

ARCHAEOZOOLOGY OF THE NEAR EAST

V

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archaeozoology of southwestern Asia and adjacent areas*

edited by

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Preface

When I participated in the IVth International Conference of ASWA, held in the summer of 1998 in Paris, I was gratified to learn that the Scientific committee had unanimously agreed to hold the next meeting in Jordan. Thus, on 2 April 2000, the Vth International Conference of the Archaeozoology of Southwest Asia and Adjacent Areas was held for the first time within the region at Yarmouk University in Irbid, Jordan after being held on the past four occasions in Europe.

The themes of this conference were divided into five areas including:

- Paleo-environment and biogeography
- Domestication and animal management
- Ancient subsistence economies
- Man/animal interactions in the past
- Ongoing research projects in the field and related areas

I wish to thank all those who helped make this conference such a success. In particular, I would like to express my appreciation to the Director of the Institute of Archaeology and anthropology at Yarmouk University. Special thanks are due to his excellency, the President of Yarmouk University, Professor Khasawneh, who gave his full support and encouragement to the convening of this conference at Yarmouk University and to all those who contributed the working papers which made the conference possible.

I also wish to thank members of the organizing committee who worked very hard for many months in preparing the venue for this conference.

Abdel Halim Al-Shiyab
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Note from the editors:

The editors wish to thank Dr. László Bartosiewicz for his excellent assistance in preparing and checking the contributions to this volume.



Participants at the 5th ASWA Conference, held at the Yarmouk University in Irbid, Jordan, 2000

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THE SHELLS OF THE NAWAMIS IN SOUTHERN SINAI

Daniella E. Bar-Yosef Mayer¹

Abstract

The *nawamis* tombs, built-up, rounded graves with corbelled roofs, are common in southern Sinai. Nine clusters of the *nawamis* were excavated systematically and produced more than 20,000 shells. One bangle type common in the *nawamis* is made of the body whorl of the large gastropod *Lambis* sp., is somewhat triangular in shape, and provides significant chronological and geographic information. This type is common in Chalcolithic and Early Bronze Age I sites in Israel and Jordan, and thus provides a chronological marker. A second type of *Lambis* bangle was found in Predynastic sites in Egypt. This is completely round and was made of a different body part of the *Lambis*, the base of the spire. The presence of both bangle types in another site in southern Sinai, Wadi Watir VIII, suggests that both were possibly produced by the southern Sinai inhabitants in order to facilitate their exchange with people in both Israel and Egypt.

Beads from the *Conus* sp. shell were found in the *nawamis* and the sites in the central Levant. Their presence in the latter sites suggests that the *nawamis* were continuously used during the Early Bronze II period, longer than proposed by previous studies.

Mother-of-pearl artifacts are also commonly uncovered in the *nawamis*, but are absent from contemporaneous habitation sites and are thus viewed as special grave offerings.

Résumé

Les *nawamis*, tombes circulaires à encorbellement, sont courants au sud du Sinaï. Neuf groupes de *nawamis* ont été systématiquement fouillés et ont fourni plus de 20 000 coquilles. Un des types d'anneaux fait dans le dernier tour de la coquille d'un large gastéropode *Lambis* sp., est de forme triangulaire et apporte des informations chronologique et géographique. Ce type est commun sur les sites d'Israël et de Jordanie au Chalcolithique et au Bronze Récent I et constitue de ce fait un marqueur chronologique. Un second type d'anneaux en *Lambis* a été trouvé dans les sites pré-dynastiques d'Égypte. Ceux-ci sont complètement ronds et sont faits dans le corps du *Lambis*, à la base de la spirale. La présence des deux types d'anneaux dans un autre site au sud du Sinaï, Wadi Watir VIII, suggère que tous deux étaient produits par les habitants du sud du Sinaï pour faciliter leur échange avec l'Israël et l'Égypte.

Des perles en coquilles de *Conus* sp. ont été trouvés dans les *nawamis* et des sites du Levant central. Leur présence dans ces derniers suggère que les *nawamis* continuaient à être utilisés pendant le Bronze ancien II, plus longtemps que proposées par les études antérieures. De même, les objets en nacre, sont souvent découverts dans les *nawamis*, mais sont absents des sites d'habitats contemporains et sont par conséquent considérés comme des offrandes funéraires spéciales.

Keywords: Nawamis tombs, shell manufacturing, Chalcolithic and Early Bronze Age, Sinai

Mots Clés: Tombes nawamis, industrie sur coquille, Chalcolithique et Âge du Bronze ancien, Sinai

Introduction

Shells can be used as a means for reconstructing certain aspects of the socio-economic mechanisms of past populations. This has been repeatedly demonstrated in both archaeological and ethnographic studies (e.g. Malinowski 1919, 1922; Safer and Gill 1982; Arnold and Munns 1994; Bar-Yosef Mayer 2000).

During the period spanning the ninth through third millennia B.C.E., the Sinai Peninsula was inhabited first primarily by hunter-gatherers, then by pastoralists. This study attempts to obtain as much information as possible regarding the economy and lifestyles of these societies, based on the shells which were found in excavated sites. Studying these finds reveals information on the source of the shells, their final deposition (trade routes), the way in which the shells were modified (technology), the manner in which they were used (as exchange items, funerary gifts, as simple decorations etc.).

Two major changes in the course of human history occur during the time from the Neolithic to the Early Bronze Age: the transition from hunting and gathering to farming, followed by the formation of urban societies. During this latter period, the societies occupying the desertic regions and the southern part of the Sinai Peninsula in particular, inhabited it continuously. This was made possible most

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probably due to the relatively comfortable climatic conditions during these periods (when compared to other desertic regions such as northern Sinai and the Negev), and the presence of water and wildlife (Goldberg and Rosen 1987; Baruch 1994; El-Moslimany 1994; Geyh 1994). One possible exception is the early fifth millennium B.C.E., presumably related to less favorable climatic conditions, for which we have very little information.

Southern Sinai was often a part of the land of Israel. Historical documents from the Byzantine period demonstrate that the northern Sinai was a province of Egypt, but the southern Sinai was an integral part of “Palestina Tertia”, the third province of Palestine (Dahari 1994; Tsafirir 1982).

The information on the Neolithic shell assemblages from Sinai has been presented previously (Bar-Yosef Mayer 1997, 1999) and here, I will focus on the use of shell during the 4th to 3rd millennia B.C.E.

History of the *nawamis* explorations

Most of the evidence for the human occupation of the southern Sinai is derived from the *nawamis*. These are burial structures attributed to a group or groups of pastoralists, inhabiting this area during the fourth and third millennia B.C.E. They will be further described below.

The *nawamis* fields (clusters of structures) were first excavated and reported by Holland (1870) and Palmer (1871). Other fields were further explored by Currelly, who was a member of Flinders Petrie's expedition (Currelly 1906), Albright (1948a, 1948b) and Rothenberg (1972). Currently, the most comprehensive reports available on the archaeology of the *nawamis* are by O. Bar-Yosef and others (1977, 1986). More specific in nature are Bar-Yosef *et al.* (1983) concerning the architecture, and HersHKovitz *et al.* (1982) and HersHKovitz (1987) concerning physical anthropology. A general summary of the *nawamis* phenomenon and habitation sites was written by Goren (1980, 1998), who, in his capacity as Staff Officer for Archaeology of the Sinai Peninsula during the 1970s, directed the excavations of most of the *nawamis* fields as salvage projects.

The *nawamis* fields included in this study are: ‘Ein Um Ahmed, ‘Ein Huderah, Gebel Gunna, Wadi Hebar, El Abar, Sawawin, Abu Halil, Nakb Hibran and Hzeimeh (also referred to as Upper Wadi Nasb). They are located by main routes and on hilltops, while the few living sites discovered are located mostly in the lowlands off the ancient main routes (Fig. 1).

The *nawamis* are above-ground burial structures, usually rounded or bee-hive in shape (Fig. 2). They range from 3 to 5.5 meters in diameter and may reach about 2 meters in height. They are built of stone slabs, from locally available rocks, either sandstone or igneous rocks. About two or three courses of stones were laid in a circle and the innermost formed a corbelled ceiling, each successive course protruding towards the center. In many cases, the roof was preserved. The floor was often a gravel fill, but was sometimes covered with stone slabs. One aspect of the architecture shared by most *nawamis* structures is the position of the entrance. In most cases, the entrances face west, i.e., toward the setting sun, which has led researchers to suggest a relationship with Egyptian beliefs of the after-life (Bar-Yosef *et al.* 1983).

Most of the *nawamis* contained human remains, in varying stages of preservation, from bone fragments to multiple burials. In very rare cases no human remains were recovered, but artifacts normally associated with burials were present. In some other cases, there were burials but no artifacts associated with them. In the majority of *nawamis*, however, there were both human remains and artifacts, presumably grave offerings.

The artifacts found in the *nawamis* were made of various materials and included: pottery vessels, flint tools (the most dominant types are transverse arrowheads as well as tabular scrapers), quartz flakes and bladelets, ground stone utensils made of basalt, limestone, or sandstone, copper awls, wooden points, bone points, cloth, and various other organic materials. Beads were, by and large, the most abundant artifacts.

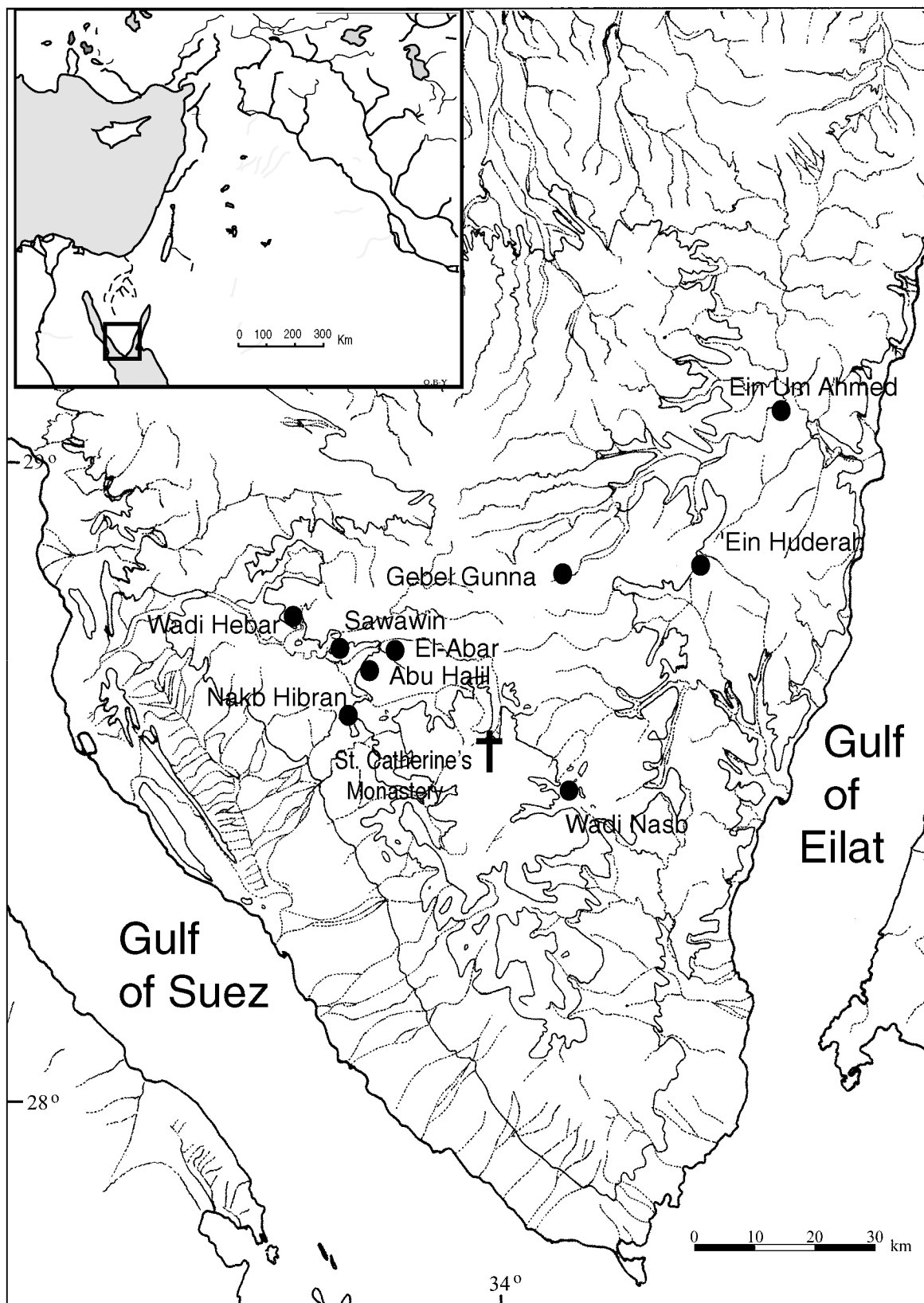


Fig. 1. Location map of *nawamis* sites.



Fig. 2. *Nawamis* structures (photo: I. Hershkovitz)

They were made of ostrich egg shell, bone, shell, faience, carnelian, and other minerals such as turquoise and hematite, and copper. Mollusc shell was also used to produce other artifacts, especially bangles, bracelets and a range of pendants. Quantitatively, it seems that shells are by far the most abundant raw material used for making artifacts.

General description of shell artifacts in the *nawamis*

Four genera comprising 99% of all of the *nawamis* assemblages were used: *Lambis truncata*, *Conus* sp., *Pinctada margaritifera*, and *Dentalium* sp. Nineteen other species, which make up about 1% of the assemblage, include various gastropods and bivalves, which were usually perforated (Table 1). All originated in the Red Sea.

Lambis truncata (Kiener, 1843) - This large gastropod was modified and shaped in multiple ways. The most obvious modification is the bangles (Fig. 3:5), which in some cases were found on the arm bones of skeletons. Many types of beads manufactured of unidentifiable shell are most likely made of this species, possibly from the waste of the shell after the manufacture of the bangle (Fig. 3:1-4). Such use of “waste” is a well-known phenomenon around the world (e.g. Kenoyer 1983; Comşa 1973). While the bangles were made of the body whorl, most of the other beads, of various shapes and sizes (referred to as “special” beads as many are unique and difficult to categorize) were made of thicker parts of the columella. In a few cases, there were faint traces of the natural sculpture of *Lambis truncata* on such “special” beads, which had one or more holes in them.

Table 1. Summary count of dominant shell groups in *Nawamis*.

	<i>Lambis</i>	<i>Conus</i>	Gastropod	<i>Pinctada</i>	Bivalve	<i>Dentalium</i>	Special	Total
Ein Um Ahmed	23	53	10	7	3	1155	9	1260
Ein Huderah	12	165	11	64	10	2100	23	2385
Gunna	1	27	6	14	3	1092	1	1144
El Abar	82	150	29	105	4	3849	37	4256
Abu Halil	92	135	40	74	3	3129	25	3498
Sawawin	77	72	55	53	2	2378	28	2665
Nakb Hibran	22	131	2	34	2	976	14	1181
Wadi Hebar	84	74	60	82	1	3257	21	3579
Wadi Nasb	75	46	7	18	1	851	18	1016
Total	468	853	220	451	29	18787	176	20984

Pinctada margaritifera (Linnaeus, 1758) - This is mother-of-pearl. Many different artifacts were made of this species, the most abundant type being disc beads (Following Beck's 1928 definition: Length less than a third of the diameter). The beads are fairly uniform in size, measuring typically 7-9 mm in outer diameter, 3-4 mm in hole diameter and 1-3 mm in thickness. These dimensions are very similar to those of disc beads made of the ostrich egg shell common in the *nawamis*.

Some of the *Pinctada* beads may have been made using the "disc bead technique" (or "heishi technique"; Francis 1989). In some cases in the *nawamis*, they had a more squarish appearance, which indicates they may have been filed individually (Fig. 4:1-3).

Another type is the two-holed artifact referred to as a "button". Here too, each button was shaped and filed individually (Fig. 4:5).

Three large oval pendants (Fig. 4:6) with multiple holes in them are of particular interest. Their hole pattern resembles an Egyptian hieroglyph that means "circular threshing-floor covered with grains" (Gardiner 1979: 498/50). If the pendants indeed represent the same meaning, then the fact that they were placed in graves only enhances their significance and they deserve further investigation (Bloch and Parry, 1982, for example, dedicate an entire volume to symbols of fertility and rebirth in funeral rituals). Fourth millennium threshing floors are well documented in the 'Uvda Valley in the southern Negev (Avner 1998).

Dentalium sp. - This is by far the most abundant species present in the *nawamis* and comprises about 90% of the assemblages (by count, not necessarily by mass). What is most characteristic of the *Dentalium* sp. is that all the specimens are very heavily abraded and worn. Some appear to have been intentionally rubbed all around, creating a square cross-section on the outside (Fig. 5, bottom left). Others seem to have been rubbed at the edges. As a result, the two ends of each bead are thinner than the rest of the body. Others have a more irregular outside surface due to grinding at different angles, which might also be a result of wear. In most shells (even those which were not rubbed) there are faint traces of the sculpture of the natural ribs of the shell. There also seems to be a general preference for beads measuring ca. 10-15 mm in length. This is in contrast to *Dentalium* sp. beads from Early Bronze Age II sites in Sinai (Bar-Yosef Mayer 1999, in press) which look much more fresh. Their natural ribs are very clearly preserved and are much longer. Within this massive collection of *Dentalium* sp. shells (Table 1), specimens with gastropod boring are not unusual and were not selected against.

Conus sp. - Various species of *Conus* were used to produce apex beads. These are large beads made of the spire of the *Conus* sp., which is relatively flat. The body of the *Conus* as well as its apex were removed, thus leaving a "ring", which has been well filed on the top, bottom, and sides. At the bottom, where the whorls are visible, they are usually ground smoothly to be flat. Very often the hole in the ring was further enlarged. Due to the thorough working of the artifacts, as well as the large variability within the natural *Conus* population it was impossible to determine the species used (see, for example, Bosch et al. 1995); (Fig. 6:5-6).

Smaller species of *Conus*, such as *C. parvatus*, were used to produce two types of smaller beads. In one type, the bottom half of the *Conus* was removed and the apex was drilled. These are sometimes referred to as *Conus* tops. In other cases, only the spire remains, thus the *Conus* top is thin and becomes into a disc bead. The second type is a complete shell with only the apex drilled (Fig. 6:2-4). These two forms were very common in PPNB sites in the southern Sinai.

A number of EBII sites, not directly related to the *nawamis*, were discovered in the southern Sinai (excavated by I. Beit Arie). In these sites *Conus* is present both in the form of apex beads and in fairly abundant numbers of *C. parvatus* specimens. In addition to complete shells with a hole drilled into the apex, these also had a pierced hole in the body whorl, or an incision was cut in the body whorl. Sometimes the small *C. parvatus* are also made into disc beads, thus resembling the (usually larger) *Conus* apex bead on the one hand, or other disc beads (made primarily of ostrich egg shell and *Pinctada margaritifera*) on the other. This range of different *Conus* bead types is also present in the *nawamis*.

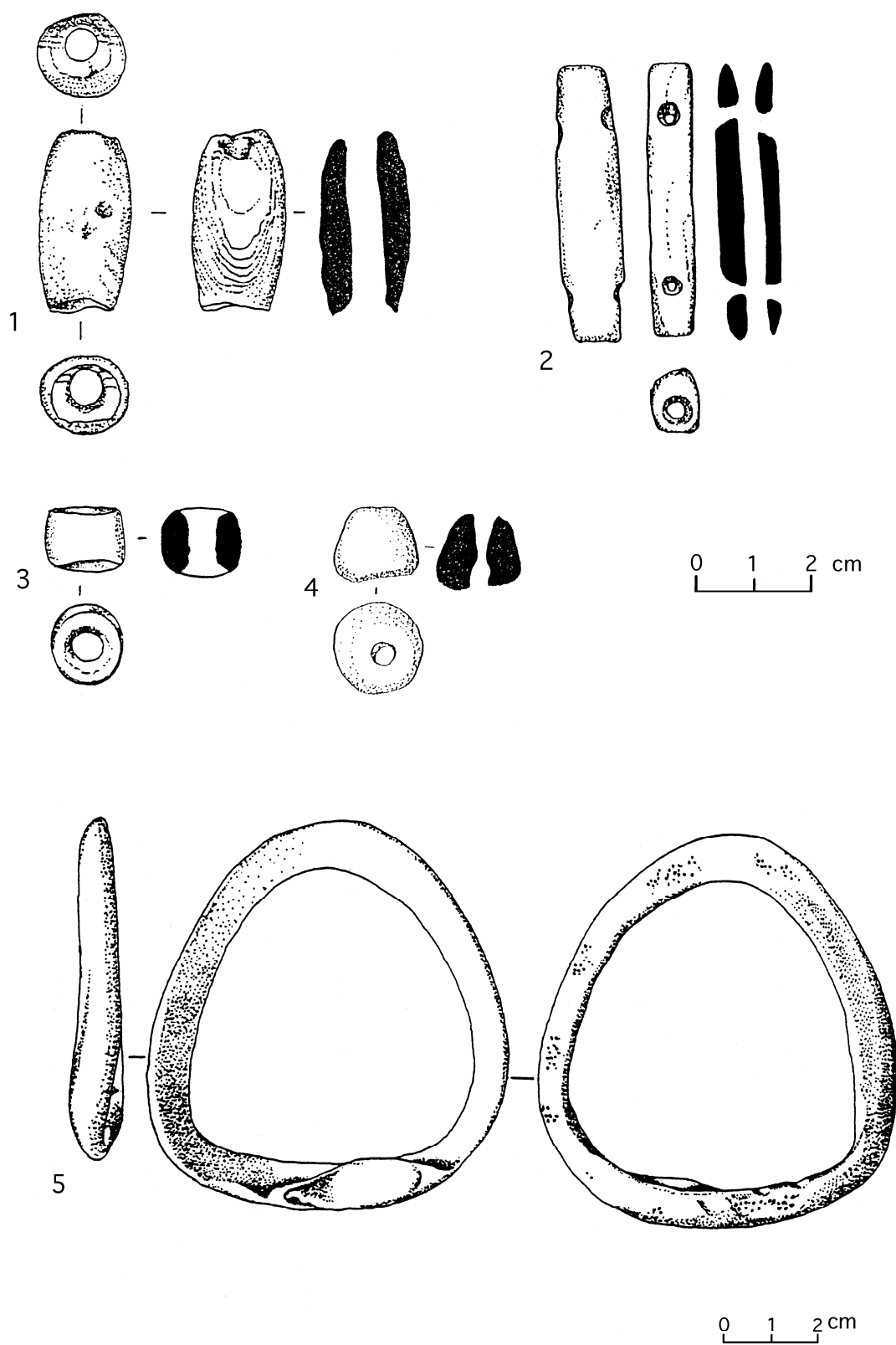


Fig. 3. *Lambis* artifacts. 1-4. "special" beads, 5. bangle.

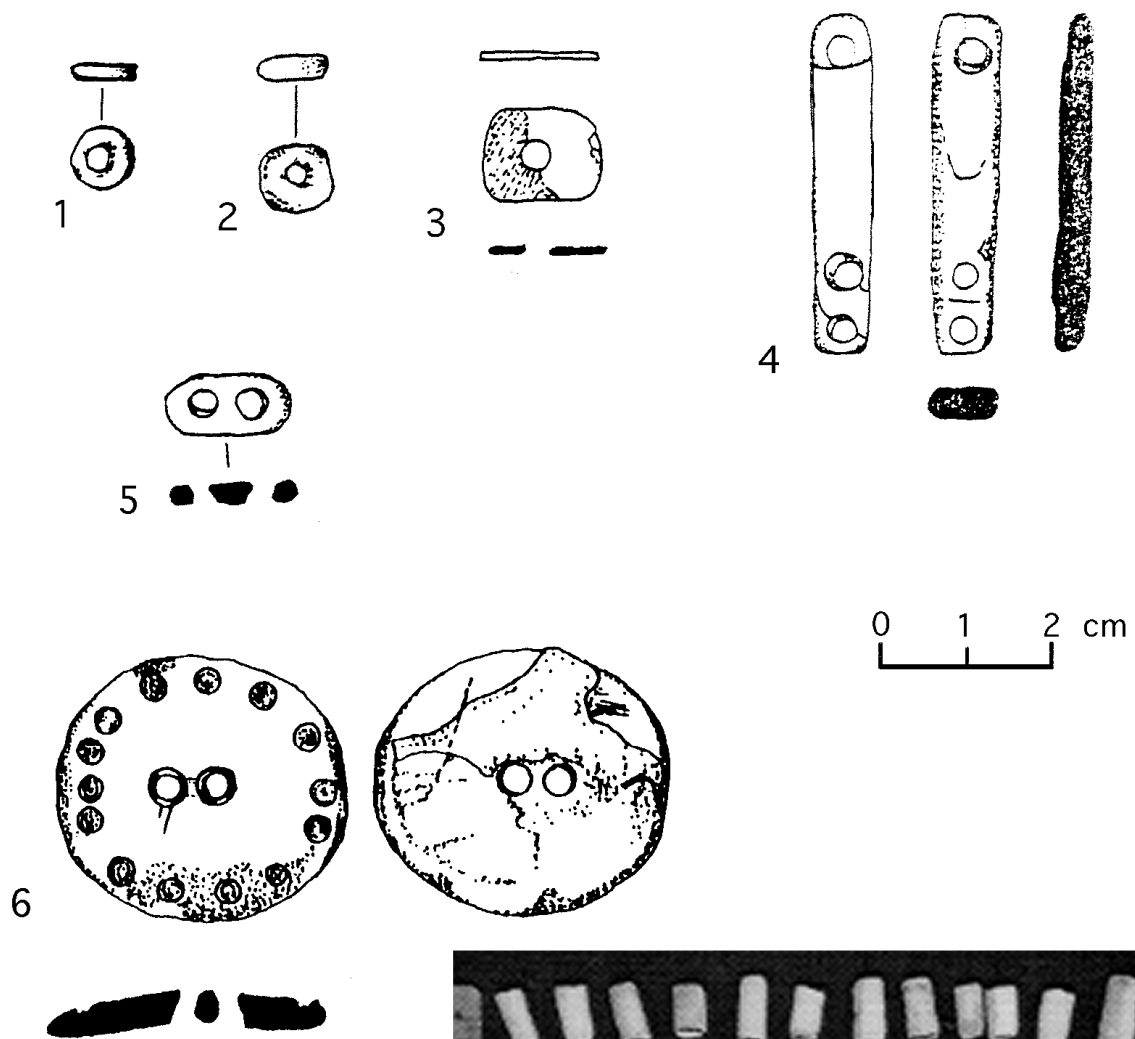


Fig. 4. *Pinctada* artifacts.

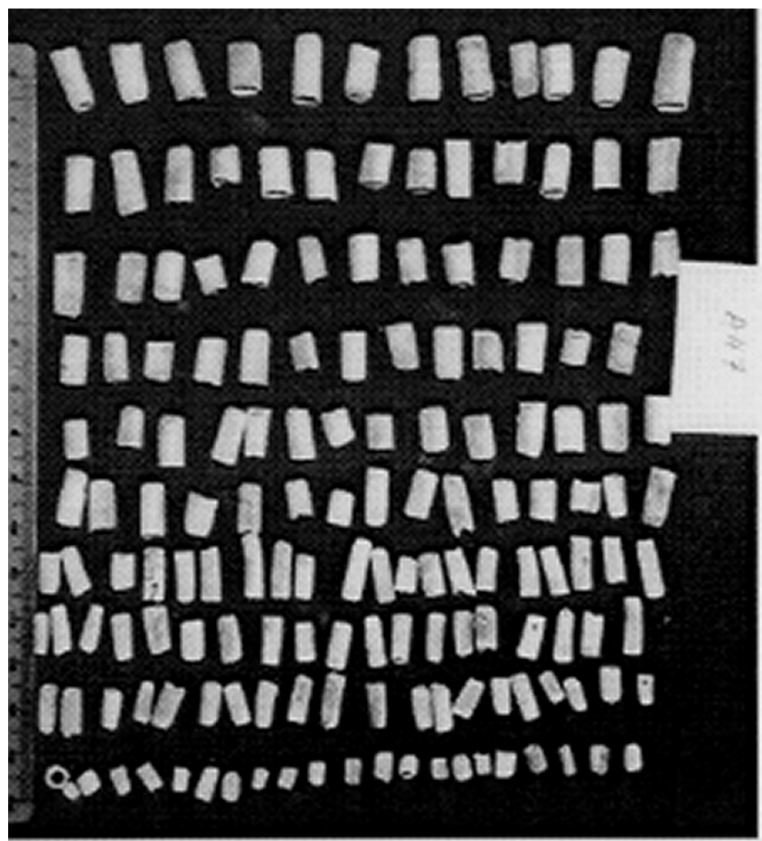


Fig. 5. *Dentalium* beads.

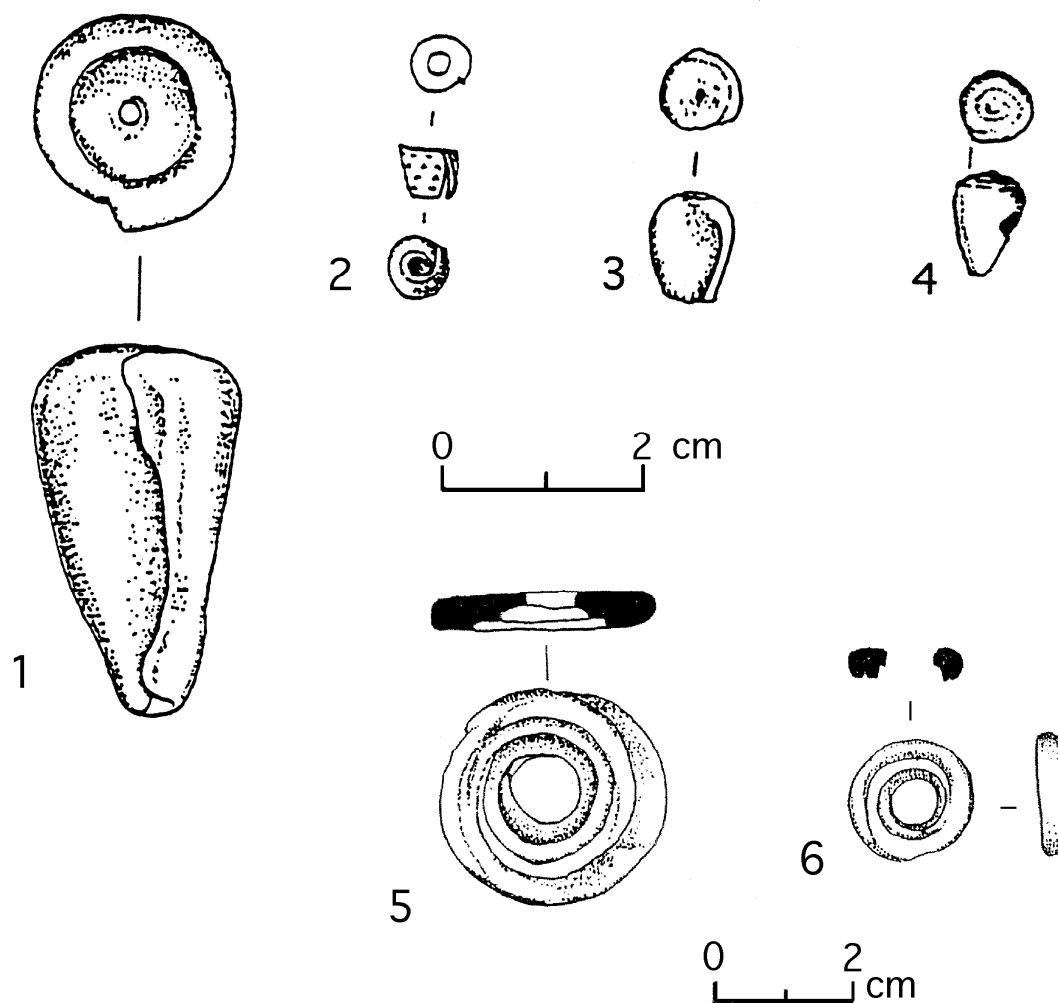


Fig. 6. *Conus* artifacts. 1. complete shell with holed apex, 2-3. *Conus* tops, 4. *Conus* with hole in body whorl, 5-6. *Conus* apex beads.

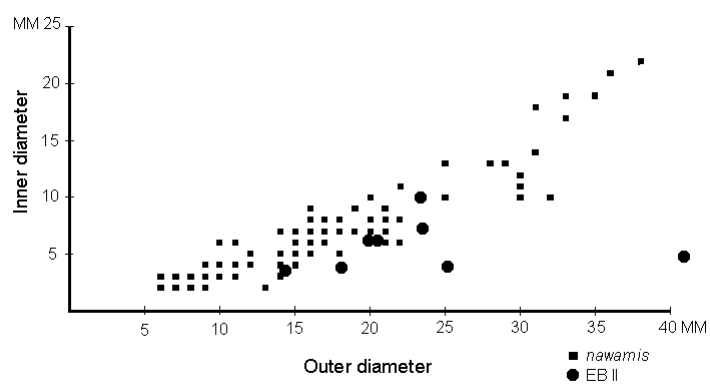


Fig. 7. *Conus* apex bead measurements from the *nawamis* and EB II sites.

Table 2. Count of other gastropods and bivalves from *nawamis*.

Genus	n=
Cellana	1
Clanculus	1
Nerita	122
Melanoides	3
Pirenella	1
Strombus	1
Cypraea	74
Polinices	4
Tonna	1
Engina	3
Mitrella	5
Ancilla	2
Glycymeris	17
Mytilidae	1
Codakia	1
Trachycardium	1
Mactra	1
Asaphis	1
Circenita	5
unidentifiable	4
Total	249

Measurements of the outer and inner diameter of the *Conus* apex beads, show that most specimens of such beads from the EBII sites are within the range of those measured from the *nawamis*. A linear regression analysis showed there was a 0.93 correlation between the diameters among these beads (Fig. 7). The *Conus* sp. thus, seems to be an important component in the EBII assemblages. One should note, however, that *Conus* beads (of various types) are also very common in earlier Neolithic sites and in Late Bronze Age and Early Iron Age sites in Israel. Therefore, they should not be considered an independent indicator of an EBII shell assemblage.

Other Gastropods and Bivalves

In addition to the four large categories mentioned above, there were nineteen other species, which make up about 1% of the assemblage, including various gastropods and bivalves that were usually perforated (Table 2). Those were scattered throughout the *nawamis* with no apparent pattern, and some, like a group of about 40 *Cypraea annulus* (a cowrie) from the Sawawin are suspected to be an Iron Age intrusion. Others may have been collected by the *nawamis* population from the surface of nearby Neolithic sites, etc. (Bar-Yosef Mayer 2000).

Living sites

The living or habitation sites excavated are: Gunna 25, Gunna 50 and Wadi Tbeik 100 (all in the Gebel Gunna area), 'Ein Um Ahmed, and Abu Halil Megurim. These sites were identified as the living sites of the builders of the *nawamis*, based on the overall similarity of artifacts in both the *nawamis* and the living sites. However, these sites contained an abundance of daily objects not included in the burials such as milling stones, hammer stones and potsherds. Lithic debitage is also more typical of the living sites when compared to the *nawamis*, where mainly finished artifacts such as transverse arrowheads and tabular scrapers were found (Hovers 1981).

In terms of molluscan assemblages, the Gunna habitation sites (Gu-25, 50, 100) are much more varied than the nearby *nawamis* of Gunna. In the *nawamis*, only 12 mollusc species are present with a total count of 1,144 specimens. In the habitation sites there are a total of 179 shells, comprising at least 32 different species (not counting unidentifiable gastropods and bivalves; Table 3). The habitation sites also contained other "typical" *nawamis* components, such as *Conus* apex beads and *Pinctada* beads but *Lambis* bangle fragments are found only at Gunna 50. This is the only one of these three sites that had no pottery and yielded a large variety of lithics. Gunna 25 and Gunna 100 contained some later Early Bronze Age pottery. All of these sites yielded some *Conus* fragments, which may have been the manufacturing waste of *Conus* rings, and *Pinctada* fragments, possibly the manufacturing waste of *Pinctada* artifacts. However, no finished or unfinished *Conus* and *Pinctada* products were found. It is thus possible that Gunna 50 is the oldest of the three sites while Gunna 25 and 100 date to a later phase of Early Bronze Age.

Chronology

Currently the *nawamis* are dated to the end of the fourth millennium B.C.E. according to Mazar (1990), and Stager (1992) who attributed them to the Early Bronze Age I. Currelly (1906:243) compared them to prehistoric Egypt, whereas Rothenberg dated them to the "Chalcolithic - Early Bronze Age".

Table 3. Summary count of shells in living sites.

Species	Gunna 25	Gunna 50	Gunna 100	Abu Halil	Ein Um Ahmed
<i>Nerita sanguinolenta</i>	1	7	4	1	2
<i>Strombus mutabilis</i>	1		1		
<i>Strombus fasciatus</i>		3			
<i>Lambis truncata</i>		8	1		16
<i>Cypraea arabica grayana</i>	3				
<i>Cypraea</i> sp.	1	2	1		2
<i>Polinices tumidus</i>	2	1			
<i>Tonna</i> sp.	1				
<i>Morula granulata</i>	2				
<i>Morula anaxeres</i>		2			
<i>Columbella</i> sp.		1			
<i>Mitrella albina</i>	18		6		
<i>Engina mendicaria</i>		1			
<i>Ancilla</i> sp.	1	2			
<i>Mitra litterata</i>	2				
<i>Vexillum</i> sp.	2				
<i>Persicula terveriana</i>	1				
<i>Conus arenatus</i>	1				
<i>Conus nigropunctatus</i>			1		
<i>Conus parvatus</i>		9	3		4
<i>Conus striatus</i>		1	1		
<i>Conus taeniatus</i>		1	1		
<i>Conus virgo</i>	1				
<i>Conus</i> sp.	2	4	1		7
gastropod		2	4		3
<i>Arca</i> sp./ <i>Anadara</i> sp.	1				
<i>Glycymeris lividus</i>			1		
<i>Pinctada margaritifera</i>	9		6		
<i>Crassostrea</i> sp.	6				
<i>Tridacna</i> sp.			1		
<i>Chama</i> sp.			1		
<i>Circenita</i> sp.			1		
bivalve		1	1		
<i>Dentalium</i> sp.	3	20	2		
Total	58	65	37	1	34

The desire to attribute the *nawamis* to either the Chalcolithic or the Bronze Age was temporarily resolved by Bar-Yosef *et al.* (1977) by determining that they belonged to a "fourth millennium" culture. Radiocarbon dating, pottery and architectural correlations, as well as comparative studies of the lithic industries, would be the most obvious means of dating. However, most of these are both scarcely available at the *nawamis* (pottery or radiocarbon datable material) and undiagnostic (lithics), hence the lack of confidence in the dates they yield.

Radiocarbon dating of mollusc shell is problematic because it will give the age of the shell rather than the date when the shell was made into an artifact. Moreover, the date is often that of the carbon in the water in which the mollusc lived, which could be a few hundred years older than the mollusc itself (Aitken 1990). Since mollusc shells were often collected as dead specimens from the beach, their age will not necessarily reflect that of the site in which they were found.

Another dating method for shells is examining the ratio of different shell species and types in the entire assemblage, similar to the seriation dating of pottery or lithic assemblages. Yet another method would be using a shell that has been made into a distinct artifact, and is known from well-dated contexts. It could then serve for dating when found in other sites, where more conventional dating methods are unavailable or insufficient.

- Two shell artifacts present in the *nawamis* seem to be useful as chronological indicators: the *Lambis* bangle is found only in Chalcolithic and EBI sites and are a good indicator of time, a fact

previously noticed by others (Bar-Yosef *et al.* 1986:137; Wilkinson 1989a: 312; Stager 1992). *Lambis* shell bangles are also known from predynastic Egyptian graves but are typologically different although they are, in general, from the same time period (further discussion see below and Bar-Yosef Mayer in press a).

- The *Conus* apex bead (or "ring") was found only in burials dated to EBaII/III in Jericho and Bab-edh-Dhra and nowhere earlier (Kenyon 1960:92, 172-173; Figs. 28, 65; Wilkinson 1989b:461-470). There seems to be further evidence for their use at third millennium sites in Mesopotamia (e.g. Oguchi 1992).

Based on the chronological analysis, as well as the fact that the shell artifacts were found together in numerous different combinations, it seems that the *nawamis* were in use throughout the Chalcolithic, EBaI, and EBaII/III. These burial sites appear to have functioned over a very long period of time, possibly as long as two thousand years. Other artifacts (including tabular scrapers, transverse arrowheads, Naqada I-II type juglets, copper artifacts, stone axes, etc.) as well as architectural considerations, also point towards multiple cultural units. This assumption corresponds with recently published ¹⁴C dates from 'Ein Um Ahmed and Abu Halil, ranging between ca. 5815 and 5130 b.p. (RT-1851-1859) i.e., the fourth millennium B.C.E. (Segal and Carmi 1996:103).

Discussion and conclusions

Except for a very few sheep/goat bones (Horwitz, personal communication), animal bones were not preserved in the *nawamis* sites. Therefore, the determination of the *nawamis* population as pastoralists comes not only from the fact that these people had to survive in the desert, but also from two other main observations: Firstly, there were no permanently settled sites associated with their burial grounds, but rather more evidence for ephemeral camps; and secondly, these camps contained huge amounts of goat dung (Goren 1998).

Pastoralists apparently have always been engaged in trade and/or exchange, either between themselves and urban-dwellers, or as go-betweens for the different urban societies surrounding them. This interaction allowed pastoralists to supplement their own way of life, which provided them with the products and by-products of their herded flocks, as well as with resources that their own lifestyle as nomads was not able to provide (particular plant foods, certain kinds of cloth, ornaments, possibly ceramics which they would use but not manufacture, etc.).

In addition to herding, most documented pastoral societies also engage in craft manufacturing, and in the Sinai peninsula any trip to the coast would provide them with ample source of raw materials for the manufacturing of shell beads and artifacts. This would in turn allow them to possess relatively cheap jewelry in large quantities, and also supply surplus items suitable for exchange.

Although there is no direct evidence for where or how the shell artifacts were manufactured, an interesting example comes from a contemporaneous site, Wadi Watir VIII. The site of Wadi Watir VIII, containing a fair number of bangles of both the "Egyptian" and "Canaanite" types, as well as a large number and variety of lithic tools, was determined by the excavator to be a massebot shrine within a cluster of dwelling sites (Avner 1984). The dwelling sites in the vicinity could be "living sites" belonging to the *nawamis* population, although they were not excavated (Avner, personal communication). Wadi Watir VIII, or one of the sites in its vicinity, could have served as the manufacturing site of the *Lambis* bangles. The bangles, made from the bottom of the spire (the "Egyptian" type), might have been made specifically for trade with Egypt (in return for faience beads? or grain?). The *Lambis* shell itself was known and valued in Egypt, for it is depicted on one of the Coptos colossi (Williams 1988). This assumption is based on the notion that there was indeed some connection between the *nawamis* and Egypt, although the presence of faience beads in the *nawamis* does not leave any room for doubt about that. The other bangles, which are more common in the *nawamis* (and are found in "Canaanite" sites as far north as Bab-edh-Dhra and Tell-el-Far'ah North), were produced from the remaining raw material. Although they were made from "scrap", these bangles were valuable to their wearers, as we find some bangle fragments with repair holes in them (in Wadi Hebar and in 'Ein

Hudarah). The same phenomenon is known for bangles from the Indus valley (Kenoyer 1983:261, Fig. 3-3).

The production of two types of bangles might also explain the production of the other "special" beads made of *Lambis*: The *Lambis* as raw material was exploited to the maximum, almost without leaving any debris (not even in the living sites where the beads are assumed to have been produced).

An overall assessment of the shell assemblages of the *nawamis* exhibited some similarities, especially in the consistency of the four dominant species. A cluster analysis done on all shells from the *nawamis* failed to explain the variability in the data (different types of special beads, different proportions between the shell groups) and no clear pattern emerged. However, there are several general conclusions which may be drawn.

The results of bead manufacturing are variable. On the one hand, one finds beads that seem to be manufactured "ad hoc" and are not very uniform (many in the category of barrel shapes), and on the other hand, one finds special beads that are very carefully worked. My impression is that there is a mixed industry of very fine versus very poor production of shell artifacts. This characterization was also noted with regard to the manufacturing of flint artifacts (Hovers 1981).

The rather monotonous assemblages with overwhelming numbers of *Dentalium* beads, stand in contrast to a major variability in bead style and in quality of workmanship. What, then, does this information reflect in terms of the population? Who were the people buried in the *nawamis*? What can their graves tell us about their lives?

It is impossible to isolate a defining characteristic of each field. Did it serve a certain "tribe"? Was it all random and dependent on the season in which the dead were buried? A seasonality study (Bar-Yosef *et al.* 1983) shows that most fields were constructed especially during fall and spring. This, however, is based only on architectural considerations and not on faunal remains, which are very scarce and have the potential to determine the season of burial (as opposed to construction)².

If indeed the number of beads reflects the status of the individuals (or families), or in other words many beads in a burial indicate that it is of a high ranking individual, then one might assume arbitrarily that a grave containing over 500 beads is that of a high ranking individual while a grave with less than 100 beads is that of a low ranking person. Accordingly, most of the *nawamis* contained "middle class" individuals. It is imperative to keep in mind though, that this speculation is based solely on the shell beads, and therefore might be biased.

The use of *nawamis* for burials without additional finds should be mentioned. One possible explanation is that those are the structures used last, during EBaIII, reflecting the decline of the urban society towards the end of the Early Bronze Age. Because the *nawamis* population depended upon the surrounding urban societies, the lack of grave goods represents an economic decline. However, the absence of any other EBaIII cultural remains in Sinai, casts doubt on this suggestion. The graves void of artifacts might represent "poor" individuals or individuals who were buried in haste, or any number of other possible scenarios (including plundering in antiquity).

As stated above, the *nawamis* population was one of pastoralists and as such they subsisted not only on herding but also on exchange with other populations surrounding them. They probably used shell beads and bangles primarily for decorating themselves, but also traded in them. The shell artifacts, thus reflect one aspect of the pastoralists' economy, as is best expressed by Anatoly Khazanov (1994: xxxi): "Specialization means more dependency. The more specialized mobile pastoralists become, the more dependent they become, in turn, on the outside, non-pastoralist, mainly sedentary world".

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² The use of fauna for studying seasonality is possible by studying either the ratios of male/female/juveniles (Speth and Spielmann 1983), or by studying cementum increments in animals' teeth (Lieberman 1994).

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