

Africa, Brazil and Chile, Ceylon, Sumatra, and New Zealand. I once heard a shantyman describing the camp he worked in as being in such an out of the way place in the woods, that even the chickadees had not discovered it. If this man's tastes had been entomological, he would certainly have found that he was not beyond the range of *A. armatus*. The genus *Isotoma*, however, holds the distributional record. It is not only known all over the globe from the shores of the Arctic Ocean to the remote islands of the Antarctic, but one of its species, *Isotoma klovtadi* Carpenter, shares the honour with another Collembolan, *Gomphiocephalus hodgsoni* Carpenter, of constituting the entire land fauna of the great Antarctic continent. Excluding as essentially pelagic the sea-birds that visit those desolate shores merely to nest, these two tiny and primitive insects are, so far as known, the only indigenous form of terrestrial animal life on Antarctica.

How these delicate, wingless insects have reached such widely separated stations is an interesting question. They are feeble and uncertain travellers, and their dispersal by their own efforts must be very slow. They have, of course, been transported to a certain extent by man along trade routes, but Dr. Folsom regards running water as the chief means of their spread over land areas, and some may be carried for limited distances by ocean currents along coasts and to outlying islands. But this does not explain how they have managed to cross vast ocean spaces and reach far distant and isolated archipelagoes in the Indian Ocean and the Pacific. Their presence in the nests of gulls and puffins on detached rocks on the coast of Ireland, as noticed by Carpenter, indicates the possibility of their transfer in some instances by birds. But the fact, also recorded by Carpenter, that they are plentiful on the ancient granite-formed islands of the Seychelles while nearly absent from the more recent coral islands of the same group, would suggest that their spread by birds must be both slow and limited in extent. It seems most probable that in some cases they have travelled to their present stations by land connections that have since disappeared. It is significant, too, that only the Arthropleona, the more primitive of the two sub-orders, have been found on the Seychelles and Hawaii. Apparently these islands were cut off from the rest of the world before the more specialized Symphypleona had been evolved. The Collembola are of an ancient race, and were old settlers in the world even in the inconceivably far-off days of those strange continents that geologists tell us existed where the oceans are now, and which they map out to the bewilderment of plain people who have been brought up on Mercator's Projection.

Heat and moisture, in some degree, are absolutely essential to all forms of life, vegetable or animal. The Collembola evidently regard moisture as a prime necessity, but many of them are not so particular about heat, and low temperatures affect them less than any other hexapod. This is shown by the habit of numerous species in coming out on the snow—a practice which has earned for them the popular name of "snow-fleas." Like most popular names, the designation is inaccurate, for the Collembola are not in any way related to the true fleas (Siphonaptera) and the species that come out on the snow occur in the summer also. But as the term is convenient to distinguish the insects in their snow-frequenting phase, its use persists.