Chapter 9
The First European Colonization of the North Atlantic

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Introduction

Many facets of what are commonly considered to be novel and unique characteristics of modern capitalism have their roots, often in a mature form, in the Medieval Period (Abu-Lughod 1991; Crosby 2004; Hoffmann 2001; Marks 2007). Archaeological work focusing on the Norse North Atlantic from the Early Medieval Period through to the Early Modern Period has been especially effective at revealing certain of these phenomena, specifically those dealing with the commoditization of natural resources and the influence of global markets on colonization. The early medieval colonial expansion of the Norse and the subsequent centuries of interaction with the medieval world system anticipate the central place that international global markets had on the formation of the post-Columbian world. This essay will discuss the North Atlantic Norse colonies, specifically the Faroe Islands, Iceland, Greenland, and Newfoundland. For the purposes of this volume, this discussion is offered as a counter-point to the discussions of the post-Columbian colonial efforts of the Europeans in the Americas. The intention is to use the medieval Scandinavian colonial migration to problematize the larger discussion on the nature of colonies, colonialism, and the emergence of capitalism.

From the end of the eighth century CE Scandinavian raiders began to appear throughout Northern Europe in what is popularly termed the Viking Age. The raiding that took place along the coasts of Atlantic Europe, the Baltic, and the eastern European river systems, was accompanied by the mercantile and colonial elements of the Viking Age (Heather 2011; Sawyer 2000; Sawyer 2003). These early medieval Scandinavian raiders and merchants planted colonies in regions as varied as present-day Ukraine and as far west as what today is modern Newfoundland. These settlements were placed in very different contexts but one unifying factor

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that archaeology has been especially important in revealing is the importance of trade and long-distance markets to the motivations behind the founding of these settlements.

Chronology and Background

The chronology for the North Atlantic side of the Norse expansion started with the settlement of the Faroe Islands sometime around the year 800 CE. Iceland was then settled around the years 871 ± 2 CE. Greenland was settled not long after this in the second half of the tenth century CE. Finally, the short-lived Newfoundland settlement was founded around the year 1000 CE.

These four regions differ in terms of climate, topography, and the dramatically different human geographies of the lands at the time of Norse settlement. All of these regions lie in either subarctic or boreal ecological zones. All Norse North Atlantic settlement during this period involved peoples whose main subsistence activities centered on the raising of the classic Eurasian domestic animal package (Cattle, Sheep, Horse, Pigs, Goats, and Dogs) and who engaged in the farming of grain crops when the climate was suitable, which was not often. These people were accomplished fishermen, marine mammal hunters, and wild bird exploiters. Obviously, they were also extremely capable sailors (McGovern et al. 2007). The Norse who settled in the North Atlantic came from a hierarchical culture and the settlers would have contained chieftains, farmers, both dependent and independent, and slaves (Bigelow 1991; McGovern 1990; McGovern et al. 2007). Genetic studies of the current populations of both Iceland and the Faroe Islands show a strong asymmetry between Scandinavian and British Isles genetic origins. The asymmetry is expressed by a high proportion of males from Scandinavia and a high proportion of females originating in the British Isles. This suggests that a significant percentage of the initial settlers were single males who left Scandinavia and then found/persuaded/abducted females from the British Isles to accompany them onward to the North Atlantic islands (Als et al. 2006; Goodacre et al. 2005).

There are a number of robust paleoclimatic proxies for the North Atlantic, many of which have excellent temporal resolution. Coupled with a growing paleoenvironmental record of the region constructed by environmental archaeologists and geographers there is a fair understanding of the climatic and environmental variables from the Settlement Period through to the present day. In terms of the relevance of such a record for the Settlement Period, there are strong indications of what some have termed a "Medieval Warm Period" that in the North Atlantic would have meant higher temperatures, and fewer and weaker storms. Following this and often termed the "Little Ice Age" was a period from roughly the thirteenth through the nineteenth century of increased variability in temperature, often trending toward cold, as well as an increase in both the frequency and power of storms (Dawson et al. 2003; Meeker and Mayewski 2002; Ogilvie 1981; Ogilvie 1984; Ogilvie 1992; Ogilvie 2001). The general picture is one in which the Norse settlers of the North

Atlantic Islands encountered a climatic situation that was much more favorable to colonization than what they would experience in the following centuries (Fig. 9.1).

The Faroe Islands are a group of fairly small islands with rugged geography and limited arable land. Much of the landscape is very steep and a great deal of the coastline is vertical. The settlement areas are on the coast near the few areas of relatively flat and workable land. The landscape that greeted the first settlers was most likely made up of wild grasses and sedges, with some juniper shrub and very limited timber, and human impacts on these island landscapes post settlement were fairly mild and gradual (Lawson et al. 2005). Faroese subsistence was, and still to a certain extent is, based on sheep farming, fishing, and the exploitation of wild bird eggs (Brewington 2006; Brewington 2010; Brewington 2011). One of the changes to this subsistence pattern visible in the archaeological record is the initial presence and then disappearance in the later medieval period of pigs. Pigs were a major agent of environmental change in the North Atlantic Scandinavian settlements, and they, along with goats, would have been one of the primary agents used by the settlers to engineer their new environments (Arge et al. 2009). The Faroes has recently produced strong archaeobotanical indications of a pre-Norse settlement (Church et al. 2013). Previously it was thought that the Faroese settlement was a similar situation to that of Iceland which to date has produced no archaeological evidence of a pre-Norse settlement. The extent or even the identity of the people behind this earlier settlement is still unknown.

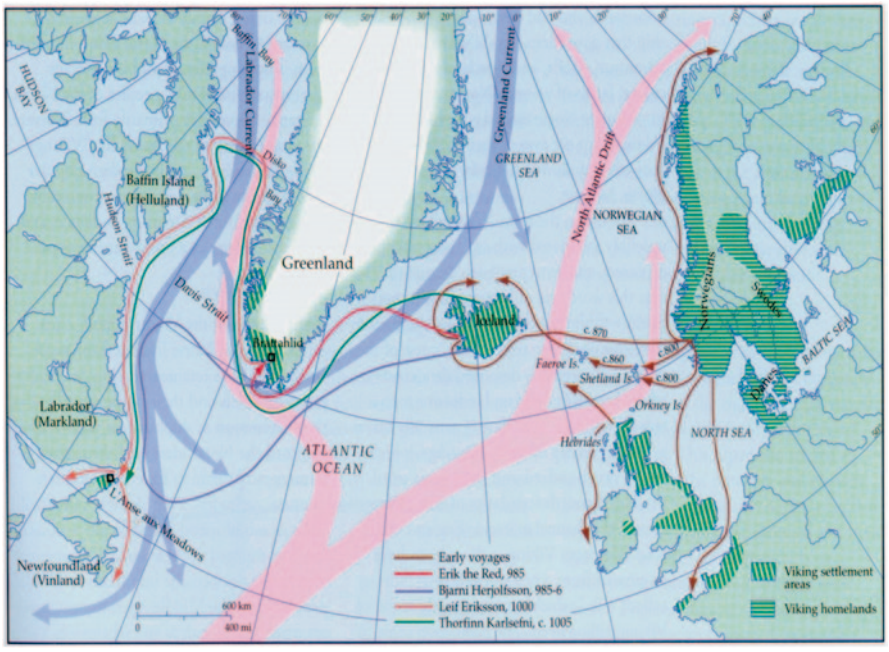

Fig. 9.1 Map of the Norse voyages of exploration in the North Atlantic (from Perdikaris and McGovern 2000). The *red arrows* represent warm ocean currents and the *blue* represent cold ocean currents. There is often high productivity of marine resources where these warm and cold currents meet and mix

The Icelandic settlement in 871 ± 2 was the occupation of a true "terra nullius." There is no persuasive archaeological evidence of a pre-Scandinavian population inhabiting Iceland before the appearance of the 871 ± 2 settlers. Iceland is a volcanic island, part of the Mid-Atlantic Rift. The south of Iceland generally has a boreal environment, warmed by the North Atlantic Drift, an extension of the Gulf Stream. Northern Iceland has a subarctic environment, colder and in general drier than the south. Both areas are suitable for sedentary lifestyles based on animal husbandry. Volcanism is a constant presence in Iceland and the destructive force of volcanic eruptions was something that the settlers had to deal with from the first years (Dugmore and Vésteinsson 2012). For archaeology, specifically, Icelandic volcanoes have had an extraordinarily positive effect by creating an excellent tephrochronological record in the soils of Iceland that is used to date Icelandic archaeology to great precision as well as to investigate the relationships between human and natural systems at high resolutions (Dugmore et al. 2012; Dugmore and Newton 2012; Streeter and Dugmore 2013). Iceland of course had a vastly larger amount of arable land than the Faroe Islands and the prehuman landscape was made up of thick birch forest as well as areas of open grassland. This forest however was subarctic birch forest, the timber from which was useful for fuel but not big enough for ship building or even the building of large structures. Timber had to be obtained from driftwood or be imported and Icelandic structures were, in some cases until the post-WWII period, largely built of turf. Human impacts on the Icelandic landscape were, in contrast to the Faroe Islands, extreme and dramatic in terms of both deforestation and erosion. Iceland has lost an estimated 90 % of the forest and 40 % of the soil that was present at settlement (Arnalds 2001). There has been a sustained effort using the techniques of environmental archaeology as well as geography, paleoclimatology and history to understand the chronology of this impact and the dynamics behind it (Dugmore et al. 2005a; Dugmore et al. 2005b; McGovern et al. 2007; McGovern et al. 1988). Icelandic subsistence was until recently based on wool production, and fishing as will be discussed below.

Greenland was settled shortly before the year 1000 CE by Icelanders, most famously by Erik the Red, who according to the Saga sources was fleeing Iceland due to banishment for manslaughter. Greenland is a very different environment from either the Faroe Islands or Iceland. The regions of Greenland that were appropriate for a Eurasian style sedentary agriculturalist way of life were the inner fjords in the Eastern and Western Settlements. These inner areas are hemmed in by the outer fjord areas, which are arctic in environment and the immense Greenland Ice Sheet in the interior. Conditions created by the interface between the arctic areas and the inland ice sheet create an insulated area that is truly green and suitable for animal husbandry. This area would have had limited shrub land and open grasslands at the time of the arrival of the Scandinavian settlers. Greenland was a different situation in which there was no human settlement in the areas claimed by the Norse settlers, though there had been previous inhabitants, and contact with Dorset and later Thule populations occurred in the northern walrus hunting grounds that were central to the Norse Greenlanders trade links back to Europe. Later in the fourteenth and the fifteenth century, Thule peoples inhabited coastal areas adjacent to the Norse

settlements. The nature of the relationship between the Norse Greenlanders and the Dorset and Thule peoples is still not well known. The archaeology has produced a number of examples of Norse objects in Dorset and Thule contexts (Gulløv 2008). Dorset and Thule material culture in Norse contexts has also been found archaeologically but in strikingly small amounts. The nature of the relationship is unclear. There is no good evidence of violence from the archaeological record, and the exchange aspect has been interpreted as examples of small-scale gift giving (Gulløv 2008). It has been pointed out that some of the few mentions of the "Skraelingar" (the term used by the Norse to describe the Dorset, Thule, and the people encountered elsewhere in the Americas) do point to a basic underlying cultural disconnect. One of the first mentions of the Skraelingar describes how when attacked with European weapons (and this report also mentions that these particular Skraelingar lacked iron, meaning that they were most likely Dorset) they did not start bleeding until they were dead (Gulløv 2008). Any first report of a new culture that mentions how they behave after being attacked certainly suggests the potential for sustained violence. Yet the archaeology does not make the relationship clear and there has been recent work suggesting that the Thule people moved into the Baffin Bay/Greenland region by the fifteenth century CE at the latest because they were drawn by the presence of iron from the Norse Greenlandic settlements (Gulløv and McGhee 2006). The last recorded contact with Greenland dates to 1409 and the settlement was certainly nonexistent by the early sixteenth century. The demise of the Greenland Norse colony has been the subject of a significant amount of scholarship and a number of different variables have been offered to explain it. Climate change, an inability to adapt to climate change, environmental degradation, conflict with the Skraelingar, as well as economic marginalization, which will be addressed in more detail below, have all been argued to be reasons for the disappearance of the Greenland colony (Arneborg 2002, 2003a, b; McGovern 2000; Petersen 2000; Seaver 1996).

The Norse settlement at L'Anse aux Meadows in Newfoundland lasted only a few years. It was most likely a reconnaissance from Greenland to determine whether there were any resources of value to be found in the vicinity. It probably served as a home base for further exploration into the St Lawrence region and possibly farther south. In terms of natural resources, it had little that Greenland needed. Good timber was nearer at hand in Labrador for example and the better agricultural land in the area was already taken. L'Anse aux Meadows was in an area already inhabited by the people the Norse referred to as the Skraelingar who were in this case probably members of the Beothuk or Innu peoples. L'Anse aux Meadows was abandoned but this was probably within pattern for a forward settlement such as this (Wallace 2003, 2008).

The Norse expansion across the North Atlantic was not a solitary event in the sense that it happened solely due to local conditions and local ideas. At the same time as the Norse were colonizing the Northern Atlantic islands, they were also expanding trade and tribute networks northward into the Finnmark, as well as into the Eastern European river systems. One of the more traditional explanations offered for this outward expansion was population pressure. Yet a number of landscape

studies have shown that some of the core Scandinavian regions were in fact less populated in the eighth and ninth centuries than they were in the sixth century, before the movements of people out of Scandinavia began. Among the alternative explanations that have been offered is the idea that increasing wealth, stimulated by contacts with the Islamic world and to a lesser extent with the Byzantine Empire, lead to the Norse expansion. In more general terms, many scholars are seeing the Norse expansion as being based on positive economic motives like the desire to participate in long-distance trade networks linked to markets of great wealth as opposed to negative motives such as population pressure and the disposal of surplus population (Heather 2011).

In the case of the settlement of Greenland from Iceland a similar situation is emerging. The motives behind this settlement were, and often still are understood primarily through the study of the Icelandic Sagas. These famous works of medieval literature have within them books that specifically address both the settlement of Iceland (Landnámabók—the Book of Settlement; Iselendingabók—the Book of the Icelanders) and of Greenland (Grænlendingasaga—the Saga of the Greenlanders; Eiríks saga rauða—the Saga of Eirik the Red). These sources put forth the idea of land hunger as a primary motivation for the settlement of Greenland (Hreinsson 1997). Yet these sagas were written in the twelfth and thirteenth centuries, long after the actual activity of their recording took place. The Sagas are as much political documents as historical and their presentation of the settlement process of both Iceland and Greenland needs to be treated skeptically (Friðriksson 1994; Friðriksson and Vésteinsson 2003). Archaeological work has shown to the contrary that new and productive land was becoming available in Iceland at precisely the time that Greenland was being settled. The motives behind these migrations were, like the original motives behind the movement out of Scandinavia, likely social and economic as opposed to demographic (Dugmore et al. 2007). Not unlike the expansion across the American West, the Norse expansion across the North Atlantic in the past was often portrayed as the work of "rugged individualists" looking for their own piece of land on which they could live independently and self-sufficiently. The self-contained independent farm was thought of as the primary social unit and autarky as the ultimate motivation. Archaeology has been at the front of challenging this view.

All of the Norse settlers of these islands were accomplished landscape engineers. While their tools and inspirations were not agricultural handbooks, architectural texts, indentured servants, and enslaved Africans, they did have a hierarchical system reliant on domestic animals that did engineer their adopted landscapes with agency and foresight. The examples of landscape engineering from the Norse North Atlantic, especially in the Icelandic context, have often been presented as a tragedy of the commons situation. Archaeologists have altered this view dramatically. The Icelandic example reveals through the analysis of faunal assemblages, landscape survey, and a variety of environmental archaeological methods that the Norse settlers likely knew exactly what they were doing when they set about the processes that lead to such dramatic environmental change in Iceland. Faunal assemblages from Iceland show a typical European domestic package at the time of settlement, i.e., cattle (*Bos taurus*), sheep (*Ovis aries*), goats (*Capra hircus*), horse (*Equus caballus*), pigs (*Sus scrofa*), and dog (*Canis familiaris*). By the twelfth century, the

goats and the pigs disappear from archaeological contexts. Current archaeological consensus is that goats and pigs were released by the first settlers in order to clear the forest areas, which were hardly optimal landscapes for pastoralists and agriculturalists. Goats and pigs make for highly effective agents of landscape change and their disappearance, after they had done their job, is seen as evidence that the Icelanders were using them as tools of landscape change. Further, not all the forest disappeared. Small areas of forest were preserved in a roughly equal distribution across Iceland and these were harvested (at times through pruning, not harvesting the whole tree) for fuel (Church et al. 2007; Simpson et al. 2001; Simpson et al. 2003). There are other strong examples of archaeological data pointing to Norse natural resource exploitation strategies with long-term resilience (Brewington 2013; Hicks in press). While there was still, in the case of Iceland, catastrophic erosion it was not the result of an unconscious pillaging of natural resources but the result of the conjuncture of a number of variables; geological, climatic, economic, and political (McGovern et al. 2007).

The larger point is that these medieval colonists, like the post-Columbian European, African, and later Asian colonists in the Americas were bringing with them a set of tools, both technological and social that they used to reengineer landscapes to their specifications and desires. Yet beyond what they brought from Europe in order to reengineer new landscapes, what is also important is what they were looking for and what might have motivated these settlers to move into the North Atlantic. Examining these motivations through archaeology not only reveals medieval roots of post-Columbian colonialism but offers a view of larger economic processes that were already reaching across the North Atlantic long before Europeans began thinking about short cuts to China and supplying the markets of Seville, Paris, Amsterdam, and London.

Long-Range Trade and the Commoditization of Natural Resources

Walrus

One motivation for the Norse spread across the North Atlantic was the search for high-value luxury goods for European and Middle Eastern market places. In this view, the North Atlantic islands were not settled in isolation by rugged individualists just looking to be left alone. They were in fact part of an intensive effort by the Norse to get to the source of and control a variety of high-value luxury goods that they used to trade for silver and luxury items from the far wealthier populations in the Byzantine Empire and the Islamic world. The eastern expansion of the Norse into the Russian river systems and north into the Finnmark and the region around the White Sea was largely driven by the same motivation. In these cases, it was access to high-quality furs, forest products, and slaves as well as to achieve greater proximity to the markets of Byzantium and especially the Muslim lands (Heather 2011; Keller 2010).

In the case of the western expansion across the North Atlantic the primary trade items that were being sought were walrus (*Odobenus rosmarus*) ivory, furs, and walrus hide rope (Keller 2010). Greenland still has walrus populations and the archaeology is clear that walrus ivory was a central part of Norse Greenland's trade back to Europe. Though no longer existent there were also walrus colonies in Iceland at the time of settlement. There are a number of settlements with walrus-based place-names in Southern Iceland and one archaeological site in particular has revealed some intriguing indications of specialized Walrus hunting at the earliest stage of settlement.

Iceland The site of Aðalstæti in downtown Reykjávik is a site whose earliest layers date from the first generation of the settlement of Iceland. It was revealed during the construction of a hotel and then excavated by Fornleifastofnun Islands (the Institute of Archaeology Iceland) in 2001 (Roberts et al. 2004). This site since then has had a Museum, the Settlement Exhibition, Reykjavik 871 ± 2, built around it. Within the skáli (a Norse long-house) at Aðalstræti three walrus tusks were recovered. One of these was in good enough condition to reveal the tool marks on the root of the tusk that are characteristic of the process used to extract walrus tusks (which are deeply rooted in the massive maxillary region of the walrus skull). Extracting walrus tusk without damaging the valuable ivory is a highly skilled process and the tusk at Aðalstræti indicates that the inhabitants of this site were skilled walrus ivory processors (McGovern 2014). These inhabitants of the earliest occupation layers of Aðalstræti were among the first wave of Norse colonists to permanently settle in Iceland and these worked walrus tusks suggest that there were trained walrus hunters and processors among these first settlers.

Along with the walrus tusks two other walrus bone elements were found, but in their case within the structure of the skáli itself. A walrus scapula was found highly compressed at the base of the skáli wall while farther down the structure a portion of an articulated walrus vertebral column was found embedded in the wall. In both cases, it is likely that the bone was visible to people outside the skáli. Marine mammal bone has been found being used as structural elements in Norse buildings but in this case neither example serves any structural purpose at all. McGovern has speculated that this could possibly represent ritual activity or a form of advertisement for the settlement's walrus processing skills (McGovern 2014).

The Aðalstræti site and the presence of a number of sites with walrus-related place names on the Reykjanes peninsula south of modern Reykjavik suggest that at least one of the motivations driving the earliest settlers to Iceland might have been the acquisition of walrus ivory and hide, which presumably would have been shipped back to Europe for trade purposes (Keller 2010).

As mentioned, there are no longer any walrus populations on Iceland's coasts. It is possible that the first Icelandic colonists hunted them to extinction, though there is no data to support this idea at this time.

Greenland The Norse settlement in Greenland contained two different settlements, the Eastern Settlement, located in the area of the current municipality of Kujalleq in the southwest of Western Greenland, and the Western Settlement, which was

closer to the current capital of Greenland, Nuuk, farther north up the western coast. The Eastern Settlement was the larger or the two, and the estimated population of the two settlements at their highest have been estimated to range from as many as 6800 (McGovern 1981) to as few as 2000 people (Lynerrup 1996). There is ample archaeological proof that this settlement had as one of its core purposes the extraction of walrus products for transport back to European markets.

High-profile sites such as the Bishop's Manor at Garðar and the Lawspeaker's Farm at Brattahlið, both in the Eastern Settlement have been the subject of archaeological excavations for years. More recently, however, a number of archaeologists have been doing more systematic survey and targeted excavations of mid- to lower-level farms (Dugmore et al. 2009; Smiarowski 2008). Walrus bone has been found in sites from every level of the economic scale. The great majority of elements found are fragments of maxillary bone, which in some cases still have ivory attached to them, which broke off from the main tusk. The chipping away of the maxillary sheath around the ivory produces these maxillary fragments. Through the life of the Norse Greenland settlement, zooarchaeologists have identified an increasing efficiency of ivory production seen through the decreasing amount of ivory lost during the extraction (Dugmore et al. 2009; McGovern 2013; Vésteinsson et al. 2002). Unlike Aðalstræti in Iceland, in Norse Greenland pieces of actual ivory are very rare and bone elements of any sort other than maxillary fragments (with the exception of the occasional baculum) are rarely found in archaeological contexts. This is often interpreted as evidence for the importance of long-range trade in Greenland. Ivory was an export product, in the production of which everyone in the Norse settlement participated as evidenced by the extraction detritus found in almost every household. It was valuable enough that almost none was kept for domestic production.

Archaeological work on the Norse Greenland settlements suggests a society that was closely organized and integrated. One of the most significant archaeological manifestations of this is the presence of important resources that would have been produced by specific groups in the population at almost every household, though not in equal numbers. Seal bone, elk bone, and walrus maxillary fragments are found at sites from the very wealthy, such as the elite farm sites Brattahlið, Garðar, and GUS (the Farm under the Sand) to the much less wealthy but far more numerous smaller farms (McGovern 1990; Perdikaris and McGovern 2007). These signs of integrated production are further support to the idea that a major motive behind the Norse Greenland settlement was not land hunger but the desire to participate in long-distance medieval trade networks.

This argument has led to increasing engagement with the idea that a major variable in the disappearance of the Norse Greenland settlement might have been competition from other markets that made Greenlandic walrus processing too expensive a project (Guðmundsson 2009; Keller 2010; Roesdahl 2005). Increasing access to African ivory could have badly impacted the margins of traders in Greenlandic ivory. Beyond this, there is also the archaeologically observed process of the growth in the trade in dried fish in the North Atlantic through the medieval period. Pressure from new and cheaper sources of ivory (east African and White Sea) coupled with the opening of a new market based not on high-value, high-margin, and low-volume

items such as walrus ivory but instead on a low-value, low-margin but very high-volume commodity created from dried fish products might have created conditions in which the central reasons for the Norse Greenlandic settlements' existence might have slowly disappeared. Live by the market, die by the market.

The European Dried Fish Trade in Historical Context

Beginning in the Early Medieval Period the trade in dried fish, specifically from genus Gadidae, the cod family, contributed to the growth of European economies and populations into the modern age. By the Early Modern Period, the trade in dried Atlantic cod (*Gadus morhua*) was a powerful stimulus toward the exploitation of North America (Pope 2004). This relatively silent player in the story of the development of both early capitalism and global trade networks has its origins in Iron Age Norway and the subsequent expansions of the Viking Age (Perdikaris 1999; Perdikaris and McGovern 2007; Perdikaris et al. 2007).

Fish in the earliest years of the Medieval Period were primarily a local resource for European populations. Coastal regions exploited near shore fisheries while inland populations utilized streams, lakes, and swamps. More organized communities, such as monasteries, built fishponds, etc. As the Medieval Period progressed, freshwater fish became a luxury good as presumably demand began to overtake supply. This demand for protein was in part taken up by cured marine fish traveling down increasingly distant trade networks. Cured herring had the primary role in terms of total value and volume throughout most of the Medieval Period, though dried gadids were a close second (Hoffman 2001).

The initial large-scale trade in dried cod was centered on the port of Bergen. This was the central market for dried cod from northern Norway. Written records begin to take note of this trade by 1100 CE. The Hansa controlled this source into the fourteenth century. Iceland began to develop as a greater source of supply for the European market in the late fourteenth and fifteenth centuries in part due to the efforts of English merchants locked out of the Bergen trade (Wubs-Mrozewicz 2008). English activity in Icelandic waters peaked between 1490 and 1530 and continued at more humble levels until the eighteenth century, with another period of intensification in the early seventeenth century (Jones 2000). The fishing grounds discovered by John Cabot in 1497 off of Newfoundland (ironically this was possibly only a few years after the Norse Greenland colony was extinguished) were being exploited by the first decade of the sixteenth century. Basques, Bretons, and Normans were all quick to exploit this new and extraordinarily fertile source of protein and capital for the European and eventually American markets (Fitzhugh 1985; Pope 2004). Dried Atlantic cod in the form of stockfish (a specific product which will be discussed in more detail below) at this point broke ahead of herring in terms of total value of the cured fish trade. This was likely a consequence of the collapse of the major herring fisheries from the later thirteenth to the fifteenth centuries. The southern Baltic Pomeranian (late thirteenth century), southern North Sea (after

1360), and then Scanian herring fisheries (early fifteenth century) collapsed, forcing merchants to meet the demand for cured fish from other sources, in part from the waters around Iceland and eventually, beginning in the early sixteenth century, from the Newfoundland and New England fisheries (Hoffmann 2001, 2005; Pope 2004).

In the late sixteenth century, the trade in fish, furs, and whale products between Europe and Maritime Canada was larger than that of Europe with the Gulf of Mexico. The fish trade was the largest single component of this commerce and it dwarfed the fur trade throughout the Early Modern Period (Pope 2004). Though the rapid growth of the sugar trade in the seventeenth and eighteenth centuries made it into a much larger financial player than stockfish, these products were in fact closely linked by the eighteenth century (Zahedieh 2002). The most visible example of this being the fact that stockfish was a central part of the diet of the enslaved Africans working the sugar plantations and has remained a common ingredient in Caribbean cuisine to this day (Braudel 1982; Kurlansky 1999). The cod trade has been, until recently, a relatively silent player on the historiographic stage. Most studies of Atlantic trade in the Early Modern Period concentrate on the more visible commodities, especially sugar and tobacco and often neglect to mention dried fish at all (Braudel 1982; Steensgaard 1990; Wallerstein 1980). Yet the cod trade was one of the largest drivers of colonial expansion and economies in the sixteenth and seventeenth centuries in the newly discovered regions of the North Atlantic and it remained a major force into the twentieth century. Peter Pope's 2004 work *Fish Into Wine* has masterfully revealed the role of the fish trade in the seventeenth century North Atlantic colonial world.

The physical properties of cured fish, stockfish especially, helped it along this path. It was in many ways a perfect early commodity. Its production was fairly consistent and seasonal. It is light, durable, has a high caloric and protein content and it can be stored for up to 5–7 years before spoiling. This was an excellent food for the provisioning needs of developing states. One of the great shifts in the European economy came during the Medieval Period with the development of low-cost medium to long-range bulk goods markets, often centered on the need for either food or fuel (Wallerstein 1988). These new bulk markets spurred growth by nourishing both people and industry and due to their lower value, relative to costly imported luxury goods, these markets encouraged the participation of a large section of the European population. Their lower value allowed for a much greater volume of trade. A commodity by definition is fungible and standardized. They are in most cases made in large quantities and their quality is relatively uniform across producers. These conditions allow for high volume (in terms of both goods and capital) long-range trade to take place, which in turn foster the development of trade networks and financial markets. Processed fish was one of the earliest and most important of these new bulk goods in Europe and the Americas.

Hoffman has argued that stockfish was one of the first commodities in the European Medieval Period that first primed the pump for the onset of globalism and the parallel "denaturing of things," again a key part of the process of commoditization. Denaturing is the transformation of an organism, a "first nature" product, into an economic and socially constructed "second nature" product and finally into an

abstracted and fungible commodity tradable over long distances and time (Cronon 1992; Hoffman 2001; Perdikaris 1999). The herring in a barrel, or the beheaded, splayed and dried carcass of a codfish in the form of stockfish were so far from their original form as to be almost unrecognizable. Geography and time altered these products as well. The stockfish being soaked for consumption in late sixteenth century Mainz, London, or Toulouse, might have been caught in the North Sea, off of Iceland or off Newfoundland anywhere from a few months to a few years before. These are all processes that are now standard to many people on this planet—food, as do so many other commodities, follows widely dispersed paths in time and space from its origin to a consumer. Stockfish was one of the first commodities to begin training Europeans and later Africans and Americans to no longer expect their food to be local and recognizable in its living form but to come from anywhere in the world and in a multitude of forms divorced from the original organism. Commoditization is one of the central elements in the process that is capitalism. Stockfish and the processed fish trade were one of the first industries, in postclassical Europe, that developed commodities as we know them today. The origins of this trade are a part of the larger story of the origin of modern commodities, capitalism, and the exploitation of new worlds.

The Archaeology

Archaeological work in Iceland and the Faroes has been crucial to understanding both the origins and the development of the trade in dried gadids. A clear artisanal, precommoditization stage of this trade has been identified in early medieval Norway as well as Iceland at sites that date to the earliest days of settlement (Fig. 9.2).

Identifying the Production and Trade of Dried Fish in Archaeological Contexts An initial first step in identifying the trade in dried fish is to look at the percentage of terrestrial versus fish elements in archaeological sites. This allows for an initial gauge of how much a given site is involved with the exploitation of marine resources, specifically fish.

Figure 9.2 reveals the presence of very high percentages of fish in the archaeofauna of both Iron Age Norway as well as medieval Norway. Paralleling this is a significantly increased percentage of fish on Icelandic and Faroese sites from the Viking Age into the Medieval Period. Though there are of course a variety of taphonomic and comparative issues behind this chart, one can see an overall pattern of increased exploitation of fish through the last millennium in the sites being shown. As has been argued in previous publications (see Barrett 2004 and Perdikaris et al. 2007 for more in-depth discussion) the origins of the trade in dried gadids very likely comes from the activity represented by the Iron Age Norwegian sites seen in this chart. Besides the simple fact of engagement with marine resources, this chart also reveals that some of these marine resources were transported within regional networks. All of the Viking Age Icelandic sites in this chart are all at least 50 km inland from the sea (HST = Hofstaðir, SVK = Sveigakot, HRH = Hrísheimar,

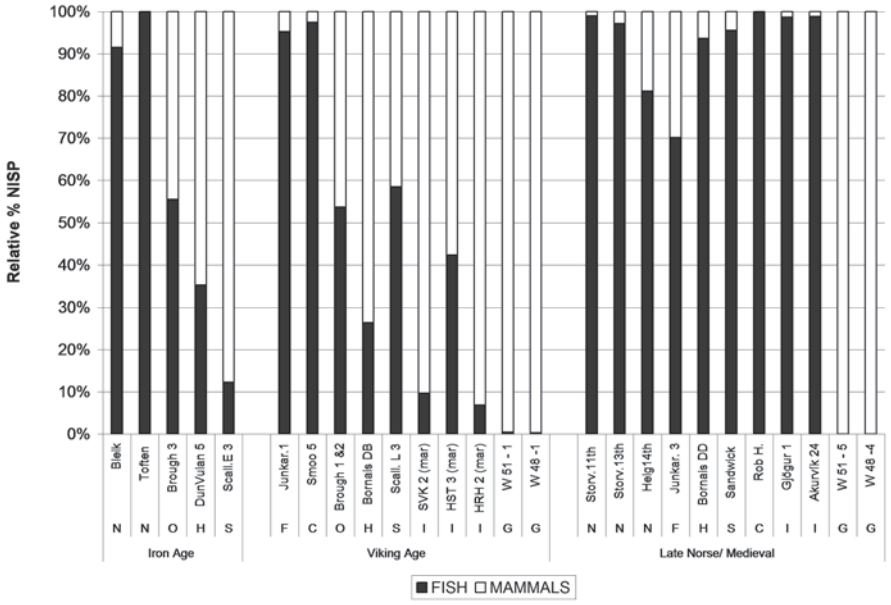

Fig. 9.2 A selection of comparably excavated (sieved) sites from Iron Age, Viking, and Late Norse/Medieval contexts from Norway (*N*), Orkney (*O*), Hebrides (*H*), Shetland (*S*), Faroes (*F*), Caithness (*C*), Iceland (*I*), and Greenland (*G*). All of these assemblages have produced large amounts of bone. Note the concentration of fish that is clearly seen in the Late Norse/Medieval contexts (with the interesting exception of Greenland). (Source: Perdikaris et al. 2007)

see Fridriksson et al. 2004, Vésteinsson 2000, Vésteinsson et al. 2002). The marine fish that ended up as archaeofauna in these sites must have been transported at least 50 km from where they were originally fished. As will be seen below, the fish element distribution found at these sites, as well as at many others, indicates that these fish were making that trip in the form of a processed dried product. These early indications of intensified marine resource use also contain signs of the trade in these early dried fish products.

One curious and striking fact that emerges from Fig. 9.2 is the almost complete absence of fish from the Norse Greenlandic sites. The Norse in Greenland were from the same populations that ran the intensified fisheries stretching back to Norway, and which are represented in the above chart. Why the Norse Greenlanders chose not to pursue marine fish as a significant part of their economy is a question that is part of the larger issue of why the Norse expanded across the North Atlantic. There are no easy answers to this question but for a more in-depth discussion please see Dugmore et al. 2012, Perdikaris and McGovern 2007, and Vésteinsson et al. 2002 among others.

Species-Specific Intensification Beyond the simple portrayal of the presence and growth of fish in archaeological contexts in the North Atlantic, we can also look more closely at the percentages of species within these fish assemblages in order to

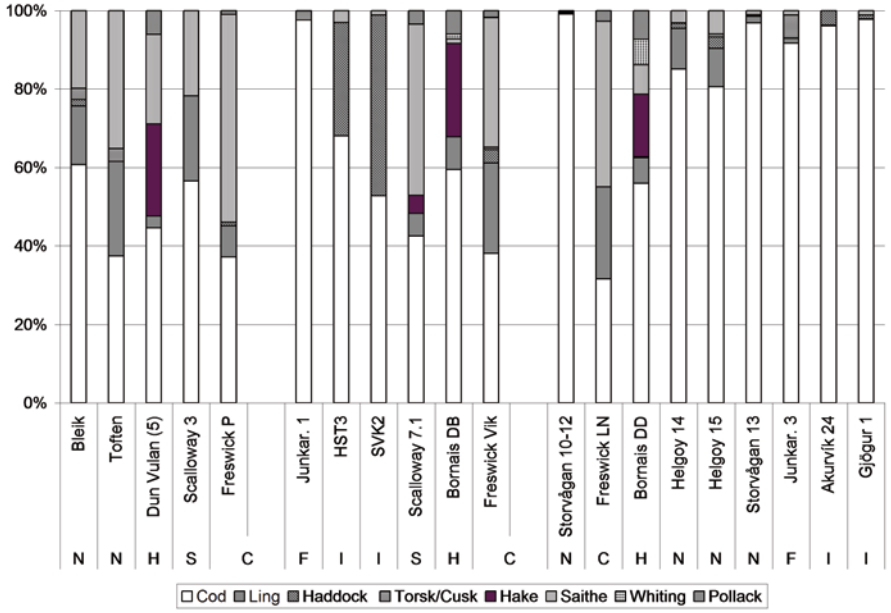

Fig. 9.3 A selection of comparably excavated (sieved) sites from Iron Age, Viking, and Late Norse/Medieval contexts from Norway (*N*), Orkney (*O*), Hebrides (*H*), Shetland (*S*), Faroes (*F*), Caithness (*C*), Iceland (*I*), and Greenland (*G*) that reveals changes in species diversity within the cod family. Iron Age and most Viking Age collections show considerable variability in species taken from within the cod (gadid) family. In the Late Norse/Medieval period, there is often a shift toward collections dominated by Atlantic cod (*Gadus morhua*). This shift continues into the early modern period. (Source Perdikaris, et al. 2007)

see the intensification of fish processing through the millennium. There is a pattern in the archaeology of the Faroese and Icelandic sites showing a greater focus on Atlantic cod (*G. morhua*) through time. Iron Age sites in Norway and Viking Age settlements in the Faroe Islands and Iceland produce fish assemblages that, though often dominated by gadids (cod family), contain a wide spectrum of species within this genus such as Haddock (*Melanogrammus aeglefinus*), Ling (*Molva molva*), Cusk (*Brosme brosme*), and Pollack (*Polachius virens*). By the thirteenth century, sites in the Faroes and in Iceland started producing archaeofauna dominated by elements from Atlantic cod.

The movement shown in Fig. 9.3 from a wide spectrum fishing pattern (at least within genus Gadidae) to a much more species-specific approach focusing almost completely on Atlantic cod is most often interpreted as one mechanism within the overall phenomenon of the commoditization of dried cod products. This move is seen as part of the transformation of North Atlantic fisheries from being either concentrated on subsistence or engaged in local trade to a fishery that was engaged with commodity markets and long-range trade (McGovern et al. 2006; Perdikaris and McGovern 2007; Perdikaris et al. 2007). A parallel line of archaeological data to

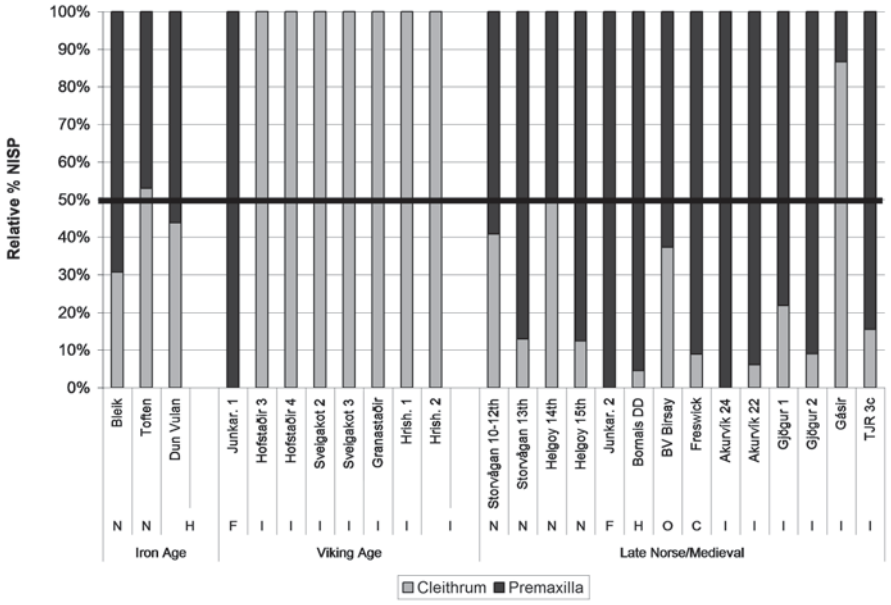

Fig. 9.4. A selection of comparably excavated (sieved) sites from Iron Age, Viking, and Late Norse/Medieval contexts from Norway (*N*), Orkney (*O*), Hebrides (*H*), Shetland (*S*), Faroes (*F*), Caithness (*C*), Iceland (*I*), and Greenland (*G*) that presents changing proportions of cleithrum and premaxilla. The relative proportion of the two elements in a whole fish is equal (*heavy line*), but where specialized production and consumption takes place the cleithra and premaxilla may become concentrated at different ends of the trade system. Production sites generally have archaeofauna with larger numbers of premaxilla, while consumption sites generally contain much larger numbers of cleithra. (Source: Perdikaris et al. 2007)

this, which reflects this phenomenon and gives it more detail, relies on determining the size of the fish being caught at the sites represented by the archaeofauna. Before discussing this it is important to present a basic but powerful tool for determining production versus consumption sites in the market for dried fish products (Fig. 9.4).

Heads versus Tails Coastal sites that produced dried fish products often have faunal assemblages that are dominated by cranial elements. Consumer sites on the other hand have faunal assemblages dominated by vertebral elements, most often precaudal vertebrae, while also often having high numbers of cleithra, an element adjacent to the pectoral girdle that was often left on the final product (Perdikaris et al. 2007; Perdikaris and McGovern 2009).

After the fish has been brought to shore, it is gutted and its head is removed along with the thoracic, and at times some of the caudal vertebrae as well. The cleithrum is left on the body as it helps to hold the flesh together at the cranial end of the fish. The gutted headless body is then left out to dry in the air, either in the open or in rough shelters. This processing effect creates the clear production versus consumption faunal signature. This relationship can be best expressed by examining the

percent of premaxilla, a fairly robust cranial element and the percent of cleithra, a similarly robust bone, within archaeological assemblages containing large numbers of fish bone (Fig. 9.4).

The consumption sites from Viking Age Iceland are all the same inland sites mentioned before. The medieval Icelandic consumption site, Gásir, was a seasonal trading site in Eyjafjord, in Northern Iceland. These late medieval sites reveal the intensification of production of dried gadid products.

Flat Dried Fish, Round Dried Fish, and the Intensification of the Trade in Dried Cod Different products are produced by the drying of gadids and two in particular are of interest in this story of intensification and commoditization. An earlier product, which was dried flat, can be seen in the early medieval archaeological record through a different percentage of vertebral representation as well as through the presence of somewhat smaller fish (in terms of length). Beginning roughly in the thirteenth century a different product, stockfish, which is air dried in the round, begins to dominate assemblages. The flat dried item is a product in which the fish is gutted, the head and most of the vertebral column is removed, leaving only the cleithra and caudal vertebra present in the resulting assemblage. These fish were then splayed out while drying so that the final product was flat. The round dried stockfish, a much more familiar product, and the one which dominated the late medieval and early modern North Atlantic fish trade, leaves a different faunal signature. In the production of round dried stockfish, the fish is gutted, beheaded, and only the thoracic vertebrae are removed. This results in archaeofauna in which the cleithra and greater numbers of precaudal and thoracic vertebrae are present.

Different sizes of fish were more suitable for each specific product. The flat dried product required a smaller fish with an ideal length between 40 and 70 cm. Round dried stockfish required a larger fish with a length somewhere between 60 and 110 cm. The move from flat dried to round dried in terms of total length of the fish being caught can be seen archaeologically (Fig. 9.5).

The move from the flat dried product to round dried stockfish was a response to the growing market for stockfish. The archaeological data presented above are the material reflection of North Atlantic peoples supplying and responding to long-distance commodity markets.

The intensification suggested by this changing faunal data is best exemplified in the Medieval Period by the Icelandic sites of Gjogur and Akurvik (Krivogorskaya et al. 2005; Perdikaris 1999; Perdikaris and McGovern 2007) and for the later Medieval Period by the site of Gásir (Harrison et al. 2008; Harrison 2013). For the Late Medieval and Early Modern Periods, this process is well illustrated by the archaeofauna still under analysis from the site of Gufuskalar in Iceland (Feeley, in process). Finally, for analyses of this process in the Early Modern Period the sites of Gufuskálar, Finnbogastaðir (Edvardsson et al. 2004), Skutastaðir (Hicks and Harrison 2008; Hicks 2011; Sayle et al. 2013), and Tjarnagata 3c (Perdikaris et al. 2002; Harrison and Snæsdóttir 2012) in Iceland are especially relevant (for more general discussion on commoditization in early modern Iceland see Hambrecht 2012).

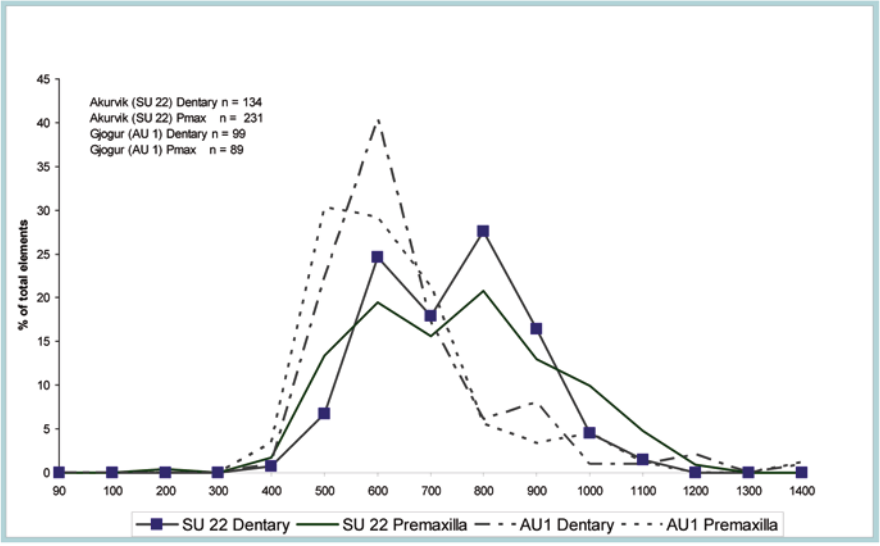

Fig. 9.5 The distribution of cod live length reconstructions in mm for the later medieval (fourteenth to fifteenth centuries) deposits at the seasonal fishing station Akurvík and the nearby permanently occupied farm mound Gjögur. The *solid line* encloses the optimal size range for the production of round dried stockfish, while the *dotted line* encloses the optimal size range for flat dried production. Akurvík appears to have been actively engaged in both types of production, while Gjögur seems to have concentrated upon the flat dried product, perhaps serving different markets

The archaeology of later medieval sites in Iceland shows the development from the artisanal industry to the highly specialized production that was feeding the mature fish trade. Specific signs of this are a concentration on Atlantic cod (*G. morhua*), especially in terms of those species being dried. The element distributions from Atlantic cod increasingly become divided between the cranial and thoracic elements found at production sites and the caudal and cleithra elements found at consumption sites. The change in fish size and in element distribution point to the turn toward stockfish and the standardization and commodification of this dried cod product.

There are of course some interesting exceptions to the process described above. One is the case of Norse Greenland and the fact that the archaeofaunas produced from such contexts consistently show very little presence of maritime fish at all. Another interesting exception comes from the seventeenth and the eighteenth century contexts from the elite site of Skálholt in Southern Iceland. These show a very different faunal signature in terms of fish. Skálholt was the cathedral farm which housed the Bishop of Southern Iceland until 1792. It is an inland site surrounded by high-quality pastureland. The site contained the household of the Bishop, a boy's school, and was in itself a large farm. The Bishop owned farms throughout the

region, as well as in other parts of Iceland. The Bishop generated rents from these farms as well as from tithe income. The site of Skálholt was perhaps one of the wealthiest in Iceland from the Medieval through the Early Modern Period. Perhaps not surprisingly during the seventeenth and the eighteenth century at least some of the inhabitants of this site were consuming whole fresh cod and haddock. While stockfish was clearly being consumed here as can be determined by written records, enough fresh fish was being consumed to skew the faunal signatures towards showing elements across the whole body of the consumed fish. This maritime signature is paralleled by an equally unique terrestrial faunal assemblage that featured prime age cattle and sheep being raised and consumed for their meat, which is not at all an ordinary situation in premodern Iceland or North Atlantic archaeological contexts (Hambrecht 2009; Hambrecht 2011). The clear signs of long-distance and eventually global commodity markets do not reveal themselves in the zooarchaeological sense discussed above at Skálholt.

Discussion

Many historians have worked to trace the premodern roots of our current global capitalist system. In many cases, they have pointed out the presence of what had often been considered to be novel "modern" and uniquely European processes in the Medieval Period and before and in geographical contexts far outside of Europe (Abu-Lughod 1991; Pomeranz 2001). On the environmental historical front, there has been excellent work revealing that the processes that we see so dramatically during and after the Columbian Exchange also have deeper roots than 1492 (Crosby 2004; Marks 2007; Richards 2006). The archaeology of the Norse colonization of the North Atlantic and of these same societies in the Early Modern Period parallel these works and add new uniquely archaeological perspective to the examination of the formation of modern world. Both the influence of long-range trade networks and the growth of sophisticated commodity markets in driving the movement of peoples across the North Atlantic are revealed by the archaeology, and specifically the zooarchaeology of North Atlantic.

The work described in this piece is the product of a large group of scholars (Perdikaris et al. 2011; McGovern et al. 2007). The work is ongoing, and there is still much to be done. One new development that is relevant to the history and effects of capitalism is a move towards attempting to construct deep baseline demographic data for both marine fish and marine mammals over the last millennium. This is being done through classic zooarchaeological methods, such as reconstructing the age/size relationship in Atlantic cod, and with new methods, especially involving the analysis of ancient DNA (Barrett et al. 2008; Szabo and Anderung in press; Olafsdottir et al. 2014). The ability to engage in paleodemographics through aDNA analysis, as well as the migratory, population, and trophic structure data that stable isotope analysis can supply, will allow zooarchaeology in particular to supply precise data on the relationships between human and natural systems through history.

It is hoped that as archaeologists we can move from analyzing the development of commoditization of natural resources in the North Atlantic to reconstructing population size and characteristics over the last millennium in order to create a deeper understanding of the detailed impacts of capitalism on what are key resource populations for that region and the larger world.

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