Domestication as a human–animal relationship

Just as humans have a history of their relations with animals, so also animals have a history of their relations with humans. Only humans, however, construct narratives of this history. Such narratives range from what we might regard as myths of totemic origin to supposedly “scientific” accounts of the origins of domestication. And however we might choose to distinguish between myth and science, they have in common that they tell us as much about how the narrators view their own humanity as they do about their attitudes and relations to non-human animals. (Ingold 1994:1)

Domestication is another topic that has received extensive attention in zooarchaeology. Much of this work has centered on techniques to recognize domestic animals and discussions of when and where the first such animals are found. However, there has also been considerable discussion of how and why domestication came about and of its significance for humans and animals. In this chapter I focus on the latter issues: on domestication as a human–animal relationship. Domestication is surely the most important transformation in human-animal relations, with far-reaching consequences for both partners.

For reference, I provide in Table 6.1 my interpretation of the current best guesses for when and where the main domestic animals were domesticated. There are better data for some animals than others, and many dates will likely be pushed back (or occasionally moved forward) in the future. In cases where there is clear evidence for independent domestication in more than one region, I give the earlier date. As will be clear from the following discussion, there can be disagreement and uncertainty about what counts as “domesticated”; this is particularly problematic for cats, which have a long history of at least occasional commensal and perhaps pet relationships with humans, but are only morphologically domesticated rather late.
Table 6.1. Approximate dates and regions of domestication of major domestic animals

<table>
<thead>
<tr>
<th>Taxon</th>
<th>Region</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dog (<em>Canis familiaris</em>)</td>
<td>Central Europe</td>
<td>32,000 BP</td>
</tr>
<tr>
<td>Sheep (<em>Ovis aries</em>)</td>
<td>Near East, South Asia</td>
<td>10,500+ BP</td>
</tr>
<tr>
<td>Goat (<em>Capra hircus</em>)</td>
<td>Near East</td>
<td>10,500+ BP</td>
</tr>
<tr>
<td>Cattle (<em>Bos taurus</em>)</td>
<td>Near East, South Asia, (North Africa?)</td>
<td>10,500 BP</td>
</tr>
<tr>
<td>Pig (<em>Sus scrofa</em>)</td>
<td>Near East, East Asia</td>
<td>10,500 BP</td>
</tr>
<tr>
<td>Water buffalo (<em>Bubalus bubalis</em>)</td>
<td>East or South Asia</td>
<td>≈5000 BP</td>
</tr>
<tr>
<td>Chicken (<em>Gallus gallus</em>)</td>
<td>Southeast Asia/East Asia</td>
<td>8000 BP</td>
</tr>
<tr>
<td>Horse (<em>Equus caballus</em>)</td>
<td>Central Asia</td>
<td>5500 BP</td>
</tr>
<tr>
<td>Bactrian camel (<em>Camelus bactrianus</em>)</td>
<td>Central Asia</td>
<td>5000 BP</td>
</tr>
<tr>
<td>Dromedary (<em>Camelus dromedarius</em>)</td>
<td>Arabian peninsula</td>
<td>4500 BP</td>
</tr>
<tr>
<td>Cat (<em>Felis catus</em>)</td>
<td>Near East</td>
<td>4000 BP</td>
</tr>
<tr>
<td>Llama (<em>Lama glama</em>)</td>
<td>Andes</td>
<td>5000 BP</td>
</tr>
<tr>
<td>Alpaca (<em>Lama pacos</em>)</td>
<td>Andes</td>
<td>5000 BP</td>
</tr>
<tr>
<td>Guinea pig (<em>Cavia porcellus</em>)</td>
<td>Andes</td>
<td>1000 BP</td>
</tr>
<tr>
<td>Turkey (<em>Meleagris gallopavo</em>)</td>
<td>Mesoamerica/Southwest</td>
<td>2000 BP</td>
</tr>
<tr>
<td>Muscovy duck (<em>Cairina moschata</em>)</td>
<td>Northern South America</td>
<td>≈1000 BP</td>
</tr>
</tbody>
</table>

Definitions

Domestication, and what constitutes a domesticated animal, is surprisingly difficult to define. Our ties to free-range cattle, barnyard pigs, battery hens, race horses, lap dogs, barn cats, laboratory rats, trained elephants, honeybees, and house mice encompass a wide range of human–animal relationships. Yet most people would consider all of these animals, save perhaps the mice, to be domesticated. And what of zoo animals, farm-raised game, aquacultured fish and shrimp, and “wild” animals that are heavily managed, even bred in captivity? Faced with these difficulties, those who would define domestication must either do so in terms so broad that the term becomes essentially meaningless, or choose just some of these relationships, leaving the others in an ambiguous zone between the wild and the domestic. I return to this fascinating gray area in Chapter 7; here, I consider the various ways of defining domestication.

Part of the difficulty in pinning down domestication is that it combines biological and social aspects (Crabtree 1993:205; Meadow 1989:81). Domestication involves both an alteration in human–animal relations
domestication as a human–animal relationship 209

and behavioral and morphological changes in the domesticated animal. Roughly speaking, definitions of domestication can be divided into those that emphasize the biological side and those that emphasize the social, although many versions include aspects of both. I arrange them according to which factor predominates.

Many scholars distinguish between taming and domestication. Generally, taming is seen as an alteration in the human–animal relationship with a particular animal that does not have lasting effects through succeeding generations, whereas domestication involves a long-term change in relations beyond the lifetime of a single animal that often results in morphological and behavioral change (Bökényi 1969, 1989; Clutton-Brock 1994; Harris 1996; Hesse 1984; Ingold 1980:82, 1984; Reitz and Wing 1999:279–305). Thus raising the young of hunted animals as pets, a frequent practice of contemporary hunters (Bulmer 1976:182; Reed 1977; Serpell 1986:48–56) and no doubt past ones as well, does not constitute domestication. Although the relationship between humans and tamed animals is clearly different from that between humans and wild animals, and worthy of our consideration (see Chapter 7), the distinction is a valid one. Keeping the occasional pet does not fundamentally alter the relationship with wild animals, nor does it transform human–human social relationships in the way that domestication does.

biological definitions
Definitions of domestication that emphasize the biological aspect tend either to emphasize human control of breeding or to see domestication as a type of symbiotic relationship between two species, not unique to humans. Clearly, these involve quite different roles for human intentionality and agency.

Control of breeding
Sándor Bökényi (1969:219) offers one of the classic definitions of animal domestication: “the capture and taming by man of animals of a species with particular behavioural characteristics, their removal from their natural living area and breeding community, and their maintenance under controlled breeding conditions for profit.” The key elements are thus the control of the animals’ movement and of their breeding, effecting their separation from the wild breeding population. This separation permits the changes in size, behavior, and morphology through which we can
recognize domestic animals. Bökönyi’s rather curious inclusion of the phrase “for profit” in his definition is presumably intended specifically to exclude pets, which represent a rather different human–animal relationship (see Chapter 7). Bökönyi (1969:219–20) distinguishes two stages in animal domestication: animal keeping, which controls animals’ movement and breeding but without deliberate selection or control of feeding, and animal breeding, with controlled feeding and artificial selection for particular traits. Animal keeping characterizes the earliest domestication in the Neolithic, whereas animal breeding does not appear until the Classical period in the Old World.

Juliet Clutton-Brock (1994:26) similarly defines a domesticated animal as “one that has been bred in captivity, for purposes of subsistence or profit, in a human community that maintains complete mastery over its breeding, organization of territory, and food supply.” She retains the notion that domestic animals must be kept for profit (here with the addition of “subsistence” to remove the capitalist implications of “profit”) and places still greater emphasis on control of breeding, movement, and feeding. She regards domestication as a process culminating in the establishment of distinct breeds (Clutton-Brock 1994:27), analogous to Bökönyi’s animal breeding. Presumably animals kept under conditions of less than complete mastery are only partly domesticated, so that domestication was a process lasting several millennia.

Clutton-Brock (1994:28–30) argues that domestication involves behavioral perhaps more than genetic modification, with humans taking control of cultural transmission in animals, although this requires an unusual definition of culture: “[A] culture is a way of life imposed over successive generations on a society of humans or animals by its elders” (Clutton-Brock 1994:29). By usurping the position of the alpha animal in the dominance hierarchy, humans become “elders” to the animals and alter the behaviors transmitted.

Thus what can be viewed as the standard definition of animal domestication emphasizes human control of animals, especially of their breeding. These definitions have generally been offered by scholars with backgrounds in biology and animal science, whose concern is to explain how domestic animals come to look and act differently from their wild counterparts. Although they do not dwell on this aspect, such definitions clearly imply that domestication was deliberately undertaken by humans motivated by subsistence or profit. Bökönyi (1969:219) and
Clutton-Brock (1994:26) both believe that people first domesticated animals (other than dogs) to ensure a steady meat supply. Humans are active agents and animals are passively shaped by human control.

**Symbiosis**

Those emphasizing control of breeding are concerned with how domestic animal populations are isolated from the rest of the species so that changes can occur. Despite the focus on the biological effects of domestication, they see the cause in cultural terms: deliberate human behavior. Another school of thought conceives the domesticatory relationship itself in biological terms, as what may loosely be termed “symbiosis.”

This approach was pioneered by Frederick Zeuner (1963), who explicitly denied human intentionality a role in domestication. Rather, he argued, human domestication of animals is just one instance of a class of mutualistic relationships among species, as for instance between ants and aphids (see also Morey 2010). Domestication developed from tolerated scavenging around human settlements (dogs, pigs, ducks), or from human social parasitism on herd animals (reindeer, sheep, goat). Later attempts to control crop robbers (cattle, water buffalo, elephant, rabbit, goose) led to their domestication. Only after domestic animals were already well established in human society did people deliberately domesticate some taxa, such as chickens, cats, horses, and camels (Zeuner 1963:56).

Terence O’Connor (1997) expands on this model, arguing that seeing domestication as the human exploitation of animals is inappropriate; animals benefit as well through increased populations. Relationships between humans and various domestic animals can be characterized in terms of the mutual benefits or lack thereof as either mutualism (benefiting both species) or commensalism (benefiting one, neutral to the other).

This kind of definition deemphasizes human intentionality and gives a greater role to the animals. As O’Connor (1997:154) suggests, it poses the question of why humans became attractive to other species at particular points in time, rather than why they decided to control other species. This approach eliminates the need to include phrases such as “for profit” in definitions of domestication, and it more easily accommodates a wider range of human–animal relationships, including pets. Indeed, domestication as such becomes a nonissue. Rather there are a
variety of human–animal relationships to which both parties adapt to varying degrees.

Of course, it is possible to characterize domestication and other human–animal relationships in this way, and it is useful to be reminded that animals play an active role. From the human point of view, however, it is also productive to consider the social aspects of domestication.

**SOCIAL DEFINITIONS**

Other definitions of domestication focus on the changes in relationships among humans and animals, and between humans. These approaches emphasize not symbiosis, but bringing animals into the human social sphere.

*Property*

Ducos recognizes the difficulties of the variability in human–animal relationships that O’Connor underscores: “It is not obvious, however, that there does exist a single common criterion for all the man/animal relationships we call domestication. In fact it is possible that our intuition of what is domestication corresponds to modern situations, not to ancient ones” (Ducos 1978:53). However, he rejects symbiosis as an adequate explanation of domestication, arguing that domestication is an unnatural, asymmetrical relationship entered into willingly by humans, but not by animals (Ducos 1989). Rather than focusing on the biological aspect of these relationships, he calls for a social definition: “[D]omestication can be said to exist when living animals are integrated as objects into the socioeconomic organization of the human group, in the sense that, while living, those animals are objects for ownership, inheritance, exchange, trade, etc.” (Ducos 1978:54). In other words, animals are domesticated when they become property. Ducos (1978:56) distinguishes between the social and biological aspects of domestication, suggesting that we call animals that are socially integrated “domesticated” and those that show morphological signs of domestication “domestic.” He further notes that, although domestication may or may not involve control of animals, it generally does mean a shift from relating to animals as species to relating to them as individuals.

Ingold (1980:82) also distinguishes between social and biological domestication, although unfortunately he uses the opposite terminology from Ducos (“domestic” for animals incorporated into the household,
“domesticated” for those exhibiting morphological change). Ingold identifies three elements of domestication that may occur together or separately: taming, herding, and breeding. Taming involves the social incorporation of the animal into the household (not necessarily as property). Herding refers to keeping flocks of animals as property; the animals may or may not be either domestic or domesticated. Breeding entails control of reproduction, but, as in ranching, such animals, although morphologically domesticated, may be allowed to run wild (hence not socially domestic).

For Ingold (1984:4), domestication is a change in human social relations that involves “the social incorporation or appropriation of successive generations of animals.” Although living wild animals are not directly engaged in human social relations, tame ones have personal relations with individual humans, and domestic ones are the objects or vehicles of relations between individual people and households. The key change in animal domestication lies not in animals’ bodies, nor even in human–animal relations, but in the social definition of animals as a resource. Wild animals are shared, whereas domestic animals are husbanded by their owners (see also Hamayon 1990:325–7). This is essentially the same as Ducos’ definition of domestication as the transformation of animals into property.

Digard (1990) likewise takes a broad view of domestication and seeks a definition encompassing all the taxa we perceive as domestic. He also sees possession by humans as the key trait that distinguishes domestic from wild animals, although he does not make the distinction between domestic and domesticated animals. Rather, he views domestication as an ongoing process that is essentially the same in all cases, but varies in degree according to the suitability of the animal taxa and the features of human societies. He argues that we should not think in terms of a state of domestication, but of domesticatory action that people exert on animals, within a particular, culturally variable domesticatory system. There is thus no particular threshold at which animals become domesticated or fully domesticated.

QUESTIONING DOMESTICATION

Some examine the range of human–animal relationships and challenge the validity of domestication as a concept. Indeed, the members of the Palaeoeconomy school offered the concept of human–animal
relationships (or “man–animal relationships” in their parlance) as an alternative to a simple wild/domestic dichotomy (Higgs and Jarman 1972; Jarman 1972, 1977; Jarman and Wilkinson 1972). The Palaeoeconomists saw domestication as a biological concept focused on the morphological changes in the animal. They preferred to study “animal husbandry” referring to the human–animal relationship, and admitting of many degrees of intensity. For them, human–animal relationships form a continuum from random hunting to factory farming, with husbandry (control) gradually intensifying along this spectrum. The point at which domestication is recognizable through morphological change is meaningless in terms of these relations (Jarman 1977).

Howard Hecker (1982) similarly rejects the utility of the concept of domestication, as based on a false wild/domestic dichotomy. He also focuses on the human–animal relationship by substituting the term “cultural control” for domestication. Again, the problem is that morphological domestication does not necessarily correspond with the key behavioral changes that are of interest to anthropologists. In fact, the elements of cultural control are quite similar to those that Bökonyi and Clutton-Brock propose as defining domestication: deliberate interference with movement, breeding, or population structure that is of long enough duration to require active care, affecting a whole group of animals (not just individual “pets”), and rendering this group more accessible for future human use (Hecker 1982:219). Intentionality is explicitly a key element.

Thus to a large extent those who reject the notion of domestication are not really objecting to the standard definitions, but to the way domestication is recognized. Instead of morphological change, they rely primarily on mortality profiles to detect the changes in the human–animal relationship that they term husbandry or cultural control. In contrast to the symbiotic view, they stress human intentionality, but their concern is with its effect on the structure of animal populations and the organization of human subsistence, rather than with the incorporation of animals into human society and its effect on human social relations.

The notion of a spectrum of human–animal relationships is a salutary one. I am not convinced, however, that domestication is a useless and arbitrary concept. The transformation of animals from shared resource to property is a critical transition, and not one that people are likely to slide into imperceptibly. There is a real difference between “managing” wild animals by practicing conservation measures and appropriating domestic
animals as property. The difference lies less in the practices of animal control than in the human social relations. Herding represents a quantum shift in human–animal relations that is eminently worthy of study. However, this change in relations is unlikely to correspond with the appearance of morphological change in animals, so we must rely on other lines of evidence to detect it (see the later section, *Studying Domestication*).

**Models of origins**

A thorough treatment of the origins of animal domestication would include consideration of the emergence of agriculture and other important social and economic changes that provide the context for at least most animal domestication. In this section, however, I give short shrift to this larger context and instead focus on the human–animal relationship, reviewing the major models that seek to explain how and why people domesticated animals. Naturally, these models are to some degree dependent on how domestication is defined, but all seek to explain how humans came eventually to control the breeding and movements of some animals to the extent that the animals changed physically and behaviorally.

**COEVOLUTION**

Coevolutionary models are linked to symbiotic definitions of animal domestication, because coevolution is the process through which organisms adapt to symbiotic relationships. Because symbiosis benefits both partners in the relationship, changes in morphology and behavior that enhance the relationship will be selected for in both species. This selection happens unconsciously at the level of the gene, so that intentionality is completely absent in this model.

In this view, humans did not undertake domestication deliberately, nor were they pushed into it by population pressure or climatic change. Rather, it happened by itself: People and animals just slid into it. Following this model, domestication is not about control or domination. It is rather a harmonious relationship of mutual benefit. Adherents of this position see animals benefiting from domestication at least as much as people (O’Connor 1997; Rindos 1984, 1989). Others have objected to this view, arguing that many changes wrought by domestication are mal-adaptive (Clutton-Brock 1994:27; Shepard 1993:286–7). This disagreement stems from different understandings of what is meant by “benefit.”
Domestication has indeed led to wider dispersal and greater numbers of the domesticates (as well as the domesticators). Yet it has not made them better adapted to life in the wild (not surprisingly, given that they are adapted to domestic conditions) nor has it enhanced their quality of life in most cases. However, symbiosis is not concerned with the quality of life, only with how many copies of a gene get into the next generation. In this sense, domestication can certainly be seen as symbiotic. However, does this mean that it is unintentional or inevitable?

A good case for a coevolutionary development of domestication can be made for some animals, but not, in my opinion, for those of greatest social and economic significance. First, some animals that are sometimes considered domestic have clearly not been deliberately domesticated and are not even symbiotic but commensal. These include the house mouse (*Mus musculus*), common and black rats (*Rattus norvegicus* and *R. rattus*), and house sparrow (*Passer domesticus*). Leaving aside recent breeds developed for laboratory use and sometimes kept as pets, these animals were not deliberately domesticated nor even deliberately kept. Rather, they moved into niches created by human settlement, and their adaptations to these niches produced changes sufficient for speciation (Armitage 1994; Boursot et al. 1993; Brothwell 1981; Cucchi and Vigne 2006; Ericson 1997; Tchernov 1984, 1991). These unwelcome guests can be considered domestic only under the broadest definition that considers domestication as equivalent to mutualism.

Second, some animals may have domesticated themselves by moving into a symbiotic relationship that humans welcomed and actively encouraged, but did not initiate. Dogs, the first domesticate, may well have arisen in this way from wolves scavenging on the margins of human occupations. People may have decided they were worth having around, perhaps initially as watchdogs, later for their help in hunting (Budiansky 1992; Coppinger and Coppinger 2001; Crockford 2000; Morey 1994; O’Connor 1997; Uerpmann 1996). Once the dogs were tolerated, their role as companions would also have arisen. Other uses (food, traction, herding) are probably later developments. Alternative views would derive dogs from pet wolves or from wolves deliberately domesticated as hunting aids (see Chapter 7, *Man’s Best Friend*).

The coevolutionary case for cats is even stronger. Little is known about cat domestication. Morphologically wild cats occur in small numbers at many Near Eastern and European sites. These animals were
transported by humans to Cyprus (along with a range of other conventionally wild and domestic species such as sheep and fallow deer; see Chapter 7, Island Introductions), where one was buried near a human at Neolithic Shillourokambos (Vigne and Guilaine 2004). Domesticated cats are securely known only from around 4000 BP in Egypt (Faure and Kitchener 2009). Cats are atypical domesticates in that they are not social in the wild, so deliberate domestication would be difficult (Clutton-Brock 1994:26; Zeuner 1963:37). Cats were probably attracted to human settlements when grain stores began to attract mice and other rodents, and they were tolerated or encouraged because of their pest control abilities (Armitage 1986:15; Faure and Kitchener 2009; Zeuner 1963:56). Some individuals, such as the Shillourokambos cat, became pets or held other special relationships with people.

André Haudricourt (1977) makes the novel proposal that human excrement was a major factor in domestication. Dogs and pigs eagerly consume human feces, and reindeer, and perhaps other herbivores, crave human urine for its salt content. Haudricourt suggests that human excrement would have attracted animals to human camps and familiarized them with human odors. If this attraction were enough for domestication, however, these animals should have become domesticated wherever their range overlapped with human occupation, and shortly after coming into contact. On the contrary, animal domestication occurred in relatively few areas and followed very long periods of human–animal interaction.

Although a coevolutionary model may be appropriate for some animals, notably dogs and cats, I do not find it plausible for herd and farm animals such as sheep, goats, cattle, pigs, and llamas. The changes in property relations involved in the transition from hunting to herding are so profound that they could not happen without people noticing or caring. Hunting and herding operate according to very different logics (see Chapter 8, Difficulties of the Transition to Herding). Sharing until nothing is left is the standard approach of immediate-return foragers (Woodburn 1982). This creates obvious problems in maintaining a breeding population.

Crucially, the inhabitants of the Near East at the time of the origin of agriculture were delayed-return rather than immediate-return foragers (Woodburn 1982). The people of the Epipaleolithic Natufian culture, for instance, stored wild grain and probably other foods (Belfer-Cohen and
Bar-Yosef 2000), and this private storage clearly set the stage for saving rather than sharing the seeds of cultivated plants. Nevertheless, even horticulturalists view wild animals as a shared resource. The sanctions on farmers who failed to share animals might not be as strong as on foragers (and this is probably why animal domestication occurs in the context of plant cultivation), but they would still be present. Keeping private herds is a real change from hunting wild animals, and it could not have happened unconsciously or without substantial renegotiations of social interactions.

Moreover, whereas dogs can scavenge around human settlements and largely take care of themselves with relatively little impact on the human organization of labor, maintaining a viable herd of sheep, for example, requires considerable labor input. People herding sheep are not doing whatever they had been doing previously, so roles would have to shift to accommodate this new activity. The movements of at least some group members and the seasonal schedule would have to adjust to the needs of sheep for fodder. Such changes do not happen imperceptibly, but must be negotiated. At some point people must decide, and convince their neighbors, that the benefits of owning animals outweigh the added labor and disruption, not to mention the potential crop damage and other costs of keeping animals.

THE PET THEORY
The keeping of pets is a widespread practice that I explore further in Chapter 7. Because pet keeping brings tame animals into human communities, some have seen it as the basis for animal domestication (Reed 1977; Serpell 1986, 1989; Uerpmann 1996). Hunters often bring back the infants of their prey to raise as pets. Charles Reed (1977:563) specifically identifies little girls as the likely pet keepers, reasoning that their maternal instinct and female hormones would incline them to care for infant animals, while adult women would be inured to killing them, as would boys, who would already be learning to hunt. David Rindos (1984:10–11) takes exception to the gendered aspect of this model, “since I am a man who played with dolls as a child, cried when his guinea pig died, and has recently discovered his paternal ‘instincts.’” In any case, the model proposes that, although most such pets would not have survived or would have run away or been driven away as adults, a few stayed and bred in the settlements. The elders of the group realized that
these animals breeding in the village provided a handy meat supply and encouraged it.

In my view, this model suffers from an inadequate conception of domestication. The presence of tamed pets no doubt provided useful knowledge about animals and the techniques of controlling and interacting with them. This knowledge surely smoothed the way to domestication. The transition to herding, however, is more complicated than simply deciding that having domestic animals around is a good idea. In the same way that the coevolutionary approach does not explain the social aspect of domestication, the pet theory fails to provide an account of why people would be willing to alter their lives so profoundly.

Carl Sauer (1969) recognizes this problem and proposes that what he calls the “household animals” (dog, pig, chicken) had their origin as pets, but the domestication of herd animals (sheep, goat, cattle) must be explained differently (see the later section, Religion and Feasting). There is much to be said for this distinction. Dogs, pigs, and chickens can all forage for themselves within human settlements and can survive in small numbers with little human intervention. The distinction here between the pet theory and the coevolutionary view is slight: Were they tolerated because they were treasured as pets or because they offered some more concrete benefit (hunting aid, guard service, sanitation) to the human partners in the relationship? For pets to provide the origins of herds, however, at some point there must be a transition from companion animal to resource. One does not eat one’s pets. And who but the pet’s owner has the right to kill it and eat it? Thus issues of property and the organization of labor do eventually intrude, but perhaps at a later point in the process.

THE WALKING LARDER
If domestication of herd and farm animals was a conscious choice, why would people make it? Animal domestication involves a conceptual shift from seeing animals as a shared resource to seeing them as property, and from a focus on the dead animal to a focus on the living animal and its offspring (Meadow 1989:81). It also involves more work than hunting, as well as considerable social upheaval. What would make all this seem worthwhile?

The classic answer is that domestic animals provided a convenient and reliable meat supply: a walking larder (e.g., Armitage 1986; Bökönyi
1969; Chaplin 1969; Clutton-Brock 1994; Davis 1991; Flannery 1969; Hecker 1984; Hole 1996; Rosenberg et al. 1998). In early versions of this hypothesis, domestication was simply a good idea that happened to present itself and was adopted because of its intrinsic superiority to hunting (Carter 1977; Wilson 1862:vol. 2, 464). More recent variants recognize that herding is more laborious than hunting, and they tend to stress “push” effects that would reduce game populations. Some have favored the regional process of climatic change (Hole 1996), whereas others have blamed local game depletion due to overhunting resulting from population growth (Rosenberg et al. 1998) or increased sedentism (Bar-Yosef and Meadow 1995:91; Chaplin 1969:239; Hecker 1984; Meadow 1989; Tchernov 1993). Some also note the “pull” effect of the integration of animal and plant domestication, in that surplus agricultural produce can be “banked” by feeding it to animals (Clutton-Brock 1994:26; Flannery 1969:74), and both animal and plant production are enhanced by grazing the flocks on the stubble of the crops, which they fertilize with their manure.

It is uncertain, however, whether early herding was more stable, reliable, or productive than hunting. Indeed, given that it involved restricted movement and hence a limitation of the foraging ability of the animals, it is far more likely to have been both less productive and riskier. This may explain, in part, the size reduction seen in many early domesticates. Ingold (1980) regards pastoralism as inherently unstable. Whereas predation by wolves, for example, tends to maintain the prey population at a sustainable level by removing the maximum sustainable yield, herding removes the minimum possible number of animals to sustain the human population, maximizing the herd population. This permits the herd to expand beyond its food base, a recipe for disaster. Herding animals for meat alone (“carnivorous pastoralism” in Ingold’s parlance) thus does not increase but actually reduces the productivity of the land compared to hunting; it is not an intensification of hunting as cultivation is an intensification of gathering.

Of course, Ingold is referring to pure pastoralism and pure hunting, in which hunter and herder are entirely or at least primarily reliant on animals for their subsistence. If people are getting the bulk of their diet from plant foods, they can overhunt and reduce the local game population. In this case herding might be more productive than hunting, but only because herding would involve a smaller harvest of animals. The same
result could be accomplished with greater yields and less labor, not to mention less social upheaval, by instituting conservation measures that reduce the number of animals killed or change the age/sex composition of animals hunted. Overhunting by definition means that the ecosystem cannot produce enough animals to support that level of offtake; herding will not change the carrying capacity without substantial added labor to produce fodder. Protection of the flocks may reduce competition from other predators, but this again could be accomplished more easily by hunting out those predators. In fact, if overhunting has severely reduced prey populations, the competing predators will probably have largely disappeared.

SECONDARY PRODUCTS

If animal domestication was not a plausible way to increase or stabilize meat supplies, might it have been aimed at some other subsistence goal? Some have argued that the only way domestic animal production can be superior to hunting in economic terms is through the use of secondary products (renewable products of the living animal, such as milk, wool, and labor), and that only the use of these products would supply a rational economic motivation for animal domestication (Ingold 1980:100; Vigne and Helmer 2007).

The conventional wisdom is that domestic animals were originally used for meat, and only later for secondary products (Bökényi 1969; Childe 1951; Greenfield 1988; Hesse 1993; Perkins 1973b). Indeed, Sherratt (1981, 1982, 1983) proposes a Secondary Products Revolution that transformed human–animal relationships several millennia after animal domestication (see Chapter 8).

The question of whether secondary products were used from the beginning of animal domestication, and hence may have motivated it, or only much later is at least potentially amenable to empirical resolution. At this point we cannot claim a definitive answer, but there is a certain amount of evidence to consider.

Wool

At this time, the question of whether a secondary product motivated domestication seems clearest for wool. Wild sheep are not woolly but hairy, with a slight woolly undercoat. Hence it is unlikely that people domesticated them for their wool. In any case, there is no sign of wool in
the archaeological record until ca. 5000 BP (Armitage 1986; McCroriston 1997; Ryder 1973, 1984). Although textile remains only occasionally survive from early sites, we do have preserved textiles going back to the Upper Paleolithic (Adovasio et al. 1996; Kehoe 1991; Kvavadze et al. 2009; Nadel et al. 1994; Soffer et al. 2000) and a number of examples of impressions or actual textiles from the Neolithic (Adovasio and Illingworth 2003; Adovasio and Maslowski 1988; Barber 1994; Makkay 2001; Médard 2006; Mouillerat et al. 2002; SAPPO 2007; Tringham et al. 1992). As yet, all of these are vegetal fibers, mostly flax (linen). There was some controversy about the identification of the textiles from the 1960s excavations at Çatalhöyük. Hans Helbaek (1963) described these fibers as wool; Harold Burnham (1965) was noncommittal but inclined toward wool. However, a careful study by Ryder (1965; Ryder and Gabra-Sanders 1985), the acknowledged authority on ancient wool, clearly demonstrates, on both morphological and chemical grounds, that the fibers are flax. Bökönyi (1974:159–60) cites a figurine from Tepe Sarab in Iran ca. 8000 BP as depicting a woolly sheep, but this may not be what it actually represents. Ryder (1984) sees it as a hairy sheep in the early stages of developing wool. Thus present evidence strongly suggests that wool use was not a factor in the domestication of sheep, but a considerably later development.

Dairy

The evidence for the first use of dairy and traction is less clear-cut. The recent development of a technique to detect chemical traces of milk on pottery should help clarify the dairy issue (Dudd and Evershed 1998). Milk residues have now been found as early as the 9th millennium BP in the Near East and southeast Europe (Evershed et al. 2008). However, animal domestication occurred in the Pre-Pottery Neolithic, so this technique will not resolve the question of whether milk was used from the beginning of herding unless we can find other materials that bear milk residues.

The major alternative approach is the use of mortality profiles: age and sex patterning in the remains of animals slaughtered. Sebastian Payne’s (1973) seminal work points out that optimizing for meat, milk, or wool production will produce differing mortality profiles. For meat, one would seek to slaughter most animals at the late juvenile–early subadult stage, when they have reached nearly full size and growth slows, such that
additional feed yields a diminishing payback in weight gain. One would tend to slaughter more males than females to preserve the breeding stock. Because it is generally only possible to sex the bones of adult animals, this strategy would create an assemblage with a large number of late juvenile–early subadult remains, and the relatively few adults would be biased toward females. For milk, one needs to eliminate the calves that compete for the milk. Because one also needs to preserve adult females as the milk producers, male calves would be differentially slaughtered. Thus the assemblage should reflect peak mortality in the infantile stage and an adult sex ratio that is heavily female. Both sexes produce wool, so to optimize for wool production one would let most animals reach the adult stage. Thus the mortality peak would be in adults, even in quite old adults, and the adult sex ratio should be roughly even.

Payne’s model was based on herders producing for a market economy, and it represents extreme strategies unlikely to be practiced in a subsistence economy. Nevertheless, the general principles reflect the realities of herding. If one wants to produce substantial quantities of milk, for instance, one must keep adult females and deal with competition from the calves either by eliminating them or by weaning early. Those who have applied Payne’s model have generally found that a dairy mortality profile does not appear until ca. 7000 BP in the Near East (Davis 1984b; Gilbert and Steinfeld 1977; Whitcher et al. 1998) and ca. 6000 BP in Europe (Greenfield 1984, 1988, 1989, 2005, 2010; Legge 1989; Sakkalaridis 1979), although some have suggested earlier dairy use (Halstead 1987; Rowley-Conwy 2000).

Several complicating factors render the straightforward application of Payne’s model problematic, however. First, as with any use of mortality profiles, there are taphonomic issues. The more delicate bones of younger animals are more prone to destruction, particularly by dogs, thus producing a skewed age profile. Underrepresentation of infantile bone clearly has an especially strong effect on the recognition of dairy mortality profiles. The usual solution has been to base age estimates on mandibles, which are relatively solid as well as easily aged (Higham 1968). However, experimental and ethnoarchaeological work has shown that even the mandibles of infantile sheep and goats are significantly more likely to be destroyed by dogs than adult mandibles, producing severe distortion of the mortality profile (Munson 2000; Munson and Garniewicz 2003).
Second, the dairy mortality profile itself may not be applicable to early herds. Lactating female mammals let down their milk in response to the suckling and nuzzling of their infants. This let-down response is partially voluntary, and it requires a certain degree of relaxation and willing participation on the part of the mother (Amoroso and Jewell 1963). Modern dairy goats and cattle usually let down their milk in response to bumping and tugging by a human or mechanical milker. Less specialized animals, however, may not let down without the presence of their own infant. Many artistic representations from relatively late in the use of dairy depict a calf or other young animal held next to its mother while she is being milked (Amoroso and Jewell 1963; Cranstone 1969:256; McCormick 1992). Abundant documentary evidence from medieval Ireland indicates that cattle were kept primarily for dairy and that calves needed to be present to milk the cows (McCormick 1992). This would result in few animals slaughtered at less than 9–12 months of age, and indeed the Irish faunal assemblages have mortality profiles that peak at 1–2 years of age. This kind of age profile could easily be mistaken for meat rather than dairy production, especially if the analysis lumps specimens into infantile/juvenile/subadult/adult age categories, because the distinction then becomes one between early rather than late juvenile slaughter peaks. For example, when viewed in this light, the cattle from Opovo, a Late Neolithic site in Yugoslavia, appear to fit a dairy profile, when otherwise they would be seen as being raised for meat (Russell 1993).

The ability to let down the milk in the absence of a calf seems to be acquired relatively late and of variable date in cattle. It may well be earlier for sheep and goat, but nevertheless the first domesticates would most likely need the stimulus of the presence of their young. Thus we should expect mortality profiles more like those from medieval Ireland than Payne’s model if dairy were the main use of the first domesticates. Early domesticates, or animals in the early stages of dairy use, would also not produce much milk beyond the needs of their offspring. If the offspring had to be kept alive to maintain milk production, the amount of milk available to humans would be relatively small. However, the infant can be shorted to some degree, and it can be weaned early. These compromises enable the extraction of a certain amount of milk for human consumption at the cost of less vigorous animals, perhaps contributing to the size diminution that often marks domestication (Meadow 1989).
A further problem with applying Payne’s herding strategies to early societies is that subsistence production is unlikely to be so specialized. Even if milk was a major goal, early herders probably sought to strike a balance between meat and dairy production. Moreover, they were most likely equally concerned with minimizing the risk of loss of a large part of the herds on which they depended, which would entail raising “extra” animals as insurance (Cribb 1987; Redding 1984; Stein 1989). The wealth value of animals may also have encouraged the maximization of herd size at the cost of optimal production (see Chapter 8). Hence it is quite likely that even an early herding strategy centered on dairy might not conform to Payne’s classic profile, because the herders raised many more animals than expected to provide insurance against animal loss and to increase their flocks. An additional practical problem is that if herds were moved seasonally, as is likely to be the case if they were of significant size, a single site assemblage would not reflect the entire mortality profile of the herding system. It may completely lack the infantile portion of the kill-off if it is not the location where lambing took place, for example (Vigne and Helmer 2007).

Roger Cribb (1984, 1985, 1987) points out that herds are rarely static, but rather dynamic. That is, herders nearly always try to increase their flocks in anticipation of catastrophic losses from disease, predation, bad weather, and raiding (Cribb 1987:384–6). He has tried to address this dynamic aspect with computer simulation of sheep/goat herding strategies, which has yielded some unexpected results. Most strikingly, it is impossible to optimize for a single product. Maximizing milk production also increases meat and wool yields; maximizing for wool decreases total productivity. The relation between milk and meat production is particularly strong. This should be no surprise to anyone familiar with the dairy industry, who will realize that a byproduct of dairy production is veal calves. Cribb suggests that a herd structure that would at least permit dairy production is thus likely to have arisen quite early, whereas wool production is more likely to occur only after the advent of more specialized economies.

Using his simulations to test some of the herding strategies reconstructed by zooarchaeologists from the age and sex structure of their assemblages, Cribb (1987:402–10) finds that many of these strategies are not viable: The herd would die off over several generations. In particular, infantile remains are seriously underrepresented in archaeological
assemblages, no doubt due to a combination of taphonomic processes affecting their survival, seasonal movement of flocks, and a failure to bring the remains of neonatal animals lost to natural causes back to the site. These factors are unfortunately too complex to enable a standard correction factor for archaeological mortality profiles, but we need to remember in modeling that we are very likely to be missing a substantial amount of the infantile mortality.

An alternative approach to detecting dairy production in ancient herds uses x-rays to assess the thickness of cortical bone, with extended lactation causing thinning due to calcium loss. In a number of Israeli assemblages spanning the PPNB to the Late Bronze Age, this thinning appears only in the Chalcolithic (or in one case the Early Bronze Age), and it becomes more pronounced in the Late Bronze Age (Horwitz and Smith 1990, 1991; Smith and Horwitz 1984). Another technique based on the same principle measures the size of the osteons themselves within the bone (Chamberlain and Forbes 2005).

At the moment, then, the evidence tends to support a gradual, patchy adoption of milking at some time after the domestication of sheep, goats, and cattle, rather than as the motivating force in their domestication. Jean-Denis Vigne and Daniel Helmer (Helmer et al. 2007; Vigne and Helmer 2007), however, have recently argued on the basis of mortality profiles refined from Payne’s that milk was used from very early in the domestication process and may have been at least a partial motivation for domestication. Hesse (1993), who tested this claim with mortality profiles in the Kermanshah Valley in Iran, rejects significant dairy use by early herders. On theoretical grounds, arguments can be made both ways. Dairy is a more efficient use of domestic animals than meat and is the most productive use of uncultivable pasture land (Ingold 1980:176; Russell 1988). For example, Paul Halstead (1981a:314) has calculated for Neolithic Greece that a village of 40–240 people would need 2,400–14,400 sheep to subsist on meat alone, but only 1,000–6,000 if they used both meat and milk. Moreover, the use of the living animal provides an obvious incentive for keeping it around.

However, would it occur to a hunter to use an animal for dairy? Drinking milk beyond infancy must have seemed like a strange notion, and presumably the first use of dairy was to feed infants who had lost their mothers or whose mothers had lost their milk (Köhler-Rollefson and Rollefson 2002). This use would require the presence of tame, lactating
female animals; there would not be time to tame one for the purpose. Ingold (1980:100) suggests that, other than pets, animals may first have been tamed and kept as decoys for hunting others of their species. This would not require breeding animals; it would be easier to tame captured wild animals. However, a female in heat would be the best lure, which could well lead to having a tame, lactating female around the settlement. Thus use as decoys might provide the motivation for taming, and dairy the motivation for domestication.

Still, the let-down issues discussed earlier would limit the amount of milk available from early domesticates, and lactose intolerance would limit its utility. Although it might be useful to have a supply of milk for infants, adult mammals, including most humans, stop manufacturing lactase, the enzyme that breaks down lactose (milk sugar) and permits the full digestion of milk. Thus people over five or six years of age would benefit little from drinking milk, bringing the value of dairy production into question.

Of course, populations with a history of dairy use have adapted by maintaining lactase production in most adults. In these cases, primarily in central and northern Europe and east Africa, there must have been sufficient benefit from drinking milk as adults to create selective pressure for this mutation (McCracken 1971). Lactose intolerance has not been suppressed in the Near East, where dairy products are consumed mainly as yogurt and cheese, which breaks down the lactose into a more digestible form. Fresh milk may have been drunk by adults only where components not preserved in cheese and yogurt – high water content in arid east Africa, and the lactose itself for temperate Europe – were needed. Lactose enhances calcium absorption, a valuable property where vitamin D from fish or sunlight is scarce (Harris 1985:143–8; Sherratt 1983:94–5). Yogurt and cheese could not be invented until animals were already being milked, whether as a source of infant food or as a fertility offering. So the question remains open, and at this point we should simply bear in mind that dairy use may not initially have been of substantial nutritional benefit except to infants. A recent study of European Mesolithic and Early Neolithic human remains found all lacked the gene for lactose tolerance (Burger et al. 2007). Only after lactose tolerance became widespread or cultured dairy products were developed would dairy use enable a significant intensification of herd animals compared to use for meat alone.
**Labor**

Animal labor can be useful to humans in many ways. Carnivores may aid in hunting, protection, vermin control, and herding, among other tasks. Game animals can lure others of their kind. Some animals can be ridden, many can carry burdens, and some can be used in traction: pulling plows or vehicles. The use of animals in traction and transport has been seen as particularly significant, forming part of the Secondary Products Revolution (Sherratt 1981, 1983). This is also the easiest kind of animal labor to detect archaeologically, although such detection is far from straightforward.

The use of animals to pull wheeled vehicles occurs far later than the beginnings of animal domestication (ca. 5500 BP at the earliest), so although there is considerable debate about exactly when and where it began, I do not pursue it here (Anthony 1986, 1998, 2007; Anthony and Vinogradov 1995; Bakker et al. 1999; Hanks 2010; Kuznetsov 2006; Pétrequin et al. 2006; Piggott 1979, 1983; Sherratt 2003). The use of the plow, as evidenced by pathologies and biomechanical alterations in cattle skeletons (Baker 1984; Bartosiewicz 1993; Bartosiewicz et al. 1997; Bogucki 1993; Halstead 1987; Mateescu 1975; Milisauskas and Kruk 1991; Sherratt 1981, 1982, 1983), may occur somewhat earlier, but probably does not predate the Late Neolithic, although it was possibly used on a small scale from the Early Neolithic on Crete, ca. 7500 BP (Isaakidou 2006).

Zooarchaeological work on the skeletal alterations resulting from use as pack animals has so far been limited. Bearing excess weight should cause diagnostic remodeling and pathologies just as traction does. Pathological alterations similar to those associated with riding (Bartosiewicz and Bartosiewicz 2002; Daugnora and Thomas 2005; Pluskowski et al. 2010) have been interpreted as evidence of pack bearing in Egyptian donkeys from Abydos, ca. 5000 BP (Rossel et al. 2008), and patterns of osteoarthritis in dogs from the North American Archaic have been seen as evidence for pack use (Warren 2000).

Given the simplicity of the technology involved and the easy conceptual extension of human burden-bearing to animals, pack use could have been practiced from very early times. Larger animals such as cattle, horses, and camels are the most likely candidates, although dogs have been used as pack animals (Crabtree and Campana 1987; Sharp 1976; Warren 2000). Horses and camels were domesticated fairly late,
and cattle, although earlier, seem not to have been the first animals to be domesticated (see Table 6.1). Rather, the first herd animals domesticated in the Old World were sheep and goats, an unlikely choice if use as pack animals was the primary goal. The situation may be different in the Andes, where llamas are important beasts of burden. This function, along with wool, might in theory have been an important motivating factor in their domestication. The size increase with domestication in llamas supports this argument (Mengoni-Goñalons 2008). However, extensive use of animals for either traction or carrying burdens should create a mortality profile dominated by adults. This profile appears only later in Andean prehistory for llamas (Browman 1989) and is quite different from the juvenile-dominated mortality profiles of early Old World domesticates. Thus although animals may have occasionally borne burdens from very early times, it does not become a major factor until much later.

Ancient foragers may often have tamed animals for use as hunting decoys as Ingold suggests. This is an important precursor to domestication in that it provided a supply of tame animals and a model for using live animals. However, taming in itself is unlikely to lead to domestication. If we see domestication in biological terms as alterations to the bodies of animals, there is no need to control the breeding of such decoy animals or to separate them from the wild breeding population. Most likely only females would be used for such purposes. If we take domestication to be a social phenomenon involving the conversion of animals to property, taming for decoys may be a better model. Someone would have to be responsible for the care of decoy animals, and this might lead to notions of ownership, just as with pets. In the absence of other factors, however, this practice is unlikely to grow beyond the keeping of occasional animals with minimal social impact.

So far I have been discussing the initial domestication of livestock. If we consider secondary domestication, the addition of new domesticates where some animals have already been kept for a long time, labor may have played a greater role. In particular, camels may have been domesticated as beasts of burden, although their milk may have been equally important. They are also eaten and raced, and their hair is used for textiles, but these are subsidiary uses (Bulliet 1990; Gauthier-Pilters and Dagg 1981; Hakker-Orion 1984; Knauer 1998; Köhler 1984; Köhler-Rollefson 1996).

In summary, although milk and labor cannot be eliminated as motivations for domestication, nor can wool for llamas and alpacas, the weight of the present evidence suggests that they were not a factor in the primary domestication of livestock (i.e., in cases where there were no other animal domesticates aside from dogs). Rather, the use of secondary products seems to be a later intensification of the domesticatory relationship, although perhaps not very much later in some cases.

RELIGION AND FEASTING
If the motivation for the transition to herding cannot be found in the need or desire for a steady supply of meat or for products of the living animal, what then might have impelled people to reorganize their societies and take on the additional labor of animal husbandry? Some believe this social change had a social motivation, in religion or status competition.

Sacrifice
Eduard Hahn (1896) proposed that animals were domesticated for their religious significance, noting that the early domesticates (sheep, goats, and cattle) all have curving horns evoking the crescent moon. The motivation for domestication, in his view, was to provide sacrificial victims for the moon goddess. Hahn connected many domesticatory techniques to religious worship. Thus traction originated in pulling sacred carts in religious processions, and plowing was a symbol of male insemination of the female earth. Castration and milking were likewise practices related to fertility cults, with the milk offered to the goddess.
Hahn based his model largely on early texts from Mesopotamia and Egypt. Given the short chronology of this time before the advent of radiocarbon and other absolute dating techniques or the excavation of Neolithic sites in the Near East, he believed that these texts were written shortly after the inception of plant and animal domestication. After more than a century of research and improvement in dating techniques, we now know that Near Eastern peoples had practiced agriculture and animal husbandry for several thousand years and through major social changes before these texts were written (see Table 6.1). As a result, more recent archaeologists have tended to dismiss Hahn’s ideas. Some geographers (Isaac 1971; Sauer 1969:chapter 5; Walsh 1989) have continued to advocate these views in relatively recent times, however, and it is worth considering whether they might apply to the Neolithic societies that did domesticate animals.

As we have seen, plowing and wheeled vehicles appear well after the beginning of herding. Although artistic depictions of plowing by ithyphallic men and furrows under burial mounds in Late Neolithic and Bronze Age Europe render a religious, phallic interpretation quite plausible, it cannot be seen as an impetus to early domestication. Present evidence does not support a major role for milking in early domesticates, although small amounts of milk may have been extracted for offerings. Whether or not this use of milk was an incentive for domestication in the first place, it could well have initiated dairy use whenever it occurred. After all, initial milk yields would be too small to be of substantial nutritional value, particularly given lactose intolerance (Sauer 1969:86–7). Yet milk, as the stuff of life, has strong symbolic value. It is offered to deities and used in rituals in many African societies, Mongolia, and in the Vedic tradition (Baldick 2000:98; Heesterman 1993; Heusch 1985; Ruel 1990), so this symbolism has certainly been apparent to many societies that use dairy products. The origins of dairy practice surely lie in some combination of this symbolic value and the use of animal milk to sustain human infants whose mothers are unable to nurse them (which would certainly enhance the life-giving symbolism of animal milk).

Nor should we dismiss the symbolic appeal of crescent-shaped horns. Cattle horns had strong symbolic value for many Neolithic cultures in the Near East and Europe (see Chapter 3). Cattle heads and horns were displayed on walls and included in burials. Whether they are phallic symbols,
moon symbols, both, or neither, they definitely carried great significance and may well have provided part of the incentive for cattle domestication. Contemporary South Asian societies keep cattle or mithan (*Bos frontalis*) primarily for sacrifice (Fürer-Haimendorf 1963; Simoons 1968); the same is true for water buffalo among the Kodi (Hoskins 1993). However, cattle do not appear to be the earliest domesticates (see Table 6.1). Sheep and goat horns are sometimes depicted in the Neolithic, but are much less prominent. Indeed, prior to the first evidence of animal domestication, gazelles predominate in Near Eastern animal depictions (Cauvin 1972).

All of this discussion is centered on the Near East. Although this appears to be the area of the earliest animal domestication, there is at least one other center of independent animal (and plant) domestication in the New World, and there is likely another one in East Asia as well. Could this model apply to these cases? It does not work in a straightforward fashion for the New World, where animals were not used for dairy and animal-drawn plows and wheeled vehicles are totally lacking. Moreover, the native faunas of South America and Mesoamerica (the areas with domesticated animals other than dogs) lack animals with crescent-shaped horns. In East Asia, the pig is the first animal domesticate other than the dog, with chickens perhaps domesticated at around the same time (see Table 6.1). These animals lack horns and are not used for dairy or traction.

However, a less literal version of the model, positing that animals were domesticated for religious rather than subsistence reasons, is tenable. Eggs are an even more obvious fertility symbol than milk and have served as such in many societies, including our Easter eggs. Because traction and perhaps dairy postdate domestication in the Old World, their lack elsewhere is not terribly significant, and the lack of horns does not preclude the use of llamas and pigs in sacrifice. The crux of the religious argument is that the reason for raising animals was to ensure a reliable supply not of meat, but of appropriate sacrificial victims (Heusch 1985:212).

This model solves the problem of why people might wish to take on the burden of raising animals when the payoff nutritionally, at the start, is probably less than that of hunting. It has its own difficulties, however, in addition to the methodological issue of how to recognize sacrifice archaeologically. How is this demand for animal victims created in a hunting context? Ethnographic evidence suggests that this is not
impossible. There are numerous examples of the capture of wild animals specifically for the purpose of sacrifice or ritual killing, with the animals kept for varying lengths of time before they are killed (see Chapter 3, *Sacrifice and Ritual Killing*). Although these instances have not led to domestication, one could certainly argue that they could do so in cases in which the animal taxon was more suitable and the human social organization was appropriate (in most cases this would mean sedentism and/or agriculture).

As discussed in Chapter 3, many argue that only domestic animals can be sacrificed, but some hunters’ rites approach sacrifice very closely. The bear feasts of Siberia and the Ainu, as well as the eat-all feasts of the North American Cree (Brightman 1993; Tanner 1979), involve a ritual consumption of animals intended to assure the future availability of game and even to coerce the animal spirits or their spirit master into providing more game (Brightman 1993:236–43). This is not so different from sacrificing an animal to evoke the generosity of a deity, and both involve the notion of releasing the life force of the animal.

Thus although the details of Hahn’s model do not hold up very well in the light of subsequent research, the general notion that domestication may have been motivated by the need for sacrificial animals deserves reconsideration. Sacrifice is a widespread practice in societies with domestic animals, and some practices of ethnographically known foragers resemble it. Ceremonies such as the Ainu bear feast, in which a ritual killing of an animal is tied to a particular occasion and the animal is kept for some time before being killed, seem most likely to lead to animal husbandry.

**Feasting**

When the sacrificial animal is eaten, as it usually is, sacrifice will be associated with feasting. Feasting thus often plays a religious role, but it has social purposes as well. Whether or not they involve sacrifice, feasts are occasions for negotiating social relationships and for increasing the status of successful hosts (Blanton and Taylor 1995; Gregory 1982; Sherratt 1995; and see the section *Feasting* in Chapter 9).

Brian Hayden (1990, 1992, 1995a, 1996a, 2001a, 2009) has suggested that feasting provided the impetus for plant and animal domestication. Briefly, he argues that, rather than being pushed into cultivation and later herding by environmental or population pressures, people developed agriculture in areas of abundance. The motivation for the increased labor
input that was required lay in prestige competition as enacted through feasting by ambitious aggrandizers/accumulators/acquisitors (“triple-A personalities”; Hayden 1996a:131). This personality type is found in all cultures and is expressed through competitive feasting whenever the environment supports it. “Where desirable plants and animals were amenable to controlled production, this situation should have led to domestication” (Hayden 1990:37).

Hayden (1995a:294) attempts to account for the fact that dogs are the first, and in many places the only, domesticated animal with an analogy to plant domestication. Just as the first plants to be domesticated were not staples but condiments or those with nonfood products (e.g., bottle gourd), so the first domesticate of all is not a farm animal. Rather, he suggests, people domesticated dogs for consumption at feasts. Their value as feasting food rested on both their rarity and the labor investment in raising them. “As with all kept animals, the number of animals raised at any one time must have been very limited, time consuming, and labor intensive” (Hayden 1990:41). Yet this hardly seems an apt description of dogs/wolves. Indeed, as we have seen, it can plausibly be argued that dogs domesticated themselves precisely because they survive so easily as scavengers on the margins of human settlements with minimal care or none at all. If one wished to make a statement about labor investment, other animals would be much more suitable. If wolves were indeed deliberately domesticated for use in feasts, and perhaps for general display value, their value was probably based more on the power implied by the control of a dangerous animal (see the later section, Domination).

Dogs have often been consumed at feasts, usually in conjunction with sacrifice (Adams 2004; Clutton-Brock and Hammond 1994; Comba 1991; Fenton 1978; Gilmore 1933; Heusch 1985; Kirch 2001; Mason 1999; Ojoade 1990; Pohl and Feldman 1982; Powers and Powers 1984; Schwartz 1997; Tooker 1965; Trigger 1990; Wing 1978, 1984). This is especially true of, but not limited to, areas where dogs are the only domestic animal. However, dog meat is not the only meat used in North American feasts, and its role in feasts is probably a secondary use rather than the motivation for domestication. Hayden implies that animal domestication is solely about food, so that the choices are either that dogs and other domestic animals were staples of daily meat consumption or they were special feasting food. However, dogs played many roles in early societies (see Chapter 7) and were only occasionally eaten. For that
matter, wolves were rarely eaten. They are scarce in archaeological faunal assemblages, and although some are consumed, they seem more often to be killed for their fur or their symbolic value (and after the domestication of other animals, probably to protect the flocks). It is perhaps more likely that the gradual incorporation of already domestic dogs into feasting suggested possibilities that could be applied to other animals.

Hayden’s model works better for other domesticated animals. “[Dogs in the Pacific Northwest] were unlikely to be used for daily subsistence needs. The use of any domesticated animals as a daily meat staple would require enormous herds. . . . Thus, the use of meat from domesticated animals as a staple food during the early phases of domestication seems unlikely. Domesticated animals appear much more likely to have been eaten only on special occasions” (Hayden 1990:41). I have already noted that domestication is not a particularly good way to maintain a steady meat supply. Use in feasts and sacrifices (often hard to separate) provides a plausible alternative to the use of secondary products as a motivation for keeping animals. This is particularly true of competitive feasts, where the host seeks to maximize labor input to create an impressive display (Gregory 1982; Hayden 1995a:289). Thus the greater labor requirements of herding as opposed to hunting become a positive feature that is desirable in itself.

Hayden suggests that animals were domesticated primarily for their high fat content in contrast to the meat of wild animals: “Only by keeping animals and intentionally feeding them to increase their fat content could individuals achieve this goal” (Hayden 1990:42). Fat is indeed a coveted delicacy, and it is often in short supply in wild foods. Many plants may have been domesticated for their oily seeds (Hayden 1990). However, if the first domestic animals were fed so abundantly, it is surprising that domestication is marked by a decrease in size. Thus the fattening of animals is probably a later development. The intensive processing of animal bones for marrow and bone grease seen in most Neolithic assemblages also suggests that fat was not abundant.

The perceived need for animals to be consumed in special contexts thus offers one of the more satisfying explanations for why people would take on the difficulties of raising animals. Whether it is a religious requirement to have particular animals to sacrifice on particular occasions or a desire to provide special delicacies for competitive feasts, the extra labor can seem not only worthwhile but also a welcome addition to the value of
the offering. This explanation also fits better with current evidence that early domesticates were used primarily for their meat. It would therefore behoove us to devote serious attention to the recognition and study of feasting remains at prehistoric sites (see Chapter 9). However, where Neolithic feasting has been identified, it is usually based on animals other than sheep and goats, the first domesticated livestock.

**Shamanism**

Although shamanism is associated with foraging societies, some have also placed it in the Neolithic. Lewis-Williams (2004; Lewis-Williams and Pearce 2005) specifically links these beliefs to animal domestication. Present-day shamanistic religions often include a notion of spirit masters/mistresses of each animal species, who may be considered to own and certainly to care for these animals (Harrod 2000; Ingold 1987:245–55). If this is an ancient belief rather than one inspired by knowledge of domestic animals (including dogs), it could make human ownership of animals thinkable. Shamans often have animal familiars (see Chapter 2, *Animal Deities*) and sometimes have tamed animals that embody this role and help the shaman control wild animals of that species (Hamayon 1990). This control is used both to enhance hunting success and to impress other people and build the status and power of the shaman. Lewis-Williams argues that this use of tamed animals could lead to herding, probably in connection with keeping animals corralled for sacrifice and feasting. Hamayon (1990), however, sees this practice as unrelated to domestication, because the animals are not raised for food.

Lewis-Williams specifically bases this model on the art from Çatalhöyük, suggesting that shamans domesticated cattle at the site to bolster their power. He sees the art and architecture of Çatalhöyük as embodying a shamanistic worldview and providing the setting for shamanic rituals. His argument is based essentially on the earlier work at the site by Mellaart (1967), much of which is now out of date, raising problems with Lewis-Williams’s model. Çatalhöyük can no longer be seen as existing in glorious isolation as the first farming site in Anatolia, but instead is heir to a long tradition in eastern and central Anatolia stretching back more than 1,000 years before the beginning of its occupation. Is it then appropriate to assign a foraging worldview to people who were farmers and herders of sheep and goats? The art, too, although distinctive, grows from a set of shared motifs found for more than a
millennium in Anatolia. Current evidence suggests that cattle domestication first occurred not at Çatalhöyük, but slightly earlier in the middle Euphrates valley to the east (Helmer et al. 2005).

If broadened in time and space, the model has much to recommend it, but some difficulties remain. If domestication is a result of shamans asserting their power over animals in order to gain power over people, and shamanism is classically a religion of foragers, why is it that animal domestication (dogs aside) occurs only in the context of plant agriculture? One would have to make either a technological argument (architectural structures associated with settled communities were needed to control herds sufficiently to domesticate them, for example) or propose that shamanism experienced a last desperate florescence as its basis in a foraging way of life was lost. This might explain the puzzling emphasis on hunting or, at least, on wild animals in the art of Çatalhöyük and other Anatolian Neolithic sites (Russell and Meece 2006; Verhoeven 2002a).

Lewis-Williams suggests that shamans first, at sites east of Çatalhöyük, sought power through the control of sheep, goats, and pigs. However, after a while these herded animals became ordinary and lost their ability to inspire awe. So the shamans then turned to cattle, which eventually also lost their dramatic power, spelling the end of shamanism. However, sheep and goat domestication is not attended by extensive art and symbolism, nor much sign of sacrifice and feasting. The process and motivation seem rather different from cattle. And cattle already hold symbolic power and are found in art and special deposits at the time of early sheep/goat herding, well before evidence of cattle domestication. Moreover, cattle retain strong symbolic significance for thousands of years after domestication. The situation appears somewhat more complicated.

DOMINATION
Models of domestication depend partly on its definition. Having cast his net broadly in his definition (see the earlier section, Social Definitions), Digard seeks the factor that unites the domestication of the dog, sheep, silkworm, canary, carp, and so forth, concluding that the common thread is domination (see also Ingold 1994). As he defines it (including pets, among other relationships), animal domestication is probably a human universal. Although he fully acknowledges the various useful products and services derived from domestic animals, he feels that the extraordinary amount of energy we devote to domesticatory action, which is often
not economically justifiable, can only be explained as an end in itself. People domesticate animals because they crave the sense of power over life and other beings that this gives them: “[I]t is the desire for the appropriation and domination of nature and of beings that constitutes their constant and profound motivation (both proximate and ultimate)”\(^1\) (Digard 1990:249–50). Regardless of whether domination motivated domestication, it is a piece of it.

As we have seen in Chapter 4, it can be argued that hunting is fundamentally about domination as well. How then is domestication different, and why does it arise in some cases and not others? Digard’s answer to the second question is that domestication occurs everywhere in some form; the variations lie in the intensity and the characteristics of the particular domesticatory relationship, which are shaped by the environment and the structure of the individual society. In response to the first question, clearly domestication differs in that hunting exerts domination by killing the animal, whereas domestication involves control of the living animal. We find many useful things to do with animal bodies, but it all starts with the desire to manipulate them. Humans thus appear as obsessed with control of their surroundings. Has this compulsion for control and domination in fact made us human?

Domestication is a very particular kind of domination. Many animals have dominance relations that facilitate social interactions. These relations tend to involve dominant animals driving subordinates away from food and mates, and depend on stylized behaviors that establish who is dominant and demonstrate that submissive animals will not challenge dominant ones. These kinds of behaviors are very much present in our relationships with domestic animals, particularly pets (Serpell 1986; Tuan 1984). Yet these interactions are not about controlling access to food and mates: Mates are not at issue because these relationships cross species, and indeed we offer food to domestic animals (although we may need to keep them away from unauthorized food). From the animal’s point of view, we invoke dominance behaviors with which they are familiar. However, from the human point of view, we are mostly acting from a different model. Here the Latin root of domestication (\textit{domus}, house,
home, family) is most appropriate: We bring animals into the household, and the idiom that we use is that of family relationships.

Ingold suggests that both the gendered concept of domination in hunting (see Chapter 4, *Hunters’ Attitudes to Animals*) and the domesticatory relationship take their model from the human family. Animal domestication is an extension of gender relations to animals, continuing the association of women and animals and their subordinate position to men: “[T]he relation of domination entailed in ‘domestication’ originally comes about through the substitution of animals for subordinate humans within the domestic division of labour of the hunting economy” (Ingold 1987:254). However, as we have seen, one can argue that women are made subordinate because they are equated to animals, not vice versa.

The more plausible family role occupied by domestic animals is that of permanent children. This fits much better with observations that it is often women who care for animals. And of course taming would have to precede domestication, and it usually occurs by raising animal infants, so they would start out with that status. (Although this familial model applies well to pets and farmyard animals such as pigs, it may not work as well for herd animals.) Treating animals as children implies nurturing, but does it also imply domination? Human societies vary in the degree to which parents are considered to own, rule, or control their children. However, young children, if only because of their lesser physical and mental capacities, have a lesser degree of autonomy than adults. Likewise, caring for animals implies that they cannot or are not allowed to care for themselves. Keeping adult animals within human society usually requires continued care, hence placing even fully grown animals in the position of children.

Cauvin’s (1972, 1994, 2000b) answer to why plant and animal domestication occurred at a particular time in the Near East is that it stems from a symbolic revolution, a new religion that fundamentally changed the relationship of humans to nature. Whereas the symbolism of the Epipaleolithic Natufian period in the Levant centers on animals, mostly gazelles (their main prey), in the Khiamian period that immediately predates the first appearance of plant domestication, the animal symbolism disappears and is replaced with images of human females. Although animals are no longer depicted, actual body parts (skulls/horns and scapulae) of
Aurochsen are buried in houses and walls; later they appear in human burials, mounted on walls, and carefully placed in houses at abandonment. Aurochsen form an insignificant part of Khiamian faunal assemblages, so evidently they play a primarily symbolic role.

Cauvin interprets the female representations (mostly figurines) as indications of a new goddess cult centered on a supreme deity. Cattle/aurochsen appear in this same religious complex as the male principle, but in animal form and subordinate to the female. Cauvin bases his argument for the subordination of bull to goddess on the (later) reliefs at Çatalhöyük, where Mellaart (1967:122) has interpreted bucraulia beneath plaster reliefs of possibly female figures as the goddess giving birth to bulls. It is by no means certain that this is actually what is being depicted, but human (most often female when marked) and cattle (most often male when marked) depictions do characterize the Neolithic of the Near East and southeast Europe from this point onward.

For Cauvin, this symbolic revolution brings about an ideological shift enabling the control of plant and animal reproduction: “Thus, in surreal assemblages which bring evidence of the world of the imagination, there are ideas of fertility, of maternity, of royalty and of being the mistress of wild animals. Here are all the traits of the Mother-Goddess who dominates the oriental pantheon right up to the time of the male-dominated monotheism of Israel” (Cauvin 2000a:29–31). Crucially, Cauvin insists that this symbolic nexus appears before the beginnings of agriculture:

This change, whose historical importance has been underlined because of the germ of all the later constructions of mythic thought of the Near East and the east Mediterranean that it contained, occurs at this initial stage as a purely mental development. It is out of the question to seek to derive it from some transformation of the material infrastructure, following a line of reasoning that has become too classical. The strategies of subsistence were in no way agricultural, and the bull can be defined as economically insignificant, since that species, which was present sporadically among the hunted fauna, was not yet preferred to other game. That only became the case at Mureybet after 9000 BC, some time before the species was finally domesticated (Cauvin 2000a:32–3).

This symbolic change involves not merely a new deity, but one that is for the first time set above humans (as inferred from the famous Çatalhöyük figurine of a female figure seated on what could be described as a throne,
and from praying/adoring figures that sometimes surround those interpreted as the Goddess). This creates a chasm between the human and the divine, and between humans and their natural environment, enabling a domination of the environment that would previously have been literally unthinkable (Cauvin 1994:98–101). Cauvin reads the subordination of the bull to the goddess through the metaphor of descent as an attempt to control the beast in humans, hence humans themselves. He sees a further symbolic transformation in the PPNB, at which point bulls are controlled by humans in depictions that he reads as bull games (again at Çatalhöyük), and male human figures begin to appear – sometimes controlling bulls as in the figurine of a man riding a bull (perhaps better described as an ungendered person sitting on a quadruped) – yet again from Çatalhöyük. The notion of self-control of the inner beast becomes dominant specifically in this distinctively male symbolism, and Cauvin sees this concept as providing both the model for animal domestication and an expansionary ideology responsible for the spread of the Neolithic (Cauvin 1994:166–71). Although plant agriculture occurred both literally and symbolically in the female sphere, men performed animal domestication, based on masculine ideas and symbols (Cauvin 1994:176).

Reading symbols is always fraught with difficulty. Marija Gimbutas and her followers read these same depictions as representations of harmony both within society and between humans and nature (e.g., Baring and Cashford 1991; Barstow 1978; Eisler 1987; Gimbutas 1982, 1989, 1991, 1999; Starhawk 1989). Putting this aside, one could make other objections to Cauvin’s interpretation. Should we really read “thrones” and “adoration” as indications of domination and hierarchy? They hold this meaning for us because of their much later association with royalty. Cauvin argues that these later rulers borrowed the symbols from the gods. Yet would they carry this sense in an egalitarian society? Cauvin does not explain why people suddenly felt the need to subordinate themselves to an omnipotent deity.

There are also questions about the timing. Cauvin relies heavily on the imagery of Çatalhöyük, which overlaps with the later PPNB and which has both domestic plants and animals, to interpret the earlier Khiamian and PPNA symbols. Clearly there is some continuity in woman and bull imagery, but it is only at Çatalhöyük that Cauvin can build a strong case that the woman is a Goddess (Cauvin 1994:49), and it is only here and at later sites that female figures are seated and surrounded by adoring
followers. In fact at Çatalhöyük the adoring gestures seem directed more
at bulls and other animals than at the female figures, which form minor
parts of these compositions.

Cauvin likewise derives the subordination through descent of the bull
to the Goddess solely from the representations at Çatalhöyük, based on
reliefs of splayed humanoid figures in what Mellaart (1967:122) labels
a birth position, with arms and legs extended and upturned. In two
instances, these reliefs appear over the plastered heads of a bull and a ram,
equipped with real horns. Mellaart and Cauvin interpret these reliefs as
depicting the Goddess giving birth to these animals. Yet it is not certain
that these reliefs are human, female, or giving birth. The excavators of
Nevalı Çori describe an extremely similar figure in the same attitude on
a stela there as an animal (Hauptmann 1999). The heads, hands, and
feet were knocked off the Çatalhöyük reliefs in antiquity, complicating
identification. Traces of ears (or a horned hairdo, according to Mellaart)
suggest they may represent animals or a human–animal hybrid, and a
recent find of a stamp seal in the same position but with head and feet
intact depicts a bear (Türkcan 2007). The frequent attention to the navel
on both seal and reliefs might mean that these are in fact therianthropes;
although all placental mammals have navels, most are inconspicuous.
These reliefs do not resemble the depictions of human females in the
paintings or figurines. There is no indication of gender, although rounded
bellies with bulls-eye designs painted on some might be intended to
represent pregnancy and are the strongest argument that these may be
depictions of birth. However, not all have heads beneath, and sheep
do not otherwise form a major part of the symbolic sphere. There are
bucrania and the occasional ram’s head elsewhere on these walls and
others with no association with female imagery; it is not clear that their
proximity to the splayed reliefs in these two cases indicates a relationship.

However one wishes to interpret the Çatalhöyük imagery, it is much
later than the symbolic revolution that Cauvin describes. The shift in sym-
bolism marked by the sudden appearance of women and bulls is real. Yet
even if one reads the Çatalhöyük imagery as representing an all-powerful
Goddess and a subordinate bull-god, it is dangerous to project this inter-
pretation back to the Levantine Khiamian. The earlier imagery, in concert
with the various forms of “skull cult” first seen in the late Natufian (Bar-
Yosef and Belfer-Cohen 1989:473), is seen more reasonably as related
to ancestor worship. If one or more of these ancestor figures is being
transformed into a supreme deity at Çatalhöyük, this may constitute a second symbolic revolution.

Another issue of timing relates to Cauvin’s assertion, critical to his model, that these symbolic and ideological changes preceded plant and animal domestication. This is correct in terms of detectable morphological changes in the plant and animal taxa. However, it is debatable whether the appearance of human female symbolism predates cultivation, and surely this is the relevant development. Cauvin himself is ambiguous about this timing. Although at some points, as quoted earlier, he insists that the symbolic transformation preceded agriculture, elsewhere he states that they occurred simultaneously. As he points out, most of the earliest PPNA settlements are suddenly located on the alluvial soils that are best for agriculture, a change from the Natufian and Khiamian. This change, he reasonably says, would only happen if the people were already farming (Cauvin 1994:83), implying that agriculture began no later than the Khiamian, at the same time as the symbolic changes. Or, one could argue, it may have begun even earlier, and the symbolism follows it.

For animal domestication the situation is more complicated. It appears to follow plant cultivation in the Near East, based on all means of detection (see the later section, Studying Domestication). If, as Cauvin sees it, the domination of wild nature is symbolized through animal representations, it is puzzling that plants are brought under practical control before animals. Domesticated animals appear in the PPNB, at the time that the bull symbolism comes to the fore. So again the symbolic change may be simultaneous with or perhaps follows the earliest herding. However, bull symbolism, although more muted, is present from the Khiamian, in the form of special deposits of body parts rather than figurines or other representations. Although these deposits certainly testify to the symbolic importance of cattle, its significance may have been linked more to feasting than to the animal itself.

As Cauvin notes, the symbolism centers on cattle, whereas the first herd animals to be domesticated were sheep and goats. This suggests that the symbolism may not have followed from the practice of domestication, although it is unclear why the symbolic control of cattle would lead in the first instance to the actual control of sheep and goats. The symbolic dominance of cattle may be exaggerated, however. Just as the proportion of female human figurines in the Neolithic tends to be overstated, because some are male and most are not visibly gendered, so the
majority of animal figurines are not clearly identifiable as anything other than quadrupeds. Of those that can be identified, cattle are indeed the most frequent, but other animals such as pigs and sheep also occur. In addition, although cattle heads and horns predominate as architectural installations at Çatalhöyük, sheep heads and horns, the jaws of boar and weasels, and the beaks of vultures also occur. The famous bull painting from Mellaart’s building F.V.1 is reproduced so often that one has the impression that herds of cattle cavort across the walls of Çatalhöyük. In fact, there are only three certain and two possible (fragmentary) paintings of cattle, most of which are not clearly marked as bulls (Ducos 1988; Mellaart 1962, 1963, 1964, 1966b, 1967; Russell and Meece 2006). In contrast, in the same room as the F.V.1 bull painting, there are paintings of 3 red deer, one fallow deer, 4 boars, at least 12 equids, a bear, a putative wolf, 4 quadrupeds that may be dogs, an animal Mellaart calls a lion, and 2 cranes (Mellaart 1966b:184–91). There are other paintings of deer in different houses, as well as painted goats. Although not all these animals are central figures in the paintings as the bulls usually seem to be, they demonstrate that bulls are not the only animal with symbolic importance. Deer and perhaps boar are treated in much the same way as the bulls in the paintings, surrounded by human figures who seem to tease and torment them (see Chapter 3, Evidence for Sacrifice).

The sudden cessation of animal (gazelle) symbolism in the Khiamian and its resumption in the PPN with different animals is clearly significant, as is the appearance of human female symbolism just as the gazelles disappear. The timing better supports a reading that plant cultivation shifted the focus away from hunting and toward either fertility, as Cauvin argues, or ancestor worship related to the increased importance of inheritance. Animal symbolism may have returned through another route (hence the shift in taxa), initially gaining importance as the central components of feasts that, among other things, may have marked the conversion of group members into ancestors. Cattle, as the largest species available, would make a particularly impressive centerpiece. The Çatalhöyük depictions indicate that by ca. 9000 BP this feasting role had been elaborated into myths and rituals surrounding the capture and consumption of animals for special events, especially cattle but including other animals as well.

Thus Cauvin has pinpointed an important ideological shift related to the origins of agriculture, although it is uncertain whether this shift in
fact precedes the economic and social changes, proceeds in tandem, or even follows them. Indeed, in a postscript added to the English translation of his book, Cauvin (2000a:220) backs off from the position that the symbolic revolution preceded the economic one, now casting them as occurring simultaneously and being of equal importance. Nor am I convinced that this shift involves the creation of a supreme deity, as opposed to a new emphasis on lineage and ancestors, on ties to house and land. It would be rewarding to examine other parts of the world where agriculture has arisen independently in search of similar symbolic transformations. Unfortunately, there is probably no other area where we yet have tight enough dating of plant and animal domestication even to attempt to address the question of whether ideological changes preceded or followed domestication.

Cauvin’s case is stronger in arguing that ideology was critical to the spread of agriculture. Although settled farmers most likely had higher rates of population growth than mobile foragers, most (Bogucki and Grygiel 1993; Haak et al. 2005; Morelli et al. 2010; Pluciennik 1996; Price et al. 1995; Robb and Miracle 2007; Sampietro et al. 2007; Thomas 1996; Tsonev 1996; van Andel and Runnels 1995; Willis and Bennett 1994; Zvelebil 1986) think the spread of agriculture through the Near East and across Europe is too rapid to be explained by demography alone (cf. Ammerman and Cavalli-Sforza 1971, 1984; Cavalli-Sforza 1996; Chikhi et al. 2002; Diamond 1997; Pinhasi and von Cramon-Taubadel 2009). Cauvin argues that it is rather the allure of the idea embodied in the Bull: the power derived from mastering the beast within (see also Rice 1997) and the way that the new religion and the new economy were firmly linked to each other. Given its increased labor requirements and the need for substantial social reorganization, farming would not be intrinsically appealing to foraging groups:

Just imagine, by contrast, what was the effect on hunter-gatherers from time immemorial of the arrival of human groups, even rather scattered groups, driving before them docile goats and sheep, where the exotic nature of the species would add to their surprise at the mastery of the herdsmen. We should ask ourselves if this strange power would not have had a much more considerable impact than the simple perspective of a controlled reproduction of their subsistence resources (Cauvin 2000a:205–6).
Thomas (1991, 1996, 1999) has made a somewhat similar argument for the spread of the Neolithic into northwest Europe. He sees it as primarily an adoption of a religion or ideology, although he contrasts this ideological Neolithic to a more economically defined Neolithic in southeast and central Europe. Certainly the meaning of the Neolithic ideology was transformed and reinterpreted as it spread and developed in Europe. Drawing on Cauvin’s work, Hodder (1990) has embraced the notion that the symbolism at Çatalhöyük and elsewhere is about controlling the wild as a metaphor for controlling people. Specifically, he sees the inside/outside distinction created by the house as central: the wild is tamed and controlled, literally domesticated, by bringing it into the house. Like Cauvin, he suggests that symbolic domestication of animals by bringing their representations and body parts into the house preceded their domestication in the usual sense of physical control. The concept of “inside” was gradually extended such that by the time the Neolithic reached northwest Europe, the original inside/outside dichotomy – which Hodder terms “domus/agrios” – in which the home is contrasted with the wild, has become a “domus/foris” distinction that opposes the community to the foreign beyond.

Cauvin himself was not entirely happy with Hodder’s interpretation. If symbolic domestication merely involves bringing the wild/outside into the house, then it would occur wherever there were houses. Cauvin on the contrary sees a symbolic revolution that happens at a specific and restricted time and place; the Neolithic does not develop as soon as there are houses in, for example, the Upper Paleolithic of Central Europe or the Natufian in the Near East. Moreover, the intimate notion of home does not seem to Cauvin to provide the expansionary dynamic he associates with the Neolithic, especially from the PPNB, and which he attributes to the bull metaphor (Cauvin 1994:274).

Others have also argued that Hodder may place too much weight on the domus/agrios distinction (Davis 1992; Morter and Robb 1998). Halstead (1996:306) suggests that ancient people may have been less obsessed with domestication and control of the wild than are archaeologists and that the tensions between household and community may have been more important in the Neolithic.

Hodder’s notion that animals are symbolically tamed by bringing them into the house before they are physically domesticated has an obvious appeal. If animal domestication involves bringing animals into the
household, there is a connection with this symbolism. However, not only
does this model fail to address why the Neolithic did not develop every-
where as soon as there were dwellings but also animals were almost surely
being brought into the household as pets on a regular basis even before
there were substantial houses (see Chapter 7).

More fundamentally, what is the role of domination in human–animal
relationships? As we have seen here and in Chapter 4, it is possible to read
virtually every human–animal relationship as domination; the same is true
of human relationships. Yet is domination really what all of them are fun-
damentally about, or is it just a contemporary western and perhaps male
obsession? If relationships among living beings are composed of some
combination of domination and cooperation, altruism and exploitation,
do we explain them adequately by focusing solely on the power relations
(Haraway 1991)? “We do not feel forced in the social world – for example
in the field of our relations with kin – to choose between either exploiting
others for personal profit or avoiding all direct contact. Yet in the con-
text of relations with animals, this is precisely the choice that is forced on
us by the conventional dichotomy between wildness and domestication”
(Ingold 1994:11–12).

In human relations, Deborah Tannen (1990) has argued that, in west-
ern societies at least, men tend to focus on the dominance relations in
interactions, whereas women concentrate on the cooperative and affective
components. Both are present in all interactions, so focusing exclusively
on either one provides an incomplete picture. It is worth examining
human–animal relationships in terms of domination, but this does not
tell the whole story. Moreover, because domination is a component of
all relationships, it is not enough to say that hunting or domestication
is based on domination. We need to consider the role that domination
plays, the form that it takes in particular instances, and why it may some-
times lead to killing animals, other times to caring for them as virtual
family members, and yet other times to treating them as commodities. In
relation to animal domestication, did the perceived need to control the
beast within lead to control of the beasts themselves?

Implications

Although the debate over how animals were domesticated is fascinating,
in some sense it does not matter a great deal how domestication occurred.
What matters most is that it did, with profound implications for both people and animals. The effects on animals have been rather thoroughly treated elsewhere (e.g., Armitage 1986; Clutton-Brock 1992; Dobney and Larson 2006; Groves 1989; Hemmer 1990; Meadow 1989; Mignon-Grasteau et al. 2005; Morey 1992; Price 2002; Ryder 1973; Tani 1996; Trut 1999; Zohary et al. 1998), and I only briefly sketch some of them here. The most obvious are probably the physical changes: size reduction in many species; changes in fur and horns; alterations in the shape of the head, often involving a neotenous reduction of face and jaw; changes in body proportions; less developed muscles and bones; and smaller brains. Behavioral changes are perhaps even more important, most obviously the loss of fear of humans. Other changes include a reduction in flight distance, greater docility, and retention of juvenile dependency. Some of these changes are the result of deliberate selection and training by people; most are probably adaptations of the animals to the domestic niche. As a result of these changes, domestic animals have spread virtually throughout the world, often at the expense of wild animals.

TRANSFORMATIONS IN HUMAN SOCIETY
As an archaeologist, my primary interest is in the effects of animal domestication on people. Here we must distinguish among different kinds of domestic relationships. The more symbiotic relationships with, for example, cats and dogs may have been personally rewarding for many people in the past as they are in the present. However, such relationships may not have had a significant effect on human social relations. In contrast, the domestication of herd and farm animals has had profound implications for human society, human–animal relationships, and human conceptions of the natural world.

With Ingold (1980, 1984) and Ducos (1978), I see the key quality of domestication as social: Domestic animals have owners. This is a fundamentally different relationship from that with wild animals, and it creates a fundamentally different set of human social relations. Wild animals can be appropriated only by killing them. Their meat is generally regarded as a common resource to which all members of the group have a claim. Although the hunter usually has special rights over the kill, they are primarily rights of prestige and distribution; the hunter is obliged to share the meat widely (see Chapter 9).
Domestication as a Human–Animal Relationship

Domestic animals have owners while they are alive; these owners have rights in them that other people do not, including the right to decide if and when to slaughter the animal. Moreover, while a hunter will usually be motivated to kill animals whenever meat is short in the group, a herder always has a strong motivation not to kill her or his animals, because every slaughter diminishes the herd. Indeed, herders do not remain herders for long if they kill too many animals and fail to maintain the breeding population and allow a buffer for losses to disease, predators, and so on. Thus people depend less on other members of the group, who are no longer obligated to share all major resources with each other, and more on the resources of the household (Ingold 1980:168). Clearly, this shift bolsters the household as an institution. Storing plant foods would create a similar effect, and indeed it may have enabled the change in social relations that underlies herding by weakening the imperative to share and by strengthening the household.

Domestic animals also bring new responsibilities. Hunters often feel a responsibility to treat wild animals with due respect (see Chapter 4, *Hunters’ Attitudes to Animals*), but herders bear the daily burden of ensuring that their animals have food and water and protecting them from predators and human raiders. These necessities of herding demand considerable work, so the division and scheduling of labor would have to be substantially reworked when people started to keep animals (Bonte and Galaty 1991). This implies changes in household organization and perhaps shifts in power within as well as between households. I discuss some of the further implications of owning animals in Chapter 8.

**LINKS BETWEEN HUMAN–ANIMAL AND HUMAN–HUMAN RELATIONS**

Whereas people tend to regard wild animals as something like equals and admire their autonomy, domestic animals are clearly in a subordinate relation. Behaviorally, humans usually accomplish control of animals by usurping the place of the alpha animal in the dominance hierarchy. Indeed, possession of a dominance hierarchy may be a prerequisite for domestication (Armitage 1986; Clutton-Brock 1994; Garrard 1984). From the human point of view, this relationship tends to be described either in kinship terms, emphasizing domestication as the act of bringing animals into the household, or in political terms, emphasizing the inequality. At best, we care for domestic animals tenderly and direct their
lives in what we perceive as their best interests; at worst, we exploit them and treat them cruelly.

Although the analogy with children (see the earlier section, *Domination*) fits some domestic animals, notably pets, the political metaphors are perhaps more apt for farm and herd animals. Those who raise animals for meat must to some degree overcome the intimacy of the relationship in order to eat their livestock. Politically, domestic animals can be seen as slaves, whom we control and exploit for our profit, benefiting them only insofar as it is useful to us (Clutton-Brock 1994; Dunayer 2001; Kent 1989; Shepard 1993; Tani 1996; Tapper 1988). One could even see pets as analogous to the relatively pampered, often genuinely loved house slaves, whose subordination to the masters is nevertheless clearly maintained. The difference is largely one of emphasis: Slaves are also treated as permanent children, and there are strong elements of caring in most nonindustrial herding relations.

If slaves are like animals and domestic animals are like slaves, is there a relationship between animal domestication and human inequality? Did one provide the model for the other in a concrete sense, not merely as a source of metaphors? Was the subordination of other humans unthinkable until people had had the experience of controlling animals (Serpell 1986:179)? Or was animal domestication, at least for herd and farm animals with owners who control them, impossible until there existed a concept of control of subordinate persons?

In the Old World, and probably in South America, one could make a good argument that animal domestication provided a model for human exploitation. In the Near East, animal domestication appears in the PPNB (see Table 6.1). Although the degree of inequality in the Epipaleolithic Natufian culture and the PPNA (with the first signs of plant domestication) are debated (Bar-Yosef and Meadow 1995; Belfer-Cohen 1995; Byrd and Monahan 1995; Henry 1989; Kuijt 1994, 1996; Wright 1978), real social stratification, as opposed to competition for prestige, is not apparent until the later Ceramic Neolithic (Halafian, Yarmoukian; Nissen 1988; Singh 1974; Steadman 2000). Likewise, the spread of domestic plants and animals precedes the development of stratified societies in Europe, Asia, and Africa. East Asia was an independent center of plant and animal domestication. Recent work shows that rice and millet domestication and likely that of domestic pigs precede substantial human hierarchy here as well (Barton et al. 2009; Cucchi et al. 2011; Fuller et al. 2007;
Fuller and Qin 2010; Jiang and Liu 2006; Jing and Flad 2002; Larson et al. 2010; Wang et al. 2010; Yuan et al. 2008).

In South America, the beginnings of camelid (llama, alpaca) and guinea pig domestication are poorly understood (Mengoni-Goñalons 2008; Spotorno et al. 2006). Domestic llamas, at least, precede the Early Horizon, which represents the first states in the Andes. In contrast, the turkey was the only “farm” animal domesticated in Meso- and North America. Turkey domestication was probably fairly late, around 2000 BP (Rawlings and Driver 2010; Speller et al. 2010), yet clearly hierarchical societies in Mesoamerica date at least from 3500 BP. Hierarchical societies also developed in North America (e.g., the chiefdoms of the Mississippian culture of the Southeast and Midwest, ca. 1000–500 BP). Perhaps the strongest counterexample is the stratified hunter-fisher-gatherer societies of the Pacific Northwest, the famous exception to the general rule that complex societies are based on agriculture (Rosman and Rubel 1971).

Nevertheless, although these groups lacked herd or farm animals, they did have dogs. Indeed, every known hierarchical society has possessed dogs or some other domestic animal. Wolfgang Schleidt (1999) intriguingly argues that wolves/dogs made us human by teaching our ancestors how to cooperate and establish friendships with non-kin (altruism, roughly speaking), in the course of establishing a symbiotic relationship as hunters of wild herd animals. There are some difficulties with this proposal. Why would early humans (apparently Neanderthals) enter into such a symbiotic relationship if they were not already cooperative hunters? Nor is it obvious that the result of such a relationship would be to pattern human society on the structure of wolf (or wolf-becoming-dog) society. Moreover, it is a highly Eurocentric model and one that does not fit especially well with current evidence that anatomically and behaviorally modern humans originated in sub-Saharan Africa (d’Errico et al. 2008; Marean et al. 2007; McBrearty and Brooks 2000; Mellars 2006), where there are no wolves. Although Africa does have wild dogs and other cooperative predators, none of these were domesticated.

One could make a somewhat stronger if less cheerful argument that dogs, as the first domesticate, provided the model both for the domestication of other species and for the exploitation of other humans. Humans and dogs may have slipped into a domesticatory relationship through a coevolutionary process, but once fully established, the dogs assumed a
subordinate position. Dog trainers know that it is essential to maintain this hierarchy, mirroring that of the wolf pack, for the human–dog relationship to work (Monks of New Skete 2002). Dogs were thus the first inferior group in human society, for the essence of domestication is to bring animals into society. Dog domestication might provide a means for people to move from regarding animals as equals to considering the possibility that they could be controlled or enslaved. Ingold (1987:254–5) notes that Arctic/subarctic foragers often conceptualize the relationship between the master/mistress of animals and the animals he or she is associated with as like that between human masters and their dogs: one of care and control. This might ease the transfer of care and control of other animals from spirits to humans. It is not such a big step to extend this control to other humans as well.

Hodder (1990) argues that the symbolic taming of the wild by bringing it into the house (domesticating it) is in the first instance about controlling people (see the earlier section, Domination). Rather than the presence of dogs, he sees this symbolic control as paving the way for both animal domestication and the domination of other people. Of course, the people engaged in this symbolic domestication kept dogs, and the example of dogs may have made the idea of taming the wild more plausible. As discussed in Chapter 4, there can be no conception of the wild until there is a notion of the domestic. Referring to dogs, Fides (1991:59) argues that “[t]he point at which we increased our power by using animals to control other animals indeed seems significant, but the importance of such (anthropocentric) improvements is ideological as well as practical, demonstrative as well as enabling, affirmative just as it is effective. Domestication of animals, bringing them into the human fold as part of our stable of resources, serves as a signal of human superiority.”

At least in recent times, the wild/domestic divide has been used to justify oppression of people linked to the wild; this is also true of ancient China (Fiskesjö 2001). The more extreme versions of the separation of nature from culture have been traced to the 16th–18th centuries in Europe. Not coincidentally, this was a time of colonial expansion. If culture is superior to nature, and humans are superior to animals, then “civilized” people are superior to people who are closer to “nature.” Foragers in particular have been labeled as living like animals because they use only wild resources. Certain races and ethnicities, women, poor people, and the insane have also been designated as more wild and less
cultured than those in power, and thus in need of control (Dunayer 1995; Ingold 1994, 1996a; Mullin 1999). Interestingly, this strategy has been at least partially reversed in the last 50 years, when the trend has been to naturalize gender and racial hierarchies, and inequality itself, through invoking our foraging and animal past (Ardrey 1966; Beteille 1981; Dawkins 1976; Lorenz 1966; Storr 1968; Wilson 1975).

Beyond the general question of whether the presence of domesticated animals inspired the domination of other humans, has the particular form of human–animal relations shaped human societies? Haudricourt (1962) first made this argument, suggesting that the total control of the shepherd over the life of the sheep inclined Mediterranean societies to paternalism and hierarchy, so that it is only in this area that the slave state developed fully. In contrast, he feels that East Asian domesticates (pig and chicken) were less closely controlled and that people who were primarily gardeners as in East Asia tended to view animals more as equals. This view, he suggests, produced an ideology of harmony and cooperation, exemplified in the Chinese state. Unfortunately, this does not seem an especially good characterization of Chinese or other Asian states, which are conventionally represented precisely as highly paternalistic and rigidly hierarchical.

In a similar vein, Gordon Brotherston (1989) argues that the Inca, and presumably earlier Andean states, drew on the social relations of herding as the ideological model for the state. The result was a much more centralized and hierarchical society than elsewhere in the New World. Andean religion exhibits these same characters, with a supreme deity and metaphors parallel to those in the Judeo-Christian tradition of the ruler as shepherd and worshippers as flock.

There is a better argument for religion following the form of herding relations than there is for the state doing so. In a crude way, monotheistic religions do seem to have originated in areas with domestic herd animals. Yet this relationship was certainly not inevitable. Marx (Hobsbawm 1964) considered ancient Greece and Rome to be the classic exemplars of slave states, yet despite arising in the Mediterranean and relying on herd animals, their religions were highly polytheistic (although hierarchical), as were those of the earlier states in the eastern Mediterranean.

Guillermo Algaze (2001) explicitly argues that a key conceptual shift enabling the emergence of the world’s first states in southern
Mesopotamia, which he terms the “Labor Revolution,” involved coming to regard subordinate humans as domestic animals to be exploited:

Southern elites came to view and use fully encumbered laborers in the same exploitative way that human societies, over the immediately preceding millennia, had viewed and used the labor of domestic animals. This represents a new paradigm of the nature of social relations in human societies. . . . Scribal summaries detailing the composition of groups of foreign and native-born captives used as laborers describe them with age and sex categories identical to those used to describe state-owned cattle. . . . [T]he two classes of labor (captive “others” and domestic animals) were considered equivalent in the minds of Uruk scribes and in the eyes of the institutions that employed them. Early Near Eastern villagers domesticated plants and animals. Uruk urban institutions, in turn, domesticated humans (Algaze 2001:212).

Similarly, Sanskrit uses the same word for domestic animals and serfs or slaves (Tani 1996:404), and more recently, the French term for feral animals, marron, was first used for fugitive slaves (Digard 1990:166). Algaze implies that not merely the domestication of animals but also their use for labor provide a model for human exploitation (see Chapter 8, The Secondary Products Revolution). However, this human exploitation arises in a society that already exhibits substantial inequalities. Might these inequalities also have their roots in the human domination of animals?

More specifically, Yutaka Tani (1996) argues for a link between the use of bellwethers (castrated rams) and human eunuchs. The bellwether has a special relationship with the shepherd; it is trained to lead and help control the flock. Tani likens this to the use of eunuchs to guard the harem and demonstrates a striking overlap in the geographical distribution of these practices. Tani concludes it is more likely that the bellwether inspired the use of eunuchs than the other way around.

Providing a mental template for domination is not the only way that animal and plant domestication contributed to human inequality. By permitting more intensified food production (particularly of plants), domestication supplied a resource base to support complex societies and the higher population densities needed to achieve them. Only rarely are wild resources able to provide this foundation, and then only to a lesser extent. This capacity, along with the profound changes in social relationships...
Domestication as a Human–Animal Relationship

Described earlier, is what led Gordon Childe (1951) to label the transformations brought about by plant and animal domestication the Neolithic Revolution, which in turn provides the underpinning for the Urban Revolution. The use of domestic animals in feasting (see Chapter 9) and as wealth (see Chapter 8) can also create and enhance human inequality.

Ingold (1980, 1994) argues that the form of human–animal relations is closely tied to the form of human social relations, both ideologically and materially. Carrying this argument further, Tapper (1988:52–3), perhaps somewhat playfully, suggests that we can use human–animal relations of production to define modes of production analogous to those that Marx (Hobsbawm 1964) set forth for humans. Thus foragers, who tend to construct their relations with animals in terms of equality and reciprocity, correspond to Marx’s Germanic mode of production. Domestic animals used for their labor (i.e., not pets) are like slaves, hence recalling slave states. Pastoralists herd animals as communities (flocks). They dominate and control them, but leave individual animals a large degree of autonomy in foraging. This Tapper sees as similar to a contract in which the masters protect the herd in exchange for “rent,” like the feudal system. Ranching, although a development of the capitalist system, resembles the Asiatic mode of production in its human–animal relations: Control is not through contract but force. In contrast, factory farming, which reduces animals to machines manipulated for profit, exemplifies capitalist relations.

Tapper strains a bit to make human–animal relations fit neatly into Marx’s modes of production. For example, as discussed earlier (Chapter 4, Hunters’ Attitudes to Animals), one could easily argue that foragers’ construction of animals as equals is a mystification of underlying relations of exploitation. He also perhaps glosses over peasants’ relations with their animals, in which the animal is treated not only as a commodity but also as a member of the household to some extent. Certainly such animals have little autonomy compared to those of pastoralists. However, Tapper’s point is important: There are many forms of human–animal relations, and these are intimately related to human social structure (see also Digard 1990).

The connections between human–animal relationships and human social relationships are complex. The two have interacted with each other in various ways in different kinds of societies, and these interactions have
helped produce these different social formations. In addition to simply supplying a ready source of meat and other animal products, animal domestication has played an active role in the transformation of human societies and has had profound effects on both wild and domestic animal populations.

**Studying domestication**

The way one defines animal domestication influences the criteria used to identify it archaeologically (Crabtree 1993:202). For those who see domestication as primarily a biological change, alterations in the bodies of the animals are the primary or only signs of true domestication. These alterations include morphological changes such as horn core shape, and especially size reduction (e.g., Armitage 1986; Bökényi 1969; Clutton-Brock 1992; Crabtree 1993; Grigson 1969; Meadow 1989; Reitz and Wing 1999; Tchernov and Horwitz 1991; Uerpmann 1979; Zeder and Hesse 2000). Such changes take time to occur; the time may be short or long depending on how closely the herders control the breeding of their animals and whether there is conscious selection. Another approach to detect the earliest stages of herding is the analysis of mortality profiles: the age/sex structure of animals killed. It is expected that a domestic herd will be characterized by slaughter of most males at an early age, producing an assemblage with many immature animals and an adult sex ratio (usually sex can only be determined in mature animals) heavily biased toward females (e.g., Bökényi 1969; Chaplin 1969; Collier and White 1976; Ducos 1978, 1993; Hesse 1982; Legge 1972; Perkins 1964; Rosenberg and Redding 1998; Zeder and Hesse 2000). Other evidence for domestication includes artistic representations and artifacts or features associated with herding (e.g., Bökényi 1969). However, these usually appear only long after other evidence indicates that domestication has taken place.

If the essence of domestication for the archaeologist is a change in property relations such that animals have owners, clearly this shift will not always coincide with morphological change in the animals. Thus although changes in size, horn core shape, and so on are useful in demonstrating that domestication has occurred, they neither mark the earliest appearance of domestication nor are present in all cases in which the domesticatory relationship arises. The other common method of
identifying domestication, the analysis of mortality profiles, holds more promise because it focuses on herd management. It is not foolproof, however, because herding strategies can vary for many reasons (see Chapter 8) and some hunting strategies or seasonal slices thereof may mimic a herding profile. Approaching domestication as a social relationship suggests other lines of supporting evidence. They may not be definitive in themselves, but can help build a picture suggesting that domestication may have occurred. They are particularly useful in pinpointing the likely beginnings of domestication identified morphologically later in a sequence.

Digard (1990) suggests that domestication is best conceptualized as domesticatory action or as a set of domesticatory practices. Although herding requires few tools, it demands extensive knowledge, hence specialists such as shepherds. Tani (1996) discusses some of these essential practices, noting differences between wild and domestic herds of sheep and goats. Whereas the wild animals are dispersed much of the year and, even when together, are spread out in small clumps, the domestic herd must be denser and more cohesive to permit control by a small number of herders. A wild herd is characterized by what Tani calls strong vertical ties between mother and offspring, and weak horizontal ties among these units or with mature males. These ties are reflected in the dispersal patterns and the ease with which individual animals move from one flock to another. The breaking down of vertical ties and the establishment of horizontal ties do not happen automatically. Rather, the domestic flock must be created through specific practices, which include separating lambs from their mothers for much of the day and keeping them together so that they bond as a group. Such practices, involving a strict limitation of when lambs can nurse, might lead to higher infant mortality, especially in the beginning. This could account for the high percentage of early infantile sheep in the Aşıklı Höyük assemblage in early Neolithic Anatolia, for example, where the sheep remain morphologically wild (Buitenhuis 2002). These domesticatory practices apply not only to the beginning of domestication but throughout the process (Digard 1990:172, Tani 1996). Virtually all domestic animals easily become feral. Continued domesticatory practices are necessary to maintain a domestic state or domestic behaviors.

Because domestic animals are owned individually rather than forming a shared resource, it is likely that domestication will bring changes in
the way animals are butchered (relating to the distribution of meat, see Chapter 9) and the contexts of consumption. Patterns of sharing are likely to change as the ideology shifts from one in which all households or group members have equal rights to one in which rights depend on ownership. There may arise a greater distinction between the butchering pattern for animals up to approximately the size of a sheep, which can be consumed by a single household and so may no longer be shared beyond it, and larger animals that are still apt to be shared given the difficulties of storing meat. This is likely to be accompanied by a greater distinction between “ordinary,” within-household consumption and larger scale consumption (i.e., feasting; see Chapter 9).