four hours. This circumstance may be taken as supporting Sohncke's theory of aërial electricity, according to which the electricity during a storm results from the friction of drops of ice and water, and this can only take place when cold currents of air at comparatively low levels flow over warm, moist masses of air.

**Physical Society**, December 14, 1888.—Prof. von Helmholtz, President, in the chair.—Dr. Thiessen gave an account of experiments which he had carried out in order to measure the amount by which gravity varies at different heights. The method he employed was that of Jolly, but with the introduction of a modification, in order to eliminate the irregularities due to differences of temperature at the higher and lower stations. Scale-pans were attached to each arm of the balance—one close up to the beam, the other some distance below it—and the weight was interchanged between the pans, both at the upper and lower stations, thus eliminating the influence of differences of temperature and of any inequality of the balance. The upward force of the air had no influence on the results, notwithstanding the varying volumes of the weights used. The distance between the upper and lower scale-pans was 11·5 metres, and the weight used was 1 kilogramme. Twenty-four determinations were made, which gave as a result that the kilogramme, when in the lower pan, weighed 2·8 milligrammes more than when it was weighed in the upper pan. After making some corrections, and, among these, one necessitated by the fact that the weight in its lower position was 4 metres below the general surface of the earth, it was found that the weight of 1 kilogramme varies by 0·28 milligramme for each 1 metre of difference in altitude.—The President gave an account of a paper by Prof. Hertz, which he had yesterday communicated to the Berlin Academy. It contained a description of further experiments on electrodynamic waves, and their analogy with waves of light. Weak induction-discharges between small metallic cylinders with rounded ends were employed, and a similar apparatus for the detection of the electrodynamic waves. The action was not propagated more than 2 or 3 metres through space; when it fell on a metallic surface it was reflected, interference phenomena were observed, and from these the length of half a wave was found to be 30 centimetres. When a metallic parabolic mirror, 1 metre across its opening, was placed behind the apparatus used to produce the discharge, the action was propagated to a distance of 8 metres; and the action was greatly increased when a second concave mirror was placed behind the receiving apparatus. When a conductor was interposed, the action ceased, while non-conductors allowed the waves to pass. By interposing perforated metallic screens, it was found that the waves are propagated in straight lines; the waves passed through a dry wooden partition. Polarization of the waves could be determined in several ways. When the receiver was placed at right angles to the apparatus producing the waves, no action between them could be detected, the vertically-produced waves not being picked up by the horizontally-placed receiver. When the two pieces of apparatus were placed parallel to each other, and a wooden cube, with a number of insulated metallic wire rings wrapped round it, was placed in the path of the electrodynamic waves, it produced the same effect as does a tourmaline plate on polarized light. When the wires were vertical—that is to say, parallel to the exciting apparatus—the action was not propagated through the cube; but it was, on the other hand, when the wires were horizontal. When the receiver with its mirror was placed horizontally, so that it did not record any action as reaching it, and the wire arrangement, described above, was placed in the path of the waves, no change took place in the receiver when the wires on the cube were either vertical or horizontal, but the receiver was affected when the wires were placed at an angle of 45°. The laws of reflection of electrodynamic waves at metallic surfaces were found to be the same as those for the reflection of light at plane mirrors. Finally, Prof. Hertz has determined the refraction which the waves undergo in a prism made of pitch, and finds that the refractive index of this substance for electric waves is 1·68.—Dr. Ritter demonstrated by experiments the action of the ultra-violet rays of light on electric discharges in accordance with the experiments of Hertz, Wiedemann, and Eberts.

STOCKHOLM.

**Royal Academy of Sciences**, January 9.—On the researches and studies made at the zoological station of the Academy at Christineberg in Bohuslan, during the past year, by Prof. S. Lovén. He gave an account of papers by Dr. Aurivillius on the disguise amongst the Oxyrhynchous Crabs, by Dr. Virén on a Nereid Annelid (*Nereis fucata, forma inquitina*), by Herr Lönnberg on cestodes in marine fishes and birds.—Researches on the periodic system of the elements, by Dr. T. R. Rydberg.—Baron Nordenskiöld exhibited some uncommonly large crystals of magnetic iron from the Nordstjerne mine near Vestanfors, and gave an account of some remarkable Swedish localities with crystallized magnetite. He also showed four meteorites, for the collection of the State Museum, received from the British Museum. Amongst these were (1) a sample of a small, highly-interesting block of iron, which fell near Rowton, in Shropshire, August 20, 1876; (2) a fragment of a meteorite which fell in Hisen, in Japan.—On some transcendents, which appear at the repeated integration of rational functions, by Dr. A. Jonquière, of Bern.—On natural etching figures and other phenomena of solution on beryllium, from Muovinsk, by Herr W. Peterson.—Researches on minerals from Fiskernæs, in Greenland, by Herr N. V. Ussing.—Mineralogical notes, II., 3-4, by Herr G. Flink.—Anatomical studies on Echidna, by Miss C. Westling.—On the dimorphism of the *Rhizopoda reticulata*, by Dr. A. Goës.—The insect fauna of Greenland; I. Lepidoptera and Hymenoptera, by Prof. Chr. Aurivillius.

## BOOKS, PAMPHLETS, and SERIALS RECEIVED.

Memoirs and Memoranda in Anatomy, vol. i.: Cleland, Mackay, and Young (Williams and Norgate).—Molekularphysik, Erster Band: Dr. O. Lehmann (Williams and Norgate).—Thomas Jefferson and the University of Virginia: H. B. Adams (Washington).—Transactions of the Sanitary Institute of Great Britain, vol. ix. (Stanford).—Life Register (West, Newman).—Essai d'une Théorie du Soleil et des Étoiles Variables: A. Brester (Delft).—Industrial Education in the South: Rev. A. D. Mayo (Washington).—Kew Observatory, Richmond, Report for the year ending December 31, 1888 (Harrison).—L'Écoulement des Glaciers: Dr. A. A. Odin (Lausanne).—Arnold Toynbee: F. C. Montague (Baltimore).—Journal of Physiology, December (Cambridge).—Journal of Chemical Society, December (Supplementary Number) and January (Gurney and Jackson).—Himmel und Erde, 1 Jahrg. Heft 2, 3, 4 (Berlin, Pactel).—Annalen der Physik und Chemie, 1889, No. 1 (Leipzig, Barth).

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