therefore, the bald outside edge were divided in millimetres, the whole range would be available for metric measurement, and if the lower half of the space at the back of the slide now empty were divided in inches, hat measurements from 20 to 41 inches would complete the range for the English scale. C. V. B.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—Mr. Frederick Wilkin, of Lower Consley Wood, Wadhurst, Sussex, proposes to found a studentship in memory of his son, Mr. Anthony Wilkin, late of King's College, and for this purpose he proposes to make over to the university the tithe rent charge on Wadhurst Parish. This benefaction is for the furtherance of ethnological and archæological research, and the holder is to be termed "The Anthony Wilkin Student." It is proposed that the student shall be selected by the board of anthropological studies; the income is estimated at about 40*l*. a year, and the board suggests that this should be accumulated for periods of five years in order that a substantial sum of about 200*l*. may be available for the selected candidate. The first studentship will be offered in 1910.

Mr. W. W. Watts, of Sidney Sussex College, Mr. H. Y. Oldham, of King's College, Mr. A. R. Hinks, of Trinity College, and Mr. G. G. Chisholm have been appointed examiners for part ii. of the examination for the diploma in geography.

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 5. 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 tutor of Trinity Hall, the senior tutor of Peterhouse, or the master of Sidney Sussex College, to one of whom the form of application (when filled up), together with certificates of birth and of moral character, should be sent. Entries should be made not later than November 23.

A TEACHING observatory will, it is reported by *Science*, be established by the Ontario Government at the University of Toronto. Dr. C. A. Chant expects to visit the observatories of the United States to study their plans and methods.

A CONFERENCE of scientific students was held at Colorado College, Colorado Springs, on April 28 and 29, and representatives of leading universities and colleges were present. A number of papers upon subjects relating to the scientific problems of the Rocky Mountain country were read. A similar conference, held a year ago at the same institution, was of such importance that it led to this second series of meetings.

WITH the view of making the municipal museum a centre of education in the broad principles of natural science, the Hull authorities have arranged with the curator, Mr. T. Sheppard, for the delivery by him of simple lectures to school children on geology, zoology, and anthropology. The lectures are given in the mornings by arrangement. Permission for pupils to visit the museum must be obtained from the clerk of the education committee. Each lecture lasts about half an hour, and is illustrated by objects from the cases. The remainder of the morning is occupied in examining the specimens, taking notes, and making sketches.

MR. A. C. BENSON contributes to the *National Review* an important article on an Eton education. Mr. Benson, though a classicist, is by no means satisfied with the existing state of educational matters at Eton. Describing the average boy who leaves Eton, Mr. Benson says:—"The basis of his education has been, as a rule, the classical basis; that is to say, the greater part of his working hours have been devoted to Latin and Greek. A small percentage of fair classical scholars and a still smaller sprinkling of distinguished classicists is the result. But the average boy leaves Eton with no mastery of either of these languages. He cannot, as a rule, construe at sight an easy passage in either, or turn a piece of English into either language without a large crop of mistakes." In another place Mr. Benson states that the boy "never reaches the stage at which classics become literature." He urges that for the large class of boys who are not intended for the university, the strictly classical programme might be with advantage modified. Mr. Benson believes that a boy who left school with a thorough knowledge of French, "who knew the elements of science, so as to be able to understand something of what was going on in the world around him, in heaven and earth and sea, in field and wood," who knew arithmetic and had a reasonable knowledge of geography and history, would leave school a fairly educated man. Mr. Benson would have a very simple core of education on the lines just indicated, and then any evidence of special capacity, linguistic, mathematical, scientific, or historical, should be carefully observed, and at a certain age a boy's studies should converge more closely upon a special subject, care being taken at the same time that the general education should not be neglected.

A VALUABLE address was delivered by Prof. A. Pedler, F.R.S., Vice-chancellor of the University of Calcutta, and Director of Public Instruction with the Government of Bengal, at the recent convocation of the Senate of the university for conferring degrees. During the course of his remarks, Prof. Pedler said that fifty years ago university education in Bengal had no existence, the doors of western learning had not been opened, and the knowledge of western science was absolutely beyond the reach of anyone in the country. During the last half-century the possibilities of obtaining western knowledge and western culture, and the facilities for higher education, have been rapidly developed, until a whole network of educational institutions has been spread over Bengal. Inquiring as to whether the form of education being given to the people is affecting them in the most satisfactory way, Prof. Pedler came to the conclusion that it is not. The arrangements he said, are wanting in concentration of effort, in thoroughness of method, and in the intelligent appreciation of means to ends. After instituting a comparison between what has been accomplished in Japan and in Bengal, he came to the conclusion that the secret of the brilliant success of university education in Japan is to be found in the observance of certain cardinal principles, viz. patience in obtaining results; thoroughness in work; concentration of university work in a few really well equipped and strongly staffed colleges, each institution being devoted to one special section of learning, which is taught thoroughly; adaptation of the courses to the practical wants of life and of modern civilisation, as exemplified by the large proportion of graduates who elect the practical rather than literary courses of study; originality as shown by the large number of young men who undertake research work, and also shown by the large number of original contributions in science. In the future, Prof. Pedler remarked, it will be necessary in Bengal to adopt all these principles and to adhere to them with uncompromising tenacity, if university work is to be placed on a really satisfactory footing. The principles could also be applied with profit to a large part of the work of our own educational institutions.

SOCIETIES AND ACADEMIES.

LONDON.

Geological Society, April 19.—Mr. H. B. Woodward, F.R.S., vice-president, in the chair.—The Blea Wyke beds and the Dogger in north-east Yorkshire: R. H. **Rastall.** The author describes the type-section at Blea Wyke in detail, dividing the rocks into the following divisions, enumerated in descending order:—(5) Dogger; (4) yellow beds; (3) Serpula beds; (2) Lingula beds; (1) Striatulus shales. Descriptions and fossil lists from these divisions are given, and the succession is compared with others.—Notes on the geological aspect of some of the north-eastern territories of the Congo Free State: G. F. J. **Preumont,** with petrological notes by J. A. **Howe.** This paper is a brief sketch of the geological structure of the northern part of the Congo State, from Buta on the River Rubi and Bima

on the Uelle in the west, to Lado and Dufile on the Nile. In the whole of this region, the only post-Primary rocks met with, other than those of comparatively modern alluvial origin, were chocolate-coloured shales (Buta Shales) and sandstone, and an Oolitic limestone, on the extreme west. From the Lipodongu Falls on the Rubi, and thence through Poko to Rungu, on the Bomokandi River, none but granitic rocks (gneisses) were observed. Along the Uelle, from Bima to Bomokandi, the same rocks were seen. In the centre of the region mica-schists, quartzites, and similar metamorphic rocks replace the granite wholly or in part. A noticeable feature here is the presence of a range of isolated hills, composed almost completely of great beds of magnetite and hæmatite occurring in the schistose series. In the south-eastern portion of the region visited, between the Uelle-Kimbali and Bomokandi rivers, a great plutonic massif is laid bare in the mountainous district of Arebi. The plutonic massif itself contains microclinic gneiss, and abundant diabasic rocks, and the same rocks in all stages of dynamo-metamorphism. On the boundary between the Congo State and the Bahr-el-Ghazal, several hills made up of rocks of coarse gneissose and schistose character are described; some of these rocks are rich in tourmaline, kyanite, and garnet in large crystals. From the region of the Enclave de Lado and the western side of the Nile between Lado and Dufile, mica-schists, quartzites, and microcline-gneisses are described. The alluvium of a large part of the Uelle is covered, on the higher ground, by a deposit of limonitic conglomerate; in places this may be due to the decomposition *in situ* of the alluvium, but in the neighbourhood of the iron-mountains a sort of passage may be seen between a conglomerate of fresh iron-ores and the more general type of limonitic conglomerate (laterite?).

PARIS.

Academy of Sciences, May 1.—M. Troost in the chair.—New researches on chemical combination: M. **Berthelot.** Various substances were sealed up in fused quartz tubes, heated for one hour at 1300° C. in an electric furnace, and suddenly cooled by dropping into water. Nitrogen and hydrogen gave no trace of ammonia; ammonia was completely split up into its constituents, and the stability was not increased by the presence of hydrochloric acid. The latter gas, heated alone, was not decomposed, and hydrogen sulphide behaved similarly if the cooling was slow, but showed evidence of dissociation into hydrogen and sulphur with instantaneous cooling.—On the permeability of tubes of fused silica: M. **Berthelot.** At the ordinary temperature, no hydrogen will pass through the walls of a fused quartz tube, even into a barometric vacuum, and even at 600° to 800° no appreciable amount passes through. At 1300° C., on the other hand, the amount transpired is considerable. Neither hydrochloric acid nor carbon dioxide get through at 1300° C.; the transpiration of nitrogen is not sensible at 600° C., very slight at 1000° C., becoming marked at 1300° C. to 1400° C. Some preliminary experiments with glass at lower temperatures appear to show similar effects, and these observations are being continued.—The action of mercuric iodide on sulphuric acid and on the sulphates of mercury: Alfred **Ditte.**—On the earthquake of April 29: M. **Mascart.** The seismograph at Bagnères-de-Bigorre showed horizontal vibrations at 2h. 1m. 20s., whilst the same oscillation was indicated at Grenoble at 1h. 59m. 15s., a difference of time corresponding to the rate of transmission through the ground.—On the triboluminescence of arsenious acid: M. **Guinchant.** The light given off by arsenious acid is due to the breaking and transformation of the crystals after their formation. The radiations are actinic, and are without any effect on the electroscope. Similar phenomena taking place during the reduction of hypochlorites and hypobromites are described, the effects in this case being attributed to the production and decomposition of haloid compounds of nitrogen.—On the physical impossibility of putting in evidence the motion of translation of the earth: P. **Langevin.** In a discussion of an experiment by Trouton and Noble it is proved that it ought to give a negative result for all orders of approximation and whatever system of suspension be employed for the condenser.—On the heat of vaporisation of liquefied gases: E. **Mathias.**—Heat in the displacement of a capillary system: M. **Ponsot.**—On the difference in temperature of bodies in contact: E. **Rogovski.** Fine wires of different diameters were heated by an electric current, and cooled by water flowing at known rates. The temperature of the wire was measured by means of its electrical resistance, and the difference of temperature between the wire and the cooling water determined as a function of the rate of flow of the water and of the diameter of the wire.—The preparation of anhydrous chlorides of the metals of the rare earths: Camille **Matignon.** The solid material obtained by the evaporation of the solution of the oxide in hydrochloric acid is heated in a current of chlorine and hydrochloric acid gas charged with the vapours of chloride of sulphur. It is possible to obtain in this way very rapidly either large or small quantities of anhydrous chlorides. Particulars are given with analyses showing the purity of the products, of the chlorides of lanthanum, neodidymium, praseodidymium, samarium, and yttrium.—On cæsium amide: E. **Rengade.** The amide is prepared by the action of dry ammonia upon the fused metal at 120° C., the purity of the product being fixed by the determination of the amount of hydrogen evolved. The amide dissolves readily in liquid ammonia, and the solution absorbs oxygen at −60° C. giving a precipitate, the hydroxide and nitrite of cæsium being formed, together with ammonia.—On a new reagent for potassium: Eugenio Pinerua **Alvarez.** The reagent proposed is a 5 per cent. solution of sodium amido-naphthol sulphonate.—On the conditions of development of the mycelium of Morchella: G. **Fron.** The mycelium of this edible mushroom requires for its strong growth plenty of hydrocarbon food, inulin and starch being especially favourable; the mineral food is of less importance.—Calcium nitrate in agriculture: E. S. **Bellenoux.** The author proposes to replace nitrate of soda by the nitrate of calcium, and gives results of comparative trials of the two showing the superiority of the latter as a manure.—The variation of the osmotic pressure in muscle caused by contraction: Stéphane **Leduc.** It is shown experimentally that an elevation of the osmotic pressure in a muscle is a consequence of contraction, the rise of the pressure being more marked as the stimulations are more prolonged.—The variations undergone by glucose, glycogen, fat, and soluble albumens in the course of the metamorphoses in the silkworm: C. **Vaney** and F. **Maignon.**—On a combination of methæmoglobin containing fluorine: H. **Ville** and E. **Derrien.** In a previous paper the authors have shown that the addition of fluorine compounds to a solution of methæmoglobin causes a marked change in the absorption spectrum, and they were thus led to the conclusion that a definite compound might possibly be produced. This compound has been isolated in the crystalline form, details of its preparation and properties being given in the present note.—Philocatalase and anticatalase in animal tissues: F. **Battelli** and Mlle. L. **Stern.**—On the action of formic acid in nervous diseases accompanied with trembling: E. **Clément.** The use of formic acid has been attended with great success in certain cases.—The volcanic regions traversed by the Sahara expedition: F. **Foureau** and Louis **Gentil.**

NEW SOUTH WALES.

Linnean Society, March 29.—Mr. T. Steel, president, in the chair.—The botany of north-western New South Wales: F. **Turner.** The characteristics of the indigenous vegetation and the exotic weeds of the country lying between the New South Wales-Queensland border and 33° S. lat., and 147° and 151° 20′ E. long., are discussed. The census of the phanerogams and vascular cryptogams given comprises a total of 452 genera and 1137 species.—Contribution to our knowledge of the physiology of the pancreas: H. G. **Chapman.** The conclusions arrived at in this paper, which is a preliminary communication, may be summarised as follows:—(1) secretins from the echidna, wallaby, Australian water-tortoise, and ibis are active upon the dog in causing a flow of pancreatic juice; (2) secretin does not appear to cause pancreatic secretion in the echidna; (3) the flow of pancreatic juice produced by pilocarpine is inhibited by atropine, while the flow produced by secretin is not so

inhibited; (4) stimulation of the vagus nerve does not inhibit the secretion due to secretin; (5) the pressure under which the fluid is secreted in the pancreatic duct is equivalent to 9 inches of the juice; (6) pancreatic juice may be activated by leucocytes so that it acts upon proteids.

DIARY OF SOCIETIES.

THURSDAY, MAY 11.

ROYAL SOCIETY, at 4, Election of Fellows.—At 4.30, On the Resemblances existing between the "Plimmer's Bodies" of Malignant Growths and certain Normal Constituents of Reproductive Cells of Animals: Prof. J. B. Farmer, F.R.S., J. E. S. Moore, and C. E. Walker.—The Effect of Plant Growth and of Manures upon the Soil: the retention of Bases by the Soil: A. D. Hall and Dr. N. H. J. Miller.—A Study of the Process of Nitrification with Reference to the Purification of Sewage: Miss H. Chick.—Pathological Report on the Histology of Sleeping Sickness and Trypanosomiasis; with a Comparison of the Changes found in Animals infected with *T. gambiense* and other Trypanosomata: Dr. A. Breinl.—(1) The Experimental Treatment of Trypanosomiasis in Animals; (2) Remarks on Mr. Plimmer's Note on the Effects produced in Rats by the Trypanosomata of Gambian Fever and Sleeping Sickness: Dr. H. Wolferstan Thomas.

ROYAL INSTITUTION, at 5.—Flame: Sir James Dewar, F.R.S.

SOCIETY OF ARTS, at 4.30.—The Manufactures of Greater Britain. III. India: H. J. Tozer.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Telephone Traffic: H. L. Webb.

SOCIOLOGICAL SOCIETY, at 8.15.—Some Guiding Principles in the Philosophy of History: Dr. J. H. Bridges.

MATHEMATICAL SOCIETY, at 5.30.—On the Intersections of two Conic Sections: J. A. H. Johnston.—On a System of Conics yielding Operators which Annihilate a Cubic and its Bearing on the Reduction of the Cubic to the Sum of four Cubes: H. G. Dawson.—High Pellian Factorisations: Lt.-Col. A. Cunningham.

FRIDAY, MAY 12.

ROYAL INSTITUTION, at 9.—The Pressure due to Radiation: Prof. E. F. Nichols.

PHYSICAL SOCIETY, at 8.—A Simple Method of Determining the Radiation Constant; suitable for a Laboratory Experiment: Dr. A. D. Denning.—A Bolometer for the Absolute Measurement of Radiation: Prof. H. L. Callendar, F.R.S.—The Resistance of a Conductor the Measure of the Current flowing through it: W. A. Price.

MALACOLOGICAL SOCIETY, at 8.—Note on *Helix pellita*, Fér., and other Shells from the Pleistocene Cave-deposits of East Crete: Rev. R. Ashington Bullen.—Notes on Recent Spanish Shells from Granada and Carmona: Rev. R. Ashington Bullen.—Description of a new Species of Vitrea from Greece: E. A. Smith.—Descriptions of new Forms of Marginellidæ and Pleurotomidæ: E. R. Sykes.

ROYAL ASTRONOMICAL SOCIETY, at 5.—Discussion of the Observations of the Satellite of Neptune made at the Royal Observatory, Greenwich, in the years 1902–3–4: F. W. Dyson and D. J. R. Edney.—Further Note on the Density and Prolateness of Close Binary Stars: A. W. Roberts.—On Hansen's Coefficients for the Inequalities in the Moon's Longitude: E. Nevill.—A Supposed Instance of Sudden Change on Jupiter: Major P. B. Molesworth.—Optical Distortion of the Object Glass of the Astrographic Telescope, deduced from Measures of the Eros Photographs, Communicated by the Astronomer Royal: Royal Observatory, Greenwich.—*Promised Papers*: On the Formula for Connecting Photographic Diameters with Stellar Magnitudes: H. H. Turner.—The Determination of Stellar Proper Motions without Reference to Meridian Observations: A. R. Hinks.—Notes on the Use of Thorp Gratings for Eclipse Work: Dr. W. J. S. Lockyer.

SATURDAY, MAY 13.

ROYAL INSTITUTION, at 3.—Moulds and Mouldiness: Prof. Marshall Ward, F.R.S.

MONDAY, MAY 15.

SOCIETY OF ARTS, at 8.—The Uses of Electricity in Mines: H. W. Ravenshaw.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—Exploration and Survey in Central Tibet and to the Sources of the Brahmaputra: Captain C. H. D. Ryder.

VICTORIA INSTITUTE, at 4.30.—The Messiah of Quadian: The Rev. Dr. Griswold.

TUESDAY, MAY 16.

ROYAL INSTITUTION, at 5.—The Study of Extinct Animals: Prof. L. C. Miall, F.R.S.

ROYAL STATISTICAL SOCIETY, at 5.

ZOOLOGICAL SOCIETY, at 8.30.—A Contribution to the Knowledge of the Encephalic Arterial System in Sauropsida: F. E. Beddard.—On Stridulating Halyinæ with Descriptions of New Genera and Species: Dr. E. Bergroth.—On the Classification of the Anthropoid Apes as Proposed by the Hon. Walter Rothschild: Sir Harry Johnston.

SOCIETY OF ARTS, at 8.—Excavation of the Oldest Temple at Thebes: H. R. Hall.

WEDNESDAY, MAY 17.

SOCIETY OF ARTS, at 8.—The Use of Wood Pulp for Paper Making: S. Charles Phillips.

ROYAL MICROSCOPICAL SOCIETY, at 8.—The Movements of Diatoms and other Microscopic Plants: D. D. Jackson.—Exhibition of Slides of the Oribatidæ.

ROYAL METEOROLOGICAL SOCIETY, at 4.30.—Measurement of Evaporation; R. Strachan.—Logarithmic Slide-Rule for reducing Readings of the Barometer to Sea-level: Dr. J. Ball.

CHEMICAL SOCIETY, at 5.30.—The Chlorination of Methyl Derivatives of Pyridine. Part I. 2-Methyl Pyridine: W. J. Sell.—The Absorption Spectra of Uric Acid, Murexide and the Ureides in Relation to Colour and to their Chemical Structure: W. N. Hartley.—Further Studies on Dihydroxymaleic Acid: H. J. H. Fenton.—The Thermal Decomposition of Formaldehyde and Acetaldehyde: W. A. Bone and H. L. Smith.—The Synthesis of Formaldehyde: D. L. Chapman and A. Holt, Jun.—The Influence of Light on Diazo-reactions. Preliminary Notice: K. J. P. Orton, J. E. Coates, and (in part) F. Burdett.

THURSDAY, MAY 18.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: On Lesage's Theory of Gravitation and the Repulsion of Light: Prof. G. H. Darwin, F.R.S.—The Atomic Weight of Chlorine; an Attempt to Determine the Equivalent of Chlorine by burning with Hydrogen: Prof. H. B. Dixon, F.R.S., and E. C. Edgar.—The Flow of the River Thames in Relation to Briiish Pressure and Rainfall: Sir Norman Lockyer, K.C.B., F.R.S., and Dr. W. J. S Lockyer.—Thorianite, a New Mineral, from Ceylon: Prof W. R. Dunstan, F.R.S., and G. S. Blake.—The Elastic Properties of Steel at High Temperatures: Prof. B. Hopkinson and F. Rogers.—Modified Apparatus for the Measurement of Colour, and its Application to the Determination of the Colour Sensations: Sir William de W. Abney, K.C.B., F.R.S.—Further Observations on the Germination of the Seed of the Castor Oil Plant (*Ricinus communis*): Prof. J. Reynolds Green, F.R.S., and H. Jackson.—On the Efferent Relationship of the Optic Thalamus and Deiter's Nucleus to the Spinal Cord, with Special Reference to the Cerebellar Influx Theory (Hughlings Jackson) and the Genesis of Decerebrate Rigidity (Sherrington): Dr. F. H. Thiele.—On Reciprocal Innervation of Antagonistic Muscles. Eighth Note: Prof. C. S. Sherrington, F.R.S.—The Structure and Function of Nerve Fibres: Prof. J. S. Macdonald.—On the Occurrence of Anopheles (Myzomyia Listoni in Calcutta: Major A. Alcock, C.I.E., F.R.S., and Major J. R. Adie.

ROYAL INSTITUTION, at 5.—Flame: Sir James Dewar, F.R.S.

SOCIETY OF ARTS, at 4.30.—Plague in India: Dr. C. Creighton.

FARADAY SOCIETY, at 8.—An Application to Electrolytes of the Hydrate Theory of Solutions: T. M. Lowry.

FRIDAY, MAY 19.

ROYAL INSTITUTION, at 9.—The Native Races of the British East Africa Protectorate: Sir Charles Eliot, K.C.M.G.

EPIDEMIOLOGICAL SOCIETY, at 8.30.

SATURDAY, MAY 20.

ROYAL INSTITUTION, at 3.—The Evolution of the Kingship in Early Society: Dr. J. G. Frazer.

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