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Beer and Its Drinkers: An Ancient Near Eastern Love Story

by Michael M. Homan

While it may not be the world's oldest profession, beer brewing has been around for a very long time.¹ Residue on fourth millennium BCE ceramics from Godin Tepe in the Zagros Mountains provides the earliest known chemical evidence for beer production,² though beer was clearly brewed long before this. Some have even argued that it was humanity's thirst for beer rather than a hunger for bread that motivated the domestication of cereals ca. 9500–8000 BCE.³ Beer was a dietary staple rich in carbohydrates, vitamins and proteins, and because the alcohol killed many detrimental microorganisms, it was safer to drink than water. Moreover, as malting increased the caloric value of cereals, practitioners of early beer production were making the most of their harvest. But best of all, drinking beer “makes the liver happy, fills the heart with joy,” as is eloquently recorded in the Sumerian Hymn to Ninkasi (ca. 1800 BCE), the Sumerian goddess of beer.⁴

Modern scholars have frequently downplayed and neglected beer's importance in the ancient Near East, focusing instead on wine and viticulture. This is especially true for the region of Syria-Palestine, with the result that beer's role in ancient Near Eastern history and in the Hebrew Bible in particular, is not well understood. Moreover, people in antiquity frequently combined fruits and malted cereals to produce alcohol, often fermenting whatever they could get their hands on. So the labels “wine” or “beer” do not always accurately reflect either the mixture of ingredients in certain beverages or the ways in which their imbibers classified them. Nevertheless, there is clear evidence in the archaeological record of beer production and beer consumption that tells us of the enduring popularity of one of humanity's oldest indulgences.

“ Beer is proof that God loves us and wants us to be happy. ”
-Benjamin Franklin

Beer's Bad Rep

Beer had an integral role in religious observance in the ancient Near East. In addition to Ninkasi, several other deities were linked to beer and beer production, including Siris, Dumuzi, Enlil, Inanna, Hathor, Menqet, Dionysus and Ceres. Beer was often poured as a libation and offered to the gods to quench their thirsts,

and one type of Ur III animal sacrifice was known as a “beer pouring.”⁵ Literary evidence reveals that prophets from Mari consumed beer to induce ecstatic states.⁶ Many temples even had their own brewers. Even Yahweh can be said to have been a heavy beer drinker, as four *hins* (ca. 16 liters) of beer (Hebrew *šēkār*) were presented to him weekly (Num 28:7–10).⁷

In spite of all of these sacred associations, many scholars, influenced more by its modern reputation than by its ancient status, have exhibited both a disdain for beer and an exaggerated belief that wine had a superior standing in antiquity. For example, in commenting on the incident in Genesis (14:18) where Melchizedek offers bread and wine to Abraham, Jack Sasson writes that “it would have been uncivilized in that area of antiquity to present any other beverage—beer, water or milk.”⁸ With further evident bias of Western scholarship, several authors associate beer with loutishness and wine with civility. William F. Albright claimed that the Philistine material culture matched the biblical text in this respect. When he labeled one common Philistine pottery form the “beer-jug,” he argued that its abundance at Philistine sites corresponded to the biblical portrayal of the Philistines as “carousers,” especially when compared to Israelite characters such as Samson who abstained from alcohol due to his Nazirite vows.⁹ In response, Lawrence Stager defends the Philistines as sophisticated connoisseurs of wine, and in doing so, he inaccurately correlates beer drinking with thuggery and uncouth behavior.¹⁰ There are also several cases in which ancient Mesopotamian writings clearly reference beer (*šikaru*), but scholars chose to translate the term as “wine” or “strong drink,” apparently to avoid denigrating the imbibers.¹¹

Beer did not have a bad reputation prior to the Classical period; moreover, the degree to which beer was disdained by



This 5th Dynasty (ca. 2500 BCE) model depicts an Egyptian woman mixing and filtering bread and water to produce beer. Ecclesiastes 11:1–2, which calls for the readers to “throw their bread upon the face of the water,” is actually an allusion to the process of making beer. The combination of malted bread and water forms a sweet liquid that brewers call “wort,” which is fermented by airborne yeast. The alcohol content of ancient brews was between two to three percent, compared with most modern beers at five percent alcohol or higher. (Photo courtesy of Nimatallah/Art Resource.)

Beer's Place in Ancient Near Eastern Society

According to the *Epic of Gilgamesh*, beer drinking (along with sex, food and oil-rubs) is part of what makes us human:

Enkidu does not know of eating food; of beer to drink he has not been taught. The prostitute opened her mouth. She said to Enkidu, “Eat the food Enkidu, [it is] the luster of life. Drink the beer as is done in this land.” Enkidu ate the food until he was sated; of the beer he drank seven cups. His soul became free and cheerful, his heart rejoiced, his face glowed. He rubbed [...]; his hairy body. He anointed himself with oil. He became human. (Old Babylonian version, 2.3.6–25)

Beer was the national drink in both Egypt and Mesopotamia, and was consumed by all classes in society. Beer's popularity in these regions was in part due to climactic and agricultural reasons, as grapes were more difficult to produce than cereals. Thus, wine often had to be imported from areas such as Palestine, Phoenicia and Greece. In Egypt, beer was considered a primary food. Similarly, the phrase “bread and beer” was a metaphor for food and drink throughout much of Mesopotamian history.

Wages and bride-prices in Egypt and Mesopotamia were often paid in beer.¹² It was used medicinally and cosmetically, prescribed for constipation, stomach ailments, coughs, swollen eyes and was even used in enemas. Hammurapi legislated the price and strength of beer in his law code (lines 108–109). Beer provided part of the ingredients for festivities and was served at a variety of celebrations. It was used as a catalyst for breaking down social barriers.¹³

In Mesopotamia, beer taverns were associated with music and prostitution, and in one Sumerian poem, Inanna's genitals are described as being as “sweet as beer.” The association of women and beer in this literature no doubt reflects the fact that women played a major role in the early stages of beer production in antiquity and, while most Sumerian deities for crafts were male, the beer deity, Ninkasi was female. Additionally, the erudite Siduri who gives advice to Gilgamesh was a beer-maid. This gender association seems to have partially changed in Mesopotamia after the Old Babylonian period, when a mass production industry was implemented and males began to dominate the state-run business. Even so, women continued to produce beer on a smaller scale in their homes.

classical authors has been greatly exaggerated. Some sources do negatively connote beer and its drinkers. Thus, Aeschylus characterizes Egyptian beer drinkers as unmanly (*Suppliants*, 953). Aristotle, in his treatise *On Drunkenness*, is reported to have claimed that “men who are intoxicated with wine fall down face first, whereas those who have drunk barley beer lie stretched out on their backs; for wine makes one top-heavy, while beer stupefies” (Athenaeus, *Deipnosophists*, 1.34b and 10.447a–b). Athenaeus writes that in Egypt, beer “was invented to help those who could not afford wine” (*Deipnosophists*).

Nevertheless, it must be acknowledged that these classical authors and their audiences were knowledgeable of beer. Beer, according to Strabo, is a “common drink to many peoples, although the ways of preparing it are different” (*Geography* 17.2.5). We know that the Minoans drank barley beer based on three pieces of evidence: several drinking vessels are decorated with depictions of barley, ideograms at times combine drinking bowls with barley ears, and the chemical analysis of Minoan ceramics reveals residues of barley beer.¹⁴ The Romans and Greeks drank beer as well, and there are positive portrayals of beer in classical literature. For example, Diodorus of Sicily writes “the Egyptians also make a drink out of barley called *zythos*, the smell and sweetness in taste make it not much inferior to wine” (*Library of History* 1.34.10). Beer is also used in several Roman medical prescriptions (Antyllus, *Corpus Medicorum Graecorum* 6.2.2, 128.28–35; Philumenus, *Corpus*, 11.1.1, 22.21–24; Marcellus Empiricus, 16.33), and frequently listed as spoils of war (e.g., Pliny, *NH* 8.7).

Beer and Archaeology

Unlike wine, beer does not improve with age and it is typically consumed immediately. We would, therefore, expect beer to appear less frequently than wine on ancient economic documents, because, as a general rule, people traded wine and grain as opposed to beer and grapes (e.g., Homer, *Odyssey*, 2.379–80). For the same reason, jars with seal inscriptions labeling wine far outnumber those of beer. Beer was rarely stored for more than a few weeks, and the entire process of brewing could be achieved with a single jar. Therefore, beer is more difficult to detect chemically in pottery residues, as opposed to wine, which would often be stored for years in the same vessel. Additionally, calcium oxalate (a.k.a. beerstone), a chemical compound that identifies beer, is more difficult to detect than tartaric acid, a chemical residue from grapes. Thus, it is in the literature, rather than in the archaeology and economic records of the ancient Near East, that beer leaves its greatest mark. The manufacture and consumption of beer occasionally leave traces in the material record, however, even though they are certainly less in number than artifacts associated with wine production.

Straws and Straw-Tip Strainers

People in the ancient Near East often drank beer through straws. This practice finds parallels today in Africa and Vietnam, and is done for a variety of reasons. Straws filtered out the barley husks and stalks, most of which would float on the

drink's surface. The use of straws reduced the amount of insects that might enter one's mouth, especially if the drinking took place at night.¹⁵ Additionally, drinking alcoholic beverages with a straw enables the imbiber to feel the effects of the alcohol more rapidly.

Xenophon mentions straws and their function when describing an underground Armenian house:

Here were also wheat, barley, and beans, and barley-wine (*oinos krithinos*) in large bowls. Floating on the top of this drink were the barley-husks and straws (*kalamoi*) were in it, some larger and others smaller, without joints; and when one was thirsty, he had to take these straws into his mouth and suck. It was a very strong drink unless one diluted it with water, and very good when one was accustomed to it. (*Anabasis*, 4.5.26–27)

The Enuma Elish refers to the gods drinking beer through a tube or pipe (Tablet III). Similarly, when the goddess Ninhursag desires beer in *Atrahasis* 3.4.20, the gods filled their “pipes.” Straws for alcohol are also mentioned in the Talmud (*Sot* 18a). Drinking beer through straws is a frequent subject of cylinder seals and relief.

Most straws were composed of organic reeds, which rarely survive in the material record; yet, many metal ones have survived, though none have thus far been discovered in Syria-Palestine. Much more common in the archaeological record are the strainer tips attached to the bottom of the straws. Bone and/or metal strainer-tips have been found in Middle Bronze Age, Late Bronze Age, and Iron Age contexts in Israel (Gesher, Sasa, Kabri, Tel el-Ajjul, Gezer, Tel Qiri and Megiddo), Syria (Alalakh, Emar), and Egypt (Tel Amarna).¹⁶ Such strainer-tips could be used for all types of beverages, though based on textual and pictorial records they are often employed for imbibing beer.

Beer Bottles, Bread Molds and Flowerpots

A common form of Egyptian pottery, and one that has clear affiliations with beer, is known as a “beer bottle,” or alternatively, “beer jar.” This is a globular-based vessel with a narrow neck used to store fermented beer throughout much of ancient Egyptian history. Their function is clear from their depictions on paintings and models of breweries, and a Middle Bronze Age tomb at Riqqa that contained a beer bottle with the inscription “beer” (*ḥnqt*).¹⁷ Beer bottles have been found at several sites in Palestine, including large quantities at Deir el-Balah, Beth Shean and Tel Mor. At Tel Mor, approximately fifty fragmentary beer jars were found in strata ranging from the fourteenth to the early twelfth centuries BCE.¹⁸

Owing to the similarities involved in producing bread and beer, many pottery forms involved in bread baking were also

“Beer jugs,” or more properly “side-spouted sieve jugs,” were designed so that the consumer could grasp the handle in his or her right hand and place the spout to his or her lips, and then drink the filtered alcoholic beverage. Whether they held wine, beer, or a combination is currently debated. (Photo courtesy of Erich Lessing/Art Resource.)

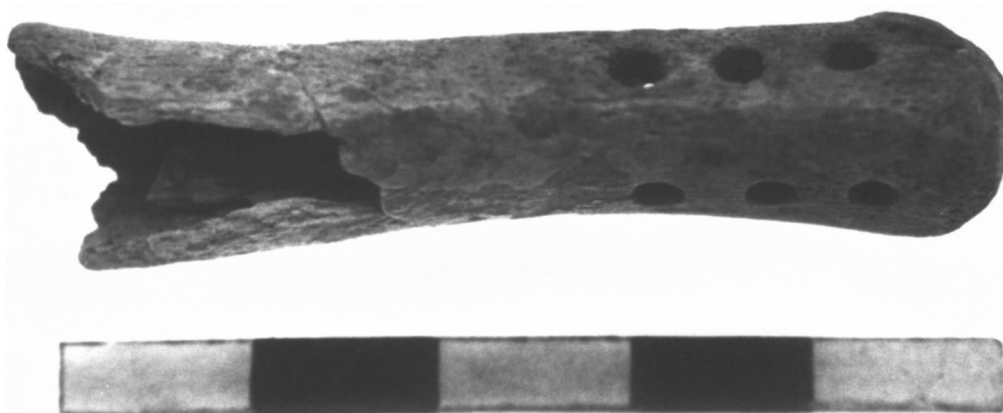




These copper alloy straw-tip strainers were discovered at Emar in Syria and date to the end of the Late Bronze Age (ca. 1300–1150 BCE). (Photo courtesy of Erich Lessing/Art Resource.)

employed in producing the barley cakes used in brewing beer. Such seems to be the case with bread molds and flowerpots, so named because of their perforated bases, and they are often found in association with beer production. At Beth Shean, there is an interesting transition from flowerpots in the 18th Dynasty of Egypt to beer bottles in the 19th and 20th Dynasties. In Level IX (second half of the fifteenth to fourteenth centuries BCE) there are only flowerpots on the site. In Level VIII–VI (thirteenth to twelfth centuries BCE/Ramesside era) only beer bottles appear.¹⁹ At times, beer bottles are also found with perforations.

Prototypes of bread molds were used in producing bread and beer throughout the Fertile Crescent from the beginning of history, with forms including the Old Kingdom bread molds (*bedja*) and possibly Mesopotamian beveled rim bowls from the Uruk period (ca. 4000–3100 BCE), though these bowls do not have the characteristic hole in the base. Thus, in the Early Bronze I period in southern Canaan at 'En Besor, baking molds and a vat were used in beer production. As depicted on various models and the second register on



This bone straw-tip strainer was discovered at Gesher and dates to the Middle Bronze Age II period. These artifacts are common in the archaeological record and bone and/or metal strainer-tips have been found in Middle Bronze, Late Bronze and Iron Age contexts in Israel and Egypt. Such strainer-tips could be used for all types of beverages, though based on textual and pictorial records they are often employed for imbibing beer. (Photo courtesy of Y. Garfinkel.)

Ti's tomb, bread molds and flowerpots were heated in fires, after which a batter was poured into them to bake. The molds were preheated to prevent the bread sticking to the ceramics. The bread molds became narrower over time and their walls grew thinner because the long narrow bread heated more quickly. The hole in the base of the flowerpots (and at times in the beer bottles) allowed the easy removal of the bread or, alternatively, the flowerpots were used to strain beer.

Aside from the flowerpots, the function of jars and bowls with perforated bases remains unclear. While many may have been used as funnels or drainpipes, others seem to have



The ceramic form known as a "beer bottle," when found in Syro-Palestinian contexts, typically indicates an Egyptian affiliation dating to the 18th–20th Dynasties (ca. fourteenth–twelfth centuries BCE). While some beer bottles stored beer, others had perforations in their base, as in these examples from Tel Mor. These were made so that the bottom could be grasped easily and may have been used

to bake barley bread. The brewer would expel the baked bread by placing a finger inside the perforation, thus pushing the bread out through the mouth. They would then mix the bread with water to produce beer. (Photo courtesy of T. Barako.)



been involved in beer production. Several large hole-based jars seem to have been the primary fermentation vat, such as the *gakkul* vat in Mesopotamia. The hole was stopped up tightly with cloth, the ingredients were added, and the lid was then sealed. As the pressure built, the fermented beer slowly dripped out of the jar's perforated bottom. There are several textual references to both the hole, deemed an "eye," as well as the dripping sound as the beverage fermented and beer was exuded.²⁰ The bowls with perforated bases were involved in mixing beer bread with water, and mashing the barley-paste through the strained hole into a larger receptacle jar, where fermentation would occur. Such bowls are often depicted in Egyptian brewing scenes, especially in Ti's tomb. Also, Petrie

excavated a perforated bowl that contained the remains of a pressed cake of barley mash and grains at Rifeh.²¹

Fermentation Stoppers

Fermentation stoppers were commonly used in the production of alcohol, and they are frequently found in the Syro-Palestinian archaeological record, especially in Iron Age contexts. They are round unfired clay objects with a small vertical perforation (the hole about ten millimeters in diameter) that would be placed on the mouth of a jar, and when cloth was densely packed inside the clay stopper's hole, it allowed gasses to escape during the fermentation process but prevented microorganisms from entering that would spoil the brew. Traditionally, excavators have misidentified these objects as weights used to keep warps straight in vertical looms, but, vertical warp weighted looms were rare in the ancient Near East, as opposed to the commonly-used horizontal loom, which, however, was not weighted.

Shape and size are useful indicators in distinguishing loom weights from fermentation stoppers. Known loom weights are often pyriform in shape, and relatively small in size, typically weighing less than two hundred grams.²² Fermentation stoppers, on the other hand, are most often round, and average four to five hundred grams, with a diameter typically in the range of eighty to one hundred millimeters, though they can be much larger.²³ Two massive fermentation stoppers from Zeitah (Tel Zayit) weighed 780 and 880 grams respectively, and measured 108.7 and 125.8 millimeters in diameter.²⁴ Yet another indicator is wear. Loom weights tied with string most often show wear markings alongside the holes. Such markings are usually absent in fermentation stoppers. Moreover, some fermentation stoppers at Zeitah contained the remains of cloth strands preserved



One fermentation stopper from Zeitah was found inside of a broken jar, as seen here. The context is a stratigraphically sealed pit that functioned as part of a building that was destroyed sometime in the mid-to-late ninth century BCE. (Photo courtesy of R. E. Tappy and the Zeitah Excavations, sponsored by the Pittsburgh Theological Seminary.)



These fermentation stoppers were discovered at Zeitah, and date to the tenth–ninth century BCE. Fermentation stoppers were placed on the mouth of a jar, and when cloth was densely packed inside the clay stopper's hole, it allowed gasses to escape during the fermentation process but prevented micro-organisms from entering that would spoil the brew. Traditionally, excavators have misidentified these objects as weights used to keep warps straight in vertical looms. (Photo by M. Homan courtesy of R. E. Tappy.)

inside the holes. Some have argued that the large size of these objects only meant that they were used to produce heavier or courser fabrics.²⁵ However, their function in the production of alcohol seems clear, as some fermentation stoppers have even been found *in situ*, resting upon the mouth of the jar, as was the case for three jars at Tell el-Hammah.²⁶ The first of these was a hippo storage jar that contained the carbonized contents of crushed wheat. The second was a hole-mouth jar that also contained the carbonized remains of crushed wheat. The third jar was an *amphoriskos*, from which no contents were retrieved.²⁷ The presence of wheat in the first two jars documents that the fermentation stoppers were at times used for beer production, and not limited to wine. Thus the term “fermentation stopper” is preferable to other terms currently used, such as “loom weight stopper” or “wine-jar stopper.”

While not found resting upon the mouth, an intact fermentation stopper at Zeitah was found inside of a broken jar resting upon the ceramic base. Further inquiry into the identification and the purpose of fermentation stoppers is necessary, partly because hundreds of these objects have been misidentified as loom weights, and partly to determine more completely the contents of the jars that the fermentation stoppers covered. Most likely, the fermentation stoppers were used to ferment beer, wine and grog.

Beer Jugs

It has been noted that the Philistine ceramic assemblage almost entirely revolves around imbibing.²⁸ One of the most famous and distinctive forms of this assemblage is the side-spouted sieve jug, commonly referred to as the Philistine “beer jug.”

How to Make Ancient Beer

Modern beers are typically flavored with hops, a practice originating in Medieval times. Thus, ancient beers taste quite different than modern varieties, though not surprisingly, ancient beers taste like water and malted barley or wheat, depending on which cereal one chooses. During a recent sojourn at the Albright Institute of Archaeological Research in Jerusalem, I followed several ancient Near Eastern texts that record beer recipes and produced many varieties of beers similar to those consumed in antiquity. I started in October by planting barley in the Albright garden, and harvested the large plants in February when the cereal was ripe. I winnowed the barley to remove the chaff, and then dehusked the grain. To convert the grain's starches to sugars, it was necessary to malt the grain, which I did by dampening the kernels. After three days, the grain began to show signs of germination. I next ground my germinating grain, formed small cakes of bread, and

These vessels contain filtered spouts with a handle at a ninety-degree angle, and thus it seems they were used for personal drinking rather than serving (where the handle would be one hundred-eighty degrees from the spout). This Philistine form



The mouth of this hippo storage jar from Tell el-Hammah was covered by a fermentation stopper, found *in situ*. The carbonized remains of crushed wheat found inside the jar show that it was used to produce beer. This locus (119) is a destruction layer attributed to the tenth century BCE. (Photo by I. Sztulman courtesy of J. M. Cahill.)

baked them at 250° F for two hours. The heat caramelized some of the sugars and created the sweet malt taste. Next, I placed the baked malted barley cakes into an open vat of water, as was the custom in ancient beer production. This is similar to the beer-making instructions found in Eccl 11:1–2, which calls for the readers to “throw their bread upon the face of the water.”²⁹ Such a combination of malted bread and water form a sweet liquid that brewers call “wort.” Then I simply waited for airborne yeast to begin fermenting the wort, which happened after about two days, as at that time, I noticed a thin layer of bubbles and foam began to form on the liquid's surface. Three days later, the fermentation was complete, and the beer was ready to be consumed, either plain or flavored with items such as dates, grapes, raisins, honey and cinnamon. The alcohol content of my beer, as with ancient brews, was between two to three percent, compared with most modern beers at five percent alcohol or higher.

This New Kingdom model depicts Egyptians brewing beer. The fire is used to bake the bread, which is then mixed with water, filtered, and stored in jars that are sealed with a ceramic lid and mud/clay on the outside. (Photo courtesy of Erich Lessing/Art Resource.)



is ultimately derived from Aegean Mycenaean IIIc prototypes, and similar forms have also been found at sites on Cyprus and in Phrygia with signs of Mycenaean material culture. The form has several variations, and is found throughout ancient Israel during the Iron Age. Thus, if the beer jug did indeed hold alcoholic beverages made from fermented cereal malt, than beer was imbibed in large quantities in ancient Israel, judging from the form's proliferation.

However, most scholars today claim that the strainer jugs were used to consume wine, not beer. This argument stems primarily from the immense wine industry present in the Iron Age strata at Ashkelon. The vessels were used to consume the beverage rather than to store it, and thus far, residue analysis on the forms unfortunately has been inconclusive. However, it must be noted that several beer jugs were found in the Gordion tombs, and while residues have not been detected in the actual beer jugs, storage vessels used in the same feast have been determined to have held a mixture of beer, wine and mead.¹⁰ One other piece of evidence has gone largely ignored. The

Greek poet Archilochos compared Phrygians drinking beer through a tube to fellatio (Athenaeus, *Deipnosophists*, 10.447), which best fits the shape of the spouts on the Iron Age jugs.¹¹ It would seem that the beer jug was used by consumers of both wine and beer, as well as those who preferred a mixture.

Biblical Beer?

While beer has not often been the subject of inquiry by Near Eastern scholars, its neglect by biblical scholars has been particularly marked. It is true that ancient Israelites are seen as, and undoubtedly were, wine lovers. The many words for wine in the Hebrew language are evidence of this.¹² The Talmud records that "stores of beer in Babylon are like stores of wine in Palestine" (*b. Pesah* 8a). Wines from various regions in Israel were as famous in antiquity as they are today.¹³ Additionally, wine is more difficult to produce than beer. Viticulture requires permanent fields and some degree of social complexity. Grapes ripen just once a year and can only be preserved as wine or raisins. Barley, however, is easily stored, which allows the



production of beer year-round. Yet, the fact that ancient Israel produced, consumed and cherished wine by no means precludes beer production. Though often mistranslated as “strong drink” or “wine,” linguistic and archaeological evidence suggests that biblical *šēkār* is best translated as beer. *Šēkār*, or beer, played a large role in Israelite religion and society. It was libated to Yahweh twice daily (Num 28:7–10), and Israelites drank it at sacrificial meals (Deut 14:26). While people who consumed beer in excess were condemned (Isa 5:11; 28:7; Prov 20:1; 31:4), its absence signified a melancholy occasion (Isa 24:9), and it was prescribed to the forlorn to temporarily erase their tribulations (Prov 31:6). Ancient Israel, like its neighbors, produced and consumed massive quantities of beer.

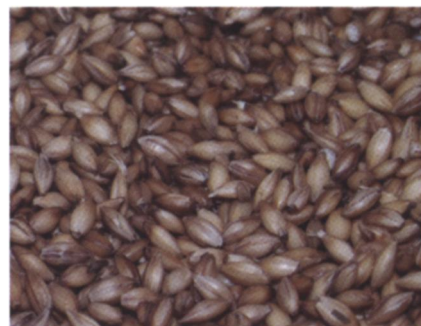
Notes

1. Much of the research for this article took place at the W. F. Albright Institute of Archaeological Research, where I was a 2000–2001 United States Information Agency Fellow. I owe the director, staff, and board members my gratitude. Additional thanks are due to Robert Mullins, Tristan Barako, William Propp, Jane Cahill, Ron Tappy, and Oded Borowski for examining earlier drafts of this article.
2. Michel and Badler (1992: 24).



▲ This 18th Dynasty (ca. 1350 BCE) stela from Egypt depicts a Semitic man drinking through a straw. People in the ancient Near East often drank beer through straws for a variety of reasons. Straws filtered out the barley husks and stalks, most of which would float on the drink’s surface and reduced the amount of insects that might enter one’s mouth. (Photo courtesy of Bildarchiv Preussischer Kulturbesitz/Art Resource.)

◀ Several ancient Near Eastern plaques, such as this Old Babylonian example (ca. 1800 BCE) in the British Museum, depict women bending over and drinking beer through a straw while simultaneously engaging in sexual intercourse with a man. This may have to do with the association of beer taverns with prostitutes indicated in Mesopotamian texts. (Photo courtesy of HIP/Art Resource.)



When barley begins to germinate, as shown (notice the white sprouts), the starches are converted to sugars. Then the barley is either baked in bread or roasted to form malted grains used in beer production. (Photo by the author.)



The most complete portrait of beer production comes from a 5th Dynasty painting in the tomb of Ti, an Egyptian official at Saqqara. Shown here are the complete panel (left), and close-ups of people heating the pottery (top left), baking and extracting bread in what appear to be vessels similar to beer bottles and flowerpots (top right) and pouring the beer into containers to be sealed (bottom). (Photos courtesy of T. Benderitter.)

3. Katz and Voigt (1986: 23–34).
4. Civil (1964: 67). In ancient Near Eastern thought, livers controlled emotions and hearts were responsible for cognition.
5. Fleming (1992: 142) Deheselle (1994: 24–38), Postgate (1992: 120, 313 n. 182).
6. Huffmon (1992: 479).
7. For *šēkār* as “beer,” see Homan (2004: 25–38).
8. Sasson (1994: 402).
9. Albright (1949: 115).
10. Stager (1995: 345; 1996: 64, 68).
11. See for example ANET 66 (Enuma Elish), 77 (Gilgamesh), and 170 (Hammurapi’s Code).
12. Samuel (1999: 121–44).
13. Walsh (2000: 13–29), Joffe (1998: 297–322).
14. Pain (1999: 54–57).
15. Dalley (1984: 89).
16. Maeir and Garfinkel (1992: 218–23).
17. Szafranski (1998: 96).
18. Martin and Barako (in press).
19. Mullins (2002, in press)
20. Delougaz (1952: pls. 194, 195), Civil (1964: 83–84).
21. Petrie (1907: 23).
22. Broudy (1979: 23–27).
23. Gal (1989: 281–83).
24. Personal communication with project director R. E. Tappy.
25. Shamir (1997: 1*–8*)
26. Cahill, Tarler, and Lipovich (1989: 36), cf. Friend (1998: 5), who claims the objects were originally loom weights, but after they were broken they were reused as stoppers.

27. Field numbers 2158, 2165, 3806, resp.; personal communication, J. M. Cahill.
28. Joffe (1999: 27).
29. Homan (2002: 121–44).
30. McGovern (2003: 279–98).
31. Sams (1977: 109).
32. Brown (1969: 146–70).
33. Lutz (1922: 22–36).

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