

College) have been appointed Demonstrators in the Cavendish Laboratory of Experimental Physics.

The University Commissioners have at last put forward a Statute by which students in "Letters" are to have a Doctorate, so that to Divinity, Law, and Medicine, two new faculties are now added, namely, Letters and Science. The University is also to have power to accept as an affiliated college any college in the British dominions, educating principally adult students, and to allow their qualified students three terms of residence towards those required to obtain a Cambridge degree.

The Woodwardian Professor gives notice that as he is prevented by illness from returning to Cambridge at present, Mr. Roberts, D.Sc. [Lond], will lecture for him during the present term.

THE returns already received for the Technological Examinations of the City and Guilds Institute show that over 1,100 candidates will present themselves for examination at eighty centres. This is a very large increase on last year, when only 202 were examined. The examinations are to be held on the evening of May 12, concurrently with the examination of the Science and Art Department on that evening.

### SCIENTIFIC SERIALS

THE *Quarterly Journal of Microscopical Science*, April.—W. T. Thiselton Dyer, M.A., Assistant-Director, Kew, on the coffee-leaf disease of Ceylon (six plates).—J. D. Siddall, on *Shepherdella*, an undescribed type of marine rhizopoda (on the plates *Shepherdia*), with two plates. The nucleus in this form seems to be unlike anything as yet described among the rhizopods. The author also figures and describes *Lieberkuehnia wagneri* from Tenby. This rhizopod is only "a native of Berlin" in a very peculiar sense. Claparede's words are, "Nous n'avons rencontré qu'une seule fois ce rhizopode, a Berlin dans une petite bouteille qui renfermait de l'eau de provenance inconnue." The present memoir throws no new light on its probable affinity to *Pamphagus mutabilis*.—A. Sedgwick, on the development of the kidney in its relation to the wolffian body in the chick (with two plates).—F. M. Balfour, notes on the development of the Araneina (with three plates).—Dr. L. Waldstein, a contribution to the biology of bacteria.—Prof. Schafer, some teachings of development.—Prof. T. Jeffery Parker, on the histology of *Hydra fusca*.—Prof. Giard, on the Orthonectida, a new class of the phylum of the worms (with a plate).—Notes and memoranda.

*American Journal of Science*, March.—On a chart of the magnetic declination in the United States, constructed by J. E. Hilgard.—The old river-beds of California, by J. Le Conte.—Age of the Green Mountains, by J. D. Dana.—On a new action of the magnet on electric currents, by E. H. Hall.—Measures of the polar and equatorial diameter of Mars, made at Princeton, New Jersey, U.S., by C. A. Young.—On the use of the sine-formula for the diurnal variation of temperature, by B. A. Gould.—On the chemical composition of the Uraninite from Branchville, Conn., by W. J. Costock.—On the mean free path of a molecule, by N. D. C. Hodges.—On the western limits of the Taconic system, by S. W. Ford.—Principal characters of American Jurassic dinosaurs, by O. C. Marsh. Part iii.

THE *American Entomologist*, No. 3, new series, March, 1880, contains a multitude of useful notes on questions concerning entomology, amongst which may be noticed trapping the Carpet Beetle (*Anthrenus scrophulariae*).—The Ailanthus silkworm.—Insects injuring the black locust.—The insect enemies of our small fruits, by A. S. Fuller.—The relation between insects and plants, and the consensus in animal and vegetable life, by L. F. Ward.—Birds v. insects, by the late E. Perris, translated.—Two days collecting in the Mammoth Cave, with contributions to a study of its fauna, by H. G. Hubbard, the latter especially interesting, giving a list of all the animals hitherto found in this celebrated cave, highly illustrated by excellent woodcuts, with a description of a very curious new form of pseudo-scorpion, described by Dr. Hagen as *Chthonius packardii*. It will be a great advantage if the editors of this periodical give in future a *resume* of the contents of each number. We are requested to notice that it is now published by the Hub Publishing Company of New York, 323 Pearl Street.

*Journal of the Franklin Institute*, March.—The Edison electric light (continued), by Mr. Outerbridge.—Committee's

report on the Goodwin mowing-machine.—Saws (continued), by Dr. Grumshaw.—Apparatus for illustrating the aberration of light, by Prof. Tobin.—On the acid products of combustion of coal, by M. Vincotte (translation).—Mica, by Mr. Rand.—A new lecture experiment; the cupelling of gold and silver.

### SOCIETIES AND ACADEMIES

#### LONDON

Royal Society, April 8.—'On the Sensitive State of Vacuum Discharges. Part II.' By William Spottiswoode, D.C.L., LL.D., Pres.R.S., and J. Fletcher Moulton, late Fellow of Christ's College, Cambridge.

This paper forms a sequel to that published under the same title in the *Phil. Trans.*, 1879. It describes a continuation of the research into the nature and laws of the disruptive discharge, or electric spark. The methods of the earlier paper have been extended, and others adapted to the new circumstances have been devised, in order to carry the investigation into high vacua. In particular, independent sources of electricity have been used for effecting the discharge, whether in the sensitive or in the non-sensitive state; and the results have been confirmatory of the conclusions derived from the more limited means formerly described. Further, the effects of various tubes containing discharges in the sensitive state upon a tube containing a discharge in the non-sensitive state have been observed and compared; and the tube so used as a test has been called the standard tube, and the method of its use the standard tube method. By this means, principally, the laws of the discharge in comparatively moderate vacua have been extended to high vacua.

In the higher vacua, the phenomena of molecular streams, and the phosphorescence consequent on them, that have been studied and described by Mr. Crookes, present themselves. These derive great importance for the purposes of the present paper from the fact that in high vacua the ordinary luminous discharge becomes so feeble in appearance that it is often difficult to observe. Under these circumstances the phosphorescence, which, like the ordinary luminous effects, may exist either in a sensitive or in a non-sensitive state, forms the best index of what is going on within the tube. Much information as to the nature and procedure of the discharge may be derived from the mode of interference of one molecular stream with another, from the direction and character of shadows cast by these streams, and by a form of interference which has here been called that of virtual shadows.

The conditions of pressure and of electrical violence, under which phosphorescence is produced, have been carefully studied; and it has been found that, with a suitable adjustment of the discharge, the phenomena are not confined to high vacua, but can be obtained under pressures much exceeding those of ordinary vacuum tubes. The phenomena of these molecular streams have also been compared with those exhibited by the projection of finely divided solid conducting matter when heaped up over the negative terminal, with the view of ascertaining the nature of the phenomenon and its position in the discharge.

At the close of the paper the authors have discussed some of the general conclusions which they think may be fairly drawn from their present researches. First, as to the relative order of magnitude of the time-quantities entering into the discharge; e.g., the times occupied by the discharge of positive or negative electricity, or of molecular streams, in leaving a terminal; the time occupied by the same elements in passing along the tube, &c. Secondly, as to the durational character of the negative as compared with the positive discharge, which appears to increase with the degree of exhaustion. Thirdly, as to the mode of formation of the positive column; and fourthly, as to the relation of the molecular streams to the discharge proper.

But for the details of these conclusions the reader must be referred to the paper itself.

April 15.—'Description of some Remains of the Gigantic Land-lizard (*Megalania prisca*, Owen) from Australia. Part II.' by Prof. Owen, C.B., F.R.S.—Referring to a former Part (*Phil. Trans.* 1858, p. 43), the author gives, in the present, descriptions of subsequently received fossils of *Megalania prisca*, advancing the knowledge of that species of large extinct lizard. Characters of the dorsal, sacral, and caudal vertebrae, with those of a considerable portion of the skull, are detailed. So much of the upper jaw as is preserved shows the species to have had that part sheathed with horn as in the tortoise. Upon the head were