

4.8 Weapons and Warfare

4.8.1 Introduction

The styles of most weapons continued from previous periods into Iron I without any significant changes. They were primarily made of bronze. Iron weapons begin to appear in Iron Age I. The information for this topic was abstracted from Y. Yadin's book, *The Art of Warfare in Biblical Lands in the Light of Archaeological Study* (Yadin 1993).

Offensive weapons were divided into three main categories according to their range. Short-range weapons were used in hand-to-hand combat and included the sword or dagger and the spear. Medium-range weapons were designed to be thrown at enemies a short distance away. Spears sometimes were light enough to be thrown, but the shorter and lighter javelin, which is a short spear, were better suited for this purpose. The warrior momentarily held a loop at the end of the cord to spin and steady the weapon in flight. Long-range weapons could be thrown or mechanically flung at an enemy further away. Examples of long-range weapons include the sling, used to hurl stones, and the bow, for propelling arrows.

Armor was used to protect the foot soldier's body. The armor included the helmet for the head, scale armor, coats of mail, the breastplate for the body and greaves to cover the shins. The foot soldier also carried a shield to cover any unprotected parts of his body. These types of

offensive weapons were used by the surrounding people of the lands of Israel/Judah.

The iron chariots, pulled by two horses, were most valuable in areas where the land was fairly flat and open. The coastal area of Palestine was relatively level, while the hill-country inland featured steep slopes and deep valleys. In ancient times, the hills were heavily forested and Israelite guerilla tactics proved successful in this territory. However, in the coastal plain, the Canaanite and Philistine iron chariots proved to be strong against the Israelites. In Judges 1:19, it is mentioned that the tribe of Judah could not drive out the inhabitants of the plain because they had iron chariots. It was not until the beginning of the monarchy (Iron Age) that Israel obtained chariots. Judges 4 & 5 specifically mentioned that Jabin and Sisera had a massive force of 900 iron chariots leaving from the stronghold of Hazor.

4.8.2 Types of Weapons and Armor

Sword: One type had a handle, a hilt, and a long, straight tapering blade sharpened on both edges as well as at the point. The other type had only one sharp edge, the opposite one being rather thicker to add weight to the blow. Sometimes this sword had a curved blade, as illustrated from discoveries at fourteenth century BCE Gezer and elsewhere. The sword was seldom a decisive weapon in Near Eastern warfare, since its length made it less effective in close fighting than daggers (Judges 3:16) or axes. The sword was one of the earliest iron objects made in the Hittite Empire, and some excellent specimens have been recovered from Anatolia (Turkey).

Mace: The mace had a short handle and a metal or stone head, shaped like a pear, an apple, or a saucer as depicted on Egyptian monuments. It was designed to beat or crush, as opposed to the axe, which was used primarily for piercing and cutting. With both these weapons the problem was to fit the head to the handle securely, and this proved more difficult for the axe than for the mace. For this reason the axe declined in importance, but the mace continued to be an important weapon throughout all periods. Archaeologists have classified axes either as socketed, in which the handle fits into a blade-socket, or as tanged, in which the rear of the blade is fitted into the handle. The blade continued to show variations in each successive period to meet new tactical situations.

Shield: The shield was a prominent defensive weapon, designed to protect the warrior and allow him to use weapons at the same time. Evidence of the use of shields was especially available because of the finds in Egypt and Mesopotamia. The early ones were large, heavy, and in some situations shield barriers accompanied the warriors. By Middle Bronze, the shields became smaller, had a rounded or pointed head and a broad base. The round shield was what protected the uncovered head. It appeared in the fourteenth century BCE, being used by the Sea People. The Hittite shield was in the shape of a figure eight and was a lighter form of the long shield. In Hebrew, the commonest term for shield is "magen," often denoting this type of shield. "Sinna" is used for the larger version. The smaller shield was carried by archers such as the Benjaminites in Asa's army (2 Chron. 14:8, "bucklers"). Shields commonly

consisted of a wooden frame covered with hide which was oiled before use in battle.

Mail: By the Late Bronze Age, the coat of mail had been developed as defensive armor. It was used mainly by archers and charioteers, who needed both of their hands free for their tasks and therefore were unable to protect themselves by carrying a shield. The coat was made from hundreds of small metal plates arranged like fish scales and sewn to a cloth or leather skin.

Metal Helmet: The metal helmet, first devised by the Sumerians covered the ears and nape of the neck. Special styles of helmets were adopted by different nations to facilitate identification in battle, as well as to reflect local, non-military traditions.

Bow and arrow: Somewhere in the early years of the second millennium the bow was invented. The upper and lower flexible portions were held together at a handgrip at the center. The bow had tremendous driving power. Both the Egyptians and the Assyrians seem to have adopted it. In the hunting scenes of the Assyrian King Ashurbanipal, the bow was clearly depicted shooting arrows into the lions being pursued. The arrows were usually made of reed and fitted with metal heads. They might be carried in leather quivers. Sometimes chariots were also fitted with quivers. A quiver is usually depicted as holding thirty arrows, or fifty when attached to a chariot. In Assyrian reliefs, to string the bow, the lower end was pressed down by the foot, while the upper end was bent so as to permit the string to be fastened in the bow. The Hebrew expression "to tread the bow" was given in Jeremiah 50:14. See Figure 4.8-4.

Sling Stones: Sling stones were used by all armies. They are mentioned in 1 Chron.12:2 regarding the ability of the Benjaminites to be good slingers in the Israelite army. The sling itself was usually made of a patch of cloth or leather with cords attached at opposite ends. Sling-stones were found in a number of excavations including Lachish, with a large number of them located at the main gate of the city, dating back to 701 BCE. One very good relief from Sennacherib's palace at Nineveh in 690 BCE shows Assyrian slingers, wearing copper helmets and coats of mail.

Battle-axe: The battle axe, like the mace, was designed for hand-to-hand combat and varied greatly in shape and size.

4.8.3 Methods of Attack

Information regarding the defensive fortification of the cities including, walls, city gates, citadels, and water-supplies have been covered in chapter 4.3, titled Town planning in this dissertation.

For an invader to capture most large cities they had to use direct assault or a long siege. In a direct assault the invader could: try to scale the wall by ladders; break through the walls by digging with tools or a battering ram; penetrate the gate by firing it or battering it open; or tunneling under the wall.

Where ramparts, moats or the side of a tell made direct attack difficult, an assault ramp might be used. Part of the moat was filled with earth or rubble and an inclined ramp built up to the city wall . An Assyrian ramp investigated at Lachish in 1977 was made up entirely of

large field stones. Assyrian reliefs from Nineveh depicting Sennacherib's assault on Lachish (Isaiah 37:33) show the ramps were surfaced with wood. See Figure 4.8-1. Assault troops behind large shield-covered battering-rams moved up the ramps. The latter were protected by archers and slingers. See Figures 4.8-2 and Figures 4.8-3. The wooden beam of the ram had an iron axe shaped head. When this penetrated the brickwork it was levered sideways to dislodge the bricks. A tower at the front of the ram was used by archers to fire at defenders on the walls. Mobile towers could also be brought against the walls and catapults throwing large stones were used against the upper sections of the walls and the defenders. To prevent the escape of the besieged people, a mound or bank of earth was constructed around the city (Jeremiah 6:6; Ezekiel 17:17). From the walls the defenders would rain down arrows, javelins, stones, boiling water and also burning torches to set fire to the battering ram. See the entries under Sennacherib's Palace relief in chapter 4 under Assyrian Inscriptions.

The prolonged process of siege was used when a city was too powerful for a direct assault or when for other reasons the invader preferred to wait. By encircling the city, the attackers sought to cut off its supplies and outside assistance, until the defenders were forced to surrender. An encircling mound and fortified camps were necessary to protect the more passive invading army. Sieges could last up to several years, such as the three year Assyrian siege of Samaria (2 Kings 17:5).

After a city was captured it was plundered and at times burned. Most cities, however, were rebuilt and used

again. The survivors might be deported, enslaved or placed under tribute, and their leaders tortured, killed or taken hostage. This destruction of the cities due to captivity was evident through the excavation of a number of cities in ancient Israel/Judah, including Hazor, Jerusalem, Lachish, and Samaria. These are discussed under the analysis of the cities in Chapter 5 on the excavations of the cities in Israel/Judah and neighboring lands. See Figures 4.8-4 and 4.8-5.

4.8.4 Concluding Comments on Weapons and Warfare

In the armies of Israel and Judah and their enemies, the infantry was separated into different units and equipped with three basic weapons: spear; bow and sling. Assyrian reliefs from the period of the divided monarchy depict Assyrian spearmen in mailed coats carrying a shield in one hand and equipped with a sword either strapped to their back or thrust into their belt. With weapons designed for close combat, the spearmen formed the first wave of attackers. Depending on the terrain, chariots and cavalry were used both on the flanks and in formations. Chariots were also used to carry commanders (1 Kings 22:31-34) and messengers around the field while the entire force was supported by the missiles of the bowmen and slingers. Multiple arrowheads and other smaller weapon artifacts were found in excavation throughout Israel and Judah.

Open field tactics, terrain considerations, and strategies based on the numbers of chariots and soldiers are found in a number of biblical passages (1 Kings 20:23-30; 22:29-36; 2 Kings 23:28-30). However, a major

challenge to military strategists in the monarchy period was the capture of a walled city. The strong points of the city (walls, glacis, moat and gate complex) had to be overcome. Again, it was the Assyrians who perfected strategies to offset each of these challenges. Their reliefs show: assault ramps; wheeled tanks attached with battering rams; sappers tunneling under walls; infantry crossing rivers and moats with inflated goat skins and mobile towers bristling with weapons thrust up against the city wall. Tactics involving some of these methods were probably used in the Assyrian capture of Samaria (2 Kings 17:5-6).

The Assyrian reliefs, especially those found on the palace walls of Sennacherib portraying his attack and victory at Lachish, produced vivid images of more tactics used in battle. While the people of the city rained down stones and arrows on their attackers, the strategy of the besieging army was to spread the defenders as thinly as possible along the walls. During lulls in the fighting, psychological ploys were sometimes used against the enemy. During the fighting, forces of slingers (2 Kings 3:25) and archers harried the defenders with flights of missiles, masking the approach of towers or reserve forces. Eventually, an attack was made at a particular spot to breach the wall and enter the city (2 Kings 25:4). The text indicates that breaching the wall was usually followed by a general pillaging and burning of the city (2 Kings 14:12-14 and 25:9-11). Excavations of various sites in Israel and Judah showed the destructions of cities by burning.

Water supplies were a constant matter of concern during times of war. Cisterns were dug to store water and

many were found in excavations of Israel and Judah that dated to the Iron II period. In times of war the entrances to springs outside the city walls were concealed (2 Chr.32:3-4). In Jerusalem and Megiddo, water tunnels were cut from inside the city to the springs. The one in Jerusalem was dug by King Hezekiah.

The ultimate punishment for people who continued to revolt against the Assyrians was deportation. In 721 BCE, the Assyrian king Sargon II captured the Israelite capital city of Samaria after a three-year siege. According to his records which were found in his palace at Khorsabad, he deported 27,290 people. 2 Kings 17:6 states they were "placed in Halah, and on the Habor, the river of Gozan, and in the cities of the Medes." This ended the monarchy in the northern kingdom.



The siege and capture of the city of Lachish, in the kingdom of Judah, 701 BCE. Length of the relief is 172 cm, width 61 cm.

These alabaster panels were part of a series which decorated the walls of a room in the palace in Nineveh of King Sennacherib (reigned 704-681 BCE).

These three surviving slabs complete the royal entourage. The right-hand end shows more cavalry and chariots waiting behind the king. It also shows an aerial view of the Assyrian camp with its oval wall and defensive towers at intervals shown flattened out. Other Assyrian camps shown on reliefs were sometimes round or rectangular. The camp seems to have been methodically planned with a road running through the middle. There are two pavilions, like the one behind the king. There are five open tents in which various activities can be seen, including the amusing scene of two men gossiping over a drink. The pair of chariots in one corner of the camp have a standard in each of them; these are the chariots of the gods, sometimes seen charging in battle. On this occasion two priests in tall hats are performing a ceremony. An incense burner stands higher than the priest, and a sacrificial leg of meat sits on an altar.

Figure 4.8-1



Gezer: Relief Drawing of Tiglath-Pileser III (734-733 BCE) depicting his weapons and methods used in an attack. This is from a relief in his South West Palace at Nimrud.

Figure 4.8-2



Bodyguards of King Sennacherib: Archer and Spear-man. This panel was one of a group found, out of position, between the palace of King Sennacherib (reigned 704-681) and the Temple of Ishtar, the principal goddess of Nineveh. The panels may have lined a bridge or corridor used by the king when visiting the temple.

The scene shows the king and his entourage in formal court dress. The two figures on this panel formed part of the king's bodyguard. The archer on the left is one of the lightly-armed soldiers who were probably drawn from the Aramaic-speaking communities in and around the Assyrian heartland, which the Assyrians had conquered. The Assyrians incorporated soldiers from all parts of the empire into their forces. The spear-man on the right wears a turban fastened by a headband with long ear-flaps, and a short kilt curving upwards above his knees. His clothing tells us that he comes from around Canaan. An almost identical uniform is worn by the men of Lachish, in Judah, as represented in panels showing Sennacherib's siege of the city in 701 BCE from another part of the palace.

Height: 160 cm Width: 111 cm Depth: 9 cm

Figure 4.8-3



Stone panel from the North Palace of Ashurnasirpal (654 BCE)

Assyrian soldiers pursuing Arabs on camels

By the date that this panel was carved, the Arab tribes of present day northern Saudi Arabia, Jordan and Sinai were becoming increasingly important. They relied for long-distance travel and rapid movement on the one-humped camel or dromedary, which had been domesticated in Arabia.

The Arabs first appear in Assyrian records in the ninth century. Texts tell of tribes, often led by queens, living in the southern borders of the Assyrian Empire. Sometimes they guarded the borders, escorted armies in desert country, and controlled the caravan trade, especially the lucrative incense trade from Yemen.

Some tribes were also ready to take advantage of any sign of weakness in the central government. They then raided settled communities, supported rebellions, robbed caravans, and disrupted communications. The Assyrian kings launched several attacks against them without much success, because the Arabs conducted guerilla-style warfare, and were usually able to escape into the desert.

Figure 4.8-4

1



Stone panel from the Central Palace of Tiglath-pileser III

This is a successful Assyrian campaign against the Arabs. This alabaster panel decorated the mud-brick walls of the Central Palace of King Tiglath-pileser III (reigned 745-727). It is one of a series of panels that depicts a procession of prisoners and booty captured during one of the king's campaigns against Arab enemies. A woman leads a herd of camels. The one-humped camel, or dromedary, was probably domesticated by the inhabitants of Arabia at the end of the second millennium. Under Tiglath-pileser the administration of defeated territory was reorganized by extending direct Assyrian rule over them, transforming them into provinces of an empire. These provinces included territory as far west as Damascus. Increasingly Assyrian kings came into conflict with Arabs. The Arabs first appear in Assyrian records in the ninth century. Assyrian texts tell of Arab tribes led by queens, and show how they became increasingly important for escorting trading caravans and military expeditions in northern Arabia and Sinai. Height: 99 cm Width: 162 cm.

Figure 4.8-5

4.9 WEIGHTS AND MEASURES

4.9.1 Introduction

When one person deals with another in a trade or a business, it is useful for there to be a prior agreement upon standards of weights and measures. Property ownership (in towns and cities at least), construction of buildings, fabrication of household items, manufacturing industries and farm implements all required some standardized measurements. Exchange of gold, silver and gems required some standard weights, as did the prescribed payments regarding religious activities.

The table below gives some of the basic and derived units of the metric system, together with abbreviations and a list of equivalent values in customary U.S. standards. It provides a background for understanding the material culture that relates to weights and measures of the Iron Age.

Weights approximate:

1 grain (gr)	= 65 mgs
1 gram (gm)	= 15.43 grains (grs)
28.35 grams (gms)	= 1 ounce avoirdupois
100 grams	= 1 hectogram (hg) = 3.527 oz.
1000 grams	= 1 kilogram (kg) = 2.2 pounds

4.9.2 WEIGHTS

In the ancient Near East standards varied between districts and cities, and there is no evidence that Israel had or used an integrated system. Both King David (2 Samuel 14:26) and the Prophet Ezekiel who said "Thus says the LORD God. . ." gave certain basic standards of weight and measurements (45:10-12). The Torah, long before had, prescribed that the sons of Israel were to keep a just weight, measure and balance (Lev. 19:35-36; Ezek. 45:10). The prophets spoke against those merchants who defrauded

their fellows, by increasing or decreasing their weights (Deut. 25:13-15), or using deceitful weights (Micah 6:11) or false balances (Proverbs 11:1 & 20:23).

Ancient weights were stones carved in shapes, usually with a flat base, which made them easy to handle or recognize (e.g. turtles, ducks, and lions). They were often inscribed with their weight. See Figure 4.9-1.

The standard weight units were as follows: (See Figure 4.9-2).

1. Shekel (Heb. sequel; Akkad. siqlu, Aram. Ugaritic tq1) was common to all Semitic metrologies and was the basic weight. One shekel was = to 20 gerahs, 2 bekas, 1.5 pims or about 10 gms. Its value varied at different times and areas. The royal shekel, set by "the king's weight" (2 Sam. 14:26), was a standard known also in Babylonia. This was probably the "heavy shekel" (kbd) of Ras Shamra.

Analysis of weights discovered at Gibeon, Gezer, Megiddo and Tell en-Nasbeh show a "heavy" shekel of 12.5-12.88 gm. The common shekel was often used to weigh metal objects (1 Sa. 17:5; Goliath's armor of 5,000 shekels = 56.7 kg. or 125 lbs); foodstuffs (2 Kings 7:1; Ezek. 4:10); and commonly gold and silver; thus implying its use as a means of payment.

Silver shekel coins (sigloi) first appeared in the reign of Darius I. Some fifty inscribed weights of a shekel or multiples upwards show a variation of 11.08 - 12.25 gms; average 11.38 gm. This compares well with calculations based on the inscribed weights of smaller denominations, which confirm a possible devaluation in post-exilic times to about 11.7 - 11.4 gms.

The Temple Shekel or "Shekel of the Sanctuary" (Ex. 30:13; Lev. 5:15, etc.) was related to a beqa which was 1/2 shekel (Ex. 38:26) and 20 gerahs (Ezek. 45:12). Though later with revaluation, it equaled 1/3 shekel (Neh.10:32). This shekel is believed to be the "nsp," of which examples have been discovered weighing 9.28 - 10.5 gm. One such inscribed shekel in the collection of the author of this dissertation is shown in Figure 4.9-3.

2. Beka (Heb. beqa, fraction, division,) was used for weighing gold (Gen. 24:22) and silver for paying the poll-tax, the equivalent of half a shekel, after the "Shekel of the Sanctuary" (Ex. 38:25-26). A total of 10 gerahs equal a beka or about 5 gms. Seven weights, inscribed bq' have been found at Lachish, Jerusalem, Gezer and Beth-zur.

3. Gerah (Heb. gera, Assy. giru). This was defined as 1/20 of a shekel (about 0.5 gm. or the equivalent to only about 7.5 grains). Barley grains were the basic measurement used (Ex. 30:13; Ezek. 45:12).

4. Mina (Maneh; Heb. maneh; Akkad. manu) was a weight used to measure gold (1 Kings 10:17), silver (Ezr. 2:69; Neh. 7:71-72) and other commodities. 1 mina = 1000 gerahs, 1000 bekas, 75 pims, and 50 shekels or about 500 gms. There is evidence that the 50-shekel minas were in use at Ras Shamra.

5. Talent (Hebrew, kikkar, "a round," Akkad. biltu, "a burden," in Greek, talanton, "a weight"). A talent = 60 minas, 3000 shekels, 4500 pims, 6,000 bekas, 60,000 gerahs

or about 95 lbs. This was the largest unit, probably named after the characteristic shape in which large metal lumps were molded, as in the lead cover of the ephah (Zech. 5:7). It was used to weigh gold (2 Sam. 12:30, etc.), silver (1 Kings 20:39), Iron (1 Chron. 29:7) and bronze (Ex.38:29). Included in Solomon's annual revenue were 666 talents of gold (1 Kings 10:14).

The 30 talents of gold paid by Hezekiah as tribute (2 Kings 18:14) corresponds with the amount Sennacherib claims to have received (Annals), implying a similar talent in use in Judah and Assyria at that time. This might be the "light" talent of about 30 kg. (66 lbs) as inscribed Babylonian duck-weights of this value range 29.76 - 30.27 kg. A weight found at Tell Beit Mirsim (4,565 gm) has been interpreted as this talent of 28.53 kg (about 62 lbs).

6. Pim (Heb. pim or payim) is mentioned only in 1 Sam. 13:21 regarding the Philistine fee for sharpening cutting tools "... the charge was a pim for the plowshare" (RSV). Twelve inscribed pim weights have been found at Lachish, Jerusalem, Gezer, and Tell en-Nasbeh.

One pim is equal to 13.3 gerahs or 1.33 bekas. One pim is equal to 7 gms. or 1/4 oz. (Aharoni 1998:1634-1636).

4.9.3 Linear Measures

1 cm = 0.39 in

1 inch = 2.54 cm

1. The cubit (Heb. Amma or ammah), was the distance from elbow to finger tip. This "natural cubit" (of a man) was used to indicate the general height of a person. The average man seems to have been significantly shorter than 5

cubits. (1 Sam. 17:4, 1 Chron.11:23). In modern measurements, four cubits would be about 6 feet tall or about 1.8 meters tall. The cubit was also used to measure objects (Esther 5:14 and Zech. 5:2). The standard Hebrew cubit was 17.5 inches (44.45 cm), slightly shorter than the common Egyptian cubit of 17.6 inches (44.7 cm).

These cubit calculations compare closely with the length given for the Siloam tunnel as 1,200 cubits, equivalent to a measured 1,749 feet, giving a cubit of 17.49 inches or 44.42 cm. Excavated buildings at Megiddo, Lachish, Gezer and Hazor reveal plans were based on multiples of this the cubit measure.

A "long" or "royal" cubit was a handbreadth (Palm) longer than the standard cubit of 6 palms (Ezek. 40:5) or 20.4 inches. Compare that to the Babylonian cubit of 50.3 cm (of fingers length marked on a statue of Gudea) which was "3 fingers" shorter than the Egyptian cubit of 52.45 cm.

2. The reed (qaneh) was 6 cubits of linear measure. It was exact enough to use as a unit of length for construction and descriptions. Of course, the word "reed" conveniently denoted a measuring instrument of the same 6 cubit length, just as one yard of distance and a yard stick are the same length. The reed was calculated considering the cubit to be 44.45 cm or 17.5 inches.

3. The span or outstretched hand from the thumb to the little finger, was a half-cubit (1 Sam. 17:4; Ex.28:16; Ezek. 43:13), though "half a cubit" was sometimes expressed literally (Ex. 25:10).

4. The finger or digit (esba) was a 1/4 hand-breath (Jer. 52:21), and the smallest subdivision of the cubit in common use in Israel and Judah, as in Egypt and

Mesopotamia. It is generally taken to be 1.85 cm. (Aharoni 1998:1636-1638). See Figure 4.9-2.

4.9.4 Distance, Large Linear Distances

Distance was equated with a known average. A "bowshot" (Gen. 21:16), was the length of a ploughed furrow (1 Sa. 14:14); "a day's journey" (Num. 11:31; I Kings 19:4), or "a journey of three days" (Gen. 30:36; Ex. 3:18; Jon.3:3).

4.9.5 Area

Yoke (Hebrew "cemed"), is the area that a yoke of oxen could plough in a day (Isaiah 5:10; 1 Samuel 14:14). In Isaiah, the cemed was a measure of vineyard land. Another area measure was related to corn fields (Leviticus 27:16). These were measured by the amount of seed they required.

4.9.6 Volume, Dry and Liquid Measures

The basic dry and liquid measures have been calculated into modern terms by the metric liter. The liter is approximately 1 quart or 32 oz. Four quarts equal a gallon.

Dry Capacity, approximate correspondences:

Cor (homer)* (10 ephads) = 6 bushels = 220 liters

Lethek* (5 ephads) = 3 bushels = 110 liters

Ephad* (10 omer) = 2.4 liters

Seah (1/3 ephad) = 7quarts = 2 liters

Omer (1/10 ephad) = 2 quarts = 2 liters

Cab (1/18 ephah) = 1 liter

* A Cor (homer/omer) was the normal load of a donkey (hamor), which has been estimated as 3.8 - 6.52 bushels. A

lethech was half an homer, or 1.9-3.26 bushels. (McCarter 1996: 120).

Liquid Capacity, approximate correspondences:

1 log = 1/3 quart = to 0.3 liters

1 hin (1/6 bath) = 4 liters

1 ephah (bath) = 6 gallons or 22 liters

See Figure 4.9-4

4.9.7 Archaeological Evidence of Weights and Measures

4.9.7.1 Some Weights Found in Israel/Judah

In excavations carried out in Israel/Judah some of the weights which have been found have their weight marked on them, but most are without any notation. The shape of the weights, for the most part, is semicircular (dome-shaped). There are also some cast metal weights that are rectangular or cube-shaped, and some that are oval or in the shape of animals. Most of the weights found in Israel/Judah are from the end of the period of the monarchy (the seventh to sixth centuries BCE).

Very few weights and inscriptions with the word shekel written explicitly have been found in strata from the Israelite period. A bronze weight in the shape of a turtle was found in the coastal plain; on its reverse side it bears the inscription "one-quarter shekel." And in fact, a weight of this sort (one-quarter shekel) is mentioned in 1 Samuel 9:8. That quarter shekel weighed 2.63 grams. That would make the shekel 10.52 grams.

Another bronze weight from Samaria, also in the shape of a turtle, bears the inscription "five," and this has been interpreted to mean five gerahs. Since there are

twenty gerahs in a shekel, that would make that weight one-quarter of a shekel as well. Its weight is 2.49 grams, making a shekel 9.56 grams.

Another weight from Samaria is marked "one-quarter shekel," and its weight is 2.54 grams. That would make the shekel 10.16 grams.

A "Shekel of the Sanctuary" or Temple Shekel, in the collection of the author of this thesis, weighs 9.75 gms, was cut from stone. This is equal to two Beqas (Bekas). It is inscribed "nsp" or "NET SEF" and is from about 800 BCE (Aharoni 1998:1638-1640). See Figure 4.9-2.

4.9.7.2 Ostrakon 18 from Arad

Excavators recovered a hoard of 18 letters (most of them dated to the eighth century BCE) in Stratum VI at Tel Arad that corresponds to the last years of Judean control of Arad. The inscriptions were written in Hebrew, Aramaic and other languages.

These ostraca authorized the distribution of specific quantities of wine, oil, and flour or meal, which were shipped to places like Ramath-negev and Beersheba. The ostrakon numbered 18, read in small part, "Now then, give Shemaryahu a lethech, and to Kerosi give a homer." Aharoni suggested that the signs used here were meant to indicate one lethech and one homer. Both of these were standard dry measures. Both are mentioned in Hosea 3:2. A homer (homer) was the normal load of an donkey (hamor), which has been estimated as 3.8 - 6.52 bushels. A lethech was half a homer, or 1.9-3.26 bushels (McCarter 1996: 120).

4.9.8 Concluding Comments on Weights and Measures

In the ancient Near East standards varied between districts and cities, and there is no evidence that Israel had or used an integrated system. Both King David (2 Samuel 14:26) and the Prophet Ezekiel said "Thus says the LORD God. . ." gave certain basic standards of weight and measurements (45:10-12). The Hebrew text designated that the sons of Israel were to keep a just weight, measure and balance (Lev. 19:35-36; Ezek. 45:10). The prophets spoke against those merchants who defrauded their fellows, by increasing or decreasing their weights (Deut. 25:13-15), or using deceitful weights (Micah 6:11) or false balances (Proverbs 11:1 & 20:23).

Analysis of weights discovered at Gibeon, Gezer, Megiddo and Tell en-Nasbeh show a "heavy" shekel of 12.5-12.88 gm. The common shekel was often used to weigh metal objects; foodstuffs (2 Kings 7:1; Ezek. 4:10) and gold and silver.

The basic unit of length was the cubit, the distance from the elbow to the fingertip. Isaiah used that fact to compare God's greatness with man's smallness (Isaiah 40:12). It was evident that as people varied in size, so did the cubit. These cubit calculations compare closely with the length given for the Siloam tunnel as 1,200 cubits, equivalent to a measured 1,749 feet, giving a cubit of 17.49 inches or 44.42 cm. Excavated buildings at Megiddo, Lachish, Gezer and Hazor revealed that the plans were based on multiples of this cubit.

The bath was the common Hebrew liquid measure. It is believed to have contained 6 hins or about 6 gallons. It was used for wine, water and oil. Pottery marked with the

name "bath" has been found. This pottery was calculated on the basis of how much these containers could hold. These jars were found at excavations in Israel and Judah. Hazor was one site that had a large number of "bath" jars.

Excavators recovered a hoard of 18 letters (most of them dated to the eighth century BCE) in Stratum VI at Tel Arad that corresponds to the last years of Judean control of Arad. The inscriptions were written in Hebrew, Aramaic and other languages on ostracas. These ostrica authorized the distribution of specific quantities of wine, oil, and flour or meal, which were shipped to places like Ramath-negev and Beersheba. The ostracon numbered 18, read in part, "Now then, give Shemaryahu a lethech, and to Kerosi give a homer." Aharoni suggested that the signs used here were meant to indicate one lethech and one homer. Both of these were standard dry measures. Both are mentioned in Hosea 3:2. A homer (homer) was the normal load of a donkey (hamor), which has been estimated as 3.8 - 6.5 bushels. A lethech was half a homer, or 1.9 - 3.2 bushels.



a. Weights in shape of calves and rams, stone and bronze, 15th - 9th centuries BCE



b. Weights in shape of ducks, stone, Mesopotamia, 1st Millennium BCE

Figure 4.9-1

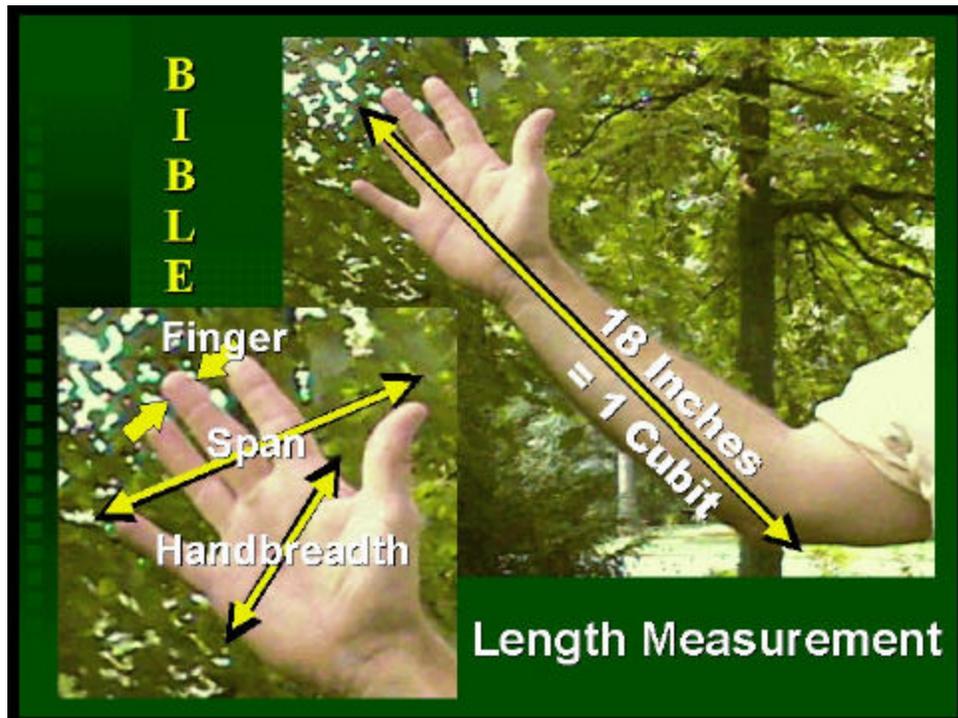


Figure 4.9-2

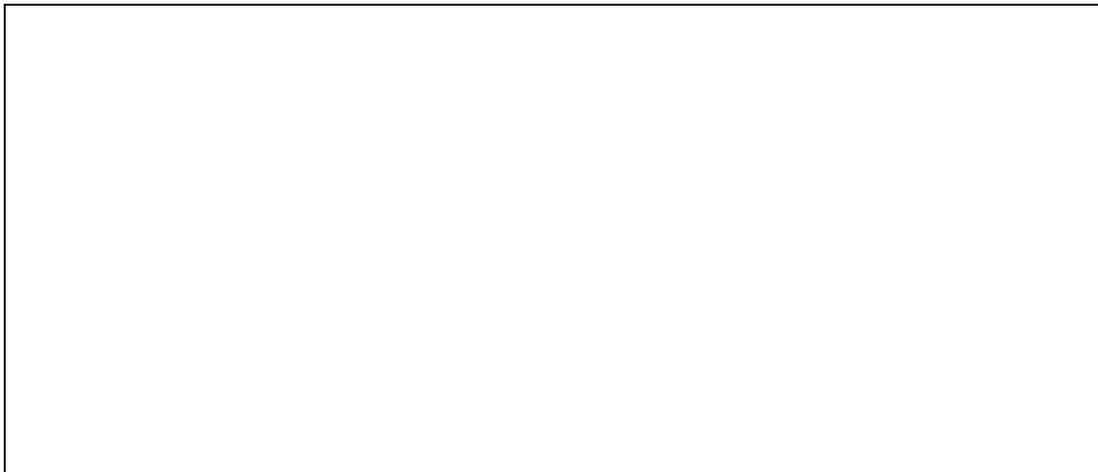


Temple Shekel weight of stone, inscribed "nsp" or "NET SEF"
This one weighs 9.75 gms and is thought to be a "Shekel of
the Sanctuary" which is equal to two Beqas (Bekas).
About 800 BCE (the Depew Collection; photograph courtesy of
the West Semitic Research Project).

Figure 4.9-3



a. The Bath was the common Hebrew liquid measure. It is believed to have contained 6 hins or about 6 gallons. It was used for wine, water and oil. Pottery marked with the name bath has been found and is calculated on the basis of how much these containers could hold. These jars are from the excavation at Hazor, Israel.



b. Amphorae jars (750-700 BCE)uncovered from a shipwreck off of the coast of Ashkelon, Israel in 1997. The handles were small "earlike" handles which allowing them to be roped together and tied down. This type was found in Tyre, Phoenicia. The jars could hold an estimated volume of 18-19 liters (4.5 gallons).

Figure 4.9-4

4.10 FARMING AND EQUIPMENT

4.10.1 Farming

Farming was the principal occupation of people in both the Bronze and Iron Ages. Farm work dictated the pace of life throughout the year, with different tasks for different seasons. Dry summers and wet winters meant that planting occurred in the late fall and harvest in the early summer. The main crops were wheat, barley, legumes, figs, grapes and olives. Vegetables included leeks, onions, garlic, cucumbers, red and green peppers, eggplant and melons. Deuteronomy 8:7-9 described the Land of Israel as "a good land ... a land with wheat and barley, vines and fig trees, pomegranates, olive oil and honey; a land where bread will not be scarce and you will lack nothing."

Because most river valleys in the region were unsuited for irrigation on a large scale, farmers were dependent on rain. In some areas, they built and maintained stone terrace-walls to retain water and soil on the steep slopes of the highlands. By late in the Iron Age, some farmers used elaborate systems of conduits and check-dams to capture and redirect rainwater into fields and thus were able to raise crops in areas receiving less than five inches of precipitation per year (Borrowski 1987:57).

The farmer's seasonal schedule is recorded in the "Gezer Calendar," a 10th century BCE inscription excavated at Tel Gezer. The tablet was incised on limestone in one of the earliest Hebrew epigraphs. It has been called a school boy's exercise because of the simplicity of the subject and the possible inexperienced hand of the scribe.

Figure 4.10-1 shows the calendar in which agricultural tasks and seasons are given (McCarter 1996:102).

Two months of harvest (*olives*) (Sept/Oct)
 Two months of planting (*cereals*) (Nov/Dec)
 Two months are late planting (*vegetables*) (Jan/Feb)
 One month of hoeing (*flax*) (Mar)
 One month of barley-harvest (Apr)
 One month of harvest and festival (*grain*) (May)
 Two months of grape harvesting (June/July)
 One month of summer fruit (Aug)

4.10.2 Tools Used In Farming

Information about the agricultural tools that were used by farmers during the time period of this dissertation and other significant periods has been provided from archaeological finds and the biblical text.

From the earliest beginnings of farming, the basic tool used was the hoe. It was used to break up the soil before planting and for weeding and thinning the crops. The mattock, which was made of bronze and iron, was a heavier tool for breaking up the soil.

The earliest plows were made of hard wood, with two handles, to which a flint blade was attached. They were named "ard," or scratch plow. Bronze metal blades were used from the second half of the 2nd millennium BCE, but were easily broken. By the end of the 11th century BCE, iron had been introduced and eventually the iron metal blades were universally used. The Philistines are believed to be responsible for developing the iron blades for the plow (1 Sam. 13:20-21). The "ard" was pulled by horses, donkey, cattle, or camels.

Coulters were an implement used for turning the soil by hand. They were usually about 3-4 inches wide and made

of iron. Sickles and scythes were used for cutting grain and grasses for fodder. Early versions had blades of flint and their handles of bone or wood, with iron blades found on Iron Age sites. Forks (pitchforks) were most probably the six-pronged variety and used to gather the mown grain for winnowing. Sieves and fans were used to separate the threshed grain from the stalk.

Pruning hooks were used to prune the grapevines after the flowers had germinated into fruit. The pruning hook was a small, sharp, curved blade which could quite easily be beaten into a spear. Isaiah's prophecy of future peace (Isa. 2:4) mentioned the pruning hook. In addition to these tools, knives of various shapes and sizes and shaving blades have been found in Israel (Douglas 1998:21-23).

4.10.3 Concluding comments on Farming

A tenth century BCE inscription excavated at Tel Gezer gave a seasonal schedule used by farmers in the Iron Age. The tablet was incised on limestone in one of the earliest Hebrew epigraphs. It has been called a school boy's exercise because of the simplicity of the subject and the possible inexperienced hand of the scribe.

During this time period land was accumulated by nobles at the expense of the original farmers. A system of royal tenants developed and stewards were appointed to be in charge of vineyards, olive groves, granaries, and cattle raising. There was protest against this development from the prophets (Isaiah 5:8).

The prosperity of the people was often noted from this time period by the size of the grain storage pits that were

uncovered. One of these was found at Megiddo. Its capacity was about twelve thousand eight hundred bushels.



Figure 4.10-1 shows the calendar in which agricultural tasks and seasons are given (McCarter 1996:102).

Two months of harvest (*olives*) (Sept/Oct)
Two months of planting (*cereals*) (Nov/Dec)
Two months are late planting (*vegetables*) (Jan/Feb)
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One month of harvest and festival (*grain*) (May)
Two months of grape harvesting (June/July)
One month of summer fruit (Aug)

4.11 FOOD PREPARATION

4.11.1 Food preparation and the four-room house.

The four-room house structure was discussed in the chapter under Architecture. Due to the importance this house structure has in the area of food and preparation it is important to mention it again in this section on Food Preparation.

It is interesting to see that at Beer-sheba and Tell Beit Mirsim, the back room of the house was part of a casemate wall surrounding the town. The house courtyard was utilized for conducting various household duties (Mazar

1990: 488). Baking ovens were often located here (or they were outside the house, in an open area or in a special small chamber). Cereals were ground in the courtyard on grinding stones usually made of basalt or other hard stone. Stone or plastered vats with attached working surfaces may have functioned as simple grape juice presses; olive presses of various special forms were also often found; and other built-in installations represent domestic activities.

Rock-cut cisterns have been found only at places where the bedrock was suitable for cutting and easily accessible, such as Tell en-Nasbeh. The rock also had to be suitable for holding water if properly sealed. In general, however, the daily water supply was taken from nearby springs, wells, streams or public water projects.

The number of people who lived in each unit has been estimated to be a "nuclear family" of five to seven persons. Larger houses could accommodate up to approximately ten or eleven people in all. The amount of pottery vessels found in a house provides some indication of the number of its occupants. Houses at Timnah (Tel Batash) contained an astonishingly large quantity of pottery vessels. In one small dwelling, comprising a courtyard and two square rooms, there were thirty bowls, eight kraters, eleven cooking pots, fourteen storage jars, twelve jugs, eight dipper juglets, and several other vessels, so the number of tenants in this unit must have been relatively high (Mazar 1990: 487-488).

Ethnographic and historical studies on the division of labor by gender demonstrate that men's activities characteristically centered on agricultural food

production, hunting, and community leadership. Women tend to manage the household economy, including food storage and preparation. Because the household was the woman's domain, she managed directly or indirectly all of its contents. This was known from archaeological finds. Some of the items connected with the processing of food and storage included food particles—remains, grinding stones, ovens, cooking pots and storage jars.

4.11.2 Animals Used for Food

Although there are a wide variety of animal bones in archaeological contexts, the vast majority are from the primary herd animals, sheep and goats. Cattle, which require more pasture land and demand abundant water, were a secondary herd animal throughout the period and their bones occur less frequently. A wide variety of other animal bones included pigs, oxen, camels, fallow deer, birds, and fish were also discovered.

The animal bones are found in domestic and other contexts. Swine astragali (ankle bones), surprisingly, appear in tombs in the Iron Age. Right forelegs or astragali of immature goats and sheep are common in pits near contexts interpreted as bamot or temples.

A detailed study of animal bones at Beersheba provided some interesting observations about use of animals for food. Sheep/goats were numerically by far the most common herd animal in all strata. Cattle (bovine animals) were also well represented, but with a considerably lower number of animals. The ratio was about three sheep/goats for every one bovine. However, if one takes into account relative sizes of the animals, it is clear that cattle figured more

prominently by weight of meat provided in the diet of the people than did sheep or goats. Generally the bones from all three types of animals came from the right foreparts of the animal. Skulls were generally found in fragments which suggest that the brain may have been eaten. Finally, there is a steady increase in the number of remains from juvenile specimens thus suggesting a growth in food supply throughout the period (Hellwing 1984:105-115). See Figure 4.11-1.

4.11.3 Grapes and Olives

Grapes and olives were both very important foods for the people of ancient Israel, Judah, and the neighboring countries. Both the grape juice and olive oil come from plants that must be pruned for some years before bearing useful fruit. Both are processed by crushing in special presses. For these reasons, these crops represent an initial investment of some risk for a farmer. Grape juice and olive oil are processed both physically and chemically in the course of their extraction, processing and storage. There can be significant variation in the flavor and structure of the end product in the eastern Mediterranean, thus creating differential values in the end products and the potential for some connoisseurship.

4.11.4 Grapes

The harvesting of grapes took place in August and September and was a joyous occasion for the community. The grapes might be dried slightly in the sun and then pressed by barefoot treading, accompanied by dancing and songs. Once the grape juice was collected in a vat, fermentation

would begin. After an initial period of vat fermentation, the wine was transferred to jars or skins for additional fermentation. Wine would be allowed to age, as older wine was preferred over new. Before drinking, the wine had to be strained and was usually mixed with water. Wine was often flavored with spices and resins for diversity of taste. The proper presentation and consumption of wine became a symbol of status and power, as witnessed by elaborate wine vessels and the importance of banqueting.

Additionally, other fruits such as dates and pomegranates were pressed and fermented to make fruit wines. See Figure 4.11-2a.

Ancient historians recorded various methods were used to preserve grape juice without fermentation. In some cases it was boiled and poured while hot into heated pottery jars. The open jar tops could be sealed closed with hot bitumen. Depending on the skill of the worker, the bottled grape juice could remain unfermented for many months or more. Fermentation of grape sugars into alcohol is an aerobic process and a good amount of air is needed for the process. Sulfur and even bitumen were used by some people to mix in with grape juice to help retard fermentation. Storage jars were sometimes, perhaps often, put into a cool spring or stream of water to "refrigerate" them. Even burying or partially burying a jar in soil or storage in a cool cave would help retard spoilage. Another method used to preserve the nutritional value of grapes was to dry them there by making raisins. Some people would boil grape juice down to a thick paste which could be easily stored or transported. It could later be eaten like a candy or mixed with water (Depew 1961).

At Gibeon, Pritchard found large underground chambers for the storage of jars of juice and/or wine and possibly used for controlled fermentation. The 63 underground storage chambers were estimated to be able to store at least 25,000 gallons of juice in jars (Pritchard 1962: 90-98).

4.11.5 Olive Oil and Olive Preparation and History

Olive oil was used in cooking, both in frying and as an ingredient in recipes. It could be flavored with spices and used as a condiment. Scents could be added to the oil and used as perfume. Olive oil was also put into in small lamps and burned to illuminate houses. It was commonly used for ritual offerings and sacrifices as indicated in the Bible.

The first and only conclusive evidence for the preliminary production of olive oil from wild olive trees dates to the Neolithic period, the sixth millennium BCE. A basin dug in a clay layer at the seashore off Mt. Carmel, was found full of olive pits and organic material. It seems that the oil was produced there in an ancient, traditional method called "Shemen Rahutz" (ancient Hebrew) or "Zeit Taphakh" (Palestinian Arabic). In addition to this botanic evidence of olive pits, dozens of uniform special installations cut in the rock surface proved the existence of advanced preliminary oil production (Eitam 2002:1-6).

Olive trees were cultivated in Israel during the 4th millennium. Permanent small villages based on mixed economy of herding and agriculture existed in the Mediterranean regions of the country, Golan and Samaria hills.

With the beginning of urbanization and population growth, in the beginning of the third millennium, horticulture expanded and developed. The strength of the population and the improvement of metal axes enabled the

forests in the central mountain region to be cut. This allowed for preparation of areas for olive groves and cultivated vines that were probably exported from Anatolia.

Despite the fact that oil and wine could actually be produced in the same simple installation, special installations for each purpose were carved side by side on sites from the Early Bronze period (2800 BCE).

There is little industrial archaeological evidence for a flourishing olive culture during the Canaanite period, but, this does not preclude the fact that such an olive culture may have existed. Only a dozen installations and some ceramic vessels with spouts for oil separations have been identified in archaeological contexts of the Canaanite culture.

When harvested, the olives contain about 20 % oil and about 50 % water. Before olives were used to make olive oil, the olives would be air dried to remove as much water as possible. After this various forms of mechanical extraction would be used (Mailer 2002:1-3).

To extract the oil from the olives the olives were crushed. The crushing was done: through rolling an elliptic stone over the olives; people wearing wooden shoes would tread over them; or the olives were placed in baskets and a wooden beam was lower over the baskets to crush them. The proof for the use of the beam installation in the oil production is known from the finding of these installations in Ras Shamra, the town kingdom of Ugarit, but not in Israel. They dated to 1500 BCE.

In the Kingdoms of Israel, Judea, and Philistia the olive oil industry developed into a mass production industry during the ninth to the seventh centuries BCE. This was proven by the hundreds of typical and unique oil presses with central collection vats that were discovered from various sites that dated to this time period. See Figures 4.11-3b, 4.11-4, and 4.11-5.

In the Iron Age II great improvements were made in the manufacturing process as well as in organization. A complex installation was developed. It included two presses and a crushing basin operated by a roller. In Israel, industrial villages for the production of oil (probably under royal auspices) were found. The two examples of these sites are at Kla' and Khirbet Khadash.

In the provincial towns in the hill country and mountain region of Judea, industrial areas became part of urban planning. Some of these towns included: Beit Mirsim, Beth-Shemesh, Tel Batash, Tel en Nasbeh and Bethel. Royal officials from King David's court hint at such a royal economy: "Khanan from Gader who was responsible for the cultivation of olive groves and Yoash, who was in charge of the production and storage of olive oil" (1 Chronicles 27: 28).

The oil industry in Tel Miqune, (Philistine Ekron) in the seventh century BCE, was probably established and operated by the Assyrians. It was an industrial center of unprecedented strength in the ancient Middle East. More than 100 oil presses were found there, mainly on the surface of the mound. Since the findings were mainly on that mound, we can safely triple the number of oil fineries

that were most likely operating in the seventh century BCE. Private olive oil manufacturing by farmers continued to exist.

Surprisingly, the Galilee region did not share in mass production during the biblical period. Only 14 oil presses (compared to hundreds in Samaria and Judea) dated from the tenth to eighth century BCE were found. The improved installation with the peripheral collecting vat was brought by the Phoenicians to their colony (Tel Shiqmona). This colony, was the royal administrative and industrial center of the "Land of Kavool," which was given by King Solomon to King Hiram of Tyre (Zor in Hebrew).

During the third century BCE, the oil production center in the Judean hills moved to the Sidonian colony of Maresha. Eighteen caves used for olive oil presses were carved in the soft limestone around the city. Oil was produced in various ways. The mortar or mill was used. Also found were the orb and an improved lever press using three weights (1500 kg weight). This indicates the great technological improvement of the olive press.

In summary, the steps in fine oil production were to first dry the olives in the air to remove much of their moisture. Then a press was used to squeeze out the first amount of oil. To accomplish this, the olives were put into shallow baskets or into bags (similar to "gunny sacks") which were stacked on top of each other. Heavy weights were piled on top and the oil was slowly squeezed out. In many places a lever system was used to multiply the force of the weights. This first oil separated from the watery juice when the juice settled to the bottom. Subsequently, the remainder of the pulp and pits (stones) would be ground in

a circular mill to express more oil and juice for separation (Eitam 2002:1-5).

4.11.6 Bread

In the Bronze and Iron Age, bread was the staple food. Since it was prepared almost every day, bread-making was one of the main activities of a household. It is thought that people in Canaan and ancient Israel consumed between 330-440 lbs. of wheat and barley per year. An individual typically consumed 50-70% of calories from these cereals mostly eaten in the form of bread.

In order to use the grain, it had to be ground into flour. Both individual and commercial mills have been found, and both involve coarse rocks, often of basalt from Galilee, which are riddled with small holes that catch the grain kernels, facilitating the grinding. A home version was called a saddle quern. It was a long, rectangular slab of stone (about 1.5 to 3 feet or 0.5 - 0.9 meters, in length). It had a concave surface, into which a loaf-shaped, hand-held stone was slid forwards and backwards over the grain. See figures 4.11-2b. and 4.11-3a. The time involved in grinding enough flour for a day's supply of bread depended on the size of the family and the number of loaves that needed to be prepared. Grinding was generally women's work, except at the commercial mill where men were the millers. It was a very laborious process and had the disadvantage of producing basalt grit which got into the bread and gradually wore down the peoples' teeth.

A second method, probably introduced in the late-Israelite period and somewhat more advanced, consisted of a large rectangular upper stone which was rocked back and forth with the aid of a lever placed in notches in the

stone. A third, larger type that was probably introduced during the Monarchy period consisted of two large round flat stones. The upper stone was rotated on its vertical axis against the lower stone. Grain was introduced through a hole in the center of the upper stone and the flour came out around between the edges of the stones.

Bread was baked in small domed clay ovens called "tabuns." Archeologists have excavated ancient ovens which were usually made by encircling clay coils or from re-used pottery jars. The oven was heated on the interior using dung for fuel. Flat breads were baked against the interior side walls.

Grain could also be eaten as porridge or seeped in water and fermented to make beer. The fermented liquid was poured through ceramic strainers to separate the beer from the barley sediment (Abercrombie 1999:1-4). For more information on this subject of food and preparation please see section 4.10, Farms and Equipment.

In order for people to survive, what was grown needed to be prepared for storage to last them the rest of the year. Some foods could be traded for other items which the local people could not produce themselves. Therefore, what happened after the harvest was just as important to the peoples' livelihood as the growing itself. Nuts were kept in a cool, dry place. Various types of fruits were dried to last the year. The largest percentage of the olive harvest was turned into oil. Grapes not eaten fresh or turned into raisins, were pressed to express the juice for storage or for making into wine. Without refrigeration, meat was "kept on the hoof" until needed for special celebrations. Some cheeses were made frequently and some were made almost daily.

4.11.7 Banquet Food: Ashurnasirpal II's Banquet Inscription

From this Inscription of Ashurnasirpal II, we find a very interesting source of information regarding the availability and the preparation of food and its serving for royalty. It was found in his palace at Kalhu (Nimrud). The following is the translation of this inscription by A.Leo Oppenheim:

[This is] the palace of Ashurnasirpal, the high priest of Ashur, chosen by Enlil and Ninurta, the favorite of Anu and Dagan [who is] destruction personified among all the great gods - the legitimate king, the king of the world, the king of Assyria,

. . . .

Ashur, the Great Lord, has chosen me and made a pronouncement concerning my world rule with his own holy mouth [as follows]: Ashurnasirpal is the king whose fame is power!

. . . .

I dug a canal from the Upper Zab River; I cut [for this purpose] straight through the mountains[s]; I called it Patti- hegalli ["Channel-of-Abundance"]; I provided the lowlands along the Tigris with irrigation; I planted orchards at [the city's] outskirts, with all sorts of fruit trees.

I pressed the grapes and offered [them] as first fruits in a libation to my lord Ashur and to all the sanctuaries of my country. I [then] dedicated that city to my lord Ashur.

[I collected and planted in my garden] from the countries through which I marched and the mountains which I crossed, the trees [and plants raised from] seeds from wherever I discovered [them, such as]: cedars, cypress, simmesallu-perfume trees, burasu-junipers, myrrh-producing trees, dapranu-junipers, nut-bearing trees, date palms, ebony, Magan-ash, olive trees, tamarind, oaks, tarpi'u-terebinth trees, luddu-nut-bearing trees, pistachio and cornel-trees, mehru-trees, semur-trees, tijatu-trees, Kanish oaks, willows, sadanu-trees, pomegranates, plum trees, fir trees, ingirasu-trees, kamesseru-pear trees, supurgillu-bearing

trees, fig trees, grape vines, angasu-pear trees, aromatic sumlalu-trees, titip-trees.... In the gardens in [Calah] they vied with each other in fragrance; the paths [in the garden were well kept], the irrigation weirs [distributed the water evenly]; its pomegranates glow in the pleasure garden like the stars in the sky, they are interwoven like grapes on the vine; ...in the pleasure garden...in the garden of happiness flourished like [cedar trees]....

.
 When Ashurnasirpal, king of Assyria, inaugurated the palace of Calah, a palace of joy and [erected with] great ingenuity, he invited into it Ashur, the great lord and the gods of his entire country, [he prepared a banquet of] 1000 fattened head of cattle, 1000 calves, 10000 stable sheep, 15000 lambs -- for my lady Ishtar [alone] 200 head of cattle [and] 1000 sihhu-sheep -- 1000 spring lambs, 500 stags, 500 gazelles, 1000 ducks, 500 geese, 500 kurku-geese, 1000 mesuku-birds, 1000 qaribu-birds, 10000 doves, 10000 sukanunu-doves, 10000 other [assorted] small birds, 10000 [assorted] fish, 10000 jerboa, 10000 [assorted] eggs,...10000 [jars of] beer, 10000 skins with wine, ...1000 wood crates with vegetables, 300 [containers with] oil, ...100 [containers with] fine mixed beer, ...100 pistachio cones,

When I inaugurated the palace at Calah I treated for ten days with food and drink 47074 persons, men and women, who were bid to come from across my entire country, [also] 5000 important persons, delegates from the country Suhu, from Hindana, Hattina, Hatti, Tyre, Sidon, Gurguma, Malida, Hubushka, Gilzana, Kuma [and] Musasir, [also] 16000 inhabitants of Calah from all ways of life, 1500 officials of all my palaces, altogether 69574 invited guests from all the [mentioned] countries including the people of Calah; I [furthermore] provided them with the means to clean and anoint themselves. I did them due honors and sent them back, healthy and happy, to their own countries (Pritchard 1973b,99-104).

See Figure 4.11-6 Frieze of Ashurnasirpal II.

4.11.8 Concluding Comments on Food Preparation

During the reign of Jeroboam II of Israel (2 Kings 14:23-25), the prophet Jonah was commanded to go to

Nineveh, and preach repentance. In the Hebrew text, Jonah 4:11 stated, "the great city in which there are more than 120,000 people . . ." Ashurnasirpal II (883-859 BCE) was king of Assyria at this time. Among the finds discovered in his palace which was excavated at Nimrud (a city located 20 miles from Nineveh) was an account of a menu he had given for a banquet when 70,000 people were fed. It supports the fact that cities of this time period were large.

Olive oil was important to the people in Israel and their neighbors. It was used to prepare food and it was commonly used for ritual offerings and sacrifices as indicated in the Hebrew text. It was also used to light small lamps so houses could be illuminated at night. In the Kingdoms of Israel, Judea, and Philistia the olive oil industry developed into a mass production industry during the ninth to the seventh centuries BCE. This was proven by the hundreds of typical and unique oil presses with central collection vats that were discovered from various sites that dated to this time period. In the Iron Age II, great improvements were made in the manufacturing process as well as in organization.

Other significant installations that were important in food preparation for the people of this time were winepresses. For grain there were large and small millstones. These installations were discovered in numerous excavated sites in Israel and Judah.



a. Polished deer astragali found at locus 1068 at Beth Shan

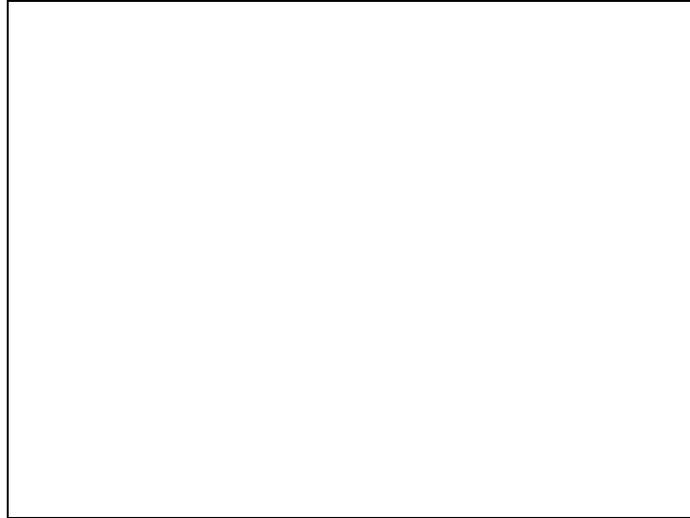


b. Polished antler tine (Beth-Shean VIII-VII locus 1068)

Figure 4.11-1



a. Grape press at Gath The name of the city in Hebrew is "gat," which means "winepress." This picture has an ancient winepress in the foreground, with the city behind. The area around Gath was very fertile and it's likely that the city had a number of winepresses. Archaeological excavations at Gath's neighbor, Ekron, found an abundance of oil presses on the site.



b. Basalt Grain Grinders Notice the various types of basalt grinders. The larger "hour-glass-shaped" ones (three are visible-left, above, and in the sunlight right of center) fit over a stationary cone (right of center in the shade). Note that the ones on the left and right have square depressions, into which wooden beams were placed. People then pushed horizontally on these beams to rotate the upper stone. The workers walked around the mill in a circle. The grain was inserted into a center hole on the top, and flour came out along the perimeter. Note the smaller grinders in the lower left portion of the picture. Capernaum is in a basalt region of the country. These grinders were probably "manufactured" here at Capernaum. ."

Figure 4.11-2

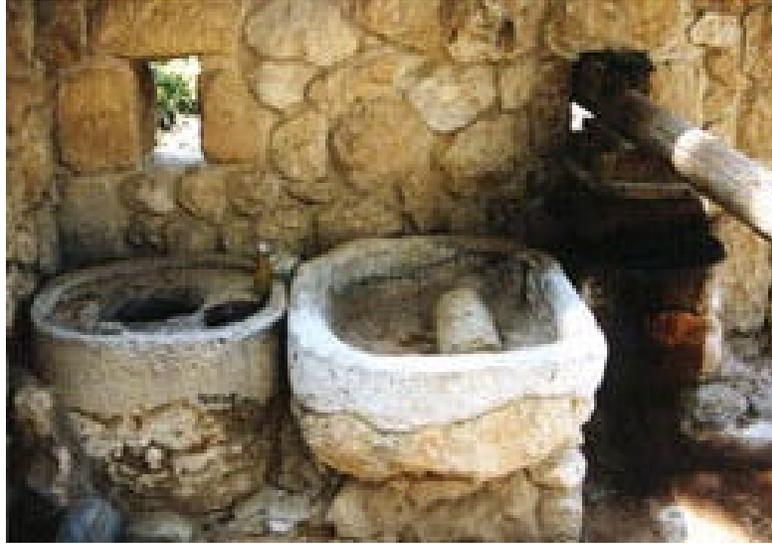


a. Basalt Millstone at Capernaum

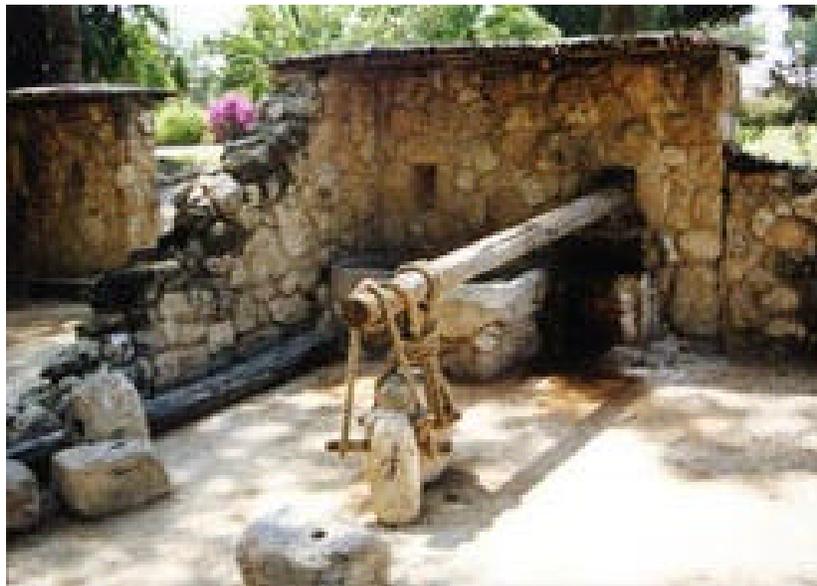


b. Olive Crushing Mill

Figure 4.11-3



a. Small Olive Press at Ekron Olives were crushed into mash by using a stone vessel like this one found at Ekron.



b. Large olive press at the Ekron Museum

Figure 4.11-4

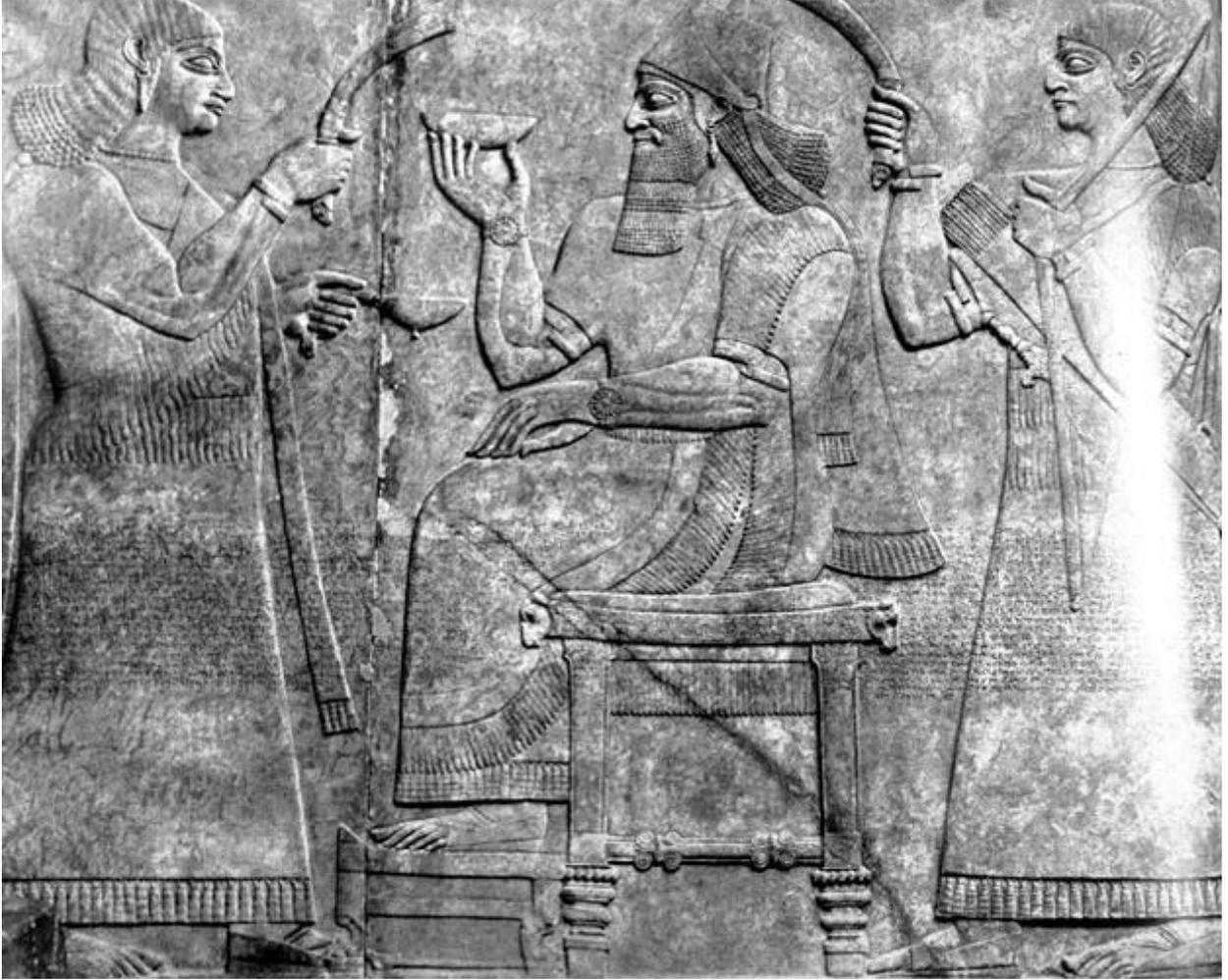


a. Storage Jars for olive oil Ekron was located in a major olive oil producing area. At its peak, the area supplied a high proportion of all the olive oil used in the region, much of it being shipped overseas. The jars were transported in ships, with the pointed bottoms placed in gravel. They were held upright by poles thrust through the loop handles



b. Ekron: Olive oil press (cultic installation) found at the temple.

Figure 4.11-5



Banquet Frieze showing Ashurnasirpal II

Figure 4.11-6