BERLIN.

Meteorological Society, March 6.—Dr. Vettin, President, in the chair.—Dr. Zenker gave an account of his work, which has been awarded a prize by the Paris Academy, on the distribution of heat over the surface of the earth. When considering the total heat which reaches the earth's surface, it is of course dependent upon the distance of the sun, and is greater at perihelion than at aphelion in the ratio of the inverse square of the sun's distance. The varying ellipticity in outline of the earth in its various positions has no influence on the heat received owing to the extremely slight difference thus produced. If any one point of the earth's surface is alone considered, then the heat received is determined by the sine of the sun's altitude or the cosine of its zenith distance, for which the speaker gave an equation expressed in terms of amplitude and declination. From the above relationships it follows, leaving the air out of account, as has usually been the case, that the heat received by the Pole on a summer day is greater than that which falls on a point at the equator. Thus taking as unit the heat received during twenty-four hours by a place at which the sun is in the zenith, the North Pole receives an amount of heat represented by 0·397, and a point on the equator an amount represented by 0·292. But the air absorbs a large part of the sun's heat. The speaker considered it unreliable to estimate the height of the atmosphere from the amount of heat-absorption, as is frequently done, inasmuch as the chief absorption takes place in the deeper layers of the air. For the determination of the coefficient of absorption Dr. Zenker accepts the values obtained by Langley from his bolometric experiments, with a reservation, however, as regards the absorption which takes place in its highest layers, which he did not admit. One factor of great importance is the diffusion of heat, already described by Clausius, from the small particles of water, dust, and air in the atmosphere, which are calculated under other definite assumptions. Another factor which must not be lost sight of is the reflection of heat at the earth's surface ; this is calculated for the three cases of a surface of water, land, and snow. Special tables are given of the heat reflected from these three kinds of earth-surface for separate places per day and per year. The application of this theoretical part of the research to the climatology of the earth's surface, the speaker intends to lay before the Society at some future time.—Dr. Less drew attention to the meteorological conditions of the past few days. A minimum temperature on March 1 was succeeded by a thaw on the evening of the 2nd, which was followed by a second very low temperature which again gave way to a thaw on the 6th. The rise and fall of the barometer corresponded to the above : the very considerable double variation in atmospheric pressure was caused by a minimum passing through South-West Sweden across the East Sea to Russia, which was succeeded by a partial minimum following the same course. Exactly similar meteorological conditions were in existence from February 4, and were caused by a minimum with its succeeding partial minimum following the same course as above. Such an exact similarity of path and action of two minima is of very rare occurrence, and deserves to be carefully studied : on both occasions, in February and March, very wintry weather was observed.—Dr. Hellman drew attention to the unusually heavy snow-fall of the past winter. As yet the maximum number of days on which snow falls in Berlin has been fifty, but this year up to the present time it has already fallen on fifty-eight days ; in the same way, until this year never more than eight consecutive days of snow-fall have been observed, but this winter there has been one period of sixteen consecutive days on which snow has fallen.

STOCKHOLM.

Royal Academy of Sciences, March 14.—Studies on the Characeæ and Violæ of the Isles of Gotland and Oeland, by Dr. Wahlstedt.—Studies on the geographical distribution of the plants in the province of Wermland, by Dr. Ringius.—On the currents of disjunction, by Dr. Mebius.—On the institution of pendulum observations in Sweden, by Prof. Rosén.—A review of the Orthoptera of Scandinavia, with descriptions, by Dr. Haij.—Analyses of gadolinite and hornilite, by Dr. W. Pettersson.—On the production of nitro-cymol and its products of oxidation, by Prof. Widman and Dr. Söderbaum.—On the occurrences of *Limnadia lenticularis* on the Isle of Nordkoster in the province of Bohus, by Hr. Hanson.—A thunderstorm combined with water-spouts near Upsala, by Hr. Th. Wigertz.—On fossil wood from Egypt and Eastern Asia, by Prof. Schenk, of Leipzig.—Volcanoes

in the interior of the north-eastern parts of Iceland, by Hr. Thoroddsen, of Reykjavik.—On the determination of the constants in the diurnal rotation, by Dr. Bohlin.

AMSTERDAM.

Royal Academy of Sciences, February 25.—M. Martin exhibited a geological chart of the course of the River Surinam, appending the communication that, during his stay in the West Indies, he succeeded in discovering the geological formation in which the gold occurring in those parts, and long since known as wash-gold, was originally deposited. This formation is the crystalline schist, a stratum in which, in Brazil also, most of the gold is met with. The speaker urged that Brazil and Surinam offer striking points of resemblance both in the order and nature of their stratifications.—M. de Vries made a communication on his determination of the molecular weight of raffinose. His results, based upon physiological methods, tended to support the formula of Loiseau and Scheibler,

$$C_{18}H_{32}O_{16} + 5H_2O.$$
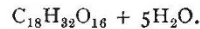
—M. Hubrecht described the early stages in the development of the blastodermic vesicle of the hedgehog. He claimed that the stages observed and described by him go a long way towards explaining the questionable points in the early stages of the human blastodermic vesicles that have yet been noticed.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

Fundamental Principles of Chemistry : R. Galloway (Longmans).—Reminiscences of Foreign Travel : R. Crawford (Longmans).—An Examination of the Theory of Evolution : G. Gresswell (Williams and Norgate).—Johnston's Botany Plates, II. (Johnston).—Key to the Volapük Grammar : A. Kirchhoff (Sonnenschein).—Specimens of Papers set at the Army Preliminary Examinations, 1882-87 (Macmillan).—Companion to the Weekly Problem Papers : Rev. J. J. Milne (Macmillan).—An Indictment of Darwin : O. Dawson (Freethought Publishing Company).—An Increase in the Produce of the Soil through the Rational Use of Nitrogenous Manure : P. Wagner; translated by G. G. Henderson (Whittaker).—Smoke in Relation to Fogs in London : Hon. Rollo Russell.

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