

i.e. neither near a node nor near a loop. About a quarter of the length of the tube, from the lower or upper end, as the case may be, appears to be the most favourable position.

RAYLEIGH

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

AMONG the bequests of the late Mr. Henry Brown, J.P., formerly of Bradford, is a sum of 5,000*l.* to the Yorkshire College, Leeds, for the purpose of founding and maintaining scholarships.

THE New York *Nation* states that Dr. A. S. Packard, jun., has been appointed Professor of Natural History at Brown University. His departure from Salem, Mass., the *Nation* states, following on Prof. Morse's and Prof. Putnam's is a serious loss to that scientific centre, and implies an inadequate endowment of the Peabody Academy of Sciences.

THE first conferment of degrees by the Johns Hopkins University took place on June 13. Four candidates were admitted to the degrees of Ph.D. and M.A.

THE following figures, which have been published quite recently at Algiers, will give an idea of the state of public instruction in that colony. Superior instruction is represented only by a preparatory school of medicine in Algiers. It is contemplated to establish in that city a university of letters, science, law, and medicine; but no step has yet been taken to realise the scheme. There are colleges, or lycées at Algiers, Oran, Constantine, Bone, Philippeville, Blidah, Mostaganem, and one or two other places, and two clerical institutions, one at Blidah, and the other at Algiers. The number of pupils of these establishments is 3,142 in a population of 344,849 of European extraction. Primary instruction is given in 803 schools, frequented by 66,343. A few natives follow the course of instruction in European or secondary schools. Most of them are pupils in the Algiers lycée, which has no less than 980 pupils, and is considered one of the best under the authority of the French government, even in France. Great efforts have been made to organise French-Arab schools for natives, but with not much success. Within the last few years thirteen French-Arab schools have been opened in the Sahara and Kabyle, which have now 1,481 pupils. The aggregate number of young Arabs, receiving education from the French government, is only 1,573 boys, and 173 girls out of a population of 2,500,000. A normal school has been established at Mustapha, near Algiers, and numbers from thirty to forty pupils.

SCIENTIFIC SERIALS

Annalen der Physik und Chemie, No. 4, 1878.—This number commences with a paper by M. Schering on friction currents as exemplified in the rubber of a (cylinder) electrical machine. For production of such currents it is unimportant whether the cylinder be connected to earth or not; and the occurrence of opposite electricities at the two ends of the rubber is also not essential. The electricity on the hinder margin of the rubber is derived from the insulator (cylinder); for it agrees in sign with that of the latter, and nearly always disappears when the insulator is connected to earth. The friction causes a less quantity of negative electricity to exist on the hinder margin of the rubber than on the forward margin; the quantity of electricity steadily varies from the hinder to the forward margin.—M. Fröhlich investigates the intensity of diffracted light in relation to that of the incident light. His experimental results closely correspond to those of theory. With small angles the entire incident energy of motion appears again after diffraction as light-motion.—Fresnel's theory of diffraction phenomena is treated at some length by M. Voigt.—Studying certain hydrodynamic problems in relation to the theory of ocean currents, M. Zöppritz concludes, *inter alia*, that the influence of friction has, in one direction, been underrated, in another overrated; the former, because it has not been supposed to extend deep enough, the latter, because in regard to propagation of variable current-motions too much has been ascribed to it. He calculates that with a mean ocean depth of 4,000 m. the trade winds in their present extent and strength would have to blow 100,000 years ere the present state of motion of the equatorial current could be supposed approximately stationary. The damping influence of continents and islands would somewhat diminish the number.—

M. Antolik communicates further observations on the gliding of electric sparks, obtaining new evidence for the fact that a greater tension is required for discharge of positive than for that of negative electricity, and that the one kind passes more rapidly and further than the other.—A formula determining the rotation of the plane of polarisation in quartz for all colours as function of the temperature, is given by M. Sohncke, who also finds that the rotation in chlorate of soda increases with rising temperature in a greater degree than in quartz.—An improved tangent galvanometer for lecture purposes (based on the principle of the Gauss-Weber mirror-magnetometer), a modification of the mercury air-pump, and a method of more accurate measurement of thickness by means of the spherometer, are among the remaining subjects here dealt with.

No. 5.—M. Kohlrausch here describes a "total reflectometer," or instrument by means of which the total reflection in solid bodies is utilised for determination of refraction. (The instrument can also be adapted for liquids.) A liquid is employed which refracts more strongly than the body examined (generally sulphide of carbon). The author gives his numerical results in a table.—A paper on the theory of double refraction, by M. Lommel, furnishes, with two previous papers, the outlines of a new theory of light (he says it might be called the "friction theory"), in which the phenomena in their connection are explained by the reciprocal action of the ether and the particles of bodies.—M. von Waha calls attention to some interesting movements obtained in badly-conducting liquids (as olive oil or petroleum), when placed, *e.g.*, on a horizontal metallic plate, connected electrically with one pole of a Holtz machine, while a point connected with the other pole is held above the liquid.—The phenomena of resonance in hollow spaces are investigated mathematically and experimentally by M. Wand, and an improved anemometer, capable of measuring the mean velocity of air-currents of constant direction between wide limits, forms the subject of a paper by M. Recknagel.

Actes de la Société Helvétique des Sciences Naturelles (C. R. 1876-77) contain an account of the sixtieth meeting of the Society, held at Bex on August 20-22, 1877, together with notes of the sectional meetings, and the following more elaborate memoirs:—On the adaptation of copepod crustaceans to parasitism, by Prof. K. Vogt.—On the fecundation and first development of the ovum, by H. Fol.—On the railway over the Simplon, by Herr Lommel.—Historical account of the mines and salt-works of Bex, by Ch. Grenier.—On the retrogradation of the shadow on the sun dial, by E. Guillemin.—Note on the study of thunderstorms accompanied by hailstorms and electric phenomena, by D. Colladon.—On the geology of the neighbourhood of Bex, by E. Renevier.—On some geological formations in the Bernese Alps, by S. Chavannes.—On the nummulites of the Western Alps, by Ph. de la Harpe.—On the origin and the repartition of the Turbellaria of the deep fauna of the Lake of Geneva, by G. du Plessis.—On the formation of feathers in the gold-hair penguin and *Megapodius*, by Th. Studer.—On the blood corpuscles of *Mermis aquatilis*, Duj., by E. Bugnion.—On a new Amphipode (*Gammarus rhipidiophorus*), by O. I. Catta.—On the doubtful species in the flora of Switzerland, by L. Leresche.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, June 19.—"On the Reversal of the Lines of Metallic Vapours," by G. D. Liveing, M.A., Professor of Chemistry, and J. Dewar, M.A., F.R.S., Jacksonian Professor, University of Cambridge. No. III.

In our last communication to the Royal Society we described certain absorption lines, which we had observed to be produced by the vapour of magnesium in the presence of hydrogen, and certain other lines which were observed when potassium, and others when sodium, was present, in addition to magnesium and hydrogen. These lines correspond to no known emission lines of those elements; but, inasmuch as they appeared to be regularly produced by the mixtures described, and not otherwise, we could only ascribe their origin to the mixtures as distinct from the separate elements. It became a question of interest, then, whether we could find the conditions under which the same mixtures would give luminous spectra, consisting of the lines which we had seen reversed. On observing sparks from an induction coil taken between magnesium points in an atmosphere of hydrogen, we soon found that a bright line regularly appeared, with a wave-