

Fig. 4. Anatolian Grey Ware
 I. (Photo: M. Artzy)
 II. (Drawing: N. Yoselevich)

We are already working on the material, including pilot projects using petrography with the kind help of Yuval Goren of Tel Aviv University, to establish possible provenience to improve our understanding of the trade network and the position of Tell Abu Hawam as the focus of the maritime and the terrestrial sea to desert routes. Several students from the Departments of Maritime Studies and Archaeology are already working on particular wares and questions towards their M.A. degrees. Inbar Hai-Baruch has already submitted her study on some of the mollusks from limited areas in Balensi's and our excavations. Geological samples have been sent to our colleagues at McMaster University, and most of the other studies, such as stones, bones, shells, etc., are in progress. We have applied for further financial aid to enable us to carry out Neutron Activation Analysis and other tests.

We hope that next year we will be able to report some of the results of this project to our readers. We would like to take this opportunity to thank Jacqueline Balensi for making her material and maps available to us, as well as the Israel Antiquities Authority, the Yefe Nof Transportation and Infrastructure Company and the Israel Electricity Company for the opportunity to carry out these projects, which, we hope, will shed new light on the Qishon estuary and the most ancient port of Haifa.

Michal Artzy

LIMAN TEPE 2002

The third season of the underwater project at Liman Tepe took place in the last weeks of August and the first part of September. As usual, we were met by our Turkish counterparts headed by Hayat Erkanal, the head of the Institute for Archaeology and Near Eastern Studies at Ankara University and the Izmir Regional Project. The project was directed as previously by Michal Artzy, aided by Avner Raban. Area supervisors were Greg Votruba, helped by Idit Yovel (Area A) and Arad Haggi, helped by Amani abu Hamid (Area D). Beverly Goodman from McMaster University in Canada, aided by Hendrik Dey (Univ. of Michigan), carried out the ancient ecology studies. Yossi Salmon was our information technologist and in charge of mapping, Noga Yoselevich, aided by Svetlana Zagorski and Amit Rosenblum, was in charge of processing the finds. Noa Sheizaf, Greg Votruba and Amir Yurman photographed under water. Teoman Iplici served again as our in-house physician. The smooth running of the project owed much to our maritime workshop team: Steve Breitstein, Amir Yurman; Levent Keskin and Oguz Bostanci were in charge of coordinating the logistics. Students from both universities and volunteers completed the team.

The objectives of the project were:

- I. Continuation of land and underwater mapping using DGPS, echo sounder and total station.
- II. Continuation of coring, both on land and in the sea.
- III. Excavation of Area A, a possible marine construction.
- IV. Excavation of Area D, the land-mass with remains of terrestrial construction.

More detail was added to the map. The mapping with the aid of the DGPS and the echo sounder in the sea was not successful because of unfavorable sea conditions during most of the underwater project. This season's mapping was carried out by using the total station (Fig. 1).

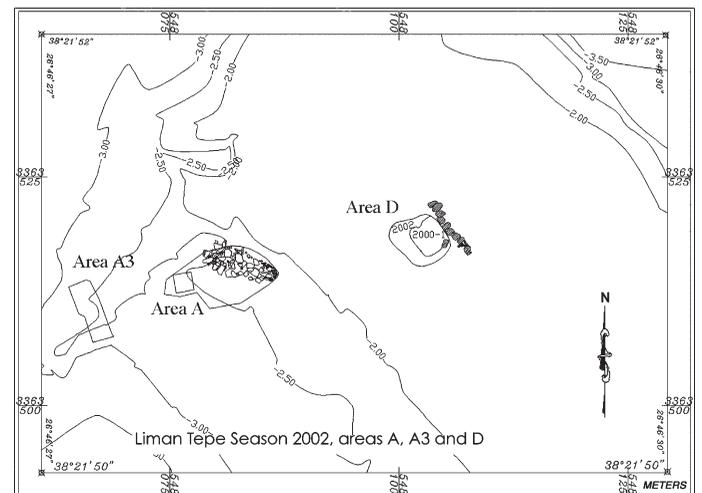


Fig. 1. Map of the excavated areas (prepared by Y. Salmon)

Sediment cores were collected for sedimentological and micropaleontological analyses. These cores are to be used to reconstruct the history of the coastline: this will be relevant to understanding the metamorphosis of the coastal site and the submerged structure currently under investigation. Cores were collected in the vicinity of the known land site and in the excavated areas. Cores were also collected under water in and around the archaeological site. Four cores were collected along a north-south transect about half a km east of the sunken part of Liman Tepe. Preliminary analysis has identified evidence of changes in the environment in the past, and further work will isolate the timing and nature of these changes.

The largest number of the pithoi/dolia remains were strewn around Area A. One of the objectives was to examine the remains of the southwestern underwater feature in the area. This projection, which seems to be attached to the land mass, is clearly visible in aerial photographs. It has been suggested that it, or possibly its foundation, might be a continuation of the western part of the EB wall which was unearthed in the terrestrial project. It is about 2 m below sea level, and its surface is eroded and encrusted. It slopes at an angle, the line of which continues below the seaweed (*Posidonia*).



Fig. 2. Michal Artzy and Stephen Breitstein exploring Area A3. (Photo: N. Sheizaf)

A section named A3 was planned. Its final measurements were 10 m long, 2 m wide and down to 3 m depth (Fig. 2). The maximum depth and width were not reached, necessitating further work in future seasons. Homogeneous rubble consisting of stones, mostly limestone, of various shapes and sizes, was observed. Most have rounded edges with geometrical shapes, although so far no articulated constructions have been noted. One possible exception might be in a group of similar sized ashlar near the eastern part of the element. It is too early to date this feature, although the lack of ceramics and the appearance of the worked stones point to human intervention. Its orientation, as it appears on the surface, indicates a maritime installation, such as a breakwater or quay, creating a possible harbor basin. The lack of ceramics poses a problem, but the appearance of the encrusted pithos/dolium rim ca. 20-30 cm from the upper portion of the structure might provide a clue as to when the element went out of use. Building stones in the general area are reminiscent of those associated with the EB construction in the terrestrial area, especially that of the tower and defensive wall (Fig. 3).

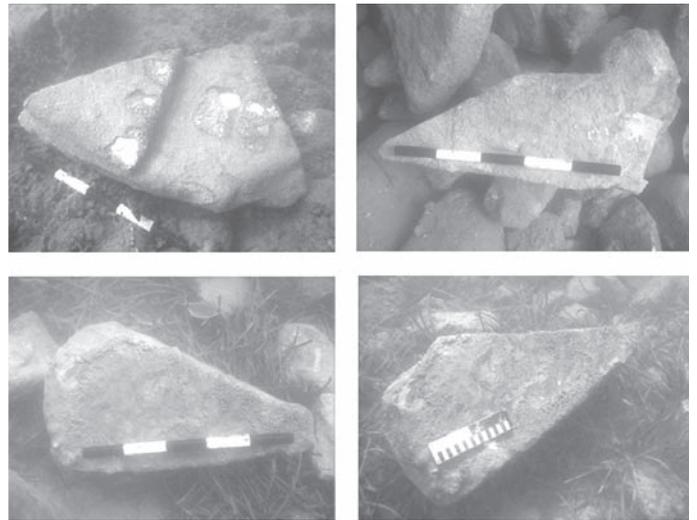


Fig. 3. Building stones in Area A3 (Photo: G. Votruba)

Area A1 was excavated in previous seasons. A probe was begun in the 2001 season. The original reason for the probe was to determine the stratigraphy beneath the pithoi/dolia fragments. These were located at ca. - 2.5 to - 3.3 m below sea level. As the 2001 season came to its end a layer of light-colored stones was noted at - 4.40 m below the fragments. The probe was continued in 2002. An area ca. 2 x 2 m was cleared and stones (Locus 21) were removed to reveal a 20 cm thick layer of pottery (-5.0) and organic matter within a matrix of sand supported by vegetation and mud. The ceramics in Locus 20 include a large percentage of finely decorated building table ware, including two lamps (Fig. 4). Many of

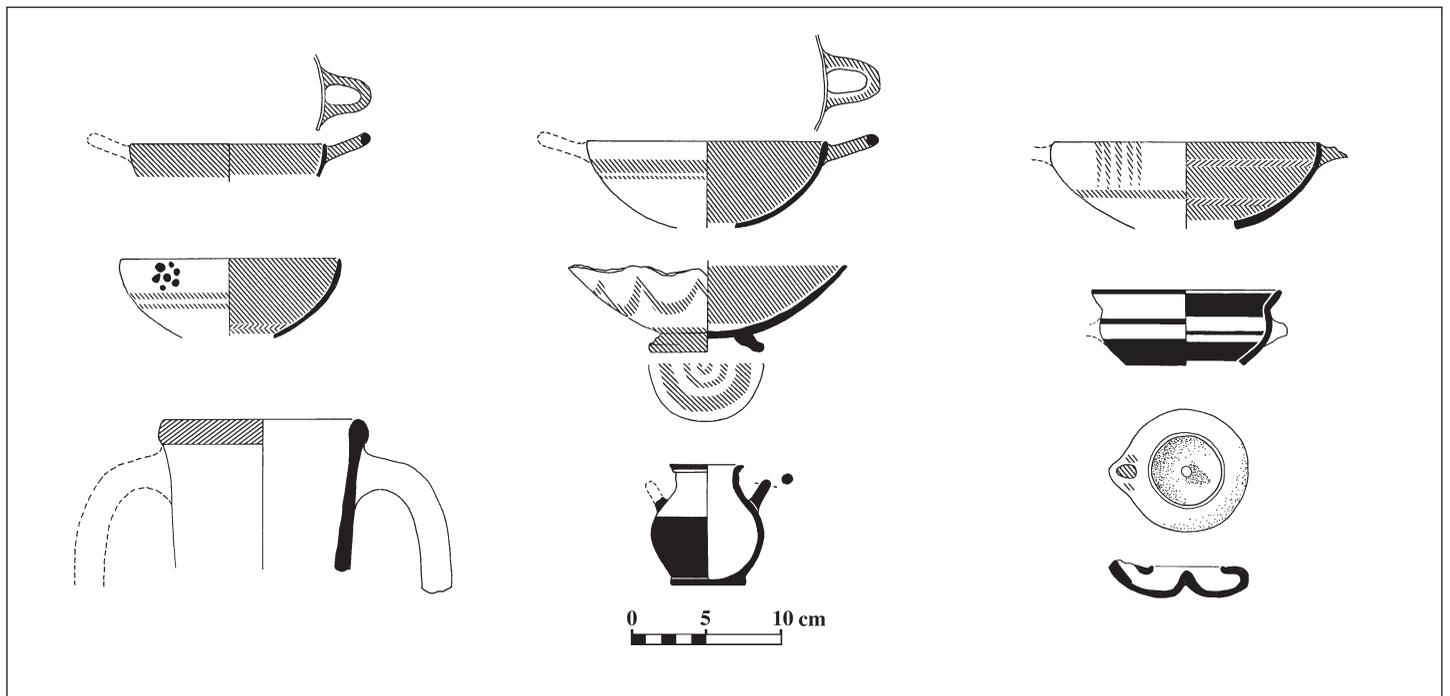


Fig. 4. Ceramics from probe in Area A1 (Drawings: N. Yoselevich and S. Zagorsky)

the sherds were sharp-edged, indicating that they were quickly covered by debris after they were deposited. The locus contained wood and bone, as well as small fist-sized stones and shells. The excavation this season did not reach the bottom of the vegetation layer, which is at least 25 cm thick. Preliminary interpretation of this locus is that it might have been the bottom of a basin formed following the construction of the quay/breakwater, with the vegetation base being the original sea floor of the harbor basin. Thus Locus 20 might represent the accumulation of the material which was either thrown into the basin during its use, and/or tumbled in during a catastrophe.

Clearance and excavation of Area D:

The area is within the sunken land-mass. It was surveyed in the 2000 season and explored in 2001. A 4 x 6 rectangle was marked near a wall (W42) which was cleared. In 2002 it was decided to enlarge the excavation area so as to be able to improve the conditions for deeper excavation. This season's work was hampered by sea conditions, especially at the beginning. The uppermost part of Area D is high enough so that with the smallest of waves divers found it hard to work without being hurt by the sharp-edged crusted conglomerate, which is typical of the upper level of the site.

The first few days were spent in cleaning the area. Just as in previous years, the clearing of the conglomerate was a physical task. The conglomerate, as noted in the previous reports, was so hard that chisels and hammers were used to

get through it. It is typically mixed with stones, crushed shells and sherds. Most of the sherds found in the area consisted of amphorae. The depth of the conglomerate was between 30 and 50 cm.

The layer below the conglomerate consisted of rubble, limestone rocks, river pebbles and a dark, almost black, mud/clay. Large stones were noted, especially in the south-western part of the area. At first it was thought that they might belong to an articulated wall, but the amount of wood and other organic remains, as well as sherds, mud and small stones, made it clear that it was possibly the remains of walls. Among the rubble, especially in the southern area, were numerous sherds of fine tableware which can be dated to the end of the 7th and beginning of the 6th centuries BCE (Fig. 5). We hoped to have located some standing walls, but alas, it was established that they were not articulated, only remains of tumbled walls, the exact position of which we have not yet established. Large ashlar were noted in the NW corner, and had to be removed because of their threat to the divers. The large ashlar remained where it had fallen because it was too large and the area too shallow to have it removed by flotation, and equipment will have to be brought in to remove it in a future season.

The level below the stone and in its vicinity seems to indicate a change. It consists of dark, almost black, mud/clay interspersed with stones, which might indicate terrestrial intervention. It contains amphora sherds and fine ware pieces (Fig. 6). On some of the stones are clear signs of

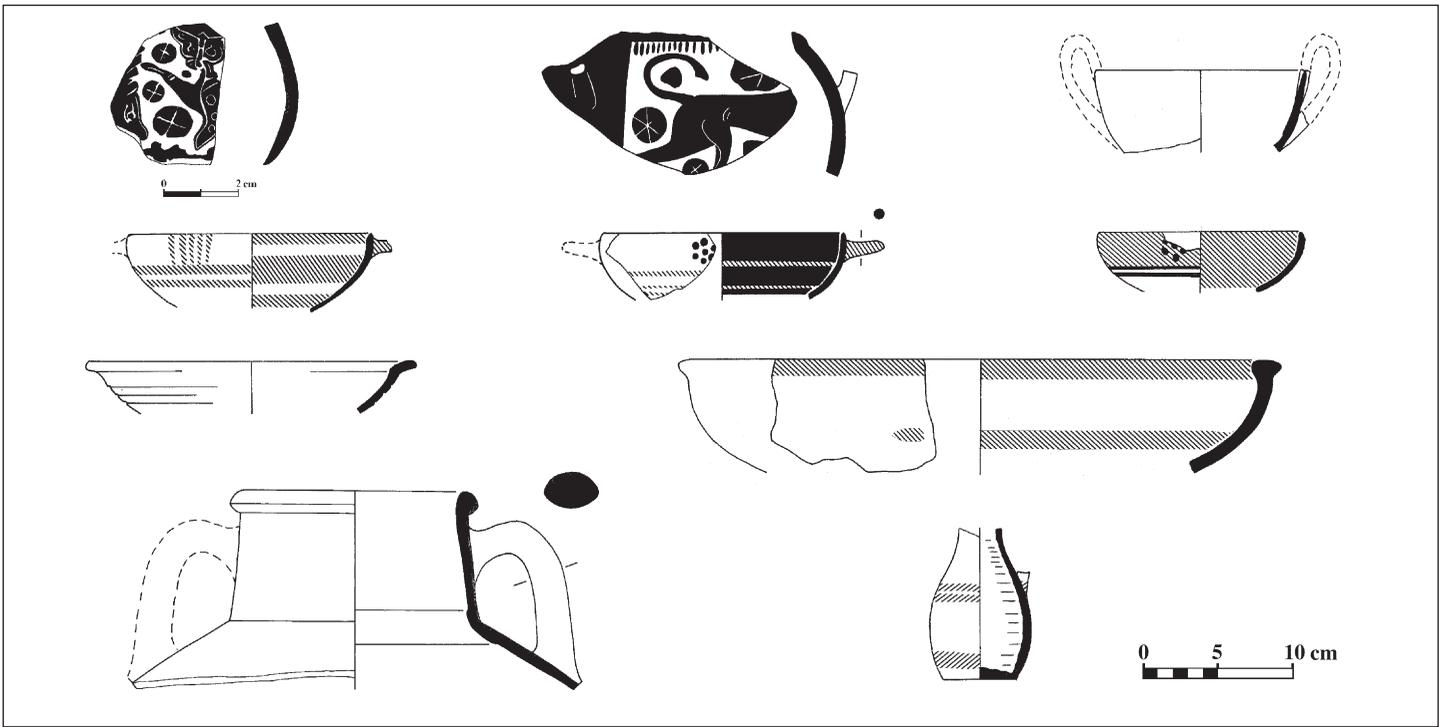


Fig. 5. Ceramics from Area D, loci 46 and 48 (Drawings: N. Yoselevich and S. Zagorsky)

marine encrustation, indicating that the area was in contact with the sea. In the northwestern corner, sherds belonging to earlier periods, hitherto not found, were located. These include Early Bronze pieces and possibly also Middle Bronze sherds. In one small space below the collapsed part of one wall, in the western part of the square, at -4.0 m, pieces of wood, mainly twigs as well as animal bones and olive pits were noted.

Because of the large stone which found its way to the center of the excavated area we had to enlarge the excavated area, but still could not find a way and time to dig deeper into what might belong to earlier strata.



Fig. 6. Juglet at the moment of finding (Photo: G. Votruba)

This season was certainly special. Most of the group made the new structure in camp their home for the duration of the project. In the previous season we were told that the Mayor of Urla, Selcuk Karaosman, who has been a wonderful supporter of the project, and the Minister of Culture were going to help construct a new building which was to be named Haifa House. Indeed, it was finished when we arrived, and made for a most comfortable abode. We would like to take this opportunity to thank our Turkish colleagues for taking the initiative to name the building 'Haifa House' (Fig. 7). We were visited again by the then Turkish Minister of Culture, Prof. Caglayan, and were introduced to a wonderful building and yard donated by the municipality for a future Maritime Museum. Ankara University is now in the process of establishing an underwater institute and we hope to be able to aid them in their endeavors.

The last evening of the season was the highlight of the wonderful cooperation of this Mediterranean Project. Not only were we fêted (a bouquet of flowers from the municipality presented by Mehmet Emec, the public relations officer of the municipality), but we returned in kind for the joint birthdays of Ourania Kouka, the Greek archaeologist who is a member of the land team and Riza Tuncel of the Turkish terrestrial team (Fig. 8).

None of this could have been carried out without the financial assistance of our friends, Sir Maurice and Lady Irene Hatter, the Frankel Foundation; the University of Haifa, in addition to the usual aid, came through with contributions

from the President Yehuda Hayuth; the Rector, Aaron Ben Ze'ev; Dean of Research, Moshe Zeidner and the Dean of the Humanities, Yossi Ben-Artzi. We are indebted to them all.

Michal Artzy



Fig. 7. 'Haifa House' (Photo: M. Artzy)



Fig. 8. Birthday children (Photo: M. Artzy)



Fig. 9. Participants in the Liman Tepe Joint Expedition