

## GENERAL NOTES

### A. S. PACKARD ON A FORMER CONNECTION BETWEEN BRAZIL AND AFRICA BASED UPON HIS STUDY OF LEPIDOPTERA

At the 8th International Geographical Congress held in 1904 at St. Louis, Missouri, Dr. A. S. Packard, Jr. (1839–1905) read a paper entitled "Evidence in favor of the former connection of Brazil and Africa and of an originally Antarctogaic land mass." Packard had been one of the founding curators of the Peabody Academy of Science at Salem, Massachusetts, and for a few years served as its director before going to Brown University as professor of zoology and geology. While at Salem he was also one of the founders of the *American Naturalist*, which he served for many years as the chief editor. He was primarily an entomologist specializing in the Lepidoptera, about which he published many articles and monographs. He also published on a wide variety of entomological and zoological topics, on glacial geology, and produced many textbooks on entomology and zoology. (See Remington, 1947, *Lepid. News*, 1(4):39; Dexter, 1956, *Amer. Nat.*, 90:209–225; 1957, *Bull. Brooklyn Entomol. Soc.*, 52:57–66, 101–112; 1981, *Bios*, 52(1):4–7.).

Packard's paper delivered at the Congress was published the following year (1905, *Rept. 8th Internat. Geograph. Cong.* (1904), 638–640). In this he stated that, based on his studies on the distribution of Lepidoptera, "we should not be too much influenced by the hypothesis or dictum of the permanency of the ocean basins" (p. 640). He offered, "a theory of a former land connection between Brazil and West Africa along or near the equator" (p. 638). From data he accumulated on South American and African species of Lepidoptera, he pointed out that "An extensive group of large African moths (Bunaeinae) are nearest allied to the Neogaic group Ceratocampidae; still stronger resemblances exist between a Chilean genus of another group, and an African subfamily (Urotinae). Another large and important family (Hemileucidae), now chiefly confined to South and Central America (Neogaea), has representatives in the Ethiopian realm. Within this group are several highly specialized genera which occur in tropical and southern Africa. There are in short, five groups of South American Syssphrigine moths alone which have representatives in Western or Southern Africa, the latter so highly specialized as to suggest their primitive origin from Neogaea. Several groups of butterflies also afford parallel facts" (p. 639).

To explain these inter-continental distributions Packard then hypothesized, "It thus appears that it would require an elevation of the ocean bottom of from about one to two miles between Brazil and Sierra Leone, Africa, to form a more or less continuous land connection between the two continents apparently sufficient to account for the spread or intermigrations in pre-Miocene times of plants and animals between what are now two widely separated areas" (p. 640).

Ortmann (1901, *Amer. Nat.*, 35:139–142) had reviewed in general the literature on the theory of land connections in the southern hemisphere, and was convinced that southern land masses had been connected in past geologic time. The following year (Ortmann, 1902, *Proc. Amer. Philos. Soc.*, 41:267–400) he amassed data to substantiate the theory, and added the results of his own research on freshwater crustaceans. Then Packard presented his evidence based on insect distribution and gave his explanation as we have seen above.

Eight years after Packard's paper was presented, Alfred L. Wegener (1880–1930) published (1912, *Geologische Rundschau*, 3(4):276–296) his now famous and generally accepted theory of Continental Drift. This work was expanded, and an English edition entitled "The origin of continents and oceans" was published in 1924 (Methuen, London, 212 pp.). Today biogeographers would favor Wegener's theory over that of Packard. However, it is interesting to note that Packard at an early date recognized a former connection between South America and Africa based upon the distribution of certain species of Lepidoptera.