

ture. More special geological papers on the volcanoes of Japan have been published by Naumann in Germany, by Milne in England, and by Wada and other Japanese authors in the scientific literature of Japan.

Junghuhn's well-illustrated account of the Javanese volcanoes holds a distinguished place in the literature, and the pioneer work of investigation begun by German explorers was ably continued by the later communications of Emil Stöhr on the Idjen-Raun and the Tenggor volcanoes in East Java, and by R. D. M. Verbeek, on the volcanic outbursts which culminated in the fearful catastrophe of the Krakatoa eruption in 1884.

India, although unvisited by recent volcanic action, was the scene of colossal outpourings of volcanic matter during the Cretaceous epoch. The Geological Survey of India has already made known the leading characteristics of the Deccan basalts and tuffs which extend throughout a vast territory in the heart of India.

A classical district for volcanic research is the island of Hawaii with the two giant-cones Mauna-Loa and Mauna-Kea. These were described in 1840 by Professor Dana, and in 1884 a detailed monograph on the Hawaiian volcanoes was published by Clarence Edward Dutton. Charles Darwin's "Geological Observations on the Volcanic Islands visited during the voyage of H.M.S. Beagle" (1844) laid the foundation for a new field of volcanic research; and the geological results of the *Challenger* Expedition have contributed materially to the scientific knowledge of submarine eruptions.

The African continental volcanoes, notably the Kamerun in the west, the Kilimandjaro and Kenia in the east, and the Ruwenzori in the interior, are remarkable for their great size. They have been frequently ascended during the last decade, and the rocks have been partially investigated, but so far their investigation has not contributed much that is new in volcanic research. The extensive outpourings of volcanic material in Eastern Equatorial Africa are stated to have begun after the close of the Jurassic period.

North America possesses active volcanoes only in the extreme north-west, in Alaska and Washington territory. These have been described by the geologists of the United States; detailed information having already been given of all the important areas, Mount Elias in Alaska, Mount Rainier (Tacoma) and Mount Hood in the Cascade mountains, and