

Candidates are to send in their applications to the Registrar of the University on or before April 21. The tenure of the Professorship is limited to three years, at the expiration of which the Professor may be re-elected for a further period of three years, but no one may hold the Professorship for more than six years consecutively.

The committee on Degrees for Research have presented a long report to the Hebdomadal Council, which has been approved by that body. The report contains recommendations that will beneficially affect the study of Science in the University. It is proposed that degrees of M.Sc. and M.Litt. shall be established which shall be open (a) to members of the University of Oxford who have taken the B.A. degree, and (b) to students, not being graduates of Oxford, who can give satisfactory proof of general education and fitness to enter upon a special course of study. Three years' residence will be required from the second class of students, or two years from those who have studied for at least two years in a university or local college approved by Convocation, or in an affiliated college. No candidate is to be admitted who is under the age of twenty-one, and every candidate not being a member of the University shall be required to matriculate, and to pursue his studies during his term of residence under the supervision of a committee appointed by a special Delegation to be established for the purpose. In supplicating for the Degree, every candidate must produce a certificate from the Delegation stating the line of study or research which he has pursued, accompanied by a report, drawn up by the candidate, of the work he has done.

CAMBRIDGE.—Honorary Degrees are to be conferred on the Earl of Kintore, Governor of South Australia, whose adventurous journey across that continent will be remembered, and on Prof. Ramón y Cajal, of Madrid, the Croonian lecturer of this year.

Lord Rayleigh has been appointed an Elector to the Professorships of Chemistry and of Mechanism, Sir R. Ball to the Plumian Professorship, Sir G. Humphry to that of Anatomy, Sir G. G. Stokes to the Jacksonian and the Cavendish Professorships, Dr. D. McAlister to the Downing Chair of Medicine, Dr. Hugo Müller to the Chair of Mineralogy, Prof. Chiene to the Professorship of Surgery, and Sir James Paget to that of Pathology.

Dr. Shore has been appointed an Examiner in Physiology in place of Dr. A. S. Lea, who is unable to examine owing to ill-health.

ON February 24, the Prince of Wales formally opened the new Polytechnic in Battersea, which has been erected at a cost of nearly £60,000. The institute forms the third of a trio of polytechnics in South London, the others being situated in the Borough-road and at New-cross, respectively. The latter institute, for which the Goldsmiths' Company provided the entire funds, namely £70,000, and an endowment of £5,000 a year, has now been open for some time, and has proved a signal success. The Borough-road institute cost about £50,000, and has been open for about a year.

DR JOHN T. HEWITT, Assistant-Demonstrator at the Cambridge University Chemical Laboratory, has been appointed by the Governors of the People's Palace to the vacant Professorship of Chemistry. Dr. Hewitt was a student of the Royal College of Science from 1884 to 1887. In 1886 he obtained a foundation scholarship at St. John's College, Cambridge, and was awarded a first class in chemistry in both parts of the Natural Science tripos. He afterwards studied in Heidelberg, and took the degree of Ph.D. in that University in 1892, having previously obtained a Hutchinson research studentship. Dr. Hewitt is a Doctor of Science of the University of London, where he obtained the exhibition and scholarship for chemistry. He has also successfully carried out some important chemical researches.

#### SCIENTIFIC SERIALS.

The *Quarterly Journal of Microscopical Science* for January, 1894, contains observations on the development of the head in *Gobius capito*, by H. B. Pollard. (Plates 21 and 22.) The stages of development of the brain, mouth, and mesodermal structures are described. The work was carried out during the occupation of the Oxford table at the Naples Zoological Station.—On the head kidney of *Myxine glutinosa*, by J. W. Kirkaldy. (Plate 23.) It would seem that the pronephros in *Myxine* may

be regarded as a stage in the phylogenetic reduction of this organ—a reduction which continues in the Pisces until the tubular structure entirely disappears, and, further, that it represents in *Myxine* the mesoblastic part of the supra-renal bodies.—Report on a collection of *Amphioxus* made by Prof. A. C. Haddon in Torres Straits, 1888–89, by Arthur Willey. All the specimens belonged to the same species, *Epigonichthys culltellus*, Peters. One of the most remarkable features in its internal organisation is the fact that the gonads occur as a unilateral series of pouches confined to the right side of the body; in connection with this fact the author adds, that often in the Mediterranean form the gonadic pouches of the right side preponderate greatly over those of the left side in number.—On the orientation of the frog's egg, by Dr. T. H. Morgan and Umé Tsuda. (Plates 24 and 25.)—On the fossil Mammalia from the Stonesfield Slate, by E. S. Goodrich. (Plate 26.) In this excellent account of these very interesting fossils, we have detailed descriptions and figures of *Amphitherium Prevostii*, Blainv., *A. Oweni*, Osborn, *Phascalotherium Bucklandi*, Broderip, and *Amphilestes Broderipii*, Owen. The only specimen of *Stereognathus ooliticus*, Charlesworth, was in too fragmentary a state to be re-described. In a foot-note Prof. E. Ray Lankester gives some graphic reminiscences of another Stonesfield fossil, probably belonging to another species of *Stereognathus* which was once in his possession.—On a Polyoid with branchiæ (*Eupolyodontes Cornishii*), by Florence Buchanan. (Plate 27.) This species was found off the mouth of the river Congo by Mr. Cornish, of the cable ship *Mirror*; a list of the species belonging to the sub-family Acœtidæ is given, and the new species with *Polyodontes gale*, Grube, are placed in the new genus *Eupolyodontes*.—On some Bipinnariæ from the English Channel, by Walter Garstang. (Plate 28.)—On *Octineon Lindahli* (W. B. Carpenter), an undescribed Anthozoon of novel structure, by Dr. G. Herbert Fowler. (Plates 29 and 30.) This remarkable form was dredged in 1870 during the *Porcupine* expedition off the south coast of Spain, not far from Cape St. Vincent, in 364 fathoms of water. It was to have been described by Dr. W. B. Carpenter, who died before doing so; the specimens were then entrusted to Prof. Moseley, who was unable to finish the work before his death; now we have the memoir completed by Dr. Fowler. In a dead condition the animal presents the form of a thin sandy disc, not exceeding 0.4 of an inch in diameter. "In *Octineon* we have an Actinarian with the characteristic habit of a Zoanthid, with the twelve mesenteries of a Hexactinian, and the eight muscles of an Edwardsid," and the evidence seems in favour of the view that it is the type of a new and highly specialised family, descended from true Hexactinian ancestors.

*American Meteorological Journal*, February.—Recent foreign studies of thunderstorms: IV. Italy, by R. De C. Ward. Systematic study of thunderstorms in Italy was begun in 1877; in 1880 the Central Meteorological Office took up the work, and the results have been regularly published in its *Annals* by Dr. C. Ferrari. The majority of storms come from north-west and west, those from the western quadrant have the greatest velocity, and those which occur in summer have a greater velocity than those in spring or autumn. The chief causes of their development are high temperatures, high vapour pressure, and calm atmosphere. Ferrari's investigation of thunderstorm phenomena is the most complete of any yet published.—Certain climatic features of Maryland, by W. B. Clark. The records of temperature and rainfall, published by the State Weather Service, show an intimate connection between the climate and the topography of the State. The mean annual temperature of the extreme western portion is 50°, while along the eastern border it rises to 58°, and the variations of the seasons are still more pronounced. The rainfall also shows perceptible differences; in the west the average is 38.5 inches, and in other parts nearly 44 inches.—Ten miles above the earth, by H. A. Hazen. This paper contains an account of the ascent of a balloon sent up by M. G. Hermite in Paris, on March 21, 1893. The highest point reached is computed to be 52,500 feet, and, according to the law of the diminution in temperature, the lowest temperature was probably not far from -104° F., but the trace was lost, owing to the freezing of the ink in the thermograph pen. The other articles are: Measurement of the seasons, by H. Gawthrop (a method is proposed by which, using the daily means as the unit, the progress of a season may be determined and graphically illustrated), and the climate of Louisiana, by R. E. Kerkham, compiled from the State Weather Service records of the past six years.

*Meteorologische Zeitschrift*, December 1893.—Comparison of mercurial barometers with boiling-point thermometers, by Colonel H. Hartl. The author has made several comparisons with the above-mentioned instruments since 1876, and finds that properly constructed and verified thermometers form very good substitutes for barometers, and are capable of giving very accurate determinations of air pressure, especially where it is a question of differences of pressure, rather than of absolute values. They are very useful as a check on the aneroid, and the author considers them indispensable for travellers who wish to determine heights of mountains.—On the determination of differences of temperature and humidity between forest and field, by Dr. J. Schubert. A series of observations was made at Eberswalde during 1892 with carefully exposed instruments, the result being that the author considers that much of the difference hitherto found to exist may be due to imperfect exposure of the instruments, and to the times at which the observations were taken. He advocates further observations, with the use of the aspiration hygrometer, by which a free circulation of the air about the bulbs is ensured.

In the number of the *Botanical Gazette* for December 1893, Mr. H. L. Russell completes his interesting account of the bacterial flora of the Atlantic Ocean in the vicinity of Woods Holl, Mass. He finds that bacteria exist in the mud of the ocean-bottom in large numbers, and that they multiply there freely, although they are not so numerous as in fresh water. The geographical distribution of the species is often extensive, and their vertical range exceeds that of the majority of the higher forms of life. The following new species are described:—*Bacillus limicola*, *B. pelagicus*, *B. litorosus*, and *B. maritimus*. Mr. M. A. Carleton describes a series of experiments on the germination of the spores of Uredineæ, especially in reference to the effects on the process of different chemicals. In the number for January 1894, Prof. Conway Macmillan proposes the terms archenema, protonema, and metanema, for the gametophytic structures below the ferns. Mr. A. Schneider describes the symbiosis of algæ and bacteria in the tubercles on the roots of *Cycas revoluta*. The bacteria belong to the genus *Rhizobium*. Although the roots are abundantly covered with many different kinds of algæ, the only species found in the cells of the tubercles was a *Nostoc*, probably *N. commune*. This abounds in the palisade-cells, where the *Nostoc*-colonies appear to take the place, and to serve the function of chloroplastids.

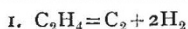
In the *Journal of Botany* for February, Mr. Jesse Reeves describes the development of the stem and leaves of *Physotium giganteum*, which differ from other acrogenous *Jungermanniæ* in the remarkable peculiarity of having a 2-sided instead of a 3-sided apical cell.—The Rev. W. Moyle Rogers adds yet three more new species (?) to the already long list of British *Rubi*, viz. *R. mollissimus*, *R. Powellii*, *R. britannicus*.

WITH the number for January 1894, the *Nuovo Giornale Botanico Italiano* commences its new series as the organ of the Italian Botanical Society, under the editorship of Prof. Arcan-geli. The first number consists exclusively of papers on Italian botany.

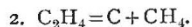
## SOCIETIES AND ACADEMIES.

### LONDON.

**Royal Society**, February 1.—“The Action of Heat upon Ethylene.” By Vivian B. Lewes. From the work of the earlier observers, the text-books have accepted the equation



as representing the decomposition which takes place when ethylene is subjected to a very high temperature, whilst, on the evidence of the work done by Marchand, and Buff and Hoffman, they represent the change taking place at a lower temperature by the equation

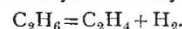


Berthelot, however, has come to the conclusion that two molecules of ethylene split up at a moderate temperature into acetylene and ethane.

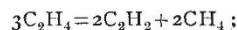
The author has made an investigation upon the action which takes place at definite temperatures upon the ethylene, the products of decomposition being as quickly as possible removed from the heated zone.

The gas being passed through 140 mm. of heated tube, no change takes place until a temperature of 800° C. is reached, when traces of acetylene are observed; between 800° and 900° C. the acetylene increases in quantity, and large quantities of methane are generated, accompanied by liquid products. This action increases until just below 1200° C. when hydrogen begins to appear amongst the products of decomposition, whilst the moment the liberation of hydrogen commences, carbon also is deposited; and the formation of oil decreases until close upon 1500° C. when the decomposition of the ethylene is practically complete, and the products of decomposition are mainly hydrogen with some undecomposed methane, and a copious deposit of carbon.

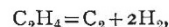
When the products of decomposition of the ethylene are heated together for some time, ethane also is produced, but splits up at 900° C. into ethylene and hydrogen,



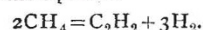
Analyses of the products of decomposition show that the primary action of heat upon ethylene may be represented by the equation



whilst the final decomposition is as represented by previous observers,



and that between these two extremes there occur a large number of interactions due to the polymerisation of the acetylene formed from the ethylene, and also at higher temperatures from the methane, according to the equation



February 1.—“On Hollow Pyramidal Ice Crystals.” By Dr. Karl Grossmann and Joseph Lomas.

February 8.—“Researches on the Germination of the Pollen Grain and the Nutrition of the Pollen Tube.” By Prof. J. Reynolds Green.

The whole of the researches described in the paper may be summarised as under:—

(1) Diastase and invertase are both present in pollen grains and can be extracted from them by the same treatment as has been found effectual in the cases of seeds and foliage leaves. The relative quantities vary a good deal; while some pollens contain both, others possess only one, which may be either of the two.

(2) At the onset of germination the amount of both diastase and invertase is usually considerably increased. In one species examined this increase was preceded by a primary diminution. When the pollen grain has lost the power of germinating, the quantity of diastase has considerably decreased.

(3) The pollen tube is nourished during its growth by plastic reserve material derived from two sources, the store of material in the grain itself, and a further store deposited in the style.

(4) The reserve store of the pollen grain consists of different materials in different species: starch, dextrin, cane sugar, maltose, and glucose being the forms in which it is found.

(5) The store in the style consists usually of the same carbohydrates, with the exception of dextrin.

(6) The style itself contains enzymes to assist in preparing the reserve materials for absorption by the pollen tube, while the latter excretes the same ferments during its progress down the conducting tissue.

(7) The absorption of food material appears to be one cause of the increase of enzyme found to occur during the germination.

(8) This absorption of food material is usually so active that the reserve store of the pollen grain is often largely increased by a temporary deposition, either in the grain or its tube, of some of the absorbed sugar in the form of starch.

(9) There is a certain amount of evidence pointing to the existence of zymogens in some pollens, particularly such as germinate in a faintly acid medium.

February 15.—“On the Straining of the Earth resulting from Secular Cooling.” By Charles Davison.

In this paper the problem as to the total volume of the earth's crust folded and crushed above the surface of zero strain is considered on the supposition that the coefficient of dilatation is not constant, but increases with the temperature. By this means it