

thus pave the way to such legislative reform as may be necessary to facilitate the introduction of a national system.

If I can be instrumental in engaging the interest of the Society in these important questions, especially that of smoke prevention, I shall vacate this chair next year with the pleasing consciousness that my term of office has not been devoid of a practical result.

### UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—In the Higher Local Examination, in which the majority of the candidates are women, there was a notable falling off this year in the number of candidates in the Natural Science group of subjects. In 1880 there were 99, and 26 failed; in 1881 there were 89, and 17 failed; in 1882, only 39, and 9 failed. The total number of candidates increased from 882 in 1881 to 961 in 1882. The examiners' reports do not indicate any special falling off in the attainments shown by the candidates. In the elementary paper (including Physics, and Biology) the results were not particularly satisfactory. Confusion in the use of terms was common, and the inability to use chemical formulæ was very marked in some cases. In Physiology mistakes were made with regard to subjects of great practical interest, and many of them might have been avoided by reference to every-day experience. In Chemistry the theory was better understood than practical laboratory details.

A supplementary local examination was held in September, for the benefit of candidates seeking exemption from the Previous Examination, and of others desiring to become medical students, &c. Nineteen intending medical students entered, none of whom satisfied the requirements of the General Medical Council.

The Fellows elected at St. John's College last week included Prof. W. J. Sollas, 1st class in the Natural Science Tripos, 1873, Professor of Geology in University College, Bristol, and author of many valuable geological and palæontological memoirs; Mr. J. S. Yeo, Second Wrangler and Second Smith's Prizeman, 1882.

Dr. Hans Gadow will conduct an advanced class in the Morphology of the Vertebrata at the New Museums during the remainder of the present term.

The Members appointed by the Senate on the General Board of Studies, on which much important work will henceforth devolve, are Messrs. Bradshaw (University Librarian), J. Peile, Prof. Cayley, Aldis Wright, Dr. Parkinson, Coutts Trotter, Dr. Phear (Master of Emmanuel College), and Prof. Stuart.

The special Boards of Studies relating to Natural Sciences have selected the following representatives on the General Board of Studies:—Medicine, Prof. Paget; Mathematics, Dr. Ferrers; Physics and Chemistry, Prof. Liveing; Biology and Geology; Music, Mr. Sedley Taylor.

Prof. Stuart has issued his address as the liberal candidate for the University, in succession to the Right Hon. Sir H. Walpole, who proposes to resign.

### SCIENTIFIC SERIALS

*The American Journal of Science*, October.—Notes on physiological optics, No. 5.—Vision by the light of the electric spark, by W. L. Stevens.—Crystals of monazite from Alexander county, North Carolina, by E. S. Dana.—Occurrence and composition of some American varieties of monazite, by S. L. Penfield.—Irregularities in the amplitude of oscillation of pendulums, by C. S. Peirce.—The Deerfield dyke and its minerals, by B. K. Emerson.—Occurrence of *Siphonotryeta scotica* in the Utica formation near Ottawa, Ontario, by J. F. Whiteaves.—A recent species of *Heteropora*, from the Strait of Juan de Fuca, by the same.—Notes on interesting minerals occurring near Pike's Peak, Colorado, by W. Cross and W. F. Hillebrand.

*Journal of the Asiatic Society of Bengal*, vol. 4, part 2, No. 1 (August 31, 1882), contains: On a collection of Japanese Clausilidae made by Surgeon R. Hungerford in 1881, by Dr. O. F. von Möllendorff (plate 1); out of 21 species, 10 are described as new. Also, by the same author, on *Clausilia nevilleana*, a new species from the Nicobars, and descriptions of three new Asiatic Clausilidae.—Second list of Diurnal Lepidoptera from the Nicobars, by J. Wood-Mason and L. de Nicéville (plate 3).—On some new or little-known Mantodea, by J. Wood-Mason

*Bulletin de l'Académie Royale des Sciences de Belgique*, No. 8.—On the new note of M. Dupont concerning his re-vindication of priority of M. Dewalque.—On the means proposed for calming the waves of the sea, by M. Van der Mensbrugghe.—On the dilatation of some isomorphous salts, by M. Spring.—Notes of comparative physiology, by M. Fredericq.—On some brominated derivatives of camphor, by M. de la Royère.—On the central bone of the carpus in mammalia, by M. Lebourcq.—Action of chlorine on sulphonic combinations, and on organic oxy-sulphides, by MM. Spring and Wissinger.

*Verhandlungen der Naturforschenden Gesellschaft in Basel*, Theil 7, Heft 1, 1882, contains: Studies on the history of the deer family, No. 1.—The skull structure, by L. Rüttimeyer.—Studies on *Talpa europæa*, by Dr. J. Kober. The literature is given in detail, followed by notes on the mole's place in the order, its local names and habits, and on its anatomy and development (plates 1 and 2, chiefly relating to dentition and embryos).—First supplement to the Catalogue of the Collection of Reptiles in the Basle Museum, by F. Müller. Notes are appended to some of the rarer species, and a new genus and species (*Tropidoccephalus azureus*) are indicated for a form allied to *Leiödera chilensis*, Gray, taken in Uruguay; it is figured on plate 3. The register of the collection to December, 1881 indicates 933 species.—On the hail-storm of June 29, 1879, by E. Haigenbach-Bischoff and others.—On the explosive powers of ice and on the Gletscherkorn, by E. H. Bischoff.—Meteorological Report for 1881, with reports by L. Rüttimeyer on the comparative anatomy collections, and by F. Burckhardt and R. Holtz, on the map collection of the Society.

### SOCIETIES AND ACADEMIES

#### LONDON

**Mathematical Society**, November 9.—Mr. S. Roberts, F.R.S., president, in the chair.—After the reading of the Treasurer's and Secretaries' reports, the Chairman briefly touched upon the loss the Society had sustained during the recess, by the death of Prof. W. Stanley Jevons, F.R.S.—After the ballot for the Council of the ensuing session had been taken, Prof. Henrici, F.R.S., the newly elected president, took the chair, and called upon Mr. Roberts to read his address, which was entitled, "Remarks on Mathematical Terminology and the Philosophical Bearing of Recent Mathematical Speculations concerning the Realities of Space."—Mr. W. M. Hicks was admitted into the Society.—The following communications were made:—On in- and circumscribed polyhedra, Prof. Forsyth.—Note on quartic curves in space, Dr. Spottiswoode, P.R.S.—Note on the derivation of elliptic function formulæ from confocal conics, Mr. J. Griffiths.—On the explicit integration of certain differential re- solvents, Sir J. Cockle, F.R.S.—On compound determinants, Mr. R. F. Scott.—On unicursal twisted quartics, Mr. R. A. Roberts.

**Geological Society**, November 1.—J. W. Hulke, F.R.S., president, in the chair.—Prof. Louis Lartet, of Toulouse, was elected a Foreign Correspondent of the Society.—The following communications were read:—The Hornblendic and other schists of the Lizard District, with some additional notes on the Serpentine, by Prof. T. G. Bonney, M.A., F.R.S., Sec. G.S. The author described the metamorphic series, chiefly characterised by hornblendic schist, which occupies the southern portion of the Lizard and an extensive tract to the north of the serpentine region, besides some more limited areas. He found that this series was separable into a lower or micaceous group—schists with various green minerals (often a variety of hornblende), or with brownish mica; a middle or hornblendic group, characterised by black hornblende; and an upper or granulitic group, characterised by bands of quartz-felspar rock, often resembling in appearance a vein-granite. These are all highly metamorphosed; yet the second and third occasionally retain to a remarkable extent indications of the minuter bedding structures, such as alternating lamination and current bedding of various kinds. They form, in the author's opinion, one continuous series, of which the uppermost is the thinnest. The general strike of the series, though there are many variations, is either north-west or west-north-west. The junctions of the Palæozoic with the metamorphic series at Polurrian and at Porthalla were described. These are undoubtedly faulted; and the two rocks differ greatly, the former being a slate like any ordinary Palæozoic rock, the other a highly metamorphosed schist. Moreover,

fragments of the hornblende schist and a kind of gneiss occur in a conglomerate in the former, south of Nare Point. The author considers the metamorphic series (the microscopic structure of which was fully described) undoubtedly Archæan, and probably rather early in that division. The rocks of the micaceous group have considerable resemblance in the greenish and lead-coloured schists of Holyhead Island and the adjoining mainland of Anglesey, and of the Menai Strait. Two outlying areas of serpentine, omitted in his former paper, were described—one at Polkerris, the other at Porthalla. The latter shows excellent junctions, and is clearly intrusive in the schist. The author stated that he had re-examined a large part of the district described in his former paper, and had obtained additional evidence of the intrusion of the serpentine into the sedimentary rock with which it is associated. This evidence is of so strong a nature that he could not conceive the possibility of any one who would carefully examine the district for himself, entertaining a doubt upon the matter.—Notes on some Upper Jurassic *Astrorhizidæ* and *Littolidæ*, by Dr. Rudolf Häusler, F.G.S.

PARIS

**Academy of Sciences, November 6.**—M. Blanchard in the chair.—The following papers were read:—On the comparative observation of telluric and metallic lines as a means of estimating the absorbent powers of the atmosphere, by M. Cornu. He selects telluric lines (caused by aqueous vapour, and varying in intensity with the amount of it) near D, the scale being four times as large as Ångström's. Metallic lines, for comparison, are indicated; also a method of deducing the total quantity of vapour.—Results of experiments made at the exhibition of electricity, &c. (continued), by M. Allard and others. Three more systems are here discussed.—On M. Siemens' new theory of the sun, by M. Hirn. The recombination of the elements dissociated in space could occur only at a notable distance from the sun's photosphere, and on falling into this they must be anew entirely dissociated, an action which would cost the heat developed by combination. Again, the work done by solar radiation in dissociation must reduce the intensity of radiation; so that the brightness of the sun, stars, and planets should diminish much more rapidly than inversely as the square of the distances. M. Hirn also supports M. Faye's objections by numerical examples.—On the functions of seven letters, by M. Brioschi.—The earthquake of the Isthmus of Panama, by M. de Lesseps. The phenomena (of which he gives a scientific account) seem to have been much exaggerated. The character of comparative immunity of the isthmus (as compared with regions near) is not seriously affected; and in any case, the construction of a maritime canal without locks is justified. There is no ground for apprehension as to the banks of the canal.—M. Peligot presented a "Treatise of Analytical Chemistry applied to Agriculture," and indicated its scope.—MM. de la Tour du Breuil addressed a further note regarding their process for separation of sulphur; they have modified the process so that it is applicable either to resistant or to pulverulent ores.—On the comet observed in Chili in September, by M. de Bernardières.—On the great southern comet observed at the Imperial Observatory of Rio de Janeiro, by M. Cruls. *Inter alia*, he refers to the aspect of the tail as of a current of extremely bright light, in which were distinct bright lines. Behind the nucleus was a dark space, and one was reminded of a bridge-pile in a strong current. The tail extending a length of 12°, seemed suddenly interrupted, and the extension for 15° beyond was of much less width and brightness. Sodium and carbon lines were observed in the spectrum.—On the functions of the genus zero and of genus one, by M. Laguerre.—On a result of calculation obtained by M. Allégret, by M. MacMahon.—On the relation between the electromotive force of a dynamo-electric machine and its velocity of rotation, by M. Levy.—Spectrophotometric measurements of different points of the solar disc, by MM. Gouy and Thollon. They could measure separately the 200,000th part of the solar disc, and the thousandth part of the spectrum. The figures obtained show the decrease of radiation on approaching the limb (greater the more refrangible the rays). The method is also applied to spots.—On the comparison of mercury thermometers with the hydrogen thermometer, by M. Crafts. Fifteen Paris thermometers examined (the crystal containing 18 per cent. lead oxide) behaved like the thermometers of ordinary glass studied by Regnault, but very unlike those of Choisy-le-Roy crystal (with nearly twice as much oxide). A German thermometer of soda-

glass gave a curve much nearer the mean than many others of Paris crystal.—On a hydrate of molybdic acid, MoO<sub>3</sub>·2HO, by M. Parmentier.—On the transformation, in cold, of the blood of animals into solid and inodorous manure, by a new ferric sulphate, by M. Marguerite-Delacharlonny. This sulphate has the formula Fe<sub>2</sub>O<sub>3</sub>·4SO<sub>3</sub>. With it the elimination of the water attains nearly one-half. It forms a hydrate which crystallises easily, and dissolves readily in heat. On adding a solution of the sulphate to fresh blood, the latter forms in a few seconds a firm elastic paste. It is then treated in a hydraulic press, and forms a sort of cake.—Researches on the passage of alcoholic liquor through porous bodies, by M. Gal. His experiments show the influence of the surrounding atmosphere on the alcoholic strength of liquids in bladders (an influence that has been too much overlooked).—On the reduction of sulphates by living beings, by MM. Etard and Olivier. The authors proved experimentally the reduction of sulphates, by Beggiatoa, and found at least three other algæ capable of the same action.—On mono-chlorised allylic alcohol and CH<sub>2</sub>=CCl-CH<sub>2</sub>(OH) and its derivatives, by M. Henry.—Chemical studies on white beet of Silesia (continued), by M. Leplay.—On the reduction of nitrates in arable land (continued), by MM. Deheraine and Maquenne. *Bacillus amylobacter* is probably the reducing agent.—Direct fermentation of starch; mechanism of this metamorphosis, by M. Mercano. Diastase is a product of the vital activity of the microbe of maize, which produces it incessantly as it traverses the envelopes of the starch grains, thus favouring its action on the stratified granuloce. The microbe is that which causes the fermentation of sugar-cane juice.—On the rôle of earthworms in propagation of charbon, and on the attenuation of the virus, by M. Feltz. His experiments confirm the views of M. Pasteur as against those of M. Koch.—On the disinfectant and antiseptic action of copper, by M. Burcq. He suggests treatment of infectious diseases with salts of copper, injection of the wood of huts with copper sulphate, also applications of copper to infected furniture, clothing, &c.—Analysis of the reflex of C. Loven, by M. Laffont.—On the venomous apparatus and the poison of the scorpion, M. Joyeux-Laffaie. The poison should be placed among poisons of the nervous system (Bert) and not among blood-poisons (Joussot de Bellesme).—Researches on the genital organ of oysters, by M. Hoek.

VIENNA

**Imperial Academy of Sciences, October 5.**—E. v. Bruecke, vice-president, in the chair.—The following papers were read:—L. Ditscheiner, on Guebard's rings.—L. Pebal, note on the mechanical separation of minerals.—H. Schwarz, on new bodies obtained from coal-tar, isomerides of pyroprocessol.—F. Schrockenstein, geological leisure hours; a contribution to the petrography of crystalline rocks.

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