

The chief results arrived at were that the time-change of density is negative in the front of cyclones and positive in the rear, that the changes are greater in the front quadrant to the right of the path than in the front quadrant to the left, in which, however, the largest rainfall occurs. From an application of the equation of continuity, the vertical velocity of the air in a moving cyclone was deduced.

Dr. Shaw read a paper on the meteorology of the winter quarters of the *Discovery*. He showed a slide of a relief-map of the district in which the *Discovery* spent the years 1902 and 1903, directing attention to the proximity of Mt. Erebus, the cloud from which enabled the observers to determine the upper-air currents. Some surprise was caused by the statement that the annual amount of bright sunshine at this place was as large as that for Scilly. The wind observations corroborated the theory that had been formed regarding the general circulation of the atmosphere in polar regions, *i.e.* an easterly surface wind with a westerly current in the upper air.

Mr. Bernacchi read a paper which was chiefly concerned with the results of the magnetic observations taken during the *Discovery's* sojourn in the Antarctic regions.

The Rev. H. V. Gill, S.J., read a paper on earthquakes and waves in distant localities. An earthquake at one place may cause the premature occurrence of an earthquake at another place. This precipitation is possibly due to the slight change in the distribution of the earth's mass relative to its axis of rotation, caused by the water disturbance accompanying the earthquake.

Dr. Shaw exhibited diagrams illustrating the storm of August 31 to September 1, the B.A. storm of 1908. The diagrams were collected from stations in connection with the Meteorological Office, and showed how the fury of the storm concentrated itself on the line from Holyhead to Kingstown.

Miss C. O. Stevens read a paper on the great snow-storm of April 25.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The following is the speech delivered by the Public Orator, Dr. Sandys, on Thursday, October 29, in presenting for the complete degree of Master of Arts *honoris causa* Prof. W. J. Pope, Dr. Liveing's successor in the chair of chemistry:—

Viri in Academiam nostram liberalissimi, viri Scientiarum Doctoris nuper honoris causa merito creati, cathedram vacuum relictam occupat hodie vir inter Londinienses natus atque educatus, vir non modo inter Londinienses sed etiam inter Mancunienses scientiam chemicam praeclare professus. Peritis nota sunt opera eius plurima de scientiae illius provincia organica (ut aiunt), deque metallis et crystallis praesertim conscripta. Quae autem ratio intercedat inter corporum naturam pellucidam et primordiorum e quibus corpora illa constent dispositionem, primus omnium (nisi fallor) detexit, et sulphuris, selenii, stanni praesertim in particulis inaequaliter distributis luculenter illustravit. Hodie vero nobis vix necesse est haec omnia subtilius persequi. Satis in hunc diem erit, si professori nostro novo munus suum feliciter auspiciat omnia prospera ex animo exoptamus.

Mr. A. R. Hinks has been appointed Royal Geographical Society university lecturer in surveying and cartography, for three years as from Michaelmas, 1908.

Dr. Marett Tims will give a course of ten lectures on the morphology of teeth in the Vertebrata during the present term. The first lecture will be in the laboratory for advanced zoology on Saturday, November 7.

THE Royal University of Ireland has conferred the degree of D.Sc. *honoris causa* on Prof. Alfred Senior, of Queen's College, Galway, in recognition of his services as a teacher of chemistry in Galway and of his discoveries in organic chemistry, notably his work on acridines.

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THE Right Hon. Earl Carrington, President of the Board of Agriculture, will open the Edric Hall and new workshops of the Borough Polytechnic Institute on Friday, November 13. This extension of the institute is primarily due to the gift of 5000*l.* by the first chairman of the governing body, Mr. Edric Bayley, which has been supplemented by grants from the London County Council amounting to about 10,000*l.*

An address on the correlation of the teaching of mathematics and science will be given by Prof. J. Perry, F.R.S., at a conference of the Mathematical Association and the Federated Associations of London Non-Primary Teachers to be held at the Polytechnic, Regent Street, on Saturday, November 28, at 3 p.m. The chair will be taken by Prof. G. H. Bryan, F.R.S., president of the Mathematical Association. Tickets of admission to the conference can be obtained from Mr. P. Abbott, 5 West View, Highgate Hill, N.

THE annual report of the treasurer of Yale University for the financial year ending June 30 shows additions to the funds of the University during the year of 253,000*l.* The principal items are 12,600*l.* from the Yale alumni fund; from the Archibald Henry Blount bequest, 67,400*l.*; from the Lura Currier bequest, 20,000*l.*; by bequest of D. Willis James, 19,000*l.*; from contributions to the University endowment and extension fund, 67,100*l.*; and from balance of the Ross library fund, 22,400*l.* Gifts to income amounted to 15,300*l.*, of which 6000*l.* came from the Alumni Fund Association.

THE winter session of the Crown School of Forestry opened on November 2. This little-known institution has its headquarters at Parkend, a small village in the Royal Forest of Dean. In a small shed, rough, unpainted, scarcely weather-proof, sixteen students receive instruction in the theoretical aspect of forestry, and in the surrounding forest they study the practical part of the subject. A nursery plot—two acres in extent—has been cleared, and an enclosure of nearly 200 acres will shortly be set apart for experimental work. The director of the school, Mr. C. O. Hanson, late of the Indian Forest Service, makes up in personal enthusiasm what is lacking in the equipment of the school, and so successful has been the work that the Department of Woods and Forests is spending a considerable sum on the equipment of a new building to accommodate the school.

DR. H. T. BOVEY, F.R.S., Rector of the Imperial College of Science and Technology, in his recent address (*NATURE*, October 15, p. 616) recommended the formation of associations of alumni by the constituent colleges, and directed attention to the American method of appointing a secretary each year whose office it is to keep in touch with the students who passed out in his year. Dr. E. F. Armstrong writes to point out that the Central Technical College—which is now a constituent institution of the Imperial College—has had an "Old Students' Association" since 1897, which is kept in touch with its members much in the way that Dr. Bovey advocates. It issues an illustrated journal, *The Central*, in which the doings of past students are regularly recorded; it also administers a successful employment agency bureau. The contributions to this periodical have frequently been mentioned in *NATURE*. Dr. Armstrong also states that a year ago the Old Centralians collected the funds to found a scholarship as a permanent memorial to the long connection of Prof. W. C. Unwin, F.R.S., with their college.

IN a lecture before the Fabian Society on October 28, Prof. M. E. Sadler said that the chief points at which, under present conditions in England, the State should aim, were:—(1) a great reduction in the size of the large classes in many public elementary schools, in order that the teachers might be able to give more individual care to the different pupils; (2) careful medical inspection, at sufficiently frequent intervals, of all school children with the view of securing the due physical development of the rising generation, parental duty in the care of children to be stringently enforced, with liberal aid in cases of

need; (3) generous provision of playgrounds, under skilful supervision, with the view of encouraging a healthy corporate life in all schools; (4) the raising, at dates to be fixed by Parliament, of the present age of exemption from school attendance throughout the country (with a possible reservation of the agricultural districts), first to thirteen and then to fourteen years of age; (5) the abolition by statute of the half-time system in the textile districts; (6) the provision of various forms of educational care for young people during the critical years of adolescence; (7) the laying upon all employers of a statutory obligation to enable their younger workpeople, up to seventeen years of age, to attend courses of suitable instruction, provided or approved by the local authority of the district, and held at a time of day which would prevent those attending the classes from suffering from overstrain of body or of mind.

A MEETING of the Child Study Society was held on October 29, when a paper was read by Miss Alice Ravenhill on the results of an investigation into hours of sleep among elementary-school children. For nearly three years Miss Ravenhill has been collecting information on the question of the quantity of sleep secured by children in English elementary schools. Of 10,000 forms issued, 6,180 were properly filled up, and gave particulars as to 3500 boys and 2680 girls. A comparison between the standard hours of sleep as defined by the best authorities and an average struck from the whole of the material at command shows a deficiency of from $3\frac{1}{4}$ to $2\frac{3}{4}$ hours at each age period, a loss equivalent to one night in four among the youngest and eldest children, and to one night in five among those of intermediate ages. For example, at ages three to five years the average is 10.75 hours, against a standard of fourteen hours, and, at thirteen years, eight hours, against 10.75 hours. The evil of insufficient sleep is widespread. Parents must be roused to a sense of the importance of the subject, and the enforcement of the laws on the employment of children should be rendered obligatory upon local authorities. Sir James Crichton-Browne, who presided, emphasised the need of sufficient sleep, and pointed out that sleep repairs waste in every organ of the body, and stores oxygen in the tissues as a reserve fund against the needs of the following day.

THE Board of Education has decided to introduce a new system of organisation for the Victoria and Albert Museum. Re-organisation of the administrative arrangements for the museum has been rendered necessary by the transfer of the technological branch of the Board of Education from South Kensington to Whitehall. Hitherto the administration of the museum has been supervised and controlled by the principal assistant secretary in charge of that branch of the Board's office and the removal of that branch to Whitehall renders the continuance of that arrangement impossible at so great a distance from South Kensington. In consequence of this transfer the Board decided to take the opportunity of placing the museum on an independent basis, equipped with the necessary administrative as well as technical machinery and staff. A new post has therefore been established under the title of "Director and Secretary of the Art Museum," the holder of which will, in future, be directly responsible to the Board, with assistance from the advisory council, for the whole administration of the museum and for the working of its staff. To this post the President of the Board has appointed Mr. Cecil H. Smith, of the British Museum. Mr. A. B. Skinner will take charge of a new department of architecture and sculpture to be created in the museum. It has been decided to classify the collections as far as possible by materials, and to constitute the following eight departments:—(1) architecture (original architectural objects and sculpture); (2) metalwork; (3) woodwork and leatherwork; (4) textiles; (5) ceramics, enamels, and glass; (6) engraving, illustration, and design; (7) the library; (8) pictures. Arrangements have further been made in the new and old buildings of the museum by which the staff attached to each of the eight departments will be provided with suitable offices in close proximity to the collections respectively under their charge.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 25.—"The Emission and Transmission of Röntgen Rays." By G. W. C. **Kaye**.

The Röntgen rays produced by some twenty elements used as anti-kathodes were investigated.

(1) The relative intensities of the radiations, when unobstructed by any screen, do not follow the order of the atomic weights of the anti-kathodes.

(2) If the different radiations are cut down by screens of increasing thickness, the intensities reach ultimate relative values which are not altered by a further increase in the thickness of the screen: thus at this stage all the radiations have the same hardness. These intensities are very approximately proportional to the atomic weights of the radiators. The relative values of the heavy-atom metals increase somewhat with a rise in potential on the tube.

(3) When screen and radiator are of the same metal, selective transmission of the radiation is manifested, that is, the radiation from the metal is augmented relative to the radiations from other anti-kathodes. The effect is also present to a less extent when radiator and screen have closely adjoining atomic weights.

(4) This augmentation, when radiator and screen are alike, is most pronounced in the case of the metals of the chromium-zinc group. It is least marked for a substance of low atomic weight.

(5) When screen and radiator are alike, the absorption per unit mass of unit area of the screen is relatively low. Benoist's "transparency" curve is much straighter for a radiator of aluminium than for one of platinum working under the same conditions. With an anti-kathode belonging to the chromium-zinc group the curve has to be modified by the addition of a sharp maximum in the neighbourhood of the radiator.

(6) The question of the anomalous results obtained with the secondary radiation from nickel is gone into.

(7) The curve of transmission in which the thickness of screen is plotted as abscissa against the logarithm of the intensity consists of three parts when radiator and screen are of the same metal. First, with thin screens, there is a relatively steep portion, which for thicker screens is followed by a straight-line region indicative of an exponential absorption; this again is ultimately succeeded by a region in which the slope gradually diminishes with the thickness of the screen. The preliminary steepness is attributed to secondary radiation; the ultimate flattening of the curve is probably due to scattering of hard primary rays. If the potential on the tube is not very high the absorption curve indicates homogeneity throughout its length.

(8) When screen and radiator have very different atomic weights, the region of exponential absorption does not appear.

Received August 6.—"The Rate of Production of Helium from Radium." By Sir James **Dewar**, F.R.S.

Some time ago the author communicated a paper to the society entitled "Note on the Use of the Radiometer in observing Small Gas Pressures: Application to the Detection of the Gaseous Products produced by Radio-active Bodies" (Roy. Soc. Proc., A, vol. lxxix., p. 529, 1907). In the course of the experiments recorded in that paper it was shown that a pressure of the fifty-millionth of an atmosphere could easily be detected by radiometer motion, and that the helium produced by radio-active processes from some 10 milligrams of bromide of radium could be definitely detected after a few hours. This led the author to desire some direct measurements of the amount of helium produced by radium, and through the kindness of the Royal Society in allowing him the use of some radium chloride belonging to them, he is able to give a condensed abstract of the experimental results so far obtained.

The salt employed was the 70 milligrams of radium chloride prepared by Dr. T. E. Thorpe, F.R.S., for his determination of the atomic weight of radium, the preparation of which is fully described in Roy. Soc. Proc., vol. lxxx., p. 298.

The apparatus used for the measurements was a McLeod