

in Labrador and the Polar Islands, might well be preserved in the Alleghanies and White Mountains. And, lastly, that a number of Scandinavian plants, which had changed their form or habit during the migration in America in conflict with the American types, would appear in the Polar Islands as American varieties or representative species of Scandinavian plants.

Whether or no this be a true hypothesis, it embraces all the facts; and botanists look anxiously to further explorations in the northern parts of Greenland for more light on the subject, and especially for evidence of rising or sinking of the land in Smith Sound and the countries north and east of it, and for evidence of ancient connection between Greenland and Scandinavia; for observations on the temperature, direction, and depth of transporting currents in these seas, and on the habits of its ruminant migrating animals, that may have influenced the distribution of the vegetation by transporting the seeds. Such facts as those of the existence of ancient forests in what are now Arctic regions, and of the migration of existing floræ over lands now bound fast in perpetual ice, appear to some naturalists to call for vaster changes than can be brought about by a redistribution of the geographical limits of land and sea, and to afford evidence of changes in the direction of the earth's axis to the plane of its orbit, and perhaps of variations in the ellipticity of the orbit itself.

It has thus been shown that much interest attaches to the Greenland flora, which is far from being exhausted. And besides these general questions, there are others respecting specific subjects, of which our existing knowledge is very imperfect. A great interest attaches to the minute forms of vegetable life which swarm in Polar areas, affording food to the Ceteacæ and other marine animals, and which colour the surface of the ocean and its bottom likewise. Many of these forms are common to the Arctic and Antarctic seas, and have actually been far better studied in the latter than in the former sea. Of land plants the Lichens and Mosses require much further collection and study, and the Arctic marine flora is most imperfectly known. Ample collections of flowering plants should be made with a view of testing the variability of species and their distribution, and observations on the means of transport of land plants by winds, currents, ice, and migrating animals, are very much wanted.

*Zoology.*—With regard to the specific results in zoology which may be expected from the proposed expedition, they are numerous and important. It is now known that the Arctic Ocean teems with life, and that of the more minute organised beings the multitude of kinds is prodigious; these play a most important part, not only in the economy of organic nature, but in the formation of sedimentary deposits, which in future geological periods will become incorporated with these rock-formations, whose structure has only lately been explained by the joint labours of zoologists and geologists.

The kinds of these animals, the relations they bear to one another, and to the larger animals (such as whales, seals, &c., towards whose food they so largely contribute), the conditions under which they live, the depths they inhabit, their changes of form, &c., at different seasons of the year, and at different stages of their lives; and, lastly, their distribution according to geographical areas, warm and cold currents, &c., are all subjects of which very little is known.

With regard to the fish, mollusca, echinodermata, corals, sponges, &c., of the Arctic zones, those of Greenland alone have been explored with anything approaching to satisfactory results. A knowledge of their habits and habitats is most desiderated, as are good specimens for our museums. More important still would be anatomical and physiological investigations, and observations on those animals under their natural conditions.

With regard to the migrations of birds, Professor Newton, of Cambridge, has drawn attention to the interesting questions which will be solved by an examination of the unknown area.

The shores of the British Islands, and of many other countries in the northern hemisphere, are annually, for a longer or shorter period, frequented by a countless multitude of birds, which, there is every reason to believe, resort in summer to very high northern latitudes, for purposes the most important, and, since they continue the practice year after year, they must find the migration conducive to their advantage. There must be some water which is not always frozen; secondly, there must be some land on which they may set their feet; and thirdly, there must be plenty of food.