# SCIENCE

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## *THE SEA BOTTOM—ITS PHYSICAL CONDITIONS AND ITS FAUNA.**

IT is hard to realize the fact that, up to a comparatively recent date, nearly three-fifths of the actual solid surface of the earth was absolutely a 'terra incognita,' a region as unknown as the poles, and as full of mystery as the center of the earth. Yet, if it be true that the sea covers nearly three-fifths of the surface of the earth, it is also true that its bottom, which is the actual solid surface of the globe, was, up to the middle of the century just ended, absolutely unexplored, excepting a very narrow strip around the edges.

For the purpose of our study this evening, we may define the deep sea as all that is deep enough to exclude sunlight and vegetable life in appreciable quantities from the bottom. We may safely assume that this limit is at a depth of about 150 fathoms. Sensitive photographic plates are said to be unaffected beyond the depth of about 125 fathoms clear water.

It thus becomes apparent that we shall have to include as deep sea almost all the area covered by the oceans of the world, there being but an inconsiderable strip around the edges that is within the 150-fathom line. The average depth is very

* Lecture delivered before the Nebraska Chapter of the Society of the Sigma Xi, February 14, 1901, by Professor C. C. Nutting, of the State University of Iowa.

information which it contains compared with other books of its size; indeed, it might be criticized as giving too much for a text-book for beginners, too little for advanced students; yet as this has always been the characteristic of the book through the different editions, the popularity of the work may be held to answer such criticism.

E. RENOUF.

BOOKS RECEIVED.

*Water Filtration Works.* JAMES H. FUERTES. New York, John Wiley & Sons. 1901. Pp. xviii + 283.

*Leçons sur les séries divergentes.* ÉMILE BOREL. Paris, Gauthier-Villars. 1901. Pp. 183. 4 fr. 50 cts.

*Essai sur les fondements de la geometrie.* A. W. RUSSELL. Translated into French by ALBERT CADENAT. Paris, Gauthier-Villars. 1901. Pp. x + 274. 9 fr.

*Moteurs synchrones à courants alternatifs.* A. BLONDEL. Paris, Gauthier-Villars. 1901. Pp. 241. 3 fr.

*The Sea-beach at Ebb-tide.* A. F. ARNOLD. New York, The Century Co. 1901. Pp. x + 490. $2.40.

## SCIENTIFIC JOURNALS AND ARTICLES.

*The Journal of Comparative Neurology* for April opens with two articles from the Neurological Laboratory of the University of Chicago, by Shinkishi Hatai. The first on 'The Finer Structure of the Spinal Ganglion Cells in the White Rat,' describes and figures two varieties of spinal ganglion cells and considers the smaller variety, the chromophilic cells of Nissl, to be an immature stage in the development of the larger variety. In the second paper, 'On the Presence of the Centrosome in Certain Nerve Cells of the White Rat,' the centrosome is described in nerve cells of new-born rats from the following localities: great pyramids of the cerebral cortex, Purkinje's cells, nucleus dentatus, ventral horn of spinal cord and spinal ganglion cells. The centrosomes were less easily demonstrated in the adult and were not found at all in some of these localities. Earl E. Ramsey, of Indiana University, describes 'The Optic Lobes and Optic Tracts of *Amblyopsis spelæus* DeKay,' a blind fish from the limestone caves of the Ohio Valley in which the eye and optic nerve are almost wholly degenerate. The optic lobes of the brain are greatly shrunken, the optic tracts and all parts of the optic tectum directly related to them are entirely wanting and the remaining layers are generally reduced in thickness. G. E. Coghill, of Brown University, discusses 'The Rami of the Fifth Nerve in Amphibia.' In the course of an examination of the nerve components of *Amblystoma*, he clears up the morphology and homologies of the maxillary and ophthalmic branches of this *Urodele* and of the frog. Dr. Strong (Columbia University) presents a 'Preliminary Report upon a Case of Unilateral Atrophy of the Cerebellum,' in which the left hemisphere of the cerebellum was almost completely wanting. Finally, 'A Bibliography of the Literature on the Organ and Sense of Smell' is given by Dr. H. Heath Bawden, of the University of Iowa. This list contains 885 titles, including anatomical, physiological and psychological subjects.

*The Popular Science Monthly* for May begins with an account of 'The Carnegie Museum,' by W. J. Holland. Frederick A. Cook describes 'The Aurora Australis,' as observed from the *Belgica*, with illustrations showing some of the many forms assumed by this interesting phenomenon, and we have the first instalment of a paper on the 'Progress and Tendency of Mechanical Engineering during the Nineteenth Century,' by Robert H. Thurston. An article on 'Primitive Color Vision,' by W. H. R. Rivers, gives a very good résumé of the evidence on which is based the deduction that color vision has been a comparatively recent acquirement of the human race, and the fifth portion of 'A Study of British Genius,' by Havelock Ellis, is devoted to childhood and youth. Under the title 'The Frog as Parent,' E. A. Andrews gives an interesting account of some of the curious breeding habits to be found among the frogs. In 'Recent Physiology,' G. N. Stewart tells of some of the lines of modern investigation and their results. The final paper, by David Starr Jordan, on 'The Blood of the Nation,' is a study of the decay of race through the survival of the unfit.

*The Plant World* for April contains the following articles: 'Hints on Herborizine,' by A. H. Curtise; 'Notes on the Flora about Nome City,' by J. B. Flett; 'The Native Oak Groves of Iowa,' by T. J. and M. F. L. Fitzpatrick, be-

sides brief articles, including a note on a fossil flower related to Hydrangea. The supplement, devoted to 'The Families of Flowering Plants,' by Charles Louis Pollard, treats of the Sarraceniales and Rosales.

An editorial article in the *Observatory* accuses the *Astrophysical Journal* of reprinting without credit an article on the 'Siderostat' by M. Cornu. As the *Bulletin astronomique*, in which the French copy of the article appeared, was published in February, 1901, and the number of the *Astrophysical Journal* in March, 1901, the editor of the *Observatory* must appreciate the promptness of American methods. As a matter of fact important European articles on astrophysics are published by the authors simultaneously in the *Astrophysical Journal*. This makes the concluding sentence in the editorial in the *Observatory* interesting: "they print the same paper in several journals, so that it may be widely read, whereas in Europe we have made it a point *not* to reprint."

## SOCIETIES AND ACADEMIES.

### SECTION OF ANTHROPOLOGY AND PSYCHOLOGY OF THE NEW YORK ACADEMY OF SCIENCES.

A regular meeting of the Section was held on April 22d, with Professor Farrand in the chair. Professor Eberhardt Fraas, of Stuttgart, a corresponding member of the Academy, was introduced by Professor Osborn, and briefly addressed the meeting.

Mr. A. L. Kroeber presented some 'Notes on the Arapahoe Indians.' In this paper the social and ceremonial organization of these Indians was compared with that of other Plains Indians. On superficial examination various tribes appear to be organized according to identical principles, but fuller knowledge generally reveals differences among the similarities. From this it was concluded that such terms as gens, band, age-fraternity and dance-society have no stable or exact meaning and hence little descriptive value, detailed information being the great desideratum.

Professor C. H. Judd reported an experimental study on 'Practice in Visual Perception.' It is a generally recognized fact that an illusion grows weaker as the observer becomes more familiar with it. A quantitative determination of the disappearance of the illusion seen in the Müller-Lyer figure was the subject of the paper. Two series of results were reported, one from an observer who looked forward to the disappearance of the illusion, the other from an observer who did not know that the illusion would disappear and did not discover that it was disappearing. In both cases the illusion disappeared in about 1,000 observations. The curves of practice differ in form and show many details of effects of pauses. In the case of the first observer the effects of the practice gained in the first series was easily marked in all the additional series which were performed with other figures and with other positions of the first figure. In the case of the second observer the effect of the practice was in some cases positive, but in one case it was so decidedly negative that it exaggerated the illusion and prevented any disappearance of it through a series of 1,500 observations.

Professor E. L. Thorndike, in a paper discussing the 'Origin of Human Intellect,' proposed as a working hypothesis that the development of ideation and rational thinking in the human species was but an extension of the typical animal form of intellect. He defended this hypothesis by showing that mere increase in the number, delicacy and complexity of associations between sense-impressions and impulses might give concepts, feelings of relationship and association by similarity as secondary results, that in the human infant this seemed to occur and that down through the vertebrate phylum a clear evolution of the associative processes along these lines could be traced.

The last report of the evening was by Dr. R. S. Woodworth, on the 'Voluntary Control of the Force of Movement.' By recording simultaneously the force of a blow struck by the hand and the extent of the movement preliminary to the blow, it is possible to see how far the force is dependent on the extent. The results showed a certain degree of correlation between the two, but comparatively a slight degree. The inference was that the force of the movement was only partially and loosely dependent on the extent, and that the control and perception of the force of a movement were in