Mr. Shaw on Heat. All these courses are given in the Cavendish Laboratory.

Prof. Stuart is lecturing on the Differential Calculus and its Application to Mechanics; the Demonstrator has a course on Elementary Applied Mechanics.

Dr. Michael Foster continues his course of Elementary Physiology. The advanced lectures announced this term are by Mr. Lea (who has been appointed Lecturer in Physiology at Gonville and Caius College), on Physiological Chemistry; Mr. Langley, on the Histology and Physiology of the Digestive System, and Mr. Hill (Downing College), on the Central Nervous System.

The Report of the Syndicate on the Higher Education of Women is to be discussed to-morrow (February 11).

The Board of Natural Science Studies recommends that the agreement between the University and Dr. Dohrn, of the Zoological Station at Naples, by which 75*l.* per annum is paid from the Worts Travelling Bachelors' Fund towards the expenses of the station, be renewed for five years. The Board calls attention to the services which those members of the University who have studied at Naples have rendered to science and the University, and to the fact that three of them have obtained professorships elsewhere, namely Professors A. M. Marshall (Owens), T. W. Bridge (Mason's College, Birmingham), and A. C. Haddon (Dublin).

At Newnham College Miss Harland is lecturing on Euclid and Algebra, and Miss Scott on Analytical Conics, Mr. Garnett lectures on Statics and on Experimental Physics, Mr. Hudson on Arithmetic and on the Differential Calculus, Mr. Hillhouse on Botany, while Miss Cross superintends practical and paper work in Chemistry and Geology.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, December 9, 1880.—"The Electrostatic Capacity of Glass," by J. Hopkinson, M.A., D.Sc., F.R.S.

In 1877 I had the honour of presenting to the Royal Society (*Phil. Trans.*, 1878, Part i.) the results of some determinations of specific inductive capacity of glasses, the results being obtained with comparatively low electromotive forces, and with periods of charge and discharge of sensible duration. In 1878 Mr. Gordon (*Phil. Trans.*, 1879, Part i.) presented to the Royal Society results of experiments, some of them upon precisely similar glasses, by a quite different method with much greater electromotive forces, and with very short times of charge and discharge. Mr. Gordon's results and mine differ to an extent which mere errors of observation cannot account for. Thus for double extra dense flint glass I gave 10·1, Mr. Gordon 3·1, and subsequently 3·89 (Report of British As ociation for 1879). These results indicate one of three things, either my method is radically bad, Mr. Gordon's method is bad, or there are some physical facts not yet investigated which would account for the difference. Two suggestions oocur:—1. Possibly for glass K is not a constant, but is a function of the electromotive force. 2. When a glass condenser is discharged for any finite time, a part of the residual discharge will be included with the instantaneous discharge, and the greater the time the greater the error so caused. To test the first I measured the capacity of thick glass plates with differences of potential ranging from 10 to 500 volts, and also of thin glass flasks between similar limits; the result is that I cannot say that the capacity is either greater or less where the electromotive force is 5000 volts per millimetre than where it is $\frac{1}{2}$ volt per millimetre. The easiest way to test the second hypothesis is to ascertain how nearly a glass flask can be discharged in an exceedingly short time. A flask of light flint glass was tested; it was charged for some seconds, discharged for a time not greater than $\frac{1}{17000}$ second, and the residual charge observed so soon as the electrometer needle came to rest; the result was that the residual charge under these circumstances did not exceed 3 per cent. of the original charge, also that it mattered not whether the discharge lasted $\frac{1}{17000}$ second or $\frac{1}{50}$ second. These experiments suffice to show that neither of the above suppositions accounts for the facts.

I have repeated my own experiments with the guard-ring condenser, but with a more powerful battery, and with a new key which differs from the old one, inasmuch as immediately after the condensers are connected to the electrometer they are separated from it. In no case do I obtain results differing much from those I had previously published.

Lastly, a rough model of the five plate induction balance used by Mr. Gordon was constructed, but arranged so that the distances of the plates could be varied within wide limits. So far as instrumental means at hand admitted Mr. Gordon's method was used. A plate of double extra dense flint and a plate of brass were tried. In the first, by varying the distances of the five plates, values of K were obtained ranging from $1\frac{1}{4}$ to $8\frac{1}{4}$, with the latter results from $\frac{1}{10}$ to 3. It is clear that the five plate induction balance thus arranged cannot give reliable results.

The explanation of the anomaly, then, is that the deviation from uniformity of field in Mr. Gordon's apparatus causes errors greater than any one would suspect without actual trial. It is probable that the supposed change of electrostatic capacity with time may be accounted for in the same way.

January 27.—"Dielectric Capacity of Liquids." By J. Hopkinson, F.R.S.

These experiments have for object the determination of the refractive indices and the specific inductive capacity of certain liquids, and a comparison of the square of the refractive index for long waves and the specific inductive capacity.

In the following table are given the results obtained for refractive index for long waves deduced by the formula $\mu = \mu_\infty + \frac{b}{\lambda^2}$, the square of μ_∞, and the observed values (K) of the specific inductive capacity.

	μ^2_∞	K
Petroleum spirit (Field's)	1·922	1·92
Petroleum oil (Field's)	2·075	2·07
,, (Common)...	2·078	2·10
Ozokerit lubricating oil (Field's) ...	2·086	2·13
Turpentine (Commercial)	2·128	2·23
Castor oil	2·153	4·78
Sperm oil	2·135	3·02
Olive oil	2·131	3·16
Neatsfoot oil	2·125	3·07

It will be seen that whilst for hydrocarbons $\mu^2_\infty = K$, for animal and vegetable oils it is not so.

Zoological Society, February 1.—Prof. W. H. Flower, LL.D., F.R.S., president, in the chair.—Mr. F. M. Balfour, F.R.S., read a paper on the evolution of the placenta and made some observations on the possibility of employing the characters of this organ in the classification of the mammals.—Mr. Sclater read notes on some birds collected by Mr. E. F. im Thurn in British Guiana, amongst which was an example of a new species of *Agelæus*, proposed to be called *A. im-Thurni*, after its discoverer.—Mr. W. T. Blanford, F.R.S., read an account of a collection of reptiles and frogs made at Singapore by Dr. W. B. Dennys. In this collection were two new species of Ophidians, which were named respectively *Cylindrophis lineatus* and *Simotes Dennysi*, and two new frogs, which the author proposed to call *Rana laticeps* and *Rhacophorus Dennysi*.—Mr. A. D. Bartlett read an account of a peculiar habit of the Darter (*Plotus anhinga*) in casting up parts of the epithelial lining of its stomach, as observed by him in the specimen now living in the Society's collection.—A communication was read from Mr. A. Heneage Cocks, F.Z.S., containing notes on the breeding of otters, as observed by him in specimens living in his possession.—The Secretary read a paper by the late Mr. Arthur O'Shaughnessy, containing an account of a large collection of lizards made by Mr. C. Buckley in Ecuador. The collection was stated to be of great interest, both on account of the number of new species it contained and the fresh material it afforded for the study of species already known. Mr. O'Shaughnessy had given last year a partial notice of this collection, confined however to a preliminary list of the species of *Anolis* identified. The present paper gave the results of a study of the whole collection, and was not restricted to a description of the new forms, but enumerated all the species, for the purpose of recording additional remarks and revisions which appeared necessary. In it twenty-seven species were mentioned, ten of which were new.—Mr. G. A. Boulenger read an account of a new species of *Enyalius* in the Brussels Museum, from Ecuador, which he proposed to name *Enyalius O'Shaughnessyi*.—Lieut.-Col. H. H. Godwin-Austen, F.R.S., read the first part of a memoir on the land-shells collected on the island of Socotra by Prof. I. B. Balfour. The present communication comprised an account of the species of *Cyclostomaceæ* found on the island.

Photographic Society, January 11.—J. Glaisher, F.R.S., president, in the chair.—Papers were read by E. Viles on the

lime-light. The principal matter insisted upon was that the oxygen and hydrogen gases should unite in one stream, just before issuing from the nozzle of the burner, and the tubes kept entirely free from wire gauze or any impediment whatever; also that the lime cylinder should be in two pieces, when if the upper part splits the lower part (already heated) could be screwed into position at once.—Also by T. Bolas, F.C.S., on the detective camera. This apparatus consists of two cameras working simultaneously together: in one the image can be seen, whilst in the other a sensitive dry plate is ready for instant exposure by pneumatic power. The whole is inclosed in an unsuspicious wooden box, which can even be placed upon the ground, and scenes and persons photographed unawares.

Victoria (Philosophical) Institute, February 7.—The Earl of Shaftesbury, K.G., in the chair.—A paper was read by Dr. Samuel Kinns, F.R.A.S., on "The Truths of Revelation confirmed by the Advances of Science."

Institution of Civil Engineers, February 1.—Mr. Abernethy, F.R.S.E., president, in the chair.—The paper read was on the Portsmouth Dockyard Extension Works, by Mr. Charles Colson, Assoc. M. Inst. C.E.

PARIS

Academy of Sciences, January 31.—M. Wurtz in the chair.—The following papers were read:—On the long duration of the life of germs of *charbon*, and on their preservation in cultivated earth, by M. Pasteur, with MM. Chamberland and Roux. This relates to an inquiry made by a committee elected by the Paris Society of Veterinary Medicine. Sheep caught the disease from being a few hours daily on ground where animals that died of *charbon* had been buried twelve years before. There was no grass to eat; the germs must have entered the sheep by reason of their habit of smelling about the ground. The farmer had a scar of malignant pustula.—Observations on the birds of the Antarctic Region, by M. Alph. Milne-Edwards. This relates to the first part of a work on the fauna of Austral regions. Birds serve more than any other animals to mark the profound differences between faunas of the southern and those of the northern hemisphere. The geographical distribution of penguins and spheniscans present interesting features in this respect.—On a mode of representation of functions, by M. Gyldén.—On a fall of sleet at Geneva, on January 19, by M. Colladon. The grains were compact and pretty round, and they showed curious dancing movements (sometimes after being motionless two or three seconds), like those of pith balls under electricity.—M. Clos was elected Correspondent in Botany, in room of the late M. Godron.—On the circulatory apparatus of edriophthalmate crustaceans (continued), by M. Delage. This relates to Amphipoda and Læmodipoda.—Action of sulphocarbonate of potassium on phylloxerised vines, by M. Mouillefert. The effects of three to six, two, and one year's treatment are severally considered.—On the figure of planets, by M. Hennessy. For the earth and near planets supposed like it the compression deduced from the theory of fluidity agrees better with observation than that deduced from the theory of superficial erosion.—On the series of Fourier, by M. Jordan.—On an extension of the rule of signs of Descartes, by M. Laguerre.—On a particular cyclic system, by M. Ribaucour.—On the quadrature on which depends the solution of an extensive class of linear differential equations with rational coefficients, by M. Dillner.—On the distinction of integrals of linear differential equations into sub-groups, by M. Casorati.—On the invariant of the eighteenth order of binary forms of the fifth degree, by M. Le Paige.—Action of hydrochloric acid on metallic chlorides (continued), by M. Ditte. In the case of chlorides very soluble in water (less so in acid liquor), and deposited in it as crystallised hydrates, hydrochloric acid diminishes the weight of chloride dissolved, and in the acid liquors one still finds hydrated salts, though much less rich than the crystals that form in this liquid. Another (and last) group contains chlorides that crystallise anhydrous in water or hydrochloric acid, but the solubility of which in concentrated acid is reduced almost to zero.—Determination of the colours which correspond to fundamental sensations, by means of rotatory disks, by M. Rosenstiehl. The line which represents the proportion of extreme sensations in the intermediate colours is a straight one (they are thus, to sight, rigorously equidistant). The line which represents the sensation of yellow reaches its culminating point in the ordinate corresponding to yellow. The sensation of red rises in a straight line to the red, and beyond that to the orange, where it culminates; then it falls to the yellow, where it is zero.—On the determination of carbonic acid in air, by MM. Muntz and Aubin. They have studied the variations of which the proportion of CO_2 in special parts of the atmosphere is susceptible, and here first describe their method (absorption by pumice-stone impregnated with potash solution, then liberation, and measurement of volume), and verify its value.—Observations on a note by M. Eisenberg, on separation of trimethyalmine from substances accompanying it in commercial chlorhydrate of trimethylamine, by MM. Duvillier and Buisine.—On a process of total destruction of organic matters, for investigation of poisonous mineral substances, by M. Pouchet. The principle is that it is possible to heat between 300° and 400°, in presence of carbon or organic compounds, mineral elements contained in a mixture of sulphuric acid and acid sulphate of potash. The sulphate of potash retains substances the most volatile and decomposable (*e.g.* salts of mercury), while the organic matters are quickly destroyed.—On the invasion of pulmonary tissue by a champignon, in peripneumonia, by M. Poincaré.—The third edition of M. Domeyko's Treatise on Mineralogy (in Spanish) was presented. It contains original researches on various South American minerals.

VIENNA

Imperial Academy of Sciences, February 4.—V. Burg in the chair.—F. Osnaghi and V. Lorenz, fifth report of the Adria Commission on the Physical Exploration of Adria.—Prof. L. Pelz, on scientific treatment of axionometry.—Prof. A. Wassmuth, on the possibility of magnetising iron at high temperatures.—Prof. T. Tlann, on the daily course of some meteorological elements in Vienna (city).—G. Bruder, on the knowledge of the tura-formation of Sternberg near Zeidler (Bohemia).—Prof. Sigmund Exner, on the knowledge of the minute structure of the cortex of the brain.

GÖTTINGEN

Royal Society of Sciences, August 7, 1880.—On fluospar in granite of Drammen, by O. Lang.—Some experiments on induction in conducting bodies, by F. Himstedt.

November 5.—On an increase of the meteorite-collection of the University, by C. Klein.—Communication regarding the publication of a text-book of analysis, by R. Lipschitz.—Electrical shadows, by W. Holtz.

December 6.—Electrical shadows (continued), by W. Holtz.—On the connection between the general and the particular integrals of differential equations, by L. Königsberger.—Observations in the magnetic observatory, by K. Schering.—On congenital growth in the thallus of Pollexfenieæ, by P. Falkenberg.—Communications on the University Library from 1876-79, by W. Willmanns.

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