THE BISHOP'S BEEF

IMPROVED CATTLE IN EIGHTEENTH CENTURY SKÁLHOLT, ICELAND

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Skálholt was one of two principal cultural and religious centers in Iceland from its foundation as an Episcopal see in the late eleventh century until its destruction by earthquake in 1784. Preliminary analysis of a dump of cattle (Bos taurus) bones from an eighteenth-century context at the bishop's farm at Skálholt has revealed a new attitude towards agriculture, diet, law, fashion and ideology. The cattle represented by these bones were a new introduction to early modern Iceland, one that would have broadcast cultural difference. These cattle were not only being raised for a different purpose than typical Icelandic cattle, they were also morphologically different. The majority were naturally polled (without horns) and a smaller number had their horns artificially removed. Seen in the context of Iceland's early modern history, these cattle exemplify a divergence from animal husbandry norms and the attitudes towards nature which underpinned them. Contrary to the classic colonial encounter of the eighteenth century, this situation was enacted not among radically different ethnicities or civilizations, but within a homogenous population sharing the same language and religion as well as a common historical heritage. Cultural differences manifested themselves in terms of ideologies and fashions, reflecting on the one hand, elements of the Enlightenment then flourishing in continental Europe, and on the other, the early modern culture of Iceland containing many elements of continuity going back to the ninth-century Settlement Period, known as Landnám.

Animal husbandry is as much a reflection of culture as architecture, ceramics, or jewelry. Zooarchaeology in Iceland has made significant contributions towards understanding culture and contexts behind decision

making in Iceland from Landnám into the early modern era (Vésteinsson et al., 2002, McGovern et al, 2001, for example). Domestic animals have always been dynamic elements within culture. We can breed them to our needs and desires. In the eighteenth century the level of random chance in animal breeding in Europe dropped dramatically as breeding technologies advanced (Russell 1986). This increased ability to manipulate animals through breeding came at the same time as Enlightenment thought was at its height in the European world. The cattle from Skálholt reflect the impact of the technological innovations in animal breeding made during the eighteenth century but even more powerfully the impact of Enlightenment attitudes towards nature.

After the earthquake in 1784, the Bishop's residence was moved to Reykjavik[1] and the manorial complex – which consisted of the Bishop's quarters, a school, and considerable infrastructure devoted to the household – was partially abandoned, and a prosperous farm took its place. Skálholt was a major livestock farm in its own right, based in a highly fertile region (relative to Iceland) in the southern part of the Island and had according to an early eighteenth-century land register one of the largest cattle herds in the country (Edvardsson, in progress). Church documents, early maps, geophysical survey, and early modern travelers' accounts all indicate the unusual size and intricacy of the complex of buildings currently being exposed by excavation. Skálholt can be regarded as a settlement of possibly the highest year-round density in Iceland

[1] The Bishop returned to Skálholt after having bought the property from the crown and lived there until his death in 1796.

until it was replaced by the expansion of Reykjavik beginning at the end of the eighteenth century (Lucas, 2005).

The zooarchaeological assemblage recovered so far is extensive, but this paper only addresses one particular midden, context 454, found in a test pit to the southeast of the main complex. This midden is no older than the eighteenth century and should be contemporary with the largest and final phases of the manor and its complex household. There is no absolute date for the midden yet the depth of the midden, over one meter, and finds found above and within the midden, such as a late 17th century Dutch pipe bowl strongly suggest a date within the 18th century. Another trench roughly 15 meters along the same slope as unit 454 and in a similar position has a terminus post quem of 1758 for the units above 80 centimeters deep. Another hint comes from Joseph Banks, an eminent British naturalist who visited Iceland and stayed at Skálholt in 1772. His traveling companions included illustrators, one of whom included some clearly polled cattle in his portraits of the settlement.

Throughout the North Atlantic region, defined here as the North Atlantic Scandinavian cultural sphere, the standard domestic-mammal zooarchaeological assemblage reflected economies that concentrated on dairy production. Three elements make Skálholt's unit 454 unique within this North Atlantic context. The first is the overwhelming presence of cattle in the assemblage. No other known archaeofaunal context (that I have found after extensive searching) from Iceland or the North Atlantic region is so dominated by cattle. The second is a zooarchaeological profile indicating large scale beef production, relative to

Iceland, the first among non-modern archaeofauna from Iceland. Finally, the cattle represented by this assemblage were a new breed either brought in from Europe or bred from Icelandic cattle. Any of these conditions alone in an Icelandic context in any period would be exceptional (McGovern, et al 2001). To find all three is remarkable and merits further consideration. Cattle with these characteristics are not found in any of the later strata so far excavated at Skálholt or elsewhere in Iceland to date.

The midden containing context 454 was, judging from contemporary maps, close to and possibly associated with a meat store room. Among the butchery-related artifacts were a piece of whale bone butcher block and a possible whale bone knife handle. The midden is located along the edge of a road that ran through a complex of outbuildings south of the Bishop's residence. It was formed via a series of dumps of refuse, ash and fill over the edge of the road. Context 454 was the only stratum in this midden associated with large quantities of well-preserved, whole animal bones. It is an extremely dense deposit, with very little sediment present among the closely packed and entangled bone fragments. Because the adjacent thin peat ash deposits interdigitate with it, context 454 seems to represent an accretion of multiple dumps occurring over a fairly short time period.

Table 1 presents a count of the identified specimens (NISP 4,227) and the less well identified categories of "Large Terrestrial Mammal" (LTM), "Medium Terrestrial Mammal" (MTM), and "Small Terrestrial Mammal" (STM) as well as

unidentified mammal bone fragments contributing to the overall bone count (TNF) of 20,554.

Table 1

Scientific Names	***English Common Names***	***NISP Count***
Bos taurus dom.	cattle	887
Equus caballus	horse	3
Canis familiaris	dog	
Sus scrofa	pig	
Ovis aries	sheep	27
Ovis/ Capra sp. Indet.	caprine	118
Cetacea sp.	whale species	2
Alopex lagopus	arctic fox	2
	Fish sp to be determined	2203
	NISP total	4277
	Large Terrestrial Mammal	888
	Medium Terrestrial Mammal	94
	Small Terrestrial Mammal	1
	Unidentified mammal fragment	15,294
	TNF total	20,554

Table 2 presents the count of fragments (NISP) and relative percentage of domestic mammals. Cattle dominate the domestic mammal assemblage; caprines (sheep and goat) together make up less than 15% of the deposit.

Table 2

Domestic Mammals	*% NISP*
Cattle (Bos taurus)	84.70
Horse (Equus caballus)	0.30
Dog (Canis familiaris)	present
Sheep (Ovis aries)	4.00
Caprine (Sheep and Goat)	11.00
Total Caprines	15.00

Of the unidentifiable mammal bones, LTM make up a similar majority in proportion to MTM as cattle to caprines in the NISP. Considering that equids are represented by only three elements, and that the proportions between bos versus

other mammals and LTM versus MTM are similar, it is not too risky to associate LTM with cattle.

Finding cattle at a high-status site such as Skálholt is not out of the ordinary, but to find an assemblage so totally dominated by cattle is. No other currently known archaeofaunal context from Iceland has such a high percentage of cattle bone. In comparison, archaeofaunal assemblages from the medieval farm sites of Sveigakot and Hofstaðir in the north of Iceland exhibit far higher numbers of caprines, with cattle routinely representing between 15-20% of the archaeofaunal assemblages in the early period after Landnám, and then falling to 10-15% later in the early medieval period (McGovern et al 2001, Perdikaris et al 2004). The archaeofaunal assemblage from a lower ranking eighteenth-century site in NW Iceland, Finnbogastaðir, has cattle making up roughly 10% of its assemblage (Edvardsson et al, 2004). Both the early modern southern farm of Storaborg and the high status farm of Bessastaðir near Reykjavik had cattle making up roughly 20% of their assemblages (Sveinbjarnsdottir, 1988).

The element distribution for the cattle strongly suggests that they were slaughtered onsite. Elements from across the whole animal are present. If the beef represented by this archaeofauna was being imported from surrounding farms or regions, our element distribution would most likely contain a majority of heavy-meat bearing bones, such as the femur and humerus.

The cattle in the context 454 collection are almost all adults or older juveniles (table 3). This, too, is atypical. Neonatal bones, barely represented in

this assemblage, normally make up 20-40% of most Icelandic farm collections from all periods.

Table 3

Adult/Juvenile and Neonatal Cow bones		
Cattle Bones	# of bones	%
Adult & juv	887.00	99.66
Neonatal	3.00	0.34

Tooth eruption patterns observed on both maxillary and mandibular cattle tooth rows, (figures 1 and 2), indicate that the majority came from young adult animals.

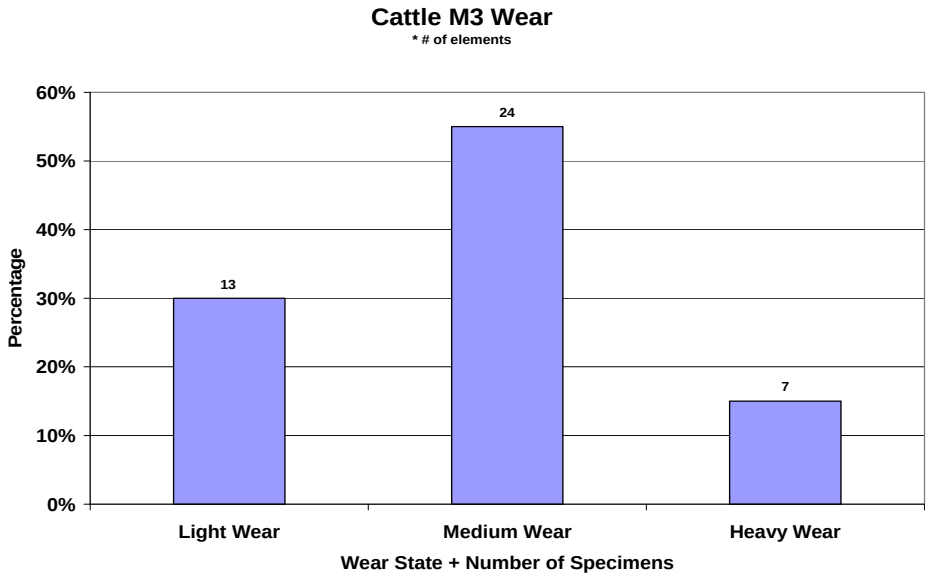

Figure 1

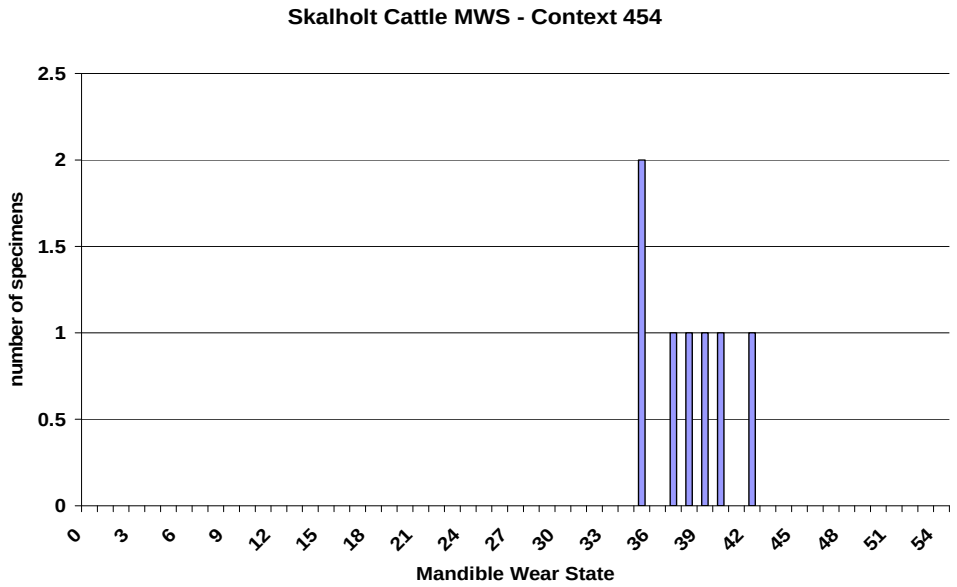

Figure 2

Figure 2 presents the mandibular wear state for the available cattle jaws, making use of the Grant (1982) method, with age estimates relative to tooth eruption and wear from Grigson (1982).

Light and medium wear account for roughly 84% of the sample of maxillary tooth rows (out of 44 samples). This strongly suggests that these cattle were slaughtered when they were three years old or older (Grigson, 1982). The significantly smaller number of M3 showing heavy wear implies that there were few older animals, meaning older than four to eight years, represented in this dump. The mandibles tell a similar story, suggesting that the majority of the cattle represented by unit 454 lived until sometime after their third year, yet not into old age, eight years or more. Due to the much larger sample size of maxillary tooth rows, the M3 maxillary tooth wear data should be emphasized over the mandibular tooth wear data, with its much smaller sample size of seven tooth rows. It's important to note that dental wear is only a relative indicator of age.

Different levels of erosion and plant composition, for example, can either inhibit or increase the levels of tooth wear in a cow. In order to lessen the “noise” from such possible variables the fusion state of selected long bones must be examined as well. These long bones reinforce the idea that these cattle lived beyond their third year, but not much longer than their fifth year (figure 3).

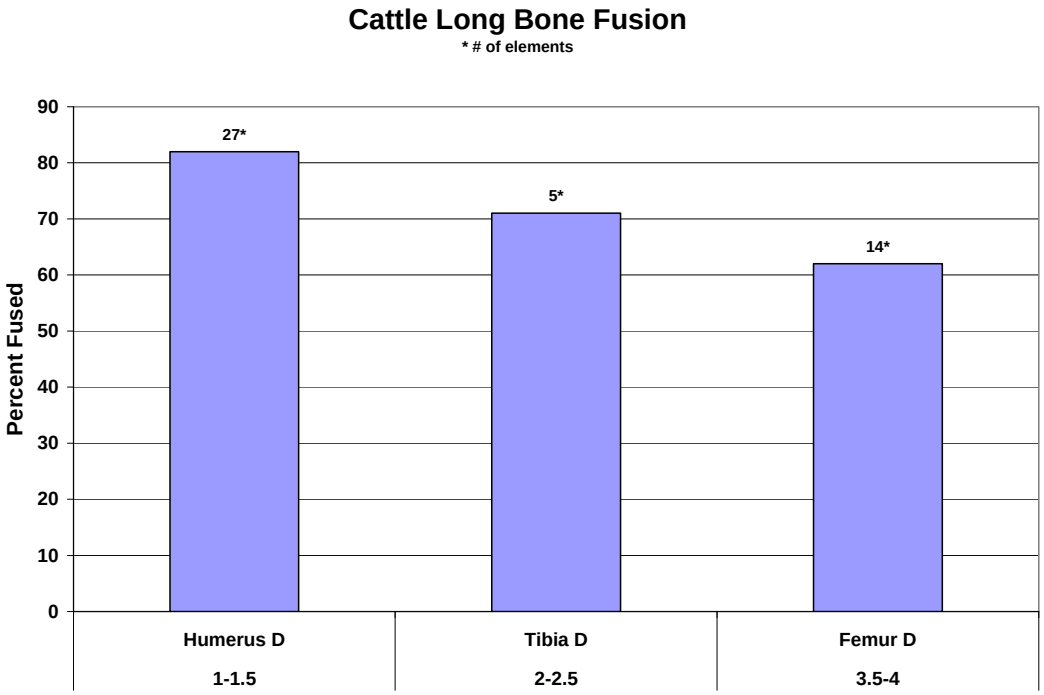

Figure 3

As can be seen from the chart above, 62% of the cattle femurs in this assemblage had fused distal ends by the time they were slaughtered. 38% were unfused, the largest proportion of long bone fusion in this assemblage. As this end of the femur does not fuse until the second half of the animals’ third year of life, this pattern of long bone fusion suggests that the majority were killed off somewhere around that age.

Both the bone fusion and tooth wear data strongly point to cattle that were slaughtered within their third and fifth years of life. This mortality pattern is more indicative of a beef cattle economy than of a dairy economy. A lifespan between three and five years would usually take them to or near the peak of their growth curve, before they could become effective milk producers but close to the point where further feeding produced little or no increase in carcass size (Trow-Smith, 1951). In contrast, in zooarchaeological assemblages of less wealthy, though by no means poor, farms in Iceland, one finds a large amount of bones from neonates and then again from older animals, past their prime (McGovern, 2003). This is a typical zooarchaeological representation of a dairy economy, in which a population of milk cows is maintained at a level determined by the amount of pasture and fodder available and neonates are slaughtered in order to save their mother's milk for human consumption. This is not to suggest that there was no dairy economy at Skálholt, only that a dedicated beef economy was present for at least part of the 18th century.

That these Skálholt cattle were being raised for beef is exceptional in the Scandinavian North Atlantic during any period. A dairy economy is in pure economic terms the most cost effective way to raise cattle. A beef economy costs far more in terms of time and fodder. For each animal, a farmer achieves only a one-time return for all their effort as opposed to the steady return of a dairy cow once it has reached a productive age.

The presence of beef on the Bishop's table for at least a significant period of time during the eighteenth century would have broadcast a message of

distinction and plentitude. This beef would have been of a very different quality than most in Iceland might have been used to before, because it was the meat of mature, rather than elderly or neonate, animals. It is obviously difficult to characterize how this quality difference would have specifically affected an individual at the Bishop's table, but I think the experience would have been a significant one regardless of the cooking method used. Virtually the entire population of eighteenth-century Iceland was made up of pastoralists. Livestock was, and still is, one of the primary elements of the Icelandic landscape, and cattle were the highest value units on this landscape. Therefore, a beef cattle economy within the traditional dairy economy would have been easily distinguishable to any Icelander both on the pasture and on the plate.

It would have also been seen as a luxury. Until the nineteenth century, and even later, few cultures around the world had made the choice to create and sustain dedicated beef cattle economies. The Bishop's slaughtered beef, eaten presumably by some elements of his household and his guests, would have proclaimed evidence of contact with a new and different culture than that of the great majority of Iceland. It would have been a strong cultural marker separating Skálholt from lower status households.

There are other examples of prime beef cattle in Icelandic Zooarchaeology, but on a much smaller scale such as at the early medieval farm of Hofstaðir (McGovern, 1999) and at the high medieval trading site of Gásir (Harrison, 2005). There is also at least one 18th century documentary mention of steers in Iceland, so Skálholt is likely not be the only place engaging in a prime

beef economy (Vésteinsson, personal communication). Yet relative to current zooarchaeological knowledge in Iceland this beef economy looks to have worked on a much larger scale than anything seen previously.

What makes these cattle even more exceptional is that all of the cattle crania (ten skull elements in which the horn core area was intact) recovered from context 454 are polled (without horns). Eight of these crania were naturally polled (figure 4), and two were artificially polled. In one of the artificially polled examples, infection set in after the removal of the horn (figure 5).

Figure 4

Figure 5

There was a very low frequency of naturally polled cattle occurring in the Icelandic cattle population from the Settlement Period to the introduction of new breeds in the nineteenth century, so it is statistically extremely unlikely that these polled cattle were the product of this very rare mutation. It follows that this particular breed of cattle of unit 454 were either introduced from continental Europe by the Bishop's household or bred by them from Icelandic cattle.

Codified in Icelandic law from the high middle ages, horned cattle had legal status as units of valuation and exchange. They were used to value property and pay debts and legal sanctions, and were central to Icelandic culture from the first settlement to the development of a dedicated fishing economy in the nineteenth and twentieth centuries. The horns are an explicit part of the definition of cattle in Icelandic law (Grágás). Moreover, horn itself was a valuable raw material for crafts productions on an island with a limited supply of wood and no utilized source of ceramic quality clay.

Skálholt's naturally and artificially polled cattle are different from the vast majority of previously encountered cattle archaeofauna in Iceland -- different in function and legal definition. In a strict reading of Icelandic law they were worth much less. I would argue that the introduction of cattle that did not fit into the traditional views of what the highest value cattle should be by one of the highest status settlements on the whole island was a dramatic and public statement of difference. To both utilize cattle as a high-status; one-time return investment while also taking them out of the traditional legal and economic system, is a vivid demonstration of power and wealth. The appearance of these cattle might have had the equivalent effect of the first Humvee seen on an American highway.

Artificial polling of existing horned cattle also shows a strong impulse on the part of the powers at Skálholt to change the Icelandic landscape not only through introduction of a new breed of animals but through the physical alteration of native cattle. This deliberate alteration of natives to resemble the newcomers, I believe, moves the agency behind these cattle into the realm of fashion and ideology. There was no practical reason to artificially poll these animals other than to create a uniform faunal landscape that reflected the ideologies and pastoral fashion pretensions of the Bishop of Skálholt.

All the more interesting was the extreme epidemiological, climatic, and geological context in which these cows were displayed. The eighteenth century began with the smallpox epidemic of 1707-09 (Vasey). Due to their relative isolation from Europe, Icelanders were highly vulnerable to smallpox; an estimated one-third to one-quarter of the total population died in the epidemic.

Additionally, this century was on average (relative to the total time of settlement) a period of extreme climatic variation. Such unpredictability at the edge of sustainable European style agriculture had dire effects on the abilities of Icelandic farmers to support themselves. The middle decades of the eighteenth century were also colder on average, killing off large numbers of domestic animals and increasing sea-ice. Famine is estimated to also have killed off roughly ten thousand Icelanders, out of an estimated total population of roughly sixty thousand, in the decade of the 1750s. Average temperatures dropped again and sea ice increased beginning in the 1780s (Ogilvie, 2001). Although Skálholt lies within one of the most robust regions of Iceland, in terms of climate stability, the stress from increased climatic variability and the cold periods in the middle and end of the century would have exerted significant pressures on the Skálholt economy (Jennings et al, 2001).

The disasters continued into the last quarter of the eighteenth century, when Iceland experienced the Famine of the Mist from 1783-1784. This was the result of the Lakagígar eruption whose effects were felt throughout Eurasia. A thick fog of toxic volcanic gasses and dust blanketed the island for the greater part of a year. Many livestock on the island and an estimated quarter of the population died (Demarée and Ogilvie, 2001). As if the island had not suffered enough, a final blow was dealt in 1784, with the earthquakes that destroyed Skálholt and leveled structures across the south of the island.

Finding a balance between the precise needs of new breeds and the environments of their new homes was a process that often failed in the

eighteenth century (Van Bath, 1966). What is remarkable is that these polled beef cattle were introduced during a century of such crisis.

Where did these cattle have come from? It is impossible to say with any great certainty at this point in the research, but it is the case that during the eighteenth century Europeans were developing some of their first polled breeds of cattle, including the Scottish Galloway and the Aberdeen-Angus breeds that were created and raised solely for beef production (Van Bath, 1963). It is also accepted by livestock and agrarian historians that the first dedicated beef economies in Europe were formed at this time. Scotland supplied Galloway, Angus, and Highlander beef cattle in large numbers for the Edinburgh and London markets (Trow-Smith, 1951, 151-153), while the Danish nobility suppled the Netherlands with large numbers of beef cattle (van Bath, 1963, 286). The latter may have been the source of the bishop's polled cattle as there was already a precedent for a beef cattle economy coming from Denmark, Iceland's colonial power. It is also likely that Denmark imported new varieties of beef cattle after the cattle plague of the 1740's destroyed as much as half of the Danish cattle population (Kjærgaard, 1994, 27-28). It is entirely possible, though not yet investigated, that the Bishop of Skálholt or one of his household might have encountered this beef enterprise and new breed imports through the Danish nobility. Though the Scottish polled beef breeds would also seem to be good candidates for the cattle of unit 454, this would be pure speculation at this point. Regardless of the individual country of origin, it is overwhelmingly likely that

these cattle or the breeding technology that created them were an import from continental Europe.

Early modern Icelandic culture and elements of early modern continental European culture came together in the Bishop's residence. The cows indicate that Skálholt was differentiated from the rest of early modern Iceland by more than just wealth. It was also culturally differentiated through its intellectual connections to Europe, at this time to Enlightenment-era Europe. Obviously the breadth and details of such a connection is beyond the scope of this paper, but I will attempt to briefly link the Bishop's beef cattle to a few of the larger intellectual and ideological currents coming from continental Europe at that time.

The Agricultural Revolution is an obvious inspiration for the appearance of these cattle at Skálholt. Most agricultural historians agree that the essence of the Agricultural Revolution was the major increase in new agrarian technologies, crops, and commercial animal breeds that appeared mainly during the early modern period in Europe, especially in England. There is also a consensus that these new technologies and breeds led to increased agricultural production (Overton, 1996, pp 1-9). Less agreed-upon is when this revolution began, though it is generally agreed that it was in full development throughout much of Western Europe by the second half of the eighteenth century.

The Agricultural Revolution is closely intertwined with Enlightenment thought. The two movements do not cleanly overlap in time yet they did have enormous influence on each other. In terms of nature, Enlightenment thought is broad, but there is an overall concentration on harnessing and controlling nature.

These themes go well beyond the biblical precedent of the creation story in Genesis by emphasizing the ability to engineer nature and cull the unproductive elements from it (Worster, 1994, chp 2). In the context of agriculture this engineering was most often termed “improvement,” a term in which both movements meet and combine (Dalglish, 2003, chp 5). Though the nature of improvement changed according to the point of view of the agents involved, generally speaking land, crops and animals were being manipulated in order to increase their value and productivity. Seventeenth and especially eighteenth-century Icelanders were not strangers to this improving impulse. Alongside the 1780 Icelandic manual of agricultural improvement, *Atli,* by Bjorn Halldorsson, there are eighteenth-century private “improving” journals of farmers from throughout Iceland (Ogilvie, McGovern, personal communication).

Yet what we see in unit 454 at Skálholt is a far more dramatic form of innovation and a greater break from traditional pastoral economies than has yet been seen in any other archaeological context in the North Atlantic. Carolus Linnaeus, the father of modern taxonomy and one of the brightest stars of the Enlightenment, epitomized a more radical end of the improving ideal when he stated as one of his goals the commercial growth of tea, saffron, and rice in Swedish Lapland. Turning this sub arctic region into a fertile agricultural zone producing cattle, wheat, and exotic spices (Koerner, 2000, pp 79-81) was one of his dream projects. The audacity of his vision reveals the extent to which the agricultural improvement impulse represented thinking that had gone far beyond the biblical commandment to utilize the beasts of the earth for their benefit. One’s

ability, and right, to alter God's creatures, just as one would a farm implement, was grafted onto the original commandment of Genesis (Worster, 1994, pp 39-41).

The idea of the inheritability of externally imposed traits, transformism, predates Jean-Baptiste Lamarck and was one of many potentially legitimate branches of natural science in the eighteenth century (Corsi, 1988). The possibility that the artificial polling of the horned cattle was an attempt at a transformist or Lamarckian breeding program is another intriguing possibility. In any case, cattle associated with Skálholt were re-ordered in a way that reflected new attitudes towards the organic world espoused by Enlightenment figures such as Linnaeus and Lamarck.

The idea of improvement is often associated with the rise of capitalism and the profit motive, but in this sense, the Bishop's beef cattle are a difficult fit. It would be hard to understand the introduction of these polled beef cattle and the artificial polling of native cattle as motivated by profit and the accumulation of capital. It is possible that the Bishops might have intended to stimulate a market for beef in Iceland, but this is very unlikely, especially in eighteenth-century Iceland. It is far more likely that these moves were inspired by on one hand the desire to reinforce the high status of Skálholt through the beef economy and on the other Enlightenment fashion and ideology through the polling, and looked to enhance social rather than financial capital.

The Enlightenment movement reverberated through the parlors and universities of Europe, and, I would argue, amid the paddocks and pastures of

Iceland through Skálholt. I believe that the zooarchaeological assemblage of unit 454 is a product of an improving impulse brought to Iceland by the Bishop of Skálholt or one of his household. The creation of a new faunal landscape had an ideological foundation, based on a new understanding of the plasticity of nature and our own potential agency within it.

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