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THE LIVING GLOBE*

By Professor BAILEY WILLIS

STANFORD UNIVERSITY, CALIFORNIA

Dynamics is the soul of the problem.

—T. C. Chamberlin.

DURING the nineteenth century, geology, dependent on physics, knew but one ultimate terrestrial force—gravity. Gravity, the conservator of established relations, was the cause of all disturbances in any effort to restore any dis-established relations. He held continents and ocean basins in balance, in spite of erosion and sediment; he raised mountain chains by contracting the earth and wrinkling the crust; he pulled the globe constantly toward the center and transformed the energy of in-fall into heat; and since the heat escaped he thus cooled the earth, pointing to a dark and chilly future. Similarly, he was the source of all heat in the sun, and the life-giving energy of that luminary was definitely limited. There was enough

truth in these ideas to command credence, and yet they so narrowed the possibilities of pre-historic geology and cosmogony, not to mention the denial of future opportunity, that they were found wholly inadequate. When Chamberlin challenged Lord Kelvin's estimate of twenty to forty million years as the probable past of the earth he argued for the strength of geologic evidence as opposed to the weakness of imperfect, incomplete knowledge of natural forces.¹

The discovery of radioactivity and of the general occurrence of radioactive minerals throughout the accessible rocks, though in very minute quantities, opened new possibilities to geologic theory. Here was a source of atomic energy, quite independent of gravity and abundantly able to supply heat for indefinite periods of time. Geologists were slow, however, to avail themselves of this potent energy. Chamberlin in 1911 welcomed the opportunity thus afforded for

* Address of the retiring president of the Pacific Division of the American Association for the Advancement of Science, Los Angeles, California, June 25, 1935.

¹ T. C. Chamberlin, SCIENCE, n. s., Vols. 9 and 10, 1899.



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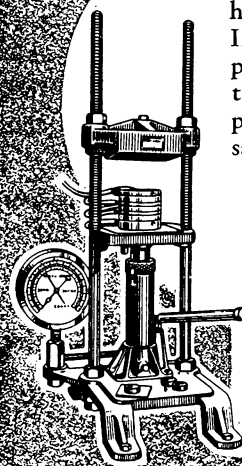
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