

give no uniform crystallisation product, but always a heterogeneous mechanical mixture, consisting of solid solutions of the components in each other, and in the limiting cases of the components themselves. The composition of eutectic mixtures—*i.e.* those mixtures of two bodies which have the lowest fusing points—does not correspond to simple molecular proportions of the components. In eutectic mixtures the process of solidification is in general more complicated than in chemically homogeneous bodies, owing to complex supercooling. Equimolecular solutions often show approximate correspondence of fusing points, also for the higher concentrations. Menthol, $C_{10}H_{18}OH$, exists in two modifications, which explains the divergences of the freezing points of even the most dilute solutions in menthol.—On glow discharge in air, by C. A. Mebius. Straight lines representing the relation between strength of current and difference of potential for different distances between the electrodes, are not parallel, the divergence increasing with the extent to which the air has been modified by the current. The fall of potential gradually decreases with a constant or an increasing current. These changes are probably due to the formation of nitric oxide, as was proved with the spectroscope.

Bulletin de l'Académie Royale de Belgique, No. 2.—On a new class of ethers: methylene lactate, by Louis Henry. Methylene monolactate, $CH_2.CH_2.C_2H_3O_2$, obtained by heating lactic acid with polymerised methanal, is a colourless mobile liquid, with a strong odour resembling methanal, and an extremely pungent taste. Its density is 1.1974 at 25° C., and it boils with remarkable regularity at 153° to 154°.—Comparison of the astronomical coordinates referred to the instantaneous (astronomical) pole and the (geographical) pole of inertia respectively, by Ch. Lagrange. The discovery of the sensible character of the variations of latitude and longitude is not of such a nature as to render necessary the substitution of geographical axes to instantaneous ones in astronomy. The mean values of the latitude and the longitude will be the geographical characteristics of the spot. But for the points of the heavens, the result of the substitution of geographical for instantaneous axes would have the eminent disadvantage of affecting all their coordinates with diurnal variations 300 times greater. This is a simple geometrical consequence of the fact that every day the geographical and the instantaneous axes describe a cone about the resultant, and that the geographical cone is 300 times more open than the instantaneous cone.—Critical temperatures of mixtures and of water, by F. V. Dwelshauvers-Dery. The critical temperature of water was obtained by finding the critical temperatures of aqueous mixtures of alcohol or acetone containing more and more water. The limiting value for water, as derived from the acetone results, was 638° C., from the results with alcohol, 641° C.—Action of heat upon carbon bisulphide, by Henryk Arctowsky. Carbon sesquisulphide, CS_2 , which is obtained by exposing the bisulphide to the voltaic arc, may also be obtained by keeping it at 250° C. for some time. It is this body whose presence in small quantities in commercial CS_2 gives this product its pungent odour.

THE number of the *Journal of Botany* for April is occupied almost entirely by papers on descriptive botany, *viz.* on African species of *Eriosema*, on South American species of *Polygala*, on British *Rubi*, on hybrid *Epilobium*, and others on special species or genera.

The *Bulletin of the Minnesota Botanical Studies* for March contains a paper on a period of growth in the fruit of *Cucurbita Pepo*, by Mr. A. P. Anderson, accompanied by an elaborate series of tables and plates of curves. The other articles in the same number refer exclusively to the Flora of Minnesota.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, March 21.—“Experiments upon the Influence of Sensory Nerves upon Movement and Nutrition of the Limbs.” (Preliminary communication.) By Dr. F. W. Mott and Dr. C. S. Sherrington, F.R.S.

Claude Bernard first showed, by experiments upon frogs, the impairment of movement in a limb deprived of sensation by cutting the posterior spinal roots. The authors have, by an extensive and varied series of experiments on the monkey,

demonstrated the important rôle played by sensation in the performance of voluntary movements.

The experiments deal separately with the upper limb and the lower limb. The phenomena do not essentially differ, but are more striking in the former.

Summary of Experiments.—The limbs were deprived of all sensation, superficial and deep, by cutting the “whole series” of posterior spinal roots. For the upper limb, 4th cervical to 4th thoracic inclusive. For the lower limb, 2nd to 10th post-thoracic inclusive.

Animals with a limb thus deprived of all forms of sensation from the time of operation onwards, even up to four months, have never been observed to use it in any finer and delicately adjusted movements. For example: the foot is not used in climbing or grasping, nor is the hand. The animal does not use the hand to defend itself, or even to satisfy hunger, when prevented from picking up food by any other way, than by using the desensitised hand. It must be concluded, therefore, that there is *actual inability* to perform the movements in question. Occasionally in struggling, coarse movements of the shoulder and elbow take place; but, as a rule, the arm hangs down helplessly. The movements abolished are those most literally represented in the cortex cerebri. Damage to the pyramidal tract is not the cause of the loss of movement, because degeneration is not found in the spinal cords; moreover, stimulation of the cortex cerebri evokes movements in the desensitised limb even more readily than the normal.

The effect of section of the “whole series,” except the *one root* which supplies the *apex* of the limb, produces only a very slight impairment of movement. Any trophic changes that occur are due to pressure and microbial infection.

“Is Argon contained in Vegetable or Animal Substances?” By George W. MacDonald and Alex. M. Kellas.

At Prof. Ramsay’s suggestion, experiments were undertaken by the authors to see whether argon could be obtained from nitrogenous vegetables or from animal tissues.

It is concluded that there is no appreciable quantity of argon in peas (or at least that the argon cannot be obtained with the nitrogen by Dumas’ method).

An experiment with regard to the presence of argon in animal tissues was also negative in its results. Mice were selected for the experiment, because the nitrogen from the whole animal could be conveniently collected by Dumas’ method.

Chemical Society, March 21.—Dr. Armstrong, President, in the chair.—The following papers were read:—The volumetric determination of sugars by an ammoniacal cupric solution, by Z. Peške. The author has devised a modification of Pavy’s method of estimating sugars, and gives tables showing the reducing power of ammoniacal cupric solution for solutions of various sugars.—The action of hydrogen sulphide on antimonious acid solutions, by O. Bošsk. The author demonstrates the existence of compounds of the composition SbX_4 ; he has obtained the tetrasulphide Sb_2S_4 , and a double compound of the composition $3KCl, 2SbCl_4$.—Action of hydrogen sulphide on antimonious, arsenic and telluric acids, by B. Brauner.—The atomic weight of tellurium, by B. Brauner. From its position in the periodic table, tellurium should have an atomic weight between 123 and 125, whilst the number actually obtained is 127.71; for this and other reasons the author concludes that tellurium is not a simple substance, although attempts to effect a separation of its constituents have failed. The author suggests that tellurium is a mixture or compound of two elements, one of which occupies the position of tellurium in the periodic table, and the other of which is the hypothetical “triargon.”—The hydrolysis of maltose by yeast, by G. H. Morris.—Studies in isomeric change. Part iv. Ethylbenzenesulphonic acids, by G. T. Moody. The sulphonation product of ethylbenzene yields only one sulphonic acid, and not two, as stated by Chrustschow. The para-acid is obtained thus: the ortho-acid can be prepared by sulphonating and subsequently reducing ethylbromobenzene.— β -Ethoxynaphthalenesulphonic acids. The arrest of isomeric change at an intermediate stage, by A. Lapworth. During the sulphonation of ethoxynaphthalene at a low temperature the 2:1-sulphonic acid is the first product. On allowing the mixture to stand, however, this spontaneously changes into the 2:1’-acid.—Some oxyppyridine derivatives, by Miss A. P. Sedgwick and N. Collie. Starting from γ -chloro- $\alpha\alpha'$ -dimethylpyridine and $\alpha\gamma$ -dichloro- α' -methylpyridine, the

authors have succeeded in preparing a number of new oxypyridine derivatives.—On the colouring principle of *Toddalia aculeata* and *Evodia meliaefolia*, by A. G. Perkin and J. J. Hummel.—Some ethereal derivatives of sarcolactic acid, by P. Frankland and J. Henderson. The molecular rotations, molecular deviations and asymmetry products of a number of alkyl salts of sarcolactic acid and its acidic derivatives have been investigated.—Electrolysis of potassium allo-ethylic camphorate, by J. Walker and J. Henderson. The chief products of the electrolysis of potassium allo-ethylic camphorate are salts of allo-campholytic acid, $C_9H_{14}O_3$, and allo-camphothetic acid, $C_{18}H_{30}O_4$.—Trimethylsuccinic acid, by W. A. Bone and W. H. Perkin, jun.—New isomeric sulphonic chlorides derived from camphor, by F. S. Kipping and W. J. Pope. The authors describe two isomeric chlorocamphene-sulphonic chlorides and their derivatives.

Royal Meteorological Society, April 17.—Messrs. F. C. Bayard and W. Marriott communicated a paper on the frost of January and February 1895 over the British Isles. The cold period which commenced on December 30 and terminated on March 5 was broken by a week's mild weather from January 14 to 21, otherwise there would have been continuous frost for sixty-six days. Temperatures below 10° F., and in some cases below zero, were recorded in parts of England and Scotland between January 8 and 13, while from the 26th to the 31st and from February 5 to 20, temperatures below 10° occurred on every day in some part of the British Isles. The coldest days were February 8 to 10. The lowest temperatures recorded were: -17° at Braemar and -11° at Buxton and Drumlanrig. The mean temperature of the British Isles for January was about 7° , and for February from 11° to 14° below the average, while the mean temperature for the period from January 26 to February 19 was from 14° to 20° below the average. The distribution of atmospheric pressure was almost entirely the reverse of the normal, the barometer being highest in the north and lowest in the south, the result being a continuance of strong northerly and easterly winds. The effect of the cold on the public health was very great, especially on young children and old people. The number of deaths in London due to diseases of the respiratory organs rapidly increased from February 2 to March 2, when the weekly number was 1448, or 945 above the average. Rivers and lakes were frozen, the ice being more than 10 inches thick. The frost will long be remembered for its effect on the water-pipes all over the country, in many cases householders being without water for more than nine weeks. As the result of inquiries the authors find that mains have frozen which have been laid as low as 3 ft. 6 in. from the surface of the ground to the top of the pipe. It appears, however, that the nature of the soil had far more to do with the depth to which the frost penetrated than the intensity of the frost itself. From a comparison of previous records, the authors are of opinion that the recent frost was more severe than any since 1814.—Mr. Birt Acres read a paper on some hints on photographing clouds.

Mineralogical Society, April 2.—A paper was read by Mr. Spencer upon *enargite*. Several new forms were discovered upon the specimens of this mineral examined. The parameters calculated from the measurements were

$$a : b : c = 0.8694 : 1 : 0.8308,$$

numbers which differ somewhat from those previously given by Dauber. The habits of the crystals and their mode of twinning were fully discussed, and the fact pointed out, bearing upon the possibility of the identity of clarite with enargite, that measurement of cleavage fragments of clarite gave angles identical with those existing between the prism cleavages of enargite when three crystals are twinned together.—Mr. A. E. Tutton exhibited his new instrument for cutting, grinding, and polishing accurately orientated section-plates and prisms of mineral or other crystals, and demonstrated the readiness with which the cutting disc or grinding or polishing lap may be driven by a small electric motor. Mr. H. A. Miers suggested the possibility of simplifying the instrument somewhat for the commoner purposes of the mineralogist, by employing only one driving gear and making the cutting disc and laps interchangeable; he also suggested the experiment of using carborundum for the cutting edge instead of diamond dust.—Mr. Miers exhibited a crystal of *lorandite*, the new arseno-sulphide of thallium discovered by Kreuner; also a fine crystal of *clèveite*, the mineral which had, at his suggestion, been examined for argon by Prof. Ramsay.

The specimen exhibited was from the neighbourhood of Moss, and this variety, as well as that from Arendal, had been found to yield the spectrum of helium.

EDINBURGH.

Royal Society, January 21.—Prof. Sir W. Turner, Vice-President, in the chair.—Drs. Gulland and Noël Paton communicated a paper on the absorption of carbohydrates from the intestine.—Prof. Ewart read a paper, by Dr. J. D. F. Gilchrist, on the torsion of the molluscan body.—Prof. Tait communicated a note on a curious property of determinants.

February 4.—Prof. J. G. M'Kendrick, Vice-President, in the chair.—Prof. Crum Brown communicated a note on normal nystagmus.—Sir W. Turner read a note on M. Dubois' account of pithecanthropoid remains recently found in Java. The remains are a skull, a third molar tooth, and a left femur. They were found in a bank of a river in Java, at some distance from each other, and at different times. M. Dubois supposed that he had established the existence of a connecting link between the ape and man, and he named it the "erect ape man," in recognition of the differences from man and the ape. Sir W. Turner remarked that it was not at all certain that the three bones belonged to the same creature. A comparison of the skull with several specimens of the skulls of aboriginals, left him unconvinced that it might not have belonged to a human being. The features of the femur could all be made out in a large collection of human thigh bones, and the tooth had quite as much resemblance to the tooth of a human being as to the tooth of an ape. He considered that the remains were of a low human type.

February 18.—The Hon. Lord M'Laren, Vice-President, in the chair.—Prof. Chrystal discussed a theorem regarding the equivalence of systems of ordinary linear differential equations with constant coefficients, and its application to the theory of such systems.—Dr. C. G. Knott communicated a note on volume-changes in iron and nickel tubes when magnetised. He dealt specially with the effects which are caused when the tubes are closed by a non-magnetic cap instead of a cap of the same metal as the tubes themselves.—Dr. W. Peddie compared the case of yellow-blue blindness, described by him some weeks ago, with the case recently described by v. Vintschgan and Hering. In the present case, unlike the latter, the whole range of the spectrum is visible. So far as the tests have yet been carried out, the presence of red seems to be very easily recognised, but all other colours seem to be nearly, or entirely, grey. Only one neutral point (near D, in the yellow part of the spectrum) seems to exist.

March 4.—Sir Douglas Maclagan, President, in the chair.—At the request of the Council of the Society, Dr. Munro gave an address on lake-dwelling research. Whatever was the object of these dwellings, or the causes of their development, it is certain that they were for centuries the characteristic dwellings of the early tribes of Central Europe. Research on the subject began with the discovery of remains in a bog in Ireland, more than half a century ago. Another discovery was afterwards made in Switzerland, and gave new significance to the Irish discovery. Dr. Munro sketched the results of the investigations made in Switzerland and in other parts of Europe, especially Italy. Perhaps no part of Europe is more prolific in remains than the valley of the Po. The first great discovery made in Scotland was in a loch in Wigtonshire. When the loch was drained, several artificial islands were found, and evidences of early Scottish civilisation, previously unknown, were discovered. Among the articles found were canoes and Roman bronze dishes. Subsequent Scottish discoveries were described, and then the recent discoveries in Bosnia were dealt with. The coincidence of the style of art in the ornaments recently found at Glastonbury with that of the North German articles is peculiarly significant.

Scottish Meteorological Society, March 27.—Prof. Copeland, Astronomer Royal for Scotland, in the chair.—Mr. R. C. Mossman gave a paper on "The Frost of 1895," in which he pointed out that the severe frost began on December 28, and ended about February 20, covering a period of fifty-four days. During this time the average temperature of the British Isles as a whole was 8° below normal, the greatest deficiency being in the central highlands of Scotland and the midland districts of England. At the same time barometric pressure was highest in Scandinavia, Lapland, and West of Russia, and lowest about Spain; an almost exact reversal of the normal

winter distribution. Thus cold, dry, and therefore heavy, air was drawn from the north east over the British Isles, not only lowering the air temperature directly, but clearing the sky of the usual winter cloud layer, and thus allowing free radiation at night, with consequent low night temperatures in valleys where the chilled air can accumulate and lie stagnant. Places thus situated recorded temperatures below zero Fahrenheit, the lowest being -17° at Braemar, and -11° at Drumlanrig. At western sea-coast places the frost seldom lasted for more than twenty-four hours without a break; while at inland stations, such as Kingussie and Braemar, the temperature never rose to the freezing point for fifteen consecutive days in February. No very low temperatures were recorded on Ben Nevis, the lowest being 2° above zero. On February 18, 19, and 20 the temperature on Ben Nevis averaged 18° higher than that at Fort William, 4400 feet below it, showing that the summit was in the down draught of the anticyclone then lying over Scotland; while at sea level the warmth and dryness of this upper current was not felt. The cold extended all over Europe, including the South of Spain and the Riviera, but scarcely touched North Africa. Though snow fell in Tunis, Algeria was beyond the cold area, the winds there being mostly westerly. To the north Iceland was the only part of Europe outside the influence of the north-east winds, and the winter there has been mild and open.—Mr. A. G. Herbertson presented an interim report on hygrometric work at Ben Nevis. He also gave an account of the Meteorological Observatory at Montpellier, France, describing many of the instruments employed there, and also pointing out the excellent results got from regular phenological observations.—Mr. Mossman gave some notes on "Auroras in the North-east of Scotland 1773 to 1894," mainly taken from data at Gordon Castle (Banffshire) and Inverness. The average number of auroras in this district for the 122 years is seven per annum, but the numbers vary from fifty cases in 1870 to none at all in sixteen years of the record. An intimate connection was shown between sun-spots and auroras; maximum sun-spot periods being the time when auroras were frequent and brilliant, while with the absence of sun-spots there were few or none. No aurora was observed in any year between May 23 and July 22, that is, within four or five weeks of the summer solstice; and the rest of the year shows two maxima, a primary in October and a secondary in February.

DUBLIN.

Royal Dublin Society, January 23.—Prof. J. Mallet Purser in the chair.—Mr. G. H. Carpenter read a paper on a collection of Lepidoptera from Lokoja, West Africa.—Prof. A. C. Haddon and Mr. J. E. Duerden described some species of Actiniaria from Australia and other countries. Ten species, most of them new to science, were described anatomically, and their relationship to other members of the group discussed.—Prof. Haddon then gave a paper on a branched worm-tube.—Mr. Duerden followed with some notes on the Hydroidea and Polyzoa collected during the Royal Dublin Society's Fishery Survey on the West Coast of Ireland. In this paper the author describes two new species of *Perigonimus*, and records the occurrence of *Campanulina panicula*, G. O. Sars, for the first time for the British seas.—A voluminous monograph of the marine and freshwater Ostracoda of the North Atlantic and of North-Western Europe (Sections ii.-iv.: Myodocopa, Cladocopa, and Platycopa) was presented (through Prof. A. C. Haddon) by Dr. G. S. Brady and the Rev. A. M. Norman.—At the meeting held February 20, Prof. Grenville A. J. Cole in the chair, the following papers were read:—Dr. V. Ball, C.B., F.R.S., made a communication in which he gave an historical account of the gold nuggets found in the county Wicklow.—Prof. W. J. Sollas, F.R.S., read a paper descriptive of the systems of Eskers in Ireland. Some beautiful photographs of nebulae and clusters of stars, taken at Daramona, co. Westmeath, were afterwards exhibited by Mr. W. E. Wilson.—At the meeting of March 20, Prof. G. F. Fitzgerald, F.R.S., in the chair, Prof. Sollas read a paper upon the age of the earth.—Prof. James Lyon demonstrated some of the errors that arise from the imperfect alignment of the slide lathe. If the line joining the centres of a slide lathe is not parallel to the line of motion of the saddle, the path of a cutter fixed in a bar which is rotated between the centres is a plane which is not perpendicular to the direction of motion. Any piece of material being bolted to saddle, and having a hole bored in it by the cutter, would be traversed by a hole the

shape of which would be the projection of the cutting circle on a plane perpendicular to the line of motion of saddle—*i.e.* an elliptic cylinder would be the result. In the second case, if the poppet-head centre be higher than the fixed centre, and a bar of material be turned between the centres by means of a tool placed in the saddle at a height above the bed about equal to the height of the centre point of the axis of bar above the bed, the result will be a hyperboloid of revolution, since this surface is generated by a straight line (the path of the tool), which is always at a fixed distance from a given axis, is not parallel to it, and does not intersect it.

PARIS.

Academy of Sciences, April 16.—M. Marey in the chair.—Observations on argon, its fluorescence spectrum, by M. Berthelot. The fluorescence of argon, when charged with benzene vapour and submitted to the action of the silent discharge, is described at length. It is noted that, with the second sample of gas supplied by Prof. Ramsay, and under the conditions of the experiment, the condensation taking place amounted to only 6 to 10 per cent. The author cannot yet explain the different behaviour of the first sample as regards condensation. The following approximate measurements have been made in the spectrum of the fluorescent light: A yellow line at λ 579 corresponding to the 575 argon line and 578 of the aurora borealis; a green line at λ 547 corresponding with Crookes' group 549 to 555, and perhaps with 557 of the aurora; violet lines 438 and 436 corresponding with Crookes' 433 and 430, and with an important aurora line.—A contribution to the study of variability and capacity of transformation in microbiology, as illustrated by a new variety of anthrax bacillus (*Bacillus anthracis claviformis*), by M. A. Chauveau and M. C. Phisalix. The cultivation obtained from the lymphatic ganglion of a guinea-pig inoculated with attenuated anthrax bacilli consisted of a new type which retained only in a very slight degree the immunising power of the attenuated culture, and no longer had any toxic action beyond that evidenced by a certain rise in temperature of the inoculated subject. The authors believe the *Bacillus anthracis claviformis* to have been certainly derived from virulent *Bacillus anthracis*, but they have not as yet succeeded in bringing back the new variety to the original virulent form.—On the minimum temperatures observed this winter at the summit of Mont Blanc, by M. J. Janssen. A description is given of the mounting of the minimum thermometers. The following minima have been recorded: Mont Brévent -26° C.; Mont Buet -33° C.; Mont Blanc -43° C.—Secular variation and ephemerides of terrestrial magnetism, by General Alexis de Tillo.—Researches on assimilable nitrogen and its transformations in arable land, by M. Pagnoul. The conclusions are drawn that: (1) Abundant rains may carry off from rich soils considerable amounts of nitric nitrogen. (2) Plants growing on the soil are able to prevent this loss. (3) Carbon disulphide arrests the action of the nitric ferment temporarily without killing it. (4) The ammoniacal form is a transition state for organic nitrogen passing into the nitric form; carbon disulphide causes the temporary suspension of the action at this stage. (5) The nitrous form is also an unstable transition state.—On the products of combustion in the electric arc, by M. N. Gréhan. Carbon monoxide is produced and, in confined spaces, has produced illness among the workmen employed in electric light stations.—On a question concerning the singular points of algebraical left-handed curves, by M. G. B. Guccia.—Summation of series by means of definite integrals, by M. Petrovitch. On types of groups of substitutions of which the order equals the degree, by M. R. Levassieur.—On the theory of the system of differential equations, by M. A. J. Stodolkievitch.—On Rondelet's rule for woods, and beams loaded on end, by M. C. Maltézos. Rondelet's rule is reduced for wood, iron, and brass, between wide limits for the ratio of length of beam to smallest side of transverse section, may be replaced by an arc of a single parabola.—Electric discharge by illumination of substances which are mediocre conductors, by M. Edouard Branly.—On a new method for the measurement of temperatures, by M. Daniel Berthelot. The author proposes the determination of density of gases, by means of their refractive indices as investigated by interference fringes, as a basis for measurement of temperature by a property of gases independent of the envelope.—On the presence of helium in

clèveite, by M. P. F. Clève. A letter in which the author gives the wave-lengths of lines observed in the spectrum of gas obtained from clèveite by heating with potassium bisulphate. The argon lines were not observed.—On the definite combinations of metallic alloys, by M. H. Le Chatelier.—On the aliphatic aldehydes $C_nH_{2n}O$, by M. Louis Henry.—Action of halogens on pyrocatechol, by M. H. Cousin.—On the drying property of fatty matters in general and their transformation into elastic products analogous to linoline, by M. Ach. Livache.—On the composition of some French and foreign oats of the 1894 crop, by M. Bolland.—On the existence of abnormal variations of pressure with the height, a vertical gradient, by M. L. Teisserenc de Bort.

BERLIN.

Physiological Society, March 1.—Prof. du Bois Reymond, President, in the chair.—Dr. Weintraud spoke on the formation of uric acid in man. After the view that the excretion of uric acid is in direct relationship to the proteids of the food had found no support from the experimental side, the theory had been propounded that it is related to the breaking-down of leucocytes. This view was supported by experiments in which the administration of nuclein and xanthin to man had increased the output of uric acid; but, on the other hand, similar experiments on dogs had always yielded negative results. The speaker had experimented on several individuals by substituting thymus gland, rich in nuclein, for the ordinary flesh of the food. The increased excretion of phosphoric acid in the urine showed that the nuclein was largely absorbed, and a constantly large increase in the excretion of uric acid was at the same time observed; the latter disappeared again at once when ordinary flesh was substituted for the thymus gland. Apart from theoretical considerations, it appears that foods rich in nuclein or xanthin should be avoided by patients suffering from excessive formation of uric acid.—The President and Dr. Sklarek made some communications as to argon, recently discovered by Lord Rayleigh and Prof. Ramsay.

March 15.—Prof. H. Munk, President, in the chair.—Prof. Liebreich stated that he had found in propyl alcohol a means of separating the cholesterol fats of the skin into those with a high and those with a low melting point. The former exhibit all the characteristics of a wax, and are distinguished by their fixed melting point and by their containing cerotic acid. By extracting human nails and vernix caseosa he had obtained a quantity of cholesterol fats which resembled in all points the cholesterol ethers of the skin. He further demonstrated a new chemical reaction which shows the existence of the inert region on the surface of fluids and in capillary tubes in which chemical changes are taking place. It consists in the interaction of chloral hydrate with sodium carbonate and gold chloride, and since all these reagents are solid it is evident that evaporation has no effect on the production of this inert space.—Dr. E. Flatau exhibited two series of nerve preparations, the first consisting of isolated ganglion cells and neurons prepared, by a modification of Golgi's method, partly from the cerebrum and partly from the cerebellum and medulla. The second series, prepared by Marchi's method, was intended to show that in the Wallerian experiment on degeneration, not only does the peripheral stump degenerate after the section, but that the central end also undergoes a secondary degeneration after the break-up of the now inactive ganglion.

Meteorological Society, March 5.—Prof. Hellmann, President, in the chair.—After the President had presented the fourth number of the *Reprints* containing the oldest charts of terrestrial magnetism, Dr. Süring gave an account of his observations on the temperature and humidity near a surface of snow. They were made last winter on the Brocken, and this winter in Potsdam, and in the following manner. One thermometer was placed on the snow, and another at the usual height above the surface, either exposed or protected, while at the same time an aspiration-thermometer placed 1 cm. above the snow recorded the temperature of the air. It was found that the size, shape and position of the thermometer lying on the snow, as well as the condition of the snow-surface, &c., had a considerable influence on the temperature recorded by this instrument; the observations had therefore been restricted to a determination of the difference between the temperature of the snow and that of the air above it, in its relations to clouds and to the motion and temperature of the atmosphere. It was found

that the difference was lessened as the sky became more clouded, and when the sky was completely clouded during a fall of snow the temperature of the snow's surface was higher than that of the air. As the temperature of the atmosphere fell, the difference became greater, but was lessened as the motion of the air increased in rapidity. On the whole, the difference was much less on the Brocken than in Potsdam. As to the influence of the snow-surface on the humidity of the air, the speaker had arrived at the result that evaporation from the snow is much more frequent than condensation from the air, but that they are about equal in amount. Prof. Hellmann spoke on the, as yet, uninvestigated velocity of the wind in Berlin, basing his remarks on the indications during ten years of a self-registering anemometer placed at a height of 33.5 metres above the ground in the tower of a house which was originally quite isolated. In later years this house was surrounded by others, but this fact did not in any way affect the working of the anemometer, whose constants were determined at the marine observatory at Hamburg and the central observatory at St. Petersburg. Taking a year as a whole, the maximum rate was observed in March, the minimum in September, and during these months the variations were least. The average for the year is 5.1 metres per second. The above-named periods of maximum and minimum have also been observed at a number of other stations, viz. Paris, Munich, Prague, Vienna, and Cracow. Winds with a velocity less than the average are more frequent than those with one above the average. The frequency of storms, as measured in hours, is greatest in January and March; it increases in October, and sinks rapidly in April. The daily period of greatest velocity lies between one and two o'clock p.m.

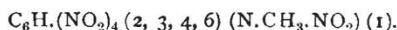
Physical Society, March 8.—Prof. du Bois Reymond, President, in the chair.—After Prof. Lampe had referred to the death of their late member, Prof. Worpitzky, Dr. W. Wien spoke on the testing of pyrometers made, according to Le Chatelier, of platinum and platino-rhodium, and connected with an apparatus constructed by Keiser and Schmidt for measuring not only the voltage of the thermo-electric currents, but also the corresponding temperatures. The testing was carried out by determining the melting-points of copper, silver, platinum, palladium, and nickel, which, as fine wires, formed the solder-joints of the platinum and platino-rhodium thermo-elements. These were heated in porcelain tubes, and the current was broken when the respective wires melted. In these experiments platinum must be protected from carbon, copper from oxygen, and palladium from hydrogen. It is impossible here to enter into all the details referred to by the speaker.—Dr. W. von Uljanin gave an account of his experiments on polarisation by oblique radiation from silver, platinum, and black glass. Assuming that the radiation from the heated plates is determined by the refraction of their substance, it was found that the curves thus arrived at corresponded in the case of silver very closely with those obtained experimentally. In the case of platinum, whose surface is very easily altered by heating, the experimental values were always less than those required by theory; in the case of black glass the correspondence of the values was greater, but not so complete as in the case of silver.—Dr. Raps introduced an improvement in his automatic air-pump, designed to facilitate the filling and emptying of the mercury, and at the same time to protect the pump from the consequent risk of breakage. The result was arrived at by means of a chamber for the expansion of air.—Prof. Vogel demonstrated the experiment, already described in NATURE, whereby a half black and half white disc with black patches on it produces different colours, when rotated at a moderate speed, according to the direction of the rotation.

March 22.—Prof. Planck, President, in the chair.—Dr. Rubens exhibited several galvanometers, and explained in detail the arrangement and advantages of one he had constructed for the measurement of reversing currents, but which can also be readily adapted for currents in one direction.—Dr. Raps spoke on a new regulator for synchronous motion, especially as required in telegraphy, explaining its principle and construction on a model.

AMSTERDAM.

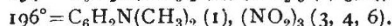
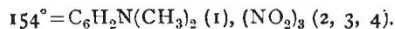
Royal Academy of Sciences, December 29, 1894.—Prof. van de Sande Bakhuyzen in the chair.—Mr. MacGillivray communicated the results of an investigation made by Mr. D. MacGillivray in the Boerhaave Laboratory at Leyden, and which proved that the germs of tuberculosis are not destitute of the power of locomotion, but possess this power, if the conditions of life are favourable.

February 23, 1895.—Prof. Hubrecht brought forward a new hypothesis to explain the origin of the amnion. Birds and reptiles have been looked upon as possessing the normal type of amniogenesis from which that of the Mammalia had to be further derived. The primitive Insectivores offer far better starting points. In the development of the hedgehog's amnion, another path is found along which it is easy to connect both the higher Mammalia and the Sauropsida. The hedgehog allows a comparison to be made between the trophoblast with the outer layer of the amphibian ectoderm. Thus it would be possible to trace the first origin of the amnion in the Anamnia.—A paper containing full particulars, and accompanied by several plates, was presented for publication in the Academy's *Verhandelingen*, under the title: "Ueber die Phylogenese des Amnions und die Bedeutung des Trophoblastes."—Mr. Suringar read a paper on "family relations in the vegetable kingdom," as set forth in a sketch in the form of a genealogical tree, designed by the author to illustrate his University lectures.—Mr. Franchimont presented, on behalf of Dr. P. van Romburgh, two papers. (a) On some nitro derivatives of dimethylaniline. By nitration of dimethylaniline in a great quantity of sulphuric acid, as well as by treating metanitrodimehtylaniline with diluted nitric acid, two dinitro derivatives were obtained: a yellow one fusing at 176°, and a red one fusing at 112°. In the yellow one there is a nitro group that may easily be substituted. By further nitration it yields two trinitro derivatives: a yellow one melting at 154° and an orange-coloured one melting at 196°. The red dinitro derivative yields only the orange-coloured trinitro derivative. All of them are finally converted into the same tetranitrophenylmonomethylnitramine, viz.:

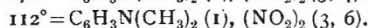
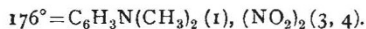


From their relations or properties the following structure is deduced:

Trinitro Dimethylaniline.



Dinitro Dimethylaniline.



(b) On addition products of symmetrical trinitrobenzol. Hepp has found that with aromatic amines S. trinitro-benzol yielded coloured addition products. With brucine, Dr. van Romburgh arrived at the same result: it formed brownish red needles fusing at 158°; strychnine did not do so under the same circumstances. With trinitro-benzol, indol yielded gold-coloured needles melting at 187°, skatol, orange-coloured ones melting at 183°, and pyrrol, gold-coloured ones melting at 95°; the last-mentioned gave off the pyrrol to the air in a few hours (at 25°). All these compounds consisted of one molecule to one molecule of trinitrobenzol. Pyridine and quinoline did not form such compounds; the former caused trinitrobenzol to crystallise in large crystals. Piperidine, nicotine and phenylhydrazine gave rise to red tints, but crystallised compounds could not be obtained. With other nitro compounds, too, as: $\text{C}_6\text{H}_3.\text{NMe}_2.\text{NH}_2.\text{NO}_2$ (1:3:4), and $\text{C}_6\text{H}_3.\text{NMe}_2.\text{NHMe}.\text{NO}_2$ (1:3:4), trinitrobenzol yielded crimson products, melting respectively at 130° and 144°, and being composed of a molecule of each of the constituents.

March 30.—Prof. Van de Sande Bakhuyzen in the chair.—Mr. Bakhuis Roozeboom has, in conjunction with Dr. Hoitsema, investigated the behaviour of hydrogen to palladium, from 0° to 190°, and from 0 to 6 atm. pressure. It results from the observations that, contrary to the opinion of Troost and Hautefeuille, there exists no such compound as Pd_2H , neither can the phenomena observed be explained by admitting the existence of two solid solutions. The absorption proceeds gradually, as if there exists but one solid solution. There is, however, at low temperatures a period in which the concentration rises much more rapidly with the pressure of hydrogen than before or afterwards. This behaviour presents an analogy to the conduct of gases near their critical temperature.

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GÖTTINGEN.

Royal Society of Sciences.—In the *Nachrichten*, part 1, for 1895, appear the following contributions in the department of mathematics and physics:—

December 1894.—I. R. Schütz: Complete and general solution of a fundamental problem in the theory of the potential.—Robert Fricke: On the theory of ternary quadratic forms with integral complex coefficients.—J. Orth: On bacterial disorders of excretion in the renal medulla.

January 1895.—I. R. Schütz: Extension of Maxwell's law of the distribution of velocities, deduced from the principle of the minimum path.—E. Ehlers: On the viscera of *Lepidosiren*.—Ludwig Rhumbler: Sketch of a natural system of classification for the *Thalamophora*.—Hermann Wagner: The area of the land surfaces of the earth according to zones.—R. Dedekind: On the basis of the theory of ideals.—Heinrich Burkhardt: Contributions to researches on the foundations of geometry.—Franz Meyer: On the structure of the discriminants and resultants of binary forms.—Wilhelm Hallwachs: On an aperiodic amagnetic quadrant-electrometer, free from residual action.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

Books.—Royal University of Ireland, Calendar 1895 (Dublin, Thom).—Société d'Encouragement pour l'Industrie Nationale, Annuaire 1895 (Paris).—Land-Birds and Game-Birds of New England; H. D. Minot (Boston, Houghton).—The Moon: T. G. Elger (Philip).—R. Bradshaw's Bathing Places and Climatic Health Resorts (K. Paul).—Soziale Evolution: B. Kidd, aus dem Englischen Übersetzt von E. Pfeleiderer (Jena, Fischer).—Motive Powers and their Practical Selection: R. Bolton (Longmans).

PAMPHLETS.—Indexes to the Literatures of Cerium and Lanthanum: Dr. W. H. Magee (Washington).—Reports of Observations and Experiments in the Practical Work of the Division of Entomology, U.S. Department of Agriculture (Washington).

SERIALS.—Journal of Anatomy and Physiology, April (Griffin).—Royal Natural History, Part 18 (Warne).—American Naturalist, April (Philadelphia).—Insect Life, Vol. vi. No. 5; Vol. vii Nos. 1-4 (Washington).—Ergebnisse der Meteorologischen Beobachtungen, Jahrg. xvi. (Hamburg).

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