

Societies and Academies.

LONDON.

Royal Society, May 7.—W. Rosenhain and Miss J. McMinn: The plastic deformation of iron and the formation of Neumann lines. Experiments have been made to ascertain the effect of variations of speed on the mode of deformation of nearly pure iron. Small rectangular prisms, having one face prepared for microscopic examination, have been compressed slowly in a testing machine and also under the blow of a falling weight. Within the range of speeds possible on the testing machine used (from 20 minutes to approximately 1 second) slip bands of very similar character are formed. When, however, such a specimen has been compressed by the blow of a falling weight very few slip bands are formed, but the crystals are crossed by much heavier and usually very straight black bands, which have been identified with the well-known Neumann lines. The formation of Neumann lines is probably not due to twinning; they are rather of the nature of broad slip regions, possibly formed by the close juxtaposition of a large number of slip planes. The surfaces on which slip has recently occurred are regions of weakness for further deformation by shock, although they do not appear to behave in the same way with further gradual deformation.

—A. E. H. Tutton: (1) The monoclinic double sulphates containing thallium.—Thallium nickel and thallium cobalt sulphates. The two salts are $Tl_2Ni(SO_4)_2 \cdot 6H_2O$ and $Tl_2Co(SO_4)_2 \cdot 6H_2O$. They show close isomorphism with salts of the series containing the alkali metals, but not "eutropism" (progression with atomic number). Thallium in its thallose capacity is thus capable of replacing the alkali metals in the crystals of these double salts, with only a relatively small amount of change like that produced by alkali metal interchange, but without relationship to atomic number. The two new thallium salts, in common with those previously studied and also with the simple rhombic sulphate and selenate of thallium, are distinguished by their very high (relatively to other salts of the two series) refraction and dispersion. This is probably where the more complicated nature of thallium atoms produces its effect. (2) The crystallographic and optical properties of iodo-succinimide. Miss Yardley's X-ray results indicated a structure corresponding with the symmetry of Class 9, the pyramidal polar class of the tetragonal system, one of the classes in which optical activity in two optical antipodes is possible. It has hitherto been assumed that iodo-succinimide is ditetragonal pyramidal (Class 13). New morphological constants were found and optical activity has been discovered, blocks about 4 mm. thick being required to exhibit it clearly. Hence, Miss Yardley's conclusion that the symmetry is that of Class 9 is in every way confirmed.

—Kathleen Yardley: An X-ray examination of iodo-succinimide. The dimensions of the true unit cell are $6.29 \times 6.29 \times 15.55$ Å.U. This minimum cell contains four molecules. The X-ray measurements predict that the crystals should be optically active; Dr. Tutton has since shown that this is actually the case.

—B. Lambert and S. F. Gates: An investigation of the relationships existing between hydrogen and palladium. The "ascending" pressure-concentration isothermal drawn through equilibrium points obtained after successive additions of hydrogen to palladium is not, in any sense, an equilibrium curve. The "descending" pressure-concentration isothermals, drawn through equilibrium points obtained after successive withdrawals of hydrogen from the

system, are regular, but interruption of the smooth withdrawals of gas by occasional additions of gas, and temporary cooling, have marked effects; the "descending" isothermal cannot, then, be considered an equilibrium curve. The existence, under some conditions, of a simple compound, Pd_2H , is considered not improbable.—C. G. T. Morison: The effect of light on the settling of suspensions. Fine-grade suspensions of soil and kaolin were used in the absence and presence of light. When a suspension settles in the absence of light the settling is uniform and normal. In the presence of light it develops well-marked striations and discontinuities.—Colonel N. T. Belaiew: On the inner crystalline structure of ferrite and cementite in pearlite. Pearlite, the "pearly compound" of Sorby, is built up of grains of alternating lamellæ of cementite and ferrite. The orientation of these lamellæ is different in different grains. The cementite lamella shows its "petal-like" structure and seems warped and twisted. The exposed outer edge shows rectangular steps pointing to a constant linear unit. The ferrite lamella reveals, at the edge, "isolated cubes" of ferrite of about $250 \mu\mu$ edge. The ferrite lamella seems to be built up of a multitude of such small cubes, and both the warping of the cementite lamellæ and the cracking of ferrite may be traced to the A_1 point, where the expansion of volume, due to the change from the face-centred to the cube-centred lattice in iron, counteracts—in the pearlite areas—the normal contraction of the cooling specimen. Reacting to the ensuing stresses, the cementite lamella becomes warped and twisted, and the ferrite splits up into a multitude of blocks or cubes.

Royal Microscopical Society, March 18.—C. Da Fano: (1) On the mounting in series of specimens stained by the Weigert-Pal method. Well-bichromated material is embedded in celloidin. The blocks are cut serially and the sections placed in order on slips of smooth paper. After drying with filter paper a progressive number is written with a mixture of 10 c.c. of indian ink and 3 c.c. of equal parts of ether and acetone on a corner of the celloidin by means of a brush. The sections are floated in weak alcohol, washed, and mordanted in a mixture of potassium bichromate. 5 gm., chromium fluoride 2.5 gm., distilled water 100 c.c. They are then stained in Kultschitzky's hæmatoxylin, differentiated by Pal's method, counterstained and mounted according to the progression of their numbers. (2) Golgi-Cox preparations mounted permanently in series. Relatively large pieces of nerve tissue or even entire brains from small animals are placed in Cox's mixture. The fluid should be changed after 24 hours and again on the third day. The pots containing the material are sealed and kept for a month at $24^\circ C.$ and then for about 6 months at room temperature. The pieces are washed, dehydrated, embedded in celloidin, and serial sections made.

—A. S. Parkes: The age of attainment of sexual maturity in the albino mouse. The examination of the gonads of young mice showed that mature spermatozoa are produced by the male at a much earlier age than ova are produced by the female. In the case of the male, active spermatozoa first appear in the epididymis during the sixth week of life. Testis sections corroborated this finding. In the case of the female the first ovulation occurs about the eighth week, though the condition of the animal obviously has a considerable influence in determining the time of the first production of both ova and spermatozoa. The vaginal orifice first opens towards the end of the seventh week, at which time also the uterus develops to a condition approaching maturity.

Royal Meteorological Society, March 18.—C. K. M. Douglas: The relation between the source of the air and the upper air temperature up to the base of the stratosphere. Trajectories of "gradient" wind were drawn, showing the previous history of the air in which *ballon sonde* ascents were made, in cases where the place of fall of the balloon showed no great change of wind with height. These showed that the latitude of the air three days previously is highly correlated with the temperature at all heights to the base of the stratosphere, with the height of the stratosphere, and with the pressure at 9 km. The latitude effect, which in general represents the temperature difference between "polar" and "equatorial" air, increases somewhat with height, up to at least 6 kilometres.—A. H. R. Goldie: Waves at an approximately horizontal surface of discontinuity in the atmosphere. Autographic instruments with open time scales show examples of fluctuations of atmospheric pressure which are undoubtedly periodic. By way of determining the origin of these, the general problem of wave-motion at the common boundary between two air currents differing in density and in velocity and direction of motion is discussed. The theory can account plausibly for the observed facts; waves with amplitudes in the bounding surface of from 150 to 750 metres or perhaps more, and with lengths of the order of from 5 to 20 kilometres, must be of comparatively frequent occurrence.—Sir Napier Shaw and H. Fahmy: The energy of saturated air in a natural environment.

DUBLIN.

Royal Dublin Society, March 31.—H. Pringle: The identity of vitamin A: the comparative effects of human and cow's milk. Cow's milk is much more efficacious than human milk in promoting growth in rats.—J. Wilson: The variations in the quantities of food required by cattle for maintenance and fat production with various kinds of rations. From Kellner's own experiments, the quantity of food required by cattle for idle maintenance is not constant, as Kellner found, but varies with the kind and quantity of long fodder in the ration. With 11 to 12 cwt. bullocks, it is equivalent to about 13, 15, and 16.5 lb. of hay, when the ration contains less than 0.6 lb. of hay, about 1 lb. of hay, and about 1 lb. of hay and straw respectively per live, hundredweight of the animal. When the bullock is fattening, the quantity of food required to put on fat varies with the kind and quantity of long fodder in the ration and with the rate of fat production. If all not retained by the animal be regarded as maintenance, the bullock, like the pig, puts on a pound of fat with a little more than 2 lb. of meals.

PARIS.

Academy of Sciences, April 6.—The president announced the death of M. Rabut, member of the Academy.—H. Vincent: New researches on the pathogeny of colibacilluria. The action of an anti-colibacillus therapeutic serum.—L. Vegard, H. Kamerlingh Onnes, and W. H. Keesom: The emission of light by solidified gases at the temperature of liquid helium, and the origin of the auroral spectrum.—P. J. Myrberg: Arithmetical invariants.—H. Eyraud: Two complementary deformations of space.—Léon Pomey: The integration of differential equations with general initial conditions comprising those of Cauchy.—Mlle. O. Jasse: Observations of the Schain (1925 *a*) and Reid (1925 *b*) comets made at the Marseilles Observatory (Eichens equatorial, 26 cm. aperture). Positions given on March 29 and 30. Schain's comet forms a nebulosity 2' in extent, with a nucleus of 11.5 magnitude. Reid's comet, 9.5

magnitude, shows a strong condensation surrounded by a nebulosity 3' in extent.—P. Chofardet: Observations of the Schain (1925 *a*) and Reid (1925 *b*) comets made at the Besançon Observatory with the *coudé* equatorial. On March 30 Schain's comet was of the 11th magnitude, 40" diameter, with a nearly central nucleus; Reid's comet on March 31 was of the 8th magnitude, with nucleus 8" diameter, tail faintly outlined.—Emile Belot: The trajectory of the protosun in the primitive nebula: the origin of comets.—Jean Villey and Pierre Vernotte: The electrical maintenance of pendulum oscillations without physical contact. The oscillations can be maintained by the electrostatic attractions between the pendulum and its fixed supports. An outline of the necessary conditions is given.—A. Grumbach: The surface phenomena in photo-voltaic elements with a fluorescent liquid. The effect of the illumination on the electromotive force of the cell platinum—fluorescent solution—platinum has been studied. The variation of potential caused by the illumination is a function of the lighting, and of the nature and concentration of the solution, but is independent of the initial electrical conditions.—Charles Chéneveau: Some optical properties of turbid solid resinous media. Opaque resins, natural or artificial, which may be regarded as the inverse of suspensions of resins in water, obey the general optical laws of turbid media containing large particles.—G. Réchou: The spectrographic study of the *K* series of the heavy elements. Values are given for the α_2 , α_1 , β , and γ lines for ten elements (tantalum to uranium).—P. Job: The spectrographic study of the iodocadmium complex. The existence of the complex ion CdI_4 is proved, and the equilibrium constant k of the reaction $Cd^{++} + 4I^- \rightleftharpoons CdI_4^{--}$ deduced from the measurements.—A. Mailhe: The catalytic decomposition of the acid chlorides. The vapours of isovaleryl, isobutyryl, propionyl, acetyl, and benzoyl chlorides were passed over nickel at about 420° C. Analyses of the gases produced in each case are given.—I. P. Voitești: Faceted pebbles in the tectonic breccia in the salt massif of Roumania.—J. Savornin: Djebel Hadid (Eastern Grand Atlas).—Frédéric Hermann: The fan of Bagnes and the Dent Blanche layer.—L. Eblé: Magnetic measurements in the centre of France. The magnetic elements are given for 45 stations in the Departments of Loir-et-Cher, Cher, and Nièvre.—R. Bureau and M. Coyecque: Atmospherics on the oceans. Their meteorological characters.—Henry Hubert: Practical problems of meteorology concerning French West Africa.—P. Lavialle: The embryonic sac of the Dipsacæ.—H. Colin and Mlle. Y. Trouard-Riolle: The crossing of smooth-haired black barley with rough-haired white barley (Albert barley).—A. Goris and M. Métin: The preventive action of anthonine towards aconitine. If less than a lethal dose of anthonine is injected into guinea-pigs, followed by a fatal dose of aconitine, the animal is protected by the anthonine, but the latter has no action as an antidote after injection of aconitine. The preventive effect of anthonine persists for at least twenty-four hours.—M. Parat and J. Painlevé: The exact concordance of the characters of the vacuome and the classical apparatus of Golgi.—Edouard Chatton and Mme. Chatton: The action of external factors on the Infusoria. The conjugation of *Glaucoma scintillans* is determined by the modification of the proportion of the constituents of a chemically defined medium.—Paillet: The cytoplasmic and nuclear alterations in the course of the evolution of *grasserie* of the silkworm.—G. Guittonneau: The formation of thio-sulphate at the expense of sulphur by the micro-organisms of the soil.