The Transition to Food Production

The transition to food production is certainly one of the most significant developments in culture in the period from 20,000 to 5,000 years ago. It is likely that before this, foragers around the world effectively managed their resources by, for example, doing some weeding before leaving a berry patch, or otherwise altering environments to make them more conducive to the cultivation of specific kinds of plant and animal foods. Beginning about 15,000 years ago, however, the manipulation of plants and animals got serious.

Ways of obtaining food began to start changing significantly between about 15,000 and 12,000 years ago. Many people around the world became food producers, meaning they began to manipulate plants and animals to increase their productivity, creating surplus. The process of food producing involves domestication, which means that the plants or animals are under the control of humans. Some people started to domesticate animals, which led to the subsistence strategy known as pastoralism. Others started to domesticate plants, which led to horticulture.

Archaeological research suggests domestication first developed in the Middle East and Asia, but was relatively quickly adopted by populations living in Europe and Africa as well. It developed independently in regions of the Americas. Early plant domesticates included rice, wheat, potatoes, and maize (corn). Early animal domesticates included sheep, goats, and cattle.

Why Domestication and Food Production?
Initially, it was likely that these new domestic plants and animals supplemented a diet of primarily wild food. However, by about 10,000 years ago, many people had become dependent on these newly domesticated plants and animals. And, with few exceptions, there was no going back. Domestication increased the carrying capacity of the regions which humans filled. Going back to subsistence based primarily on foraging would not support the increased numbers of people. Eventually, by
Box 6.2

**Why Did People Domesticate Plants and Animals?**

Why people started to domesticate and eventually depend on plants and animals is one of the principal areas of research interest in archaeology. Until the 1960s, it was widely assumed that domestication was a good thing, allowing access to more food with less risk, less work, and better health. Archaeological questions tended to focus on where the first domestication occurred and how the idea spread, all assuming that it made life better. Archaeological and ethnographic research in the late twentieth century, however, convinced many that the assumptions were not warranted; while some may have benefited from the transition to food production, many suffered from worse nutrition and less leisure time. The question then became, considering the negative effects of domestication, why many groups around the world would initiate the process of domestication, which led to pastoralism and horticulture.

Over the last few decades, popular explanations for the origins of domestication of both plants and animals have usually focused on ecological reasons. For example, many archaeologists reason that environmental changes reduced the number of people who could effectively forage in a region. Rather than reduce their population to match the now-reduced carrying capacity, move to another area, or resort to raiding others, people began to increasingly manage their resources to the point of domestication, which led to pastoralism and horticulture.

Other popular, but not as widely accepted, ideas are that the reason for plant domestication may have been to produce alcohol, or perhaps to gain status. The notion that plants and animals may have been domesticated as prestige items, or luxury foods, to gain status and social and political advantages is the subject of an article by archaeologist Brian Hayden (2003) called “Were Luxury Foods the First Domesticates? Ethnoarchaeological Perspectives from Southeast Asia.” Hayden suggests that certain animals and plants (including rice) were domesticated as luxury foods for feasting. He reasons, “... the primary force behind intensified subsistence production is not food shortage, but the desire to obtain social and political advantages—to obtain the most desirable mates, to create the most advantageous alliances, to wield the most political power.”

In Hayden’s view, domestication was initiated in societies where people were attempting to gain wealth and status, primarily by impressing others, and one way of accomplishing this was to have feasts with what he describes as luxury foods. Eventually these luxury foods became staples. For analogies of how early domestic foods like rice became staples, Hayden writes:

> Chocolate, once reserved for Mesoamerican elites, is now the bane of overfed multitudes. Oversized, out-of-season fruits and vegetables which once only graced the tables of kings and nobles have become everyday fare. Fat-rich meats, which formerly were used only for special occasions or for the highest ranks of society, are now commonplace.... Wines and spirits that played crucial roles in feasts for elites ... have now become the profane intoxicants of households throughout the industrial world. In short, our eating habits today largely are the result of, and reflect, the luxury foods of the past. (pp. 458, 459)
several thousand years ago, some horticulturalists took it a step further, which led to agriculture, sometimes known as intensive cultivation.

There is no consensus on why people started to become food producers. Historically, the domestication of plants and animals was envisioned by anthropologists as a great idea that made life easier, and most hypotheses to explain domestication began with notions of intelligence or keen observation. Now, however, it is clear that while the lives of some people got better, that certainly wasn’t the case for all. Ethnographic research indicates that for most people, pastoralism and horticulture required more time spent on subsistence than a life based on foraging did. Analysis of skeletons also supports the notion that for many, health suffered as a result of domestication. Poor nutrition and diseases are reflected in the skeletons of early pastoralists and horticulturalists.

There were certainly trade-offs. One clear advantage of domestication was that it produced a food surplus, which could be used as a hedge against poor hunting or gathering, or turned into a trade item. Domestication was also associated with reduced mobility, which some viewed as an advantage. Staying in one place for longer periods, as one does when depending on domestic plants and animals, also meant people could accumulate more. Further domestication increased the carrying capacity of a region, meaning more people could live together. With large populations and more permanent settlements came more internal conflict, inevitable social inequality, and the emergence of more formal political systems.

Explanations for the emergence of food production are an area of considerable debate in archaeology. Many archaeologists recognize that since many people suffer from having to work more and being in worse health, a better explanation than food production simply being a good idea is required. After all, it isn’t as if people in various parts of the world 15,000 to 12,000 years ago all woke up one morning and said, “We have too much leisure time and are too healthy, so let’s change the way we get our food.” Archaeologists examine the trade-offs.

What some researchers see as an advantage, others see as a disadvantage. Many in contemporary societies, for example, view being sedentary (living in permanent settlements) year round, as an advantage. Yet many foragers place a higher value on mobility. Many suggest the food surplus is a hedge against poor crops or hunting. On the other hand, domestication also ties up your resource base in fewer species, making people more susceptible to a disease or drought.

Most popular explanations for the emergence of food production are linked with changing environments. A basic idea is that changing environments may have reduced the carrying capacity of a region. Hypothetically, for example, an area that once maintained a human population of 1,000 may, due to environmental change, now only support a population of 900. The population has some choices.
Box 6.3
Was Alcohol a Driving Force of Human Evolution?

Probably not. But some people like to consider it.

In 2014 researchers suggested the ability to process alcohol was a driving force of becoming human. Their research, they claimed, indicated a mutation occurring in an ancestral human population about 10 million years ago made possible the ability to process alcohol, and thus, eat fermenting fruit. This, they suggested, created a new food source—fermenting fruit left rotting on the ground. The mutation thus became favorable, was selected for, and spread. To effectively make use of this new food source, the researchers claim, the ancestral humans likely started spending increasingly more time on the ground, which in turn led to bipedalism. Thus, according to this very unlikely scenario, the ability to process alcohol led to humans. This is an interesting hypothesis, but only a real stretch of the imagination, perhaps under the influence of alcohol, would place it among the most realistic views of human evolution.

In Uncorking the Past: The Quest for Wine, Beer, and Other Alcoholic Beverages, archaeologist Patrick E. McGovern (2009:xi) describes the allure of alcohol:

Humans throughout history have been astounded by alcohol’s effects, whether it is imbibed as a beverage or applied to the skin. The health benefits are obvious—alcohol relieves pain, stops infection, and seems to cure diseases. Its psychological and social benefits are equally apparent—alcohol eases the difficulties of everyday life, lubricates social exchanges, and contributes to a joy in being alive.

Most archaeologists believe the origins of plant domestication are linked to food shortages, although some suggest it may have been more political (see Box 6.2). Some take another view: that the early domestic plants, such as wheat and barley, may have been cultivated to produce alcoholic beverages, particularly beer. It remains a minor, but interesting hypothesis—that the driving force of domestication was beer drinking.

Evidence for the production of beer begins appearing in the archaeological record about 10,000 years ago, predating wine by at least a thousand years. How or why people started making beer is uncertain, but it quickly caught on. Besides the fact that it made people feel good, other reasons that have been offered to explain the adoption of beer include that fermentation increased the nutritional value of wheat and barley, and that by killing the pathogens in water through the fermentation process, it was a safer and healthier option than drinking untreated water.

McGovern (2009:7) suggests some other reasons:

Alcoholic beverages have other advantages. Alcohol spurs the appetite, and in liquid form, it also satiates feelings of hunger. The process of fermentation enhances the protein, vitamin, and nutritional content of the natural product, adds flavor and aroma, and contributes to preservation. Fermented foods and beverages cook faster because complex molecules have been broken down, saving time and fuel. Finally, as we have learned from numerous medical studies, moderate consumption of alcohol lowers cardiovascular and cancer risks.

Some breweries, with the aid of archaeologists, have begun recreating (and marketing) palaeo beers. The beers are typically based on a residue analysis on pots evidently used to store beer, which upon identification of the elements, are turned into a recipe. In more recent times, once writing began, the ancient recipes were recorded, and those recipes can be used today. Thus, some lucky drinkers have been able to drink beers as they would have been 9,000 years ago in China as well as in the ancient civilizations of Mesopotamia and Egypt.
They could perhaps become aggressive and raid food from neighboring groups; they could migrate elsewhere; they could have fewer children; or they could simply start domesticating plants and animals to get the carrying capacity back up to 1,000. The big problem, of course, is that once domestication begins and food surplus is created, the populations keep increasing, and the cycle of increasing food production to keep up with demand continues.

There are, of course, other explanations for the transition to food production that are not based on environmental change. Archaeologist Brian Hayden, for example, suggests that at least some foods may have been domesticated to increase wealth and status (see Box 6.2). Others suggest that some plants may have been domesticated for the making of alcohol (see Box 6.3). This last idea, which has received considerable interest in recent years, has led to many jokes, including one explaining that the reason permanent settlements are associated with domestication is so that waiters know where to find us.

Transitioning from subsistence relying absolutely on wild foods to subsistence relying on domestication need not be considered a drastic event that developed in a vacuum. Food production can certainly be considered revolutionary, but it wasn't as if the change from depending on wild sources to domestication required special knowledge. It is very likely that people were already managing their resources in numerous ways. Archaeologists working in some coastal areas, for example, find

Figure 6.1
Beer and Cultural Evolution
Beer was part of the diet of many people at least 10,000 years ago. It had many benefits and some suggest it was the driving force of cultural evolution including the domestication of plants.
Credit: Anders Nilsen
archaeological evidence of people altering the landscape of beaches to make clams more productive. Similarly, there are indications that people in the past may have deliberately set fire to areas to manipulate the kinds of plants and animals that would repopulate. People have been smart for a very long time. It stands to reason that before leaving an area where they were gathering wild plants, for example, they may have done some clearing of unwanted plant material. Making the transition to domesticating plants and animals was likely a case of just doing more of what they were already doing in regard to managing the resources. And maybe doing it a bit differently.

Identifying Subsistence Strategies in the Archaeological Record

There are many ways of identifying subsistence strategies archaeologically. Foragers, for example, are usually distinguished in part by a wide variety of wild plants and animals as food refuse. Since foragers usually live in small groups, create temporary settlements, and are egalitarian, evidence of these factors can also be used to support inferences of foraging.

Because foragers are relatively mobile, archaeologists are often interested in determining in which season a site was used. The primary way of doing this is to look for the presence of seasonal plants in a site. The presence of migratory animals also allows for inferences.

Indications of pastoralism and horticulture are made by examining plant and animal remains and correlating them with other cultural elements, such as the size of settlements and populations.

Pastoralists, for example, usually have little diversity in the animals used for food, but retain a diversity in plants, which they often continue to gather. Horticulturalists, on the other hand, exhibit little diversity in plants but considerable diversity in animals. Since pastoralists and horticulturalists tend to live in larger and more permanent settlements, indications of these can also be used to make inferences about subsistence.

Of course, inferences of pastoralism and horticulture are aided by determining whether the plants and animals can be classified as “wild” or “domestic.” Ways of making these determinations are covered in the next section.