of State which may have conferred upon it powers in relation to secondary education. The Royal Commission on Secondary Education recommended that there should be a central authority, a Government Department, in London, to supervise secondary education and local authorities in the country. The opinion of the Government is that the central authority in London must be created and arranged before the local authorities in the country can be usefully set on foot, and it is to organise and arrange a central department in London to exercise the sort of functions recommended by the Royal Commission that this Bill has been brought before Parliament. The Bill proposes the abolition of the existing Committee of Council on Education and to replace it by a Board of Education consisting of the First Lord of the Treasury, the Chancellor of the Exchequer, and the Secretaries of State for various departments, having a President and a Parliamentary Secretary in the same manner as the Local Government Board and the Board of Trade. To this new Board of Education are to be transferred all the powers and functions which are at present exercised by the Committee of Council, so that it will stand in relation to educational matters and the distribution of the science and art grants and technical instruction exactly in the same position, and have exactly the same powers, as the present Education Department possesses.

SCIENTIFIC SERIALS.

American Journal of Science, June.—Othniel Charles Marsh—portrait and obituary notice.—The Camden Chert of Tennessee and its Lower Oriskany Fauna, by J. M. Safford and C. Schuchert. The latter describes in detail a peculiar chert formation discovered by the former.—Recent discovery of rocks of the age of the Trenton formation at Akpabok Island, Ungava, by J. F. Whiteaves. Describes the fossils collected by Dr. R. Bell, of the Canadian Geological Survey, on Akpabok Island, between Ashe Inlet and Fort Chimo, and concludes that they belong to a lower geological horizon than the Hudson River formation as at first supposed.—Studies in the Cyperaceæ, No. 10, by T. Holm. Describes the North American species of *Fimbristylis*, Vahl.—On Roscœlite, by W. F. Hillebrand and H. W. Turner. Roscœlite is a vanadium mica, some specimens of which show a tendency to crystallise in little rosettes. It occurs most frequently embedded in quartz at Placerville, California. It contains 45 per cent. SiO_2, 24 per cent. V_2O_3, 11 per cent. alumina, 10 per cent. potash, 4 per cent. water, and traces of magnesia and ferrous oxide.—Gravitation in gaseous nebulæ, by F. E. Nipher. If R be the radius of a spherical mass of gas of cosmical dimensions, and T its temperature, the product TR is constant. The heat capacity of such a gravitating mass is negative. If heat leaves the gas, it contracts and becomes warmer. The physical condition to be satisfied in order that a central mass or core, having a radius equal to that of the sun, should contain a mass equal to that of the sun, is that its temperature is 20 million degrees Centigrade. The pressure at the surface of this sphere is 366 million atmospheres. The average density of the spherical mass, which is three times the density at the surface of the hydrogen sun, is about 7 per cent. less than the average density of the sun itself, but the nature of the gas is immaterial. In the sun as it is, the rarefied external parts of the solar nebula have parted with their heat, and the temperature throughout the mass has ceased to be uniform. But the abolition of cosmical pressure has almost wholly compensated the fall in temperature of the sun from 20 millions at least to perhaps 10,000 degrees.

Symons's Monthly Meteorological Magazine, June.—Unprecedented frost in the United States in February 1899. In that month 64°·8 were recorded at Camden Town, being 2° 3 higher than any reading recorded in February in London during 104 previous years, while about the same time at New Orleans an equally unprecedented low reading of 7° (25° below freezing) was registered. Prof. Garriott, in charge of the forecast division, states that the most remarkable series of cold waves in the history of the Weather Bureau traversed the United States from the North Pacific to the South Atlantic coasts during the first half of February, damaging crops and fruit in the southern States to the extent of millions of dollars. The cause of this intense cold is ascribed to barometric depressions in the south, combined with a large area of high barometer over British north-west territory.—On a recent recurrence in weather: a lunar or 30-day period, by H. H. Clayton. The author has treated the temperatures observed at the Blue Hill Meteorological Observatory, from July 1898 to February 1899, in the same way as Mr. A. MacDowall has treated the temperatures for the same time observed at Greenwich. The figures show a well-marked period of about thirty days, but the interval is too short to determine whether the period had the exact length of the lunar period, or had any relation of cause and effect.

Wiedemann's Annalen der Physik und Chemie, No. 5.—A double trough refractometer, by W. Hallwachs. The author describes certain improvements in his differential interference refractometer for liquids, and measurements made with it on solutions of cadmium bromide, sugar, chloracetic acid, and chloracetates.—Optical properties of burnt-in gold and platinum films, by G. Breithaupt. Thin layers of gold, platinum, and other metals were burnt into glass or obsidian, and tested with regard to their dispersion. Gold showed normal dispersion, so did brass, when well polished with cotton wool. Platinum, steel, and nickel steel showed anomalous dispersion.—A new method of detecting electric waves, by A. Neugschwender. This is the author's second communication on the subject of his damp anti-coherer. He found that the establishment of conductivity between the two sides of a metallic slit on moistening it depended upon the presence of some metallic salt in the moisture which could be separated electrolytically. Under the microscope the metal so separated out forms a tree-like formation, which suddenly breaks up on the impact of electric waves, thus destroying the conductivity.—Determination of the pitches of Appunn's pipes by optical and by acoustic means, by F. A. Schulze. The author has repeated Appunn's determinations of the pitches of high pipes by the method of revolving mirrors, by Kundt's dust figures, and by Quincke's interference tube. He confirms Stumpf's result that the highest Appunn pipes have pitches assigned to them which are wrong by several octaves.—Determination of high pitches by difference tones, by C. Stumpf. The author defends the trustworthiness of the method of difference tones against Appunn's criticism.—On the refracted wave at so-called total reflection, by W. Voigt. Against Ketteler's criticism the author maintains that there exists a stream of energy parallel to the surface of the second medium in "total" reflection, and that this stream of energy is nothing else than a ray of light.—Thermal insulators, by W. Hempel. This is a comparison of the insulating properties of Dewar tubes silvered on the outer surface of the inner tube, with those of wool and feathers. Eiderdown turns out to be the most effective of the old insulators, as it is capable of maintaining a charge of solid carbonic acid and ether below $-66°$ for an hour and a half, whereas the same charge surrounded by cotton or silk reaches $-56°$ in the same time, and $-33°$ when surrounded by an imperfect vacuum. At the same time, the charge remains below $-70°$ in a Dewar tube, the initial temperature in every case being $-79°$.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 18.—"Diffusion of Ions into Gases." By John S Townsend, M.A. (Dublin), Clerk Maxwell Student, Cavendish Laboratory, Cambridge. Communicated by Prof. J. J. Thomson, F.R.S.

In the paper upon this subject the principles of the theory of interdiffusion of gases are applied to the diffusion of ions produced in a gas by the action of Röntgen rays. When a gas is ionised in this way, and then removed from the action of the rays, the conductivity gradually disappears. If there are no electric forces acting on the gas, the loss of conductivity is due partly to the encounters between positive and negative ions, and partly the effect of the surface of the vessel which discharges those ions that come into contact with it.

The ions may be considered as a separate gas (A) mixed with the ordinary uncharged molecules (B), which are unaffected by the rays. When the mixture is passed along a metal tube there is a loss of conductivity, due to the ions coming into contact with the surface. A formula is given for calculating the rate of diffusion of the ions A into the gas B from this loss of conductivity, which was found experimentally. The following values were obtained for the coefficients of diffusion of ions into air, oxygen, carbonic acid, and hydrogen.