SCIENCE

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

*THE REVIVAL OF INORGANIC CHEMISTRY.**

NOTHING can be more instructive to the student interested in the results of intellectual cross-fertilization than the effect of the recent fecundation of chemistry by physics. Through the application of physical methods and ideas to chemistry, the latter has given birth to a new branch of study, physical chemistry, which promises to produce as radical a change in our conceptions of molecular phenomena as did the overthrow of the phlogiston theory or the introduction of the conception of valency at a later period.

The attempt of Berthollet to introduce dynamical conceptions into chemistry, at the beginning of the century, fell on thorny ground, and from that day until very recent years the growth of chemistry, great as it has been, has been most remarkably one-sided. The Periodic Law has been discovered, many new elements have been found, new compounds without number have been prepared, the rules governing their formations and transformations have been ascertained, and even their microscopic anatomy has been studied to such an extent that for countless of them we have established formulas which express, schematically, the relative arrangement of the atoms in the molecule. In stereochemistry we have even gone so far as to be able to

*Annual address of the President of the Chemical Society of Washington, delivered March 30, 1899.

schüssiger Kräfte und das der activen Erholung erschöpfter Kräfte." The æsthetic social point of view is enlarged on throughout much in the same way as in his previous work.

In general the remarks we have made on Professor Groos's previous work (*Psychological Review*, Vol. 6, p. 86 ff.) apply also to this. The last book is larger, fuller and more cautions, but it lacks in clearness and directness and penetration. Though sometimes suggestive, it is rarely illuminating. Very comprehensive and learned, it is useful as a summary and discussion, but it has not the vitality of real research. The book is swamped in quotation, and we have more a history and discussion of opinion than a first-hand investigation. Though by bringing in everything of the least relevancy Professor Groos attains a certain completeness, it is greatly to be doubted whether in breaking ground in a new subject this is the most useful method. The foundations for a real science of play can only be laid by the direct detailed study of the life-history of the individual, the results being made to an extent verifiable by the photograph and phonograph.

HIRAM M. STANLEY.

BOOKS RECEIVED.

The Elements of Practical Astronomy. W. W. CAMPBELL. New York and London, The Macmillan Company. 1899. Pp. xii + 264. $2.00.

Nature Study for Grammar Grades. WILBUR S. JACKMAN. New York and London, The Macmillan Company. 1899. Pp. 407. $1.00.

The Fairyland of Science. ARABELLA B. BUCKLEY. New York, D. Appleton & Co. 1899. Pp. x + 252. $1.50.

Electricity in Town and Country Houses. PERCY E. SCRUTTON. Westminster, Archibald Constable & Co. 1899. 2d Edition. Pp. xii + 148.

Report of the Commissioner of the United States Commission of Fish and Fisheries. Pp. clxxv + 350.

Corn Plants. F. L. SARGENT. Boston and New York, Houghton, Mifflin & Co. 1899. Pp. 106. 75 cts.

Anglo-American Pottery. E. A. BARBER. Indianapolis., Ind., Press of the Clay Worker. 1899. Pp. xix + 161.

Photographic Optics. R. S. COLE. New York, D. Van Nostrand Company. 1899. Pp. 330.

SCIENTIFIC JOURNALS AND ARTICLES.

The Botanical Gazette for April contains the following leading articles: 'A Conspectus of the Genus *Lilium*,' by F. A. Waugh, which brings together and organizes the widely scattered material; 'Some Appliances for Elementary Study of Plant Physiology,' by W. F. Ganong, in which are described, with figures, a temperature stage, a clinostat, a self-recording auxanometer, an osmometer, a respiration apparatus, a germination box, a transpiration device, the graduation of roots, tubes, etc., and a root-pressure gauge; 'Oogenesis in *Pinus Laricio*,' by Charles J. Chamberlain, a paper with plates, in which the following results are announced: The ventral canal cell occasionally develops as an egg; the chromatin of the egg nucleus takes the form of nucleoli which finally collect from all parts of the nucleus to a definite area near the center and there develop into a typical spirem; the chromatin of the two sexual nuclei is in the spirem stage at fusion; the fate of the spindle indicates that the kinoplasmic fibers arise through a transformation of the cytoplasmic reticulum; a continuation of 'The Ecological Relations of the Vegetation of the Sand Dunes of Lake Michigan,' by Henry C. Cowles, the present part, profusely illustrated, discussing the encroachment on preexisting plant societies and the capture of the dune-complex by vegetation. Under 'Briefer Articles' Julia W. Snow describes (with plate) the life history of a new Ulvella (*U. Americana*), and Bradley M. Davis discusses recent work on the life history of the Rhodophyceæ. The number closes with the usual reviews, notes for students and news.

American Chemical Journal, April, 1899. 'On the Hydrolysis of Acid Amides:' By I. Remsen and E. E. Reid. The rate of hydrolysis of a large number of acid amides was compared and certain groups or positions of groups were found to exercise a marked influence on the reaction. In general the results agree with those obtained in the study of the rate of formation of ethereal salts. Ortho groups were found to exert a very marked 'protective' influence in many cases. 'Aliphatic Sulphonic Acids:' By E. P. Kohler. The author describes the preparation and reaction of (1) brome-