

To remove from the mind as far as possible this natural feeling of discouragement, I shall endeavor in this chapter to prove that what seems most strikingly anomalous, in the "erratic formation," as some call it, is really the result of that glacial action which has already been alluded to. If so, it was to be expected that so long as the true origin of so singular a deposit remained undiscovered, erroneous theories and terms would be invented in the effort to solve the problem. These inventions would inevitably retard the reception of more correct views which a wider field of observation might afterwards suggest.

The term "diluvium" was for a time the popular name of the boulder formation, because it was referred by some to the deluge, while others retained the name as expressive of their opinion that a series of diluvial waves raised by hurricanes and storms, or by earthquakes, or by the sudden upheaval of land from the bed of the sea, had swept over the continents, carrying with them vast masses of mud and heavy stones, and forcing these stones over rocky surfaces so as to polish and imprint upon them long furrows and striae.

But no explanation was offered why such agency should have been developed more energetically in modern times than at former periods of the earth's history, or why it should be displayed in its fullest intensity in northern latitudes; for it is important to insist on the fact, that the boulder formation is a *northern* phenomenon. Even the southern extension of the drift, or the large erratics found in the Alps and the surrounding lands, especially their occurrence round the highest parts of the chain, offers such an exception to the general rule as confirms the glacial hypothesis; for it shows that the transportation of stony fragments to great distances, and the striation, polishing, and grooving of solid floors of rock, are here again intimately connected with accumulations of perennial snow and ice.

That there is some intimate connection between a cold or northern climate and the various geological appearances now commonly called glacial, cannot be doubted by any one who has compared the countries bordering the Baltic with those surrounding the Mediterranean. The smoothing and striation of rocks and erratics are traced from the seashore to the height of 3000 feet above the level of the Baltic, whereas such phenomena are wholly wanting in countries bordering the Mediterranean; and their absence is still more marked in the equatorial parts of Asia, Africa, and America; but when we cross the southern tropic, and reach Chili and Patagonia, we again encounter the boulder formation, between the latitude  $41^{\circ}$  S. and Cape Horn, with precisely the same characters which it assumes in Europe. The evidence as to climate derived from the organic remains of the drift is, as we have seen, in perfect harmony with the conclusions above alluded to, the former habits of the species of mollusca being accurately ascertainable, inasmuch as they belong to species still living, and known to have at present a wide range in northern seas.

But if we are correct in assuming that the northern hemisphere was