

University. After considerable discussion, resolutions were passed approving of the admission of certain educational institutions having one, or more than one, faculty of University rank as constituent Colleges of the University, of the establishment of a Council of Education, and of certain changes in the constitution of the Senate.

SCIENTIFIC SERIALS

THE most important paper in the *Journal of Botany* for April is the commencement of a Synopsis of the Rhizocarpeæ, by Mr. J. G. Baker, another of the series of this writer's exhaustive monographs of the families of Vascular Cryptogams outside the Ferns. The present instalment includes the genus *Salvinia*, in which three new species are described, and a portion of *Azolla*. In the May number we find a continuation of Mr. W. B. Grove's paper on new and noteworthy fungi, in which several new species are described, and one new genus of Sphæroideæ, *Collonema*. Mr. W. H. Beeby gives further particulars respecting the distribution of his newly discovered *Sparganium neglectum*, and Mr. Arthur Bennett an account of the distribution in Britain of the various species of *Potamogeton*, in addition to those contained in the second edition of "Topographical Botany."

SOCIETIES AND ACADEMIES

LONDON

Royal Society, May 20.—"Relation of 'Transfer-Resistance' to the Molecular Weight and Chemical Composition of Electrolytes." By G. Gore, LL.D., F.R.S.

In the full paper the author first describes the method he employed for measuring the "resistance," and then gives the numerical results of the measurements in the form of a series of tables.

He took a number of groups of chemically related acids and salts of considerable degrees of purity, all of them in the proportions of their chemical equivalent weights, and dissolved in equal and sufficient quantities of distilled water to form quite dilute solutions. The number of solutions was about seventy, and included those of hydriodic, hydrobromic, hydrochloric, hydrofluoric, nitric, and sulphuric acids; the iodides, bromides, chlorides, fluorides, hydrates, carbonates, nitrates, and sulphates, of ammonium, cesium, rubidium, potassium, sodium, and lithium; the chlorides, hydrates, and nitrates, of barium, strontium, and calcium; and a series of stronger solutions, of equivalent strength to each other, of the chlorides of hydrogen, ammonium, rubidium, potassium, sodium, lithium, barium, strontium, and calcium. A series of similar liquids to those of one of the groups of acids, of equal (not of equivalent) strength to each other, was also included.

As electrodes, he employed pairs of plates of zinc, cadmium, lead, tin, iron, nickel, copper, silver, gold, palladium, and platinum; and separate ones formed of small bars of iridium.

He took each group of solutions, and measured in each liquid separately, at atmospheric temperature, the "total resistance" at the two electrodes, and the separate "resistances" at the anode and cathode respectively with each other, and thus obtained about seventy different tables, each containing about thirty-six measurements, including the amounts of "total," "anode," and "cathode" resistance of each metal, and the "averages" of these for all the metals.

By comparing the numbers thus obtained, and by general logical analysis of the whole of the results, he has arrived at various conclusions, of which the following are the most important:—The phenomenon of "transfer-resistance" appears to be a new physical relation of the atomic weights, attended by inseparable electrolytic and other concomitants (one of which is liberation of heat, *Phil. Mag.*, 1886, vol. xxi. p. 130). In the chemical groups of substances examined it varied inversely as the atomic weights of the constituents, both electro-positive and electro-negative, of the electrolyte, independently of all other circumstances; and in consequence of being largely diminished by corrosion of the electrodes, it appeared to be intimately related to "surface-tension." He suggests that corrosion may be a consequence, and not the cause of small "transfer-resistance." The strongest evidence of the existence of the above general law was obtained with liquids and electrodes with which there was the least corrosion and the least formation of films; those liquids were dilute alkali-chlorides, with electrodes of platinum.

This research is an extension of a former one on "Transfer-Resistance in Electrolytic and Voltaic Cells," communicated to the Royal Society, March 2, 1885. Further evidence on the same subject has been published by the author in the *Philosophical Magazine*, 1886, vol. xxi. pp. 130, 145, 249.

"A Study of the Thermal Properties of Ethyl Oxide." By William Ramsay, Ph.D., and Sydney Young, D.Sc.

A year ago a paper was communicated to the Society on the behaviour of ethyl alcohol when heated. A similar study of the properties of ether has been made, in which numerical values have been obtained exhibiting the expansion of the liquid, the pressure of the vapour, and the compressibility of the substance in the gaseous and liquid conditions; and from these results, the densities of the saturated vapour and the heats of vaporisation have been deduced. The temperature range of these observations is from -18° to 223° C.

It is the authors' intention to consider in full the relations of the properties of alcohol and ether; in the meantime it may be stated that the saturated vapour of ether, like that of alcohol, possesses an abnormal density, increasing with rise of temperature and corresponding rise of pressure; that at 0° the vapour-density is still abnormal, but appears to be approaching a normal state; and that the apparent critical temperature of ether is 194° C.; the critical pressure very nearly 27,060 mm. = 35.61 atmospheres; and the volume of 1 gramme of the substance at 184° between 3.60 and 4 c.c.

Mathematical Society, May 13.—J. W. L. Glaisher, F.R.S., President, in the chair.—Mr. F. W. Watkin was admitted into the Society.—The following communications were made:—On Cremonian congruences contained in linear complexes, by Dr. Hirst, F.R.S.—Solution of the cubic and bi-quadratic equation by means of Weierstrass's elliptic functions, by Prof. Greenhill.—On the complex of lines which meet a unicursal quartic curve, by Prof. Cayley, F.R.S.—On Airy's solution of the equations of equilibrium of an isotropic elastic solid under conservative forces, by W. J. Ibbetson.—Conic note, by H. M. Taylor.—On the converse of stereographic projection and on tangential and coaxial spherical circles, by H. M. Jeffery, F.R.S.

Zoological Society, May 18.—Prof. W. H. Flower, F.R.S., President, in the chair.—Mr. C. W. Rosset exhibited a series of photographs taken during his recent visit to the Maldivé Islands, and made some remarks on the zoological collections obtained during his expedition.—Mr. Philip Crowley, F.Z.S., exhibited some pupæ of nocturnal Lepidoptera which had been sent to him from Natal; and read some notes from his correspondent, which proved that they were subterranean.—Mr. Joseph Whitaker, F.Z.S., exhibited a specimen of Wilson's Phalarope, said to have been obtained at Sutton Ambian, near Market Bosworth, in Leicestershire.—A communication was read from Dr. A. B. Meyer, C.M.Z.S., containing an account of the known specimens of King William the Third's Bird of Paradise (*Rhipidornis guglielmi-tertiæ*), and remarking on a fourth specimen which had been recently obtained by the Dresden Museum.—Mr. Frank E. Beddard read a paper on some new or little-known Earthworms, together with an account of the variations in structure exhibited by *Perionyx excavatus*.—Mr. Sclater read a paper on the species of Wild Goats and their distribution. Mr. Sclater recognised ten species of the genus *Capra*, distributed over an area extending from Spain to Southern India, and from Central Siberia to Abyssinia.

Royal Meteorological Society, May 19.—Mr. W. Ellis, F.R.A.S., President, in the chair.—Mr. L. T. Cave and Rev. C. Malden, M.A., were elected Fellows of the Society.—The following papers were read:—The severe weather of the past winter, 1885-86, by Mr. C. Harding, F.R.Met.Soc. The author showed that the whole winter was one of exceptional cold, not so much on account of any extremely low temperatures experienced, but more from the long period of frost and the persistency with which low temperature continued. In the South-West of England there was not a single week from the commencement of October to March 21 in which the temperature did not fall to the freezing-point. In many parts of the British Islands frost occurred in the shade on upwards of 60 nights between the beginning of January and the middle of March, and during the long frost which commenced in the middle of February and continued until March 17 the temperature fell below the freezing-point in many places on more than 30 consecutive nights. At Great Berkhamsted, in Hertfordshire, frost