

might occur under conditions less exaggerated. Sir Charles, like all other thoughtful geologists, was well aware of the general fixity of the areas of the continents, though with great modifications in the matter of submergences and of land conditions. The union, indeed, of these two great principles of fixity and diversity of the continents lies at the foundation of theoretical geology.

We can now more precisely indicate this than was possible when Lyell produced his "Principles," and can reproduce the conditions of our continents in even the more ancient periods of their history. An example of this may be given from the American continent, which is more simple in its arrangements than the double continent of Eurasia. Take, for instance, the early Devonian or Erian period, in which the magnificent flora of that age, the earliest certainly known to us, made its appearance. Imagine the whole interior plain of North America submerged, so that the continent is reduced to two strips on the east and west, connected by a belt of Laurentian land on the north. In the great mediterranean sea thus produced, the tepid water of the equatorial current was circulated, and it swarmed with corals, of which we know no less than 150 species, and with other forms of life appropriate to warm seas. On the islands and coasts of this sea was introduced the Erian flora, appearing first in the north, and with that vitality and colonizing power of which, as Hooker has well shown, the Scandinavian flora is the best modern type, spreading itself to the south. A very similar distribution of land and water in the Cretaceous age gave a warm and equable climate in those portions of North America not submerged, and coincided with the appearance of the multitude of broad-leaved trees of modern types which appeared in the middle Cretaceous, and prepared the way for the mammalian life of the Eocene.

We have in America ancient periods of cold as well as of warmth. I have elsewhere referred to the boulder conglomer-