direct ratio to the amount of rain and snowfall at Niigata and Akita, on the Japan sea coast. The curves for earthquake frequency in Japan show that these disturbances gradually increase in number over a period of years, and then undergo a corresponding decline, and in accordance with a recognized principle, destructive earthquakes are most likely to occur in a period of minimum earthquake frequency. Such minima occurred in 1883, 1893, and 1903, and very violent earthquakes took place in 1884 and 1894. These periods, it is noted, corresponded to a conspicuous freedom from rain and snowstorms in the north, while in the years of maximum earthquake frequency at Tokyo, i. e., with no violent shocks, the amount of rain and snow falling in the north was much above the average.

In the Journal of the College of Science, Tokyo Imperial University (vol. xli, Art. 5), Prof. Terada, in a paper devoted mainly to another topic (see *Nature*, vol. 105, pp. 599–600, July 8, 1920), describes the above correlation between earthquake frequency in some districts and precipitation in others as a case of parallelism rather than one of cause and effect; he prefers to attribute both phenomena to barometric changes rather than to associate the instability of the soil with percolation.—*E. W. W.*

ON THE PROPORTIONALITY BETWEEN EARTHQUAKE FREQUENCY AND RAINFALL.

By G. ZEIL.

[Abstract from Comptes Rendus, Paris Academy, t. 171, pp. 117-119, 12 July, 1920.]

Upon comparing a chart of the seismic belts of the globe with a chart of the distribution of rainfall, striking similarities are found. Regions of heaviest rainfall, such as Assam, east coast of Madagascar, Dalmatian coast, east coast of Mindanao, western Norway, etc., are also the most frequently and severely shaken by earthquakes. That this relation is due to sudden readjustments following the accumulation of stress caused by erosion and deposition is confirmed by the fact that the rainy Amazon Valley is almost free from earthquakes, because the heavy forest covering prevents denudation. The restoration of equilibrium in a lithospheric arch previously unloaded by erosion would give rise to what may be termed a centrifugal quake, and an upward movement of the arch; the restoration of equilibrium in a deep basin previously loaded by deposition would give rise to a centripetal quake, and a sinking of the basin; simultaneous restoration of equilibrium in two such regions adjacent to one another would cause an antagonistic quake. Actual tectonic quakes appear to conform to this classification (G. Zeil, "Les mouvements ascensionnels de l'écorce terrestré et les tremblements de terre tectoniques," *Bull. Soc. Géol. de France*).

Discussion.—The above may possibly be a factor in the explanation of the apparent connection between rainfall and earthquakes, but the abstractor desires to point out that the theory upon which G. Zeil bases his views of geodynamics seems to be, as expounded in a series of papers (*Comptes Rendus*, 169, 1406–1408, 1919; 170, 397–399, 597–600, 1920), a somewhat superficial combination of generally recognized geologic facts into a theory which can be attacked at several points. Although rejecting the doctrine of isostasy, Zeil presents views which practically amount to an acceptance of it. The whole ground covered by him has previously been subjected to a truly profound analysis by Chamberlin, Barrell, and others (see, e. g., Barrell, "Strength of the Earth's Crust," *Jour. Geol.*, vols. 22–23; Chamberlin, "Diastrophism and the Formative Processes," *Jour. Geol.*, vols. 21–22; and other recent writers on geodynamics.)—*E. W. Woolard.*

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RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

C. FITZHUGH TALMAN, Professor in Charge of Library.

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

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