

which the explorers had accumulated. He divided the earth, in relation to the distribution of mammals, into a series of circumpolar zones. Louis Agassiz followed Wagner on similar lines (1845-1854). Dana was led by his studies on the distribution of corals to lay great, indeed exaggerated, emphasis on the (isocrymal) lines of equal minimum temperature in winter. In 1853 Schmarda distinguished no fewer than thirty-one continental and ten oceanic regions, but these were for the most part artificial. So far, only climatic and topographical determinants had been recognized, and even these with little clearness.

That little was achieved by these earlier workers must be admitted. Ideas were lacking; only two of the operative factors had been recognized; and even the descriptive survey was very partial. Ortmann cites Semper's verdict as to the state of affairs shortly before the publication of the *Origin of Species*. "Our whole zoo-geography is indeed nothing more than a great mass of materials thrown together without thought."

In 1858, however, Dr. P. L. Sclater published a fundamental paper on the geographical distribution of birds; in the same year Dr. A. Günther dealt with reptiles; but of even greater importance was the work of Andrew Murray (*The Geographical Distribution of Mammals*, London, 1866), who sought in the past history of the earth for a clue to the present distribution. The same note was struck by Jaeger and Bessels in their study of the distribution of deer; while Huxley, Semper, and others began to show the importance of considering the present state of affairs in the light of what was known as to relationships, pedigrees, and original headquarters—thus introducing another new idea.

Prof. A. Agassiz's study of the distribution of the sea-urchins in four great realms may be noted as a very thorough piece of work in relation to a special group.

In 1876 Alfred Russel Wallace published his great work on the geographical distribution of animals, and gave a new dignity and stability to the whole inquiry. He did great service not merely by his systematic arrangement of an enormous mass of facts, but by