PART I

CHAPTER I

THE ARCTIC REGIONS

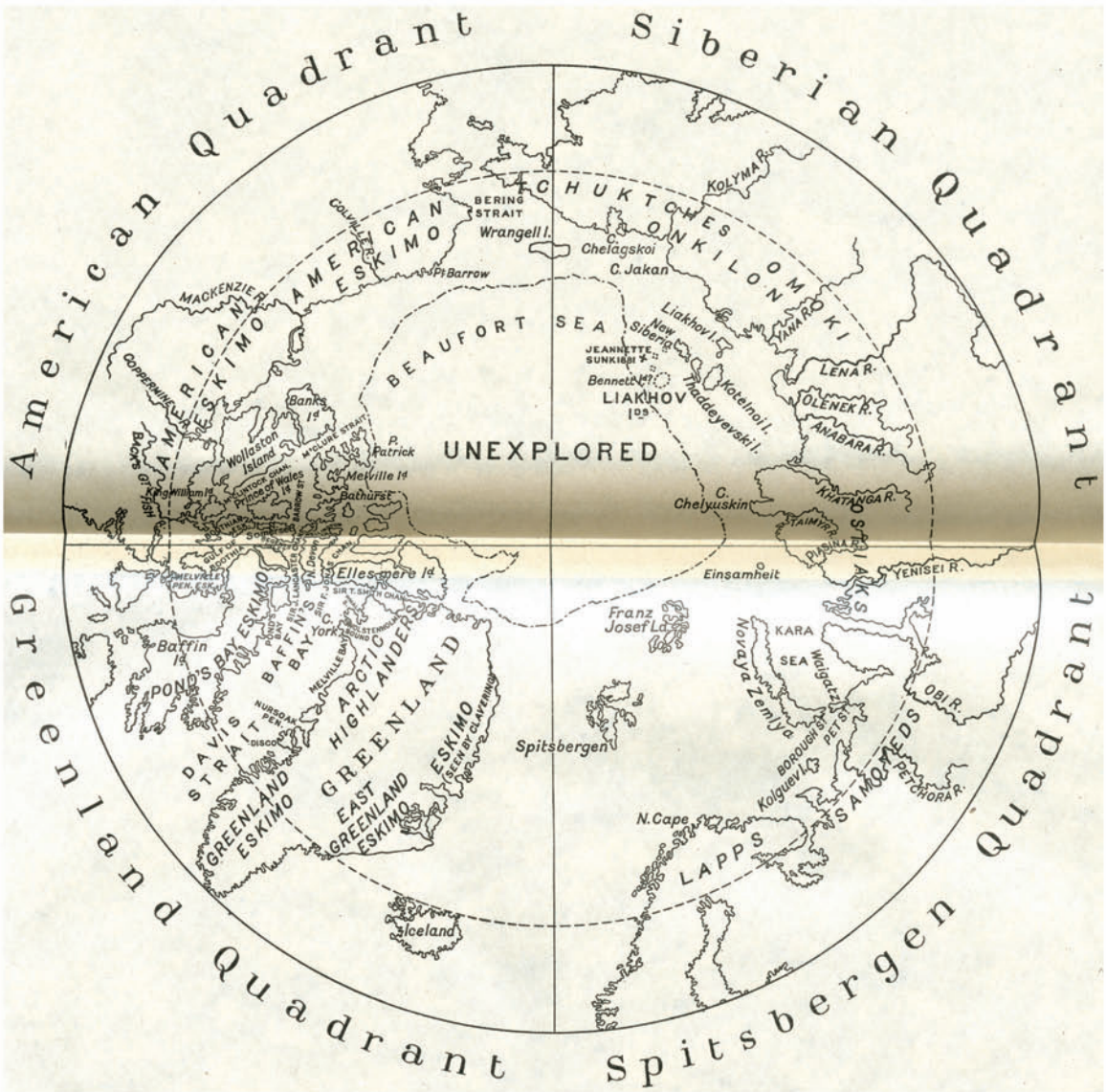
THE history of the Polar Regions, of those vast areas, difficult of access, which include millions of square miles of land and ocean at either extreme of our planet, is of surpassing interest and importance. It is not only that we here meet with examples of heroism and devotion which must entrance mankind for all time. It is not only that there are dangers to be encountered and difficulties to be overcome which call forth the best qualities of our race. These, no doubt, are the main reasons for the deep interest which polar exploration has always excited. But there are others of almost equal importance. These regions offer great scientific problems. They present wide fields of research in almost all departments of knowledge. They have in the past yielded vast wealth, and have been the sources of commercial prosperity to many communities, and they may be so again. Their history is a history of noble and persevering effort; extending over a thousand years in the Arctic where the work is well-nigh finished, but only just beginning in the Antarctic regions, where it will have to be completed by our descendants.

In approaching the subject it is well to have before our minds the extent of these great areas, the history of which we would grasp and understand. At the polar circle, which is 1410 geographical miles from the centre, they have a periphery of 8460 miles, and each includes 6,000,000 square miles. The Arctic and Antarctic circles are in 66° 32′ North and South, but these parallels are merely conventional. It is more convenient, as will be seen hereafter, to take the Polar regions as beginning at about the 70th parallel, the Sub-arctic and Sub-

antarctic regions extending from 60° to 70°, a zone in which the fauna is richer and more varied.

The division of these polar regions into quadrants is useful because it facilitates geographical description and impresses the relative positions of the different parts on the mind. In the Arctic regions a line may be drawn from the Lofoten Islands to Bering Strait, with another crossing it from the head of Hudson's Bay to Cape Chelyuskin; thus forming four quadrants.

At the present day a fringe of coast lines forming the northern shores of the three great continents, with a deep interior polar sea, are the main features of the Arctic regions, but it was not always so. Looking back into remote geological periods, we have evidence of marvellous changes in the Arctic regions since the globe was a gradually cooling mass of vapour. In this process, extending over vast ages, the polar regions must have been, as they are now, cooler than the equatorial regions, and for the same reason. It was, therefore, in the polar regions that life first became possible, and here the life of the Silurian age arose. There is evidence of a continent in Jurassic and Tertiary (Miocene) times where now there is a polar ocean of great depth, save where Spitsbergen and Franz Josef Land exist as the sole remaining fragments of that continent. There is evidence that forests once flourished where now nothing higher than the dwarf willow can exist. There is evidence, too, of tremendous volcanic eruptions, covering great areas with sheets of basalt. In contemplating these mighty revolutions, and the gradual changes through long æons of ages, the leading fact connected with the polar regions is that here life first became possible. Here it was first possible that man could exist. The evidence that the arboreal vegetation of the miocene period originated round the north pole appears to be quite conclusive. The exploration of the Arctic area has disclosed proofs of wondrous secular changes which no imagination, however vivid, could surpass. Alike in the far south, as in the far north, there is food for the imagination—lights thrown here and there on the history of a marvellous past. Such speculations are a fitting introduction to a study of the existing state of things, which has lasted through the



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historical period, and probably for ages before the dawn of history.

The two halves of the Arctic regions may be called the Old World or Eastern, and the New World or Western halves. In the former the water flows in, and in the latter it flows out, thus causing a great oceanic circulation not yet fully investigated, but now clearly understood in its general outline.

In the eastern half of the Arctic regions the warm current from the Atlantic flows along the coast of Norway and then bifurcates, one branch going north along the western side of Spitsbergen, the other continuing along the Lapland coast and turning up the west coast of Novaya Zemlya. All the great rivers of Siberia also empty themselves into this eastern half. Thus there is a constant tendency, aided by prevailing winds, for the whole drift from the eastern shores to flow across the Arctic Ocean to the western side.

On the American or western side the tendency is to flow outwards, but there is only one outlet, along the east coast of Greenland. The in-flow is insignificant, Bering Strait is shallow, and but a small volume of water finds its way within the Arctic area by that opening. The flow from all the American rivers, except the Mackenzie and Colville, is at once checked by land in front of their mouths. Hence the whole tendency of aqueous movement is to flow out, while there is only one means of escape.

The consequence of this general drift outwards, with but one corresponding outlet, is very remarkable. The harvests of ice are carried across the Arctic Ocean until they are brought up by the American coast and islands, where they are completely stopped. Then the ice gradually increases from annual snow falls and other causes until it becomes upwards of a hundred feet in thickness. There is some movement in the summer, and a tendency eastward to the north of Ellesmere Island and Greenland, to join the Greenland current. The other straits and channels are too shallow for such ice to pass. In one place alone, between Melville and Banks Islands, there is a drift of this heavy ice into the Parry Archipelago, for a distance of 500 miles, but it is then stopped by

King William Island. Otherwise the only outward current for the heavy polar ice is down the east coast of Greenland. Even there the great body of ice comes from the Arctic Ocean itself, and but a small part is due to the escape of ice that has been pressed upon the western land. The outward current of Baffin's Bay only carries off the ice of one or two years' growth, which has formed in the bay itself and in the straits and channels leading into it. There is thus a vast accumulation along the outer shores of the western side, and the rising tendency of Arctic lands no doubt increases the difficulty of escape, and the consequent secular and unchanging block all along the western outer shores of the Arctic Ocean.

We may now turn to the quadrants of which mention has already been made on page 4. On the eastern side the first quadrant extends from the Greenwich meridian to 90° E., on an arc of the Arctic Circle, with two converging lines each 1410 miles long. In this quadrant we have Arctic Norway and Russia to Cape Chelyuskin, and the Spitsbergen, Franz Josef, and Novaya Zemlya groups of islands. It may be called the Spitsbergen Quadrant. The second quadrant on the eastern side includes the Siberian coast from Cape Chelyuskin to Bering Strait—the Siberian Quadrant. The third quadrant, being the first on the western side, includes Greenland, Baffin's Bay, and Baffin, North Devon, and Ellesmere Islands. The fourth quadrant, being the second on the western side, contains the northern coast of the American continent, and the Parry Archipelago. It is the American Quadrant.

It is desirable thus to have before us a general sketch of the Arctic economy before proceeding to the contemplation of the achievements of discoverers. We shall better appreciate their labours, their splendid efforts extending over centuries, if we know what they did not know, the results of their combined victories over the mighty obstacles which Nature placed in their way.

CHAPTER II

ICE AND ICEBERGS

A KNOWLEDGE of the nomenclature of polar phenomena is an essential preliminary to the study of the history of Arctic adventure. We must know the meanings of words which constantly recur and which form, as it were, the dialect of our subject. We begin then with the names for different forms and appearances of polar ice.

It used to be thought that ice could only be formed in creeks and inlets of the coast. It is now known that young ice forms on the surface of the open sea, and thickens into dense masses, where it is not disturbed by waves. *Young ice* then is the thin film first formed on the surface of the sea, when the temperature is sufficiently low in the autumn. When it becomes rather thicker it is called *bay ice*. In a ruffled sea the pieces of *bay ice* strike each other on every side, becoming rounded and having the edges turned up. This is *pancake ice*.

In a year, under favouring circumstances, the ice attains a thickness of six feet, in two years of nine feet. Sometimes masses of ice under-run each other, and the result is a thickness of 20 to 50 and even 100 feet.

A *field* is an expanse of ice of such extent that its termination is not bounded by the horizon. A *floe* is the same as a *field* except that its whole extent can be seen. *Floe bergs*, occurring on the northern shores of the polar ocean, are large masses of sea ice, broken off from ancient floes of great thickness, and forced upon the shore. *Ground ice* is formed on rivers or shallow inlets while the sea, as a whole, remains unfrozen. *Land ice* or the *land floe* is ice attached to the land.

Field ice varies in thickness from 15 to 20 feet. On its surface there is a deposit of several feet of snow which melts in the height of summer, forming numerous fresh-

water pools on the ice. Generally an ice-field is traversed by long ridges of *hummocks*, often 40 to 50 feet high, brought about by the collision of two fields, the irresistible pressure causing them to rise up.

The term *floe* is applied to pieces which are from half a mile to a mile in diameter. Pieces smaller than a floe are called *drift ice*. When drift ice is so extensive that its limits cannot be seen, it is called a *pack*, when the pieces do not touch an *open pack*, when they are pressed together a *close pack*. A *patch* is a collection of drift ice, the limits of which are visible. A *stream* is a drifting line of drift ice. A *tongue* is a projecting point of ice, under water. A *calf* is a mass of loose ice lying under a floe near its margin, and, when disengaged from that position, rising with violence to the surface. *Brash ice* consists of fragments and nodules, the wreck of other kinds of ice, and *sludge* is the term applied to smaller pieces, generally saturated by the sea.

A bright white line on the horizon, seen over an ice-field, and denoting more ice, is known as the *ice-blink*. Over land or large masses of ice it generally has a yellowish tinge. On the other hand a blue streak on the horizon, denoting open water, is called a *water sky*. A *lane* or *lead* is a narrow track of open water between floes or pack ice. *Rotten ice* is old ice partially melted, and in part honeycombed.

When a ship is forcibly pressed by ice floes on both sides she is said to be *nipped*, and she is *beset* when closely surrounded by ice. To *bore* is to enter the ice under press of sail or steam and to force a way through by separating the masses. *Sallying* is causing a ship to roll by making the men run in a body from side to side, to relieve her from adhesion of young ice.

An *ice foot* along a coast line is caused by the accumulation of the autumn snow-fall, as it drifts to the beach, being met by sea-water with a temperature just below the freezing point of fresh water. It is at once converted into ice, forming a solid wall from the bottom of the sea, constantly maintained. The upper surface of an ice foot is level with high water mark. The terrace above this wall, from its edge to the base of the *talus*, has a width dependent on the land slope. Thus an ice foot will