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The Beginnings of Agriculture: The Ancient Near East and North Africa

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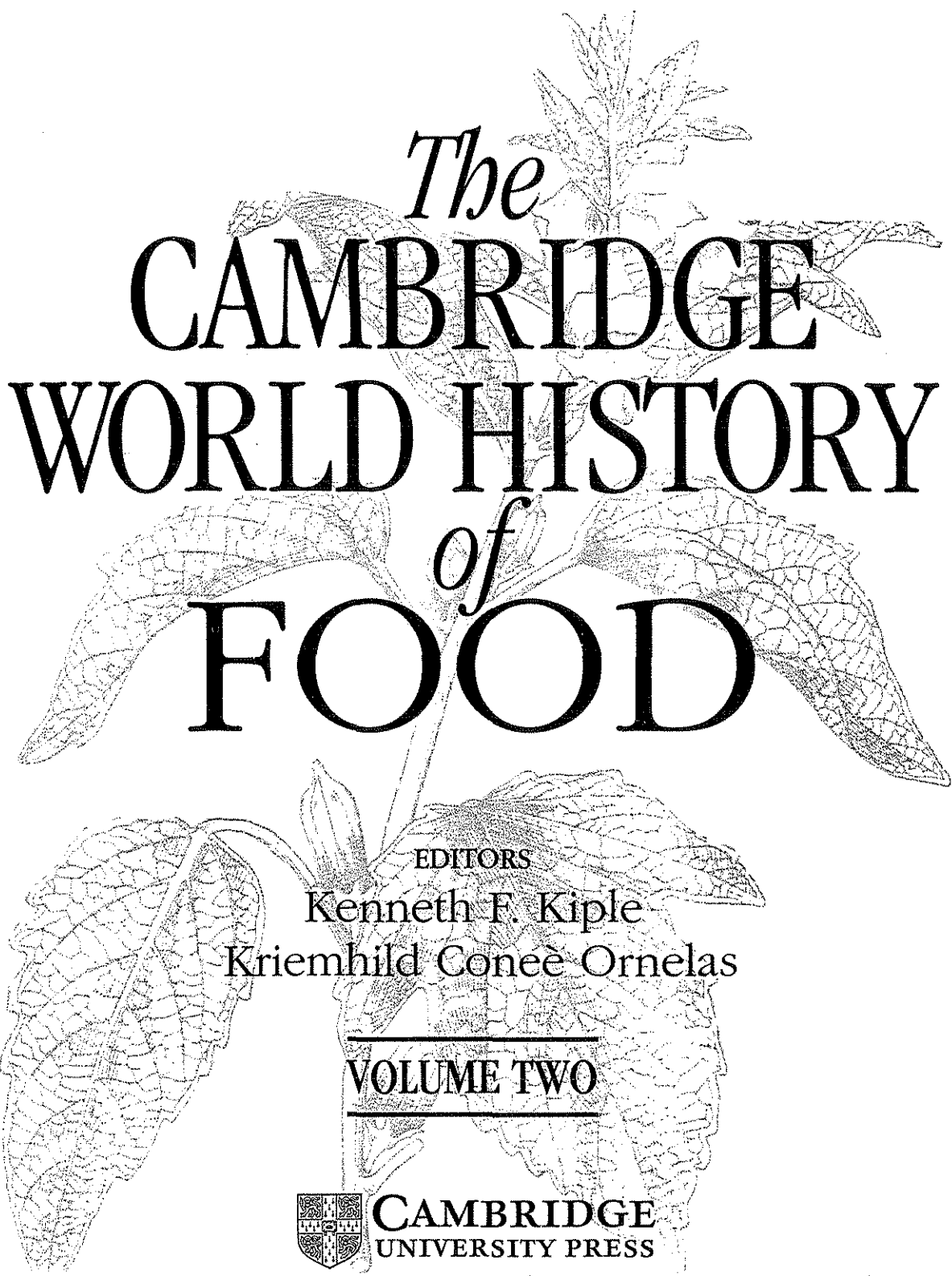
The Beginnings of Agriculture: The Ancient Near East and North Africa

Abstract

The Sumerians may have said it best: “Food: That’s the thing! Drink: That’s the thing!” (Gordon 1959: 142). From bread and beer to wine and cheese, the people of the ancient Near East and North Africa developed a rich cuisine based on a set of crops and livestock domesticated in Southwest Asia, and a sophisticated technology of food preparation and preservation. This chapter traces the history of diet and food of hunter-gatherers who lived at the end of the Stone Age in the Near East and North Africa, the impact of the development and the spread of agriculture, and the social context of food and drink in early Mesopotamian and Egyptian civilization.

Disciplines

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The Beginnings of Agriculture: The Ancient Near East and North Africa

The Sumerians may have said it best: "Food: That's the thing! Drink: That's the thing!" (Gordon 1959: 142). From bread and beer to wine and cheese, the people of the ancient Near East and North Africa developed a rich cuisine based on a set of crops and livestock domesticated in Southwest Asia, and a sophisticated technology of food preparation and preservation. This chapter traces the history of diet and foods of hunter-gatherers who lived at the end of the Stone Age in the Near East and North Africa, the impact of the development and spread of agriculture, and the social context of food and drink in early Mesopotamian and Egyptian civilization.

Geographical Background

Patterns of subsistence in any society reflect geography and cultural development. The civilizations of the ancient Near East and North Africa developed in a complex environmental mosaic that encompassed coasts and inland plateaus, high mountains and lands below sea level, barren deserts, fertile plains, and dense woodlands. The boundaries of the environmental zones have shifted over the years because the region has known both dry periods and moister phases.

People, too, have wrought changes on the land as they assisted the movement of plants and animals from their original homelands. Over the millennia, humans have turned deserts into gardens with irrigation, and have transformed naturally productive lands into deserts by overgrazing and fuel cutting. Specifying the environmental picture at any particular place and time is not an easy task.

Elevation has also had a profound influence on vegetation and climate in the Near East and, ultimately, the productive capacity of the land. Levantine mountains form the western border of the Fertile Crescent, and the Taurus-Zagros chain lies to the north and east, from Mediterranean Anatolia to southwestern Iran. The winter months bring the snow and rain that support forests and grasslands. The three main vegetational zones are forests in the mountains and hill zones surrounding the Fertile Crescent, steppe at slightly lower elevations, and desert in the lowlands.

The natural forest and steppe forest formations are dominated by oaks. Conifers of various types occur throughout. Pistachio is common in both the Mediterranean forests and the southern Zagros (Zohary 1973). This band of hilly country borders undulating grasslands and shrubby steppe to the south. Lying south of the steppe are the hot deserts of Arabia. The Tigris and Euphrates river systems originate in the mountains in the north, run through Mesopotamia, and drain into the Persian Gulf, providing a distinct riparian habitat, as well as an important source of water for irrigation. During the last 15,000 years, the margins of these environmental zones have shifted back and forth with drier and moister climatic phases (Zeist and Bottema 1991).

North Africa has a less hospitable environment than the Near East. The Sahara desert spans the continent; on its southern margins are the dry Sahel grasslands, and along its northern periphery are more semiarid lands. The immense Sahara has a varied terrain with scattered oases, depressions, high ground, rugged hills along the Red Sea coast, and mountains in the central region. Higher mountains lie to the northwest in the Maghreb. Along the North African coast, light winter rains sustain a narrow band of green. The Nile Valley is the lushest region in North Africa because of the river water derived from Equatorial Africa, but the desert lies just beyond the river valley.

The Near East

Foragers

Fourteen thousand years ago, human populations throughout this region were mobile hunter-gatherers who relied on wild plants and animals for sustenance (Table V.A.1). Little is known of the full range of foods eaten by these people. There is scant evidence of the plant foods consumed even though nuts, starchy seeds, and tubers were probably important contributors to the diet (Colledge 1991). But the skeletal remains of forest and steppe animals attest to a variety of game that was eaten, including several types of deer and gazelle, wild cattle, pigs, sheep, goats, and onagers (Hesse 1995).

Table V.A.1. *Chronology of the Near East and Egypt*

Near East		Egypt	
Calibrated date B.C.		Uncalibrated date B.C.	Calibrated date B.C.
Literate civilizations of Mesopotamia			Pharaonic state
3,100	-	2,600	-
	Early states		Predynastic
3,500	-	2,800	Later villages & towns
	Later villages & proto-urban societies	3,000	-
			Early predynastic villages
		3,700	-
			Semisedentary farmers/foragers
	Pottery Neolithic	6,300	-
6,900	-	6,000	-
			Mobile foragers
Aceramic Neolithic			
10,200	-	8,300	-
	Sedentary and semisedentary foragers		
12,000	-	10,000	-
	Mobile foragers		

Source: Adapted from Evin (1995) for the Near East and Hassan (1985) for Egypt. Calibrated dates interpreted from Stuiver et al. (1986, fig. 7) and uncalibrated dates based on Libby half-life (5,568 years).

Note on Chronology: Scientists have developed ways to calibrate radiocarbon dates so that they more accurately reflect calendar years. Most of the reports and papers cited here, however, use uncalibrated radiocarbon dates for periods before the early states. In order to be consistent, we have decided to use calibrated and historical dates throughout (cf. Evin 1995). We hope this does not cause confusion for readers who investigate some of our source material.

By 12,000 B.C., seeds and nuts had become an important part of the diet (Flannery 1973). At this time, foraging populations in the more favorable areas became less mobile and began to stay in settlements for extended periods. People living in the steppe and steppe forest began to concentrate on a few main species of animals and plants. The faunal evidence is fairly straightforward; at sites from the Levant to the Syrian steppe, gazelle appears to have been the primary source of animal protein (Garrard 1984). At Abu Hureyra, for example, gazelle constitutes about 80 percent of the animal bone (Legge 1975). Depending on local availability, the meat diet in other areas also seemed to focus on only one or two wild ungulates, like sheep, goat, pig, and onager (Hesse 1995).

As the climate changed during this period, the habitat of wild grasses expanded. Analysis of isotopes in human bone from archaeological sites suggests that people were now eating more plant foods. The most extensive collection of archaeological plant remains comes from the site of Abu Hureyra. Though Gordon C. Hillman, Susan M. Colledge, and David R. Harris (1989) suggest that the Abu Hureyrans consumed a wide array of plants, some of the plant remains they have turned up as evidence may have derived from animal dung burned as fuel, and so may not fairly represent human food choices (Miller 1996). Slightly later samples from nearby Mureybit (Zeist and Bakker-

Heeres 1984) have a few concentrations of seeds that are more likely to be human food remains, especially those of wild einkorn.

Accompanying the shift to a settled lifestyle were advances in food technology that probably contributed to a more stable food supply and population growth. In addition to cooking, which probably had been practiced for about a million years, archaeological evidence points to improvements in grinding and storage technology. Without grinding and cooking, the digestibility of wild cereals and pulses would have been low, but with such techniques, even pulses that are toxic when fresh could be nutritious, and, consequently, the amount of food available from a given tract of land would have been increased. Moreover, storing food in pits reduced both intra- and interannual variation in food availability.

These technological changes encouraged an increase in sedentism as well as in population during the early village period. Food, a welcome addition to most social interactions, probably also became important for greasing the wheels of human relations. Feasting, practiced on a grand scale in later periods, was doubtless begun for a variety of reasons, ranging from the cementing of alliances to the attracting of labor. Such activities would have encouraged sedentary foragers to accumulate surplus beyond bare subsistence needs (Bender 1978).

Farmers

Sometime after 12,000 B.C., sedentary hunter-gatherer communities in the Levant, followed slightly later by inhabitants of Anatolia and parts of the Zagros Mountains, embarked on a path that led to the domestication of plants and animals and, ultimately, food production. This shift in subsistence that archaeologists refer to as the "Neolithic Revolution" was the most profound change in human history and one that still has a far-reaching impact on the planet.

Current consensus is that plant domestication in the Near East began in the Jordan Valley around 9500 B.C. (Zeist 1988), and animal husbandry started about the same time or a little later in the Zagros Mountains and, possibly, North Africa (Hole 1984; Rosenberg et al. 1995). By the middle of the ninth millennium B.C., domesticated plants could also be found in Anatolia and the Zagros. Even with advances in agriculture, however, wild plant gathering and hunting continued to play an important role in the economy. In fact, it is probable that the ancestors of the first domesticated plants in the Near East - emmer, einkorn, and barley - had been important food plants for local foraging populations.

Domesticated plants entered the archaeological record at different times and places. For example, emmer wheat originated in the Jordan Valley, but bitter vetch is probably Anatolian. The earliest farming villages did not use pottery or domestic animals and, like their forebears, stored grain in pits. As early as the ninth and eighth millennia B.C., the ability to store surplus food enabled small, undifferentiated settlements of farmers to develop into larger communities of more complex social and economic organization. Changes are evidenced by public architecture (shrines), differences in wealth as reflected in the goods accompanying burials, specialized occupations for a few, and elaborate mortuary cults (see Voigt 1990). Some of the communities were also vastly larger than the earliest villages and may have housed a thousand or more inhabitants.

Nomadic foragers who followed herds of goat and sheep in the mountains of Iran began managing wild herds about 12,000 years ago, and pigs may have been domesticated at about that time as well (Rosenberg et al. 1995). Cattle were domesticated in Anatolia about 7000 B.C. By determining the age and sex of the animals slaughtered, faunal analysts can infer herd management strategies. For example, if the bone assemblage includes both adult males and females, it is unlikely that milk production was the goal; whether hunted or herded, the primary product supplied by the animals of the early herders was meat.

By 6700 B.C., a fully agricultural economy that relied almost entirely on farming and herding was established over much of the Near East. The staple crops grown over a broad area were cereals (emmer, einkorn, durum wheat, bread wheat, and two- and six-row barley) and pulses (lentil, bitter vetch, and chickpea). It is likely that these crops were eaten, even

toxic ones (like bitter vetch) because they are sometimes found in concentrations in roasting pits. Whereas cereals satisfied much of the caloric needs of the early villagers, the addition of domesticated pulses and livestock helped satisfy protein needs. A variety of wild plants, including such nuts as pistachio, almond, and acorn, continued to enhance the diet as well (see, for example, Mason 1995).

Farming spread to the hot, dry lowlands of Mesopotamia where techniques for water management developed. Late in the sixth millennium B.C., the Near Eastern complex of crops and livestock also spread to the Nile Valley, where still other irrigation techniques emerged to take advantage of the Nile floods. Farming villages proliferated as the new subsistence systems proved to be highly productive and capable of supporting a burgeoning population. After the initial phase of domestication, such fruits as grape, olive, fig, and date were domesticated. Their dietary and economic potential, however, was not fully realized until relatively late.

The Near Eastern agro-pastoral subsistence system proved very productive, initially supporting ever-increasing populations. Although one might think the domesticated pulses would be the perfect dietary complement to the cereals, the inclusion of domestic animals in a mixed economy had several advantages lacking in a purely plant-based system. First, animals provided ready access to dietary fat; aside from wild nut trees (especially pistachio and almond), oil plants (olive, flax, and sesame) do not appear to have been utilized at this early date. Second, land marginal for agriculture could have been used productively for pasture. Third, animals convert inedible pasture plants into tasty meat, which would have increased the food supply. Finally, domestic animals may have been traded with other groups to "set up reciprocal obligations and maximize sharing during lean years" (Flannery 1969: 87).

In the short run, the new farming methods seem to have been successful in evening out seasonal and year-to-year fluctuations in the food supply. On a theoretical level, the combined effect of plant and animal husbandry should have been a more stable food supply for growing populations (Raish 1992; Redding 1993). Yet the land could not continue to support expanding populations without some change in management (Köhler-Rollefson 1988). In fact, the first half of the sixth millennium B.C. saw a fairly widespread abandonment of settlements and the reestablishment of smaller communities on other sites, and faunal assemblages from Iran to Syria show a renewed emphasis on hunted animals (Buitenhuis 1990, Zeder 1994). Overgrazing and inadequate fallowing may have exacerbated a long-term impact of fuel cutting by village farmers, with inevitable results.

It was the development of new techniques of chemically transforming food that allowed the theoretical advantages of the agro-pastoral system to be realized. Pottery, widespread by 6000 B.C., permitted

new forms of storage and cooking possibilities (though stone boiling in animal skins would have been possible even in prepottery days) (Moore 1995). Fermentation allowed farmers to transform grain and fruits into psychotropic substances; though alcohol is itself not digested, the fermentation process makes many nutrients more available.

Fermented grapes could also have yielded vinegar, a pickling agent. In the Near East, the earliest evidence for fermentation comes from Iran - wine residues at Hajji Firuz, around 5500 B.C., and beer (and wine) residues at Godin Tepe, around 3500 B.C. (Michel, McGovern, and Badler 1993; McGovern et al. 1996); it did not take long for people to appreciate the added value of fermentation. Beer became a convenient and pleasant way to consume grain's carbohydrates and vitamins. It is probably no accident that olives, which must be cured before eating, were domesticated in this era, and olive oil would have been a welcome addition to the diet.

Early Near Eastern farmers did not just experiment with plants. Although we do not know when adults in these populations lost at least some of their inability to absorb lactose (Simoons 1979), at some point they probably began to consume milk from their herds. Cheese, ghee, yoghurt, and other cultured milk products were most likely innovations of the later village societies. Based on the age of slaughter, the zooarchaeologist Simon Davis (1984) suggests that dairy products were not emphasized until relatively late, around 4500 to 4000 B.C. in western Iran. In the Levant, ceramic vessels considered to be churns date to this time (Kaplan 1954). And in the earliest archaic texts from Mesopotamia (before 3000 B.C.), mention of an elaborate array of storable dairy products that were produced in institutional quantities suggest strongly that these items had long been part of the culinary repertoire (Nissen, Damerow, and Englund 1993).

Finally, the period of the later villages seems to have been the time when people began to use salt as a food preservative, although the mineral may have been used for animal hide preparation as early as the seventh millennium B.C. Archaeological evidence for the production and procurement of salt at this time is not available (Potts 1984), but it is difficult to imagine that the large quantities of fish placed as offerings in the fifth millennium B.C. temple at Eridu were fresh! Certainly by the third millennium, drying and salting were well-known techniques of food preservation (see Reiner 1980). In summary, it seems that the major food-transforming technologies developed and spread between about 5500 and 3500 B.C.

By about 3500 B.C., orchard crops began to make a noticeable contribution to the diet. Grape and olive in the Mediterranean region and date in Mesopotamia, so important to the earliest civilizations, had been domesticated. Such fruits as fig, pomegranate, and apple came under cultivation, too. By this time domesticated livestock had almost completely replaced their

wild relatives and other hunted animals. The ability to preserve large quantities of varied foods permitted surplus accumulation that, in turn, provided an impetus toward the developments we associate with civilization: urbanization, a high degree of economic specialization, and social inequality (Sherratt 1981; Redding 1993).

The First States

Productive surplus-generating agriculture may not have caused the changes set in motion, but it certainly permitted them to occur. Towns began to appear across Mesopotamia and the northern plains, which individually, as well as collectively, had all the trappings of a society more complex than any previously seen in the Near East. Among them were monuments and temples, full-time craft specialists, social stratification, and large populations.

Specialized nomadic pastoralists who began to share the landscape with settled agricultural populations joined in feeding the growing urban populations, and by 3500 B.C. the trend toward larger and more complex communities culminated in the emergence of the literate civilizations of Mesopotamia and, around 3100 B.C., in the appearance of a state in Egypt. Such social and cultural changes accompanying the rise of complex societies also had profound implications for foodways.

In earlier times, differences in consumption patterns had resulted from seasonal and local resource availability. But these early civilizations were now composed of people divided by wealth, class, occupation, and ethnicity, and their diets varied accordingly. Social status, in other words, had become an additional factor in determining who ate what.

Moreover, the basic Near Eastern crop complex was joined by a few new plants, as indicated by the archaeological record of the third and second millennia B.C. (see Miller 1991). For example, a grave offering included dried apples at Ur (Ellison et al. 1978), and coriander, fruits, and garlic cloves have been uncovered at Tell ed-Der (Zeist 1984). Plants originally domesticated beyond the borders of the Near East also began to appear, including millets, sesame, and rice (Zohary and Hopf 1993). Wild plants continued to add variety to the diet, as evidenced by occasional finds in food-related contexts: a jar of caper buds and fruits at Sweyhat (Zeist and Bakker-Heeres 1985), *Prosopis* seeds at Nimrud (Helback 1966), and *Chenopodium* at Shahr-i Sokhta (Costantini n.d.).

Deposits in cesspits provide direct evidence of diet, but they are not commonly found. A mineralized cess deposit from the third millennium B.C. city of Malyan, however, produced dozens of grape seeds and incompletely digested seeds of wheat and barley (Miller 1984). Most plant remains found are charred, however, so they do not directly represent food remains. Rather, they reflect fuel use, trash disposal, and cooking accidents. Archaeobotanical analysis is, therefore, not the primary means of understanding

class or ethnic distinctions in human food consumption, but the situation is different for faunal remains.

As in earlier times, the major food animals were sheep, goat, cattle, and pig. Such domesticates as donkey, horse, and camel became more common, but they do not appear to have been eaten to any great extent. A variety of wild animals, such as gazelle, small game, birds, turtles, and fish, are frequent but minor contributors to faunal assemblages (Hesse 1995).

Several studies of the pattern of animal bone disposal on urban sites demonstrate the strategies employed to ensure a steady access to animal products, as well as social differences among the inhabitants. On most Near Eastern sites, the bulk of the bone is from sheep or goat, yet a fluctuating percentage of pig bone consistently appears. Pigs do well in forest and thickets, and can only survive harsh summers with shade and water. Generally then, pork-consuming regions are ecologically suited to the pig (Hesse 1995: 215).

The distribution of pigs in the later periods probably reflects the economics of pig production; they are a fine animal for town dwellers because they reproduce quickly and eat garbage. Thus, in Mesopotamia, the town residents of al-Hiba ate more pork than their rural counterparts in the community of Sakheri Sughir (Mudar 1982: 33). The difficulty in managing large numbers of pigs was another variable in pork consumption. At Lahav, in Israel, their numbers increased when the site was occupied by relatively isolated independent households. But when the settlement was integrated into a regional economy and, presumably, pig raising was more strictly regulated, production declined (Zeder 1995a). Faunal studies have not yet detected specific evidence for the Jewish prohibition on pork consumption because it is difficult to segregate ecological and economic from symbolic values reflected in archaeological bone remains (Hesse 1995: 215).

The dietary impact of wealth is exhibited at al-Hiba, a site where residents of the temple precinct had greater access to domestic animals, and residents of the lower town ate relatively more wild animals, along with pork (Mudar 1982). At Leilan, too, the lower town residences of poorer people had relatively large quantities of pig bones (Zeder 1995b). At Malyan, differential distribution of species and of meat-bearing elements across the site suggests that some residents had more direct access to the herds of sheep and goat than others, and some higher-status households appear to have had greater access to choicer cuts than did lower-status ones (Zeder 1991: 199).

Our sources of evidence for food multiply after the advent of complex society. Visual representations of food and texts concerning its production, distribution, preparation, and consumption fill out a picture constructed with more ubiquitous archaeological remains like seeds and bones. Writing, glyptic, and monumental art are associated with the upper strata of society and comprise evidence that begins to overshadow the

archaeological plant remains among the literate societies. Animal bones, however, continue to be the primary source of information about meat consumption.

Among the earliest written signs in Mesopotamia is the one for beer, a necked jar (Green and Nissen 1987: 229). Even after the pictograph was transformed into a more abstract cuneiform sign, the image of two people sitting opposite each other and drinking (beer) with reed straws out of a necked vessel became one of the major elements in banquet scenes on seals (Selz 1983). Bread baking, beer brewing, and other food procurement and preparation scenes give some idea of the vast establishment that was necessary to support the major palace and temple institutions (Strommenger n.d.).

Plants of any sort are rarely depicted in the art of the ancient Near East, as either landscape elements or food. In contrast, images of animals are relatively common. There is no reason to suppose, however, that they are literal symbols of food sources, even when the subject is a food animal. Stylized animal representations in clay figurines are a normal part of assemblages from the aceramic Neolithic on. Although they frequently show important food species (bovids, caprids, and dogs), the animal taxa do not occur in proportion to bone refuse. The famous installations and wall paintings of Çatal Hüyük (eighth to seventh millennium B.C.) depict cattle, but they also depict vultures (Mellaart 1967). The pottery of some late farming cultures includes stylized birds and caprids, but again, there is no direct correlation with the faunal remains.

Depictions of animals in the art of the early civilization of Mesopotamia include many different life forms: scorpions, fish, turtles, birds, and wild and domestic mammals, along with imaginary creatures (Strommenger n.d.). Files of animals on cylinder seals and wall art seem to show sheep, goat, and cattle heading toward byres and are probably depictions of offerings to temple or palace. Haunches of meat and other comestibles are also elements in offering scenes. Portrayals of capture, such as men fishing with nets, sometimes suggest food procurement, but at other times, sport, as with the Assyrian royal lion hunts. A victory stela, showing human captives caught in a net, illustrates a new use for an old technology (Strommenger n.d.: 67), further demonstrating that pictorial evidence cannot be taken at face value. Moreover, scenes directly reflecting diet or dining only refer to a small segment of society. Their symbolic message is more significant than their documentary value.

Mesopotamians began keeping records on clay toward the end of the fourth millennium B.C. In the third millennium, the Sumerians developed writing for a variety of additional purposes. Hundreds of plant and animal names, many of which were used as foods and medicines, occur in ancient Sumerian and Akkadian texts from Mesopotamia (see, for example, Powell 1984; Stol 1985, 1987; Waetzoldt 1985, 1987; Postgate 1987). Economic and literary texts from Mesopotamia point to

the importance of wheat, barley (and beer), date (and date wine), cattle, goat, sheep, dairy products, fish, and some fowl. Onion, garlic, and leek were the most important condiments. Different types of food preparation, such as roasting, brewing, and baking, are mentioned, as are names for many types of beer, cheese, and the like (Civil 1964; Ellison 1984; Bottéro 1985).

With textual evidence, it becomes easier to assess geographical, cultural, and social dietary variations. For example, although the staple plant foods of the Near East continued over a wide area, they had overlapping distributions. Cultural preference within the irrigation civilizations of southern Mesopotamia favored barley and beer, as well as date and date wine, whereas wheat and grape wine prevailed in the hilly regions and were joined by olive oil around the Mediterranean (see Powell 1995). Many regional differences are a function of ecology – grapes are more suited to a Mediterranean regime, and dates cannot be grown in the cooler climes. But these “natural” explanations for food preferences do not exclude cultural differences in attitudes toward various kinds of food. Wine, for example, came to have a religious significance in the Mediterranean civilizations that carries through to this day.

Distribution of food in the urban societies of lower Mesopotamia reflected social distinctions. It would seem that in the stratified societies of the ancient Near East, meat was a less important part of the diet for those of the lower classes. Economic texts from some of the major third millennium institutions show that careful track was kept of food provided to workers. Barley comprised the bulk of the rations for people working for the state or temple, although oil, malt products, meat, and other animal products were also distributed. Amounts varied according to the age and sex of the recipients, but scholars still disagree about whether daily ration for a worker constituted his or her whole diet or just a part of it (Gelb 1965; Ellison 1981).

Palace and temple archives also give a glimpse of herd management and production, but they deal exclusively with the large institutional herds of cattle, sheep, and goats. It has long been recognized that such archives tell only part of the story. Illustrative is sheep milk. Textual evidence suggests that only cattle and goats were milk producers, and sheep were grown for their wool and meat (Stol 1993). Yet sheep milk is high in fat and protein and would hardly have been wasted. Perhaps shepherds were allowed to milk the herds directly, or, as is ethnographically attested, sheep milk was mixed with cow's milk, but not recorded separately. Similarly, although quantities of fish were frequently deposited in temple and palace storehouses, no mention is made of fish preservation; because large quantities of fresh fish spoil rapidly, it seems likely that fish preservation and processing (for oil) was carried out by the private sector (Potts 1984).

Textual evidence of food preparation is slender. Perhaps best known is a hymn to the Mesopotamian beer

goddess, which describes how *bappir*, an aromatic-flavored dough, is mixed with barley malt and fermented with herbs and other flavorings to make beer (Civil 1964). Three culinary texts from the second millennium B.C. (Bottéro 1985, 1995) contain recipes of sorts, although they are by no means step-by-step cooking instructions. Jean Bottéro, the Assyriologist who has studied them, considers them to be a codification of court cuisine that sets down general guidelines. Although the texts do not contain materials representative of the entire range of foods eaten by the upper stratum of society, let alone ordinary people, a few things are worth noting. The recipes include words for a variety of birds. They also contain words for meats and a method of cooking that included repeated washing of meat at different stages of food preparation. The number of plant types mentioned is relatively low, and those that have been identified appear to have been cultivated (with the possible exception of the potherbs). Finally, Mesopotamian cuisine was based on the use of sauces, which, as Bottéro points out, permitted the blending of subtle flavors unavailable with less elaborate forms of food preparation.

In earliest times, subsistence depended on wild resources available locally. The advent of agriculture brought together plants and animals from different regions and led to the creation of the Near Eastern agricultural complex of wheat and barley, pulses, sheep, goat, cattle, and pig. People of the Near East came to depend on domesticates, but wild plants and animals always constituted at least a minor portion of the diet. Advances in food preparation and storage technologies transformed agriculture into a highly productive and reasonably stable food procurement system, and effective food preservation techniques, in turn, permitted dense populations in towns and cities. Allowing for differences rooted in geography and culture, the diet and cuisine of Egyptian civilization developed along a similar path.

Egypt and North Africa

Beginning some 11,000 to 12,000 years ago, North Africa experienced a moist phase that lasted until historic times, although it was broken by several brief arid spells. During this period, summer rains produced seasonal lakes and dry grasslands, and the boundary of the Sahel shifted hundreds of kilometers north of its present location (Grove 1993). Hunter-gatherers who had been living on the margins of the Sahara began moving out onto what had been desert to subsist on wild plants, such fauna as gazelle and hare, and, in some cases, even fish (Muzzolini 1993).

By the seventh millennium B.C., these groups were growing larger and becoming more settled, as in the Near East. At Nabta Playa in southwestern Egypt, there were seasonal settlements that included storage pits, wells, and oval huts arranged in rows. Archaeological remains of plant foods indicate that the inhabitants gathered wild grasses, especially sorghum (*Sorghum*)

and millet (*Pennisetum*), as well as Christ's-thorn fruits (*Zizyphus spina-christi*) and other wild fruits and seeds.

They cooked the plant foods in vessels, possibly made of hide, set in the sand of the hut floors (Wasylkova et al. 1993). They may have also used the grinding stones that have been found in abundance at these sites to process grain. By the sixth millennium B.C., the Nabta Playa folk herded domestic cattle, sheep, and goats. The cattle were probably kept mainly for milk and blood, rather than meat (Wendorf and Schild 1984, 1994). Some scholars believe they were herded as early as 8000 B.C., but others reject this very early date (Gautier 1987; Muzzolini 1993; Wendorf and Schild 1994).

Livestock raising was gradually adopted by various groups of hunter-gathers in the Sahara and surrounding regions. Eventually pastoralism, combined with the gathering of wild plants, became a common pattern across North Africa, persisting in some areas until Roman conquerors introduced farming (Muzzolini 1993). In fact, in some regions of the desert, pastoralism and plant gathering are still practiced, although by 3,000 to 4,000 years ago, much of the Sahara had become far too arid to support any life (Grove 1993). It is believed that the African cereals, such as millet and sorghum, were domesticated in the Sahel, but little archaeological evidence of these plants has been collected (Harlan 1992). In contrast, the Egyptian Nile Valley has yielded a rich archaeological record of food and diet.

Nile Valley Hunter-Gatherers

Just off the Nile Valley in Wadi Kubbania, investigation of a series of 18,000-year-old camps has revealed one of the most detailed records of a hunting and gathering diet in the Old World (Wendorf and Schild 1989). Root foods from wetland plants, such as tubers, rhizomes, corms of sedges, rushes, and cattails, were dietary staples. The most important of these was purple nutgrass (*Cyperus rotundus*) (Hillman, Madeyska, and Hather 1989), which grows abundantly in wet ground and can be easily harvested with a digging stick. Young tubers are simply prepared by rubbing off the outer skin and roasting. Although older nutgrass tubers become woody and bitter with toxic alkaloids, grinding and washing renders them palatable. All of the archaeological specimens were found charred, suggesting roasting as the method for preparing young tubers. Aging tubers were probably prepared with the grinding stones found scattered across the Kubbanian sites (Hillman et al. 1989). Root foods were abundant through the fall and winter but became woody and eventually inedible by summer. Seeds of wetland plants helped fill the gap, but during the summer, the Nile's annual inundation restricted plant foods to wild dates and dom (or doom) palm fruits (Hillman et al. 1989).

The flood also brought catfish, the main source of animal protein for the Kubbanians. Catfish would have been exceptionally easy to catch at the onset of the inundation, when they spawned (Gautier and van Neer

1989). As the Nile waters moved across the floodplain, catfish would move to shallow water, where they congregated in dense masses and where they were doubtless readily taken with baskets, nets, spears, clubs, and even by hand. At the Kubbanian campsites, catfish were prepared for storage by drying or smoking after their heads had been removed. The vast quantities of catfish bones that littered the campsites suggest that they may have been eaten for some months after having been caught. Fish were supplemented with migratory waterfowl and small quantities of gazelle, hartebeest, and aurochs (Gautier and van Neer 1989).

The Nilotic adaptation, focused on root foods and catfish, appears to have persisted up until the beginnings of agriculture in Egypt, though the scant record of diet throughout these millennia does not provide incontrovertible evidence for either stability or change (Wetterstrom 1993). There are clues, however. Fishing gear and catfish bones are common at late hunter-gatherer sites. Fishing may have become even more important in the diet as fishing techniques apparently improved. Three fish of the deep Nile channel (Nile perch, *Bagrid*, and *Synodontes*) became common at sites after about 9,000 to 10,000 years ago (Neer 1989). The bones of aurochs, hartebeest, and gazelle indicate that they were the most abundant mammals. Occasional finds of other animals, such as hippopotamus or wild sheep, suggest rare catches.

Evidence of plant use for this period in the Nile Valley has not been collected systematically except at one site - a camp in the Fayum. Here, seeds of wetland plants were recovered, but no root foods were found, probably because preservation was poor (Wetterstrom 1993). The only other clue to the use of root foods is the fact that many sites during this period were located in ideal situations for collecting wetland tubers - next to embayments where the marshlike conditions necessary for wetland plants would have prevailed.

The Early Farmers of Egypt

The earliest traces of domestic plants and animals in Egypt are dated to roughly 5000 B.C. at a series of campsites in the Fayum Depression and in the oldest level of Merimde, a site on the western edge of the delta (Wetterstrom 1993). The Fayum data suggest that local forager groups adopted a few domestic crops and livestock but continued subsisting on wild plants and animals (Caton-Thompson and Gardiner 1934). Merimde, slightly younger than the early Fayum sites, may have been farther along in this transition. Although the settlement was probably only used seasonally, livestock bones found there are far more abundant than those of wild fauna (Driesch and Boessneck 1985). At this point, however, crops may not have supplied the bulk of the plant foods, as the facilities necessary for storing harvests were very limited (Wetterstrom 1993).

It is not clear when ancient Egyptians finally crossed the threshold from foraging to farming, shift-

ing the balance in their diet from wild products to crops and livestock, but this appears to have occurred within a few centuries after domesticates were taken into the economy. Before 4400 B.C., Merimde had become a substantial village with abundant settlement debris and capacious storage facilities, while similar sites began to appear elsewhere, first in the north and later in the south. By 4000 to 3800 B.C., full-time farmers lived in permanent villages in the south as well as the north (Wetterstrom 1993).

The Near Eastern crop complex was the source of Egypt's first domesticates, and it formed the core of the agricultural economy through later periods (emmer wheat, six-row barley, lentils, peas, and flax, along with sheep, goats, cattle, and pigs). All of these, except perhaps cattle, probably came to Egypt from the Levant by way of the Sinai. As noted, cattle could have been independently domesticated in North Africa. The Near Eastern crops, all adapted to the Mediterranean climate, were planted in the fall after the annual flood had receded. As in the Near East, domesticated crops and livestock probably evened out the large seasonal fluctuations in the diet. Stored food may also have reduced the impact of year-to-year variations in Nile floods.

After Egyptians had become dependent on farming, they doubtless continued to supplement their diet with wild foods (Wetterstrom 1993). Fish were an important resource in many communities year-round, as were migratory waterfowl in the winter months. Larger animals, like gazelle, hippopotamus, and crocodile, occasionally show up among archaeological remains. But hunting was probably a rare adventure by this time. Where bone remains have been collected, wild fauna are extremely uncommon, as is hunting gear.

The archaeological evidence for wild plant foods is also unfortunately very limited. A small number of types have been recovered from archaeological sites, including the fruits of Christ's-thorn (*Zizyphus spina-christi*), sycamore fig (*Ficus sycamorus*), dom palm (*Hyphaene thebiaca*), and balanites (*Balanites aegyptiaca*), which has an edible oil in its seed. The small nutlike tubers of nutgrass (*Cyperus esculentus*) have been recovered from a variety of contexts: burials, inside a pot at a settlement, and from the stomach of a body mummified by the desert sands. This sedge, related to the *Cyperus* eaten at Wadi Kubbbaniya, has been cultivated for its tubers since pharaonic times (Täckholm and Drar 1950). Seeds of grasses, sedges, vetches, and other wild plants have also been found at pre-Dynastic sites, although it is not clear if these were all used as foods. A variety of wild plants that do not preserve very well, if at all, were probably also gathered, including leafy vegetables and the stalk and rhizome of papyrus that we know were eaten in later periods (Täckholm and Drar 1950).

How prehistoric Egyptians prepared these foods and combined them into meals is very difficult to

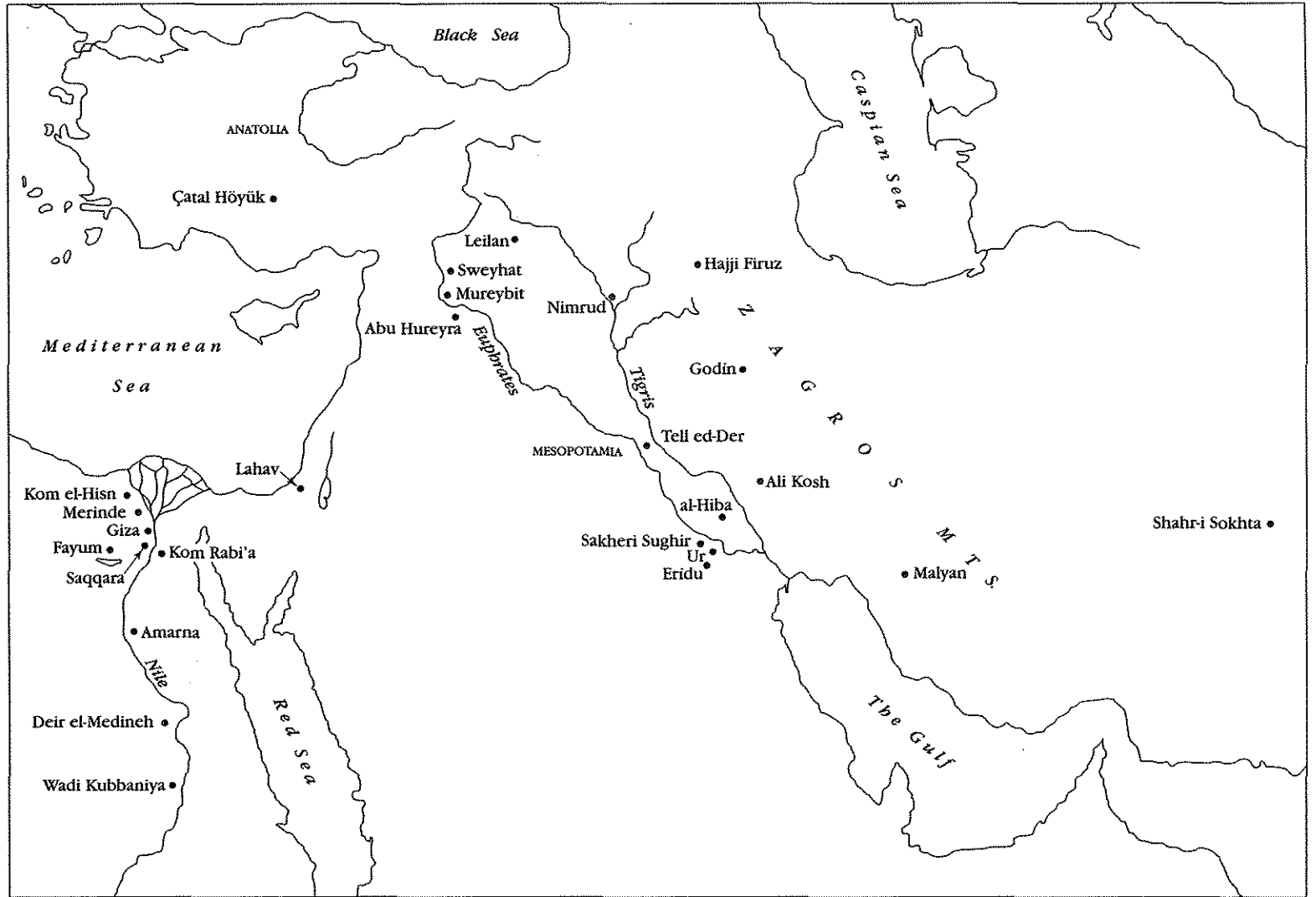
determine. Without the texts or representations of foods, so abundant in later periods, pre-Dynastic foodways must be inferred from a meager archaeological record. Cuts of meat - ribs, blades, legs - found in pre-Dynastic burial pots (Brunton 1928, 1937) hint at simple cooking techniques: boiling in pots or roasting over a fire. Headless remains of fish found in pots at settlements (Brunton 1928) suggest that fish were boiled after beheading. Fish may have also been smoked for storage as in earlier times, but there is no clear evidence of this.

Perhaps the easiest way to use cereals is in porridge, and this dish was probably on the early Egyptian farmer's menu. Bread is another simple way to turn grain into food. There is abundant documentation of bread in the Pharaonic Period, but for prehistoric periods, the evidence is limited to coarse loaves found in graves and settlement sites. At one site, a charred piece of bread was made of flour described as "more crushed than ground grain" (Debono 1948: 568). Though the pre-Dynastic breads seem crude, some may have been leavened with yeast, as they are porous (Brunton 1928). This would not necessarily have required any sophisticated understanding of baking techniques; a simple sourdough can easily be produced if flour and water are left to sit and collect wild yeast from the air. Fermentation could also have been readily discovered when grain and water or fruit juices were allowed to sit for a while. Egyptians certainly realized early the potential of fermentation, as attested to by traces of beer dregs found in the bottoms of vessels (Lucas and Harris 1962; Helck 1975a). Beginning around 3500 to 3400 B.C., formal brewery installations appeared at a number of sites (Geller 1989), associated with increasing economic specialization in Egypt.

Like Mesopotamia before it, Egypt, after the mid-fourth millennium B.C., was transformed from a society of simple autonomous villages into an organized, hierarchical state. In southern Egypt, burials showed marked differences in wealth and status among different groups, as well as individuals (Trigger 1983, Bard 1994). Large centers with temple and palace complexes and industrial and residential areas began to appear in southern Egypt. By around 3100 B.C., a centralized state had emerged with domain over the whole Nile Valley from the delta south to the First Cataract near Aswan (Bard 1994).

Pharaonic Egypt

The Pharaonic Period in Egypt, which spanned nearly 3,000 years, was an extraordinarily stable, conservative era (Map V.A.1.). From the beginning, a strong centralized government ruled Egypt as a single polity. The reign of the pharaohs was disrupted only three times when the power of that government broke down as a result of civil war or foreign invasion. Following these three so-called "intermediate" periods between the Old, Middle, and New Kingdoms and the Late Period, the central government was reestablished (Table V.A.2).



Map V.A.1. The world of Pharaonic Egypt.

Table V.A.2. *Pharaonic Egypt*

Period	Dynasties	Dates
Early Dynastic	1-2	c. 3100-2686 B.C.
Old Kingdom	3-6	c. 2686-2181 B.C.
First Intermediate	7-10	c. 2181-2040 B.C.
Middle Kingdom	11-12	c. 2133-1786 B.C.
Second Intermediate	13-17	c. 1786-1567 B.C.
New Kingdom	18-20	c. 1567-1085 B.C.
Third Intermediate	21-25	c. 1085-664 B.C.
Late Dynastic	26-31	c. 664-332 B.C.

Source: Bienkowski and Tooley (1995), p. 16.

Like early Mesopotamian civilization, pharaonic Egypt had a complex economic and social organization. People were divided by wealth, class, and occupation. Whereas the pharaoh, a divine king, presided at the top of the hierarchy, most of the people belonged to the lowest classes, working in myriad trades and as farmers and laborers (O'Connor 1983). In theory, the pharaoh owned all of Egypt; in practice, much of the land was held by the crown, but there were also large private estates. Crown-land harvests and taxes in kind from private lands supported the state bureaucracy, the military, and the conscripted laborers. Some land was also held as trusts, which supplied food to mortuary cults and temples (O'Connor 1983; Trigger 1983).

Pharaonic foods and diet are documented by a wealth of sources. These include artistic depictions in tombs, food offerings and offering lists in tombs and temples, tomb models, texts, and archaeological remains (Helck 1975b). Artistic depictions of everyday life, including food preparation, are common in Old and Middle Kingdom tombs, but less common in those of the New Kingdom. They are a rich source of information but can be difficult to interpret, as Egyptians tended to use a highly standardized iconography (Weeks 1979; Samuel 1989, 1993a, 1993b, 1994). Tomb models, most frequent in Middle Kingdom contexts, pose some of the same problems. Offerings and offering lists present a selective set of foods, the significance of which may elude present-day observers (Weeks 1979). Texts dealing with economic matters are abundant for the New Kingdom but less common for earlier periods. In addition, many words in the texts, including names of foods, are not yet understood (Janssen 1975).

Popular tales from the Middle and New Kingdoms offer clues to diet, but they are limited in scope. Archaeological data provide actual evidence of foods, allowing proper taxonomic identification in many cases, and may be useful in refining insights gained from textual sources and representations in tombs. Unfortunately, for the Pharaonic Period most archaeological material comes from tomb and temple contexts, with very little recovered from settlements. Other kinds of archaeological evidence, such as ovens, bakeries, and hearths, indicate something of

food processing and preparation, but the precise ways in which they were used is not always apparent. Recently, archaeologists have tried to test insights and theories gained from tomb depictions and other evidence by experimenting with baking, milling, and brewing techniques (Samuel 1989, 1993a, 1993b, 1994; Lehner 1994, 1997).

What emerges from the assorted lines of evidence is that all members of Egyptian society shared the same basic foods, with the upper strata having access to larger quantities and greater variety. At the core of the ancient Egyptian diet were bread and beer, consumed as staples by pharaoh and peasant alike throughout pharaonic history. Indeed, bread and beer were the basic wages, along with oils, grain, and clothing, paid to workmen on public and private projects (Eyre 1987). They were also the foods mentioned most often in popular tales, such as in the Middle Kingdom "Tale of the Eloquent Peasant" (Darby, Ghalioungui, and Grivetti 1977). As the hero set out on a trip, he commanded his wife, "[Y]ou shall make for me the six measures of barley into bread and beer for every day on which [I shall be traveling]" (Simpson 1973:31).

Bread and beer were also fit for a king, however. An economic text from the Thirteenth Dynasty recorded a daily delivery of 1,630 loaves and 130 jugs of beer to the king's court (Scharff 1922). Bread and beer were also delivered to the temples every day and were viewed as essentials for the afterlife. The elite placed offerings of bread and beer in their tombs and enumerated them on offering lists. For example, Pharaoh Tutankhamen's tomb was stocked with bread (Hepper 1990).

Bread was produced in modest village kitchens (Janssen 1975) and in the large "commissaries" of elite households, the court, temples, and civic projects (Helck 1975b; Samuel 1993a, 1993b). Whereas the village breads that have been recovered are simple round loaves baked in an oven (Darby et al. 1977), professional bakers used a variety of techniques. Ceramic molds, which first appeared in late pre-Dynastic times, were commonly employed in the Old and Middle Kingdoms to bake offering breads and probably also rations for workmen (Jacquet-Gordon 1981; Lehner 1994). These coarse, thick-walled molds, shaped like flowerpots, were used as a kind of portable oven for baking in open pits (Lehner 1994). By the time of the New Kingdom, molded breads appear to have been made for special purposes and were baked in ovens in long, narrow, cylindrical molds (Samuel 1989, 1993b).

In addition to the mold-made loaves, a wide assortment of other breads and cakes were prepared for the temple and for the elite, employing a variety of techniques, temperatures, and grains (Drenkhahn 1975; Wild 1975; Samuel 1994). This was especially true during the New Kingdom, when loaf shapes proliferated; tomb art depicts spirals, cows, human figures, and other fanciful forms (Wreszinski 1926). Forty different

kinds of breads and cakes were known at this time, compared to about a dozen in the Old Kingdom (Wild 1975). Emmer flour appears to have been the main ingredient in Egyptian bread, but other ingredients were also used (Grüss 1932; Täckholm, Täckholm, and Drar 1941), such as barley flour, ground nutgrass (*Cyperus esculentus*) tubers (Wilson 1988b), and sprouted wheat, which gave bread a slightly sweet flavor (Samuel 1994). Bakers sometimes added honey, dates, figs, and other fruits (Wilson 1988a; Samuel 1993a). For example, bread found in Tutankhamen's tomb was flavored with Christ's-thorn fruits (Hepper 1990).

Like bread, beer was brewed in modest households and in commissaries. Little is known of home-brewed beer, but breweries are frequently depicted in tomb scenes and models (Montet 1925). Archaeological traces of them have been found at a number of sites, as have vats and jars with beer residues (Lutz 1922; Lucas and Harris 1962; Helck 1975a; Geller 1992a, 1992b). The brewing process carried on at these ancient breweries, however, has not been well understood (Nims 1958; Geller 1992a; Samuel 1993a). The depictions are often ambiguous and the texts accompanying them subject to various interpretations because of difficulties in translating the language.

Delwen Samuel (1996) sidestepped these problems by turning to the direct evidence of brewing - ancient beer dregs and brewing by-products from the New Kingdom. Using scanning electron microscopy, she examined the microscopic structure of the starch granules in the residues and determined the processes they were subject to while being transformed into beer. It appears that Egyptians prepared grains intended for brewing in several different ways. After the grain was malted, or sprouted, some of the moist malt was heated while the rest was dried gently. The latter would have provided active enzymes for breaking down starch granules into simple sugars, which would support the yeast or lactic acid that is essential for producing alcohol. The roasted malted grains would have imparted a pleasant flavor and yielded a gelatinized starch that would be particularly susceptible to enzymatic attack. In addition, unsprouted, cooked grains may also have been used to make some beers. A large variety of named beers may have been produced by using different kilning and cooking techniques to prepare malted or unsprouted grains prior to brewing (Samuel 1996).

Both emmer and barley were used for beer in institutional breweries (Samuel 1996). In modest households, though, barley seems to have been the choice for brewing, as suggested in the "Tale of the Eloquent Peasant" and the evidence at Deir el-Medineh, a New Kingdom artisans' village, beer was brewed from barley rations (Lucas and Harris 1962; Janssen 1975). Bread, which has long been regarded as an essential ingredient of Egyptian brewing (Faltings 1991), played no role in these beers, according to the evidence that Samuel

examined. As for flavorings in ancient Egyptian beer, there is little substantial evidence (Samuel 1996), although dates have often been propounded as a basic ingredient (Faltings 1991). As for Old Kingdom brewing techniques, Samuel's findings for the New Kingdom may well apply. No comparable studies have been conducted on beer dregs of the former period, and the archaeological evidence poses the ambiguities noted.

While bread and beer were basic subsistence to ancient Egyptians, vegetables and fruits were apparently regarded as above the level of basic needs. They were sometimes distributed as wages but were also depicted in market scenes, indicating that they could have been acquired through barter (Eyre 1994). The lower classes probably saw only the most common fruits and vegetables. The high labor costs of watering fruits and vegetables would have put many of them out of the reach of the poor (Eyre 1994). For the elite, on the other hand, "a variety and abundance of fresh produce was the mark of a luxury diet, emphasized by the elaboration of the fruits and vegetables recorded as offerings on the walls of tombs and temples" (Eyre 1994: 73).

Common vegetables in ancient Egypt included lettuce, leeks, onions, garlic, cucumbers, and radishes (Helck 1975b). Other names are listed in texts, but they have not yet been translated (Janssen 1975). How vegetables were prepared is not clear; they are shown as fresh produce in temple and tomb depictions. For lower classes, vegetables probably served mainly as condiments, as suggested by a New Kingdom tomb scene in which a workman eats a lunch of bread, cucumber, and onion (Wilson 1988a).

The lower classes may have also supplemented their diet with wild plants. A host of weedy plants found in the fields and gardens, such as amaranth, chenopod, knotweed, sheep's sorrel, and wild grasses, could have been used as potherbs and grains. Their seeds have been found in settlement sites, such as Kom el-Hisn, an Old Kingdom community in the delta (Moens and Wetterstrom 1988), and Kom Rabi'a, a Middle and New Kingdom artisans' village at Memphis (Murray 1993), but it is not known for certain that these were actually consumed; many probably arrived at settlements as contaminants of cereal harvests. Still, many of these herbs have edible greens and/or seeds, which, ethnographic accounts indicate, have been used by others as foods (Fernald and Kinsey 1958; Nicolaisen 1963; Goodman and Hobbs 1988; Harlan 1989; Facciola 1990).

A number of fruits were known in ancient Egypt. Starting in the Old Kingdom with a short list - sycamore fig, dom palm, balanites, date, Christ's-thorn, and grape - the assortment grew as new types were introduced. Early additions were the true fig (*Ficus carica*), melon (*Cucumis melo*), persea, and a small watermelon (*Citrullus lunatus*) cultivated for its seeds (Germer 1985). Later, cordia (*Cordia myxa*), pomegranate, and olive were adopted. During the

New Kingdom, exotic tropical fruits, such as grewia (*Grewia tenex*), were imported, as were pinenuts and almonds (Hepper 1990).

For peasants, the most important fruits were probably those that grew in Egypt with little or no care, such as Christ's-thorn, sycamore fig, and dom palm, as they would have been relatively cheap. Pomegranate, grape, and olive, on the other hand, all require tending and watering and were probably the prerogative of the elite. In tomb paintings and reliefs, fruits were usually displayed in large, overflowing baskets, perhaps to be consumed fresh, but fruits were also enjoyed dried, or cooked, and used as ingredients in other dishes. At Saqqara, a funerary meal laid out in a Second Dynasty tomb belonging to an elderly woman included plain Christ's-thorn berries placed on a plate and figs (probably *Ficus sycamorus*) prepared as a stew (Emery 1962). Fruits, particularly grapes, were also used to prepare wines imbibed by the elite (Janssen 1975). Wine production, which required substantial labor and skill, took place primarily in the delta and oases. But wine was also imported from Palestine, starting, perhaps, as early as pre-Dynastic times (Stager 1992). Often listed as an offering, wine was frequently depicted in New Kingdom funerary banquet scenes and was included in the funerary meal at Saqqara just discussed (Emery 1962).

Animal products were highly valued in the ancient Egyptian diet and together constituted the third most frequently mentioned food item in popular tales, after bread and beer (Darby et al. 1977). But they were not considered basic for subsistence, as indicated by the fact that meat was not given as rations. Market scenes in tombs show peasants buying pieces of meat through barter (Harpur 1987). For the well-to-do, meat figures prominently in tomb scenes, offering lists, and actual food offerings in tombs. The Saqqara funerary meal included four plates of meat out of a total of twelve dishes (Emery 1962).

Cattle were the most highly valued livestock in ancient Egypt, serving as draft animals and sacrificial beasts, as well as a source of food. Associated with the bovine deity Hathor (a mother goddess), they were considered sacred. Costly to raise, cattle were the premier choice for sacrifice at temples and tombs. Countless tomb paintings and reliefs show scenes of cattle husbandry, sacrificial processions, and the sacrifice of young, well-fed oxen. Beef consumption was almost certainly a prerogative of the elite, and the priests who butchered the cattle may have eaten the largest share (Darby et al. 1977). At the pyramid complex of Giza, for example, cattle bones from animals under two years of age predominate among the faunal remains (Redding 1992). The "middle classes," however, were not entirely excluded from enjoying beef. At Deir el-Medineh, cattle were delivered for feast days and periodically at other times for butchering, providing an occasional, but not rare, treat for the king's artisans (Janssen 1975).

For the lowest classes, beef was probably an extremely rare luxury. At Kom el-Hisn, for example, there is almost no bovine bone among the abundant faunal remains, although cattle were raised there (Moens and Wetterstrom 1988; Wenke 1990; Redding 1992). Kom el-Hisn peasants consumed only the occasional elderly or very young animal that died of natural causes, although they raised cattle destined for sacrifice at major ceremonial centers, such as the pyramid complex at Giza (Redding 1992).

Small livestock (sheep, goat, and pig) were more important sources of protein for lower classes. Bones of sheep and goats are common at settlement sites (Redding 1992). At Kom el-Hisn, peasants may have maintained their own small flocks while raising sacrificial cattle (Redding 1992). Pig remains are even more abundant at Kom el-Hisn and other settlement sites, such as the workmen's village at Amarna (Hecker 1982). Richard W. Redding (1991) proposes that peasants in rural areas raised small numbers of pigs for their own consumption, particularly in marginal regions where grain agriculture was not important.

Small livestock apparently played a minor role in the diet of the well-to-do. Large herds of sheep and goat were kept primarily for wool, hair, and milk. They were seldom depicted as sacrificial animals or placed in tombs as offerings. On the other hand, the Saqqara funerary repast did include a pair of kidneys from a small domestic animal (Emery 1962), and texts indicate that goats were occasionally sacrificed for certain festivals (Darby et al. 1977).

Relatively little is known about how meat was prepared, but food offerings placed in tombs during the Old Kingdom provide clues. Ribs and legs of beef found in the Saqqara funerary meal were most likely boiled or roasted. A dish that could not be identified (perhaps a stew) included ribs of beef among its ingredients (Emery 1962). A kitchen scene from a Fifth Dynasty tomb shows a cook cutting chunks of ox meat into pieces that were placed in a large cauldron. The hieroglyphic label underneath reads "cooking meat" (Hayes 1953: 97). Texts and a few tomb scenes indicate that beef was roasted as well (Darby et al. 1977).

While domestic livestock played an important role in ancient Egyptian life, the major sources of animal protein for rich and poor appear to have been fish and wild fowl. Both were abundant, and because little investment was required to produce them, they were probably inexpensive, compared with domestic animals. Texts from Deir el-Medineh indicate that they were very cheap at the time (Nineteenth Dynasty), with fish nearly as cheap as bread and beer (Janssen 1975). Fish are often shown in market scenes being purchased by barter (Eyre 1987). At Deir el-Medineh, fish were apparently a major source of protein, because they were distributed as rations (Janssen 1975). At Kom Rabi'a, abundant fish bones suggest that fish were an important source of food there as well (Ghaleb 1993).

As virtually the entire population lived close to the Nile waters, nearly everyone would have had some access to fish, at least during the flood season.

Poor Egyptians would, likewise, have had access to waterfowl during the winter migration. Fish and fowl were also common foods of the elite, who included them in tomb offerings and, particularly during the Old Kingdom, depicted fishing and fowling on their tomb walls (Montet 1925; Harpur 1987). Tomb scenes of food preparation indicate that fish were usually sun dried, pickled, or salted, whereas fowl was commonly roasted on a spit (Montet 1925). Wild fowl were also kept and fattened for consumption. The funerary meal from the Saqqara tomb included a cooked fish, cleaned, dressed, and beheaded, as well as a pigeon "stew" (Emery 1962).

Wild mammals were another potential source of meat, but hunting, already on the decline during the pre-Dynastic Period, had become an insignificant source of food by Old Kingdom times. At settlement sites, bones of wild mammals are rare; at Kom el-Hisn, for example, gazelle and hartebeest accounted for only 3 percent of the total faunal remains (Wenke 1990).

The traditional "poor man's meat" - pulses - were probably eaten by most of the people of ancient Egypt, although there is scant documentation. Pulses do not appear as tomb offerings or art, nor are they mentioned with any frequency in texts. But there are scattered archaeological finds, hinting at their importance. Lentils, for example, occur frequently in Tutankhamen's tomb as a contaminant of baskets of food offerings, suggesting that they were a common crop in ancient Egypt (Vartavan 1990, 1993). At Giza, lentils were found in trash left by workmen (Wetterstrom unpublished data). In Zoser's Third Dynasty tomb at Saqqara, lentils occurred in straw fill (Lauer, Täckholm, and Åberg 1950). They are also common in Middle and New Kingdom deposits at Kom Rabi'a (Murray 1993).

Records of other pulses in Egypt are few (scattered reports of lupine and fava beans [see, for example, Germer 1988]). Peas occasionally appear in archaeological contexts, such as Kom el-Hisn (Moens and Wetterstrom 1988). Chickpeas were apparently introduced in New Kingdom times; a few occurred in Tutankhamen's tomb as contaminants (Vartavan 1990, 1993). They are mentioned in texts from the Eighteenth Dynasty on but do not occur as offerings.

Dietary oil was considered an essential food, as indicated by the fact that it was among the rations allotted. Flaxseeds, castor beans, moringa nuts (*Moringa aptera*), olives, and, in later periods, sesame and safflower were all sources of oil (Germer 1985). Sesame seeds occur as offerings in Tutankhamen's tomb (Vartavan 1990), but they were not restricted to the elite; at Deir el-Medineh, artisans were given rations of sesame oil (Janssen 1975). In contrast, olive oil, most of which was imported from Palestine beginning in pre-Dynastic times (Stager 1992), was food for the elite.

The first cultivated spice found in Egypt is fenugreek, dated to 3000 B.C. (Renfrew 1973). From the New Kingdom on, and perhaps earlier, a wider range of seasonings was available in Egypt. In Tutankhamen's tomb, black cumin (*Nigella sativa*) and coriander occurred frequently as contaminants among baskets of foods, suggesting that they were grown widely and, therefore, were popular condiments (Vartavan 1990). Dill and cumin were also known in New Kingdom Egypt (Germer 1985). How these seasonings were used is not known, as recipe texts from ancient Egypt have yet to be found.

Honey and fruits were the only sweeteners known in ancient Egypt. In the Old Kingdom, honey, a scarce and costly resource, was under Pharaoh's control. Still expensive by the Middle Kingdom, honey was a frequent offering in private tombs and was employed extensively in temple rituals (Kueny 1950). It is unlikely that lower classes ever saw honey, relying instead on fruits and fruit juices as sweeteners. Sweetened breads and flavored beers, however, were probably a rare treat among the poorest classes.

During the 3,000 years of pharaonic history, it appears that the diet changed slowly, showing great conservatism and stability, like other aspects of Egyptian culture. The most visible changes relate to the introduction of new crops, new technologies, and new imports. Although the core of the agricultural system remained unchanged, with emmer wheat and barley the dominant crops, improvements in water management made it possible to grow fruits and vegetables in orchards and plantations (Eyre 1994) and, probably, to raise many of the new introductions, such as olives. While bread and beer retained their place as staples, baking and brewing technologies became more sophisticated.

Changes in the diet and the rewards of new technologies were probably not universally experienced. Initially, the diets of rich and poor were likely not vastly different. The elite would have had access to greater quantities of food, particularly meat, and sole access to a few costly goods, such as wine and olive oil. The elite may also have eschewed some low-status foods, such as pulses. But by New Kingdom times, and perhaps earlier, the gulf between rich and poor diets may have expanded into a chasm. The upper classes, undoubtedly, had greater access, and in some cases exclusive access, to new crops and imports, such as pine nuts, almonds, and pomegranates. In addition, tomb art and textual evidence suggest an elaboration of cooking techniques among the well-to-do during the New Kingdom.

Conclusion

In this chapter we have traced the history of food and diet over a heterogeneous territory and through a long time period that extended from the end of the Stone Age to the first civilizations. This era saw what

are arguably the most significant changes ever to occur in the human diet, establishing the food patterns that still sustain people today.

With the adoption of farming and herding, peoples in the Near East and Egypt abandoned their diverse hunting-gathering diet and came to rely on the Near Eastern complex of domesticated plants and animals. After the shift to agriculture, both areas followed similar cultural trajectories, which involved the development of larger and more complex communities and, eventually, the emergence of civilizations. In both regions, improvements in food production and food storage technologies led to surplus accumulation and permitted the growth of large, dense populations and urban centers.

With the advent of complex society, people no longer had equal access to all types of food. An elite class ultimately controlled the production and distribution of much of the food supply. Some foods even became their sole prerogative, particularly exotic imports and those requiring extensive labor to produce. Most of the population, however, subsisted mainly on grain and grain products as earned wages in kind. In both Egypt and the Near East, the diet was based on plants, primarily cereal products like bread and beer, supplemented with vegetables, fish, and meat. For the lower classes, meat was probably a rare commodity except for the pigs that households could raise without interference from state authorities. Yet, although Egypt and the Near East followed similar social trajectories and shared the same core diet, they developed their own distinctive cuisines. Today much of the world shares that same core diet based on the Near Eastern domesticates, and variations on it are still developing.

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