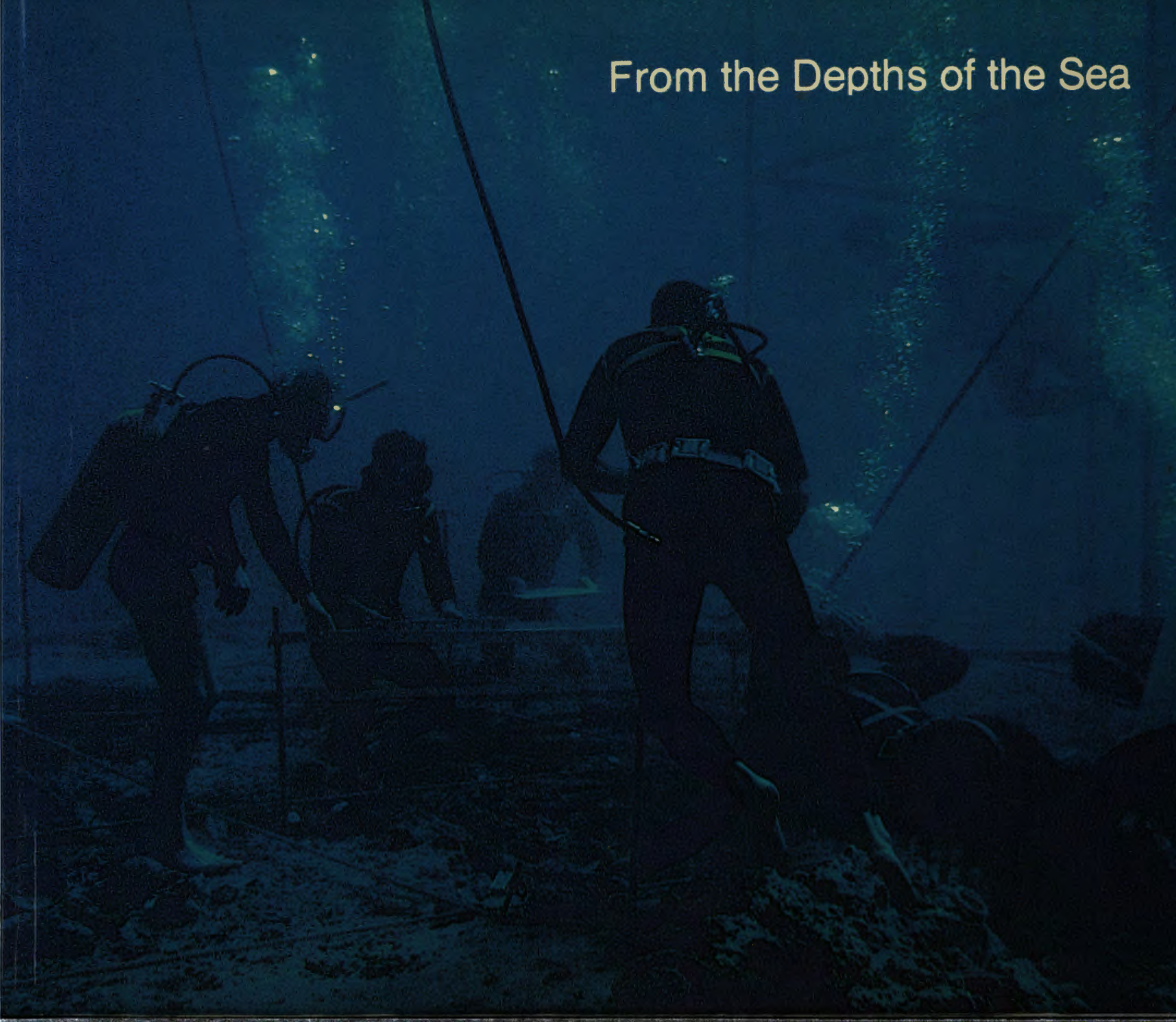


From the Depths of the Sea





The Israel Museum, Jerusalem



35.2

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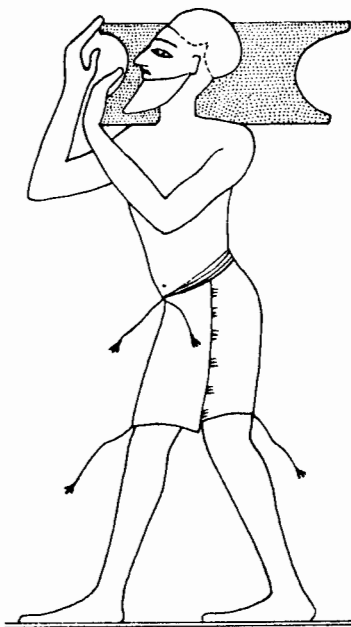
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"From the Depths of the Sea"

Psalms 68:22

**Cargoes of Ancient Wrecks
from the
Carmel Coast**





Man carrying an "ox-hide" ingot on his shoulders, from a wall-painting in a nobleman's tomb, Thebes

Finds from the Late Canaanite (Bronze) period

14th–13th century BCE

The countries of the Eastern Mediterranean enjoyed in this period widespread trade relations, as documented both by Egyptian and Canaanite inscriptions and by the archeological evidence. Metals formed a substantial part of this trade and therefore ingots and the ingot trade take pride of place in this exhibition.

Unlike deposits such as clay, mines of metallic ores were scarce and were concentrated in a few areas. Ancient metallurgy was always dependent on the development of trade routes and of means of transportation, both of the metals and of their end-products. The methods of extracting the metal from the ore, working it and manufacturing objects were highly complex and required several stages between the raw material and the finished product, involving many craftsmen. Since metal vessels were more costly and less breakable than pottery vessels, they were less subject to changes in local fashions and styles, and cannot therefore serve as chronological indicators, like ceramics. However, the discovery of metal artifacts in various areas throws light on ancient trade routes and helps to trace the paths along which ideas travelled from region to region. For reasons of convenient transportation the ore was cast in ingots shaped like "tongues", "buns", "loaves" or "oxhides". The form of the ingot depended on its place of manufacture and whether it was destined for the immediate production of artifacts or for trade purposes. Some of the small ingots were probably recast from a larger ingot for easier handling.

The exhibition displays for the first time a very large collection of metal ingots which were recovered from the sea in a 3 km long section between Kibbutz Haĥotrim in the south and Kefar Samir in the north. Three assemblages of ingots and similar metal objects, found at a distance of 50–100 m from the coast, date from the Late Bronze Age. The composition of these assemblages and the way they were dispersed along the coast suggest the possibility that they may have originated in three ships of the same period. The fact that these cargoes were found at relatively short distances from each other does not speak against this suggestion, since numerous ships plied this route in antiquity. Alternatively, the three assemblages could have originated in a single ship which for some reason or other had to jettison part of its heavy cargo, and the similarity of all three assemblages supports this assumption.

The Book of Jonah describes such a situation: "But the Lord sent out a great wind into the sea, and there was a mighty tempest in the sea, so that the ship was like to be broken. Then the mariners were afraid and cried every man unto his god, and cast forth the wares that were in the ship into the sea, to lighten it of them ..." (Jonah 4:4, 5). However, the proximity of the finds to the coast makes such an assumption difficult to accept, since a ship would approach a coast lacking any shelter only if swept along by a storm. In such a situation, the seamen would have no time to throw anything overboard and their only desire would be to save their lives.

The southernmost of the three assemblages was discovered in 1980, opposite the northern boundary of Kibbutz Haĥotrim. The objects were scattered on the seabed and were temporarily revealed by the currents of the sea. This assemblage consisted of lead ingots, fragments of lead and copper ingots, broken horse-bits and a hoe. Two large stone anchors discovered nearby may well have belonged to the ship carrying this cargo.

A second cargo of ingots was discovered in the winter of 1982 during an underwater survey of the "Hishule Carmel" coast about 100 m from the coastline at a depth of 3–4m. During most of the

year the site is covered with sand and is only very rarely exposed. The survey team located tin and copper ingots scattered on a clay bedding over an area of 8 sq m, apparently fixed in place for a long time. The absence of marine accretions indicates that the ingots had previously never been exposed.

Following this discovery, an underwater salvage excavation was undertaken at the site. An area of 6 sq m was exposed and with the help of an airlift four anchors of soft limestone each weighing about 250 kg, were also uncovered, lying in a row at a distance of no more than 2 m from each other. However, it is not certain that these anchors belonged to the ship carrying the ingots.

The remains of the third, northernmost cargo came to light intermittently opposite Kefar Samir over a period of about eight years, thus emphasizing the importance of underwater surveys. They were found at a distance of about 100 m from the coast over an area of 50 sq m and at a depth of about 3 m. The assemblage consisted of tin and lead ingots, a sickle sword and anchors.

Osnať Misch-Brandl, Ehud Galili and Shelley Wachsmann

The ingots

The ingots recovered from the sea were of three kinds—lead, copper and tin. The presence of such ingots on the coast of Eretz-Israel indicates the passage of ships engaged in the metal trade, travelling perhaps to Tyre, Akko and Tell Abu Hawam near Haifa. Who were the merchants who traded in metal?

Almost certainly at least part of the trade in this period was in the hands of private entrepreneurs who owned the ships. They navigated from port to port, buying and selling metals wherever possible.

Cypro-Minoan (?) characters are incised on many of the lead and tin ingots and apparently also on the copper ingot. This script was used in Cyprus in the 14th–13th century BCE and is also known from Ugarit on the Syrian coast. The prevalence of this script appears to point to Cyprus as a transit station and a commercial and administrative centre for the metal trade, and Ugarit may have been another such centre. It is not clear whether the Cypro-Minoan signs indicate ownership or the value of the ingots, but obviously they had a function in the metal trade, whether private or organized by the state.

Lead

Lead has a low melting point (327°centigrade) and was therefore considered an easily worked raw material, either by itself or as an additive to other metals. Lead served for the manufacture of small objects ever since the Neolithic period. Geological tests as well as descriptions in ancient literature indicate that lead mines existed only in Greece, Crete and-Anatolia. The scarcity of lead mines in antiquity and the consequent necessity to import lead, sometimes over great distances, resulted in its significant increase in value. Lead was mainly used as an additive to copper and bronze, while in its pure form it served to refine silver and perhaps even gold, and to produce various objects, such as pipes, weights, roof covering and sculpture models.



Metal ingots and their melting, from a wall-painting in a nobleman's tomb, Thebes

1. Lead ingots

1.1 Round bun ingot

Convex on one side, with a Cypro-Minoan sign (?) Ψ , incised after casting, flat on the other.

Hahotrim coast. D 13.5–15.5 Th 1.0–1.5
Weight 995 gr

1.2 Cut ingot

The ingot is cut lengthwise and has a hole in the centre produced at the time of casting and perhaps intended to carry the ingot on a pole.

Hahotrim coast. L 12.5 W 5.2–7.8 Th 1.5
Weight 803.4 gr

1.3 Rectangular ingot

Perforated in upper part. An additional piece of lead was cast on to the upper part of the ingot.

Kefar Samir coast. L 11.5 W 8.5 Th 1.5
Weight 1.220 kg

1.4 Rectangular ingot

Perforated in upper part. Cypro-Minoan (?) sign Ψ incised after casting.

Kefar Samir coast. L 12 W 7 Th 1
Weight 680 gr

1.5 Rectangular ingot

Perforated in upper part. Part of the metal was poured outside the mould, probably accidentally. Cypro-Minoan (?) sign $+$ incised after casting.

Kefar Samir coast. L 13.5 W 7.5 Th 1.8
Weight 1.484 kg

1.6 Round bun ingot

Upper part perforated. Convex on one side, with Cypro-Minoan (?) sign Ψ , other side flat.

Kefar Samir coast. D 14–16 Th 0.8–4.0
Weight 3.380 kg

1.7 Round bun ingot

Upper part perforated. Convex on one side, with Cypro-Minoan (?) sign $+$ incised after casting, other side flat.

Kefar Samir coast. D 18–20 Th 0.7–6.0
Weight 6.938 kg

Copper

Copper was the first metal used by man as far back as the ninth millennium BCE, when native copper from surface deposits was utilized. Copper extracted from mined ores, whose melting point is 1083°centigrade, and copper alloys first appear in the fourth millennium BCE. Important evidence of this is furnished by the copper artifacts in the treasure from Nahal Mishmar in the Judean desert.

2 Ingot of the "oxhide" type

A horse shoe-shaped sign $\ominus$ was added at the time of casting.

The shape of this ingot, which recalls a stretched oxhide, was the characteristic shape of the copper ingots in the Late Bronze Age, and was probably dictated by considerations of convenience when carrying the heavy ingot. After casting, the copper ingot was transferred from the mining area to a manufacturing centre, where it was melted together with tin to produce a bronze ingot.

"Oxhide" ingots have been found all over the Mediterranean basin — in Cyprus, Crete, Syria and Anatolia. Dozens of such ingots were discovered at Cape Gelidonia and in a ship's cargo near Kaş, both off the south coast of modern Turkey. Such ingots are also represented on wall paintings in the tombs of nobles at Thebes.

"Hishule Carmel" coast. L 65 W 36
Th 3 Weight 16.5 kg

Tin

The adding of up to 10% tin to copper in order to produce a bronze alloy began in the early second millennium BCE, and bronze is a commonly used metal to this day. It has a melting point of 843–1037° centigrade. In the ancient world, tin was a precious metal, both because it was rare and because the tin-producing areas were far from the countries of the eastern Mediterranean.

The sources of tin in antiquity are still insufficiently known. Recently, tin mines of the third and second (?) millennia BCE were discovered in Afghanistan and Uzbekistan. Mesopotamian records mention *anaku* as a metal brought to Mesopotamia from the east. If *anaku* is indeed tin, it furnishes additional support for this source of the tin.

3 Tin ingots

3.1 Round convex ingot

Kefar Samir coast. D 35 Th 15
Weight 37 kg

3.2 Round convex ingot

The ingot is split in the middle, with a perforation which may have served for carrying or for weighing on a suspension balance. These two ingots form part of a group of eight loaf-shaped ingots discovered in 1983. This is the largest cargo of tin known up to the present, with the eight ingots totalling 150 kg in weight. Five lead ingots (Nos. 1.3–1.7) were found together with this group.

Kefar Samir coast. D 28 Th 14
Weight 27 kg

3.3 Five ingots of indeterminate shape

All the ingots are convex on one side and flat on the other. Three bear Cypro-Minoan (?) signs $\Upsilon \Upsilon_1$, Υ_1 incised after casting on the flat side. "Hishule Carmel" coast.
Weight 2.240–4.245 kg

Bronze objects

4 Sickie sword

The sword was produced by casting, and the wood inlay in the hilt has survived. The blade is decorated with incisions and the band at the junction of the hilt and the blade is ornamented with incised triangles and punctured dots (see drawing). This type of sword, called sickle-shaped because of its resemblance to a sickle, was, in fact, used for slashing and therefore the cutting edge was on the convex side. The biblical expression "to smite with the edge of the sword" may refer to such weapons. These swords were carried on the shoulder (see drawing). They were popular in Canaan in the Late Bronze Age. A sickle-shaped sword bearing the name of the Assyrian king Adad-Nirari I (1325 BCE) is one of the important objects for dating this type of sword to the 14th century BCE.

Kefar Samir coast. L 56 Th of blade 1

5 Hoe

Made in one piece consisting of the blade and the socket for inserting a wooden handle (see reconstruction). Such hoes were also found in the wreck off Cape Gelidonia and in Cyprus.

Hahtotrim coast. L 16 D upper part 5.5

6 Fragments of horse-bits

At least one bit can be reconstructed (see drawing) from the fragments, measuring 33 cm. The bit or mouthpiece consists of two twisted bronze rods, with a loop at one end and a bridle ring for attaching the reins at the other. Horse-bits of this type have been found in Eretz-Israel, Egypt, Anatolia and Greece. These fragments formed part of a bronze cargo destined for scrap.

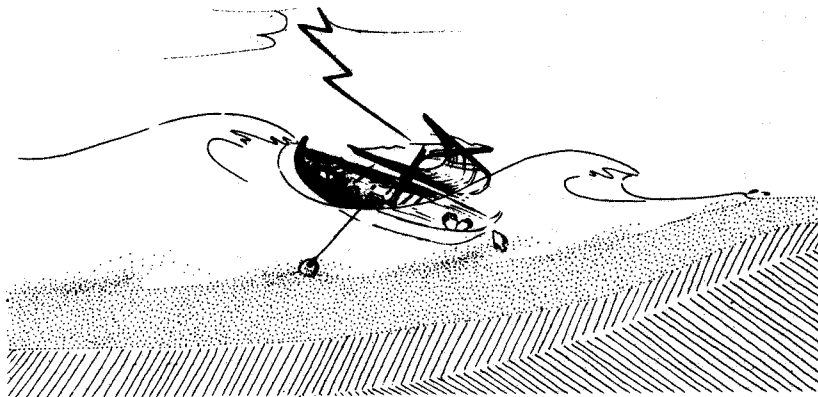
Hahtotrim coast, cheek-pieces: L c. 17 each; Bit: L c. 16.5 each

Anchors

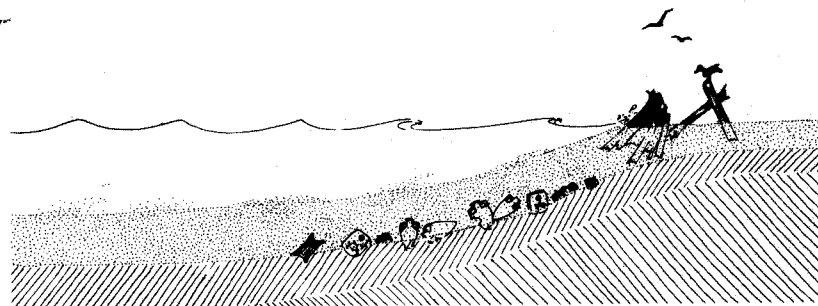
The large stone anchors found together with the three cargoes weigh up to 250 kg. The weight of the anchor was directly related to the size of the ship which carried it. Such anchors are called "weight anchors", since it is their weight which anchors them to the seabed. They have a single hole used to attach the rope connecting it to the ship. These stone anchors are characteristic of the entire Canaanite period and were in use in the eastern Mediterranean, probably originating on the Syrian coast or in Cyprus.

Anchor, sandstone

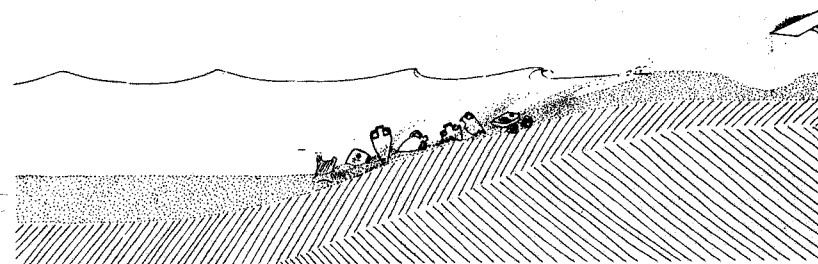
The figure of a sea-turtle is incised on the anchor. It is one of five stone anchors discovered in 1978 about 25 m northwest from the sickle sword. Three are of limestone and two of sandstone and they weigh between 105 and 180 kg. Kefar Samir coast. L 77 W 70 Th 20 Weight c. 170 kg



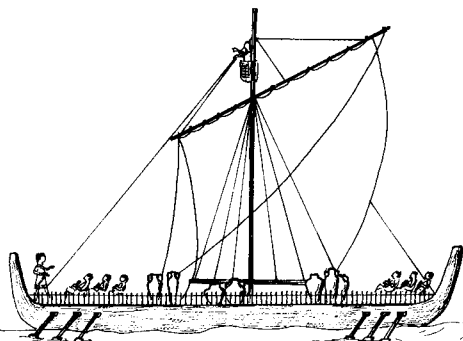
The ship is wrecked



Heavy objects sink to the bottom of the sea



The exposure of objects centuries later



The cargo-carrying ship (reconstruction of a Canaanite ship)



מטיל "עור-הפר" מנחושת, משמאל: מצרים נושאים מטילי מתכת על שכמם,
 מתוך ציור-קיר מקבר אצילים בנא-אמון
 Copper "ox-hide" ingot, left: Egyptians carrying metal ingots on their
 shoulders, from a wall painting in a nobleman's tomb, Thebes



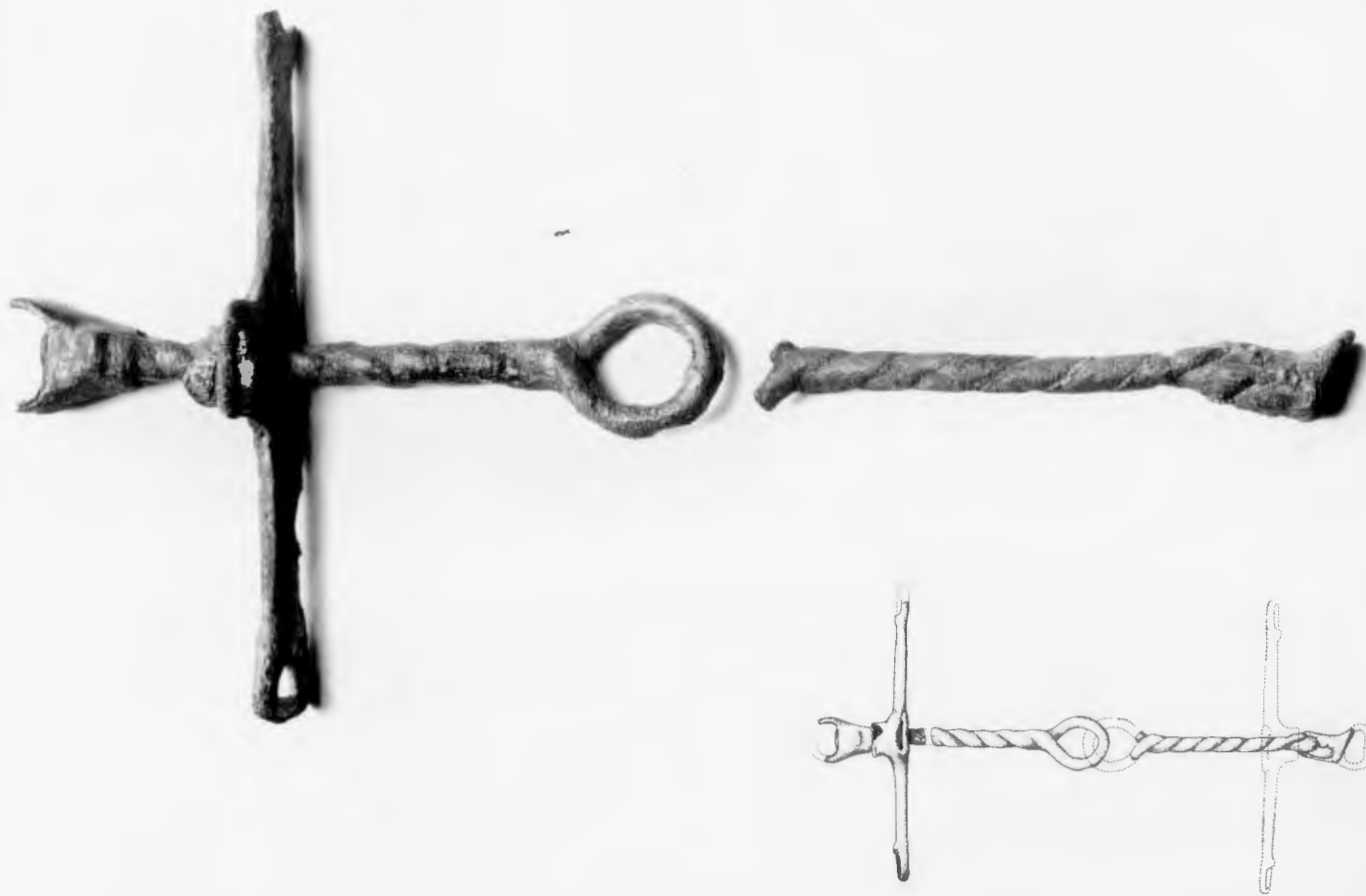


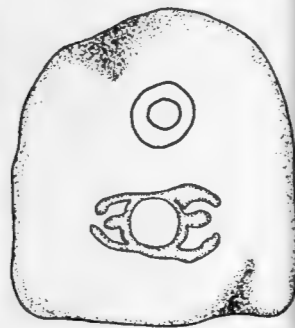




חרב־מגל, משמאל: נער נושא חרב־מגל, תיאור על־גבי שנהב כמעני ממגידו
 Sickle sword, left: boy carrying sickle sword, depiction on Canaanite
 ivory from Megiddo







אשיב ממצולות ים

