Bryopsis and *Botrydium*, where it is very commonly placed and put into the heterogeneous assemblage of the Protococcaeæ. We also notice that the animal-like *Ceratium*- and *Noctiluca*-forms find a place near them although of very doubtful affinities.

The Diatoms are placed by themselves as they well deserve to be, and even their superficial resemblance to the Desmids can hardly save them from the suspicion that their affinities are with organisms other than the undoubted seaweeds.

The Red Seaweeds are without question the most difficult and complicated group, not only in vegetative structure, but even more so in the details of the sexual reproduction. Mr. Murray's chapter was evidently written before Wille's paper announcing the discovery of the fusion of the two sexual nuclei had been published.

Schmitz's classification, based upon the variation in the development of the carpospores after the fertilization of the 'carpogonium,' has been followed, and this part will make accessible to the student an excellent account of Schmitz's system in a very convenient form.

The account of the Blue-green Seaweeds occupies the closing chapter of the book, and this is perhaps the least satisfactory part. The very interesting matter of the cell structure is very slightly touched upon, and the relationships between this group and other groups of organisms is barely hinted at. Considering the lack of general information about this group, even the comparative morphology might have received more attention.

It is pleasant to see that the author has not followed, in this book, the terminology of Bennet and Murray's Cryptogamic Botany, but has used such words as antheridia, carpogonium, sporangium, and the like. The whole make-up of the book is very pleasing, the illustrations in the text are well selected and excellently reproduced, and the colored plates, interesting and valuable to the beginner for whom the book is intended, while lacking absolute accuracy of tint, are perhaps as good as the very low price at which the volume is sold would allow.

W. A. Setchell.

University of California.

Korean Games, With Notes on the Corresponding Games of China and Japan. By Stewart Culin, Director of the Museum of Archæology, University of Pennsylvania. Philadelphia. 1895. 1 vol. Large 4to. Pp. 177.

This handsome volume is a monograph of rare merit on a branch the importance of which is but imperfectly appreciated even by some of our most advanced ethnologists.

The subject of games, especially the games of children, has been generally regarded as beneath the dignity of real scientific treatment. They have been indulgently regarded as trivial pastimes, or, at best, as amusements only.

A quite different presentment of their significance is advanced in the work before us. The author, drawing most of his information from fresh and unpublished sources, describes ninety-seven games played by the youth of Korea, or by those of older years who retain the love of festal occupations. Some of them sound quite familiar, such as cards, chess, dominoes, dice, backgammon and blind man's buff; others have titles which seem remote from our experience as 'five gateways,' 'clam-shell combat,' 'water kicking' and 'corpse searching!' When, however, we come to examine even these, we recognize in most of them traits of familiar friends.

The methods of playing are explained, the terms employed are given in the Korean and often in the Chinese and Japanese tongues as well, and the position and costumes of the players and their utensils are depicted in twenty-two full-page colored plates by native artists and in 135 text illustrations, many of these also from native sources.

This is the basis of the study, and along with four elaborate indexes, one general and three of names in the languages referred to, make up the bulk of the volume. But the portion which will deservedly attract the thoughtful student beyond this is the Introduction, covering twenty pages, in which the author sets forth with singular lucidity the position which games should hold in ethnologic investigation. This is full of novel and original suggestions, the results not merely of the present monograph, but of years of study of the games of the world.

He claims, and one must concede with the strongest evidence in his support, that games

were originally not festal, but divinatory. Our ordinary checker board represents in its origin the conception of the universe common to nearly all tribes in a primitive condition. The numbers of our cards can be traced back to certain numerical categories and relations which profoundly affected the personal and social life of early tribes and peoples. The diversions of children are survivals of divinatory rites on which depended at one time the actions of mighty states. The magical implement which beyond any other was popular in early divination was the arrow; and the author, in a masterly manner and with rare insight, traces its later development under many transformations down to our cards of the present day. He shows that such evolution was not a transfer from one nation to another, but independent, though closely parallel, in Asia and America; and thus adds one more proof of the universal oneness of human intelligence. This volume will certainly mark an epoch in the proper understanding of what games are in the domain of anthropologic science. D. G. BRINTON.

SCIENTIFIC JOURNALS.

THE AMERICAN JOURNAL OF SCIENCE, DECEMBER.

THE number opens with an article by B. O. Peirce and R. W. Willson on the temperature variation of the thermal conductivities of marble and slate. This is an advance publication of the methods and results of an investigation carried on under the auspices of the Rumford Committee of the American Academy of Arts and Sciences. The important result is arrived at that, in the case of the slabs of marble experimented upon, the conductivity remains sensibly constant throughout the whole range of temperature employed, say from about 40° to above 300°. In the case of slate there was found an apparent increase of conductivity of about 30 per cent. between 70° and 300°. E. Cutter describes a practical method of obtaining the keynote of an auditorium. The stratigraphy of the Kansas coal measures is discussed at length by E. Haworth; the article is illustrated by a map of the eastern part of the State and two vertical sections, one a detailed section of the diamond drill core obtained from the Topeka well, and the other a general section of the coal measures. E. H. Mudge discusses the post-glacial submergence in its relation to central Michigan. W. H. Weed and L. V. Pirsson describe certain igneous rocks of Yogo Peak in the Little Belt Mountains, Montana. They show that Yogo Peak is composed of a core or stock of massive, granular, igneous rock, and that this rock is composed chiefly of augite and orthoclase. The mass shows a progressive differentiation along its east and west axis, with a continual increase in the ferro-magnesian elements over the feldspathic ones. The resultant rock types are classified into three groups: syenite, where feldspar exceeds augite; *yogoite*, where they are practically equal, and *shonkinite*, where the augite dominates, the latter being similar to a rock type previously described.

S. L. Penfield gives directions in regard to the practical use of Retgers liquid to separate minerals of high specific gravity. This liquid consists of a mixture of silver and thallium nitrates fusing at 75° C. and having a specific gravity above 4.5. W. M. Foote gives a preliminary account of a new mineral named *northupite*; this is a chloro-carbonate of sodium and magnesium, and occurs in isometric octahedrons at Borax Lake, California. O. C. Marsh discusses at length the 'Affinities and Classification of the Dinosaurian Reptiles.' This article is accompanied by a large plate giving figures (restorations) of twelve typical dinosaurs, eight American and four foreign species. J. B. Woodworth describes some reptilian foot prints in the sandstone of Avondale, New Jersey. A brief communication by Alexander Agassiz, among the notes and abstracts which close the number, gives some preliminary results of observations of temperature made at great depths in one of the Lake Superior copper mines. The deepest point at which the temperature was taken was 4,580 feet and the temperature was only 79° F. Taking a depth of 105 feet as that unaffected by local temperatures, a column of 4,475 feet of rock is obtained with a difference of temperature of only 20°, or an average increase at the remarkably low rate of 1° F. for 223.7 feet of descent. The usual rate is about 1° F. to fifty feet.