described proving this formation to be contemporaneous with that of Cerin in the Bugey, which is referred by Lapparent and Haug to the summit of the Virgulien. Professor Sauvage,* the eminent director of the Boulogne Museum, now gives us an account of the piscine fauna so far as known from the new locality, which comprises in all thirteen species. The more important of these are illustrated in four photographic plates, amongst the number being a supposed chimæroid egg-case, certainly a very rare petrifaction. It is also interesting to note the presence of *Palæobatrachus* and ichthyosaurs in these beds.

FURTHER LIGHT ON THE TREMATASPIDÆ.

IN an interesting memoir of thirty-three pages published by the St. Petersburg Academy, Professor William Patten,† of Dartmouth, discusses the structure and classification of the primitive family of ostracaphores known as the Trematapidæ. He describes with painstaking minutiæ the cephalic shield of *Trematapis schmidti,* illustrating the same with two excellent plates. Our knowledge of this form has been increased by Patten's studies in several important particulars, such as regards the sensory canal system, arrangement of ventral plates, and number of incisions which are commonly regarded as branchial openings, but are interpreted by Patten as having served for the attachment of swimming appendages. Professor Patten's views in regard to arthropod affinities of ostracophores have recently been discussed by Dr. O. Jaekel in the *Zeitschrift der deutschen geologischen Gesellschaft,* and by the reviewer in the *American Naturalist.*

C. R. EASTMAN.

SCIENTIFIC NOTES AND NEWS.

THE University of Pennsylvania has conferred its Doctorate of Science on William Healey Dall, of the U. S. Geological Survey and the U. S. National Museum.

DR. CHARLES S. MINOT, of Harvard Medical School, and Dr. Franklin P. Mall, of Johns Hopkins University, have been made members of the commission for Neurological Research, appointed by the International Association of Academies.

EDINBURGH UNIVERSITY will confer the honorary LL.D. on Dr. Alexander Macalister, professor of anatomy at Cambridge, and on Dr. Hannis Taylor, professor of constitutional and international law at Columbian University.

ST. ANDREWS UNIVERSITY will confer the degree of LL.D. on Dr. J. N. Langley, professor of physiology at Cambridge University.

THE French Geographical Society has awarded its great gold medal for 1904 to Sven Hedin, the Swedish explorer.

DR. NICHOLAS SENN, of Chicago, has been elected a member of the Swedish Medical Association.

ARRANGEMENTS are being made to celebrate the seventieth birthday of Professor Hugo Schiff, the Italian chemist.

PRESIDENT ROOSEVELT has received acceptances from five of those appointed as members of the Isthmian Canal Commission, namely, Rear Admiral John G. Walker, United States Navy, retired; Gen. George W. Davis, United States Army, retired; Col. Frank Hecker, of Detroit, director of transportation during the Spanish-American war; William Barclay Parsons, engineer of the New York subway, and William H. Burr, professor of engineering at Columbia University.

THE Royal Commission on London Traffic have nominated Sir John Wolfe Barry, one of the royal commissioners, Sir Benjamin Baker and Mr. W. Barclay Parsons, consulting engineer to the Board of Rapid Transit Railroad Commissioners of New York, to advise the commission on certain important technical questions connected with locomotion and transport in London.

DR. JAMES CRAUFORD DUNLOP has been appointed superintendent of statistics in the office of the registrar-general for Scotland, in place of the late Dr. Blair Cunyngham.

* 'Noticia sobre los Peces de la Caliza litográfica de la Provincia de Lérida,' by H. E. Sauvage. *Mem. R. Acad. de Ciencias y Artes de Barcelona,* Vol. IV., No. 35, 1903.

† 'On the Structure and Classification of the Trematapidæ,' by William Patten, *Mém. Acad. Imp. Sci. St. Petersb.,* Vol. XIII., No. 5, 1903.

Mr. H. F. Newall has been appointed assistant director of the observatory of Cambridge University.

Professor Blaserna, of Rome, has been elected a foreign member of the French Physical Society.

Professor A. E. Austin, of the Tufts College Medical School, will pass the next seven months working in Ludwig's Biochemic Laboratory in Vienna.

Dr. D. H. Scott, F.R.S., has been elected president of the Royal Microscopical Society for the ensuing year.

M. d'Arsonval has been elected president of the French Physical Society.

M. Henri Cordier has been elected president of the Paris Geographical Society.

Dr. C. W. Hayes, of the U. S. Geological Survey, is giving a course of six lectures to the geological students of the Johns Hopkins University during the month of February. The lectures embrace a discussion of the structure of the Appalachian district and of the origin of some of the more important non-metallic deposits of economic value in the eastern and southern states.

Dr. Philip Jaisohn, late special adviser to the privy council of the king of Korea, lectured before the Geographical Society of Philadelphia on March 2 on 'Korea and its People.'

At the Royal Institution, London, Professor H. L. Callendar has begun a course of three lectures on 'Electrical Methods of Measuring Temperature,' and lectures have been announced for February 26 by Mr. Alexander Siemens, his subject being 'New Developments in Electric Railways'; for March 4, by Professor W. Stirling, on 'Breathing in Living Things'; and for March 11, by Professor F. T. Trouton, on 'The Motion of Viscous Substances.'

The Academy of Sciences at Berlin has held a meeting to celebrate the birthday of Frederick the Great and of the present German emperor. The principal address was made by Dr. Wilhelm Waldeyer, professor of anatomy.

On February 12, exercises commemorative of the centenary of the death of Immanuel Kant were held at the University of Alabama, at which short addresses were made by Dr. Edward F. Buchner, on the life of Kant and his influence on philosophy; by Dr. H. F. Sayre, on Kant in his relations to astronomy and physical science; by Dr. John Y. Graham, on Kant's contributions to the theory of evolution; by Professor T. W. Palmer, on his contributions to the development of mathematics, and by Mrs. J. Y. Graham, on Kant as a factor in the literature of Germany.

We learn from *Nature* that the hundredth anniversary of the death of Priestley was commemorated in Leeds by the congregation of Mill Hill Chapel, where Priestley was minister for some six years, and also by the Priestley Club. The members of the club, to the number of fifty, dined together, and the president, Dr. T. E. Thorpe, C.B., F.R.S., afterwards gave a public address on 'The Life and Work of Joseph Priestley,' in the Philosophical Hall. At Warrington on the same day, Dr. Thorpe unveiled a memorial tablet at the house which Priestley occupied during his stay in that town.

It is proposed to publish a volume commemorating the work of the late J. S. Budgett, of Trinity College, Cambridge, whose death we were recently compelled to record. A large part of the material collected by him in Africa has not been described, and it is intended that this shall be worked out by his friends and issued under the editorship of Professor J. Graham Kerr.

We regret to record the death of Sir Leslie Stephen, one of the great men of letters of the Victorian era, whose work was largely influenced by the scientific thought of the nineteenth century. His 'Science of Ethics,' published in 1882 and based largely on the theory of evolution, is a scientific work of importance.

The deaths are announced of Mr. W. G. MacMillan, secretary of the British Institution of Electrical Engineers and formerly lecturer on electrical engineering in Mason College, Birmingham; of Dr. Vassili Afanasieff, professor of pathological anatomy in the University of St. Petersburg, at the age of fifty-

five years; and of M. A. Laumonier, the French physician and botanist at the age of sixty-four.

THE senate passed the legislative, executive and judicial, and the agricultural appropriation bills on February 25.

MR. HENRY L. DOHERTY, president of the National Electric Light Association, has offered a gold medal for the best paper on underground construction for alternating or direct current plants.

THE foundation of Schnyder von Wartensee offers its prize of about $700 for an essay on the climate of Switzerland during the last thirty-seven years. Essays, which may be in English, should be sent before September 30, 1906, to the library at Zurich.

Nature states that the Municipal Council of Paris has adopted a proposal of M. Bussat for the foundation of a laboratory of applied physiology. M. Bussat has himself sketched out a scheme of the work which should be undertaken in such a laboratory, relating to the alimentary value of foodstuffs, muscular work, intoxication, etc., and he suggests that the director should give publicity to the work of the laboratory by means of courses of lectures addressed to the pupils of the professional and normal schools of Paris.

Nature states that it is proposed to hold a horticultural and gardening exhibition in the month of June next under the auspices of the Royal Botanic Society in the new exhibition grounds of the society, situated in the center of the Botanic Gardens in Regent's Park, London. The proposed scheme embraces horticulture, forestry, botany, educational methods, nature-study, and a special section for colonial produce. In addition to the exhibition, lectures and conferences are in course of arrangement.

ACCORDING to the London *Times* the British Board of Agriculture, through Mr. Brook Hunt, has asked the governors of the South-eastern Agricultural College, Wye, Kent, to consider a scheme for establishing local field stations for experiments and for providing special courses of training in the processes of agriculture. The board has also suggested the appointment of an instructor in poultry-rearing for the counties of Kent and Surrey. A scheme for establishing school gardens throughout the county of Kent is already under consideration. This, it is understood, has the approval of the Board of Agriculture, and no difficulty in obtaining their sanction for the expenditure of the necessary money is anticipated. The technical education funds of the county will bear the cost of the experiment.

PENNSYLVANIA'S commission for the World's Fair has applied for 3,500 square feet of space for its fish exhibit in the Forestry, Fish and Game Building, and has appropriated $10,000 for the display. A letter from Mr. W. E. Meehan, state fish commissioner of Pennsylvania, announces that he is prepared to put in thirty-five aquaria, as many as the United States Fish Commission will have in its exhibit in the Government Fisheries Building. Pennsylvania's exhibit will also 'include stuffed specimens of mammals, birds and reptiles that prey upon fish life, fishes of abnormal size, legal and illegal devices for taking fish, paintings in colors of the principal food and game fish of the state, state literature upon the subject of fish protection and culture, a miniature waterfall and trout stream, and a hatchery in full operation.'

THE United States Department of Agriculture has just issued 'Farmers' Bulletin No. 189,' 'Information concerning the Mexican Cotton Boll Weevil.' It was prepared by W. D. Hunter, special agent in charge of Cotton Boll Weevil Investigations, Division of Entomology. The work of the Division of Entomology for several years has demonstrated that there is not even a remote probability that the boll weevil will ever be absolutely exterminated. Although the very large yields of cotton of former years may perhaps no longer be possible, it is nevertheless entirely feasible to produce cotton at a margin of profit that will compare favorably with that involved in the production of most of the staple crops of the United States by what have become known generally as cultural methods. These methods consist of modifications of the system of cotton raising

made necessary by the weevil. They were originally suggested by a careful study of the life history and habits of the pest, and naturally any improvement that may eventually be made will be the result of the continuation of that study. They have been tested successfully on a large scale by the division of entomology, as well as by many planters, during two very unfavorable seasons. These methods are in brief as follows: First. Plant early. Second. Cultivate the fields thoroughly. Third. Plant the rows as far apart as experience with the land indicates is feasible, and thin out the plants in the rows thoroughly. Fourth. Destroy, by plowing up, windrowing, and burning, all the cotton stalks in the fields as soon as the weevils become so numerous that practically all the squares and bolls are being punctured. Of greatest advantage is the reducing for the next year of the number of the weevils by the destruction of the plants in the fall. The advantage thus gained is followed by bending every effort toward procuring an early crop the following season. Fifth. While fertilizers are not now used to any considerable extent in cotton producing in Texas, there is no doubt that they should be; not that the land is poor, but that crops may be procured earlier so as to avoid a considerable degree of injury by the weevil, which is more destructive to later crops. The bulletin contains a description of the weevil, the territory affected, and the plan of the investigations by the division of entomology, and gives some of the results of the field work and an experiment showing the damage resulting from favorable hibernating quarters. The bulletin concludes with an account of the legal restrictions concerning the shipment of infested cotton seed and a warning to cotton planters against the inflation of prices of the seed of certain varieties, and the attempts of unscrupulous persons to dispose of common seed from various localities as that of early maturing varieties.

UNIVERSITY AND EDUCATIONAL NEWS.

The presidents of seven New York universities and colleges—Syracuse, Rochester, Union, Colgate, St. Lawrence, New York, University and Hamilton have appeared before the senate finance committee at Albany, to urge the adoption of a substitute instead of the proposed bill appropriating $250,000 for the erection of an agricultural hall at Cornell University.

The supreme court of New Jersey has rendered a mandamus directing the state comptroller to issue a warrant on the state treasury for $80,000 in favor of Rutger's College. The money is due for scholarships established by the legislature, and has remained unpaid for a long time on the contention that the legislative act relating to scholarships was unconstitutional.

Mr. Philip H. Walker has given £1,200 to Oxford University, to establish a studentship in pathology.

The new buildings for the Medical School, the Sedgwick Geological Museum, the Botanical Library and the Law School of Cambridge University were opened on March 1.

On February 19, fire completely destroyed the building at the Ohio State University containing the Departments of Chemistry, Pharmacy, Metallurgy and Mining Engineering. The loss is estimated at $100,000.

The course in economic geology at The University of Chicago this year consists of a double study for twelve weeks. The course is divided into two parts: 'The Non-metallic Mineral Resources,' and 'The Metallic Mineral Resources.' The first part was given Dr. E. R. Buckley, director of the Missouri Bureau of Geology and Mines and the second part is being given by Dr. H. Foster Bain, geologist of the U. S. Geological Survey.

The following have been appointed electors, at the University of Cambridge, to the professorships indicated: chemistry, Professor J. J. Thomson; anatomy, Sir M. Foster; botany, Professor Clifford Allbutt; Jacksonian (chemistry), Sir William Ramsay; Downing (medicine), Sir M. Foster; zoology, Mr. J. W. Clark; physics, Professor R. B. Clifton; physiology, Professor Clifford Allbutt; surgery, Sir Frederick Treves, Bart.; pathology, Professor R. Muir.