grow in it; and what is good for one is bad for another. Rocks favor certain plants; and, in some instances, differences in rocks adapt them to different species of Lichens and Mosses. As the composition of the air, earth, or water varies, the inhabitants differ, what is death to one being life to another.

The general principle that all living species must have food and just the food they need, or die, is one of the foundations for the differences in limitation under all the causes above mentioned. Geological changes that vary these conditions have therefore been a great means of determining distribution, by varying temperatures, climate, and land level; by varying soils and converting deserts into dry land, marshes, or seas by joining lands through change of level, so as to favor or compel migration; or sinking them, to the extermination of species. In addition, as Darwin has shown, the changes brought about in the associations of species, in these ways and through their mutual dependence as to food and all necessities, have been other ceaseless causes of variation in distribution. Those continental lands that are most isolated, like Australia and South America, have, for the reasons mentioned, and others, the largest number of peculiar species, and hence the most homogeneous population.

## BRIEF REVIEW OF DISTRIBUTIONAL FACTS OF GEOLOGICAL INTEREST.

### Terrestrial Species.

#### 1. *Plants.*

Plants of the land spread to all heights, even above the snow-limit. Among Cryptogams, Ferns and Lycopods flourish in all latitudes from the equator to the polar latitudes; but Tree Ferns, not beyond the parallel of 35°. Under the warm moist climates of tropical and warm-temperate latitudes, Ferns and Lycopods grow in greatest numbers and luxuriance. Palms have their limit in South America in latitude 36°, in North America and Australia in 35°, and in Asia in 34°; in Europe one species, *Chamærops humilis*, extends as far north as latitude 44°.

The Conifers range through all zones. The Yews, as Salisburia, live in warm-temperate latitudes. But the subdivision of Cycads is confined to tropical and warm-temperate latitudes. They occur in southern Asia, Japan, the East Indies, Madagascar, Australia, southern Africa, and tropical America, including Mexico and the West Indies.

#### 2. *Animals.*

*Australian characteristics.* — Australia, although near the East India Islands, is remarkable for the absence of all ordinary or placental Mammals except Bats of the genus Pteropus, Rats, and Mice. Instead, it has a large population of Marsupial Mammals, the diversified types of ordinary Mammals being represented under the Marsupial or pouched structure. Wallace, in allusion to the diversity among them, says (*Geogr.*, i. 391): "Some are carnivorous, some herbivorous; some arboreal, some terrestrial; there are insect-eaters, root-gnawers, fruit-eaters, honey-eaters, leaf or grass-feeders. Some are like wolves in habits, others like marmots, weasels, squirrels, flying-squirrels, dormice or jerboas. All are members of one stock, and have no real affinity with the Old-World forms, which they often outwardly resemble." Besides Marsupials, which are sometimes called semi-oviparous, there are the still inferior Monotremes, the Duck-bill and Echidna, both of which are strictly oviparous, although true Mammals inasmuch as they suckle their