

were chiefly of a biological and geological character; in Section C various engineering questions were discussed, and in Section D great prominence was given to education, philosophy and sociology. The volume deals with forty-seven papers, which are with a few exceptions printed in full or abstracted.

UP to the present the alloys of nickel and iron have attracted attention chiefly on account of the fact that alloys containing about 35 per cent. of nickel have an exceedingly small coefficient of expansion, which in certain cases may even become negative. Their elastic properties appear, however, to be of equal interest and importance, and a paper on this subject, by M. Guillaume, in the *Séance* of the French Physical Society, contains a number of important data. At ordinary temperatures the modulus of elasticity reaches a maximum at 29 per cent. and a minimum at 45 per cent. of nickel, and between these limits the modulus of elasticity *increases with the temperature*, whilst two alloys must exist in which the modulus is independent of the temperature. These results can be explained by supposing that the change from β to γ iron is accompanied by a large increase in the modulus of elasticity, and that in the alloys referred to this transition is brought down to the ordinary temperatures and extended over several degrees.

In recent months some attention has been paid to the problem of bringing about electrolytic decomposition by means of alternating currents. The most important paper that has appeared on the subject is that by Le Blanc and Schick in the *Zeitschrift für physikalische Chemie*, in which experiments are described on the dissolution of metals in various solvents by the aid of alternating currents of frequency ranging from 72 to 38,600 alternations per minute. In the simpler cases, such as the dissolution of copper in sodium hydrogen sulphate, the weight of metal dissolved is very small, and even at a frequency of only 72 is less than one-third of that calculated from Faraday's law. On the other hand, potassium cyanide, especially in concentrated solutions and with a high current density, dissolves the metal freely even with very high frequencies, and in one experiment the weight of copper dissolved amounted to no less than 66 per cent. of the theoretical quantity when the frequency was above 30,000; this result is probably due to the formation of complex double cyanides in which the metal forms part of the acid radicle, and so is hindered from being re-deposited on the electrode.

THE additions to the Zoological Society's Gardens during the past week include a Campbell's Monkey (*Cercopithecus campbelli*) from West Africa, presented by Mr. J. A. L. Campbell; a Vulpine Phalanger (*Trichosurus vulpecula*) from Australia, presented by Mr. Herbert A. Parkes; an African Civet Cat (*Viverra civetta*) from Africa, presented by Lieut. H. Nelson, R.A.; three Reeve's Pheasants (*Phasianus reevesi*) from northern China, presented by Miss J. Mann; a Blue-fronted Amazon (*Chrysotis oestiva*) from South America, a Princess of Wales's Parrakeet (*Polytelis alexandrae*) from Australia, presented by Mrs. St. Clair Christophers; a Bonnet Monkey (*Macacus sinicus*) from India, a Blackish Macaque (*Macacus fusco-ater*) from the Celebes, a Striped Hyæna (*Hyaena striata*) from North Africa, a Virginian Opossum (*Didelphys virginianus*) from North America, a Burrowing Owl (*Speotyto cunicularia*) from South America, a Grey Parrot (*Psittacus erithacus*) from West Africa, five Eyed Lizards (*Lacerta ocellata*), south European, deposited; a Mouflon (*Ovis musimon*), born in the Gardens.

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OUR ASTRONOMICAL COLUMN.

RETURN OF BROOKS'S COMET.—A telegram received from the Kiel Centralstelle on April 17 announces that Brooks's comet was observed at Geneva at 9h. 50m. (Geneva M.T.) on April 16. Its position at that time was R.A. = 16h. 58m. 8s., decl. = +44° 10', and it was slowly travelling northward. Both a nucleus and a tail were seen.

A second telegram received on April 18 announces that Prof. Kobold observed the comet on April 17, and found its position, at 11h. 34m. 0s. (Kiel M.T.), to be R.A. = 16h. 56m. 23.8s., decl. = +44° 43' 47".

The above data show that on April 16 the comet was nearly on a straight line joining σ and ι Herculis, and rather nearer to the former than the latter, also that the comet is apparently travelling towards Draco.

ABSORPTION OF STAR-LIGHT BY A COMET'S TAIL.—In No. 3914 of the *Astronomische Nachrichten* Dr. Max Wolf discussed a photograph which led him to the conclusion that the light of the star B.D. +63°-1056 was affected by selective absorption in passing through the tail of comet 1903 IV. on July 25, 1903.

The consideration of later observations has led him, however, to doubt the reality of the apparent absorption, which he now considers may have been due to a photographic effect produced by the comet's light on the film of the negative (*Astronomische Nachrichten*, No. 3934).

THE SPECTRA OF NOVÆ.—In an article published in No. 3917 of the *Astronomische Nachrichten*, Herr H. Ebert explains how the multiple character of the lines in the spectra of new stars may readily be accounted for by supposing it to be due to "anomalous refraction" in the layers of vapours, of different characters and densities, through which the light has to pass between the source and the observer. By a number of curves and diagrams he shows that in the complex strata, which may be reasonably supposed to exist in the vapours surrounding a new star, the light would be refracted hither and thither until, when it emerged from the outer layers, the distribution of the brightness in the spectrum would have been considerably modified by anomalous refraction.

The "shifting" of spectral lines in the experiments which have been performed by several observers on the spectrum of the spark discharge under various liquids may, according to Herr Ebert, be readily explained by this theory.

NEBULOSITY AROUND NOVA PERSEI.—In No. 2, vol. xix., of the *Astrophysical Journal*, Mr. Otto Luyties, of Baltimore, discusses the theories which have been promulgated in reference to the nature and the expansion of nebulae around Nova Persei, and points out the effect which the shape of the body concerned might have upon the observed velocities. He states that the previous estimations of the parallax of the Nova nebula and of the rate of its expansion have been partly based on the probably erroneous assumption that the emanations which caused the illumination were originally propagated in a direction at right angles to the line of sight. If, however, the mass illuminated were spherical in form, the resulting distortion on the photographic plate would lead to serious misconceptions as to the rate of expansion and the nature of the emanation. Mr. Luyties then discusses the possible effects of such distortion, both for the case of radial illumination from the centre and for that in which the emanation proceeded from a point on the boundary of the sphere, and shows that the correction for such distortion, when a likely value is allotted to the parallax, could be made to account readily for the apparent retardation of the illuminations, and for other anomalies which have been observed, when the actual velocity of the emanations was of the order of that of light.

STELLAR DISTRIBUTION.—A communication from Mr. J. E. Gore to No. 343 of the *Observatory* gives the results obtained from a count of the stars of each magnitude from the third to the sixteenth on a chart of the Pleiades published in Klein's Star Atlas. This chart covers three square degrees, and Mr. Gore finds that the actual value of the ratio for all magnitudes is considerably less than 4, which is the theoretical value if all the stars were equally distributed in space.

The total number of stars counted on the chart was 1281, and this would give for the whole sky, if of uniform richness, a total of 17,615,031.