

a tube was too slight to be amenable to direct chemical test, but the change operated by the light could be clearly demonstrated by passing an electric discharge through two similar tubes, one of which had and the other had not been exposed to the radiant energy from a source of high potential. If space could be thought to be filled with such vapour, of which there was much evidence in proof, solar rotation would necessarily have the effect of drawing such vapour towards its polar surfaces, and emitting it equatorially by an action independent of solar gravity, and which might be likened to that of a blowing fan. When reaching the solar photosphere, this circulating dissociated vapour would, owing to its accumulated density, flash into flame, and could thus be made to account in great measure for the maintenance of solar radiation, whilst its continual dissociation in space would account for the continuance of solar radiation into space without producing any perceivable calorific effect.

Time did not permit him to enter more fully on these subjects, which formed part of a solar hypothesis which he had ventured lately to bring forward, his main object on this occasion having been to elucidate the point of cardinal importance to that hypothesis, that of the solar temperature.

The lecture was illustrated by several experiments, showing the methods by which the dependence of radiation upon temperature had been arrived at.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—Mr. H. Marshall Ward, M.A., late Scholar of Christ's College, First Class in the Natural Sciences Tripos, 1879, Lecturer at Owens College, and Fellow of Victoria University, has been elected Fellow of Christ's College.

It is proposed to appoint a Curator of the new Archaeological Museum at Cambridge at a stipend of 150*l* a year. Valuable contributions towards developing the Museum in the direction of ethnology have been promised.

In a discussion on the proposed immediate appointment of a Professor of Physiology, it was mentioned that enlarged classrooms and a lecture-room, which did not exist, would be needed. A hope was expressed that the Professorship of Pathology would be filled up as soon as there was a reasonable prospect of sufficient appliances in the form of laboratory, &c., being provided for the Professor.

MR. W. N. STOCKER, M.A., Fellow of Brasenose, has been appointed Professor of Physics at the Royal Indian Engineering College, Cooper's Hill. Mr. Stocker took a first-class in mathematics and also in natural science, and has been for the last eight years Demonstrator in the Clarendon Laboratory.

SCIENTIFIC SERIALS

Journal of the Russian Chemical and Physical Society, vol. xv, fasc. 1.—Researches on the naphtha of Caucasus, by MM. Beilstein and Kurbatoff. The naphtha from Bakou consists mostly of hydrocarbons of the C_nH_{2n} series, identical with the products of hydrogenisation of the aromatic series C_nH_{2n-6} . That of the TzarSKIYE Kolodtsy has a different composition; it contains but little of the hydrocarbons of the C_nH_{2n} series, but chiefly those of the C_nH_{2n+2} types, with a mixture of those of the aromatic series C_nH_{2n-6} . This analysis explains why the petroleum derived from the Bakou naphtha, although having a greater density together with the same volatility, burns brighter than the American, as also the higher qualities of the oils received from this naphtha. Its hydrocarbons being all liquid it contains but little paraffin, and the greasing oils may be cooled to lower temperatures, without liberating paraffin.—On the use of hyposulphite of ammonium, instead of the sulphide of ammonium, in qualitative analysis, by A. Orlovsky.—On the hydrogenisation of turpentine and cymol, by P. Orloff.—Additions to the theory of the action of chloride of ammonium.—On the evaporation of liquids, by B. Srezniewsky, being the conclusion of a treatise which has appeared in several preceding numbers of the *Journal*. The conclusions arrived at are: the velocity of evaporation is not constant; the velocity of evaporation of drops depends upon their height, and increases as the height diminishes; at a height of an average size it is proportioned to the periphery of the basis.—An aerial calorimeter (a project of), by N. Hesehus.—Elementary demonstration of the pendulum formulæ, by V. Wolkoff.

Vol. xv, fasc. 2.—On the transformation of the primary radical of propyl into a secondary, being a continuation of the researches undertaken by MM. Kékulé and Schröter, on the transformation of bromide into isopropyl under the influence of aluminium bromide.—On the heat of dissolution of mixtures of salts, and on the principle of maximum work, by P. Chrustchoff.—Analysis of the mineral waters of Slavinsk, in the Government of Lublin, by M. Kondakoff. They may be considered as one of the best iron mineral waters, as they contain the least mixture of other mineral substance; that is, 0.19 to 0.22 parts of carbonate of iron out of 3.18 to 3.38 parts of other salts, against 0.37 to 4.36, contained in the water of Spa, or 0.45 to 6.14, and 0.24 to 5.45 in those of Altwasser and Reinerz.—On the chloride of pyrosulphuryle, by D. Konvaloff.—Analysis of sulphur concretions in the fireproof clay from Bakhmut, by M. Kondakoff.—On the structure of nitric compounds of the fatty series, by M. Kissel.—On the permutations of bases in solutions of their neutral salts, by Prof. Menshutkin (analysed elsewhere).—On the specific heat of several products of distillation of naphtha, by E. Kuhlín.—On a secondary product obtained during the preparation of allyldimethyl carbinol, by W. Dieff; it distilled at 165° to 185°, and its structure may be represented as $C_9H_{16}O$.—On the critical temperature of isomeric and homologous series, by A. Nadejdine. The supposition formerly made by the author as to the critical temperature increasing in the same proportion as the temperature of boiling is confirmed by experiments with a sufficient degree of accuracy; it would result that the functions which express the dependency of the critical temperature upon the molecular structure are the same as those expressing the same dependency of the temperature of boiling, and differ only by their constants.—On comets and solar radiation, by M. Schwedoff.—Several conclusions from the theorem of Carnot, by M. Srezniewsky, being a confirmation of the formula of Kirchhoff ("Ueber einen Satz der mechanischen Wärmetheorie") for the expression of the absorption of heat during the formation of saturated solutions, and a verification of it for a certain number of salts.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, March 8.—"Note on the Reversal of Hydrogen Lines; and on the Outburst of Hydrogen Lines when Water is dropped into the Arc." By Professors Liveing and Dewar.

The concentration of the radiation of hydrogen in a small number of spectral lines would lead us to expect that the absorption of light of the same refrangibility as those lines would, at the temperature of incandescence, be correspondingly strong, and that therefore the hydrogen lines would be easily reversed. The mass of hydrogen which can be raised to a temperature high enough to show the lines is, however, so small that, notwithstanding the great absorptive power of hydrogen for the rays which it emits, the reversal of the lines has not hitherto been noticed. In fact, the lines are very readily reversed, and the reversal may be easily observed.

When a short induction-spark is taken between electrodes of aluminium or magnesium in hydrogen at atmospheric pressure, a large Leyden jar being connected with the secondary wire of the coil, the hydrogen lines show no reversal; but if the pressure of the hydrogen be increased by half an atmosphere or even less,¹ the lines expand and a fine dark line may be seen in the middle of the F line. As the pressure is increased, this dark line becomes stronger, so that at two atmospheres it is very decided. As the F line expands with increase of pressure, the dark line expands too, and becomes a band. It is best seen when the pressure is between two and three atmospheres. When the pressure is further increased, the dark band becomes diffuse, and at five atmospheres cannot be distinctly traced. No definite reversal of the C line was observed under these circumstances. The dispersion used, however, was only that of one prism.

By using a higher dispersion the reversal of both the C and F lines may be observed at lower pressures. For this purpose a Plücker tube was used,² filled with hydrogen and only exhausted until the spark would pass readily when a large jar was used.

The light of the narrow part of the tube is, under these cir-

¹ The metallic gauge connected with the Cailletet pump used is not at all sensitive, so the pressures here mentioned are only approximate.