others, in developing this region along the lines of classification marked out by the Conference of 1889, are too well known to require specific attention. That basin portion of the continent is disclosing in striking characters and in magnificent array the successive and continuous steps of progress through the great time gap between the Archean complex and the fully developed faunal conditions of the early Combrian, in which gap, it is believed, lies one-half the geologic history of the globe. The Algonkian seems to be a fact, and a large one too, in North American geology; yet this period is not mentioned save in a single footnote (p. 296). In the four and one-half pages devoted to the Archean, ten lines are given to the rocks of the period, of which 'there is nothing very characteristic, * * * * * except their extreme and universal metamorphism.' The word Huronian does not occur in these pages.

Perhaps a word of caution should be spoken against the impression given by Figs. 264 and 265, that iron ore is interstratified with its associated rocks and hence may reach through to the bottom of the earth's crust. Investigations show that iron ore of the Lake Superior type does not occur as interstratified formations and does not appear to any workable extent in the Archean of North America, as the term Archean is understood among working geologists. In giving 34 per cent. of his Archean space to evidences of life the author says of the leading type that its 'organic origin is not now generally admitted.'

To the writer it would seem that had fewer pages been devoted to geysers and earthquakes, topics of no great geologic significance so far as past researches reveal, and more been given to the subjects enumerated above, geologic science would have been aided in its appeal to the instincts of American students of geology.

3. Finally, from a pedagogical standpoint, this book is to be judged because the author calls it a text-book for colleges. From this standpoint it chief defect lies in the multiplicity of theories advanced and discussed. A text-book should be the exponent of a doctrine. It should be constructed on the definite and positive plan best adapted, in the mind of the author, to expound his body of principles. When several theories are presented and the student practically told to take his choice (p. 100 et seq.), or when he is told that all are true (p. 65), the function of the text-book disappears. The book in so far becomes a compilation of opinions. So far as the development of geologic science goes, the reader is in the dark as to what to believe, unless he assumes that the chronological order of the opinions expressed represents such development. Geology is a science; it has passed the stage of assumption. While much remains to be discovered, worked out and established in geology, still the body of facts and well-understood phenomena now clustering around the subject is sufficient to fill a book. By the presentation of these facts and phenomena the student who leans upon a text-book subjects himself to the inspiration of positive ideas and, in his intellectual processes, acquires that habit of decision so essential to practical success.

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## SCIENTIFIC LITERATURE.

*Die Morphologie und Physiologie des Pflanzlichen Zellkernes, eine kritische Litteratur.* Studie von PROF. DR. A. ZIMMERMANN. Jena, Verlag von G. Fischer. 1896. Pp. viii + 133.

This collection of literature and critical review of the numerous scattered investigations and comparatively few extended studies which have been made upon the nucleus in plant cells is very welcome to all plant cytologists. It is indeed, an excellent and well prepared summary, and avoids the errors of classification, which to some extent impaired the usefulness of the 'Botanisches Mikrotechnik' by the same author.

The work is divided into a general part and a special part. In the former, under the following chapter heads, research methods, nomenclature and general considerations, chemical structure, morphological differentiation of the resting nucleus, nuclear division, nuclear fusion and nuclear physiology, the various observations of a large number of investigators are collected. In this part the two most interesting and useful chapters are those on karyokinesis, in which Zimmermann's views upon

the nucleolus and upon the mechanics of the process are succinctly stated again, but with due regard to his critics, and on the physiology of the nucleus in which the somewhat divergent views upon nuclear function are balanced, and much useful information brought together regarding the influence upon the nucleus of such environmental forces as gravity, light, electricity, mechanical pressure, heat, etc. In discussing the mechanics of karyokinesis, Zimmermann uses considerable illustrative material from the field of zoocytology, but, while quoting the interesting results of Henneguy, does not seem to have known the opposite view supported by Watasi from his studies of cephalopods. Nor is his account of the center zone in plants altogether abreast of present knowledge, while the discussion of fragmentation is itself rather too fragmentary.

The second part of the work, the special part, takes up in detail researches upon the nuclei in Angiosperms, Gymnosperms, Pterodophytes, Bryophytes, Fungi, Algæ and Schizophyta. Here a large amount of special literature is indexed, and on the whole this is the most useful part of the volume. Several of the recent papers of American investigators receive proper consideration, which is a gratifying departure from the methods of too many of the European writers.

A bibliography including nearly six hundred titles and two indices, one a 'Sachregister' and the other to the names of plants, complete the volume.

In the light of modern study and his own added experience in book-making, it would be very helpful if Dr. Zimmermann could find time to revise and rewrite his older work on the plant cell. Certainly this paper is of the greatest value, but needs a better handling than was given it in the Schenk's *Handbuch*.

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*The Myths of the New World:* By Daniel G. Brinton, A.M., M.D., LL.D., D.Sc., Professor of American Archæology and Linguistics in the University of Pennsylvania. Third Edition revised. David McKay, Philadelphia. 1896.

The appearance, in 1868, of Dr. D. G. Brinton's 'Treatise on the Symbolism and Mythology of the Red Race of America' marked an epoch in the study of the 'Myths of the New World.' Although prior to this date able scholars had made valuable researches among various groups of American aboriginees, in this volume the first attempt was made to mass this scattered information, and to present in a clear and concise form whatever contribution might be offered by the natives of this western continent, in answer to the general inquiry as to 'man's earliest ideas of a soul and a God, and of his own origin and destiny.'

In the recent rapid growth of our knowledge of the red race, it is not easy to appreciate the difficulties encountered thirty years ago, and the courage requisite to accomplish the task undertaken by the author. A new claim was set up by him for the natives of America, a claim which was no less than the right to be heard in the general discussion of the upbuilding of the intellectual life of the human family. The issue of a revised third edition of 'The Myths of the New World,' in which much of the text has been rewritten, and some fifty pages of new material added, brings forward the arguments offered in 1868, reinforced with additional evidence gathered from the recent work of students who have opened new fields of research or gleaned in those already known.

The title might imply to those unfamiliar with former editions that the volume contained a collection of myths, whereas myths are only referred to by the author as he seeks to trace the intellectual history and to ascertain the 'laws of religious growth of the red race.' For this purpose he treats the race as a "unit, regarding its religion as the development of ideas common to all its members, and its myths as the garb thrown around these ideas by imaginations more or less fertile, but seeking everywhere to embody the same notions."

The author attacks his theme with directness and force, accepting at the opening of his first chapter the unity of the human family, and granting that the aim of man is to find out God, the cause of all. Natural religions are therefore 'the effort of the reason struggling to define the infinite.' Concerning the birth of re-