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## AMERICAN MATHEMATICS DURING THREE QUARTERS OF A CENTURY<sup>1</sup>

SINCE the time of the discovery of America and the middle of the nineteenth century, Europe as a whole had had Euler and Lagrange; England had had Wallis and Newton; France had had Descartes, Fermat, Pascal, Monge and Galois; Italy had had Galileo and Ruffini; Switzerland had had the famous family of Bernoullis; Germany had had Leibnitz and Lambert; Norway had had Abel; but America had had no one who could reasonably be classed with these men as regards mathematical contributions. Nathaniel Bowditch, 1773-1838, is probably most worthy of consideration in this connection, but he fails to measure up to such high standards.

When the first meeting of the American Association for the Advancement of Science was held in 1848, various mathematicians of Europe who were then living had already made contributions which unquestionably outranked the best mathematical contributions that had been made in America up to that time. In support of this we need only remind ourselves of the discoveries relating to the convergence of Taylor's series and the founding of group theory by A. L. Cauchy, the fundamental contributions to number theory and to several other fields by C. F. Gauss, the interpretation of ordinary complex numbers by couples of real numbers and the discovery of quaternions by W. R. Hamilton, the Ausdehnungslehre of H. Grassmann, the projective methods of generating geometric figures due to J. Steiner, etc.

During the year of the first meeting of this association there occurred the death of a very original Bohemian mathematical philosopher whose work failed to receive sufficient recognition until quite recently, viz., B. Bolzano, who had an Italian father and was professor of the philosophy of religion in the University of Prague. It has recently been announced that Bolzano gave the first known example of a continuous function which has no derivative at any of its points, and that as early as 1830 he had developed a method for constructing continuous functions having no derivatives. This is of great historic interest in view of the fact that the later work of Weierstrass and others along the same line attracted unusual attention

<sup>1</sup> Address of vice-president and chairman of Section A—Mathematics—American Association for the Advancement of Science. Cincinnati, Ohio, December, 1923.

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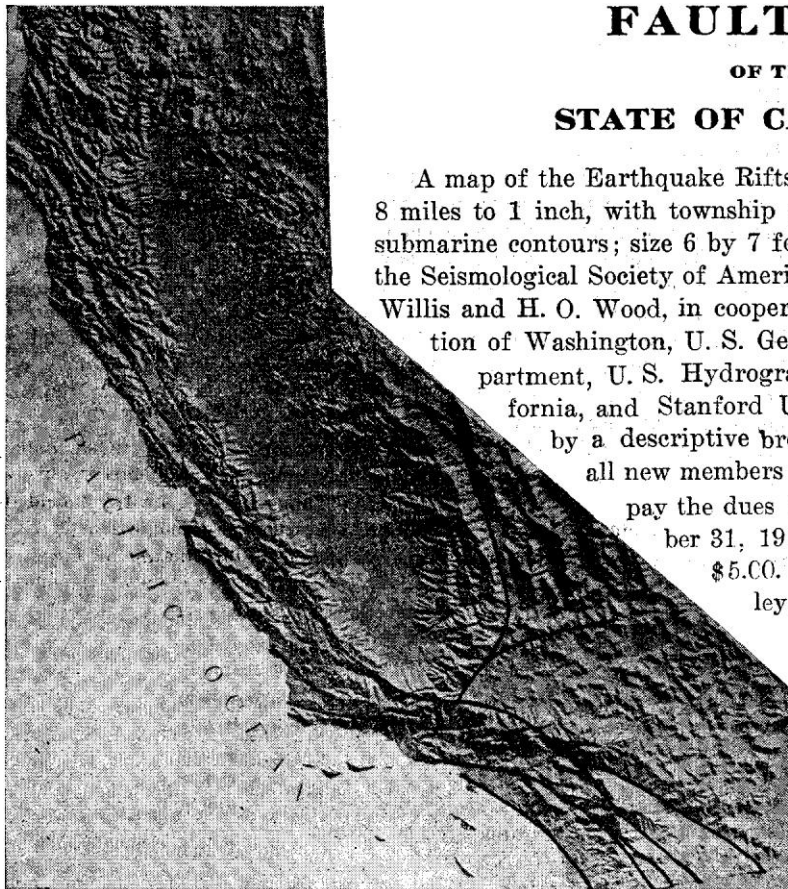
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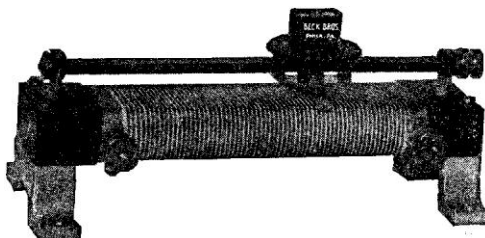
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