

SCIENCE

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FRIDAY, JUNE 30, 1899.

LORD KELVIN'S ADDRESS ON THE AGE OF
THE EARTH AS AN ABODE FITTED
FOR LIFE.*

I.

CONTENTS:

<i>Lord Kelvin's Address on the Age of the Earth as an Abode fitted for Life (I):</i> PROFESSOR T. C. CHAMBERLIN.....	889
<i>Perspective Illusions from the Use of Myopic Glasses:</i> DR. ROBERT MACDOUGALL.....	901
<i>Birds as Weed Destroyers:</i> DR. SYLVESTER D. JUDD.....	905
<i>The Biology of the Great Lakes:</i> PROFESSOR JACOB REIGHARD.....	906
<i>The International Catalogue of Scientific Literature:—</i>	
<i>Geology and Geography:</i> PROFESSOR N. S. SHALER.....	907
<i>Physiology:</i> PROFESSOR JACQUES LOEB.....	908
<i>Scientific Books:—</i>	
<i>James's Talks to Teachers on Psychology:</i> PROFESSOR CHARLES DEGARMO. <i>Wetterprognosen und Wetterberichte des XV. und XVI. Jahrhunderts:</i> DR. A. L. ROTCH. <i>Books Received</i>	909
<i>Scientific Journals and Articles</i>	911
<i>Societies and Academies:—</i>	
<i>The New York Academy of Sciences—Section of Biology:</i> PROFESSOR FRANCIS E. LLOYD.	
<i>The New York Section of the American Chemical Society:</i> DR. DURAND WOODMAN. <i>The Washington Botanical Club:</i> DR. CHARLES LOUIS POLLARD.....	912
<i>Professor Dewar on Liquid Hydrogen</i>	914
<i>Automatic Ship-Propulsion:</i> R. H. T.....	915
<i>Remeasurement of the Arc of Peru</i>	916
<i>Leland Stanford Jr. University</i>	916
<i>Scientific Notes and News</i>	917
<i>University and Educational News</i>	919

IN the early half of the century, when the more sober modes of interpreting geological data were struggling to displace the cataclysmic extravagances of more primitive times, it is not strange that there should have arisen, as a natural outgrowth of the contest, an ultra-uniformitarianism which demanded for the evolution of the earth an immeasurable lapse of time. It is not remarkable that individual geologists here and there, reacting impatiently against the restraints of stunted time-limits imposed on traditional grounds, should have inconsiderately cast aside all time limitations. It was not unnatural that the earlier uniformitarians, not yet fully emancipated from inherited impressions regarding the endurance of rocks and the immutability of the 'everlasting hills,' should have entertained extreme notions of the slowness of geological processes and have sought compensation in excessive postulates of time. Natural as these reactions from primitive restrictions were, a reaction from them in turn was inevitable. This reaction must have ensued, in the nature of the case, whenever geologists came seriously to consider those special phenomena which point to

MSS. intended for publication and books, etc., intended for review should be sent to the responsible editor, Professor J. McKeen Cattell, Garrison-on-Hudson N. Y.

*This JOURNAL, May 12, pp. 665-674, and May 19, pp. 704-711.

the predictions in the almanacs, which were first printed in Latin and afterwards in the language of the country where they appeared. Such an almanac, the *Bauern-Kalender*, or peasants' calendar, having symbols to represent the predicted weather, is still published in the Austrian Tyrol. The custom of writing accounts of extraordinary meteorological events is very old, and, after the invention of printing, these reports, in pamphlet form or on single sheets, were widely distributed throughout Europe. As they were intended for the people, few have been preserved in libraries, but some of these are here reproduced.

The volume contains 33 pages of historical and critical introduction and 26 *facsimiles* of German, French, English, Italian, Spanish, Danish and Dutch tracts, most of them curiously illustrated. Probably to no other person than Dr. Hellmann would so many rare works in all parts of Europe be accessible, and his scholarly preface greatly aids the comprehension of these interesting specimens of ancient weather lore. One or two copies of the volume may be obtained for the publisher's price, viz., 20 Marks, or \$5, from the undersigned, at Hyde Park, Mass.

A. L. ROTCH.

BOOKS RECEIVED.

Proceedings of the Fourth International Congress of Zoology, Cambridge, 22-27 August, 1898. London, C. J. Clay & Sons. 1899. Pp. xiv + 422 and 15 plates. 15s. net.

Cinématique et mécanismes potentiel et mécanique des fluides. H. POINCARÉ. Paris, Carré et C. Naud. 1896. Pp. 385.

Alaska and the Klondike. ANGELO HEILPRIN. New York, D. Appleton & Co. 1899. Pp. x + 312.

Leitfaden der Kartenentwurfslehre. KARL ZÖPPRITZ. Leipzig, Teubner. 1899. Pp. x + 178. Mark 4.80.

Der Gang des Menschen. II part. OTTO FISCHER. Leipzig, Teubner. Pp. 130 and 12 plates. Mark 8.

Elektrische Untersuchungen. W. G. HANKEL. Abhandlung der mathematisch-physischen Classe der königlichen sächsischen Gesellschaft der Wissenschaften. Leipzig, Teubner. 1899. Vol. 24. Pp. 471-97 and 2 plates. Mark 2.

Practical Physiology. DR. BURGH BIRCH. Philadelphia, Blakiston's Son & Co. 1899. Pp. x + 273. \$1.75.

The Steam Engine and Gas and Oil Engines. JOHN PERRY. New York and London, The Macmillan Company. 1899. Pp. viii + 646.

Geological Results, based on Material from New Britain, New Guinea, Loyalty Islands and elsewhere, collected during the years 1895-7. Cambridge, The University Press. 1899. Pp. 356 and 5 plates.

SCIENTIFIC JOURNALS AND ARTICLES.

The Journal of Geology, April-May, 1899.—H. F. Reid, 'The Variations of Glaciers,' pp. 217-225. Professor Reid presents the fourth of his summaries of observations on the advance and retreat of glaciers in different parts of the world. While recession is the rule, there are some instances of advance, and some evidence has been gathered of recurrent cycles of maxima and minima. In the case of two Swiss glaciers the periods proved, respectively, 44 and 51 years.

G. C. Curtis and J. B. Woodworth, Nantucket, 'A Morainal Island,' pp. 226-236. The former author describes a recently constructed model of Nantucket, and the latter its geology.

Mark S. W. Jefferson, 'Beach Cusps,' pp. 237-246. The small cusps along beaches are explained by the action of retreating high waves, whose waters breach the strip of seaweed that is usually present just above the line of ordinary waves, and that binds the shingle together. Between the breaches the cusps gather at intervals of ten to forty feet.

Walter D. Wilcox, 'A Certain Type of Lake Formation in the Canadian Rockies,' pp. 247-260. Interesting data are given regarding the glacial phenomena of the Canadian Rockies, and particularly regarding Lake Louise. A means of estimating the time since the retreat of the great ice sheet is suggested, but for lack of the necessary apparatus it has not been carried out.

J. P. Goode, 'The Piracy of the Yellowstone,' pp. 261-271. Recent changes in the drainage of Yellowstone Lake are described and explained. The Yellowstone River, as at present known, appears to be of development in late geological time.

C. E. Monroe and E. E. Teller, 'The Fauna of the Devonian at Milwaukee, Wis.,' pp. 272-