

in 1903, describing particularly the remarkable objects of stone, bone, shell, wood, and pottery which he collected during the trip, and giving an insight into their various uses. Dr. C. M. Child, of Chicago University, describes the form-regulation in Coelentera and Turbellaria, of which he made a special study during his occupancy of the Smithsonian table at the Naples Zoological Station, and Dr. Carl H. Eigenmann introduces some new genera of South American fresh-water fishes, and new names for some old genera. Of timely interest is the account of Korean headresses in the U.S. National Museum by the late Mr. F. H. Jennings, in which are described and illustrated twenty-four varieties of Korean hats and other headgear, including headband buttons and hatpins for topknots.

A brief history of the Hodgkins Fund of the Smithsonian Institution, and of what has been accomplished with its income toward "the increase and diffusion of more exact knowledge in regard to the nature and properties of atmospheric air in connection with the welfare of man," bears the name of Helen Waldo Burnside, and is accompanied with an illustration of the beautiful Hodgkins medal. Mr. A. B. Baker gives an account of a notable success in the breeding of black bears, which is of special interest to those having charge of animal collections. In a contribution on Chinese medicine, Dr. James M. Flint briefly explains the origin of medicine and the theory of disease in the Celestial Empire. The last of the series of articles consists of notes on the rocks of Nugsuaks Peninsula and its environs, Greenland, by Mr. W. C. Phalen, the remaining pages of the magazine being occupied by brief descriptions of various activities of the institution and their results.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The following is a copy of the speech delivered on April 28 by the Public Orator, Dr. Sandys, in presenting Prof. Ostwald, of Leipzig, for the degree of Doctor in Science *honoris causa*.

Viri et rerum naturae in scientiis excolendis et scientiarum illarum in terminis propagandis prospere occupati, non unius tantum populi intra fines angustos cohibentur, sed orbis terrarum totius inter cives merito numerantur. Nuper apud Londinienses Faradaii nostri memoriam oratione luculenta prosecutus est vir scientiarum laude illustris, qui a Germanis olim oriundus, Germanorum ultra terminum orientalem Russorum in imperio natus et professoris officio functus, postea in ipsam Germaniam atque adeo ad universitatem insignem Lipsiensem vocatus, in scriptis suis omnibus Germanorum gravitatem cum Francogallorum stilo lucido consociavit. Idem ne Europae quidem terminis contentus est, autumno proximo (nisi fallor), velut alter Mercurius, Atlantis nepos facundus, etiam aequor Atlanticum transiturus. Quanta diligentia, memoria quam tenaci, ingenio quam multiplici praeditus, scientiae chemicae et scientiae physicae confinia quam diu quam feliciter lustravit, a collegis magnis sine ulla invidia peregre laudatus, a discipulis plurimis in omni orbis terrarum regione dilectus. Quot opera, inter sese quam varia, scientiae suae explicandae destinavit; idem etiam aliorum labores in Actis a sese tam diu editis quam diligenter in unum collegit, collectos in ordinem quam perspicuum redegit. Nemo mirabitur Actorum illorum librum prope quinquagesimum viri tanti in honorem nuper esse dedicatum, qui abhinc annos fere quinquaginta natus, vitae suae iam per partem dimidium doctoris nomine decoratus est. Virum talem ad litora nostra honoris causa nuper vocatum, etiam nostro doctoris titulo libenter ornamus.

A COMBINED examination of non-resident candidates for open scholarships, exhibitions, &c., will be held at Trinity College, Clare College, Trinity Hall, Peterhouse, and Sidney Sussex College, Cambridge, beginning on Tuesday, December 6. Candidates will be examined at each college at the same time and by the same papers. Forms of application for admission to the examination may be obtained from any of the Tutors of Trinity College, the Senior Tutor of Clare College, the Master of Trinity Hall, the Senior Tutor of Peterhouse, or the Master of Sidney Sussex College. Entries should be made not later than November

18. Papers will be set in classics, mathematics, natural sciences, moral sciences and history. In mathematics and science the range of subjects included in the examination will be as follows:—*Mathematics*.—Arithmetic, geometry, algebra, trigonometry, elementary statics and dynamics, conic sections treated both geometrically and analytically, and the elements of the differential calculus. *Natural Sciences*.—Physics, chemistry, zoology, botany, physiology, and geology. Candidates for an emolument at Clare College may also offer elementary biology as a subject. Of these subjects no candidate may offer more than three. In making awards, excellence in one subject or in two subjects will be taken especially into account. There will also be (1) a paper of general questions in natural sciences which must be taken by all candidates who offer natural sciences, and (2) an optional paper in mathematics suitable for candidates who offer physics as one of their subjects.

THE Education Bill for Scotland was read a second time in the House of Commons on Monday by a majority of fifty-seven.

A LIST of the courses of lectures proposed for the summer term in the various German-speaking universities and technical schools is given in the *Physikalische Zeitschrift* for April 15.

THE foundation-stone of an extension of the Durham College of Science, Newcastle-on-Tyne, was laid on Monday by Mr. T. G. Gibson. The cost of the new buildings has been provided by a fund of 50,000*l.*, raised to commemorate the life of the first Lord Armstrong, whose name the college will henceforward bear.

A COURSE of ten advanced lectures on the "Tracts of the Brain," by Dr. W. Page May, was commenced yesterday at University College, and will be continued on Wednesdays at 5 p.m. The lectures are open without fee to all internal students of the university.

THE following appointments are announced:—Dr. Friedrich Engel, of Leipzig, professor of mathematics in Greifswald; Dr. J. Schubert, of Eberswald, professor of physics, meteorology and geodesy; Dr. K. Hopfgartner, of Innsbruck, professor of chemistry; Dr. K. Schaum, of Marburg, extraordinary professor of physical chemistry; Prof. Paul Behrend, of Hohenheim, professor of organic chemistry; Prof. Lorenz, of Göttingen, ordinary professor of mechanics; and Prof. Roessler, of Charlottenburg, professor of electro-technics—the last three at the Danzig Technical School; Dr. A. Hagenbach, professor of physics at Aachen; Prof. Moersch, professor of engineering at Zurich; Dr. Wedekind, of Tübingen, and Dr. Otto Dimroth, extraordinary professors.

REPLYING to a question in the House of Commons on April 27, Mr. Brodrick said that papers would shortly be laid on the table relating to the subject of the further maintenance of Coopers Hill College, including the report of the committee which sat last year. In consequence of the strong recommendations of that committee and the evidence brought before them, that efficient candidates for the Public Works Department in India can be provided by other engineering colleges at a less cost to the candidates and to the Indian Government, it has been decided to close the college. No decision, however, has yet been arrived at as to the date of closing, and all possible consideration will be shown to those concerned.

In his presidential address at the recent annual general meeting of the Institute of Chemistry, Mr. David Howard reviewed the work of the council of the institute during the past year. Among other matters of interest he referred to the work of a special committee appointed to consider the advisability of instituting examinations for technical chemists. Mr. Howard said the most common difficulty at present is how to bridge over the gap between the scientific training and the practical work of the technical chemist. "What the chemist has to learn is to think in tons, not in grams." A large number of well known manufacturers consulted by the committee, while agreeing as to the value of a sound training in chemistry and physics, were emphatic that they did not want chemists trained or examined in the special technology of particular industries. The scheme drawn up by the committee is, as far as

possible, based on the opinions of the manufacturers. As Mr. Howard said, it is gratifying to know that in this investigation the institute can rely on the cooperation of so many leaders of industry, among whom are ironmasters, alkali, acid and general chemical manufacturers, brewers, cement makers, and representatives of dyeing, calico printing, and other important industries. A technical chemist possessing all the qualifications suggested by the manufacturers would be at once a competent mechanical engineer, electrical engineer, architect and surveyor, accountant and book-keeper, draughtsman, patent agent, and lawyer, in addition to being a capable chemist, and he would possess also special personal qualities, including the power of organisation, tact and general business capacity. The committee is strongly inclined to think that it is possible so to direct the post-graduate studies of the young chemist that he may adapt himself to technical practice, and thus not only improve his own position, but be better qualified to bear his part in the prevailing struggle of industry.

THE King on April 28 laid the first stone of the new buildings for the Royal College of Science, Ireland, which are situated at Leinster Lawn, Dublin. The ceremony was commenced by the reading of an address by Sir Horace Plunkett, vice-president of the Department of Agriculture and Technical Instruction for Ireland, reviewing the work of the department as a whole, and especially that part of it entrusted to the Royal College of Science for Ireland. Referring to the latter, the address comments on the assistance received by the department from local authorities in the work of developing a system of technical instruction throughout Ireland, and points out the national value of a complete system of education. The King, in reply to the address, expressed his pleasure at performing the ceremony, and continued:—"In these days scientific training is an indispensable condition of success in commercial and industrial life. To be thoroughly effective it requires all the help which research and modern appliances can give. You are therefore wise in providing the improved equipment and the widened opportunity for instruction which this college will henceforth supply. You have told me that the efforts of your department to extend scientific education among the people have been supported by popular sympathy, and by the cooperation of representative public bodies. I am glad to receive this assurance; for without such sympathy and cooperation any scheme of technical instruction, however well devised, must fail to come into close touch with the life of the people, and must fall short of complete success. I agree with you in thinking that a complete system of education is necessary for the full realisation of your aims; and my best wishes go with your efforts to improve the intellectual and material conditions of the country." During his Irish visit the King also took another opportunity of emphasising the value of education in assisting the development of a country. At Kilkenny, in reply to addresses from a number of bodies, including the Kilkenny Agricultural Society, His Majesty said:—"I notice with pleasure the earnest efforts which are now being made for the industrial development of Ireland, and especially for the promotion of the agricultural industry, in which I take great practical interest. Agricultural prosperity, in my judgment, depends largely upon improved educational methods, cooperation, and better facilities for distributing produce. I am glad to know that, along these lines, progress is now being made in Ireland."

SOCIETIES AND ACADEMIES.

LONDON.

Linnean Society, April 21.—Prof. S. H. Vines, F.R.S., president, in the chair.—Mr. Clement Reid exhibited drawings by Mrs. Reid of fruits and seeds of British pre-Glacial, inter-Glacial, and Roman plants: 2nd series—Calycifloræ. The most interesting addition to the inter-Glacial flora is the south European *Cotoneaster Pyracantha*, which occurs abundantly on the Sussex coast in deposits which yield also *Acer monspessulanum*, *Najas minor*, and *N. graminea*. The pre-Glacial Calycifloræ include *Trapa natans*, but the rest of the species yet determined are still living in Britain;

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many, however, need further examination. The plants from Roman Silchester include the vine, bullace, damson, and coriander.—Dr. O. Stapf, on behalf of Mr. W. B. Hemsley, exhibited some specimens of *Primula vulgaris*, Huds., which displayed the phenomenon of phyllody of the calyx in an unusual degree.

Physical Society, April 22.—Dr. R. T. Glazebrook, F.R.S., president, in the chair.—Calculation of colours for colour sensitometers and the illumination of "three-colour" photographic transparencies by spectrum colours: Sir W. de W. Abney. In three-colour photography, photographs have to be taken through a red, a green, and a blue screen, the transparencies or prints from which are then viewed. The exact shades and hues of these screens depend on the light which is used for viewing the transparencies or on the colours employed in printing. The present paper confines itself to the former case.—Normal piling as connected with Osborne Reynolds's theory of the universe: Prof. J. D. Everett. The paper maintains that, in a struggle for existence between different kinds of closest piling, represented by separate clusters with room to change their arrangements, normal piling possesses great advantages, first, in its six sets of lines of spheres, which serve as battering rams, and secondly, in its four sets of tiers in closest array, which facilitate the coalescence of adjacent clusters.—Note on the diffraction theory of the microscope as applied to the case when the object is in motion: Dr. R. T. Glazebrook. According to the Abbe theory of microscopic vision, when a grating is placed on the stage of a microscope and illuminated by plane waves, diffraction images are formed in the focal plane of the object-glass and the images in the view-plane result from these, and this is undoubtedly true. It is proved in this paper that the image in the view-plane may change without an alteration in the position of the diffracted images.—An "automatic gas-pump" was exhibited by Mr. C. E. S. Phillips. The apparatus is constructed upon a plan which enables the pump, when once set in operation, to continue automatically and to produce as perfect a Torricellian vacuum as is possible.

EDINBURGH.

Royal Society, March 21.—Prof. Flint in the chair.—Dr. J. Erskine Murray exhibited and explained a differentiating machine, by means of which the first derivative of a given curve could be traced mechanically. A rod A is pinned at one end to a rectangular frame so as to be capable of revolution in the plane of the frame. A second rod B is retained by guides on the frame so as to be capable of motion only in the direction of its length. A pin in B engages in a longitudinal slot in A, and thus the distance between B and the pin about which A revolves is constant. The displacement of B relatively to the frame is therefore proportional to the tangent of the angle of inclination of A. If the revolving rod A be guided by hand so as to be always tangential to the given curve, a curve the coordinates of which are proportional to the differentials of the original curve is traced out by any point on B. The frame supporting the rods is free to move in direction X at right angles to the rod B. In order to eliminate the y-coordinate of the original curve, the board on which the derived curve is traced is free to move in OY but not in OX.—Dr. J. Halm gave an account of his spectroscopic observations of the rotation of the sun, which had been carried on at the Royal Observatory, Edinburgh, since 1901. The method employed was essentially that used by Duner, but some simplification and greater steadiness of the apparatus had been secured by the employment of a siderostat and heliometer. The results so far obtained seem to point to a decisive influence of solar activity upon the surface rotation. By arranging the results in two groups, one comprising the observations of 1901-2, a time of sun-spot minimum, and the other those of 1903, at a period of vigorously renewed solar activity, Dr. Halm obtained undoubted evidence of the existence of systematic differences between these two groups of quite unexpected magnitude. The decrease of angular velocity from the equator towards the poles, as observed in 1901-2, agreed very well with that found by Duner in 1887-9, also at a time of sun-spot minimum. But the appearance of spots in 1903 was accompanied by an extraordinary increase of angular