

than twice that required to maintain it when once started. These experiments show that the behaviour of a gas with reference to the passage of an electric spark is analogous to that of a vapour condensing to a liquid, the freezing of a liquid, or the deposition of crystals from a saturated solution. For in the case of a gas which contains a foreign substance (water vapour) the potential difference which the gas can support without a spark passing is approximately steady, but when the gas is carefully dried it can support an abnormally large potential difference, though when once the discharge has started the potential difference at once falls to its normal value. The passage of the spark producing a supply of modified gas which persists for some time after the discharge has stopped.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—The opening of the new department of Human Anatomy was the occasion of some ceremony on Saturday afternoon. The Vice-Chancellor presided at a large gathering of scientific and medical men, including some distinguished visitors from the leading medical schools and universities. After speeches from Sir William Turner, Mr. Arthur Thomson, Sir Henry Acland, and Prof. MacAlister, the Vice-Chancellor declared the buildings open, and the proceedings closed with a vote of thanks to the Vice-Chancellor, moved by Prof. Burdon Sanderson.

The lectures and practical courses in the Natural Science Department are as follows for the current term:—In Physics, Prof. Clifton lectures on Electricity, and gives practical instruction with the assistance of Mr. J. Walker and Mr. S. A. F. White. Mr. R. E. Baynes, lectures at Christ Church on Heat and Light, and Sir John Conroy and Mr. F. J. Smith lecture at Balliol and at Trinity College, respectively, on Elementary Physics and on Mechanics and Physics.

In Chemistry, Prof. Odling lectures on Organic Chemistry, and Mr. W. W. Fisher, on Inorganic Chemistry. Other lectures and practical instruction are given by Mr. J. Watts, Mr. V. H. Veley, Mr. J. E. Marsh, and Mr. J. A. Gardner. Mr. Vernon Harcourt and Mr. P. Elford lecture at Christ Church and St. John's respectively. Prof. A. H. Green lectures on Geology in the Museum on Mondays, Wednesdays, and Fridays.

Prof. Ray Lankester lectures three days a week on the Comparative Anatomy of the Vertebrata, and Dr. W. B. Benham and Mr. G. C. Bourne give other lectures in the Linacre Professor's Department. Mr. J. Barclay Thompson lectures on the Osteology of Fish and Amphibia; and the Hope Professor of Zoology, on Means of Defence in the Struggle for Existence.

In Physiology, lectures and practical instruction in the subjects for the Final Honour Examination are given by Prof. Burdon Sanderson, Mr. J. S. Haldane, and Mr. M. S. Pembrey.

Prof. S. H. Vines gives advanced and elementary courses on Botany at the Botanical Gardens.

In Anthropology, lectures are announced by Dr. E. B. Tylor, by Mr. H. Balfour, and by Mr. Arthur Thomson.

It is announced that the examination for a Biological Fellowship at Merton College will commence on November 14.

Examinations for Natural Science Scholarships and Exhibitions at Balliol, Christ Church, and Trinity, are announced to begin on November 21.

CAMBRIDGE.—The Vice-Chancellor gives notice that Mr. H. Yule Oldham, University Lecturer in Geography, will deliver an inaugural lecture on the progress of geographical discovery, in the large lecture theatre of the chemical laboratory, on Tuesday, October 24, at noon.

During the Michaelmas and Lent terms, Mr. Oldham will give courses of lectures on the principles of physical geography, in the same theatre, on Thursdays, at noon, beginning on October 26.

The Council of the Royal Geographical Society offer to award during the present academical year an exhibition of £100 to be spent in geographical investigation (physical or historical) of some district approved by the Council, to a member of the University of not more than eight years' standing, who shall

have during his residence attended the courses of the lectures in geography. Further particulars will be announced.

The office of Director of the Fitzwilliam Museum is vacant by the resignation of Dr. Middleton. A new Director will be appointed on Friday, November 17. The stipend is £300 a year. Candidates are to send their names to the Vice-Chancellor by Friday, November 10.

The Walsingham Medal, founded by the High Steward of the University, will be offered during the present academical year for the best monograph or essay giving evidence of original research in any subject connected with biology or geology. Essays are to be sent to Prof. Newton by October 1, 1894.

There are this year 132 freshmen who have indicated their intention of studying medicine in the University.

Entrance Scholarships in Natural Science have been awarded at Christ's College to A. V. Cunningham (£60), Clifton College, and J. Hart-Smith (£30), Berkhamstead School; and at Emmanuel College to W. F. A. Ermen (£50), Clifton College, and R. G. K. Lempfert (£50), Manchester Grammar School. At Downing College an Examination for Minor Scholarships (£50) in Natural Science will be held on April 17, 1894. At St. John's the Examination for Natural Science Scholarships (£80 and under) and Exhibitions (£50 and under) will begin on December 5, 1893.

THE United States Bureau of Education has published a remarkable "Circular of Information," by Dr. Arthur Macdonald, entitled "Abnormal Man." The volume includes essays on education and crime and related subjects, with digests of literature and an extensive bibliography. With regard to the effect of education on crime a statistical investigation shows that in France and Italy there has been an increase of both education and crime. Germany shows an increase of habitual criminality and a general increase of both university education and crime. As far as statistics are accessible, Austria shows an increase in education and a decrease in crime. Also, while there has been a decrease in the number of convictions for crime from 1881 to 1887 in Norway and Sweden, there has been an increase in education. But in Norway alone for the year 1888-89 there was an increase in the number of crimes. In England, Scotland, and Ireland all statistics are in accord in showing an increase in education and a decrease in crime from 1885-1890. Japan and Saxony also exhibit an increase in education and a decrease in the number of convictions. It thus appears that while some countries show an increase in both education and crime, yet not a few, and some of the most developed nations, show an increase of education and a decrease of crime. The statistics, therefore, fail to show the exact relation between education and crime.

SCIENTIFIC SERIALS.

American Journal of Mathematics, vol. xv. No. 3. (Baltimore, 1893).—On groups whose orders are products of three prime factors, by F. N. Cole and J. W. Glover (pp. 191-220). In this paper the authors fully determine the groups for three prime factors, equal or unequal. Those of order pq and p^2 are known from Netto.—The nature and effect of singularities of plane algebraic curves, by Miss Scott (pp. 221-243) is a continuation of the paper in vol. xiv. In the earlier memoir the method employed was stated to be directly applicable, in general, to the determination only of the joint components of the singularity; in this the restriction is removed, and it is shown that the process enables one, in every case, to enumerate the double lines (double tangents and inflexional tangents) involved in the singularity.—The elliptic irregularities in the lunar theory, by E. W. Brown (pp. 244-263), gives a general solution in series of the problem: a system of three bodies is in motion in one plane, the first is revolving about the second, and is disturbed from its elliptic orbit by the third. The third body is supposed to be of infinite mass, and to be moving in a circle of infinite radius with a finite angular velocity. Given the relative positions of the three bodies at any one time, to find their relative positions at any other time. The differential equations used at the outset are given in Dr. Hill's paper (vol. i.) and M. Poincaré's researches (*Acta Math.* vol. xiii.) afford considerable help in the work.—On the transformation of linear differential equations of the second order with linear coefficients, by Oskar Bolza (pp.