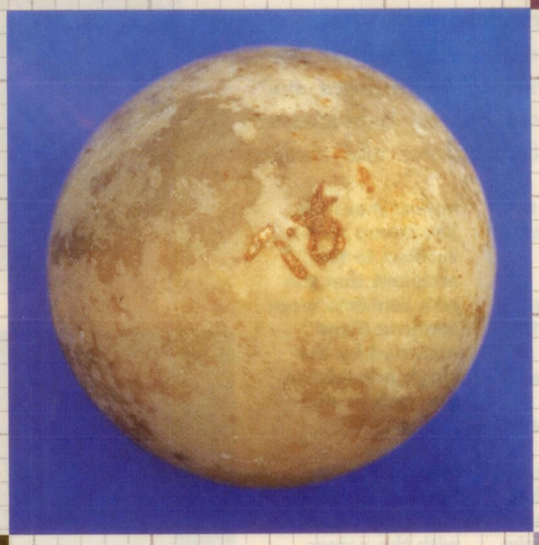
ESTABLISHING **WEIGHTS** AND **MEASURES** IN ANCIENT ISRAEL



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A STUDY OF THE SYSTEM OF WEIGHTS and measures of a nation (or "metrology") provides the foundation for understanding some of the factors that shaped the social and economic development of that nation. The systems of weights, measures of length, and measures of capacity in ancient Israel were related to the ancient metrological systems common in Mesopotamia. The ideal condition for trade and commerce in Israel and among ancient Near Eastern nations required an accurate system of weights and measures.

The Metrology of Ancient Israel

In Israel, the demands of the covenant required an honest use of weights and measures since members of the covenant community were to treat one another with respect. Honesty in merchandising is related to the injunction in the Decalogue that prohibits a person to covet that which belongs to another person.[1] This was the reason the laws of holiness in the Book of Leviticus urged the Israelites not to defraud each other: "Do not defraud your neighbor" (Lev. 19:13, NIV).[2]

The metrology of ancient Israel was derived from systems that originated in Mesopotamia, primarily in Babylon. As early as the third millennium B.C., the Babylonians had developed an elaborate system of weights and measures based on the sexagesimal system.[3] Today's division of hours into 60 minutes and minutes into 60 seconds is based on the Babylonian sexagesimal system. Because of commerce and trade, the Babylonian system of weights and measures made its way into Syria and Canaan.

Since the ancient patriarchs of Israel came from Mesopotamia, they possibly brought with them the system of weights and measures they previously used there. However, a reconstruction of this system is difficult. What

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Bronze lion weight from Nimrud; dated 726-722 B.C. The Akkadian inscription on the top reads: Palace of Shalmaneser King. The piece weighs 2,864 grams, about 6 lbs.

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Previous page, from top to bottom, left to right: A slate fragment of a cubit rod, from el-Amarna, in Lower Egypt; dated about 1350-1320 B.C. Remarkably, this rod shows the divisions at the beginning of a cubit—one finger, two fingers, three fingers, and one palm.

From ancient Ur; a carved stone with a handle; likely a weight; dated to Early Dynastic III, 2600-2400 B.C.

Five-shekel weight from Iron Age III (8th–6th centuries B.C.) The stone is inscribed with the Hebrew sign for shekel.

Jar from Lachish, dated to the 8th cent. B.C. Two of the handles are stamped with "lamelekh Hebron" meaning this was something from Hebron that belonged to the king (or his administration). The jar dates from the reign of Hezekiah, who was king of Judah about 715–686 B.C. Jars displaying the royal seal were used to collect taxes of grain, wine, and oil, among other things, for the king. The stamp (seal) assured an honest measure. The stamp also verified to the recipient that the jar's contents were confirmed and recorded by the king's administration before shipping.

Inscribed in Old Persian, Elamite, and Babylonian, with the names and titles of Darius I (521-486 B.C.). According to Old Persian and Elamite measures, the piece weighs two karsha, which is the equivalent of one third of a Babylonian mina. This polished diorite had a weight of 166 grams, or 5.9 oz.

the Bible has to teach about the metrology of ancient Israel must be adduced from archaeology, the biblical texts, and the literature of the ancient Near East.

Although the people of Israel used a system of weights and measures that was derived from Babylon, Israel's system was not the exact equivalent of the Babylonians'. Israel adapted Babylon's systems to meet its social and economic needs. Any attempt at comparing the biblical standards of weights and measures with contemporary standards is difficult if not impossible, since values change with the passage of time and modern American and British standards are radically different from Mesopotamian and biblical systems.

Lower left: This tablet lists in succession measures of capacity, weights, and measures of area and of length. It probably served as a textbook in the schools for teaching the measures and their units, as well as for the writing of numerals. The numerals were written in fractions, units, tens, and sixties, and multiples of these up to theoretical quantities—the highest being the equivalent of over 14-million gallons.

Below: An Old Babylonian record of a loan from the Shamash Temple at Sippar. In ancient Mesopotamia temples likely guarded the official weights and also served as storehouses of wealth, which they lent with interest.

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Weights and Measure in Israel

The terms Israel used to classify weights and measures came from items in everyday life. They derived measurements of length from the length of the limbs of the human body. The cubit was the distance between the end of one's elbow to the tip of the middle finger (approximately 18 inches). The span was measured from the tip of the thumb to the tip of the little finger while both are extended (half a cubit). Only once does the Old Testament use the finger as a unit of measurement (Jer. 52:21).

The names the Israelites used for measuring capacities were generally the terms they used for the receptacles that held the provisions. The *omer* (Lev. 27:16), a word derived from the Hebrew term for "donkey,"refers to a load the animal would carry. The *kor* (1 Kings. 4:22) was a container to measure flour, wheat, and barley. The kor was also a measurement for oil (5:11). The *letek* is a smaller container, equal to half a homer (Hos. 3:2). The Hebrew term *ephah* (Lev. 5:11) referred originally to a basket but later came to refer to a measure of flour, barley, and other grains. The *seah* was a container the Israelites used to measure grain (1 Sam. 25:18, NIV). The *bath* was used to measure liquids such as oil (Ezek. 45:14), water (1 Kings 7:26), and wine (Isa. 5:10).

Precious material and metals were weighed on balances with two scales. The weights were made of hard stones called *eben*, a Hebrew word that means "stone" and "weight." These stones were kept in a bag (Deut. 25:13; Mic. 6:11; Prov. 16:11). The Hebrew word that means "to weigh" is *shaqal*, which is the root for the word *shekel*. Thus, the shekel became the basic unit of weight. The value of the shekel was equivalent to the weight of 180 grains of wheat. Three kinds of shekels were in use in the Old Testament Era: the king's shekel or the royal standard (2 Sam. 14:26); the shekel of the sanctuary (Ex. 30:13); and the common shekel (Josh. 7:21). Genesis 23:16 speaks about the shekel "current among the merchants." Determining the value of this shekel is difficult, however, since many merchants had two kinds of weight, one for buying and one for selling.

Since the shekel was the basic measure of weight, determining its value is important.[4] This unit of weight was common to most societies in Mesopotamia. The Book of Ezekiel provides the value of the shekel: "The standard

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Above: A collection of stone and clay weights. In front, drop-shaped weights of 0.5 oz. (left), 1.2 oz. (right). Behind, conical weights of 3.5 oz (left); 0.8 oz. (right); and at far right, a domed weight, 0.2 oz. From el-Amarna, in Lower Egypt; dated 1350-1320 B.C.

unit for weight will be the silver shekel. One shekel will consist of twenty gerahs, and sixty shekels will be equal to one mina" (Ezek. 45:12, NLT). Another translation better reflects the Hebrew text: "The shekel is to consist of twenty gerahs. Twenty shekels plus twenty-five shekels plus fifteen shekels equal one mina" (NIV). This division of the mina into three different categories may indicate that people used weights of 25, 20, and 15 shekels.

The shekel had yet another value: "The silver obtained from those of the community who were counted in the census was 100 talents and 1,775 shekels, according to the sanctuary shekel–one beka per person, that is, half a shekel, according to the sanctuary shekel, from everyone who had crossed over to those counted, twenty years old or more, a total of 603,550 men" (Ex. 38:25-26, NIV).

Taking this information about the shekel of the sanctuary in Exodus 38:25-26, the value of the shekel is as follows: 1 talent was worth 60 minas; 1 mina was worth 50 shekels; and 1 shekel was worth 2 bekas [beqa's]. Using the information from the Book of Ezekiel, the value of the shekel is as follows: 1 talent was worth 60 minas, 1 mina was worth 60 shekels, and 1 shekel was worth 20 gerahs. Since Ezekiel was writing while in exile in Babylon, the value of the mina (60 shekels) corresponds to the value of the mina in Babylon during the exile.

Laws about Weights and Measures

Ensuring that a system of weights, measures of length, and the measures of capacity were fair required the sanction of authoritative law to make certain the weights and scales people used for buying and selling conformed to a standard set by the community.[5] The law about weights and measures in the Book of Deuteronomy was enacted in order to promote economic honesty in buying and selling: "You must not have two different weights in your bag, one heavy and one light. You must not have two differing dry measures in your house, a larger and a smaller. You must have a full and honest weight, a full and honest dry measure" (Deut. 25:13-15, HCSB). What the law forbade was the practice of employing a double set of stones or weights and different ephahs or dry measures, one used for buying and the other used for selling. Babylonian wisdom literature speaks of merchants who use different sets of weights.[6] Thus the law required that in buying and selling, the people of Israel had to use "a full and honest weight" and accurate ephahs. A similar law for just balances, just weights, just ephahs, and just hins is in the section of the Book of Leviticus commonly known as the Holiness Code: "You shall do no injustice in judgment, in measurement of length, weight, or volume. You shall have honest scales, honest weights, an honest ephah, and an honest hin" (Lev. 19:35-36, NKJV).

Israel's prophets accused the merchants of cheating people with dishonest scales, bags of deceitful weights, and making "the ephah small and the shekel great" (Amos 8:5; see Hos. 12:7; Mic. 6:10-11). Some biblical scholars believe that during his religious and economic reforms at the end of the eighth century B.C., Judah's King Hezekiah introduced official weights called *lmlk* weights, which helped standardize weights for Judah. The Hebrew word *lmlk* means "belonging to the king." Archaeologists have also uncovered jars, the handles of which bear a *lmlk* stamp. The stamped handles may indicate an attempt to establish uniform volume measurements as well.[7]

According to the law in Deuteronomy, dishonest scales were an abomination to the Lord. The word "abomination" occurs several times in Deuteronomy in passages dealing with moral and religious violations of God's law. In the Book of Proverbs, the word refers to the actions of a perverse individual in contrast to the action of a righteous person.[8] Since false weights and deceptive measures caused deception, any false dealing between members of the covenant community became an abomination to the Lord.

1. Walter C. Kaiser, Jr., *Toward Old Testament Ethics* (Grand Rapids: Zondervan, 1983), 136.
2. Unless otherwise indicated, all Scripture quotations are from the Revised Standard Version (RSV).
3. M. Pierce Matheney, "Weights and Measures" in *Holman Bible Dictionary*, ed. Trent C. Butler (Nashville: Holman Bible Publishers, 1991), 1403.
4. Roland de Vaux, *Ancient Israel* (Grand Rapids: Eerdmans, 1997), 203.
5. Ibid., 195.
6. W. G. Lambert, *Babylonian Wisdom Literature* (Winona Lake, IN: Eisenbrauns, 1996), p. 133, line 108.
7. John Bright, *A History of Israel* (Philadelphia: Westminster Press, 1981), 283.
8. Moshe Weinfeld, *Deuteronomy and the Deuteronomic School* (New York: Oxford Univ. Press, 1972), 268.

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TABLE OF WEIGHTS AND MEASURES

BIBLICAL UNIT	LANGUAGE	BIBLICAL MEASURE	U.S. EQUVALENT	VARIOUS TRANSLATIONS
WEIGHTS				
Gerah	Hebrew	1/20 shekel	1/50 ounce	gerah; oboli
Beqa'	Hebrew	1/2 shekel or 10 gerahs	1/5 ounce	bekah; half a shekel; quarter ounce; fifty cents
Pim	Hebrew	2/3 shekel	1/3 ounce	2/3 of a shekel; quarter
Shekel	Hebrew	2 bekahs	2/5 ounce	shekel; piece; dollar; fifty dollars
Litra (pound)	Greco-Roman	30 shekels	12 ounces	pound; pounds
Mina	Hebrew/Greek	50 shekels	1 1/4 pounds	mina; pound
Talent	Hebrew/Greek	3,000 shekels or 60 minas	75 pounds/ 88 pounds	talent/talents; 100 pounds
LENGTH				
Handbreadth	Hebrew	1/6 cubit or 1/3 span	3 inches	handbreadth; three inches; four inches
Span	Hebrew	1/2 cubit or 3 handbreadths	9 inches	span
Cubit/Pechys	Hebrew/Greek	2 spans	18 inches	cubit/cubits; yard; half a yard; foot
Fathom	Greco-Roman	4 cubits	2 yards	fathom; six feet
Kalamos	Greco-Roman	6 cubits	3 yards	rod; reed; measuring rod
Stadion	Greco-Roman	1/8 million or 400 cubits	1/8 mile	miles; furlongs; race
Milion	Greco-Roman	8 stadia	1,620 yards	mile
DRY MEASURE				
Xestes	Greco-Roman	1/2 cab	1 1/6 pints	pots; pitchers; kettles; copper pots; copper bowls; vessels of bronze
Cab	Hebrew	1/18 ephah	1 quart	cab; kab
Choinix	Greco-Roman	1/18 ephah	1 quart	measure; quart
Omer	Hebrew	1/10 ephah	2 quarts	omer; tenth of a deal; tenth of an ephah; six pints
Seah/Saton	Hebrew/Greek	1/3 ephah	7 quarts	measures; pecks; large amounts
Modios	Greco-Roman	4 omers	1 peck or 1/4 bushel	bushel; bowl; peck-measure; corn-measure; meal-tub
Ephah [Bath]	Hebrew	10 omers	3/5 bushel	bushel; peck; deal; part; measure; six pints; seven pints
Letek	Hebrew	5 ephahs	3 bushels	half homer; half sack
Kor [Homer]/ Koros	Hebrew/Greek	10 ephahs	6 bushels or 200 quarts	cor; homer; sack; measures; bushels
LIQUID MEASURES				
Log	Hebrew	1/72 bath	1/3 quart	log; pint; cotulus
Xestes	Greco-Roman	1/8 hin	1 1/6 pints	pots; pitchers; kettles; copper pots; copper bowls; vessels of bronze
Hin	Hebrew	1/6 bath	1 gallon or 4 quarts	hin; pints
Bath/Batos	Hebrew/Greek	1 ephah	6 gallons	gallon(s); barrels; liquid measure/gallons
Metretes	Greco-Roman	10 hins	10 gallons	firkins; gallons

Adopted from *Holman Illustrated Bible Dictionary*; gen. ed. Chad Brand, Charles Draper, and Archie England (Nashville: Holman Bible Publishers, 2003), 1666-67.