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THE RELATION OF SEISMIC DISTURBANCES IN THE PHILIPPINES TO THE GEOLOGIC STRUCTURE.[1]

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In the light of studies of the last ten years, stimulated by the tremendous cataclysms of Messina and San Francisco, entirely new principles have been introduced into the study of seismic disturbances of the crust of the earth. The old centrum theory of Mallet is generally discredited.

Beyond a doubt, many seismic disturbances are due to causes other than vulcanism. Many of the worst disasters we have experienced have nothing to do with volcanoes; and that volcanoes are near by is only a coincidence, or may be explained by the fact that the place where great disturbances in the earth's crust take place is naturally a zone of weakness and where molten material would be expected to seek an outlet. At the time of the Messina earthquakes, Mt. Etna, which can be seen from Messina, was comparatively quiet. The great disturbances at Messina, as is generally known, were due to an adjustment along the line of a great fault in the earth's crust, which is marked by the Straits of Messina.

The work of the Italian Geological Survey has demonstrated that these disturbances are propagated along very definite lines. So thoroughly did the Italian geologists do their work that by superimposing upon a geologic and topographic map of the province of Calabria another map showing the location of cities and all the works of man, with all historical data regarding earthquakes, one can see at once that: (1) certain points are more subject to earthquakes than others; (2) points removed from these lines have suffered less or not at all; (3) at intersections of these lines the greatest disasters oc-

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