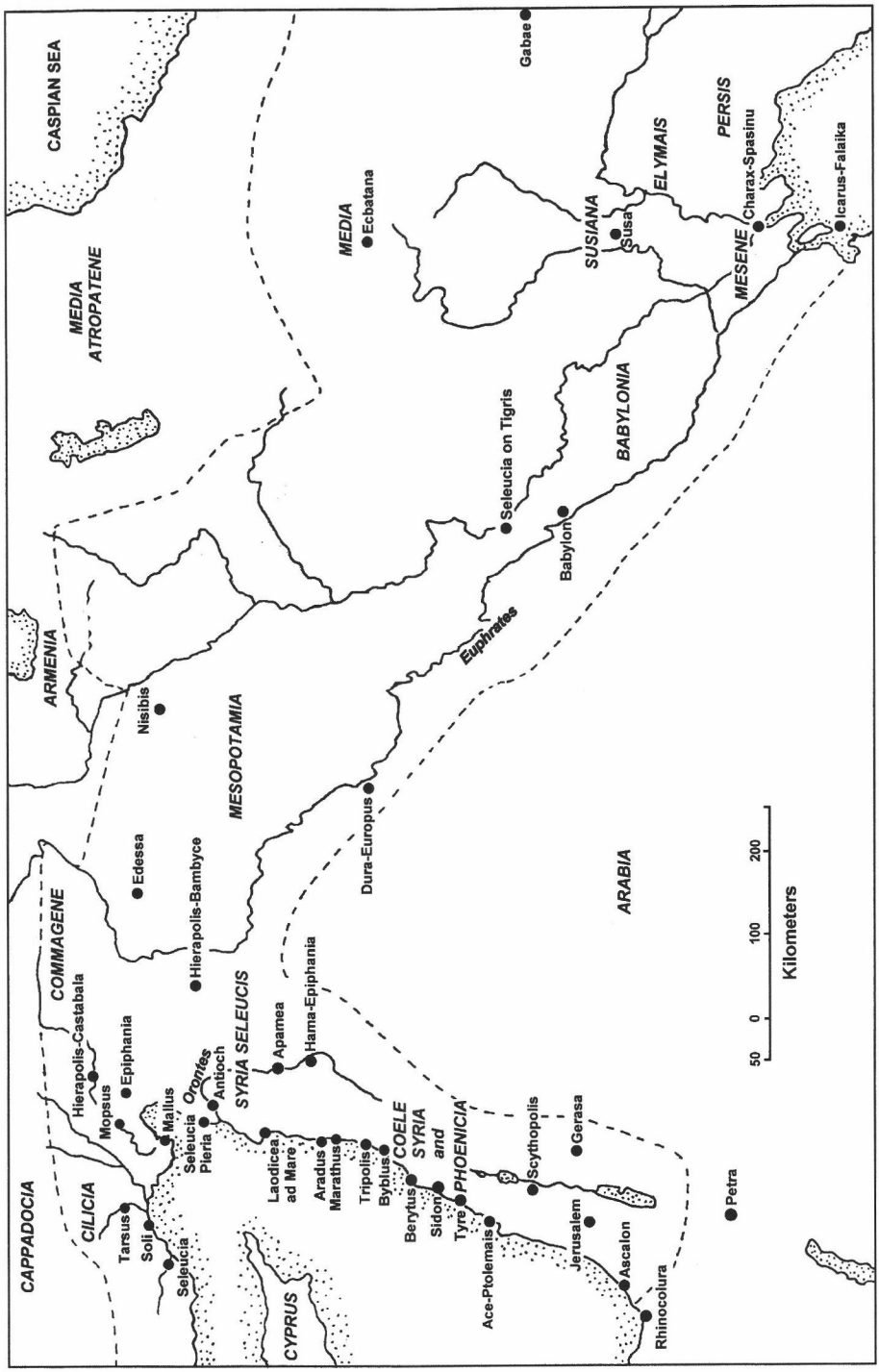

Fig. 5. Map of the Seleucid Empire at the accession of Antiochus IV Epiphanes in 175 BCE. (after Mørkholm 1966, 120–21)

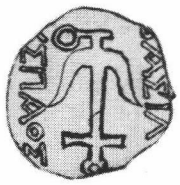

Fig. 6. Bronze coin of Hyspaosines of Mesene (*c.* 125–121/0 BCE). Restored design with inverted anchor between inscription ΒΑΣΙΛ[ΕΩΣ] (right) ΥΣΠΑΟΣ[ΙΝΟΥ] (left) (of King Hyspaosines). Diameter approximately 14 mm.

ing the inverted anchor (*SSP*, no. 122; no. 128; pp. 389–91). These coins, too, carry Greek inscriptions in the *Diodochic* format.

The preoccupation of these various rulers with Seleucid credentials lasted into the late first century AD, certainly in Commagene (*BMC Galatia*, Commagene no. 1, Pl. XV.7), where there was a definite dynastic connection: Laodice, daughter of Antiochus VIII Grypus (126–96 BC) married Mithridates I Kallinikos (*c.* 100–70 BC), king of Commagene. This can be the only explanation for the anchor on this coin, for Commagene was landlocked.

The anchor motif is one of the series of symbols drawn from the Seleucid and a wider Hellenistic repertoire employed on the coins of Judaea minted by Herod the Great (37–4 BC) (Jacobson 1986); see Fig. 7 (*BMC Palestine*, Herod I, no. 42, Pl. XXIV.9; cf. Meshorer 1982b, Herod the Great nos. 17–22; p. 13). In this and the following examples, the anchor is shown upright, judging by the direction of the inscription. The anchor also occurs on coins struck by his son Archelaus (4 BC–6AD) (*BMC Palestine*, Herod Archelaus, nos. 38–43; cf. Meshorer 1982b, Herod Archelaus no. 1). Then, more than a decade after the extinction of Jewish independence by the Romans, we find the anchor appearing on an issue of the last Herodian monarch, Agrippa II (*c.* 48–100 AD), which was minted in his inland principality of Chalkis, in southern Lebanon (*BMC Palestine*, Agrippa II, no. 62, Pl. XXVII.15). It seems that the Herodian dynasty, like that of Commagene, clung on to this Seleucid emblem right to the very end.

There is one final point to be made in connection with these late appearances of the anchor on the coins of Commagene and Judaea. They were struck more than a century after Seleucid currency had passed out of circulation and they

Fig. 7. Bronze coin of Herod the Great (37–4 BCE). Anchor with inscription, from upper right, ΒΑΣΙΛ[ΕΩΣ] HPW[ΔΟΥ] (of King Herod). Diameter approximately 13 mm.

were not merely slavish copies. The only obvious explanation for the anchor on these and, by implication, on the earlier coins referred to might be that legitimate succession to the Seleucid kings was indeed of importance to these monarchs. From this it follows that the use of this symbol by Alexander Jannaeus and his near-contemporaries in the East cannot be put down simply to imitation of the 'good' money of the Seleucids, to secure confidence in the currency of the ascendant native monarchies.

Notes

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The lime-burning plant at the Ali-Muntar Hill in Gaza

AVI SASSON

The city of Gaza is renowned, among other reasons, for its wide range of traditional crafts and trades (Braslavy 1946: 278; *idem* 1957: 40; Dar 1974). Towards the middle of the twentieth century, a new industry began to develop, which was previously unknown in the city of Gaza, namely lime production. While lime-kilns feature prominently in the landscape and have had a serious effect on the local ecology and environment, those who have described the landscape of the city of Gaza have not referred to the lime-burning plant at Ali-Muntar (Yizraeli 1979: 302; Ilan 1968: 295). This is apparently a clue to the dating of this industry, a point that will be expanded upon later.

The goal of this paper is to document one of the few remaining facilities of an industry using traditional methods that have been operating in Palestine up until the 1970s. While this lime-burning plant was once considered a local 'modern' industry, an understanding of its various components and its method of operation may facilitate students of technology in regard to their study of the operation of similar but ancient, facilities that are encountered throughout Palestine (Sasson 1990: 47–48).

In most areas of the country where the bedrock consists of various types of limestone, concentrations of lime-kilns are commonly found in varying degrees of density. These usually correspond to the density of the inhabited areas of that region. The phenomenon of lime production in or around calcareous chalky regions is the direct result of calculations based on considerations of efficiency and economy. In the coastal plain area, where *kurkar* (sandstone) predominates, not one lime production centre from any other period has been found similar to the one known at Ali-Muntar. The kilns that have been found come from the coast of Ashdod,[1] Caesarea (Frova 1963: 23; Negev 1992: 1374), and Tel Hefer (Porat 1993), and have been dated to between the Byzantine period and the late Middle Ages. These kilns were used to burn building stones taken from structural remains of earlier periods found at these sites. In the previous century a lime-production centre existed at Jaffa but judging from reports it appears to have utilized an entirely different technique of production (Avitsur 1985: 12; Elkayam 1990: 225–226; Shva 1977: 95–96). In the absence of published sources on the subject, this paper is based on fieldwork, including a survey with measurements, and on observations and meetings with local residents.[2]

Geographical and historical background

The hill of Ali-Muntar (ref. Point 100/100 Israel Survey Map, 640/485 UTM) lies to the east of the city of Gaza, west of the Gaza bypass road, and rises to a height of approximately 90 meters above sea level. This hill, composed of *kurkar*, is part of a series of *kurkar* ridges within the coastal plain. This range, originating in Rapha (Rafiah), extends in the direction of Ali-Muntar and, from there, runs northwards to Yad Mordechai (Nir 1961: 70–71; Picard and Solomonica 1936). For hundreds of years this range served as the eastern boundary of the city of Gaza.

The hill of Ali-Muntar consists of two domed hillocks almost equal in height. On the northern dome, according to Moslem tradition, lies the grave of Ali-Muntar, a hero from the Middle Ages. Various traditions also connect this site with the biblical Samson (Canaan 1927: 299). (Fig. 1). The topographical significance of this hill made it of strategic importance over the generations, hence the source of the Arabic name *muntar* – 'watchman'. The lime-burning plant is located on the southern hillock. Between the two hills is an access road extending to the Ali-Muntar neighbourhood, which is also the northern boundary of the lime plant.

The lime burning industry at Ali-Muntar is exceptional not only in geological, topographical and geographical terms, but also historically and this will be elab-

Fig. 1. A drawing of the Ali-Muntar tomb.

orated upon later. The lands in this region were originally owned by the Husseini family, related to the Jerusalem family of the same name, and are now owned by Sheikh Ibrahim Abad, who also owns the local building-block and white-lime factory. According to evidence provided by local residents and based on the findings made in the field, it emerges that the lime-kiln industry at Ali-Muntar was the only centre throughout the Gaza Strip region used in the past for the constant production and supply of lime (Braslavy 1946: 278).

Dating the lime-kiln

Despite the fact that the site is accessible and appears to be contemporary, the problem of dating the lime-kiln remains an open question. For thousands of years residents of Gaza apparently bought their limestone products from a variety of sources in the mountainous regions of Hebron. There is, moreover, no evidence in the 19th century traveller and scholarly accounts regarding the existence of such a plant or anything similar to it in Gaza or its environs. George Gatt who surveyed and described the various parts of the city and its industries at the end of the 19th century makes no mention of Ali-Muntar (Gatt 1888). Neither this plant nor anything resembling it appear in the aerial photographs taken by the Germans during World War I. The establishment of a lime-kiln of any sort at Ali-Muntar must therefore, according to the testimony of local residents, have occurred during the time of the British Mandate, probably in the 1930's. However, neither the literature of the period (Al Arraf 1943), nor the contemporary maps, can confirm this.

The present centre was apparently established and/or supported by the Egyptian regime during the 1960's. From testimony provided by Yissachar Goldraat (pers. comm.; an interview with Goldraat, a researcher on the history of Gaza, was held on 5th August 1988) and Rami Yizraeli (Yizraeli 1979: 302) it would appear that the lime-kiln was still operating in 1975. During the course of the present research, parts of the facility were already in a state of neglect. Visits to the site which we conducted over a period of several years showed a process of advancing disrepair. While the factory's owners still market building materials, they now buy ready-made plaster from the centre of the country instead and market it in the Gaza Strip. It should be noted that the large lime-burning factories, which include a number of lime-kilns arranged in proximity to each other, are familiar to us from the lime factories that were established during the British Mandate, such as those in the Castel, Majdal Zadk, Wadi Ara, and others, but still there was a vast difference between these and the lime-burning plant in Gaza. In some ways the lime-burning facility in Gaza most resembles those seen in Turkey.

General description of the lime-burning factory

Of the ten lime-kilns that were in operation in the factory only two now remain, both almost intact. (Fig. 2) According to Yissachar Goldraat (pers. comm.), at the

height of their productivity 20 kilns operated at the site. One of the local residents we spoke to claimed that there were originally 30 kilns. The remains of the other kilns may still be discerned at the site. The lime-burning plant included several systems working independently of each other. Each system had two major facilities, one alongside the other: the source of energy which was the *solar*-oil pool and the lime-kiln itself. The distance between the two facilities was about ten meters. Because of the similarity in the overall structure of the kilns and their method of operation, we shall be describing only one system below.

Description of the kiln

The kiln has a rounded structure, four meters in diameter, built above ground. (Fig. 3). In this respect it is different from the earlier types of kiln which was generally dug into the earth for at least half its height. The southern side of the kiln abuts the side of the hill for reinforcement and support. This support was important in maintaining the kiln and is familiar from earlier kilns where the

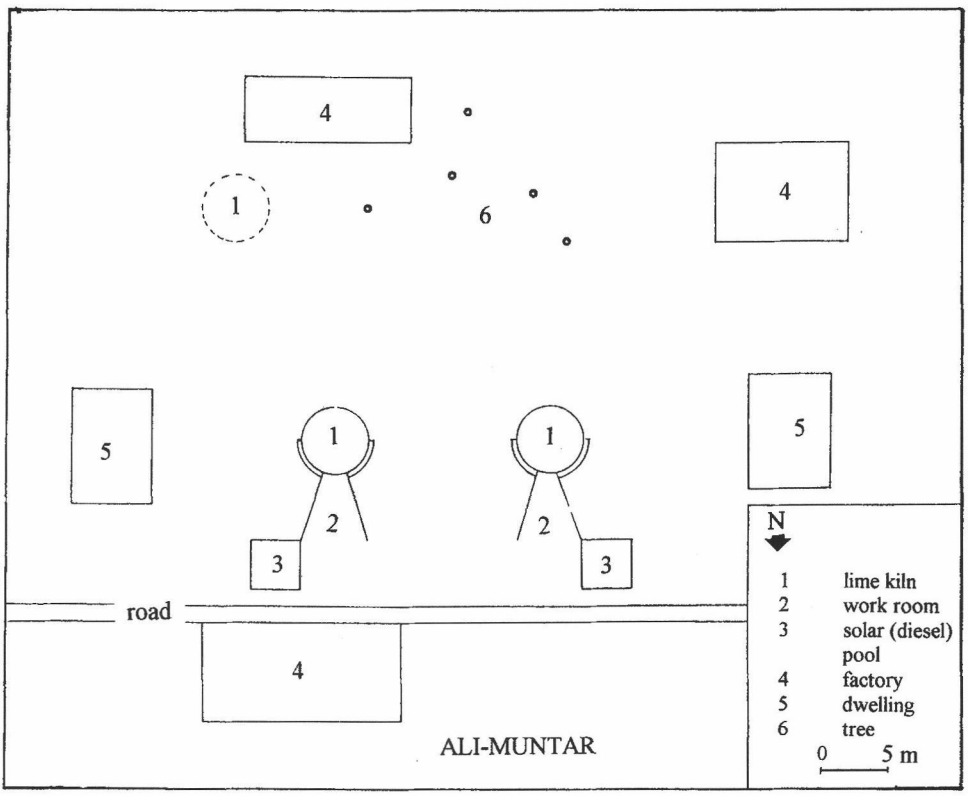

Fig. 2. A sketch-plan of the lime-burning factory.

builders had originally designed them to be built into the slope of the hill. (Fig. 4). The visible part of the kiln is 4.5 meters high. Another half a meter must be added to account for the base and approximately another meter to the ceiling, while it was being operated. It appears, therefore, that when in operation the kiln rose to a total height of six meters. The kiln wall was approximately one meter thick. Even relative to ancient kilns, this is considered a rather large structure. (Fig. 5)

By building the kiln into the side of the hill the structure was therefore fortified. Indeed, on the northern side of the kiln, which does not lean against the side of the hill, a retaining wall 1.5 meters thick was built. The kilns of Ali-Muntar were built, as at other sites, of stone quarried from the indigenous rock, in this case *kurkar*. Here, however, two layers of revetment may be distinguished in the kiln wall. While the entire structure was built of *kurkar*, the inner wall of the kiln was covered with smooth stones made of hard lime collected from nearby riverbeds (Nahal Saad and Nahal Besor, among others). (Fig. 6) The purpose of lining the kiln's inner wall was to thicken and reinforce the part which was eventually subjected to high temperatures during the burning process. In ancient kilns the inner walls were usually constructed of larger stones than those used in the outer walls. However, the kilns found on the coastal plain which were also built of *kurkar* had no such inner wall. This would explain the high rate of structural decay in these kilns as well as the low quality of the lime produced there. The raw material that was burned to make lime that came into contact with the chalk contained a greater amount of impurities than that which was burned in a kiln lined with stones.

The large structure of the kiln was comprised of three parts: the furnace, the

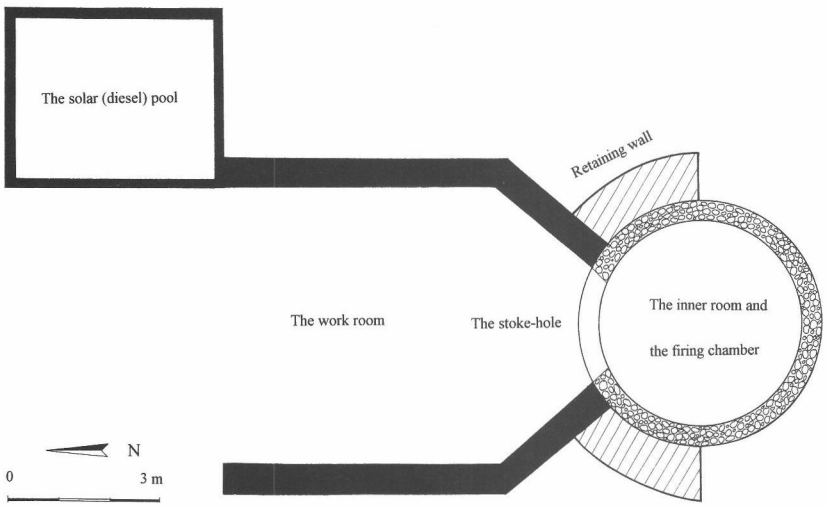

Fig. 3. Plan of the eastern kiln.

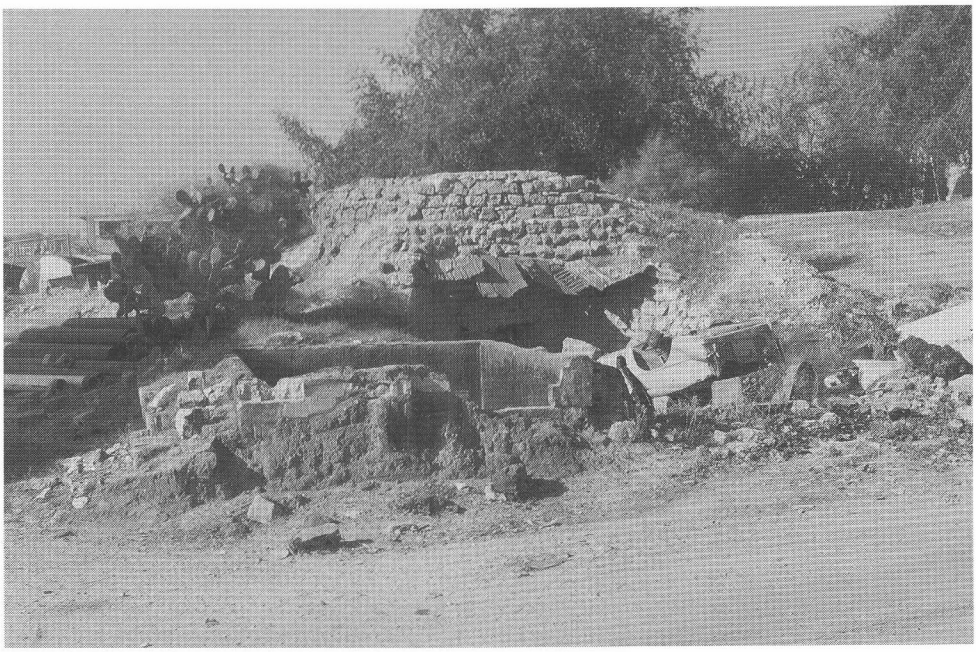

Fig. 4. General view of kiln.

stone room, and the work room. The first two units were built inside the kiln, while the third was built outside. The following is a description of these units and their manner of operation.

The furnace

This is the lowest part of the kiln. Its opening, which is actually also the door into the kiln, faces north. (Fig. 7) In ancient kilns, the openings of the furnaces generally faced west or towards the direction of the local wind current, which had an important role in the combustion of the material used as fuel. In the more advanced system, wind direction had no significance and the direction of the opening was solely determined therefore by considerations of expediency. The opening is at a height of about two meters and is conical in shape. Its external width is approximately one meter and its internal width is 0.75 cm.

The ceiling of the combustion chamber was arched and built of large unhewn stones. The chamber was approximately two meters high. Despite the fact that the kiln was lined with smooth rocks taken from the riverbed, the actual base of the kiln (i.e. the inner wall of the combustion chamber) was built with *kurkar* rocks that were larger than those used in building the upper section of the kiln. The reason for this, as has previously been mentioned, was the high temperatures to which this chamber, and, more specifically, the rocks of the inner wall, was subjected. In the

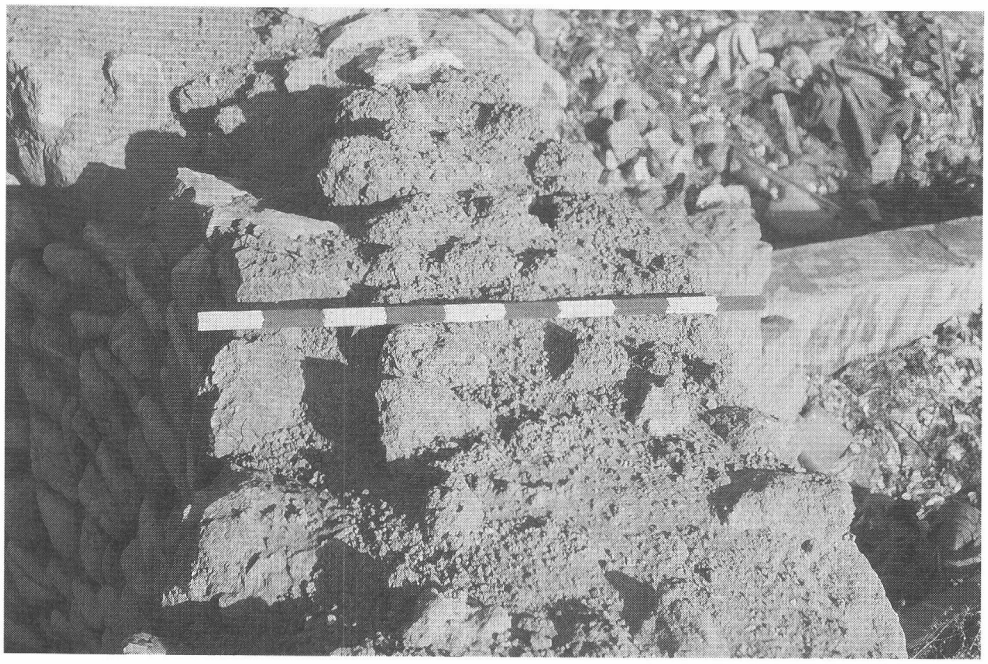

Fig. 5. The wall of the kiln.

centre of the combustion chamber was the tank of *solar* (diesel) oil. While the kiln was in operation, the opening was closed off either with slabs of stone or sheets of metal. The builders left a small vent to enable those stoking the fire to supervise the operation and to ensure that the system was functioning properly.

The stone chamber

The base of this chamber is in effect the arched ceiling of the furnace room below it. The chalk rocks used for burning were relatively small and were introduced into the stone chamber from the outside. A large amount of rocks were loaded at one given time and this created a kind of dome 2–3 meters high. The dome of the stone chamber was plated with a layer of large rocks on the outside. This was designed to support the stone chamber within the kiln as well as to preserve the heat that was being generated in the stone chamber during the burning process. A large rock was generally placed on the top of the kiln. This rock turned red-hot while the stones were being burnt and signalled the completion of this stage. (Fig. 8)

To allow for the convenient loading of the raw materials, a ramp was built outside the kiln for the men who delivered the rocks to walk up. Steps like these or similar ones have been found in a very small number of ancient kilns. In a kiln built into the Roman embankment at Masada (Sasson 1990: 20, 107–109) we found a small

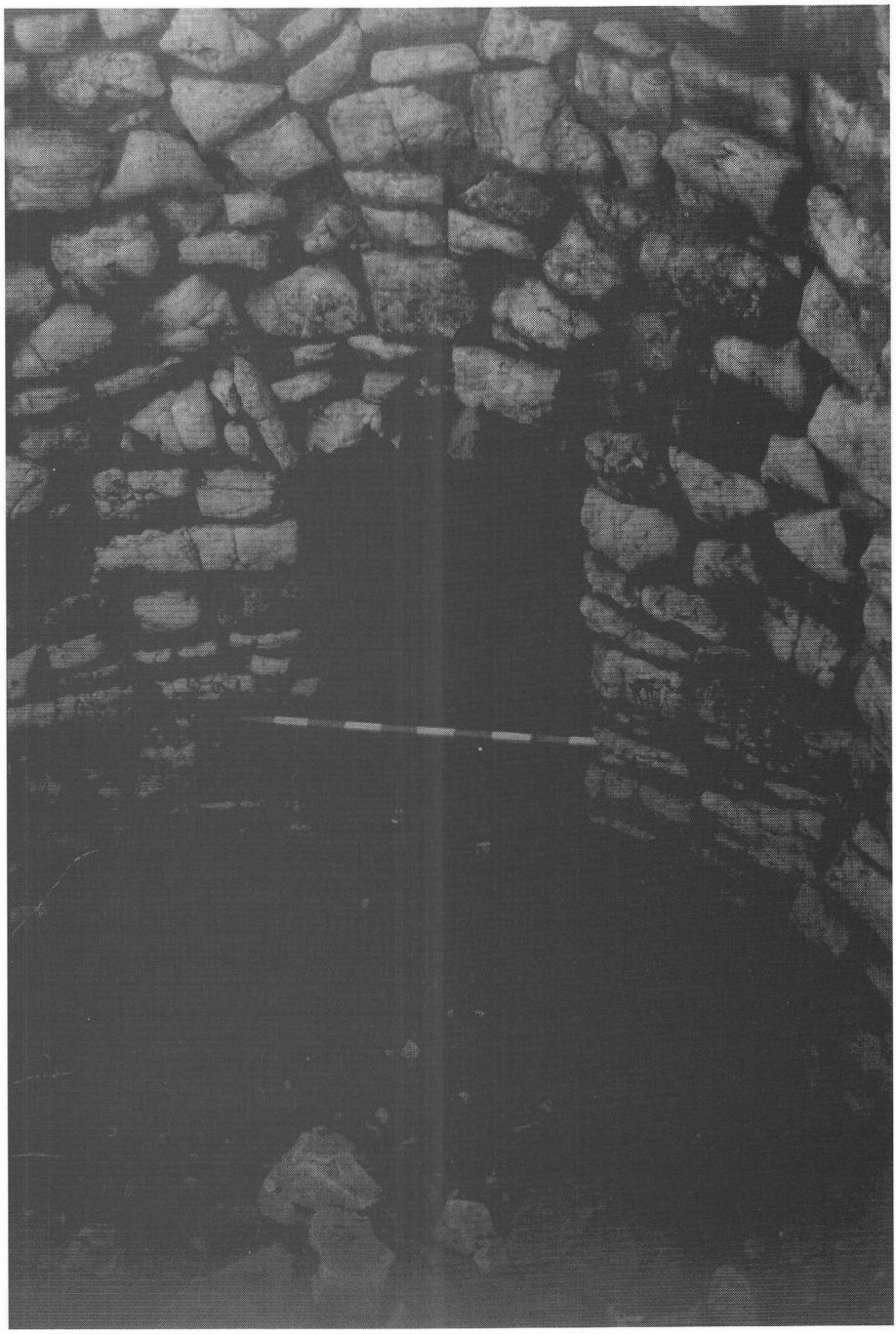

Fig. 6. The inner wall of the kiln.

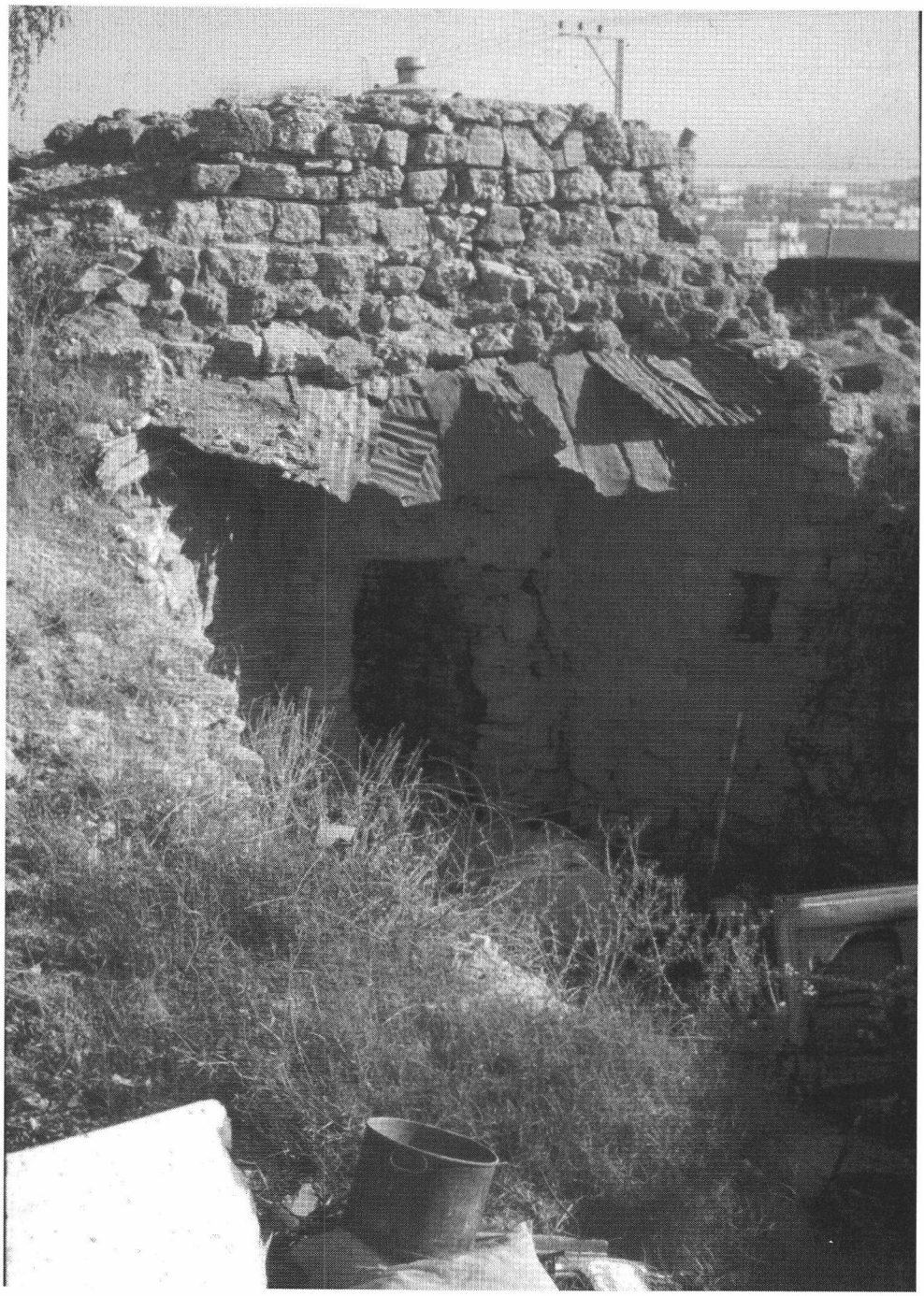

Fig. 7. The doorway into the kiln.

Fig. 8. The roof of the stone chamber.

set of stairs that was used by the workmen. The reason why most traditional kilns do not have steps such as these is probably because they utilized the slope into which the kiln was built as a loading ramp. In the southern side of the ramp, approximately three meters above the floor, was an opening through which the workmen removed the material after the burning had been completed.

Up until this point the design of the lime-burning plant in Gaza may be said to be similar to that of the plant in Samaria, as described by Ismail Khdijah (Khdijah 1971) (Fig. 10), but not really like that of the traditional kilns, as described by Amotz Cohen (Fig. 11) or Hirschfeld (Fig. 12) (Cohen 1973; Hirschfeld 2000).

The work room

This unit serves as a kind of 'anteroom' to the kiln and has three walls. The southern wall is actually the wall of the kiln, in the centre of which is the heating vent. Two diagonal walls extend to the north from both sides of the vent, thereby creating a trapezoidal-shaped cell. The ceiling of this cell is supported by wooden and metal beams (that were dismantled from the nearby railroad track) and upon these a layer of mud was poured. (Fig. 13)

This is the place where a workman would stand, whose job it was to supervise the firing of the kiln and its operation 24 hours a day. An alcove was built into one of the diagonal walls where the workers stored the tools and food that were

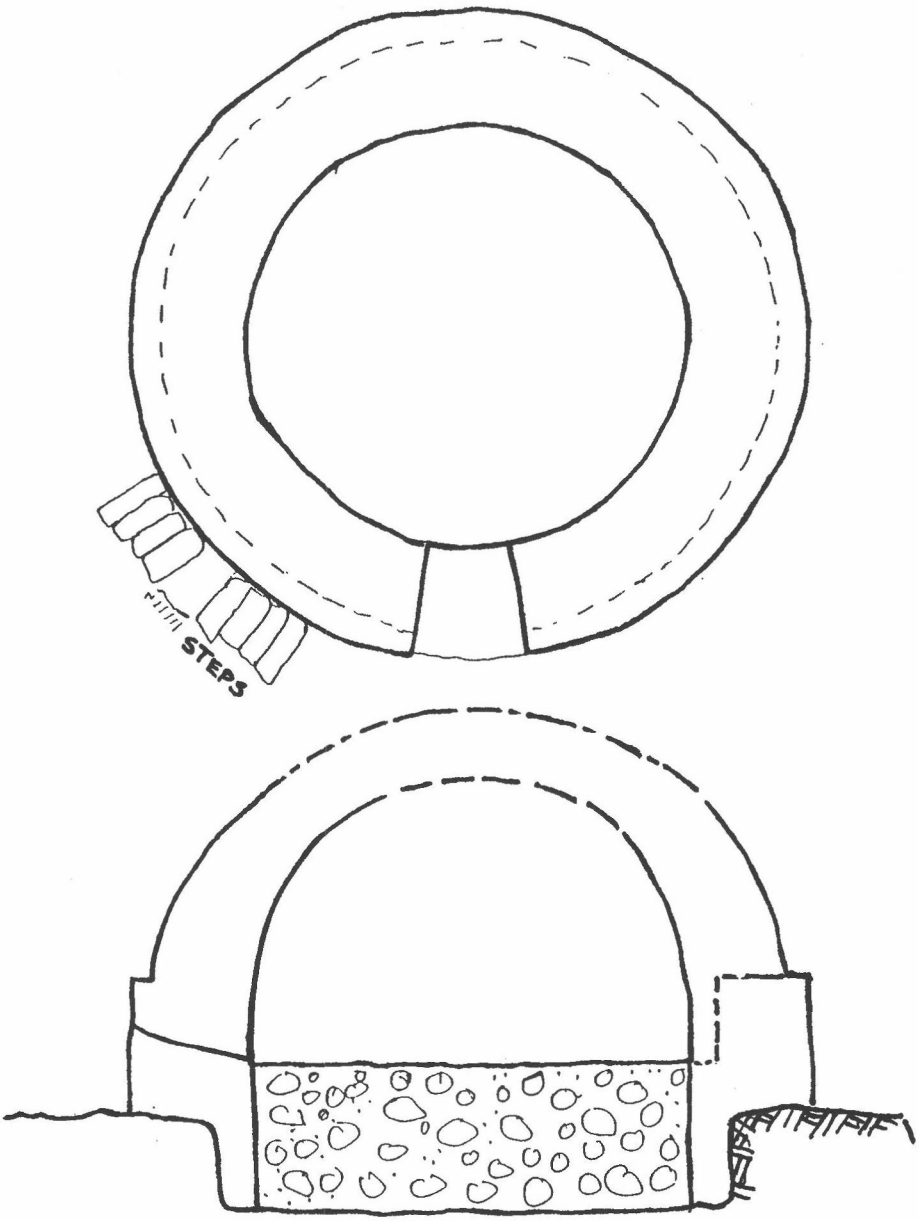

Fig. 9. The Masada kiln – schematic plan and section (after Sasson 1990: 60).

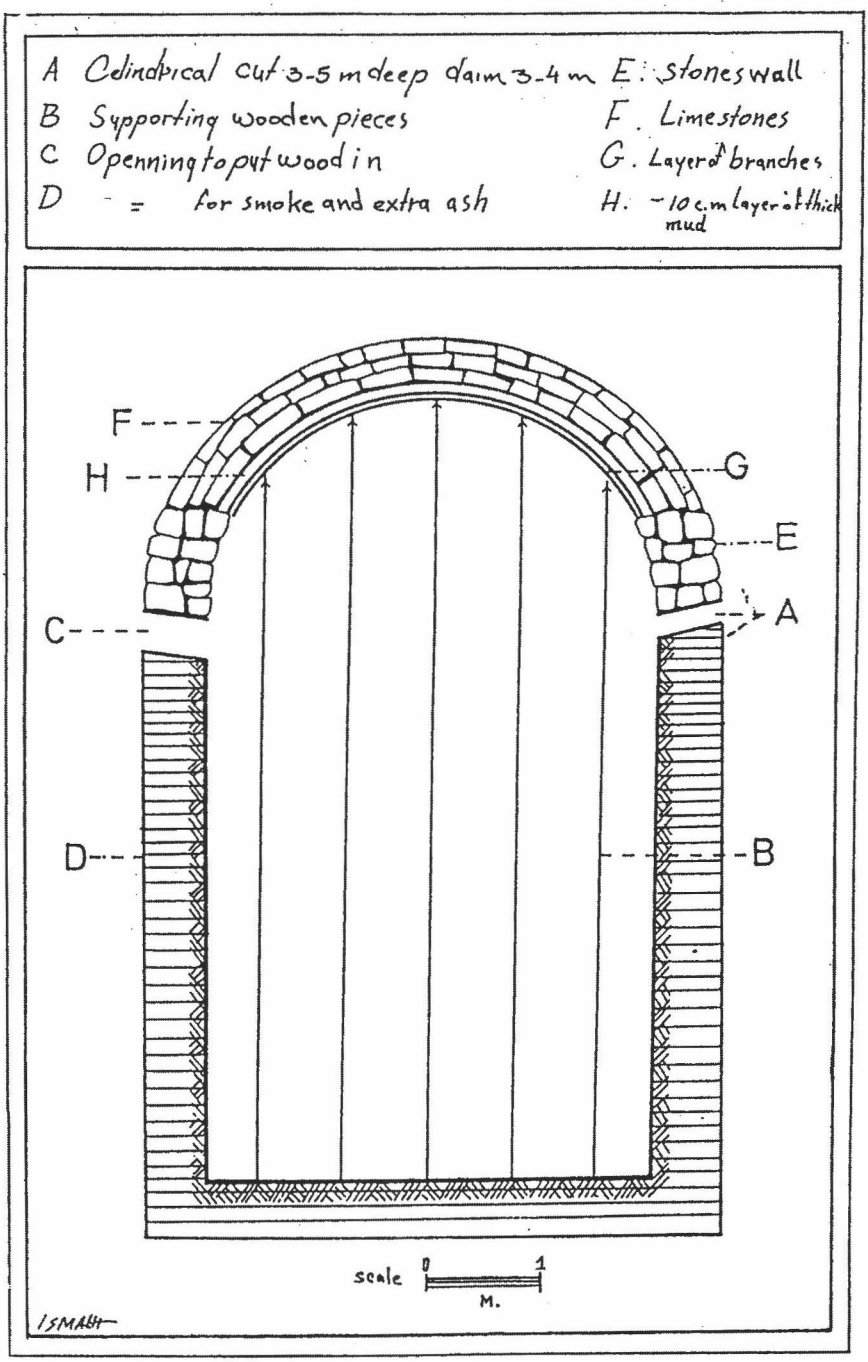

Fig. 10. The Samaria kiln (after Khdijah 1971).

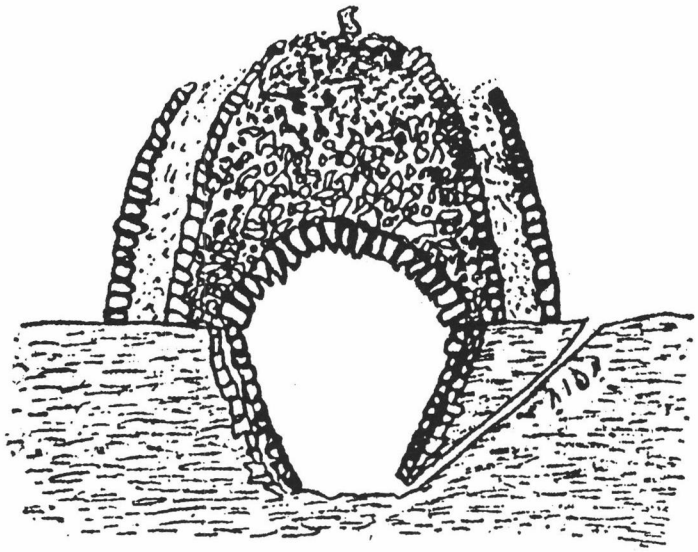

Fig. 11. A traditional kiln (after Cohen 1973).

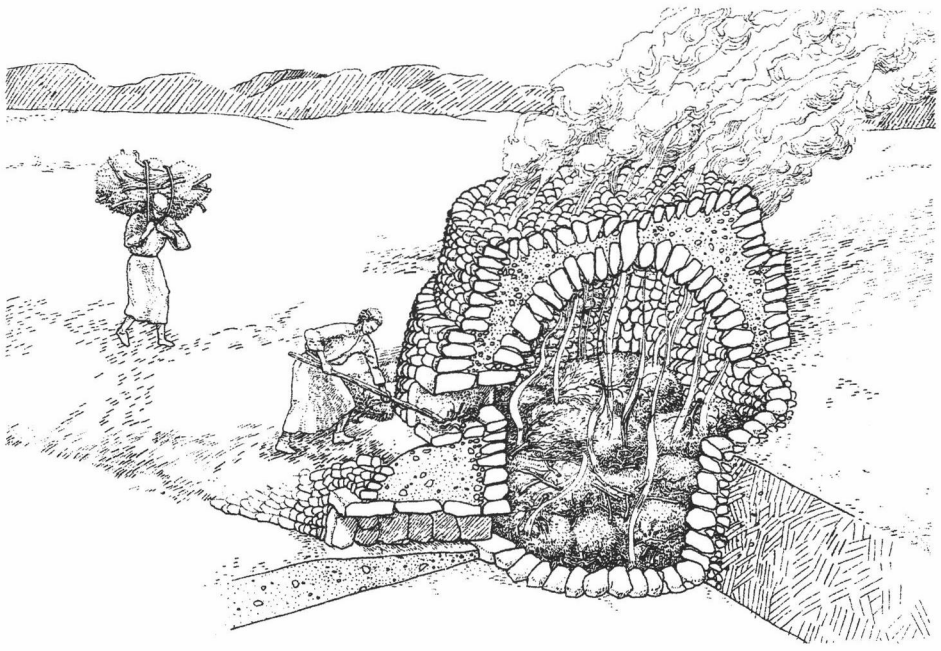

Fig. 12. A traditional kiln (after Hirschfeld 2000).

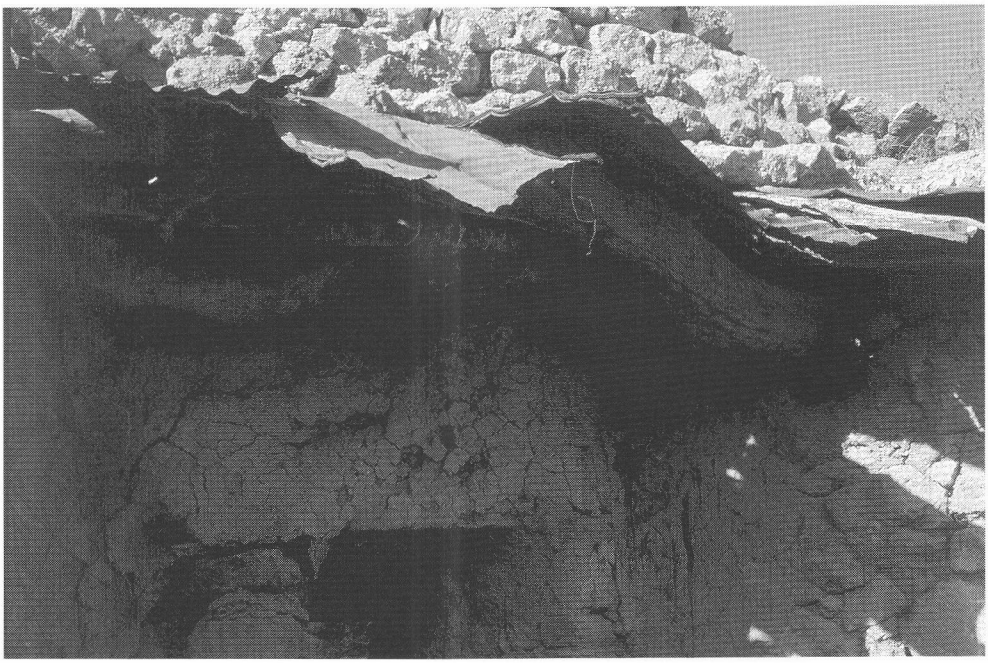

Fig. 13. The entrance to the work room.

needed during the day's work. The kiln could in effect have been operated even without this unit, but its construction contributed to the conservation of the heat and energy released during the burning process.

The *solar* (diesel) oil pool

When limestone is burnt to produce lime, the kiln must reach a temperature of one thousand degrees and more, in order to separate the CO_2 from the rock and to obtain CaO calcite in as pure a form as possible. In the traditional method, the furnace was stoked with small branches and twigs taken from trees and bushes particularly the prickly burnet, which was used in great quantities. According to one opinion, every firing of the kiln required between 60 and 90 tons of stoking material.

At the beginning of the twentieth century, which saw technological advances in the stone and lime industries, a shift was made to the use of *solar* (diesel) oil and crude oil as fuel. This was also the case in Gaza. However, despite this, there was a certain stage when wood (purchased in Gaza) was burnt, since before the kiln was fired up with *solar* (diesel) oil they had to heat up the combustion chamber for several hours to make it easier and faster to burn the *solar* oil later. At this stage they would burn a quantity of wood amounting to approximately one ton.

A pipe led from the *solar* (diesel) oil pool to the kiln. This pipe passed through the boiler (containing water) which was designed to heat the *solar* (diesel) oil flowing in the pipe and to make it less viscous. This made it easier to inject the *solar* (diesel) oil into the combustion chamber.

The *solar* (diesel) oil was injected into the combustion chamber from the nozzle ('disa') with five vent-holes that allowed for an even distribution in all directions. The ejection and injection of the *solar* oil was done with the aid of a mechanical pump ('pompa') operated by one of the workmen continuously. This method required that the workman had to be replaced every two hours.

Due to the great heat in the area surrounding the kiln, the *solar* (diesel) oil pipe (which was one inch thick) was covered by a thicker pipe to prevent heat damage. According to evidence provided by local residents, the kiln was fired for approximately 12 days. However, by comparing this information with that obtained from other kilns it would appear that this estimate is somewhat exaggerated. It was probably over a period of about one week.

The *solar* (diesel) pool is 3.5 meters from the kiln and was built from hollow building bricks ('blocks') 0.2 metres thick. The pool is 3.9 meters long, 3.1 meters wide and 1.5 meters deep. The pool could contain up to 18 cubic meters of *solar* (diesel) oil. In the centre of the walls and along their length a kind of pilaster was inserted in order to give support to the ceiling or to serve as a protective cover when necessary (as a protection against children, rain, and so forth). (Fig. 14)

Raw materials used in the production of lime

As previously mentioned, most lime-kilns were built in calcareous (chalky) areas where the indigenous rock was burned to produce lime. However, there are exceptions to the rule such as those kilns located in the coastal plain which were furnished with raw materials for lime-burning from the building stones of the earlier inhabitants on the same sites.

The lime-burning plant in Gaza is unique because the rocks burned there were not indigenous and had in fact to be brought there from a great distance. This singularity becomes even more significant in light of the fact that the present border between the State of Israel and the Gaza Strip resulted in the city being cut off from the limestone hills of southern Judea, thereby forcing manufacturers of lime to seek out alternative sources of stone. Indeed, until the Six-Day War in 1967, lime manufacturers were forced to wander as far afield as northern Sinai. The nearest site where limestone was quarried was Jabal Libni, 100 kilometers away as the crow flies and 150 kilometers distant by road. Many different kinds of limestone and chalk are found in this region (Eayal 1987: 22; Sasson 1990: 139). (In geological terms, the Judean group is represented mainly by chalk, and chalk is also found in the Mount Scopus group). As far as the manufacturers were concerned, they were able to quarry many different types of rock there. From the information available to us, the Egyptian Government at the time aided

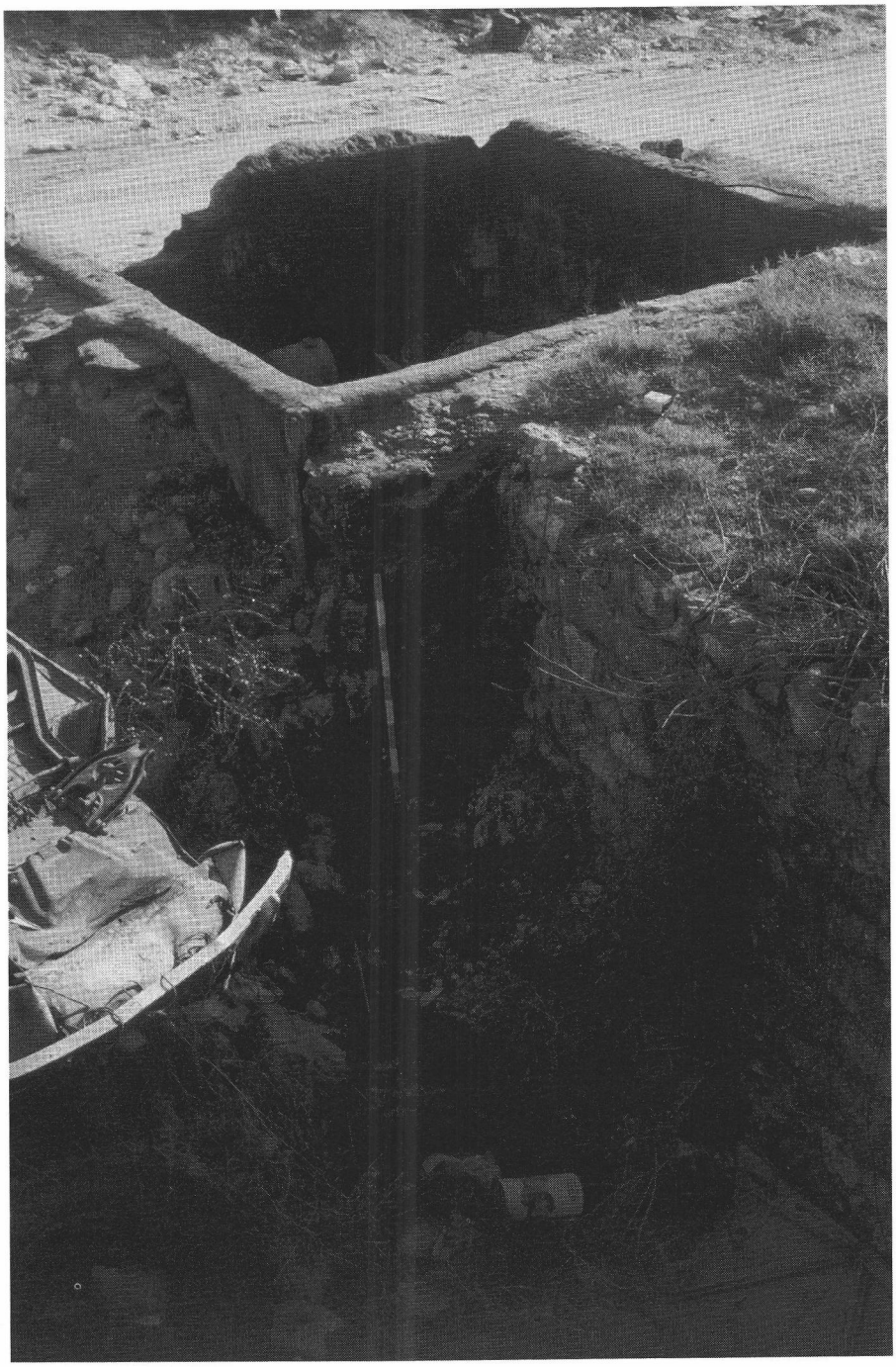

Fig. 14. The *solar* (diesel) oil pool.

the dynamiting and the quarrying of stone in this area for the benefit of the Gaza manufacturers of lime.

Since 1967, when the road between the Gaza area and southern Judea was re-opened, lime manufacturers have sought closer sources to supply them with limestone in the Yatta and Dahariya area in the southern Hebron hills. This region has several advantages as far as the Gaza lime manufacturers are concerned. Firstly, it halved the distance needed to transport the materials. The southern Hebron region is approximately 50 kilometers distant from Gaza as the crow flies and 70 kilometers by road. Secondly, an improved type of stone could now also be obtained. According to Tawfik Canaan (1933: 22), the dolomite rock known as *mizzi hilu* (rose-formation) is the best for producing lime. This kind of rock is very common in the hills of southern Hebron (Avnimelech 1966; Blake 1935: 9–10; Gorodish 1975; Rot and Plechser 1977; Yaffe 1993). Finally, the area of Yata is also the centre of a stone industry and various sub-industries (Hoter 1965). This factor also created an entire new system of economic considerations, since the Gaza manufacturers of lime did not quarry the rock by themselves but purchased it from other stone-quarry contractors.

Whether the stone was purchased in northern Sinai or in the hills of southern Hebron, a considerable distance still remains between the place were the stone originated and the place where it was burned into lime. This factor would not only influence the means of transportation of the raw materials but would also express itself in the economic aspects of the industry. It would seem more worthwhile, in economic terms, to burn the stone in the place where it is quarried and only then to transport the finished product to marketing centres, as it was done traditionally.

In many regions of the country we have observed a direct link between the area where the raw materials are obtained and where they are burned. The distance between the site where the stone is quarried and where it is burned usually varies from several dozen to a couple of hundred meters. At any rate, it is unsual to find great distances between the source and the kilns, such as in the case of the Ali Muntar example. Apparently the reasons for this were political and internal, in so far as the proprietors of the plant and the government authorities were concerned. It cannot also be ruled out that the trucks travelling in one direction – empty of lime and stone – could be used for other purposes, which would have paid, at least partially, for the long two-way journey.

The construction and method of operation of the lime-burning plant

In this section we shall try to summarize and describe the lime factory and all its parts. The kilns were apparently all built at the same time, during the Egyptian regime in Gaza. Four or five builders working for one week were required to complete the construction of one lime-kiln. The building stones were *kurkar* with the addition of smooth rocks from the nearby riverbeds. Before the kilns were put into operation, all the raw materials and tools were prepared in advance.

Until 1967 the stone was brought from northern Sinai, and from then on and until the plant's closure, the stone was purchased in the hills of southern Hebron.

Four to five workers operated the kiln. It was their job to load the stone chamber with the raw materials and it was they who added the fuel to the furnace. These workers worked on a rotation basis and supervised the operations 24 hours a day over a period of one week. Although they also alternated with each other in performing some of the other tasks in the individual kiln, it seems that they were busy most of the time in producing the lime, since the large number of kilns in operation at the plant made it possible to stagger the work shifts. In this way they could create a situation whereby one kiln was just beginning its operation while another was at the height of its activity, and so forth.

While the stone was being burned into lime, thick clouds of smoke would have billowed over the hill of Ali-Muntar, as if signalling to everyone in the vicinity that limestone was in the process of being burned. Long-time residents of Kibbutz Kfar Gaza have provided very graphic descriptions of the sight from their homes. When the stone at the top of the kiln became red-hot after a few days of burning, this served as a signal to the workers that the stones inside the kiln had burned sufficiently. At that point they allowed the kiln to burn for another 12 hours and then they stopped providing fuel. The kiln was subsequently left to cool off over a period of several days. The burnt stones were removed afterwards through an opening in the southern side of the kiln. According to Yizraeli the kilns were operated up to ten times over the summer and three to four times during the winter (Yizraeli 1979).

The kilns were built at a short distance from each other in order to enable trucks, unloading raw material or loading the finished product, to make their way between the kilns. Thus, the trucks were saved from having to make unnecessary maneuvers and they were also able to load the contents of two to three kilns onto the trucks at the same time. (Fig. 15)

From this central factory the finished product, either in the form of powder or as small stones, were transported to various destinations. In Gaza itself the lime was sold in the general market near the central bus station. According to the testimony of local residents, the price for 100 *rotls* (about 288 kg.) of lime was five Egyptian *liras*, while the contents of an entire kiln fetched between 600–750 Egyptian *liras*.

Summary

This paper has dealt with the unique qualities of the lime-burning plant at Ali-Muntar and its contribution towards understanding the various processes in the lime production industry of ancient times.

As we have already suggested this factory represents a merging of ancient/traditional and modern practices, both in terms of the method of production and the economics of this industry. This conflict between tradition and modernity stems at times from considerations and problems that are similar to those already

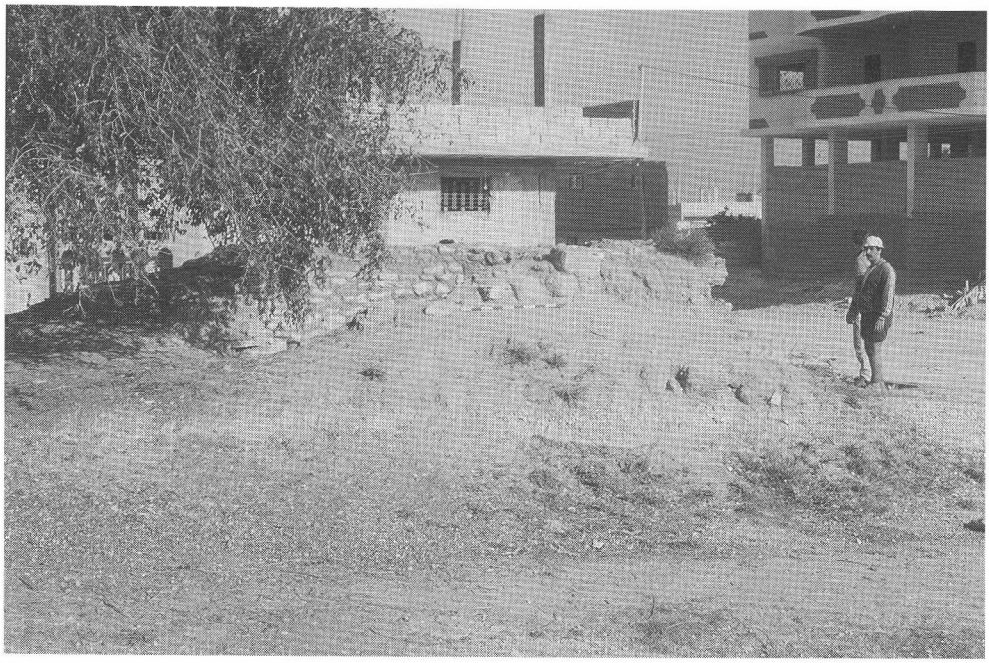

Fig. 15. The western kiln.

encountered in ancient times. We have mentioned a number of lime-producing sites from ancient times located at sites on the coastal plain. By comparing these to the plant at Ali-Muntar we are able to conclude that these other examples were not only not commercial kilns but were designed for fairly limited local use only. The ancient kilns of the coastal plain burned building stones and marble fragments taken from earlier inhabited sites. For this reason, it was both efficient and expedient to operate kilns at these places, but there were limitations in the quantity of production and in the duration of their use. These limitations explain why so few ancient kilns have been found in these areas. Conversely, we can say that the lime-producing centres of the ancient large cities on the coastal plain must now be sought in the chalk regions to the east of these cities. As to the quality of the rock burned for lime, we should not necessarily seek this in proximity to these same cities but rather in those regions where the rock is better suited for that purpose, even if that mean travelling much greater distances. In addition, one must remember that, at times, political and governmental factors may influence matters that would seem to be primarily technological issues.

Acknowledgements

I would like to thank those local residents and personalities mentioned above for the information that they supplied. Yissachar Goldraat, who served in various

functions in Gaza, also contributed important information. The turbulent period during which the survey took place has made it difficult to enlarge upon certain aspects of the research. The Cherna and Dr. Irving Moscowitz Chair at Bar-Ilan University supported this research. Doron Heksher and Noam Amir of Kibbutz Yavne also participated in the field work. Dr. Yoseph Porat, of the Israel Antiquities Authority, Dr. Shimon Stern, fom Bar-Ilan University, and Miria Shliselberg from Kibbutz Yanne, also participated in this research. My thanks to them all.

Notes

1 Referred to by Dr. Y. Porat at a lecture on 22/10/86 at the Archaeological Conference held in Ashdod.

2 On November 11, 1987, we held an interview with Muhammed ben Muhammed Abad, whose father was one of the operators at the kiln, and with Sheikh Ibrahim Abad, the owner. Unfortunately the information we received from the Staff Officer in charge of employment in the Civil Administration does not pre-date 1967. The information from the first years of the Israeli presence in the city does not contribute to a solution of the basic questions that this article is attempting to answer. According to data supplied in1987 by the Bureau of Statistics of the Civil Administration, there were two workers employed at the building works at Ali-Muntar. This information does not correspond with the information that we received from the local residents.

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Book Reviews

Tamar Schick, *The Cave of the Warrior. A Fourth Millennium Burial in the Judean Desert.* In collaboration with D. Barshad, I. Shaked, E. McEwen, Y. Sitry, A. Oshri, Y. Nagar, C. Shimony, E. Werker, I. Segal, Z.C. Koren, A. Nissenbaum, A.J.T. Jull, D.J. Donahue, I. Carmi, D. Segal, O. Negnevitsky, D.T. Ariel. IAA Reports No. 5. Israel Antiquities Authority and The Archaeological Staff Officer of Judea and Samaria: Jerusalem. 1998.

This volume presents the unusual finds from a small cave in a cliff *c.* 3.5 km. north-west of Jericho, of which the most important, a male burial accompanied by very well-preserved organic material, and liberally sprinkled with red ochre, is dated to the first half of the fourth millennium BC. It was found by an expedition searching for more 'Dead Sea Scrolls'.

Following an introduction and description of the discovery and excavation of the cave, the text is organized as 12 chapters, each devoted to the different types of artefact associated with the burial, their materials and function, plus discussion. The textiles, all of linen and showing high levels of craftsmanship in the weaving and dyeing of large cloths, augment the important body of textiles that occasionally emerge from the dry caves of the Dead Sea wilderness. The largest, a remarkable 7 m. × 2 m., was used as a shroud. The dead man had beautifully made leather sandals, with two layers for strength and comfort in the sole. A broken left leg (p. 28, 67) would not account for the more worn state of the left sandal (p. 37), more likely the right. The body rested on a well-preserved reed mat, and was accompanied by a basket and a wooden bowl that may have contained food offerings. With the burial also, were a magnificent flint knife, a bow, arrows, and a stick. The re-curved bow and the two arrows inform an otherwise huge gap in the material record, and the information derived from the study of these weapons is fascinating.

These chapters are supported in a second section by the detailed accounts of the scientific analyses to which the objects were subjected (including radiocarbon, fibres, wood), and an account of the conservation. The very full presentation of this material is commendable, not least the step-by-step account of how the textiles were unfolded, cleaned and preserved. A lively account starts with the large foil-wrapped bundle being brought into the laboratory. The textiles were so dusty, and smelt so awful (sudden onset of decay in a more humid atmosphere? modern animal droppings? we are not told) that masks had to be worn, and the work carried out in a basement instead of the lab. As the body and other objects had already been removed in the field, the textiles had already suffered some disturbance.

This is an excellent production, with well-written text, fine colour cover, three

pages of full colour photographs and numerous semi-tones and line drawings in the text. It is marred by the lack of any plan or drawing of the disposition of the burial in the cave, very sparse information on the interment itself (we are told little beyond the facts that it was a primary, articulated burial, in a 'semi contracted-foetal position inside some kind of tubular cloth envelope'). Undoubtedly (as is noted, pp. 3–4) some of these failures were due to the pressures arising from the need for speed, to get the very fragile materials into an appropriate environment as quickly as possible, but nonetheless some possibly unique evidence has been lost in the process. There is no mention of sieving or flotation processes of the cave debris; the contents of the basket were lost; the location is poorly described and the environmental context is virtually nil.

The cave also contained an earlier child burial of the mid-fifth millennium, and nine coins of the Hasmonean king Antigonus. No contextual information about these coins is given, but D.T. Ariel provides a splendid essay on the historical context and the struggles between Herod the Great and Antigonus in the region of Jericho.

Kay Prag
(The Manchester Museum)

Achim Lichtenberger, A, *Die Baupolitik Herodes des Großen (Abhandlungen des deutschen Palästina-Vereins 25), Harrassowitz Verlag, Wiesbaden, 1999.*

Jostein Ådna, *Jerusalemer Tempel und Tempelmarkt im 1. Jahrhundert n. Chr.* (Abhandlungen des deutschen Palästina-Vereins 26), Harrassowitz Verlag, Wiesbaden, 1999.

Herod the Great, who ruled Judaea from 37 to 4 BC, was one of the most prolific builders of the Classical world. Thanks to Josephus, the Jewish historian who lived a century later, Herod's buildings are well documented. When interest in the ancient topography of Palestine developed in the nineteenth century, the major Herodian sites were quickly identified. However, archaeological investigation of the Herodian monuments only gained momentum following the excavations at Masada in the early 1960s.

It was to be expected that the welter of exciting discoveries would inspire books on the subject of Herod's building programme. Surprisingly, the first substantial appraisal only appeared in 1995. This was a comparative study of the art and architecture of Masada by Gideon Foerster. Duane Roller produced an overview of Herod's building programme in 1998 and now two books dealing with different aspects of the subject have been published in German under the auspices of the *Deutschen Palästina-Vereins.*

The first of these, by Achim Lichtenberger, is the more important of the two publications in every sense. This author addresses a raft of issues that others have asked before, which can be reduced to a single question, namely what motivated

Herod to build on such a lavish scale? Several years ago, Ehud Netzer attempted to approach this issue by an examination of the utilitarian function of the monuments, but his unfamiliarity with the ancient literary sources, the architectural tradition of the Graeco-Roman world and, above all, with the ideology of kingship prevented him from progressing further (Netzer 1981). Duane Roller returned to this question in his book (Roller 1998). He demonstrated a deeper knowledge of Classical culture but failed to grasp the opportunity to rigorously assess the testimony of Josephus in relation to the archaeological evidence (Burrell and Netzer 1999). Lichtenberger has taken up this challenge and has carried out a more methodical analysis.

Lichtenberger begins with a useful explanation of his research approach and methodology, stressing the need to relate the motives for Herod's building programme and the architectural repertoire itself to Hellenistic and Roman ruler ideology. In the second section of the book, we are presented with a survey of Herod's monumental building works in chronological order, based on the author's reading of Josephus, although the latter is not always clear about the dates of Herod's buildings and is often ambiguous about commencement and completion dates. Lichtenberger is therefore demanding a precision in the building chronology that is unattainable. He might have done better to break down Herod's building programme by decade as Israel Shatzman has done (Shatzman 1991, 273–74). Lichtenberger's pedantic streak is also evident in his categorisation of three building phases in his Section III. On closer scrutiny, the third phase is essentially a continuation of the second phase. The two building phases then correspond to the construction of fortresses and civil works (including the foundation of the new cities of Caesarea, Sebaste and Antipatris) respectively.

The 150 page survey of Herod's building projects in Judaea and wider afield is one of the best available. He includes a discussion of the Herodium in the 'hills on the Arabian frontier,' which is mentioned once by Josephus (*Jewish War* i 419), and may be a corruption of the original text. Also included in this survey is the resort of Kallirrhoe on the northeastern shore of the Dead Sea, where Herod sought a cure when he was dying. Kallirrhoe has been located at ʿAin al-Zara, where a complex of buildings was unearthed in excavations in 1985/86 and 1989 by a German team, headed by Christa Clamer, and has been identified as a palace belonging to Herod (Clamer 1997), although none there is specifically mentioned by Josephus. While the author generally acknowledges and discusses different interpretations that have been put forward in relation to the different buildings, he offers his own suggestions and insights. Frequently these represent interesting contributions to current debates, although on occasion they are clearly wide of the mark. So, for example, Lichtenberger sees the walls built of limestone ashlars that surround the enclosure of Machpelah in Hebron as contradicting Josephus. However, the Jewish historian refers to the actual tombs of the Patriarchs being made of marble, rather than the enclosure walls of the monument (Josephus, *Jewish War* iv 523).

The author finds testimony for Herod's building policies and motivations in

the works of Josephus. This is justified by the fact that Josephus clearly drew on the writings of Nicolaus of Damascus, Herod's chief counsellor and Greek scholar, for his portrait of the king. Lichtenberger sees the passage in *Jewish War* i 401–431 as a panegyric on Herod's building achievements, lifted directly from Nicolaus. In *Jewish Antiquities* xv 326, two sides of Herod's outlook are defined as fear (*phobos*) and greatheartedness (*epimeleia*). His *phobos* found expression in the fortifications and security measures, while his *epimeleia* was manifested in his relief of famine and his benefactions to cities, including the rebuilding of the Temple. His ostentatious patronage of communities within his kingdom and throughout the Greek-speaking world, and the magnificence of his buildings, were in the tradition of the illustrious Hellenistic monarchs. This munificence was intended to earn him a favourable reputation (*eudoxia*) and was the underlying motive for Herod's love of fame (*philotimia*) (*Jewish Antiquities* xv 330; xvi 150–60).

From his careful analysis of the buildings hand-in-hand with the literary records, Lichtenberger has made a refreshing contribution to the study of Herod's building programme. The same cannot be said about the book on the Temple of Jerusalem by Jostein Ådna. The author's thesis is that the esplanade and enclosure constructed to encapsulate Herod's Temple was modelled on the illustrious building complexes erected by Julius Caesar in Alexandria and Antioch in 48–47 BC. These magnificent buildings are now lost, but the *Kaisareion* at Cyrene in North Africa built between the late 1st century BC and the 1st century AD, has been partially preserved. This comprises a large, inward-facing enclosure, surrounded by porticoes, including a triple-aisled basilica on one side. Eric Sjöquist argued that the Cyrene complex faithfully reflects the basic layout of its illustrious predecessors and they influenced the design of other similar large peristyle enclosures with a basilica on one side, such as those at Smyrna and Cremna in Asia Minor. Ådna adds Herod's Temple enclosure to this group of buildings inspired by the *Kaisareia* at Alexandria and Antioch. The snag with Sjöquist's theory, as endorsed by Ådna, is that the *Kaisareia* at Alexandria and Antioch are only known from short, confused descriptions and it is not even clear whether either possessed a basilica, as pointed out by Klaus Tuchelt (1981). Furthermore, each appears to have possessed more complex layouts than single peristyle court or *quadriporticus*. In fact, there is clear evidence that the scheme of a *quadriporticus* and basilica developed with Italian *fora* in the late Republican period (Nünnerich-Asmus 1994, 74–110; Gros 1996, 95–119). Ådna appears to be ignorant of the scholarship referred to above, after Sjöquist, which bears on the core of his argument. This is a great pity, as the synthesis of the traditional Jewish sanctuary with a *quadriporticus*, taken from normative Roman forum architecture, begs interesting comparisons with other Herodian building projects, which also blend Roman architectural ideas with east-Greek and oriental ones.

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Obituaries

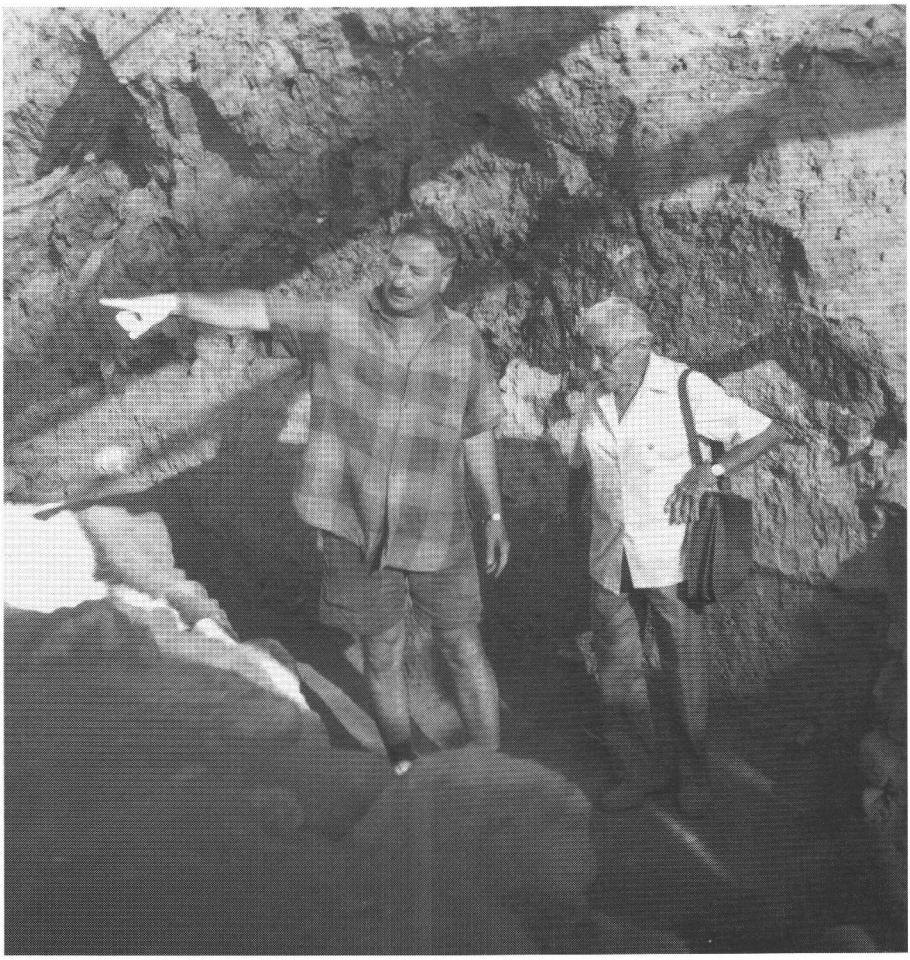
CLAIRE EPSTEIN (1911–2000)

Claire Epstein passed away shortly before her 89th birthday following complications that developed after a fall, leaving a legacy rich in service to her country and to the archaeology of the Near East.

I last saw Claire sitting up in bed in Hadassah Hospital, Mt. Scopus, Jerusalem, her body frail, her countenance a bit pale, but her mind as sharp as ever. We both believed that she was actually on her road to recovery from the injury that would eventually take her from us, and after she shooed her devoted grandson from the room with orders for him to get something to eat, I sat down to talk to her about the latest discoveries and happenings in the archaeological world. Full of plans for future publications, but with some sense of urgency because of her advancing years, Claire outlined several of her works in progress and I filled her in on my latest excavation news. As usual there was no chit chat; Claire was more interested in trading information and ideas. She was always a bit impatient of anything frivolous. She did, however, express a keen interest in the upcoming appointment for director of the Israel Antiquities Authority, a post she considered vital to the future of archaeology in Israel. That was the Claire I knew, a spare, energetic woman with a brisk air, always in motion, always busy. A few weeks later, at her funeral, I was to discover other, deeper sides to Claire, ones she had kept more private, and separate from her life as an archaeologist. I learned that Claire was also a deeply loved matriarch of the family of her late adopted son, Nissim, and her loss to its members was devastating. In addition, Claire had a long and distinguished past of community service and scholarship, only some of the details of which I was aware.

Claire Epstein was born in London (1911), the only daughter and oldest of three children of German immigrants, Olga and Mortimer Epstein. Somewhat unusually for her generation, she was educated at the University of London in English and Italian literature. As a young woman she became active in Zionist circles, studying Hebrew and helping to found the local branch of the Habonim youth movement. Utilizing her Hebrew language skills she was involved with translating material for the Peel Commission.

In 1937 Claire emigrated to British Mandate Palestine, settling in Tel Aviv where she worked as liaison to the Mandate government until 1942. Answering a call to help the war effort, she joined the Women's Corps of the British Army, serving four and a half years in Egypt. Shortly after returning to Tel Aviv, Claire



Clair Epstein, with Amnon Ben-Tor, visiting the excavations at Hazor in 1997
(photo: B. Barnett)

became a member of the newly established Kibbutz ʿEn Gev on the southeast shore of Lake Kinnereth (the Sea of Galilee). It was in those years that she came to live close to the land and began to develop the keen interest in its buried past that she was to maintain until the very end. Ancient Hippos (Susita), a conical hill at the base of the Golan Heights, not far from ʿEn Gev, was the first focus of Claire's archaeological awareness and provoked a powerful attraction for her. Eventually, the site would become the scene of her first independent excavation, but that was considerably later in her career. In the meantime, Claire's interest in the archaeology of the region blossomed over the years, even as she worked as a vintner. With the ideological split in the kibbutz movement, Claire moved to Kibbutz Ginnosar on the northwest shore of the lake in 1955. It was then that

she joined the Hebrew University's excavation at Tel Hazor. There she served as field supervisor of Areas A and D. In addition, it was through her acute sense of observation that the important Canaanite temple of Area H was discovered.

In 1959, at the age of 50, Claire, with a full career of service and activity behind her, embarked upon a formal course of higher studies at the Institute of Archaeology of University College, London. She earned her PhD under Kathleen Kenyon in 1962, writing on the question of 'Palestinian Bichrome' pottery, a study that was later published as a monograph by Brill in Leiden. Returning to her kibbutz from which she had taken a leave of absence, Claire engaged in several years of non-archaeological endeavours, but between 1965 and 1967 she was drafted to help her Kibbutz Movement with its Land of Israel Studies Program. Claire's energy and abilities were directed at organizing a union between similar programs from all the kibbutz movements, one that still exists and continues to contribute tremendously by training thousands of Israelis and instilling in them a love of the land and its archaeological heritage. From that time Claire became a full-time archaeologist, directing excavations at the site of Hippos/Susita and work on several tombs of the Middle Bronze Period at Kibbutz Ginossar and Kefar Szold.

In 1967 she joined a team of colleagues doing an emergency archaeological survey of the Golan Heights, an area newly accessible to Israelis after the Six Days War. Her major discoveries include large dolmen fields throughout the region and, in particular, several concentrations of so-called 'tank dolmens', immense piles of basalt boulders that appear, from a distance, to have the outlines of modern armoured vehicles. Her experience in the survey led to a long-lasting association with the region and a hitherto unknown chapter in the late prehistory of the southern Levant, the Chalcolithic Culture of the Golan. It seems that Claire, who had no driving license, was always off to work on the Golan, and in those years and for more than two and a half decades, she, was probably the most familiar hitchhiker throughout the region. Claire, working for many seasons with a small band of local Druze villagers, with whom she developed a relationship of mutual respect and fondness. They excavated and surveyed a series of small, but important Chalcolithic sites in which Claire was able to outline the basic parameters of this cultural horizon, with its small agricultural villages and parochial artistic traditions. Directing these excavations over numerous seasons, she also was responsible for recording and researching them, a formidable task for one individual. By dint of sheer hard work, over a period of years, she was able to put together her *opus magnum*, a monograph entitled *The Chalcolithic Culture of the Golan*, that was finally published in 1998 in the Israel Antiquities Authority Reports series.

It was at this point in her life that I came to know Claire. It fell to me to teach her the intricacies of word processing on a computer. She was 78 then and showed no signs of slowing down. We hit it off well because of our mutual passions for the late prehistory of the southern Levant. She was always full of energy and loved to visit archaeological sites, so together we planned trips when-

ever possible. Once, when visiting a border site, Claire, then about 80 years old, was bawled at by a young army lieutenant for leaving 'commando-like' shoe prints on a patch of security road where they could be taken for evidence of unfriendly infiltrators. After sheepishly owning up to her error, we all had a good laugh imagining how this thin slip of a woman might have caused a major security incident. I can also remember Claire's great excitement on another occasion, on her first trip to Jordan, when we stood on a high, windy and rain-swept plateau at Umm Qais (the ancient Decapolis city of Gadara), looking down towards Israel and her home kibbutz of Ginnosar. On her last trip to Jordan, Claire, then 87 years old, not only travelled the more trendy tourist routes with her companions, but also managed to go all the way by jeep to the basaltic Black Desert in the northeast of the country to see the famed site of Jawa.

Claire was not only an archaeologist with a passion for fieldwork, she was also a meticulous and hard-working researcher and scholar. Sitting in her small kibbutz apartment just a step away from the Kinneret with the Golan as its backdrop, she loved to listen to classical music while she wrote. When the resources of her personal library proved too meager, which was often, she caught the bus to Jerusalem to spend the day working in the library of the Israel Antiquities Authority; on those days we would meet and discuss our mutual interests. It was her last trip that caused the injury and its complications from which she never recovered. When other friends and I spoke to Claire, while she was incapacitated, she indicated in no uncertain terms that she fully expected to be able to continue with several projects she had started. One of these, most of which she had finished herself, was eventually submitted for publication and has since appeared in volume 33 of *Levant*. Claire's archaeological legacy is in her publications. Her work is wide ranging and includes her bichrome and Golan Culture monographs, as well as a number of short excavation reports and numerous articles on many different aspects of late prehistory. One of the most notable of these works is her interpretation of the stratigraphy of the sacred area at Megiddo; recent excavations have shown her analysis to be quite astute. During her lifetime Claire received the highest public recognition from the archaeological community for her work. She received the Percy Schimmel award, the Israel Prize, and the Irene Levy-Sala award for her monograph on the Golan Culture, her *opus magnum*, of which she was inordinately proud.

As I look back on these few words, written on such a rich and active life spanning almost nine decades, I can only regret that I did not know Claire longer and better. Claire is survived by her younger brothers, Anthony and Teddy, and by a large, adopted family in Israel. We, in the archaeological community, deeply miss her presence. May her memory be blessed.

Eliot Braun

E. JERRY VARDAMAN (1927–2000)

Professor E. Jerry Vardaman, who was retired from the Cobb Institute of Archaeology (Mississipi) died on the 17th November 2000 of a massive heart attack at his home in Starkville. Born in 1927, Vardaman was proud of many things and among them for studying for a period under W.F. Albright, for having obtained his ThD (1958) and his PhD on Herodian inscriptions (Baylor, 1974), for his work with M. Avi-Yonah at Caesarea-on-the-coast (1962), for his excavation at Machaerus in Jordan (1968), and for his work with A. Negev at Elusa (1980). He was particularly proud for having published the first report in English (*JBL* 1962) of the discovery of the Latin inscription of Pilate, and for having himself excavated in the synagogue of Caesarea the first fragment of the Hebrew inscription mentioning Nazareth. Apart from his own family, a wife and two daughters, Vardaman was 'in love' with the Herodian family, as well as with his books (which he was capable of binding personally in leather), and with his large collection of ancient coins. For those who knew him, he had a very big smile and was quick to reply (in his southern US accent) using unfamiliar biblical passages, always in a most humorous way. He will be sadly missed by his colleagues and friends.

Nikkos Kokkinos

Summaries of Lectures

The Divine Image in Late Antique Synagogues

Martin Goodman

The lecturer argued that the images of the sun king in Late-Roman synagogue mosaics, such as that in Hammat Tiberias, may be best explained as a representation by Jews of the appearance of the Jewish God. After a brief explanation of the place of these mosaics in synagogue art and of their undeniably Jewish provenance, he discussed the literary images of God in Jewish sources from the Bible to the late Amoraic period, highlighting the ambiguity in these sources as to whether God's image can be discussed at all, about the degree to which anthropomorphic images are appropriate, and the extent to which images of fire are the best way to imagine the divine nature. Special attention was paid to the curious passage in Josephus, *War* 2.128, where the Essenes are said to have prayed to the sun, and the pervasive use of solar images for a variety of supreme divinities in Late-Roman paganism and Christianity. The lecture concluded with the observation that Jews' freedom to speculate on the appearance of God may have been increased rather than decreased by their view that at some level his image is beyond imagination altogether.

Reconstructing Ancient Faces

A. J. N. W. Prag

The bones of the skull form the armature of the face, as steel girders form the armature of a building. Just as the concrete is poured around the girders to a predetermined thickness, so the muscles

are added to the skull following a database of flesh thicknesses that has been built up for over a century and takes into account sex, race, age and health. The technique of facial reconstruction is therefore fully objective: the artist is guided by the rules of anatomy, not by any preconceived notions of how a particular person may have looked. This makes it essential that enough of the skull survives to give its overall shape: recent research has shown that one cannot – for example – reconstruct a face if the mandible is missing, hoping to rely on an approximation based on similar skulls. The resulting face will be an approximation too, not an accurate reconstruction.

The technique is an old one, brought into the twentieth century by the Russian palaeontologist Mikhail Gerasimov (1907–70). Over the last quarter-century it has been developed much further by practitioners around the world: the leaders must still be the team set up by Richard Neave at the University of Manchester. Computer-based methods are taking over, but at present the old-fashioned manual technique still produces a more lifelike and much less wooden result, for the eye and brain of an experienced medical artist still holds more resources and more understanding than a computer.

The first step is to make an accurate plaster cast of the skull, into which pegs are inserted to indicate the flesh thickness; then the face is built up muscle by muscle in clay until the pegs are buried just beneath the surface. Guidelines exist for the soft parts of the face: the width of the mouth matches the distance between the inner edges of the irises of the eyes; the nasal aperture in the skull is three-fifths of the width of the nose itself, whose shape must fall within a triangle drawn by extending the line of the nasal floor outwards, and by following downwards the last third of the nasal bone.

It is now relatively easy to determine the sex and age of a skull, particularly if more of the skeleton survives. The face that emerges at this stage will be that of a man or woman of the appropriate age, but it will have no hair, beard or moustache, unless for some reason there was evidence for these on the body: in forensic specimens enough tissue often survives to give clues about its colour and length, and in archaeology the same is often true of Egyptian mummies and of bodies found in peat-bogs. In forensic specimens the aim of the reconstruction is simply to help the police identify a body, generally where more traditional methods have failed, and this first hairless version is often sufficient to give them a lead. Once someone has tentatively recognised the face, suitable hair can be added to test the identification.

There have been many successful identifications and many crimes solved by the use of such reconstructions in police work. From the archaeological standpoint such cases are valuable because, like the controls carried out on cadavers or on living people, they demonstrate that the technique works, that it produces faces that can be recognised by the dead person's friends and family. However, the reconstruction of an archaeological specimen goes much further, for here the aim is not merely to produce a recognisable face, but to bring together all the details that specialists can deduce from the evidence of the remains, from the bones themselves and from the circumstances of their burial. It is in fact a three-dimensional report, perhaps more accurate and certainly more powerful than a conventional printed account.

Nevertheless the resulting reconstruction cannot be a portrait in the strict sense like the figures in waxwork shows which are based on known likenesses of historical people: a portrait takes into account elements of the person's character and lifestyle that may be known from written sources but which leave no trace on the bone. These scientific reconstructions rely in the first instance entirely on the evidence of the skeletal material, and call on a great variety of disciplines to achieve this. Superficial details such as hairstyle and beards are only added from

secondary evidence after the basic reconstruction has been completed.

It is this multi-disciplinary aspect that makes the work exciting and that gives it its scientific value. Because of the thoroughness of the research involved reconstructions have led to identifications in archaeology too. Two examples must suffice. In the case of the skull from tomb 2 at Vergina in Macedonia the discovery of a blinding injury to the right eye identified the dead man as King Philip II, murdered in 336 BC, and thus confirmed the site as Aigai, the early capital of the Macedonians. From facial reconstructions of skulls from Grave Circle B at Mycenae it has been possible to suggest familial and dynastic links across the different groups of graves, which has now led to a further programme of research into the DNA of Aegean bronze age populations. Truly, watch this space.

(The Manchester Museum, University of Manchester)

Waterworks in the Time of Hezekiah and Judaean Princesses in Assyria

Stephanie Dalley

There were many rock-cut tunnels, channels and shafts in ancient Jerusalem. Mostly, they are impossible to date with precision. The Siloam tunnel with its incomplete inscription is normally attributed to Hezekiah by association with biblical text, but that dating has recently been questioned. Moreover, still problematic is the purpose of the tunnel, which seems to have replaced a nearby channel. Both the channel and the tunnel brought water from the Gichon spring out into a pool, the newer pool of Siloam lying just slightly higher up the hill than the older one. Most commentators have associated the tunnel with preparations for the Assyrian siege of 701, despite the fact that it would have taken many months to cut the tunnel out of the rock.

Apart from the brief vaccillation of 701, a supportive relationship between Assyria and the kings of Judah can be traced during the late 8th century and the first half of the 7th under Ahaz, Hezekiah and Manasseh. By comparison with events in Samaria, Hamath and the Philistine cities, where external pressures incited rebellions, usurpations and the installation of pro-Assyrian rulers or direct rule from Assyria, Judah was stable. In the Syro-Ephraimite war Judah refused to join the anti-Assyrian coalition of Samaria and Damascus.

The ultimate goal of Assyrian policy was trade with Egypt. To achieve that aim, Tiglath-Pileser III, Sargon II and Sennacherib all marched down through Palestine, passing Jerusalem in the secure knowledge that Judah would cause no trouble, and they set up trading posts on the border of Egypt. After the fall of Samaria, Sargon allowed a priest back to Bethel to resume Israelite religious practices. When Hezekiah centralised his reforms, he was allowed to involve people from Ephraim and Manasseh, even though they belonged by that time to an Assyrian province under direct rule. Some of Isaiah's oracles are distinctly pro-Assyrian.

During Sennacherib's campaign of 701 the Assyrian army marched past Jerusalem, as it had done on previous occasions. When the pre-Assyrian Padi of Ekron was sent to Jerusalem by an anti-Assyrian faction which briefly seized control in Ekron, Sennacherib was able to extract him and re-install him in Ekron. It must have been a momentary lapse on the part of Hezekiah to resist Assyria, perhaps due to pressure from Merodach-Baladan II in combination with the Nubian overlords of Egypt who had recently overrun the Nile Delta. The results were only moderately bad for Judah: the siege of Lachish, the diminution of Judaean territory to the advantage of neighbouring states, and a heavy tribute. Nobody in Jerusalem was killed and only princesses, female courtiers and musicians were deported. The Rab-Shakeh's promises to the besieged Jerusalemites were alluring, not threatening, and achieved their aim. The army left before Hezekiah had delivered

the tribute. Hezekiah was not deposed or replaced, but enjoyed many more years of peaceful reign, and so was treated quite differently from other rulers, who were killed with their fellow conspirators, and replaced.

The biblical text clearly separates the act of blocking the stream at Gichon, which was an act of war, from making the tunnel, but many interpreters have ignored the separation. Quite apart from the problem that Hezekiah's tunnel seems to have delivered the water outside the citadel walls, it is doubtful whether there was time to make the tunnel during the brief period when Judah resisted Assyria. This suggests that the tunnel was a peace-time achievement. Since the new Siloam pool lay higher up than the old pool, we can suggest that its main function was to water a larger area of (royal?) gardens than was possible from the older, lower-lying pool, and that the work was designed to emulate the waterworks and gardens of Sennacherib in Assyria.

There was a time when Sennacherib was building his famous palace gardens at Nineveh, 'a wonder for all peoples.' He channelled 18 mountain streams, beginning at Bavian 50 miles away, where tunnels had to be gouged out of the rock in several places. The water crossed a wide valley on an aqueduct more than 280 m long, built up on free-standing stone arches, 22 m wide with a surface incorporating 0.40 m of waterproof lime cement, with a fall of 0.80 m over 64 m, a fall rate of 1/80. It flowed into Nineveh at just the right height to water the garden built outside his palace. More than two million dressed stones were used. He was particularly pleased to have designed an automatic sluice which 'opened by itself, without using a spade or shovel, and allows the water of prosperity to flow. Its gate is not opened by any action of men's hands.' This detail is appended to the main inscription, almost as if it were an afterthought.

At Arbela he built an underground tunnel to bring good water into the city, constructing it like a *qanat* with shafts to the surface at intervals, and recorded his deed on an inscription (badly eroded) at the entrance.

In these deeds, as they are recorded in the Assyrian royal inscriptions, we see that it had become fashionable for a king to record in detail his engineering achievements, a fashion very rare in the ancient world. Sennacherib was not the first to make this fashion, for his father Sargon II wrote of how he had witnessed mining and smelting in the mountains. Sennacherib inherited that detailed interest from his father, and in speaking of the new mechanism for bringing water into his palace and its gardens, he wrote at length about the disadvantages of an older method of casting bronze and the advantages of his new method, making moulds of clay and repeatedly pouring liquid metal into them, describing the exertions of the workmen.

The fashion for mentioning engineers, engineering and the toils of the workforce was short-lived. It was not displayed in the inscriptions of his son Esarhaddon, nor his grandson Assurbanipal, nor was it taken up by Nebuchadnezzar II. The preserved part of Hezekiah's tunnel inscription belongs to the same short-lived fashion in royal inscriptions.

Why was Judah so reliably pro-Assyrian, and why did Hezekiah imitate the peace-time deeds of Sennacherib? The question can be answered from archaeological finds made by Iraqi archaeologists at Nimrud. Grave II in the North-West palace contained a sarcophagus with two female skeletons, identified by inscriptions on sumptuous grave goods as Yaba the queen of Tiglath-pileser III and Ataliya the queen of Sargon II. Since they were buried together, they must have belonged to the same family. Ataliya is attested as a name for an Israelite woman who became queen of Judah in earlier times, and her name contains the element Ya(hu) as an acknowledgement of her national god, likewise the younger Ataliya from Nimrud. Yaba, though not attested as a personal name in the Bible, bears a name which can be understood as Hebrew. Among their grave goods is a fillet or

diadem, which has some of the characteristics of the later Jewish phylactery: the black, square-cut stones at the front, the wide band, and the long band hanging down at the back. Its design is remarkably abstract, non-representational, and it presumably came with the Judaean princess as part of her dowry. Ataliya would have been the mother of Sennacherib, and probably was Hezekiah's sister. Yaba would have been Sennacherib's grandmother, since we now know that Sargon II was a son of Tiglath-pileser III.

It is notable that neither woman was required to take an Assyrian name on becoming queen. The inscriptions make it clear that both women were the chief wife of their respective husbands.

The good relations between Judah and Assyria can now be explained as resulting from two diplomatic marriages. Hezekiah's tunnel and his inscription belong within the context of peace-time waterworks, of which the most famous example was associated with Sennacherib's Hanging Gardens at Nineveh. Hezekiah was under a binding obligation, like Ahaz before him, to remain faithful to Assyria, and this enabled his brief moment of weakness to be forgiven. Even before Samaria and Damascus came under direct rule, Assyria ensured the loyalty of Judah through diplomatic marriages.

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The Renewed Excavations at the Neolithic Art Centre of Sha'ar Hagolan

Yosef Garfinkel

Sha'ar Hagolan is located in the Jordan Valley, 1.5 km. south of the Sea of Galilee, at an elevation of 200 m below sea level. The site lies on the northwestern bank of the Yarmuk River, near the meeting point of Israel, Jordan and Syria, a magnificent setting that includes the Golan Heights to the east, Mount Gilead to the southeast, and the Hills of Galilee to the west. The area is rich in water and fertile land. The archaeological remains extend over a broad area of approximately 20 hectares, making it one of the largest known Neolithic settlements in the Near East.

The site was discovered by members of Kibbutz Sha'ar Hagolan, during the construction of fishponds in the late 1930s, but became known in archaeological research following the work there by the late Prof. Moshe Stekelis of the Hebrew University of Jerusalem. He conducted five excavation seasons at the site between the years 1949–1952. Stekelis's excavations were carried out at four different locations (Areas A–D), all of them several hundred metres away from the banks of the Yarmuk River. He recognized the unique character of the flint industry, the pottery and the art objects, and designated the assemblage the 'Yarmukian Culture' after the nearby Yarmuk River. A final excavation report was published in Hebrew in 1966 and in English in 1972.

In 1989 and 1990, the excavations at Sha'ar Hagolan were renewed by myself, on behalf of the Institute of Archaeology of the Hebrew University of Jerusalem, 37 years after Stekelis completed his excavations. The area of the site was, at that time, under intensive cultivation, and it was only possible to excavate limited test pits within an olive grove located between two fishponds, near the Yarmuk river (Area E). After the fishponds ceased functioning and the olive grove was

uprooted in the mid 1990s, a large-scale excavation project began at Sha'ar Hagolan. This project is scheduled to continue for ten seasons and to date, four extensive excavation seasons have been conducted (1996–1999). New areas were opened, and some 1800 sq.m. excavated. The main excavation area is Area E, in which some 1300 sq.m. have been uncovered.

Stekelis did not discover evidence of permanent architecture in his excavations, and so he concluded that: 'the Neolithic settlers of Sha'ar Hagolan apparently lived in circular huts, half sunk below ground level.' Rounded pits, without solid architecture, have been reported from other Yarmukian sites, including Munhata, Hamadiya and Habashan Street in Tel Aviv. The large number of pits dug by the Yarmukians created the false impression in the early days of research, that the Yarmukian population was seminomadic and pastoral, inhabiting the sites only part of the year. In a recently published book on urban development in ancient Israel the Yarmukian era was described by Herzog as: 'a major breakdown . . . The collapse is evident from the disintegration of all major settlements and the erection of small villages. The dominant dwelling form in this period is the circular house, in most cases these were only circular pits that formed the lower part of huts'. This picture, however, must now be completely altered. In our new excavations at Sha'ar Hagolan, three monumental building complexes with rectangular rooms were uncovered. Between these structures, two streets were found.

Building Complex I

This 400 sq.m. complex is composed of one roughly triangular courtyard surrounded by eight rooms. (Fig. 1) The building had one entrance from the street, which opened, directly into a courtyard, which served as the center of the building and in which most of the activities took place. A series of small roofed rooms surrounded the courtyard and opened onto it. One room was circular and may have functioned as a central silo, although no other archaeological evidence has been recovered to support this hypothesis. The others were either rectangular or square. Three were paved with flat basalt river pebbles. Some of the rooms may have served for dwelling purposes and others for storage. This is the earliest example in Israel of a 'courtyard building', a type very common in the ancient Near East that persists to this day in traditional village communities.

The finds in this monumental structure include numerous flint artefacts, potsherds, animal bones, a few figurine fragments, some obsidian artefacts and seashells. An unusual large clay statue was uncovered in the courtyard near the eastern wall (see below).

Building Complex II

One room and part of the courtyard of this structure were uncovered during the 1989 excavation season. It took ten years, upon resumption of the excavation, for us to realize the large size of this building complex. In the summer of 1998, we focused our entire effort upon this structure and uncovered a total of 500 sq.m., but the northern and western parts of the structure continued beyond the excavated area. (Fig. 2) In the summer of 1999 an additional 10 metres were excavated along the east-north part of the complex, and yet it still extends into the unexcavated area. The total size of this building complex is thus unknown, but must be greater than 800 sq.m.

The well-preserved eastern side of the structure consists of a row of small rooms. The southern side was eroded by the Yarmuk River, however remaining portions indicate that there, too, stood a row of rooms. At the center of the structure is a large, open area, apparently a central courtyard. To the west of this were found mudbrick walls. These walls extend further to the west, beyond the

Fig. 1. Building Complex I at Sha'ar Hagolan – a monumental Neolithic complex composed of one roughly triangular courtyard surrounded by eight rooms (photo: Y. Garfinkel).

excavation area, making it difficult at this stage to establish an architectural plan. The bricks are circular in shape, flat on the base and rounded on the top, like a round loaf of bread, and consist of particularly light-coloured sediments, apparently originating in the local Lisan geological formation.

This monumental structure proved extremely rich in finds, which include numerous flint artefacts, potsherds, animal bones, some 40 figurines or figurine fragments (Fig. 3), obsidian flakes and seashells.

Building III

Only the western extremity of this monumental structure has been uncovered. Here a large open area with various installations was exposed. In a future season we hope to enlarge the area and uncover more of this building.

The Streets

Two passageways were excavated in Area E at Sha'ar Hagolan. One is a 3 m. wide straight street, separating Building I and Building II. It has so far been exposed to a length of 35 metres. The other is a curved alley, 1 m wide, separating Building I and Building III. The alley has been exposed to a length of 15 metres, so far. Such findings may reflect a differential system consisting of broad, straight streets and narrow, curved alleys.

The 1999 Excavations at Area H

Area H lies c. 200 metres north of Area E, in the southeastern corner of a large field that had once served as a fishpond. The ancient remains are relatively close to the current ground surface and thus have been partly disturbed by modern agricultural practices. Fifteen squares

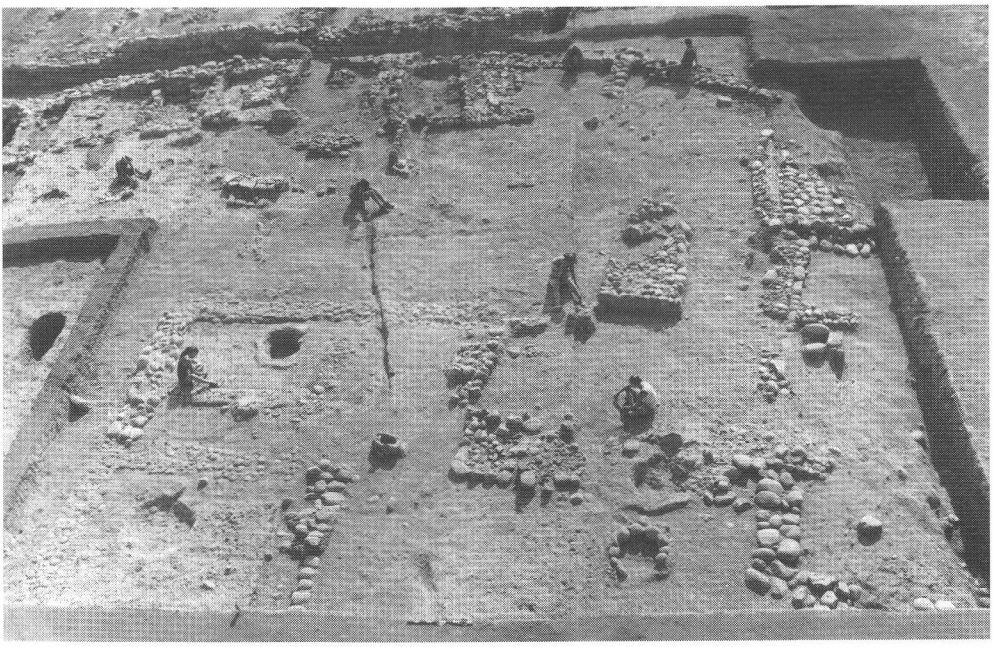

Fig. 2. Building Complex II at Sha'ar Hagolan – The eastern side of a Neolithic structure, exposed for some 40 metres, consists of a row of small rooms. The southern side was largely eroded by the Yarmuk River. At the centre of the structure is a large, open area, apparently a courtyard. The northern and western parts of the structure extend beyond the excavated area. (photo: Y. Garfinkel).

(375 sq.m.) were excavated and the entire area was found to contain Yarmukian architectural remains. A few building phases were noted. Walls in this area are characterized by a stone socle with mud-brick superstructure. Several complete rooms, unrelated wall segments, installations and paved stone floors were uncovered. These seem to be parts of three or four different buildings. More seasons are needed in order to obtain the plan of complete structures. Nevertheless, the type and size of the walls, rooms, and courtyards appears to be similar to those found in Area E.

In conclusion, our new excavations clearly indicate that the Yarmukians were not pit dwellers, but engaged in building architectural structures and roads. A larger area must be excavated at Sha'ar Hagolan in order to obtain a clearer picture of the village plan and the organization of its network of passageways. Therefore, future work at the site will concentrate upon the following three aspects:

(1) Architecture. In order to understand the type and shape of the architecture used in the Neolithic village, a minimum of at least three or four complete structures must be excavated and studied. We cannot base our conclusions upon a single building complex.

(2) Activity areas. The function of the structures is of great importance. Were they private dwellings for domestic use, or public buildings for ceremonial purposes?

(3) Village planning. The streets and monumental complexes seem to indicate that an urban plan of some type existed. No similar evidence has been found at other Neolithic sites in Israel.

Once these three aspects of the site are

Fig. 3. 'Venus' of Sha'ar Hagolan – the best preserved clay figurine yet uncovered at Sha'ar Hagolan. This female figure, 14.2 cm. in high, is represented in a seated posture, with one hand under the breasts. The other hand is broken. This item is presently on a five-year loan to the Metropolitan Museum of Art in New York City. (photo: D. Harris)

better understood, a new chapter in archaeology will have to be written. Sha'ar Hagolan holds tremendous potential for research and understanding of Neolithic architecture and its function.

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Grants Given by the Society

RACHEL JOHN

The Megiddo expedition had begun three weeks prior to my arrival at Mizra, the Kibbutz that served as accommodation and administrative base to the dig. It was the task of the newcomers for the second session to step into the shoes of those diggers just departed and to continue their work for the remaining four weeks of the expedition.

I arrived on June 30th 2000 and at 4.15 am the following morning the alarm rang and we were out of bed and on the bus that would take us to the *tel* by 4.30 am. Kibbutz Mizra was half an hour's drive away from Megiddo and so we were there and ready to start work by 5.00 am. This was a shock to the system and it took me a while to become accustomed to hard physical work at such an early hour of the morning. As a heat wave began to descend upon the Middle East in the following weeks, I came to appreciate this time before breakfast at eight, when there was no heat.

Megiddo is an ancient city located in the Jezreel valley two hours north-west of Jerusalem and close to Nazareth and Afula. It has seen more battles in history than any other place on earth and is most famously referred to in the book of Revelation as the location of the final battle that will mark the end of the world, Armaggedon.

The *tel* had been divided into six different areas, F, M, L, J, H, K, although not all of the surface area of the *tel* was under excavation. Each area was then divided into squares. So there were usually one or two people in charge of each area called 'area supervisors' and then one person in charge of each square called a 'square supervisor'. There were two or three people in each square. I had been placed in Area K, which was a domestic area. It was divided into twelve squares: M9, M10, M11, N9, N10, N11, O etc, P etc. I began in P10 which appeared to be a porch entrance to the paved courtyard in O10. It had been dug down five feet already by the time I got there after the first session. My first task was to define a mud brick wall which appeared to have collapsed in front of the stone wall which separated P10 from O10. This caused debate amongst the dig directors, Israel Finkelstein, David Ussishkin and Baruch Halpern, the latter two believing it had been placed there deliberately while the former believed that it had fallen there. They would visit our area on their *tel* tour in the morning before breakfast and give their opinions on our progress. I found this part of the day fascinating as it meant I was able to hear live debate amongst the most prominent archaeologists and scholars in their field, to whose books and articles I had referred while studying for my degree paper in biblical archaeology.

At the end of the second week of digging in the second session we had reached our goal of having exposed level K4 across the squares. K4 belonged to the Iron Age. This had taken a lot of work, sometimes large amounts of pick axing, sometimes more delicate work with trowels and brushes. We had separate buckets for extracting pottery, flint and bone and shell. The floors were excavated in 1×1 m grid squares and each object was pin-pointed and drawn. Three sets of samples were taken from every fine grid square twice, first for accumulations above the floor and then for the floor itself. The samples were for phytoliths, fish bones and botanical remains.

So at the end of the second week we swept the area and made it ready for pho-

tography. For the remaining two weeks, I moved from square to square doing different things. In M11 I cleared a thin plaster floor for drawing and then levelled the rest of the area with a pick axe. In square O9 I cleared several pits set into the floor. Area K was useful for finding out about Iron Age domestic architecture and day-to-day living and so each level was removed once everything had been recorded. Archaeology is sometimes a destructive process.

Each evening on the kibbutz we would wash the pottery that we found in the day and then 'read' the pottery which we found the day before. This part of the day, just before the kibbutz evening meal, clarified the results of the dig and helped me to see the beginning of the process of drawing information from the site and piecing it together to produce an over all picture. Rather like picking potsherds from the baskets and piecing them together to form a complete vessel.

The dig was a highly educational experience and our free time was valuable in that it gave us a chance to explore other sites in Israel. The Anglo-Israel Archaeological society paid for my flight to and from Israel and, as the overall trip was quite expensive, this was a great advantage. I included this experience on my *Curriculum Vitae* and on my return home I managed to be called to interview at the Ashmolean Museum in Oxford for a job working with the re-organization and computer cataloguing of their impressive Near Eastern collections. I got the job and my experience in Megiddo learning about Near Eastern antiquities has been invaluable as I am dealing with notes from the excavations of various important archaeologists. It also helps knowing some of the processes that led to the antiquities being where they are now.

The Megiddo expedition was a superb introduction into Near Eastern archaeology and I would recommend it to anyone wishing to learn more. A physically and mentally demanding experience, but one that will remain fresh in my memory.

Notes for Contributors

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