

clear that Prof. Wiedemann's line of investigation would afford an absolute proof that the changes of spectra are really due to the causes to which they are now hypothetically referred by the majority of observers. It is however rather unfortunate that in the particular case under discussion the chemical origin of the band-spectrum has not been settled to the general satisfaction of all observers. A good many of them believe the spectrum to be due to a hydrocarbon, and in that case Prof. Wiedemann would simply have measured the heat of combustion of hydrogen and carbon. No doubt Prof. Wiedemann will extend his measurements to other gases for which the spectroscopic difficulties have been more satisfactorily settled.

Prof. Wiedemann has also investigated some phenomena in vacuum tubes, which have also been partly discussed by other observers. Thus under certain conditions more exactly investigated by Messrs. Spottiswoode and Moulton, it is known that a conductor of electricity brought near a vacuum tube will deflect the discharge. Prof. Wiedemann finds, as had already been previously noticed by Mr. Goldstein, that the point touched by the conductor behaves like a negative electrode. It is known that as a rule the rays proceeding from a negative electrode are propagated in straight lines, and do not turn round a corner. An experiment however is mentioned by Prof. Wiedemann, in which an exception to this rule seems to take place; but Prof. Wiedemann himself suggests that secondary phenomena might have influenced the result. Perhaps an explanation is to be found in the fact proved by Mr. Goldstein, that when two tubes of different width are fused together the point of junction behaves like a negative electrode.

Some experiments were made to show that the rays producing the phosphorescence can traverse the positive discharge; also to prove that when the pressure is very small the shape of the electrodes has a great influence on the number of discharges and on the other phenomena attending them.

Prof. Wiedemann winds up with some interesting speculations on the nature of the discharge of electricity through gases, but it was our object to give an account only of his experimental results. A theoretical discussion would lead us too far, as we should have to take account of other writings which have lately appeared. We may return to this part of the subject on another occasion. It is evident from the account we have given that the calorimetric methods employed by Prof. Wiedemann have enabled him to take a very material step towards the elucidation of a difficult problem, and we may hope for another series of his valuable measurements.

ARTHUR SCHUSTER

### UNIVERSITY AND EDUCATIONAL INTELLIGENCE

EDINBURGH.—The Baxter Physical Science Scholarship of £166<sup>l.</sup>, conferred by the University of Edinburgh on the most eminent B.Sc. who has taken his degree during the present or the preceding year, has been awarded to Mr. D. Orme Masson, lecturer on Chemistry at University College, Bristol, who is prevented from accepting it in consequence of holding his present appointment.

THE system of Fellowships in the Johns Hopkins University is of considerable interest. Twenty Fellowships, each yielding five hundred dollars, are annually open to competition in this University. The system of Fellowships was instituted for the purpose of affording to young men of talent from any place an opportunity to continue their studies in the Johns Hopkins University, while looking forward to positions as professors, teachers, and investigators, or to other literary and scientific vocations. The appointments have not been made as rewards for good work already done, but as aids and incentives to good work in the future; in other words, the Fellowships are not so much honours and prizes bestowed for past achievements, as helps to further progress, and stepping-stones to honourable intellectual careers. They have not been offered to those who are definitely looking forward to the practice of either of the three learned professions (though such persons have not been formally excluded from the competition), but have been bestowed almost exclusively on young men desirous of becoming teachers of science and literature, or determined to devote their lives to special branches of learning which lie outside of the ordinary studies of the lawyer, the physician, and the minister. Every candidate is expected to submit his college diploma or other certificate of proficiency from the institution where he has been taught, with recommendations from those who are qualified to

speak of his character and attainments. But this is only introductory. He must also submit, orally or in writing, such evidence of his past success in study and of his plans for the future, together with such examples of his literary or scientific work as will enable the professors to judge of his fitness for the post. The examination is indeed in a certain sense competitive; but not with uniform tests, nor by formal questions and answers submitted to the candidates. First, the head of a given department considers, with such counsel as he may command, the applicant's record. The professors then collectively deliberate on the nominations made by individual members of their body. The list upon which they agree, with the reasons for it, is finally submitted by the president of the University to the Executive Committee, and by them to the trustees for final registration and appointment. By all these precautions the highest results which were anticipated have been secured. A company of most promising students has been brought together, and their ability as teachers and scholars has been recognised by the calls they have received to permanent and attractive posts in different parts of the country.

A SPECIAL feature of Russian universities is that the students mostly belong to the poorer classes, and that they earn the means of existence by teaching or by translating foreign works for the monthly reviews. Thus, at the same time as the foundation stone of the Siberian University was laid at Tomsk, a subscription was raised for the erection of a building in which gratuitous lodgings might be given to students. The well-known explorer of Western Siberia, M. Yadrintzeff, immediately after his return from his last journey, delivered a series of lectures on the scenery of Altay, to raise funds for that purpose.

THE new university at Tomsk will be most liberally endowed. Up to the day of laying the foundation-stone 354,000 roubles (about 53,000*l.*) had been received for the building, 100,000 roubles (15,000*l.*) for teaching utensils, and 31,000 roubles (4600*l.*) for stipendia. A library of more than 35,000 volumes is ready, and only waiting the building of the necessary apartments to house it.

### SCIENTIFIC SERIALS

*Trimen's Journal of Botany*, October, 1880-January, 1881.—Among the more valuable articles in the most recent numbers of this journal may be mentioned:—*Musci præteriti* (new or badly-described mosses), by R. Spruce.—An account of the Acanthaceæ of Dr. Welwitsch's Angolan herbarium, by S. Le M. Moore, with descriptions of a number of new species.—On *Manihot Glaziovii*, the plant affording Ceara india-rubber, by Dr. Trimmen.—On a collection of Madagascan ferns, by J. G. Baker.—On *Chara obtusa (stelligera)* Bauer, a species new to Britain, by H. and J. Groves.—The history of the scorpionid cyme, by Dr. S. H. Vines.—On the plants of North Aran Island, co. Donegal, by H. C. Hart; with a number of interesting shorter notices and articles.

*Journal of the Royal Microscopical Society*, vol. iii. No. 6 for December, with special index number, contains—The Transactions of the Society.—Charles Stewart, on some structural features of *Echinostrephus molare*, *Parasalenia gratioza*, and *Stomopneustes variolaris*, with plate 20.—Dr. H. Stolterfoth, on the diatomaceæ in the Llyn Arenig Bach deposit.—Dr. G. W. Royston-Pigott, on a new method of testing an object-glass used as a simultaneous condensing illuminator of brilliantly reflecting objects such as minute particles of quicksilver.—The record of current researches relating to invertebrata, cryptogamia, microscopy, &c.—The year's journal forms a volume of over 1100 pages, of which less than 200 are filled with the Transactions of the Society, and over 800 with the increasingly useful record. With the February number will commence a new series.

### SOCIETIES AND ACADEMIES

LONDON

Zoological Society, January 4.—Prof. W. H. Flower, LL.D., F.R.S., president, in the chair.—Mr. Sclater exhibited and made remarks on a skin of the Southern Merganser (*Mergus australis*) from the Auckland Islands, belonging to the collection of Baron Anatole von Hügel.—Prof. A. Newton, M.A., F.R.S., exhibited on behalf of Prof. Alphonse Milne-Edwards, F.M.Z.S., an egg of *Coriama cristata*, laid last summer in the Jardin des

Plantes, and possibly the first ever seen of which the parentage was certainly known, though an egg, also exhibited by Prof. Newton, had been for many years in the collection of Mr. H. F. Waker.—Dr. Albert Günther, F.R.S., read an account of the zoological collections made by Dr. R. W. Coppinger, R.N., during the survey of H.M.S. *Alert* in the Straits of Magellan and on the coast of Patagonia, and called attention to the most remarkable species represented in the various groups, which had been worked out by himself and his assistants in the Zoological Department of the British Museum. Dr. Günther also called attention to several interesting cases of the similarity of forms in these collections to known forms of the Arctic regions and of the Australian seas.—A communication was read from Prof. J. O. Westwood, containing the descriptions of some new exotic species of moths of the genera *Castnea* and *Saturnia*.—A second paper by Prof. Westwood contained observations on two Indian butterflies—*Papilio castor* and *P. pollux*.—Prof. W. H. Flower, F.R.S., described the skull of a very large elephant seal (*Macrorhinus leoninus*), lately received in the Museum of the College of Surgeons from the Falkland Islands, and discussed the questions of affinities and systematic position of this animal among the Pinnipeds. Prof. Flower arrived at the conclusion from an examination of its dental, cranial, and limb characters, and from some other points in its anatomy, that the elephant seal is the member of the group the farthest removed from the terrestrial carnivora and showing most cetacean analogies. He also considered that at present there is no evidence of the existence of more than one species of the genus.—Dr. A. Günther read some notes on the species of insectivorous mammals belonging to the genus *Rhynchocyon* and *Petrodromus*, and described two new species of the former genus, proposed to be called *R. macrurus* (from the Rovuma River), and *R. chrysopygus* (from the Mombaca River).

## PARIS

Academy of Sciences, January 3.—M. Wurtz in the chair.—M. Jamin was elected Vice-President for 1881, and MM. Decaigne and Edm. Becquerel were elected Members of the Central Administrative Committee.—M. Becquerel gave information as to the Academy's publications, and the changes among members and correspondents. Two members have died during the year, M. Chasles and General Morin; and seven correspondents, MM. Borchardt, Peters, Lissajous, Favre, Müller, Schimper, and Mulsant.—The following papers were read:—On magnetic oxide of iron, by M. Berthelot. The heat liberated in fixation of oxygen by iron decreases (for a given quantity of oxygen) as we pass from the protoxide to the magnetic oxide, then to the peroxide.—Researches of M. Fourier on the fall of the barometer in cyclones, by M. Faye. M. Fournier gives a formula for the progress of the barometer, and shows its validity by observations at the Island of Reunion.—Mr. Gould was elected Correspondent in Astronomy, in room of the late M. Peters.—On observations of the satellites of Jupiter at Toulouse Observatory in 1879, by M. Baillaud.—On a process of astronomical observation for the use of voyagers, dispensing with the measurement of angles for determination of latitude and of sidereal time, by M. Rouget. This is by observing two stars that have at a given moment the same altitude; combining such observations in pairs, and noting the interval between the two phenomena, &c.—Determination of the lines of curvature of all the surfaces of the fourth class, correlatives of cyclides, which have the circle of infinity for double line, by M. Darboux.—Measurement of the electromotive force of batteries, by M. Baille. He uses a torsion balance having a long wire (2.70m.) of annealed silver, and a lever with balls of gilt copper at each end. Similar balls are fixed at the angles of a rectangle, and diagonal pairs are in communication with each other. The lever, placed at equal distance from the fixed balls, is connected through the torsion wire with the + pole of a battery, the other pole being to earth. One pole of the pile to be measured is connected with the fixed balls. The deflections are read by reflection of an illuminated glass scale. The apparatus is enclosed in a metallic case connected with the ground. A thick envelope of wood-shavings is used to exclude disturbances from heat.—On the velocity of light: reply to M. Cornu, by M. Gouy.—Study on spectrophotometers, by M. Crova. Two spectra from different sources may be easily compared by covering half the slit of a photometric spectroscope with a small rectangular prism, the edge of which cuts the slit normally into two equal parts; one half receives one of the lights directly, the other, by total reflection, the other light placed laterally. Aberration can be corrected with a

cylindrical lens. The elliptic polarisation from total reflection may be suppressed, by replacing a simple prism by two total reflection prisms superposed in contact.—On a method of reproducing speech in electric condensers, and particularly in the singing condenser, by M. Dunand. He connects one pole of a battery with one end of the induced wire of the coil, the other pole with one armature of the condenser, while the second armature is attached to the other end of the induced wire. (In the circuit of the primary coil are a battery and carbon microphone). In this way speech may be reproduced with perfect distinctness. The condenser giving the best effects was 0.06m. in length of side; it contained thirty-six sheets of tin-foil. For the auxiliary battery two or three (Leclanché) elements will give weak articulate sounds. The intensity increases with increase of the number of elements, but not proportionally. The current of the auxiliary coil does not traverse the condenser.—M. du Moncel made some remarks on the subject.—On the vapour-density of iodine, by MM. Crafts and Meier. They study the variation of the density with the tension and with the temperature. The facts agree with the hypothesis of progressive dissociation.—On the direct preparation of chlorised and bromised derivatives of the methylic series, and especially of chloroform and bromoform, by M. Damoiseau.—On the functions of the small oblique muscle of the eye in man, by M. Fano.—Facts for the study of formation of fogs, by M. André. This relates to a case in which a high barometer was observed to sink suddenly (with rain), while a fog present disappeared; with slow rise of the barometer the fog reappeared.—New eruption of Manua-Loa (Hawaiian Islands), by Mr. Green. This was on November 9.—On the formation of a thin layer of ice on the sea observed at Smyrna during the winter of 1879, by M. Carpentin. A slight breeze seems to have driven the waters of the Guedye against the quays of Smyrna, and there formed a thin layer on the surface, which froze in a complete calm on a clear night.—On a new use of electricity, by M. Grandt. This is, propelling vessels. A steam-engine drives one or more electro-dynamic induction apparatuses; the current is sent through a voltmeter; the gases are conducted to an orifice in the keel, and exploded by an induction spark, with propulsive effect.

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