



An archaeologist peels back the soil from the floor of a sod house, part of a Viking-age farm that dates to the earliest period of Iceland's settlement. The barren hills in the distance were once covered with trees which were used to fuel the farm's iron-smelting operation. Excavations like this one at Hrisheimar are causing scholars to rethink how Iceland may have been settled and how the Vikings cared for their environment.



EVEN WHEN THE WEATHER IS CLEAR, gusts of wind lash the hillsides overlooking the Viking-age farm at Hrísheimar leaving the land raw and strewn with pebbles. A few miles east the Eurasian and North American tectonic plates are pulling apart, creating the fissure from which Iceland has sprung. Over millions of years the landscape here has been heaved up by volcanoes and flattened by glaciers. Sitting between the Arctic Circle and the warm Gulf Stream current, the climate shifts back and forth, balmy one day, wet and frigid the next. Iceland balances on many edges and nowhere is it more apparent than at Hrísheimar, on the border of a grassy marsh, a sub-Arctic desert, and the blurred fringe of recorded history.

Thomas McGovern of Hunter College has been working with a multinational team of archaeologists for the past 10 years to excavate a series of sites in the Mývatn district, an area 30 miles inland from Iceland's northern coast. The district is named for Lake Mývatn,

Iceland's Unwritten Saga

Did Viking settlers pillage their environment?

by ZACH ZORICH

which lies about two miles east of Hrísheimar. Covering 14 square miles but reaching a depth of only 15 feet, Mývatn is the annual nesting ground for about 30,000 ducks. This project is the first to explore the archaeology of an entire region of Iceland, and is a radical departure from traditional methods of studying Iceland's settlement based on historical documents. It is also changing the perception of what life was like for the earliest Icelanders and redefining a nation's history.

Until recently, most of what was known about Iceland's settlement came from its long and impressive literary tradition. The Icelandic sagas are some of the earliest narrative stories from Western Europe, but they were written 200 to 300 years after Iceland's settlement period, or *landnám*—meaning “land-taking.” The historical picture the sagas create is in some ways incomplete and colored by medieval sensibilities, so excavations such as McGovern's provide the only direct evidence of life during the *landnám*.

According to the sagas, the first Icelanders were political refugees. By A.D. 872, Harald Fairhair had completed his conquest of Norway, and was taking revenge on his enemies, as the following passage from *Egil's Saga* shows.

The king's animosity towards Kveldulf and his son grew so fierce that he hated all their relatives or others close to them, or anyone he knew had been fairly close friends. He dealt out punishment to some of them, and many fled to seek sanctuary elsewhere, in Norway or left the country completely.



Sophia Perdikaris, Thomas McGovern, and a crew from Icelandic and U.S. universities enjoy a respite from the rain and the excavations at Hrísheimar.

striped with the soil and volcanic ash brought in with the strips of sod that were piled on top of each other to build the house walls. Just below the remnants of the household garbage lies a light gray band of ash from an eruption of the volcanic fissure Vatnaöldur dated to A.D. 871 (plus or minus two years), known to archaeologists as the landnám tephra, which provides a clear marker of the earliest Viking settlement. Hrísheimar's position just on top of the tephra is consistent with the earliest sites

Iceland had been discovered by a wayward sailor named Gardar Svavarsson sometime in the 860s. Having no human inhabitants and a climate similar to Norway's, Iceland may have seemed like an ideal place for an itinerant chieftain to resettle his farm and family without submitting to a king. Until 1262, Iceland did not have a national government; each chieftain ruled over his own farm and an annual meeting called the *Althing* was convened to settle disputes.

According to the twelfth-century *Book of Settlements*, most of Iceland's early inhabitants lived near the coast, grabbing up the most desirable plots of land to raise the same type of livestock they had in Norway—cattle, pigs, sheep, and goats. Over a period that may have taken 100 years, new settlers claimed the less desirable farms in the interior. Under this scenario, the farms around Lake Mývatn should have been occupied a few decades after the first wave of settlement. But, Hrísheimar is telling a different story.

ON THE SURFACE, THE treeless hills at Hrísheimar make it seem like a prime example of environmental devastation brought on by ill-informed and over-ambitious Viking settlers. Beneath the surface, a more complex picture is emerging.

McGovern is tall, heavyset, and wears a long white beard. His cheeks develop a rosy hue as we stand in the wind, making him look like Norman Rockwell's Santa Claus wearing field-worn overalls and thick, square glasses. He leads me from the parking area down the rocky hillside. Tufts of grass sprouting from whatever meager soil remains sheltered by the larger stones are the only visible life on the hillside, a marked contrast to the lush green grass that holds on at the base of the slope and covers the site.

Among the earliest buildings at Hrísheimar are two rectangular houses about 12 feet in length. The sod buildings collapsed long ago, but the excavation pit walls are tiger-

in Iceland, and radiocarbon dates confirm the site's antiquity. In spite of the farm's location 30 miles inland, Hrísheimar appears to be one of the first places settled, contradicting the old assumptions that Iceland's interior was ignored until the coastal areas were settled.

Some of the most important clues about life at the site come from the table scraps of millennia-old meals scattered outside the pit house. "We found a whole assortment of domestic animals including pigs, marine fish, freshwater fish, and duck eggs left here pretty much as the landnám tephra was falling," says Sophia Perdikaris, a professor at Brooklyn College. The people at Hrísheimar probably relied on naturally available foods to supplement their diets until they could establish their herds of cattle, pigs, and sheep, but the marine fishbones and duck eggs are especially revealing about society during the landnám.

All of the marine fish eaten at sites around Lake Mývatn were processed in a very specific way. "The pattern of the vertebrae is fairly typical of a flattened, air-dried fish product," says Perdikaris. No head bones of ocean fish have been found at any of the sites around Lake Mývatn, indicating that the fish were probably dried at a processing station on the coast and traded to the people living near the lake. Dried cod and haddock have been a staple of the Norwegian diet since 100 B.C., but the evidence of trade networks operating from the earliest stages of the landnám shows that certain aspects of Norwegian society may have been transported to Iceland intact, and that settlers were dependent on one another to make their livings.

The presence of duck eggshells and the absence of duck bones at the Mývatn sites show that a system of social customs was also imported by the first settlers. Local records first mention the custom in 1712, noting that killing ducks is forbidden and anyone collecting eggs must leave four in the nest to ensure a stable duck population. The archaeologi-

cal record seems to indicate that these laws were in place from the very beginning. “The duck eggs are a classic example of an ecological disaster that didn’t happen,” says McGovern. “All that has to happen is for one guy to decide he is going to kill all the ducks and take all the eggs and then either everyone is a sucker or they go out and do the same thing. If that had happened there would be no ducks at Lake Mývatn.” It is a surprising example of sustainable resource management that is still practiced today.

ONE OF THE THINGS that may have drawn settlers to Hrísheimar was the marsh. As McGovern shows me around the site he points out a collection of stone slabs that is splayed open like petals on a flower. “This used to be an iron smelter,” he tells me. The people of Hrísheimar dug the iron-rich sediment out of the marsh at the base of the hill and packed it into these smelters with charcoal made from the forests of birch and willow trees that used to grow about 15 feet high on the hills around the area. After the charcoal had burned itself out, a little bit of raw iron would be left. About a dozen of these stone-slab clusters dot the hillsides. This scale of iron production contradicts the idea that Iceland was dependent on trade for its iron; it also may show why the land around Hrísheimar is so badly eroded.

Ragnar Edvardsson, McGovern’s field director at Hrísheimar and a doctoral student at City University of New York, explains to me that studies of Iceland’s iron-producing sites are still relatively new and many questions remain unanswered. “Are they producing carbonized iron?” Edvardsson asks, prompted by some hunks of burned bone he found while excavating some of the smelters. Adding bone to the smelters would have raised the carbon content of the iron making it harder. “If they are adding carbon, then they are creating steel and that’s really a high level. It’s a real industry.”

The hills at Hrísheimar were once covered with small birch and willow trees. However, the trees were probably fed into the iron smelters a long time ago. Today it is estimated that 90 percent of the forests that covered Iceland prior to settlement are gone. Most of the forests disappeared during the first 50 years

Among the significant discoveries at Hrísheimar is Iceland’s oldest toilet. Soil from this oval-shaped pit should yield information about the health and diet of Iceland’s earliest settlers. The large holes next to the pit may be from a framework that people held onto while using the facilities.



This bone-and-antler comb, found at Hrísheimar, was probably imported from Scandinavia and used for a few generations before it was thrown away.

of settlement, indicating that the need for pasture land led to their destruction.

“But, is deforestation environmental destruction?” McGovern asks, turning traditional wisdom on its head. “If you are trying to build things out of turf and raise the greatest number of cattle and sheep on the landscape, maybe trees aren’t a good thing, especially since they are too small for lumber.” McGovern points out that the remaining stands of trees are spread out so that nearly every district in Iceland has some, and the areas that don’t, have access to large amounts of driftwood. The settlers appeared to have managed the remaining forest to provide fuel for their fires.

Deforestation, however, may have had some very real costs. At Hrísheimar, the loss of trees changed the water drainage into the marsh and prevented iron from collecting in the sediments. When exactly the deforestation took place is not known. If it happened while Hrísheimar was still occupied, deforestation may have cut off one of the farm’s main sources of income.

ABOUT FOUR MILES EAST of Hrísheimar, Orri Vésteinsson, a researcher at the Archaeology Institute of Iceland and co-leader of the project with McGovern, is beginning a new season of excavations at Sveigakot, another settlement-period farm. Sveigakot was never rich. Moss-covered lava fields east of the farm limited the available pasture land, and the lava’s rugged surface provided livestock with a good place to break their



legs. A few hundred yards west lay the swift-flowing Kráká River, another barrier to grazing animals. "You see places like this one and you wonder, why would anyone want to live like this?" says Vésteinsson.

Evidence from Sveigakot is challenging the idea that Iceland was settled almost exclusively by freedom-seeking Norwegians. Over the past eight field seasons the archaeologists have uncovered three rectangular pit houses, a cattle barn, and a small hall. Vésteinsson showed me one of the pit houses. A large boulder sits in the middle of the floor, and others stick out of the walls. "At Sveigakot, building a sunken house is quite idiotic," says Przemysław Urbańczyk of Warsaw's Institute of Archaeology and Ethnology, "because wherever you dig there are these huge rocks. There must have been somebody very stubborn to have built a sunken house."

It seems like a place that would have discouraged settlement, but the tephra layers and carbon dating show that Sveigakot was occupied within the first few years of landnám. The early date makes Vésteinsson question not only the idea that it took decades to populate Iceland's interior, but that most of those who came were independent farmers.

"Maybe it makes more sense to see the colonization as being organized by very few individuals, and they bring people in by a variety of methods. Some of them could even be un-free," suggests Vésteinsson. "You could buy people in the markets, or you could con them. If you look at later history that is exactly what happens . . . people colonize because they are poor, they get tricked, or they are convicts."

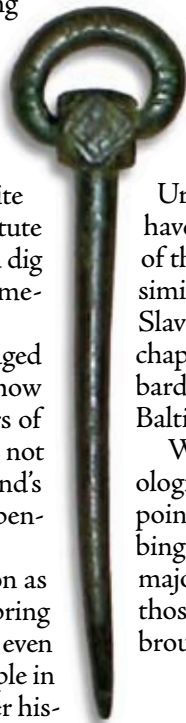
Egil's Saga mentions slaves and other followers being brought to Iceland.

Ketil Gufa came to Iceland when it was by and large settled . . . [He] had sailed over from Ireland, and brought many Irish slaves with him.

Even so, the *Book of Settlements* indicates that about 90 percent of Iceland's settlers were independent farmers from Norway. Sites like Sveigakot make it seem more reasonable that Iceland was largely settled by people beholden to a relatively small number of powerful chieftains.

The typical slave in the sagas is Celtic, but Urbańczyk looks at the pit houses and thinks they may have been built by Slavs from the Baltic region. The size of the houses and arrangement of the living space are very similar to pit houses found east of the Elbe River and at Slavic enclaves in Denmark. He also notes that a sword chape, a decorative piece of metal from the tip of a scabbard, and some brooches found in the Mývatn area are of Baltic style.

When I raise an eyebrow at the idea of a Polish archaeologist discovering Slavic people in Iceland, Vésteinsson points out that it is not really surprising. "The slave-grabbing areas are in the Baltic," he says. "I'm not saying the majority of the people who settled Iceland were from those parts, but the ethnicity of the people who were brought here may have been quite mixed." The idea also



This bronze, ring-headed pin once secured a Viking's cloak. Below, archaeologists prepare to excavate Sveigakot, a relatively poor Viking-age farm. The rugged lava field in the background would have severely limited where the farm's livestock could graze.





Birch and willow forests like this one at Lake Mývatn used to cover much of Iceland's interior. Viking settlers cleared the forest for their pastures and burned the trees to make charcoal. The forests have never recovered. It is estimated that 90 percent of Iceland's pre-settlement forest is gone.

gains some support from a study by Hildur Gestsdóttir, of Iceland's Institute of Archaeology, and T. Douglas Price, at the Laboratory for Archaeological Chemistry at the University of Wisconsin–Madison, that compared the amount of strontium isotopes in human remains from all over Iceland from before A.D. 1000. The study included bones from 90 individuals and revealed that between 9 and 13 of these early settlers came from several different areas outside of Iceland, but researchers have not been able to pinpoint where.

MCGOVERN PUTS ME TO WORK excavating an area just outside the pit house at Hrísheimar. In the time it takes to label an artifact bag and seal a piece of sheep bone inside, the freshly exposed soil has dried out and a gust of wind whips the dust into my right eye. “Don’t rub it,” McGovern warns me. What has landed in my eye are small shards of volcanic glass—also one of Iceland’s most persistent problems. About 40 percent of the soil present at the time of the landnám has blown away. The main cause of erosion is fiercely debated, but the most likely candidate is not deforestation, it is sheep.

During the winter, grass goes dormant and it cannot recover from the damage done by grazing livestock. If sheep are left in pastures too late in the year they can kill the grass, destroying the root structures that hold the soil in place. Most of the erosion at Hrísheimar happened after 1717 when Icelanders took advantage of a high demand for wool by raising as many sheep as possible.

Over the past 30 years, soil conservation efforts have changed the way Icelanders run their farms. A visit to Asvaldur Thormodsson’s farm at the base of a steep-sided mountain near the coastal town of Húsavík helps me put the problem in perspective. Thormodsson has 150 sheep and 40 dairy cows, but he can only graze 100 of his sheep in the common pastures on the mountain. He must bring them

down when the first snow falls. Some years that means they only graze there for two or three months, which increases the amount of money he must spend to feed them.

It’s a small price to pay for not having his livelihood swept away by the wind. “We must make the land better than it is now,” he tells me in a thick Scandinavian accent. “A few days ago we had a sandstorm. This must stop because the sand will bury the plants.” Fortunately efforts to conserve the soil by limiting livestock grazing are paying off. Gesturing at the mountainside, he tells me the grass grows higher on the slope every year.

Farmers like Thormodsson may benefit most from McGovern and Vésteinsson’s work. Understanding how their ancestors used the land and the consequences of their actions could inform future land-management decisions.

McGovern and I drive north of the lake to see the real extent of the damage that soil erosion has done to Iceland’s interior. We travel up a gravel road through a Mars-like landscape that extends farther than I can see. McGovern pulls to the side of the road near a weather station and a squarish stand of green shrubs called lupins. The shrubs are an attempt to stabilize and reclaim the sub-Arctic desert, but the lupins are having trouble holding on. McGovern points out a collection of large rocks a few hundred feet ahead of us. “That used to be a farm,” he tells me, but any artifacts the farmers left behind were swept away with the soil. McGovern hopes that future work in the Mývatn area will help him understand how the environment reached this point.

“It’s not a simple story,” says McGovern. “There is a sense of these people almost getting it right for a very long period of time and then something happens and they go over a threshold.” McGovern hopes to learn more about how the Viking settlers managed to avoid destroying their land for centuries before the environment reached that point. As the worldwide climate changes and natural resources are exploited to their limits, Iceland may become an example for other nations that are approaching their own thresholds. Looking out over the farm’s eroded remains, it isn’t exactly clear whether we are seeing the past or the future. ■

Zach Zorich is associate editor at *ARCHAEOLOGY*.