



## A LATE BRONZE AGE CANAANITE MERCHANT'S HOARD OF GOLD ARTIFACTS AND HEMATITE WEIGHTS FROM THE YAVNEH-YAM ANCHORAGE, ISRAEL

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### ABSTRACT

*An underwater survey at the ancient anchorage of Yavneh-Yam, located on the southern Mediterranean coast of Israel, has revealed remnants of a sunken cargo dated to the Late Bronze Age. The cargo includes a small collection of objects composed of whole and broken down gold jewelry and scrap, in addition to a collection of small stone weights suggesting that it was the stock-in-trade of a Canaanite merchant that plied the eastern Mediterranean waters. The gold and the weights appear to represent means of payment that were commonly known and in use throughout the Bronze and Iron Ages in the southern Levant.*

### INTRODUCTION

The Mediterranean coast of Israel has few natural shelters and is often exposed to storms. Wind powered watercraft losing control during storms tended to drift to the lee shore, were grounded and then wrecked by the shore breakers. Some ships were wrecked while sailing along the open coast away from a shelter; others were wrecked while sheltering in natural anchorages, such as Yavneh-Yam (Figures 1A, 1B). Light objects and wooden hull-parts subsequently drifted ashore and vanished from the wreck site. Heavier objects, such as those made of metal or stone, released during the wreckage, were buried in the shifting sand at the wreck site and were protected by it until discovery.<sup>1</sup> In recent decades, human intervention in the coastal environment, mainly sand quarrying and the construction of harbors, resulted in a reduction of sand quantities and consequently, coastal erosion. Thus, numerous shipwreck sites have been exposed, destroyed or their remains further dispersed. Underwater rescue surveys have facilitated the discovery, documentation and exploration of surviving remains.

The present article discusses a group of gold artifacts and hematite weights originating from a defined shipwreck assemblage recovered in the Yavneh-Yam anchorage. A comprehensive study of the full assemblage is currently under preparation.<sup>2</sup>

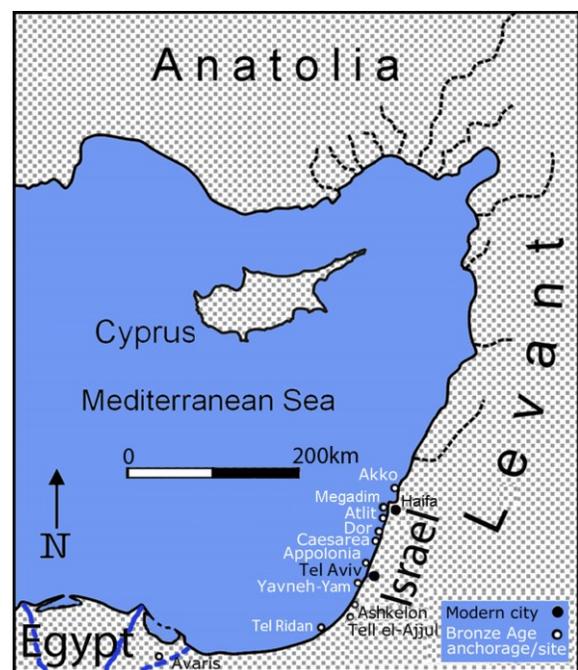


Figure 1A: Location map - the eastern Mediterranean

## THE YAVNEH-YAM ANCHORAGE SITE

The Yavneh-Yam anchorage (Figure 1B) was intensively surveyed by underwater archaeologists between 1983-1995<sup>3</sup> and the abundant finds found throughout the anchorage demonstrate that it sheltered ships from the Late Bronze Age to the Middle Ages.<sup>4</sup> In antiquity, except for a small and poorly protected anchorage at Tel Ridan located to the south, this anchorage was the only shelter for ships sailing along the coast of southern Israel and northern Sinai (Figure 1A). Underwater finds in the anchorage included several defined shipwreck assemblages as well as hundreds of isolated artifacts, including stone and metal anchors, remnants of ships and their cargoes. Among the stone anchors are 32 one-holed weight anchors, weighing 40-150 kg, and several composite stone anchors with two or three holes. Most were made of local limestone or kurkar yet one was made of non-local granite, suggesting connections with the Egyptian or north Sinai coasts.<sup>5</sup> Heavy weight anchors (weighing more than 50 kg) with one hole and an oval or round top are typical of the Middle and Late Bronze Ages, yet finds from Kition suggest that the use of three-holed anchors began during the Late Bronze Age.<sup>6</sup> However, no clear association of the scores of stone anchors recovered from the anchorage with the discussed assemblage can currently be made.

## THE YAVNEH-YAM LATE BRONZE AGE SHIPWRECK CARGO

A large assemblage of items, all dated to the Late Bronze Age, was recovered from the south-eastern section of the anchorage (Figure 1B). The anchorage is located within an elongated shallow (2-6 m deep) trough positioned between the coastline and the lee side of a submerged *kurkar* (sandstone) ridge several hundred meters west of the coast. At the bottom of the anchorage is a packed and marly paleosol often covered by shifting sands that move during storms randomly exposing areas of the paleosol upon which are found heavy archaeological remains such as stone and metal items that have not been swept away or deteriorated. These are periodically hand collected and documented by underwater surveys carried out immediately after storms, while finds not threatened with destruction or looting are documented and left in place.

The assemblage discussed here was all retrieved from one locale on the paleosol of the sea floor, within an area of 20 x 10 m at a water depth of 2-3 m. No remains of a ship's hull were recovered, yet it is assumed that as they were all found in one locale, these objects originated from the cargo of one ship that sheltered in this anchorage, had drifted ashore and was subsequently wrecked in the shallow area of the anchorage during a violent storm.

Among the finds of the assemblage were 46 small and minute gold objects and a collection of seventeen small stone balance weights which are the focus of this article. The gold items include several whole jewelry objects and numerous gold jewelry scraps with a total weight of 8.27 g (Figure 2). The small stone weights include 16 grain- or sphenonoid hematite weights and a pendant

stone weight, with a total weight of 239.79 g (Figure 3). In addition to these collections, several other small finds, including a hematite cylinder seal of Syrian origin<sup>7</sup> as well as bronze spearheads, arrowheads, axes and bronze figurine of a smiting deity, probably representing the Canaanite god Baal, were recovered from the same locale.<sup>8</sup> In addition, a neck fragment of a Canaanite amphora dated to the Late Bronze Age was also recovered.<sup>9</sup> This type of jar was produced in Canaan and was widely used in maritime transport along the Syro-Canaan coast and beyond, where it is found as far as Egypt, Cyprus, southern Anatolia and Mycenaean Greece (Figure 4).<sup>10</sup>

## THE GOLD OBJECTS

The gold objects within the assemblage (Figure 2) consist of two pendants (Figures 5-6), a ring (Figure 7) and a collection of various types of beads along with gold jewelry scrap including raw material for the production of jewelry and broken jewelry items (Figures 8-10).

A gold leaf pendant weighing 0.58 g (Figure 5) was recovered, made of a length of gold wire, hammered out into an elongated flat oval leaf or petal at both ends. The leaves are decorated with a lightly chased line running parallel to their edges while a small rounded protrusion is executed in *repoussé* in the center of each leaf. The wire, representing the stems of both leaves, was then folded 180 degrees and twisted around to form a suspension loop at one end. This form of pendant belongs to broad and varied group of Late Bronze Age floral pendants.<sup>11</sup> Examples are known from Lachish, found when soil from the Late Bronze Age Fosse Temple was sifted.<sup>12</sup> Several more examples derive from Tell el-

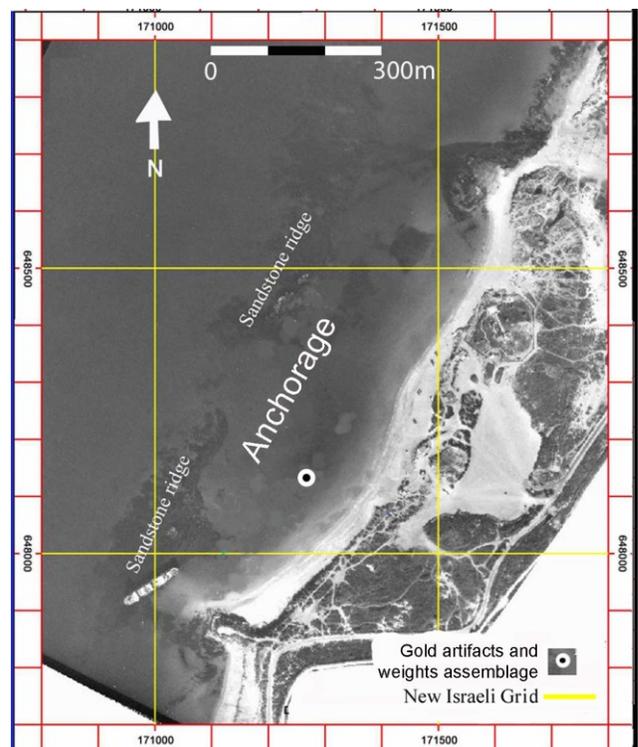


Figure 1B: Location map - the Yavneh - Yam anchorage,



Figure 2: The gold objects



Figure 3: A selection of hematite weights

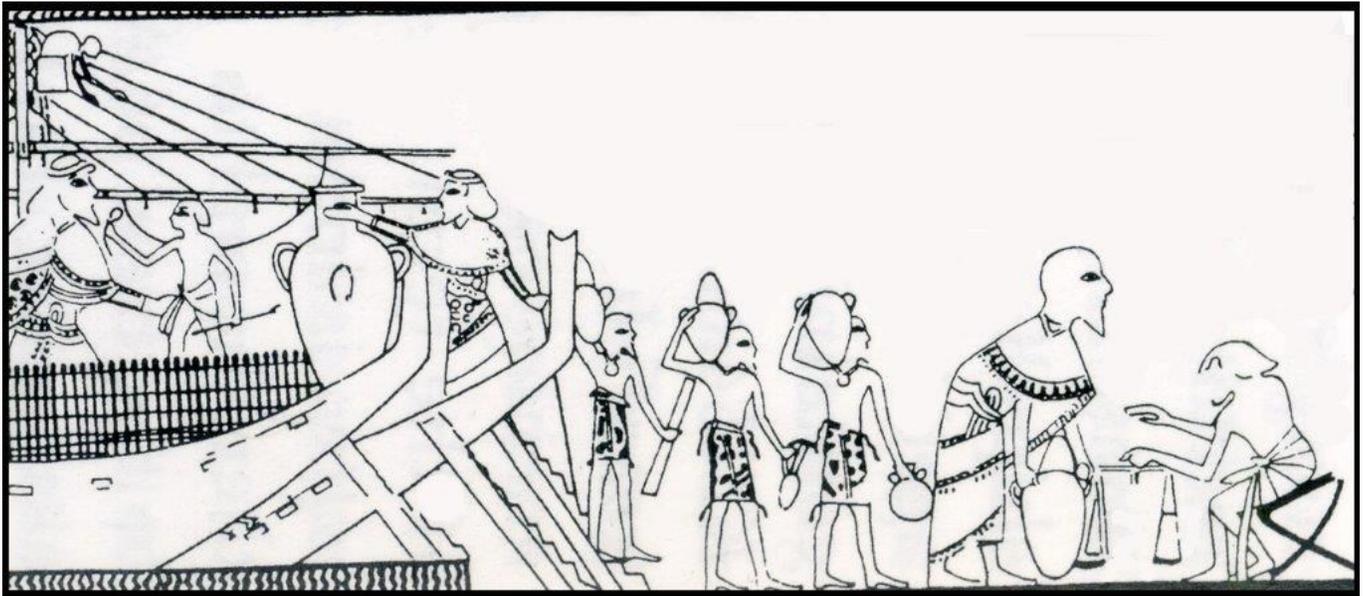


Figure 4: An Egyptian tomb depiction of a Canaanite merchant ship being unloaded in Egypt. Note the typical Canaanite transport amphorae and the use of a scale balance beam, at right (modified after Wachsmann 1997, 314, fig. 14.6, following George Daressy, "Une flottille phénicienne d'après une peinture récente," *Revue Archéologique* (1895): 286-292, Pls. XIV-XV, pl. 15

'Ajjul; two examples were found in Hoard 277, buried in a room associated to Town II and probably dating to a late phase of the LB IA period<sup>13</sup> and another from Hoard 1312 which overlay a wall of Town II<sup>14</sup> also probably dated to the LB IA period.<sup>15</sup> A complete 'crescent' or 'horns' pendant weighing 0.56 g (Figure 6) was also recovered, composed of an open gold ring, the terminals nearly touching, to which is attached a broad suspension loop so that the terminals of the ring shank are at bottom when the pendant is hung. The shank is made of undecorated square-section wire. The suspension hoop was made of sheet gold with a *repoussé* ribbed decoration, folded into tubular shape and then attached onto the ring shank.

Such objects appear to have been worn as cultic pendants as is depicted on a painted stone female figurine from Saheb, dated to the Late Bronze to early Iron Age I period<sup>16</sup> or on the chest of a male priest presiding over a ceremonial basin, as found on a basalt statue from Hazor, also dated to the Late Bronze Age.<sup>17</sup> The form belongs to an extremely popular group termed "Crescent or Horns" pendants commonly found throughout Canaan primarily during the LB I-II periods.<sup>18</sup> They are usually made in gold, silver and electrum, less often in copper alloy. With its small size, undecorated shank and broad suspension hoop, the present example is very typical of this form.

The assemblage also included a simple gold ring (Figure 7) weighing 0.77 g, of rounded section wire with tapering ends. One of the ends appears to have been broken or cut off. The small diameter of this ring (1.5 cm) deems its use as a finger-ring unlikely though it may certainly have been used as an earring or nose-ring.<sup>19</sup>

Such rings are commonly found in gold, silver or copper alloy already during the Early Bronze Age.<sup>20</sup>

Several types of small gold beads were also recovered (Figure 8). These include wound wire bead made by tightly winding wire around a biconical shape (Figure 8A) or cylindrical form (Figure 8B), sheet metal beads made of hammered sheet gold bent into a tube and then creased in parallel lines to imitate a wire-made bead (Figure 8C), beads or small rings made by winding a wire around a thicker wire or pin, the ends then meeting (Figure 9). Such beads are all very common and are found as early as the first Dynasty in Egypt and the Royal tombs at Ur in Mesopotamia.<sup>21</sup> In addition, beads made of several granules were recovered (Figures 8E, 10E: H). These were produced by soldering together a ring made of minute gold granules, then joining together two such rings, one stacked atop the other. The granulation technique first appears in Mesopotamia where granule beads were discovered in the Royal Cemetery of Ur dating to the middle of the third millennium BCE<sup>22</sup> while locally, it was introduced nearing the end of the Middle Bronze Age, as in examples from the gold hoards at Tell el-Ajjul.<sup>23</sup> Granulation became especially common during the Late Bronze and Iron Ages in the southern Levant.<sup>24</sup> A single elongated bead with four perforations, produced by soldering together four small wire beads side by side was also found (Figure 8F). Such beads with multiple perforations are commonly called spacer beads and were used in the construction of multi-stranded necklaces or collars.<sup>25</sup>

Another fragment of a bead was a shallow cap made of sheet gold with a wire ring collar around its perforation (Figure 10E: F).

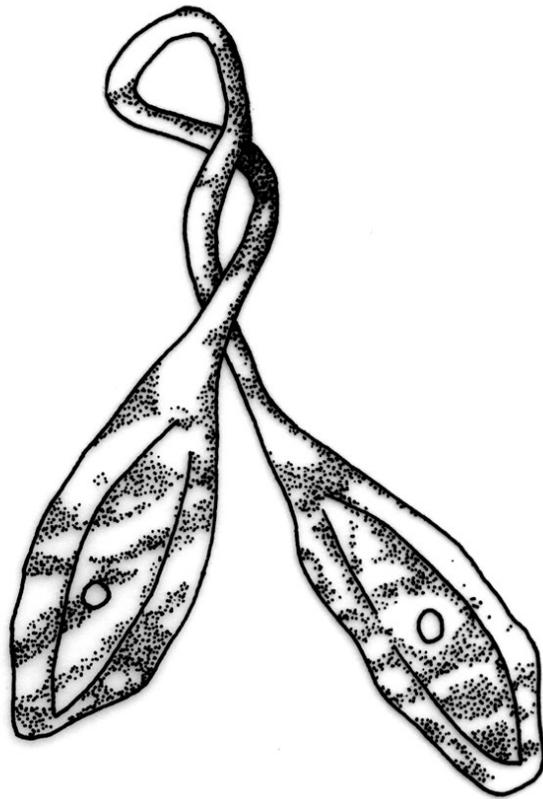


Figure 5: A gold-leaf pendant

This object is polished on the outside only and may have been fitted on the end of a bead or pendant. Use of such capped beads is locally known already during the Middle Bronze Age II (19<sup>th</sup>-18<sup>th</sup> centuries BCE) and continues in use to at least the end of the Iron Age II (7<sup>th</sup> century BCE).<sup>26</sup>

In addition to the gold jewelry described above, several small gold rings (Figure 9), gold wire fragments (Figure 10A), whole and flattened gold granules (Figure 10B) and small gold snippets and shavings (Figure 10D) and spills (Figure 10C) were also recovered. Many of these exhibit chisel cut marks, evidence that they were once a part of larger creations that had been deliberately cut, broken or shaven down. Some of the wire fragments (Figure 10A) exhibit a faint elongated crease along their axis, indicating that they may have been made by the strip drawing method. This

method was practiced in Egypt from at least the third millennium BCE,<sup>27</sup> whereby long and thin strips were twisted and then rolled between two flat surfaces or possibly pulled through a small perforation, such as a stone bead, causing the strips to tighten up into a solid circular section.<sup>28</sup> Several other jewelry fragments were also recovered, among them a decorated pin head (Figure 10E: A).

#### THE HEMATITE WEIGHT ASSEMBLAGE

Seventeen hematite stone weights were discovered (Table 1) weighing 239.79 g altogether.<sup>29</sup> Among these were 14 weights in the form of a spondonoid wheat grain (nos. 1-13), eleven having a flat base and two (nos. 11, 10) lacking a defined base. In addition, a weight in a form of a cylinder (no. 21), a plano-convex weight (no. 20) and a weight in the form of a pendant (no.22). The total

mass of each weight was measured by a calibrated balance accurate to +/- 1 mg and was rounded to the nearest one hundredth of a gram (see Table 1).<sup>30</sup>

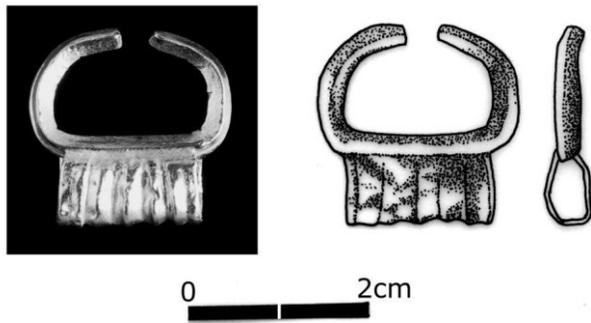


Figure 6: A gold 'crescent' or 'horns' pendant



Figure 7: A plain gold ring

Wheat grain-shaped hematite weights are known from throughout the Levant and it is generally accepted that they have a Mesopotamian-Syrian origin.<sup>31</sup> In the southern Levant, such weights have often been found in Late Bronze Age strata.<sup>32</sup> Some correlation appears to exist between the weights, especially the wheat grain forms, and weight systems used in the Levant, Egypt and Mesopotamia during the Late Bronze Age (Table 1). There are some weights that could have been units of the Egyptian KEDET (nos. 1, 6, 7, 8, 9, 10, 12, 20), the Ugarit SHEKEL (nos. 2, 3, 4, 9, 20, 22), the Mesopotamian SHEKEL (nos. 2, 11, 18, 21), the Phoenician SHEKEL (nos. 1, 2, 4, 6, 7, 12, 20) and the Judean SHEKEL (nos. 1, 6, 7, 8, 12, 20).<sup>33</sup> The comparison suggests that the weights do not represent one ordered system and are probably parts of more than one weighing system.<sup>34</sup>

#### CULTURAL AND CHRONOLOGICAL ASSOCIATION OF THE GOLD FINDS

Though most of the objects of the gold assemblage are not chronologically instructive, the assemblage as a whole may be specifically dated only by the two pendants which are associated to the LB I-II period (15<sup>th</sup>-14<sup>th</sup> centuries BCE). All of these items are products typical of Canaanite goldwork. Further substantiation of the chronological and cultural association of the assemblage is provided by the cylinder seal, the transport amphora and the bronze figurine, all typical Canaanite products of the Late Bronze Age. The association of this collection to the local Late Bronze Age settlement at Yavneh-Yam is further substantiated by 27 tombs of the Late Bronze Age that have been excavated to the north and south of the site.<sup>35</sup> Within the settlement, several structures associated to the Late Bronze Age are also known.<sup>36</sup>

#### THE SIGNIFICANCE OF THE YAVNEH-YAM GOLD ASSEMBLAGE

The present collection of gold objects is made up of whole gold jewelry in addition to broken down jewelry, parts for jewelry in the making and gold jewelry scraps. The very small size of the collection, with a total weight of only 8.27 g, suggests that it was probably once much larger and more varied than what is presently available for study. In this light, we could conceivably see this assemblage as a utilitarian founders' hoard,<sup>37</sup> possibly representing a goldsmith's stock-in-trade that may have been leftover by-products of a production process that would include raw materials, complete objects and partial objects or objects-in-the-making that could have also functioned as 'spare parts' within a fabrication process. Additional gold artifacts belonging to this hoard may be scattered on the sea bottom and covered with sand or may have been salvaged in antiquity or plundered by modern treasure hunters. However, what is missing from this gold assemblage is the direct evidence of a jeweler or goldsmith themselves which must include gold working tools, such as small hammers, punches, chisels, dies and tweezers.

The lack of direct evidence for a goldsmith allows consideration of other options. Other objects found in apparent association to the gold items such as the small sphendonoid or grain-shaped stones, may be interpreted as small weights that could have been used to weigh out precious metal. The small hoard of gold items, in association to the weights, may thus be possibly seen as a portion of a Canaanite merchant's hoard that could have been used as a means of currency.

The material most commonly used as a standard of value (currency), and from which coins were made in a much later period is metal, primarily gold, silver and copper, occasionally iron. Several Late Bronze Age shipwrecks containing copper, tin and lead were recovered off the Israeli coast, testifying to a wide spread metal trade along the Levantine coast. In one of the cargoes, a

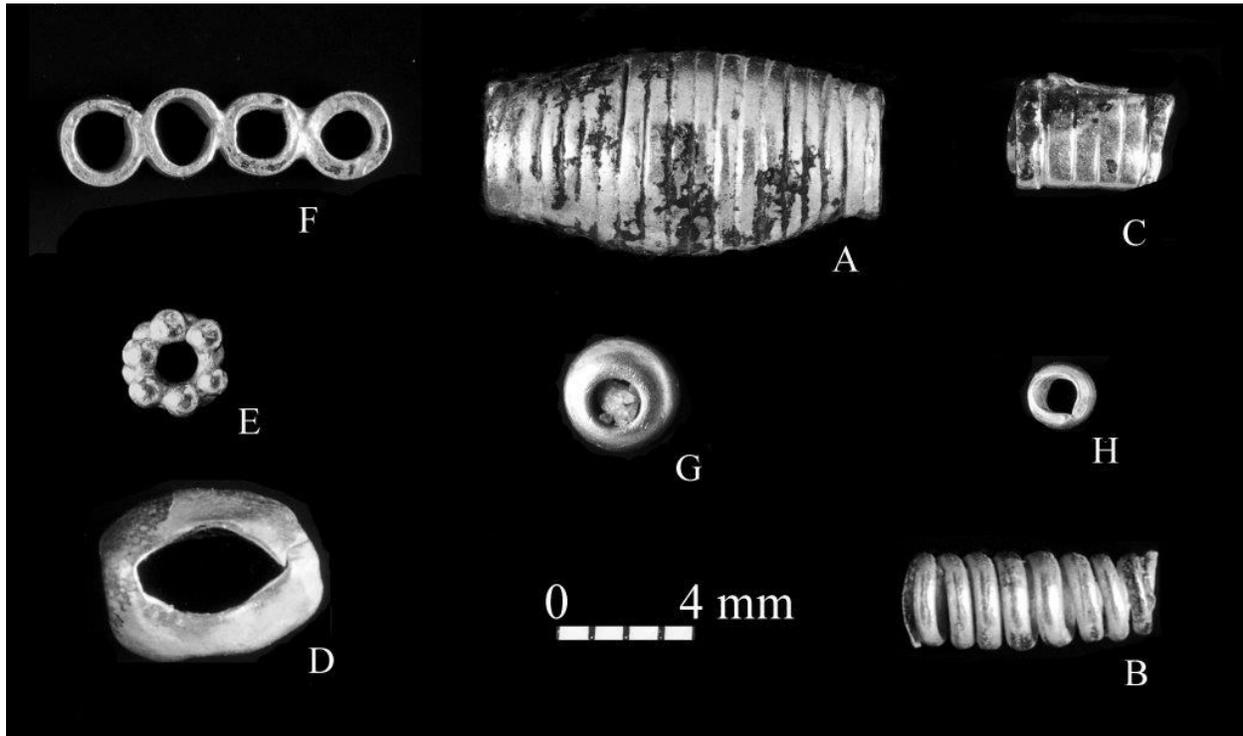


Figure 8: Several types of gold beads: A) wound wire bead made by winding wire around a biconical form; B) wound wire bead made by winding wire around a cylindrical form; C) hammered sheet bent into a tube and creased; D) bead made from slightly flattened wire wound around a thin wire with the ends meeting; E) bead made of several granules; F) spacer bead; G) gold bead; H) small gold ring or bead

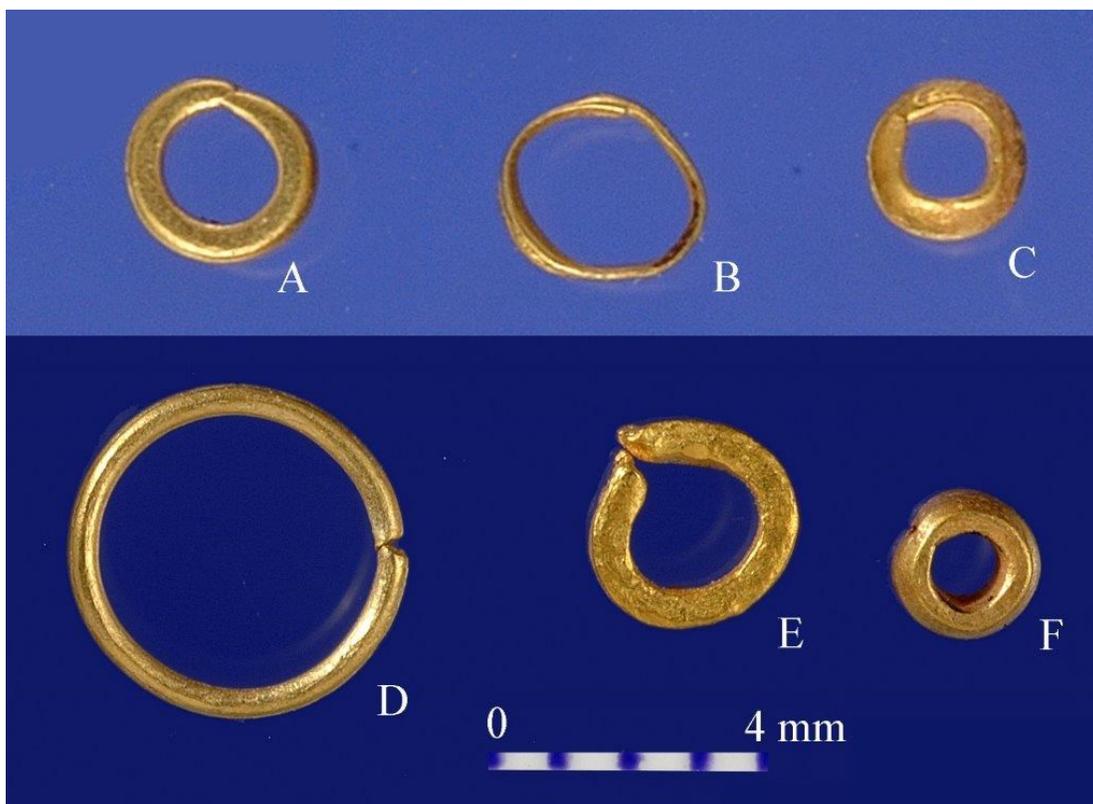


Figure 9: Small gold rings or beads



Figure 10A: Gold scrap - wires

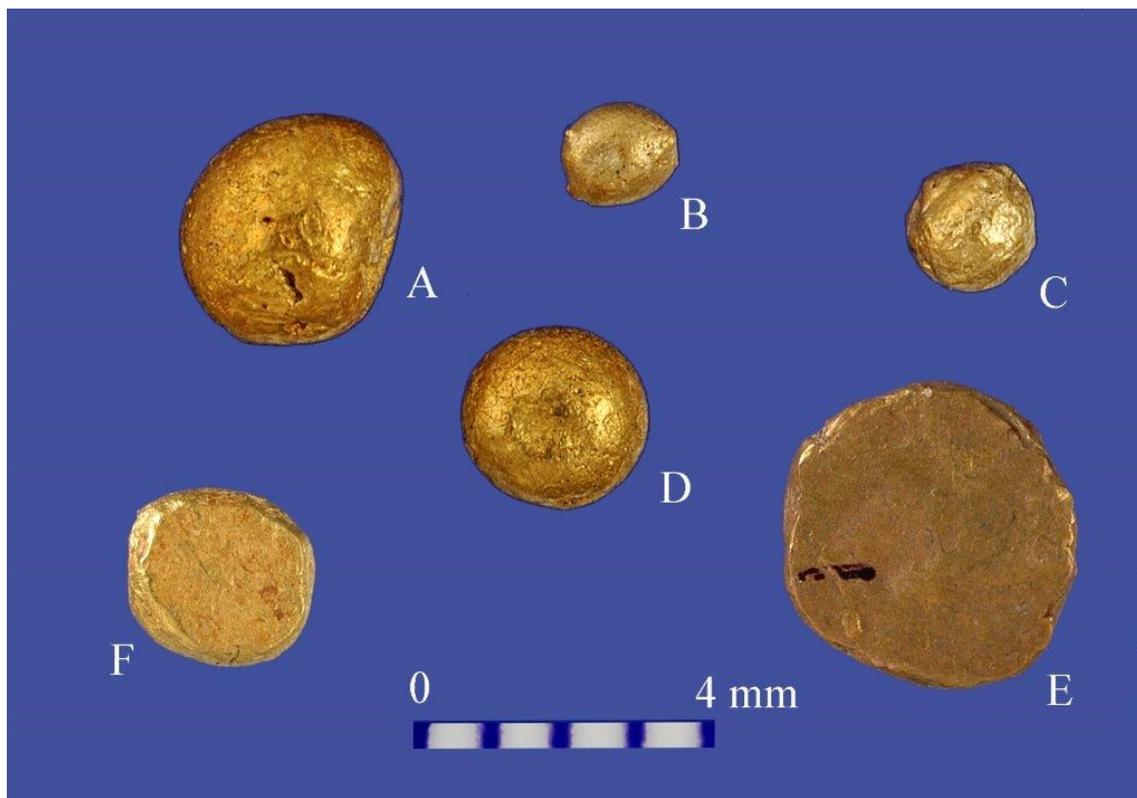


Figure 10B: Gold scrap - granules

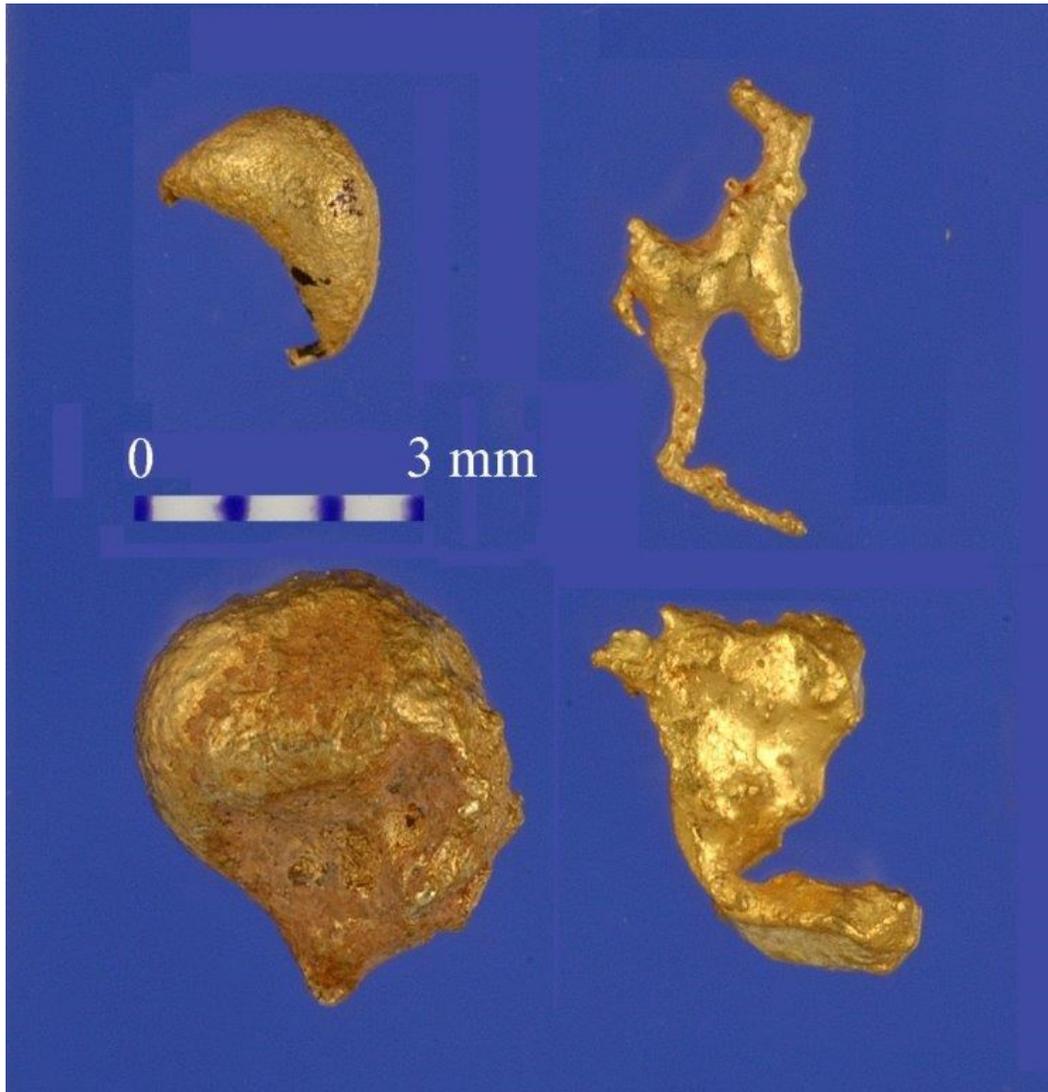


Figure 10C: Gold scraps – spills

bronze sickle sword of possible Egyptian origin was recovered.<sup>38</sup> As to the intrinsic value of the material, precious metal by weight, especially silver and gold, was used in the ancient Near East as early as the 3<sup>rd</sup> millennium BCE as a means of establishing a standard for assessing the worth of material objects to facilitate barter exchange. Precious metal thus served as a means of payment, security for the purchase of property and goods, and for settling debts and taxes.<sup>39</sup> Currency (such as metal bullion) used according to specific weight standards is generally understood to be money.<sup>40</sup>

As a commodity of value, precious metal as well as broken down jewelry made of precious metal, was used in commerce for various transactions, its worth as bullion being determined by the weight of the material against a set standard. Many of the gold items (see esp. Figure 10C: D) appear to have been purposefully cut while others (Figure 10C: C) were spills. The small size of the objects would have been used in order to incrementally reach a set weight to determine the value of the metal mass. The weighing was probably carried out on a pair of small scales suspended from a

balance beam. Such an apparatus was first introduced into Egypt during the 18<sup>th</sup> Dynasty and was in common use throughout the New Kingdom<sup>41</sup> (and see Figure 4). Metal and bone scale pans, usually about eight cm in diameter and with at least three stringing holes around their circumference, are locally found throughout the Bronze and Iron Ages as well as in neighboring lands;<sup>42</sup> the earliest dated example of such scales is known from the Early Bronze Age at Tel Fadous-Kfarabida in Lebanon.<sup>43</sup> Use of gold and silver that was purposefully cut into smaller pieces for use as payment in this fashion is known in the southern Levant already during the Middle Bronze Age (16<sup>th</sup> cent. BCE), such as in a hoard of broken down silver jewelry and cut silver pieces found at Shiloh<sup>44</sup> while at Troy, long and thin gold bars marked with precut incisions in order to facilitate their cutting into smaller and regular pieces (*Geldbarren*) are known even earlier, during the EB III period (ca. 24-22 cent. BCE).<sup>45</sup> Finally, use of a scale weight system on Canaanite merchant vessels plying the eastern Mediterranean waters during the Late Bronze Age has conclusively been shown

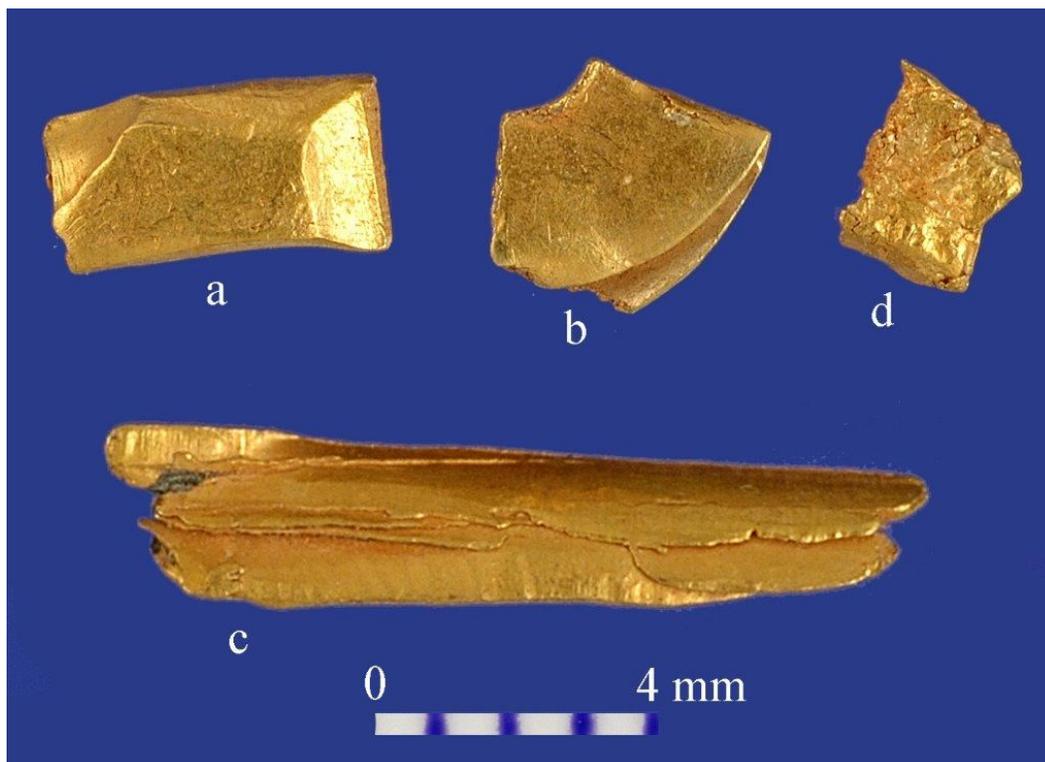


Figure 10D: Gold scrap - snippets



Figure 10E: Gold scrap – sections of gold jewelry pieces

Cat. No.	Weight (gr.)	Shape	Egyptian Kedet (9.1 gr.)	Ugarit Shekel (9.4 gr)	Phoenician Shekel (7.6 gr.)	Mesopotamian Shekel (8.1-8.4 gr.)	Judean Shekel (11.33 gr.)	Notes
1	1.47	Sphendonoid	1/6		1/5		3/24 Shekel (3 Ger'a)	Ger'a = 1/24 Shekel
2	1.60	Sphendonoid		1/6	1/5	1/5		
3	2.46	Sphendonoid		1/4				
4	2.49	Sphendonoid		1/4	1/3			
5	4.19	Sphendonoid						Worn
6	5.56	Sphendonoid	6/10		3/4		1/2 Shekel (1 Beq'a)	Beq'a = 1/2 Shekel
7	5.78	Sphendonoid	2/3		3/4		1/2 Shekel (1 Beq'a)	Beq'a = 1/2 Shekel = (1 Beq'a)
8	5.85	Sphendonoid	2/3				1/2 Shekel (1 Beq'a)	Beq'a = 1/2 Shekel = (1 Beq'a)
9	9.10	Sphendonoid	1	1				
10	18.2	Sphendonoid	2					
11	40.1	Sphendonoid				5		
12	45.6	Sphendonoid	5		6		4	
18	25.4	Sphendonoid				3		Worn
19	43.4	Sphendonoid						
20	4.79	Plano-convex	1/2	1/2	2/3		10 Ger'a	
21	16.6	Cylinder						Irregular
22	7.24	Pendant	8/10	3/4	1?			Weight pendant

Table 1: The weights of the Yavneh-Yam assemblage

to have existed on the Uluburun shipwreck, off the southern Anatolian coast<sup>46</sup> and is eminently clear in Egyptian depictions from the New Kingdom (Figure 4).

While the workmanship of the gold jewelry appears to be Canaanite, the source of the gold itself was most probably Egyptian. During the Late Bronze Age, the Egyptian New Kingdom's political and military hegemony over the Levant is well-known and Egyptian gold was eagerly sought in neighboring regions as well. Silver and predominantly gold, appearing in the form of ingots and cut pieces and scrap for weighing, was also used as a form of currency in New Kingdom Egypt, as is apparent in a gold hoard from Tell el-Amarna.<sup>47</sup> A passage from the Amarna letters from the time of Amenophis III, relates the disappointment of the Babylonian king upon receipt of a gold shipment of low quality from Egypt,<sup>48</sup> so that gold from Egypt was apparently used in trade and diplomatic gift exchange throughout the Ancient Near East during the Late Bronze Age.<sup>49</sup> With the expansion of the Neo-Assyrian empire, silver became the generally accepted means of currency by the 7<sup>th</sup> century.<sup>50</sup> However, gold was also in use in a similar manner during the Bronze and into the Iron Age I period when it was gradually replaced by silver.<sup>51</sup>

## CONCLUSIONS

The small assemblage of gold, along with the collection of weights, is possibly to be seen as evidence of a Canaanite merchant

on board the shipwreck found in the Yavneh-Yam anchorage. The Late Bronze Age is well known for the intensity of trade throughout the eastern Mediterranean, with merchant ships that plied the coastal waters from Egypt to Lebanon and further north as well. The Yavneh-Yam anchorage would have been a convenient stop along this route to engage in trade or to find shelter. The gold items could have been used for purchase or income from sale of goods and services. The Canaanite merchant could have stopped at numerous ports and anchorages (*cabotage*) along the eastern Mediterranean coast, while at each of these the merchant may have had to use the weight value system in that region. The range of weights found in the present assemblage would thus be useful in accommodating the needs of the merchant at his changing ports of call.

## ACKNOWLEDGMENTS

We wish to thank Haifa University and the Israel Antiquities Authority for supporting the research and for the photography and drawings of the artifacts, B. Rosen for his useful comments to the manuscript, R. Kletter for studying the weights and providing an unpublished draft of their study, J. Yaroslevich for the drawings and T. Sagiv for the photos and S. Wachsmann for his help and for the permission to use the drawing in Figure 4.

## NOTES

- 1 See Ehud Galili and Baruch Rosen, "Ancient Remotely Operating Instruments Recovered Underwater off the Israeli Coast", *International Journal of Nautical Archaeology* 37.2 (2008): 283-294.
- 2 See Ehud Galili, "Yavneh-Yam Anchorage, Finds from Underwater Surveys, Final Report" (Forthcoming).
- 3 See Avner Raban and Ehud Galili, "Recent Maritime Archaeological Research in Israel – A Preliminary Report," *International Journal of Nautical Archaeology* 15.1 (1985): 25-37. See also Ehud Galili and Jacob Sharvit, "Underwater Archaeological Remains at Yavneh-Yam," in: Moshe Fischer (ed.) *Yavneh, Yavneh-Yam and their Neighborhood : Studies in the Archaeology and History of the Judean Coastal Plain Yavneh, Yavneh-Yam and their Neighborhood* (Tel Aviv: Tel Aviv University, 2005), 303-314.
- 4 See Galili Forthcoming.
- 5 See Galili Forthcoming. In addition, a pair of stone anchors bearing Egyptian engravings was recovered off Megadim, on the northern Carmel coast (see Ehud Galili and Kurt Raveh, "Stone Anchors with Carvings from the Sea off Megadim, Israel," *Sefunim* VII (1988): 41-47). Another pair of one holed stone anchors bearing engravings of Egyptian hieroglyphs was recovered two km north of Atlit (see Robert R. Stieglitz, "Inscribed Egyptian Stone Anchors," *Sefunim* 4 (1972-1975): 42-43 (Hebrew); see also Shelley Wachsmann, *Seagoing Ships and Seamanship in the Bronze Age Levant*. (College Station, Texas: Texas A & M University Press, 1997), 268, figs 12.21, 12.22. These finds attest to at least two ships which were sailing between Egypt and the Canaanite coast and were grounded and wrecked on the northern Carmel coast.
- 6 See Honor Frost, "Bronze Age Stone-Anchors from Eastern Mediterranean," *Mariner's Mirror* 56 (1970): 377-394; Honor Frost, "Anchors, the Potsherds of Marine Archaeology: On the Recording of Pierced Stones from the Mediterranean," in: David Blackman (ed.) *Marine Archaeology* (London: Butterworth, 1973), 397-409; Honor Frost, "The Kition Anchors," in: Vassos Karageorghis and Martha V. Demas (eds.), *Kition V* (Nicosia: Department of Antiquities, Cyprus, 1985), 281-321; Honor Frost, "Anchors Sacred and Profane, Ugarit-Ras Shamra, 1986; the Stone Anchors Revised and Compared, in: Yon Marquerite (ed.), *Ras Shamra-Ougarit VI: Arts et Industries de la pierre* (Paris: Editions Recherche sur les Civilisations, 1991), 355-410.
- 7 The cylinder seal appears to be representative of a well-known class of seals (Syrian Group II, see Henri Frankfort, *Cylinder Seals: A Documentary Essay on the Art and Religion of the Ancient Near East* (London: Macmillan, 1939), 273; see also Gustavus A. Eisen, *Ancient Oriental Cylinder & Other Seals* (Chicago: Chicago University Press, 1940) generally dated to between 1700-1350 BCE, or possibly a local variant representative of the Syrian Group III, more narrowly dated to between 1350-1200 BCE (Frankfort 1939, 260). The dating of the other finds, such as the jewelry (see below), favors a chronological attribution to Syrian Group II (Galili forthcoming).
- 8 See Ehud Galili and Jacob Sharvit, "Yavneh-Yam Anchorage. Finds from the Underwater Survey," in: Moshe Fischer and Batia Dashti (eds.) *Yavneh Yam and its Surroundings* (Palmahim: Kibbutz Palmahim, 1991), 111-121 (Hebrew). See also Galili and Sharvit 2005; Raban and Galili 1995; Galili forthcoming.
- 9 See Rachel Bar Nathan, Na'ama Zilberstein and Ehud Galili, "The Ceramic Assemblage from Yavneh-Yam Anchorage," (Forthcoming) Pl. 1:1.
- 10 See also Avshalom Zemer, *Store Jars in Ancient Sea Trade* (Haifa: National Maritime Museum, Haifa, 1977).
- 11 See Patrick E. McGovern, *Late Bronze Palestinian Pendants. Innovation in a Cosmopolitan Age*, JSOT/ASOR Monograph Series No. 1 (Sheffield: Sheffield University, 1985), 51-52, Type IV.H.3.b.
- 12 See Olga Tufnell, Charles H. Inge and Lankester G. Harding *Lachish II The Fosse Temple*, (London: Oxford University Press, 1940), pl. 26: 8.
- 13 See William M.F. Petrie, Ernest J.H. Mackay and Margaret A. Murray, *City of Shepherd Kings and Ancient Gaza V* (London: British School of Egyptian Archaeology, 1952), 8-10, 28.
- 14 See William M.F. Petrie, *Ancient Gaza IV Tell el Ajjul* (London: British School of Egyptian Archaeology, 1934), pl. 20: 1312.
- 15 See Ora Negbi, *The Hoards of Goldwork from Tell el-Ajjul* (Goteborg: Studies in Mediterranean Archaeology Vol. 25, 1970). While all gold examples of this pendant form appear to indicate a date in the early 15<sup>th</sup> century BCE, singular specimens may also occur in much later periods as well, such as a silver example from Tomb 16 at the Atlit necropolis, see Cedric N. Johns, "Excavations at 'Atlit (1930-1). The Southeastern Cemetery", *Quarterly of the Department of Antiquities of Palestine* 2 (1933): 41-104 (Pl. 17: 40) that are dated to the Persian period (5<sup>th</sup>-4<sup>th</sup> centuries BCE) and was found along with a scarab, spiral rings and several stone beads. However this object, associated to a burial of the Persian period, could also have been an heirloom or a curio that was picked up from an earlier occupation. Such phenomena of valuable jewelry items being reused centuries after their original fabrication are not uncommon. See Amir Golani, *Jewelry from the Iron Age II Levant* (Orbis Biblicus Orientalis SA Series 34, Fribourg: Vandenhoeck and Ruprecht, 2013), n. 8, pp. 12, 116).
- 16 See Peter M. Fischer, *A Late Bronze to Early Iron Age Tomb at Sabem, Jordan*, *Abhandlungen des Deutschen Palästina-Vereins Band 21* (Wiesbaden: Harrassowitz, 1997), figure 25.

- <sup>17</sup> See Ruhama Bonfil, "Coming before the King – A Ceremonial Basin in Hazor's Throne Room", *Eretz Israel* 30 (2011): 59-72.
- <sup>18</sup> Cf. McGovern 1985, 68-70, Type VI.B.1. For a full listing and references, cf. Golani 2013, 157-159. For further discussion see Tallay Ornan, "Labor Pangs: The Revadim Plaque Type," in: Susanne Bickel, Silvia Schroer and René Schurte (eds.), *Bilder als Quellen/Images as Sources. Studies on Ancient Near Eastern Artefacts and the Bible Inspired by the Work of Othmar Keel* (OBO Special Volume, Fribourg, Suisse: Academic Pres Fribourg, 2007), 218-219, 229.
- <sup>19</sup> See Golani 2013, 129.
- <sup>20</sup> See Amnon Ben-Tor, "Two Burial Caves of the Proto-Urban Period at Azor," *Qedem* 1 (1975): 1-53, Figure 12, 10.
- <sup>21</sup> See Rachel K. Maxwell-Hyslop, *Western Asiatic Jewellery 3000-612 B.C.* (London: Methuen, 1971), 20, pl. 15a; see also Golani 2013, 187-188, 193.
- <sup>22</sup> See Leonard C. Woolley, *Ur Excavations: The Royal Cemetery II* (London: British Museum Press, 1934), 297.
- <sup>23</sup> See Negbi, 1970.
- <sup>24</sup> For more on the granulation technique, see Hans W. Müller and Eberhard Thiem, *The Royal Gold of Ancient Egypt* (London: I.B. Tauris, 1999), 98; Diane L. Carroll, "A Classification for Granulation in Ancient Metalwork," *American Journal of Archaeology* 78 (1974): 33-39; Francois de Callatay, "Granulation," in: Tony Hackens and Rolf Winkes (eds.) *Gold Jewelry Craft Style and Meaning from Mycenae to Constantinople* (Leuven: Institut superieur d'archeologie et d'histoire de l'art, College Erasme, 1983), 184-191; Jochem Wolters, "The Ancient Craft of Granulation: A Reassessment of Established Concepts," *Gold Bulletin* 14(3, 1981): 119-129; and Golani 2013, 27-28, 186-187.
- <sup>25</sup> See Golani 2013, 193.
- <sup>26</sup> See Golani 2013, 216, figure 35: 9-10.
- <sup>27</sup> See Jack Ogden, *Jewelry of the Ancient World* (New York: Rizzoli, 1982), 48.
- <sup>28</sup> See Yehiel Zelinger and Amir Golani, "What Can Pass Through a Small Hole and its Significance," in: Avraham Faust and Eyal Baruch (eds.), *New Studies on Jerusalem, Proceedings of the Seventh Conference, December 2001* (Ramat Gan: Jerusalem Studies Publications, 2001), 13-20 (Hebrew), English Summary 5\*-6\*.
- <sup>29</sup> The weights were numbered together with several metal weights which were recovered from the anchorage but are not associated with the discussed Bronze Age assemblage. Thus the numbers 13-17 (of the metal weights) are missing from the table.
- <sup>30</sup> The weights were weighed by electronic weight type Meter Precisa 125A. The assumed units were calculated when there was less than 5% matching error. Weight study after Raz Kletter, "The Answer of the Weight: Weighing and Weights in Ancient Israel," *Et Mol: Journal for the History of the Land of Israel and the People of Israel* 3 (2001): 155 (Hebrew). Kletter Raz, Galili Ehud and Sharvit Jacob 1999. A group of weights from Yavneh –Yam. Unpublished IAA draft report.
- <sup>31</sup> See Raz Kletter, "Phoenician(?) Weights from Horvat Rosh Zayit," *Atiqot* 25 (1994): 33-43; Karl M. Petruso, "Early Weights and Weighing in Egypt and the Indus Valley," *Bulletin of the Museum of Fine Arts Boston* 79 (1981): 44-48.
- <sup>32</sup> e.g. at Megiddo, see Gordon Loud, *Megiddo II* (Chicago: Chicago University Press), pl. 168: 1-7, 9-10, 12-14, 16-17, 20.
- <sup>33</sup> See Kletter, 1994; Petruso 1981; Kletter *et al.*, 1999.
- <sup>34</sup> See Kletter *et al.*, 1999.
- <sup>35</sup> See Rivka Gonen *Burial Patterns and Cultural Diversity in Late Bronze Age Canaan*, American Schools of Oriental Research Dissertation Series 7 (Winona Lake: Eisenbraus, 1992), 91-92; Lily Singer-Avitz and Yosef Levy, "Two Tombs of the Late Bronze Age at Palmahim," in: Moshe Fisher and Batia Dashti (eds.) *Yavne Yam and its Surroundings* (Palmahim: Kibbutz Palmahim, 1991), 93-100 (Hebrew).
- <sup>36</sup> See Jacob Kaplan, "Further Aspects of the Middle Bronze Age Fortifications in Palestine," *Zeitschrift des Deutschen Palästina Vereins* 91 (1975): 1-17, p. 12; Yosef Levy, "Yavne Yam," *Hadasot Arkheologiyot* 92 (1988): 33-34, (Hebrew).
- <sup>37</sup> See Bernard A. Knapp, James D. Muhly and Polymnia M. Muhly, "To Hoard is Human: Late Bronze Age Metal Deposits in Cyprus and the Aegean," *Reports of the Department of Antiquities of Cyprus* 1988: 233-262, p. 237.
- <sup>38</sup> See Ehud Galili, Noel H. Gale, Baruch Rosen, "Bronze Age Metal Cargoes off the Israeli Coast", *Skylis* 11 (2011): 64-73; Ehud Galili, Noel H. Gale and Baruch Rosen, "A Late Bronze Age Shipwreck with a Metal Cargo from Hishuley Carmel, Israel," *International Journal of Nautical Archaeology* 42.1 (2012): 2-23.
- <sup>39</sup> See Miriam Balmuth, "The Critical Moment: The Transition from Currency to Coinage in the Eastern Mediterranean," *World Archaeology* 6 (1975): 293-298, pp. 294-295; Marvin A. Powell, "A Contribution to the History of Money in Mesopotamia Prior to the Invention of Coinage", in: Blahoslav Hruska and G. Komoróczy (eds.) *Assyriologia* 5, (Budapest: Eötvös Loránd Tudományegyetem, Ókori Történeti Tanszkek, 1978), 211-243, pp. 226-227; Marvin A. Powell, "Money in Mesopotamia," *Journal of the Economic and Social History of the Orient* 39 (1996): 224-242, pp. 227-228; Susan Frankenstein 1979. "The Phoenicians in the Far West: A Function of Neo-Assyrian Imperialism," in: Mogens T. Larsen (ed.). *Power and Propaganda: A Symposium on Ancient Empires, Copenhagen Studies in Assyriology* 7 (Copenhagen: Akademisk Forlag, 1979), 263-294, p. 272; Daniel C. Snell, "Methods of Exchange and Coinage in Ancient Western Asia," in: Jack M. Sasson (ed.), *Civilizations of the Ancient Near East Vol. 3* (New

- York: Scribner, 1995), 1487–1497, pp. 1490-1493.
- <sup>40</sup> See Charles T. Seltman, *Greek Coins*, (London: Methuen, 1965), 1.
- <sup>41</sup> See Frederic George Skinner, *Weights and Measures* (London: Science Museum Survey, 1967), 33.
- <sup>42</sup> See Gabriel Barkay, "A Balance Beam from Tel Lachish," *Tel Aviv* 23 (1996): 75–82, p. 78.
- <sup>43</sup> See Herman Genz, "Restoring the Balance: An Early Bronze Age Scale Beam from Tell Fadous-Kfarabida, Lebanon," *Antiquity* 85 (329, 2011): 839-850.
- <sup>44</sup> See Israel Finkelstein, "A Group of Metal Objects from Shiloh," *Israel Museum Journal* 4 (1985): 14-26.
- <sup>45</sup> See Irina Antinova, Vladimir Tolstikov and Treister Mikhail, *The Gold of Troy - Searching for Homer's Fabled City* (London: Thames and Hudson, 1996), 118-119.
- <sup>46</sup> See Cemal M. Pulak, 2000. "The Balance Weights at the Late Bronze Age Shipwreck at Uluburun," in: Christopher F.E. Pare (ed.), *Metals Make the World Go Round: The Supply and Circulation of Metals in Bronze Age Europe*, Proceedings of a Conference held at the University of Birmingham, June 1997, (Oxford: Oxbow Books, 2000), 247-266.
- <sup>47</sup> See Henri Frankfort and John D.S. Pendlebury, *The City of Akhnaten II* (London: Egypt Exploration Society, 1933), 59-61. Pl. 43.
- <sup>48</sup> See Jorgen A. Knudtzon, *Die El-Amarna Tafeln* (Leipzig: J.C. Hinrichs, 1915), 70-71, 92-93
- <sup>49</sup> And see Marian Feldman, *Diplomacy by Design: Luxury Arts and an 'International Style' in the Ancient Near East, 1400-1200 BCE* (Chicago: Chicago University Press, 2006).
- <sup>50</sup> See Frankenstein 1979, 287; Postgate 1979, 218; see also Seymour Gitin and Amir Golani, "The Tel Miqne-Ekron Silver Hoards: The Assyrian and Phoenician Connections," in: Miriam Balmuth (ed.), *Hacksilber to Coinage: New Insights into the Monetary History of the Near East and Greece (Numismatic Studies 24)*, New York: American Numismatic Society, 2001), 27–48, pp. 36-37.
- <sup>51</sup> See Golani 2013, 50-53.