

could only be obtained with nickel owing to the oxidation of the thin films of iron and cobalt at high temperatures (300°). With nickel a rise of temperature produced at first no change in the rotation, but above 300° a sudden diminution was observed which rapidly became progressively greater; the relationship of the diminution of rotation to the increase of temperature was the same as for the magnetic susceptibility of the metal.

February 24.—Prof. Schwalbe, President, in the chair.—Dr. Raps demonstrated his latest and most improved form of automatic gas-pump for blood-gas analysis. Dr. Richarz developed, in accordance with the kinetic theory of gases, and under certain assumptions as to the constitution of solid bodies, the formulæ for the law of Dulong and Petit. The formulæ furnished an explanation of the divergence from this law which is exhibited by certain elements. Dr. Gross spoke on the laws of energy, proceeding with his criticism of Clausius's views, stating that he regarded Clausius's second law as unproved, and finally coming to the conclusion that entropy is constant.

Physiological Society, February 17.—Prof. Zuntz, President, in the chair.—Dr. von Noorden gave an account of four experiments on nutrition carried out under his direction on men. The first established the fact that nitrogenous waste, as in the case of diabetes, even when excess of proteid is given, can be most definitely lessened by the ingestion of large quantities of carbohydrates. Fats cannot take the place of carbohydrates in the above. The second showed that when carbohydrates are given in increasing quantities over a prolonged period to a person in nitrogenous and calorimetric equilibrium, they lead for the most part to a storage of fat (95 per cent.), and to a less extent of proteid (5 per cent.). The speaker expressed the opinion that this proteid is laid on in the living cell as a sort of non-living reserve proteid. The third set of experiments showed that when the food of a fat person is diminished down to the requirements of a seven- to ten-year-old child, then any increase of its proteid constituents leads to a storage of proteid with a simultaneously considerable loss of fat. Experiments on the respiratory interchange of the person experimented upon showed that the intake of oxygen had been reduced to a minimum and that the respiratory quotient was 0.7. The last set of experiments, made on a gouty patient, showed that with a constant diet, the ratio of intake and output of nitrogen was very variable, at one time a large amount of nitrogen being retained in the body while at another time much more nitrogen was excreted than was given with the food.

AMSTERDAM.

Royal Academy of Sciences, February 25.—Prof. van de Sande Bakhuyzen in the chair.—Mr. Weber read a paper on the origin of the mammalian hair. The author gave a *résumé* of his earlier researches on the scales of mammals, which led him to the hypothesis that the primitive mammals were covered with true scales. A weak point in this hypothesis was, that except Manis and the Dasypodidæ, generally the tail alone is scaled. The author showed, however, that according to the researches of H. de Meyere, the arrangement of the hairs on scaleless skin of numerous mammals is the same as that in scaled parts. Both are placed in alternating groups. The author believed that primitive mammals were covered with scales, and that few and small hairs were placed behind them. On acquiring a constant temperature the hair coat got denser as a good protection from loss of heat. This was the cause of the reduction of the scales, and also mostly of their final loss.—Mr. Lorentz dealt with the influence of the motion of the earth on the propagation of light in doubly refracting media. In the September meeting the author communicated a simple form for the equations which determine the propagation of light in isotropic bodies, moving through the æther with a constant velocity β , the æther itself being supposed to remain at rest. It is now shown how these formulæ are to be modified in the case of a crystallised medium, and to what consequences they lead, as to the motion of light, relatively to the ponderable matter. The velocity of propagation of a ray of light (to be distinguished from that of the waves) is found to be $W = W_0 - \frac{\beta}{n^2} \cos \delta$, W_0 being the value for the same direction and for $\beta = 0$, δ the angle between the ray and the velocity β , V the velocity of light *in vacuo*, and $n = \frac{V}{W_0}$.

The course of reflected and refracted rays may be deduced from Huygens's principle or from the condition that $\int \frac{ds}{W}$ must be a minimum (ds being a linear element). Owing to the above value of W , the motion of the earth will neither affect the course of the rays nor the interference phenomena. In this way some experimental results of Ketteler (*Astronomische Undulations-theorie*, pp. 151–173, *Pogg. Ann. Bd. 147*), and Mascart (*Ann. de l'École normale*, 2^e série, t. i, pp. 191–196) may be explained.—Mr. Kamerlingh Onnes gave the results of measurements of Dr. Zeeman on the dispersion of Sissingh's magneto-optic difference of phase in Kerr's phenomenon. The dispersion is contrary to the theory of Drude.—He described further a new entoptical phenomenon found by Dr. Zeeman in sighting a split, and communicated the results of the measurements of Dr. de Vries on the variation of the ascension of capillary tubes for æther with the temperature from -102°C . to the critical temperature $193^{\circ}\cdot6$. The surface work plotted in function of temperature gives a curve turning the convex side to the axis of temperature and ending tangentially to it.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—An Elementary Treatise on Pure Geometry: J. W. Russell (Clarendon Press).—Comité International des Poids et Mesures, Quinzième Rapport (Paris, Gauthier-Villars).—The Intelligence of Animals: G. W. Purnell (Christchurch, N.Z., Whitcombe and Tombs).—How to Improve the Physique: "Medicus" (stock) Handbook of Jamaica, 1893 (Stanford).—Modern Meteorology: Dr. F. Waldo (Scott).—Gesammelte Abhandlungen über Pflanzen Physiologie: J. Sachs, Zweiter Band (Leipzig, Engelmann).—An Elementary Treatise on Modern Pure Geometry: R. Lachlan (Macmillan).—The Food of Plants: A. P. Laurie (Macmillan).—Elements of Physiography: Dr. H. Dickie (Collins).

PAMPHLETS.—Ueber die Bestimmung der Geographischen Länge und Breite und der Drei Elemente des Erdmagnetismus, &c.: Dr. H. Fritsche (St. Petersburg).—Diseases incident to Workpeople in Chemical and other Industries: W. Smith (Eyre and Spottiswoode).

SERIALS.—Himmel und Erde. März (Berlin, Paetel).—Revista Internazionale di Scienze Sociali e Discipline Ausiliarie, February (Roma).—Journal of the Chemical Society, March (Gurney and Jackson).—Annales de l'Observatoire de Moscou, deux série, vol. 3, liv. 1 (Moscou).—Medical Magazine, March (Southwood).—Botanische Jahrbücher, Fünfzehnter Band, v. Heft (Williams and Norgate).—Transactions of the Wagner Free Institute of Science of Philadelphia, vol. 3, part 2 (Philadelphia).

CONTENTS.

PAGE

Colliers and Colliery Explosions. By W. G. . . .	481
Reveries of a Naturalist. By Dr. Alfred Russel Wallace	483
Our Book Shelf:—	
Strasburger: "Ueber das Verhalten des Pollens und die Befruchtungsvorgänge bei den Gymnospermen"	484
Guillemin: "Autres Mondes"	485
Paget: "Some Lectures by the late Sir George E. Paget"	485
Letters to the Editor:—	
Origin of Lake Basins.—The Duke of Argyll, F.R.S.	485
The Cause of the Sexual Differences of Colour in Ectectus.—Prof. A. B. Meyer	486
Blind Animals in Caves.—Prof. E. Ray Lankester, F.R.S.	486
Lunar "Volcanoes" and Lava Lakes.—S. E. Peal	486
The Croonian Lecture	487
Applied Natural History. By W. L. Calderwood	492
The South Kensington Laboratories and Railway	494
Notes	494
Our Astronomical Column:—	
The Melbourne Observatory	498
Natal Observatory	498
The Biells of 1872, 1885, and 1892	498
Comet Holmes (1892 III.)	498
Prof. Hale's Solar Photographs	498
Geographical Notes	498
Flies and Disease Germs	499
Scientific Serials	499
Societies and Academies	500
Books, Pamphlets, and Serials Received	504