depth of 100 fathoms, is mainly to inform the general reader what oceanographic research consists of, how it is carried on, and, in general, what has been accomplished; but it will also be found useful in the hands of the observer of oceanographic data and of the student of oceanographic problems.

An important feature of the book is the biblographic list at the end.

As the operations referred to are in the main those which are carried on in the waters of lesser depth bordering the oceans, a less general title would have been more appropriate.

No inadvertence in the revision of the proofs has been detected except the manifest confusion between t and t′ and f and f′ in the explanation of the hygrometric formulæ on page 110.

G. W. LITTLEHALES.

SCIENTIFIC JOURNALS.

JOURNAL OF GEOLOGY, DECEMBER–JANUARY.

Review of the Geological Literature of the South African Republic: By S. F. EMMONS. The great and rapid development of gold mining in the Transvaal has attracted the attention of the world to this region, not otherwise of immediate interest. This article sums up the literature concerning the gold fields. The most important of these is the Witwatersrand, usually called 'the Rand,' in which Johannesburg is situated. This is in the southern part of the Republic. It is about 2,000 square miles in extent. The rocks are auriferous conglomerates of which there are several beds. On the whole the gold is distributed rather uniformly in these beds. They are crossed by basic dikes as well as quartz veins, and at the intersection of the latter the quartz is said to be peculiarly rich. As to the origin, the author quotes Smeisser as saying that the evidence points to the fact of deposit with the conglomerate 'fossil placer deposits' and also to deposit from solution subsequently. Working has progressed to a depth of nine hundred feet, but drill holes show that workable beds extend much deeper. The average gold content of this region is ten to fifteen dollars per ton. The output for 1894 was £7,800,000; that of 1895 is estimated at £8,750,000. Hatch estimates the whole product of the Transvaal at £700,000,000, a sum greater than the whole product of the United States up to date.

Igneous Intrusions in the neighborhood of the Black Hills of Dakota: By I. C. RUSSELL. This is a description of a series of hills on the northern border of the Black Hills which appear to be of a type not clearly recognized heretofore. All are due to the intrusion of igneous rock into stratified beds, but they differ from the laccolites of Gilbert in that the molten material did not spread out into a broad dome. They differ equally from the volcanic necks of Dutton, since they did not reach the surface. The name Plutonic Plug is proposed for the intruded mass. Perhaps the most impressive of these plugs is that of Mato Teepee, which has been completely uncovered and rises almost perpendicularly from its platform to a height of 625 feet. Basaltic structure is beautifully developed, the columns reaching a diameter of ten feet. How the sedimentary beds were lifted or displaced to admit of the intrusion of such a mass is not clear to the author.

The Geology of New Hampshire: By C. H. HITCHCOCK. Historical accounts of the surveys of several States have already been given in the Journal. The present article continues the series. The first survey of new Hampshire was begun in 1839 by Dr. C. T. Jackson, of Boston. This lasted three years. The second survey, under the direction of the author, was begun in 1868 and continued ten years. Great difficulties were encountered in the wildness of the region, and the fact that the study of crystalline rocks had not at that time progressed very far, and the crystalline area in the State was considerable. Much attention was paid to surface geology. Such questions as the direction of movement of the ice sheet, the diversity of the 'ice age,' terminal moraines, river terraces, etc., were carefully studied and much light was thrown upon them during the course of this survey.

North American Graptolites: By R. R. GURLEY. No general revision of the American graptolites has been attempted since Hall's work was completed, thirty years ago. This paper is an attempt at such a zoölogic and geologic revision, though its aim is mainly geologic. All the species known in American strata are discussed with reference to generic disposal and

ascertained range. A complete list accompanies the paper.

T. C. Chamberlin reviews 'The Hill Caves of Yucatan,' by Henry C. Mercer, and also a paper by G. Frederick Wright, 'New Evidence of Glacial Man in Ohio.'

The evidence in question in the latter paper is a rude stone implement found in a gravel terrace near Brilliant, on the Ohio River, by Mr. Sam. Huston, a surveyor and collector, three or four years ago. The reviewer suggests that some of the natural modes of intrusion are not excluded by Mr. Huston's observations, and that it was not shown that the terrace is primary. The fact that there are terraces along the river at much higher levels gives ground to suspect that the terrace may be more or less secondary and reworked in post-glacial times. Respecting intrusion, it is pointed out that the decay of tree roots, which had deeply penetrated the porous sand and gravel, might afford the means of intrusion to the moderate depth at which the implement was found (eight feet), without any notable disturbance of the stratification.

T. Wayland Vaughan reviews at length an important paper by J. A. Merrill, 'Fossil Sponges of the Flint Nodules of the Lower Cretaceous of Texas;' and S. Weller reviews the 'Thirteenth Annual Report of the State Geologist of New York.'

THE PSYCHOLOGICAL REVIEW, JANUARY.

THE new volume opens with an article by Prof. G. S. Fullerton on *Psychology and Physiology*, in which it is argued that the discussion of the nervous system in works on physiology contains more anatomy and psychology than physiology. Foster's *Text-Book of Physiology* is taken as an illustration to show how consciousness is used where physiological knowledge fails, the sensory-motor arc being described as partly physical and partly psychical. If the parallel or automaton theory be adapted by the physiologist he should aim to make his science wholly independent of psychology; if he admit a causal interaction between body and mind he should leave to psychology the investigation of the mental process. Each science has its appropriate methods, and neither should trespass on the field of the other.

Prof. Münsterberg communicates four researches from the psychological laboratory of Harvard University. Dr. W. G. Smith has investigated the place of repetition in memory. When ten 'nonsense' syllables were read, there were remembered with entire correctness after one repetition 2.2; after three repetitions, 2.5; after six, 2.8; after nine, 3.4; after twelve, 3.9. The increase with continued repetitions is perhaps less than might have been expected, but there was a considerable degree of individual variation, one observer remembering but one, and another 6.2 syllables after twelve repetitions. Miss M. W. Calkins contributes experiments on the relative significance of frequency, recency, primacy and vividness in association. A color and a numeral were shown in conjunction, and after a series had been given the colors were repeated in a changed order and the suggested numerals recorded. Frequency was the most constant condition and vividness next in importance. Mr. L. M. Solomons shows that if a white disk is placed in a weak light, and a rotating black and white disk in a stronger light, it is not possible to get the two to look alike. Mr. J. P. Hylan reports on fluctuations in the intensity of weak sensations.

There are shorter contributions by Prof. Strong on physical pain and pain nerves; by Prof. Jastrow on community of ideas of men and women; by Mrs. Franklin on the functions of the rods of the retina; by Mr. Urban on the prospective reference of mind; by Prof. Hyslop on localization in space, and by Mr. Lay on synæsthesia. Recent psychological literature is reviewed at length by Professors James, Binet, Cattell, Hibben, Angell and others.

PSYCHE, FEBRUARY.

A. DAVIDSON describes the habits of a California wasp of the genus Odynerus, which with its parasite, bred by Dr. Davidson, are described by W. H. Ashmead. W. S. Blatchley continues his notes on the winter insects of Vigo county, Ind., the present instalment covering the Carabidæ. H. G. Dyar gives a synopsis of the larvæ of the moths or the genus Notolophus (Orgyia), with critical notes on most of the species. A. P. Morse continues his discussion

of the Tryxalinæ of New England by an account of the new genus Pseudopomala, the single species of which is described in detail. J. W. Folsom describes three new species of the Thysanuran genus Papirius found in Massachusetts. Sharp's treatment of the insects in the new volume of the Cambridge Natural History is reviewed, and the proceedings of the Cambridge Entomological Club for January are added. In a supplement, containing contributions from the New Mexico Agricultural Experiment Station, new insects are described by T. D. A. Cockerell and L. O. Howard, including diagnoses of a large number of new Coccidæ by the former.

SOCIETIES AND ACADEMIES.

CHEMICAL SOCIETY OF WASHINGTON, 84TH REGULAR MEETING, THURSDAY, DECEMBER 12, 1895.

THE President, Chas. E. Munroe, in the chair, with thirty-six members present. Messrs. H. Carrington Bolton, W. W. Skinner and F. B. Bomberger were elected to membership. Dr. W. F. Hillebrand discussed and exhibited the spectra of Argon and Helium.

Dr. H. W. Wiley read a paper on the 'Use of Acetylene Illumination in Polariscope Work with Illustrations.' He said that Acetylene, while not inferior to other forms of illumination in point of accuracy, is so intense as to permit of accurate polarization with solutions so dark in color that they cannot be polarized with lights ordinarily used for this purpose. The Acetylene light and the 'Schmidt-Haensch Triple Field Polariscope' were exhibited. This polariscope was said to be of great assistance in rapid and accurate work.

Mr. F. P. Dewey presented a comprehensive paper on 'The Early History of Electric Heating for Metallurgical Purposes.' He traced the history of the application of the current to the production of metals from heated compounds, the necessary heat being developed by the current itself. Beginning with the very early work of van Marum, published in 1795 at Haarlem, the idea was followed through the work of Sir Humphrey Davy, 1808–1808; Children, 1809–'15; Depretz, 1848–'9; Pichon, 1854; Fox, 1875; Siemens, 1879; Bradley, 1883; Cowles, 1885; Heroult, 1886, and Moissan, 1892–'5.

Dr. Marcus Benjamin contributed a 'Sketch of Professor Josiah P. Cooke,' who, from 1849 until the time of his death in 1894, was Ewing Professor of Chemistry in Harvard University. The sketch was of special interest from the fact that the statements given were taken from a manuscript sent by Prof. Cooke to Dr. Benjamin some years ago. Besides his six years' interest in the great chemical inventions of his time, *i. e.*, friction matches, daguerreotypes and gun cotton, the development of the chemical department under his guidance was fully described. The first practical instruction in chemistry to undergraduates in our American colleges was given by Prof. Cooke. A laboratory was fitted up in a cellar room of University Hall, of Cambridge, and from this grew the present magnificent equipment. Dr. Benjamin discussed Prof. Cooke's chemical work, especially that on the atomic weight of antimony, and referred also to his writings, of which 'The New Chemistry' is probably best known.

A. C. PEALE,
Secretary.

BIOLOGICAL SOCIETY OF WASHINGTON, 254TH MEETING, JANUARY 25.

CHARLES T. SIMPSON presented a paper on *The Extra-limital Mississippi Basin Unios.*

The speaker stated that the Unione fauna of the Mississippi basin was one in which the species were finely developed, often large or solid, richly sculptured or colored. The fauna of the Atlantic region consisted of smaller, less finely developed forms. The boundary between these regions on the north and northeast is not at the Height of Land, but far to the northward. Some 40 or more species of Mississippi naiades are found extra-limital in the northern and Atlantic drainage, while probably but a single Atlantic drainage form inhabits the Mississippi Valley. He believed this distribution was caused by the fact that at the close of the Glacial Epoch the northern lakes overflowed into the Mississippi Valley, and the Mississippi basin species ascended by way of these old streams into the British possessions.

These extra-limital forms were generally smaller and thinner, less highly colored, and