

**HUMAN-ANIMAL INTERACTIONS AND THE  
SHIFT FROM HUNTING TO HERDING**

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## **Introduction**

The changing relationship between humans and animals through time is arguably one of the most complex problems that face archaeologists today, and it is probably for this reason that only a few researchers have attempted to study this area. However, if it is one of the most difficult topics of study, it is one of the most potentially rewarding areas as well, especially for understanding the transition from hunting and gathering to food production in the form of animal domestication and nomadic pastoralism. This transition is at best tenuously understood, but there is a general consensus that a whole host of biological, psychological, social, economic, and cultural changes accompanied it. The nature of this transition from hunting to herding, however, can be illuminated in the light of these associated changes, and this paper seeks to identify and interpret some of them using the specific example of pastoralism as generally practiced in the ancient and modern Near East.

## **Versions of Nomadism**

The difference between a hunting and gathering lifestyle and a pastoral lifestyle seems very clear cut. There are, however, one distinguishing characteristic of these lifeways that is often confused, and we must clarify it before proceeding. This oft-confused term is the concept of nomadism as it applies to both situations. Khazanov (1994) writes that the term ‘nomads’ has historically been applied both to hunter-gatherers and to pastoralists. He believes that this has caused confusion because while both are highly mobile, hunter-gatherers are governed by different conditions (ie. not having to look after the needs of domesticated animals) and implement their “nomadism”

in a very different way than nomadic pastoralists. He defines pastoral nomadism as an economy of extensively mobile pastoralism where the majority of the population follows the pastoral migrations. I define nomadic pastoralism as a food producing strategy based on the intensive management of herd animals for their meat and for secondary products such as skin, wool or hair, milk, blood, dung, traction, and transport. Because of the different climates and environments of the areas where nomadic pastoralism is practiced and the ecology of their herd animals, this management includes seasonal migration of herds. Because a majority of the members of the group are in some way directly involved with herd management, the household moves with the herd. While the products of the herd animals are the most important resources, utilization of other resources is not excluded. Barfield's (1993) definition of nomadic pastoralism agrees with this, and explains that the stipulations of this definition effectively exclude other intensive pastoralists, such as large scale dairy farmers, who are not nomadic, and other nomadic groups, such as hunter-gatherers and gypsies, who are not pastoralists.

Hunter-gatherers, on the other hand, move their residential locations as a response to temporal and spatial shortages in natural food resources (Bettinger 1991). This iteration of the concept of nomadism differs from that used for pastoralists in a few very important ways. While both sets of nomadic movements may have a lot to do with the ecology of herd animals, hunter-gathers movements are either based on following a natural herd or predictions on where a natural herd may be. Pastoralists, however, are in control of their herd animals and, as mentioned above, make their migration decisions based on knowledge or predictions about where pasture and water are (Barfield 1993). While other natural resources may factor in to movement decisions for pastoralists, they

will be eclipsed by the needs of the herd animals if they might interfere with them. Hunter-gatherer groups, conversely, may change the main resource criteria for movement decisions according to resource availability and ease of procurement (as optimal foraging theory tells us) (Bettinger 1991).

Another important difference between the concept of nomadism between hunter-gatherers and pastoralists is the extent of their nomadic movements. Nomadic Bedouin pastoralists have a much larger material culture than nomadic hunter-gatherer groups, yet their nomadic movements take them much farther afield than most nomadic hunter-gatherer groups can venture. It would be very difficult if not impossible for nomadic Bedouin pastoralists to be as nomadic as they are with out domesticated animals to use for traction and transport of these material culture items. Kohler-Rollefson (Kohler-Rollefson 1993, 1996) shows that the advent of the domesticated camel around 2000-1000 BP corresponds with the dates for the earliest pastoralist archaeological remains found in the most remote areas of the Near East. She argues that the ecological characteristics of the camel, namely its extraordinary water conserving abilities and its ability to survive on the sparse and poor quality desert vegetation, allowed nomadic pastoralists to exploit areas that were previously inaccessible to even hunter-gatherers. Before the domestication of the camel, donkeys were used extensively by nomadic pastoralists for traction (Khazanov 1994). Donkey bones were found in some of the most ancient nomadic pastoral archaeological sites, and probably had an effect on pastoral movement capabilities that was similar to the introduction of the camel (Bar-Yosef 1996; Sherratt 1983).

The idea that the animals themselves are part of the reason why nomadic pastoralists are nomadic, and can even *be* as nomadic as the are in the first place brings us

to the main topic of this paper. It is one of the ways the change in relationship between humans and animals has affected both sides. While some authors may see this change as a purely ecological one (ie. Alvard 2001; Alvard and Kuznar 2001; Clutton-Brock 1999; Khazanov 1994), others think of it as more of a psychological one (i.e. Ingold 2000; Smith 1992). The first group (which I term the ecological approach) looks at the origins of pastoralism as the result of economically driven choices by some human groups in response to climatological and demographical changes. The second group (which I term the psycho-ideological approach) looks at it as an ideological and psychological shift, as Ingold (2000) puts it, from “trust to domination” of animals. These two perspectives are best explained in isolation from each other before trying to draw a synthesis.

### **The Ecological Approach**

The main herd animals considered in this paper-- sheep (*Ovis aries*), goats (*Capra hircus*), and camels (*Camelus dromedarius*)-- were selected because they are the only key herd animals that can be the dominant or even sole component of pastoral herds in the Near East (Barfield 1993; Khazanov 1994). Even if other animals are kept, these are the only animals taken into consideration when planning nomadic movements and site location. Goats and sheep were the only small-bodied animals with the herd structures and dispositions suitable for domestication and easily available to incipient pastoralists in the Near East (Clutton-Brock 1999). These animals are used only for their primary product (meat) and their secondary products (dairy, skins, hair/wool, blood, dung, etc.), and are not used for traction or transport. Camels, donkeys, horses and oxen were the only domesticatable animals available to Near Eastern pastoralists that are large enough

to be effective vehicles for the traction of material items and transportation of people during nomadic movements (Clutton-Brock 1999; Ovadia 1992). Of these the camel is the most suitable for marginal environments, followed by donkeys and then horses, while oxen, because of their high resource consumption, are generally not hardy enough to be effective herd animals in marginal environments (Barfield 1993; Clutton-Brock 1999; Khazanov 1994). Of the three hardier animals, the camel also most readily provides the same kinds of secondary products that sheep and goats produce and is easiest to maintain in large herd sizes in a marginal environment (Kohler-Rollefson 1996). While donkeys are used by many pastoral groups in the Near East, they never are the main herd animal, and are usually used only as beasts of burden during nomadic movements and to bring in materials to support and feed the main herd animal when needed (Barfield 1993). Khazanov (1994) writes that horses have always been rare and very expensive in the Near East, and since their arrival was probably contemporaneous with that of the camel (c.f. Clutton-Brock 1999 for exact dates), nomadic pastoralists probably did not use them much for traction. Some modern Bedouin do, however, breed horses for riding, but they are usually only available to the richest tribes who can afford specialist herders for their care. In any case, they do not factor into the main group's nomadic movements or selection of site location (Barfield 1993; Cole 1975).

Alvard (2001; Alvard and Kuznar 2001) uses advanced ecological modeling (based on prey conservation and optimal foraging theories) to show that if meat is the only resource considered, pastoralism is likely to occur if resources are less abundant, are defended, and when the cost of deferring harvest of the meat is low (i.e. the potential benefits of conservation and deferred harvest of meat outweighs the potential cost of

immediately harvesting and consuming that meat). He also uses an allometric model, which predicts that as the deferment cost increases, the body size of the domesticate should decrease. This is because smaller animals are smaller meat packages and therefore an individual smaller animal costs less to conserve than an individual large animal. Large animals will not be domesticated until a potential pastoralist group has enough resources to invest in larger meat packages. This prediction seems to fit the pattern of the species domestication timing seen in the Near East where goats and sheep are domesticated before donkeys, camels, cattle, and horses (For actual dates see Clutton-Brock 1999). This highly ecological perspective breaks down the change from hunting and gathering to pastoralism into a simple cost/benefit optimization scheme given certain conditions that are assumed to have been present at the time of incipient domestication.

Many researchers have assumed early pastoralism to be linked rather closely with early agriculture (eg. Hole 1996; Levy 1983). Since even modern Bedouin nomadic pastoralists depend greatly upon agricultural resources, this may be true. Ecologically minded researchers assume that early meat pastoralism, because it requires long term deferment and therefore could not on its own fully support a group, would had to have been tied to a more productive economy. Some researchers believe that hunter-gatherer groups probably could not have devoted the time and energy needed to build and sustain meat herds, and therefore see pastoralism as tied to early agriculture and not a direct shift from a hunting lifestyle. Others believe it is possible for hunters to support tamed animals during their movements, and that this, coupled with their more intimate knowledge of natural herd ecology would set them up as perfect incipient pastoralists. If we take the concept of the collector type of hunter-gatherer from the forager-collector model (c.f.

Bettinger 1991), we see that many of the necessary conditions (as noted above by Alvard 2001; Alvard and Kuznar 2001) of pastoralism, such as storage and the ability to defer consumption of goods, would be coupled with the more intimate knowledge of animal ecology and behavior that hunters have. This would make collector-type hunter-gatherers outstanding candidates for being incipient pastoralists.

Lightfoot (1983) postulates that nomadic pastoralism is a response to a marginal environment. In order to gain enough resources in a marginal environment, Lightfoot believes that either resource intensification, migration, or both must occur. Bar-Yosef (1996) believes that the growing populations in the early Chalcolithic states of the more temperate regions of the Near East pushed the more subsistence level groups into the surrounding marginal environments. Adding this idea to Lightfoot's hypothesis gives a compromise mechanism for the origin of nomadic pastoralism (at least for the Near East). Perhaps these more subsistence based groups, including, possibly, collector-type hunter-gatherers, developed nomadic pastoralism as a response to crowding by agro-pastoralism into a new marginal habit.

Although the faunal osteological analysis is the main line of evidence used to determine the presence of pastoralism in a site (Alvard 2001; Alvard and Kuznar 2001; Bar-Yosef 1996; Chang and Koster 1986; Khazanov 1994; Legge 1996), and several problems to this approach have been identified (c.f. Chang and Koster 1986; Simms 1988), the fundamental principles that this method of identification are sound. Those principles assert that the process of domestication has changed the biological, social, and herd compositional characteristics of the domesticate (c.f. Clutton-Brock 1999 for descriptions of biological changes to domesticated animals). While it is extremely



difficult to differentiate some species of wild herbivores from their domestic counterparts based only on the anatomical traits of skeletons, Legge (1996) makes a case for determination of domesticates from wild species based on size difference. This method is difficult in practice, as the natural size variation of an animal may overlap significantly with its wild progenitor (especially ovi-caprines and camelids, the main domesticates of the Near East). A more reliable indicator is the frequency of animal sex and age and species diversity in the faunal record of a site because it differs between pastoral and hunter-gatherer sites. (Alvard 2001; Alvard and Kuznar 2001; Bar-Yosef 1996; Chang and Koster 1986; Khazanov 1994; Legge 1996) The presence of many young males and old females of one or two species often indicates pastoralism, whereas hunter-gather sites have a more random age, sex, and species distribution which often mirrors the sex/age distribution of wild animal populations. Also, skeletons are more likely to be complete at pastoralist sites whereas partial skeletons more commonly represent the faunal record of hunter-gatherer sites (O'Connell, et al. 1992; O'Connell and Marshall 1989). This pattern stems from the different ways in which each group uses animal resources. Ideally, pastoralists would want to maintain the best possible herd composition of many fertile females and only a few breeding males, and so are more likely to kill mainly young males and older females for meat. Hunter-gatherers, on the other hand, do not usually manage their game populations and are more opportunistic in selecting animals for meat. Furthermore, they frequently kill game far from the campsite, and so only bring the limbs, which are the most meat rich portions, back to the campsite (O'Connell and Marshall 1989). This type of faunal analysis may also prove to be misleading in a situation where pastoral people were contemporaneous with hunter-gatherers. Trade or

theft of pastoralist meat animals by hunter-gatherer groups produces very similar faunal assemblages at both types of sites.

Humans too have change biologically since the development of pastoralism. Domestic herd animals probably were first used only for meat, but the use of secondary products probably began around 6000 BP (Alvard 2001; Levy 1983; Sherratt 1983; Simms and Russell 1996; Uerpmann 1996). This phenomenon has been interpreted by examining the rate of spread that would account for the percent of adult hypolactasia (a pedomorphy for lactose tolerance) in the modern human world populations (Simms and Russell 1996). The gene controlling adult hypolactasia is autosomal dominant, and if dairying began at the same time as domestication (10,000 BP), then a very low selective advantage of only 1-3% would account for the present spread. But since dairying did not begin until 4000 years after first domestication, milk drinking would have had to have had a much higher selective advantage than this, and indeed milk and dairy provides much of modern pastoralists' dietary energy (Sherratt 1983). The high selective advantage of adult hypolactasia has affected all human groups that practice or practiced pastoralism, and its widespread presence in modern populations is a product of the shift to herding.

### **The Psycho-Ideological Approach**

The psycho-ideological approach has been used considerably less than the ecological approach in investigations of the transition to pastoralism. Two most notable researchers to use this approach are Ingold (1980; 2000) and Smith (1992), and although

they also discuss many of the ecological aspects of pastoralism described above, they direct their research along more psychological, ideological, and social lines.

Smith (1992) argues that the major psychological shift from a hunter-gatherer lifestyle to a pastoral lifestyle lies in the *willingness* to defer resource harvest to a later date. In other words, a fundamental change in psychology must take place. Hunter-gathers, in Smith's opinion, lack the propensity to defer harvest of immediate food resources, and the acquirement of this ability is necessary *before* a group can adopt pastoralism. These arguments are in addition to the ecological preconditions of pastoralism discussed by Alvard (2001; Alvard and Kuznar 2001) that only address the ability of the deferment in purely ecological terms (cost/benefit analysis). Smith believes that the psychological predisposition of deferment is at least as important as the economic ability to defer.

This type of shift probably has to do with the change from what Ingold (2000) terms "trust to domination" in the relationship between people and animals as pastoralism is adapted. Ingold writes that although both hunters and herders see animals as being both sentient and self-determined in their actions, the fundamental difference in the human-animal interactions of hunters and herders lies in the way each group deals with the animals abilities. He writes that hunters use a system of trust and autonomy in their relationship with animals in that they feel that if they respect the animal's self-determination, it will return the favor by offering itself as prey. Pastoralists, conversely, see these powers of their animals as something that must be overcome by strength and possession.

Needless to say, such a radical shift in the basic relationship between animals and humans would affect change in other aspects of human life. The most obvious change that comes with domination is the idea of private property (Ingold 2000; Smith 1992). The idea that herd animals need to be subjugated to the will of the human also entails that they must *belong* to someone. This also means that individuals could then own more objects than others, and both Ingold (2000) and Smith (1992) write that this marks a shift from the more egalitarian social structure of most hunter-gatherers to the more hierarchical social systems of food producers.

Another avenue that Smith (1992) explores is the different roles animals play in the ideology of hunter-gatherers and pastoralists. He notes the main difference lies in the total incorporation of the animal into the pastoralists' world versus a looser relationship between the hunter and the animal. Ritual and ideology involving animals or animistic spirits in hunter-gatherer societies are mainly propitiation ceremonies that are meant to placate the prey animal's spirit and ensure its goodwill and willingness to be hunted. Pastoralists, on the contrary, use animals in a larger variety of instances including naming and propitiation ceremonies and hospitality rituals, and these generally take the form of a sacrifice as an offering (Smith 1992). Smith (1992) also writes that these types of sacrifices are a product of the overwhelming need of the pastoralist to ensure good returns from their herd. This is also reflected, he writes, in that pastoralists see their animals in extra-familial terms and not as just food resources.

## **Conclusion**

It is obvious that the transition from hunting to herding entailed much more than simply shifting the economic base of nomadism. As well as numerous biological, social, and economic changes to both human groups and the domesticated herd animals, the shift to pastoralism entailed broader psychological and ideological changes. The nature of the interaction between humans and animals is complicated in hunter-gatherer societies as well as in pastoral societies, but the differences are obvious: as Ingold (2000) so succinctly puts it, it is a change from trust to domination. The impetus for such a shift, however, is still unknown. It seems most probable, however, that many types of preconditions, stimuli, or chance occurrences in the realms of economics, ecology, social structure, psychology, and ideology had to act together to allow the incipient pastoralist to make the leap to herding.

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