

Viking Navigation

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During the Viking period (ca. 800-ca. 1050), Scandinavian navigational practices may have been the most skillful in Europe. True, the Viking sailor may have been no better than others while traveling coastal waters, for knowing the location of sandbars, skerries, and other hazards and the tendencies of tides, coastal winds, and currents was part of any sailor's stock-in-trade since at least the time of Odysseus. What distinguished the Viking as a navigator were his methods of crossing wide and open seas during the traditional sailing season from April to October.

As is often the case with the history of early navigation, direct contemporary evidence for Viking navigation is lacking: the northern navigator passed along only orally what he learned for himself and what he knew of the cumulative experience of past generations. We are forced to glean what we can about his practices from mostly casual references in sagas and other accounts of his time that were written considerably afterward, usually by men who themselves were inexperienced at sea. Inadequate as it is, this evidence reveals at least the Viking's most important navigational methods.

So far as can be known with certainty, he used no instruments beyond the simple lead and line for soundings, useful enough in shallow waters but not in deep seas, where he relied upon his senses and rudimentary celestial observations. A passage in *Landnámabók* (Book of [Icelandic] settlements, Hauksbók version) says that one should sail west from Hearnar in Norway, just north of Bergen (60° 24' N), to reach Hvarf, at the southern tip of Greenland (59° 41' N). On his way a mariner will pass "north of the Shetlands, which can be seen on a clear day, and south of the Faeroes, so that the sea will appear to be halfway up the slopes, and then to that point south of Iceland where there are birds and whales." The island promontories, as well as sightings of glaciers on Iceland and Greenland mentioned by other authors, were of obvious importance for getting one's bearings, and haunts of whales, together with familiar schools of fish, could indicate that an island destination was near even if it was enveloped by fog. Seabirds not far from land--and first sighted as much as 150 miles south of Iceland by modern trawlers--would provide similar aid.

We must suppose too that such visual clues to location as typical cloud formations, varying color of the sea, drift ice and icebergs, and occasional pieces of driftwood and floating seaweed were not ignored. Nonvisual aids also must have been valuable: the sounds of cracking icebergs, blowing whales, and squawking birds; the relatively fresh taste of water emptying into the sea from an island's river; the feel of the comparatively cold East Greenland polar current; and the fresh, earthy smell of land, recognizable from quite far out at sea. Knowledge of location gained in these ways was particularly important when lost in fog or when on an exploratory voyage. And all sensory clues were used whenever possible to confirm a position that was learned as a result of astronomical observations made during periods of fair weather.

The passage in Landnámabók does not say how one was able to sail west from a particular point in Norway to one in Greenland, but obviously celestial navigation was involved. In northern waters during the long summer days of the sailing season, the star that helped most was the sun, not Polaris. Certainly the Viking sailor was well aware that the farther north he sailed the lower the sun reached at its zenith, midway through its heavenly transit; and conversely the farther south, the higher it reached--in other words, he knew what we would call relative latitude. Thus if he could keep the sun at the same distance above the horizon at midday, day after day, he would be traveling in a due easterly or westerly line, thereby practicing what is sometimes known as "latitude sailing." This apparently simple feat was not easy to accomplish. The sun's distance above the horizon could be consistently measured with anything conveniently available--the length of an upraised arm, for example--but for this measurement to be even reasonably accurate, the ship itself had to be on an even keel, not usual in the North Atlantic. Furthermore, the best opportunity for measuring the sun's distance above the horizon is presented only at midday; at another time--halfway between rising and the zenith, for example--it is much more difficult to judge without reference to a fixed geographical point and without a timekeeping device (such as even a small water-clock), something which the Viking sailor evidently did not use. During the twenty-four-hour period between middays, his ship surely would leave a due easterly or westerly course before the error could be corrected with another observation of the sun's meridian.

Though it had these limitations in practice, as well as others, latitude sailing still was much appreciated. Whenever new land in the west was discovered--progressively, the Faeroes, Iceland, and Greenland--the height there of the sun at midday would be ascertained several times during the sailing season; when traveling from Norway, which faces all of these places, a sailor first would sail up or down the Atlantic coast to the point where the sun's altitude was the same, then make his departure across the sea. Latitude sailing was also indirectly useful for north-south sailings. For instance, if an Icelander knew the height of the midday sun in northern Ireland at various times during the sailing season, he could sail south of his island until he reached the latitude of Ireland, then sail east until he struck land. Though he knew about relative latitude, the Viking navigator had no way of determining even relative longitude at sea; rather he gauged his voyage's progress by the number of days it took, a practice reflected in other sailing directions preserved in Landnámabók: for instance, a voyage from the most westerly point of Norway to the east coast of Iceland, a distance of about 530 nautical miles, required a sailing of seven days, a period which should be understood only as the average under favorable circumstances.

Currents and winds were of course most welcome to the Viking seafarer, provided he wanted to travel in their direction; otherwise they could be most distressing. Flowing from west to east, the North Atlantic current is the main one in the open waters he sailed. Prevailing winds come from the same direction. Sailing from Norway westward against both of them usually required a considerable amount of tacking, an additional reason for the only approximate nature of Viking latitude sailing. Until the comparative latitude of a western destination had been well ascertained by repeated and constantly more refined observations throughout the sailing season, and until a considerable body of sea lore had been accumulated for the route to help make up for the unavoidably inaccurate estimations of latitudinal position along the way, the need for tacking against wind and current could make a voyage to the west quite hazardous. On early direct voyages to Greenland from Norway, for example, if one tacked too far to the north, or was

prevented from making adequate compensation for it by a new adverse wind, the ship might not just reach the drift ice off the eastern coast of Greenland but be stranded on the isolated and desolate coast itself; if one tacked or was driven too far to the south, the ship might reach North America. It was because of "prolonged difficulties at sea" on his way from Norway to Greenland that Leif Eriksson discovered America, according to *Eiríks saga rauda* (Erik the Red's saga).

Difficulties in sailing from Norway to Greenland persisted even thirty to forty-five years after the island was first settled by Norsemen, if we can believe the words that Snorri Sturluson, author of *Óláfs saga helga* (St. Olaf's saga), put into the mouth of an experienced sailor when speaking to Olaf, ruler of Norway from 1015 to 1030: "Now, it may happen, King, as is not unlikely and can easily occur, that we cannot make Greenland but are driven to Iceland or to other lands."

Because of ignorance of the route or some unusual ill-luck, fourteen of the thirty-five ships that left western Iceland to first settle Greenland in 984 or 985 were either lost at sea or driven back home. Nevertheless, the passage to Greenland was generally easier from Iceland than from Norway. After crossing the Denmark Strait from western Iceland to some distance off the east coast of Greenland, taking care to avoid the drift ice, an Icelandic sailor would be aided by the Greenland current, which flows down the eastern side of the large island and around its southern tip to the west coast, where the Norse settlements were located. He was also assisted by the prevailing northerly winds of the island's east coast and, once he got around the southern tip, by the prevailing southerlies of the west coast. The main difficulty was in rounding the tip, for there he would encounter the same westerlies that caused difficulties for a Norwegian as soon as he left his home shores. An agreement of about 1022 between St. Olaf and the Icelanders refers to this problem when it takes into account that Icelanders who were on their way to Greenland, or on an exploratory voyage, might unintentionally be driven to Norway by that troublesome wind.

Beset with dangers of sudden shifts of wind or lack of it altogether, blanketing fog, and other perils of the North Atlantic, the Viking who crossed this ocean was always an adventurer. That the mishaps he had, as recounted in sagas and other sources, are the exception rather than the rule owes much to his navigational skill.

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