

that the rhythm thus established may be maintained for a certain time under uniform conditions of illumination. This is the case with the sensitive plant and many another.

Animals also exhibit a like periodicity. Thus some years ago Dr. Gamble and I showed that certain shrimp-like animals, *Hippolyte varians*, roll up their brilliant chromatophores at night and assume a sky-blue colour. When daylight comes they put on their daytime dress by spreading out the pigment of their chromatophores in far-reaching superficial networks. Kept in the dark, these animals retain for many days this periodic habit, and when the hour of night arrives, although they have no light to tell it by, they lay aside their daily garb and put on the uniform of night. So also the plant-animal *Convoluta roscoffensis*, which lives on the seashore, orders its behaviour by the sun and moon. It lies on the sand till the waves of the making tide are upon it, and then descends to security and darkness. When the tide recedes it rises to the light. Even the uncongenial surroundings of a teacup and a laboratory fail to break this habit; for in these surroundings its uprisings and down-lyings keep time with the tides.

To one who has scrutinised with perplexed mind these mysteries of biology, the speculation may be permitted that light and darkness may work these wonders through the control of chemical agents such as oxydases. But though it be legitimate to make a speculation of this kind, it is idle to hunt the unknown to the death without the lethal weapon of experiment, and so I leave it for the present unpursued, and with it my address. We have it on the authority of a poet and philosopher that to the traveller on a lonely road each bush becomes a bear, and I am not oblivious of the fact that oxydases have obtruded themselves with a certain obstinacy in the course of my address. Nevertheless, obsession has its uses and significance, for it is the after-effect of enthusiasm; and though I have dealt, perhaps at undue length, with special problems and with suggestions, I venture to think that I have made out my case for the opportuneness of an *entente cordiale* between physiology and Mendelism.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The Henry Sidgwick memorial lecture at Newnham College will be given by Prof. Ward in the College Hall on Saturday, November 9, at 5 p.m., and will be open to all. The subject will be "Heredity and Memory."

The prize of 50l. out of the Gordon Wigan Fund for a research in chemistry has been awarded to D. H. Peacock, of Trinity College, for investigations on "Hydroxyhydrindenehydrazine and its Resolution," "1:2:4-Triketopentamethylene," and "The Theory of Molecular Volumes."

The next combined examination for fifty-seven entrance scholarships and a large number of exhibitions, at Pembroke, Gonville and Caius, Jesus, Christ's, St. John's, and Emmanuel Colleges, will be held on Tuesday, December 3, and following days. Mathematics, classics, natural sciences, and history will be the subjects of examination at all the above-mentioned colleges. A candidate for a scholarship or exhibition at any of the six colleges must not be more than nineteen years of age on October 1, 1912. Forms of application for admission to the examination at the respective colleges may be obtained as follows:—Pembroke College, The Master; Gonville and Caius College, the Master; Jesus College, A. Gray; Christ's College, the Master; St. John's Col-

lege, the Master; Emmanuel College, the Master; from any of whom further information respecting the scholarships and other matters connected with the several colleges may be obtained. The forms of application must be sent in on or before Saturday, November 23.

Colonel Harding, of Madingley Hall, has offered to the Vice-Chancellor to hand over to the University a sum which will produce an annual income of between 50l. and 60l. a year, to be devoted to the payment of a lectureship in zoology.

A SERIES of ten free public lectures upon natural history, folk-lore, and related subjects will be given in the new Lecture Hall of the Horniman Museum, Forest Hill, S.E., at 3.30 o'clock on Saturday afternoons, commencing October 12.

It is stated in *Science* that at the September meeting of the Yale Corporation it was announced that since the last meeting three wills have been filed for probate from which Yale University will probably receive during the year about 150,000l. These bequests include 50,000l., unrestricted, by bequest of Mr. Matthew C. D. Borden, and the McPherson fund of between 80,000l. and 100,000l., "to be employed in assisting worthy indigent students."

A COPY of the second issue of the "Register of Old Students of the Royal College of Science, London," compiled by the Old Students' Association, has been received. An excellently reproduced photograph of Sir William Crookes, O.M., F.R.S., the president of the association, serves as a frontispiece to the register. The names of 876 old students are given; of these 729 are associates of the college, and in their cases the subjects in which they took their diplomas are enumerated. Copies of the register may be obtained, price 1s. net, from Messrs. Lamley and Co., Exhibition Road, South Kensington.

THE Secretary of State for India in Council has made the following appointments to the Indian Educational Service:—Dr. W. N. F. Woodland to be professor of zoology at the Muir Central College, Allahabad; Dr. A. N. Meldrum to be professor of physics and chemistry at the Institute of Science, Ahmedabad; Mr. W. S. Rowlands to be professor of philosophy at the Government College, Jubbulpore; Mr. G. H. Luce to be professor of English at the Government College, Rangoon; and Mr. C. S. Gibson to be additional professor of chemistry at his Highness the Maharaja's College, Trivandrum, in the Travancore State Service.

At the University of Leeds on October 3 honorary degrees were conferred upon Mr. Arthur Cooper, president of the Iron and Steel Institute; Sir Robert Hadfield, F.R.S., a past president of the institute; M. Adolphe Greiner, of Liège; Herr Friedrich Springorum and Mr. J. E. Stead, F.R.S., members of the council of the institute; Mr. Corbet Woodall, Mr. Charles Carpenter, and Mr. Thomas Newbigging, for their services to science in the gas industry; and Sir Swire Smith, Mrs. R. W. Eddison, Mr. W. E. Garforth, and the Rev. W. H. Keeling, headmaster of Bradford Grammar School, for their services to science and education in Yorkshire.

THE students of forestry in Edinburgh University, as part of their practical training, have during August and September been camping out at the Drumbuick Wood, Methven, Perthshire, and part of the Logiealmond estate of the Earl of Mansfield, so as to have the opportunity of measuring timber. The trees were principally Scots pine, larch, and spruce, and these were numbered and measured. The accessible trees were dealt with in detail in 10-ft. sections, while

every tenth was barked so as to obtain the allowance necessary to be made for bark. The work of the students was supervised by Mr. Lyford-Pike, junior lecturer in the University, who was assisted by a few recent graduates in forestry.

DR. L. SILBERSTEIN will commence a course of twelve lectures on "The Theory of Relativity" at University College, Gower Street, W.C., to-morrow, October 11, at 5 p.m. The first part of the course will be historical, beginning with Maxwell's electromagnetic theory, and the Hertz-Heaviside equations; the second part will be concerned with the principle itself; and the third with its applications and recent extensions. Much attention has been paid to the subject since Einstein founded the modern theory in 1905, but the arguments for the principle, and the conclusions to which they lead, are not well understood. There must be many students of physics who will be glad to have a clear and connected statement of a theory which, carried to its furthest extent, would declare that "the phenomena of physical science do not lead us to any knowledge of a permanent and unique frame of reference relative to which the motions of bodies may be determined."

COPIES of the calendar for the academic year, 1912-13, of the University of Leeds are now available. As is natural in the case of a great modern university, the faculties of science and technology take a prominent place in the activities connected with the institution. The degree of bachelor of science, whether with or without honours, may be taken in pure or applied science. The student wishing to graduate on the technical side may study mechanical, civil, electrical, mining, or gas engineering, fuel and metallurgy, agriculture, colour chemistry and dyeing, or the chemistry of leather manufacture, and, if successful, secure his degree. In addition, the University grants diplomas in certain circumstances in the branches of applied science in which degrees are awarded, and also in textile design and cloth finishing, in woollen and worsted spinning, cloth manufacture, and textile chemistry. Evening classes in a wide range of subjects are also provided for students whose time is occupied in industrial pursuits during the day.

An interesting short history of Bedford College for Women is included in the calendar for the sixty-fourth session, that of 1912-13, of the college, which was recognised in 1900 as a school of the University of London in the faculties of arts and science. It will be remembered that a bequest in 1908 of 11,500*l.* from the late Mr. R. J. Turler enabled the council in the same year to purchase the end of the lease of South Villa, Regent's Park, for the sum of 15,000*l.*, a promise from the Crown having been obtained of a new lease for 99 years. The site is an ideal one. New buildings, for which Mr. Basil Champneys has been appointed architect, and will include a library, laboratories, lecture rooms, and a residence for students, are now in course of erection, and it is hoped that they will be ready for occupation by next Easter. It is estimated that the cost of the undertaking will amount to about 115,000*l.*, including 18,000*l.* which has been expended in connection with the purchase of the lease of the new site. The total sum given and promised amounts to 130,000*l.*, which leaves 15,000*l.* to form the nucleus of an endowment fund.

THE calendar of the North of Scotland College of Agriculture for the session 1912-13 points out that the classes of the college are held in the University of Aberdeen, with the exception of the class in agri-

cultural engineering, which meets in Robert Gordon's Technical College. The courses of instruction provided are arranged for the benefit of every section of the agricultural community. The lectures, in the branches of agriculture and agricultural chemistry, are arranged in a series of three years with the view of giving full treatment to these subjects. Students unable to spare the time for a long course in agricultural science, but who can spare five months in winter, have an opportunity of obtaining a diploma in agriculture conferred by the University. Young men and women who wish to qualify themselves as agricultural teachers or as specialists in some branch of agricultural science may obtain the degree of bachelor of science of the University on passing the preliminary examination of the University and two professional examinations. Extended courses of lectures in forestry are arranged for those desirous of training as factors and land stewards; courses for teachers in school gardening and other subjects required in rural districts are provided, and every effort is being made to supply suitable technical education for the district.

THE *London University Gazette* for September 25 announces a number of courses of advanced lectures in various subjects, among them being a course of three or four lectures on "The Theory of the Solid State," by Prof. W. Nernst, professor of physical chemistry and director of the Institute of Physical Chemistry in the University of Berlin. Other courses to be delivered during the session are:—The fundamental chemical processes of plant life, Prof. H. E. Armstrong, F.R.S.; the Gnetales, Prof. M. J. Benson; the permeability of protoplasm, F. F. Blackman, F.R.S.; the activities of green plants in relation to light, Harold Wager, F.R.S.; meteorology in relation to the navigation of the air, Dr. W. N. Shaw, F.R.S.; the action of enzymes, Prof. W. M. Bayliss, F.R.S.; the physiology of the mammalian heart, Dr. F. S. Locke; protozoa, Prof. E. A. Minchin, F.R.S.; the growth of the vertebrate embryo, R. Assheton; recent work on experimental embryology, Dr. J. W. Jenkinson; mimicry and protective resemblance, Prof. E. B. Poulton, F.R.S.; the evolution of the mammary apparatus in the mammalia, Prof. E. Bresslau, of Strassburg; growth and form, Prof. D'Arcy Thompson, C.B.; the advanced metallurgy of gold, silver, copper, lead, &c., Prof. W. Gowland, F.R.S.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, September 30.—M. Emile Picard in the chair.—Edmond Perrier: The skull known as that of Descartes in the museum. Reasons are given for the probable authenticity of this skull.—Pierre Termier: The scientific results of the Alpine excursion of the Geologische Vereinigung; the lepontine strata to the west of Innsbruck.—M. Gouy: A particular kind of electric currents. A non-electrified body is usually regarded as carrying equal charges of the two kinds of electricity. The latter, according to current views, are carried by particles possessing a certain independence, and under certain conditions may move with different velocities. If this is the case, the movement of a non-electrified body may give rise to an electric convection current, producing its ordinary effects. This view is applied to the case of incandescent gases in motion.—M. Arnaud: Astronomical refraction in the neighbourhood of the horizon.—Em. Bourquelot and Mlle. A. Fichtenholz: The presence of quebrachite in the leaves of *Grevillea robusta*. The fresh leaves contain more than 4 grams of quebrachite per kilogram, or four times the amount extracted from the bark of