

UNIVERSITY AND EDUCATIONAL
INTELLIGENCE

EDINBURGH.—The Marquis of Hartington has, by a large majority over Mr. Cross, been elected Lord Rector of Edinburgh University.

PRUSSIA.—We notice from the last report of the Prussian Minister of Instruction that the present number of instructors in the ten universities amounts to 896, viz., 466 ordinary professors, 7 honorary, 199 extraordinary, and 224 *privat-docenten*. The philosophical faculties include 400, the medical, 250, the legal, 86, and the theological, 110. The number of instructors varies from 29 at Münster, to 201 at Berlin. The number of students is about nine times that of the professors, viz., 8,209, and includes 1,080 from other countries than Prussia. According to their faculties they are divided as follows: evangelical-theological, 684, catholic-theological, 289, legal, 2,261, medical, 1,349, and philosophical, 3,626. The attendance at the universities during the past summer was Berlin 2,237, Breslau, 1,245, Göttingen, 917, Bonn, 897, Halle, 827, Königsberg, 620, Greifswald, 503, Marburg, 401, Münster, 315, and Kiel, 241.

In the budget submitted to the present Prussian House of Deputies are the following items:—Erection of the German Industrial Museum, 998,000 mk.; erection of a Polytechnic in Berlin, 8,393,370 mk.; erection of an Ethnological Museum in Berlin, 1,800,000 mk.; and for the Berlin University, erection of a Herbarium, 422,000 mk.; of a Clinic, 1,955,000 mk.; of a new building for a second Chemical Laboratory, as well as of a Technical and Pharmaceutical Institute, 967,000 mk.

BONN.—On entering upon the duties of rector of the University, Prof. Kekulé, the distinguished chemist, delivered, on October 18, a brilliant address on the scientific position of chemistry, and the fundamental principles of this science. He made the following definition of chemistry as distinct from physics and mechanics:—"Chemistry is the science of the statics and dynamics of atoms: physics that of the statics and dynamics of molecules; while mechanics considers the masses of water consisting of a large number of molecules." After rapidly sketching the growth of the present atomic theory, he claimed that the mass of results now obtained showed that chemistry was slowly but surely approaching its goal, the knowledge of the constitution of matter. In opposition to the opinion that theory should be banished from the exact sciences, he regarded it as an actual felt necessity of the human mind to classify the endless series of individual facts from general standpoints—at present of a hypothetical nature—and that it was precisely the discussion of these hypotheses which often led to the most valuable discoveries.

VIENNA.—In Vienna the question is being agitated of separating the natural sciences at the University into a separate faculty, apart from the philosophical faculty, as is the case in Strassburg and a few other universities, which have risen superior to the old mediæval classification.

STRASSBURG.—The imperial authorities have finally decided upon extensive appropriations for the new buildings of the University. They will embrace edifices for lecture-rooms, chemical and physical laboratories, and surgical and psychiatric clinics. The new observatory will be completed next year, and the botanical gardens are rapidly being laid out. In 1882 the University expects to occupy its new buildings.

KÖNIGSBERG.—Prof. W. Lossen, of Heidelberg, well known by his researches on hydroxylamine, has accepted a call to the Chair of Chemistry at the University of Königsberg.

UPSALA.—The University is attended at present by 1,395 students, of whom the half are included in the philosophical faculty. The corps of teachers embraces sixty-three ordinary and extraordinary professors, and fifty-four *privat-docenten*. Of these eighty-two are in the philosophical faculty.

ST. PETERSBURG.—The lectures at the St. Petersburg Ladies' High Medical School re-opened this year on October 13. One hundred and eighteen students were admitted, though a far larger number of applicants passed the examination. The number of the students admitted, however, was limited as above because of want of room. A fifth class has now been added, and the students receive, after having finished the studies, the degree of surgeons.

SOCIETIES AND ACADEMIES

LONDON

Linnean Society, November 1.—Prof. Allman, F.R.S., president, in the chair.—Messrs. S. M. Samuel and P. Wyatt Squire were duly elected fellows of the Society.—A communication was read by Dr. G. King on the source of the winged cardamom of Nepal. By Dr. Pereira it had been regarded as the produce of *Anomum maximum*, Roxb.; but this is indigenous to Java. Roxburgh named two Indian species, *A. aromaticum* and *A. subulatum*, and Dr. King shows that the latter is the so-called winged cardamom of Nepal, its true habitat being the Morung mountains and not the Khasia hills as asserted by Voigt.—There followed a paper by Capt. W. Armit on Australian finches of the genus *Poephila*. Mr. Gould had recognised two birds, *P. gouldiae* and *P. mirabilis*, as good and distinct specific forms, a statement questioned by Mr. Diggles at the Queensl. Phil. Soc., 1876. Capt. Armit having studied the live birds in their native haunts gives his evidence in favour of Mr. Gould as to the just separation of the said Australian finches.—The self-fertilisation of plants formed the subject of an interesting paper by the Rev. G. Henslow, a notice of which we shall give elsewhere.—Mr. Ed. J. Miers gave a revision of the Hippidae." This group of the Anomourous Crustacea, although, by their elongated carapace and antennæ bearing considerable resemblance to certain of the Crystoidea, to wit the Chilian, *Blapharipoda spinnimana* and *Pseudocorystes sicarius*, yet the author considers their true affinities to be with the Oxyostomatous Brachyura, through the Raninidae. The Hippidae inhabit all the warmer temperate and tropical seas of the globe. Their life history and habits lately have received considerable elucidation at the hands of Mr. S. J. Smith, of Connecticut, in a study of the development of the common species of the eastern shores of the United States. Their limits are restricted northwards by the cold winters. The *H. talpoidea* lives gregariously, burrowing in the loose, changing sands near low-water mark. Other species, however, inhabit deep water, such as the *Albunea guerinii* in the Gulf of Algiers, &c.—Mr. E. M. Holmes laid before the meeting the late Dr. Hanbury's collection of cardamoms (from the Pharmaceutical Society) in illustration of Dr. King's paper above mentioned; he also drew attention to an undetermined fungus in a sugar cane, which mould had caused the destruction of a plantation in South India.—The Rev. T. H. Sotheby exhibited branches of two remarkable shrubs, *Colletia cruciata*, Hook., and *C. Biconensis*, Lindl., grown in Lady Rolles' garden at Bicton. These South American plants it seems, are not unknown in this country (one Fellow present stating he possessed them now in flower), but the history of their introduction, nevertheless, is a curious one.—Dr. Masters showed an unusual specimen of a grape within a grape, viz., adventitious fruit developed in place of the normal seeds; he also explained the *rationale* of adventitious tubers producing buds on the root of some examples of *Brassica Rapa* exhibited by him.—Some twigs and flowers of British grown gum trees were shown by Mr. A. O. Walker, among others *Penstemon Clevelandii* said to have flowered here for the first time.

Physical Society, November 3.—Prof. G. C. Foster, president, in the chair.—The following candidate was elected a member of the Society: Alexander Jessemann.—Prof. McLeod described some experiments he has recently made to determine the exact number of vibrations of tuning forks by means of the apparatus he exhibited to the Society on April 28 last, and which was designed for determining slight variations in the speed of machinery or other analogous purposes. He has studied two sets of forks belonging to the Physical Laboratory at South Kensington, and a new set just received from König, and his results exhibit a remarkable concordance, the extreme results in the worst set of observations on a fork of 256 complete vibrations only differing by 0.005 per cent., and in a good set they agreed within 0.00078 per cent. Examining the new series from 256 to 512, he found them to give from 0.3 to 0.5 of a vibration more than was anticipated, but as this variation may be due to a difference between the temperature and that at which they were adjusted, he is waiting to ascertain what this was. He considers also that the manner in which the fork is held has an effect on its vibrations, and he hopes to be able to get some information as to the effect of temperature on elasticity.—Dr. Huggins exhibited some artificial gems recently prepared by M. Feil, the well-known glass manufacturer of Paris, who has succeeded in crystallising stones of the corundum class.

Rubies, as well as a topaz and emerald, were exhibited. Dr. Huggins believes that the colour is imparted by small quantities of metallic oxides, and that the mass is mixed with boracic acid and maintained in a fused condition for a considerable period. M. Feil hopes to obtain larger stones by maintaining the heat constant for several weeks consecutively.—Dr. Lodge then read a communication from Professors Ayrton and Perry, of the Imperial College, Japan, in continuation of one read to the Society on May 26 last, on ice as an electrolyte, and since published in the *Philosophical Magazine*. The experiments therein described led them to expect a very sudden rise in the specific inductive capacity as the temperature of the ice increased through zero and it became water. Recent results have shown that, though rapid, this increase is not as great as they anticipated, and, whereas at -12° C. the capacity is 0.002 microfarads, at $+5^{\circ}$ C. it is 0.1185 microfarads, and after this temperature the increase was so rapid as to render exact readings difficult. Referring to Prof. Clerk Maxwell's theory in which he compares electromagnetic disturbances with light vibrations, they point out that he exclusively regards a conducting medium. But they showed in a former paper that no dielectric can be considered non-conducting, hence they conclude that the measured specific inductive capacity can never be even approximately equal to the square of the index of refraction. Prof. Foster mentioned that he recently had occasion to collect as many results as possible on specific inductive capacity and refractive index, and he found that, where these figures were low, the agreement with the law was fairly close, but with greater values the inductive capacity and the square of the refractive index separate very rapidly.—Prof. Guthrie described a simple means for showing the interference between two plane waves by means of two long cords vibrating side by side. If a vibration of considerable amplitude be imparted to them, and the plane in which they travel be carefully examined, two faint black lines will be seen, which cross and recross each other more rapidly as the cords are less and less in unison, and with perfect unison remain stationary.

Royal Microscopical Society, November 7.—Mr. H. C. Sorby, president, in the chair.—A paper was read by Mr. Thos. Palmer on the study of evergreens by means of the micro-spectroscope, in which he described the results of his examination of solutions of the colouring matters, oils, &c., from the leaves in various stages of growth. The paper was illustrated by drawings and by the exhibition under the micro-spectroscope of some of the solutions referred to.—A paper by Mr. F. A. Bedwell on the building apparatus of *Melicerta ringens*, was read by the secretary. It minutely described the structure and functions of those organs, and was an important addition to the number of contributions to the history of this beautiful rotifer. The paper was illustrated by drawings, some of which were enlarged upon the black board by Mr. Charles Stewart.—A paper was taken as read on the lachrymal gland of the turtle, by Mr. Charles Stewart.

PARIS

Academy of Sciences, November 5.—M. Peligot in the chair.—The following papers were read:—On some applications of elliptic functions (continued), by M. Hermite.—*Résumé* of a history of matter (third article), by M. Chevreul. This comprises from the thirteenth to the seventeenth century.—On the hydrogenation of benzene and aromatic compounds, by M. Berthelot. The experiments show that the action (sufficiently intense and prolonged) of hydriodic acid brings all these carburets to the composition of carburets absolutely saturated, such as hydride of hexylene, C_2H_{14} , volatile about 69° .—Reply to a recent note of M. de Parville, "On the semi-diurnal variation of the barometer," by M. Faye.—The echidna of New Guinea, by M. Gervais. This animal is very different from the echidna of Australia. *Inter alia*, it is larger and has darker hair; the claws (which are strong and adapted for digging) number three on the fore as on the hind feet; and the (black) muzzle is much longer than in *E. aculeata*, and sensibly arched; the tongue is also much longer and very slender, and the horny papillæ are differently arranged; the number of vertebrae and ribs is different, &c. M. Gervais regards the animal as belonging to a separate genus, termed *Acanthoglossus*.—On a project of an inter-oceanic canal; studies of the international commission of the Isthmus of Darien, by M. de Lesseps. This relates to a report of recent scientific exploration by Lieut. Wyse (of the French Navy). The project comprises a tunnel of about 17 kilometres, the remainder of the length being about 55 kilometres. The

total cost is estimated at 600,000,000 francs.—Stellar systems formed of stars associated in a common and rapid proper motion, by M. Flammarion.—On the order (or class) of a plane algebraic curve, of which each point (or each tangent) depends on a corresponding point of another plane curve and on the tangent at that point, by M. Fouret.—Applications of a mode of plane representation of classes of ruled surfaces, by M. Mannheim.—On the liquefaction of acetylene, by M. Cailletet. The gas was compressed by means of a hydraulic pump through mercury, in an apparatus of special form. Acetylene is liquefied, e.g., at $+1^{\circ}$ under 48 atm., at 18° under 83 atm., at 37° under 103 atm. The liquid is colourless and extremely mobile; it seems very refringent, and is lighter than water, in which it can be largely dissolved. It dissolves paraffin and fatty matters. Hydride of ethylene was liquefied in the apparatus at a slightly higher pressure than that of acetylene. The tensions of these two carburets and ethylene are but little different about zero. Reaction of chlorhydric acid on two isomeric butylenes and on olefines in general, by M. Le Bel. The ethylenic carburets combine with cold chlorhydric acid; on the contrary, the hydrocarbons $CH_2 = CHR$ and probably those with the formula $CHR = CHR$ are not attacked.—On the alteration of eggs produced by mould from without, by MM. Béchamp and Eustache. Hen's eggs may remain long in a medium filled with infusoria without these organisms penetrating. The shell and its lining membrane can be traversed by mucedineæ, which develop abundantly on the inner face of the latter. The yolk-membrane, however, is impenetrable by mucedineæ or any other microzoa or microphytes. The mediate relations of mucedineæ with the yolk produce a true fermentation apart from any organic ferment except microzymas. The acidification of the white is due exclusively to the mycelium of the mould. The production of bacteria in the yolk is due to development of the normal microzymas of the yolk.—On a new function of the genital glands of sea-urchins, by M. Giard. During part of the year these glands play the part both of excretory organs and of deutoplasmigenic organs. This fact presents a new point of relation between echinoderms and annelids, and even arthropods.—Causes which determine the liberation of agile bodies (zoospores, antherozoids) in the lower plants, by M. Cornu. The exit is not the result simply of a physical phenomenon of endosmose, but is at least partly due to the activity of the corpuscles themselves. This activity requires a sufficient temperature, or a certain quantity of oxygen (furnished directly or by oxidation of the green parts), for its exercise.—Meteorological observations made in a balloon, by M. Terrier. This ascent was made on October 18, at 3.30 P.M., from Paris. It is affirmed that the temperature of the atmospheric layers at sunset decreases uniformly with increase of height (the decrease was 1° per 100 metres). The lower winds are less stable than the upper, and it is necessary to interpret the latter for weather prognostication. The aerial currents of small height and velocity are influenced and notably deflected by the inequalities of the ground.

CONTENTS

| | PAGE |
|---|------|
| BREHM'S THIERLEBEN | 41 |
| OUR BOOK SHELF:— | |
| Loewy's "Heat" | 43 |
| Smith's "Ferns, British and Foreign. The History, Organography, Classification, and Enumeration of the Species of Garden Ferns, with a Treatise on their Cultivation" | 43 |
| LETTERS TO THE EDITOR:— | |
| The Radiometer and its Lessons.—Prof. G. CARRY FOSTER, F.R.S.; WILLIAM CROOKES, F.R.S.; ALFRED R. WALLACE | 43 |
| Experiment on Fluid Films.—SEDLBY TAYLOR | 44 |
| Expected High Tides.—B. G. JENKINS | 45 |
| The Towering of Wounded Birds.—CHARLES DIXON | 45 |
| Cruelty to Animals' Act and Physiological Teaching.—FRANK W. YOUNG | 45 |
| Smell and Hearing in Moths.—J. C. | 45 |
| Bees Killed by Tritoma.—ALFRED R. WALLACE | 45 |
| Lecture Experiment.—W. A. SHENSTONE | 45 |
| Fowles' "Manual of Chemistry."—THE REVIEWER | 46 |
| OUR ASTRONOMICAL COLUMN:— | |
| The Transit of Mercury, May 6, 1878 | 46 |
| Nova Cygni, 1876 | 46 |
| Comet 1873, IV | 46 |
| Minor Planets | 46 |
| THE ROYAL DUBLIN SOCIETY | 46 |
| ON THE Eocene FLORA OF BOURNEMOUTH. By J. S. GARDNER | 47 |
| THE TELEPHONE | 48 |
| AFRICAN EXPLORATION | 49 |
| MODERN TORPEDO WARFARE (With Illustrations) | 50 |
| NOTES | 52 |
| UNIVERSITY AND EDUCATIONAL INTELLIGENCE | 55 |
| SOCIETIES AND ACADEMIES | 55 |