Points from Foregoing Letters

EXPERIMENTALLY determined values of the nuclear energy change for the transmutation of sulphur, chlorine and potassium are given by Dr. E. Pollard and C. J. Brasefield. These suggest that the energy levels are closer in nuclei of the type $4n$ than in more complex nuclei. The masses are derived for the majority of nuclei from neon to argon. Plotting departure of mass from whole number against nuclear mass number (Oliphant), these show indications of extra stability at each repetition of four units until ^{40}A is reached, which is exceptional, indicating that the stability is due to α-particles and not to units of four irrespective of charge.

Dr. St. Ziemecki and Dr. K. Narkiewicz-Jodko have taken measurements of cosmic ray intensity at individual points between 6,600 m. and 10,000 m. in a free balloon, and find that the results fall on a smooth curve, contrary to the results obtained by G. A. Suckstorff during similar observations.

New observations on the infra red spectra of molecular hydrogen of the light (H_2), heavy (D_2) and mixed (HD) type are reported by Prof. G. H. Dieke. The author calculates that the effective moments of inertia are $0\cdot871$, $1\cdot156$ and $1\cdot725 \times 10^{-40}$ for H_2, HD and D_2 respectively, and the effective internuclear distance is $1\cdot019 \times 10^{-8}$ cm. The observed spectrum lines are attributed to the so-called ^1X-level of the hydrogen molecule, and the author discusses how far this empirically deduced 'level' can be identified with one or another of the theoretically deduced 'states' inferred from the current theory of the structure of the hydrogen molecule.

From the intensity of certain lines in the Raman spectrum of the light scattered by organic substances like ethylene dichloride, the molecules of which may have two different configurations known as cis and trans, S. Mizushima, Y. Morino and S. Noziri deduce that in the solid the molecules are in the trans state ; in the liquid form or in solutions some are in the cis and others in the trans state.

A mathematical theory of the maintenance of electrical oscillations by a single anode magnetron is put forward by Dr. F. B. Pidduck. The stream of electrons must be interrupted, and oscillations can then be maintained by any emission, however small, provided the resistance of the circuit is small.

Prof. B. C. Guha and J. C. Pal find that extracts of cabbage and of bel (Aegle marmelos) obtained with absolute alcohol and ether give a considerably increased vitamin C value on being heated. This increase is ascribed to the splitting of bound ascorbic acid, and not merely to an apparent increase caused by the destruction of the appropriate oxidase by heat.

The isolation of two fluorescent substances from leaves, barley seedlings, etc., by means of adsorption on magnesia in a percolator (Tswett column) is described by Dr. H. H. Strain. The author considers that by their fluorescence these substances may affect many physiological processes, such as photosynthesis, pigment formation, cell elongation and sensitivity to light, and may account for the fluorescence of etiolated seedlings and of other pigment-free parts of plants.

A figure of the truncate-tailed ocean sunfish, Ranzania truncata, published by Ulisse Aldrovandi in 1613, is submitted by Dr. E. W. Gudger, as being the earliest known drawing of that species. Dr. Gudger gives a review of other early references and drawings of ocean sunfishes.

G. E. H. Foxon points out that orientation to gravity is of vital importance to both the fairy shrimp (Chirocephalus) and the water flea (Daphnia), although for quite different reasons. From experiments it is concluded that in Chirocephalus orientation is a direct result of bodily form, and that in Daphnia it is due to a combination of shape and posture ; in neither case do special organs of orientation appear to be involved.

A photomicrograph of a pollen grain of hornbeam (Carpinus) found at a depth of $1\cdot5$ m. in highly humified peat in the Burrough Bog, Timahoe, Co. Kildare, Ireland, is submitted by C. J. La Touche. It is of interest in view of the general assumption that the hornbeam has been introduced only recently in Ireland.

From the variation in the radium content in successive layers of ferro-manganese concretions, the time of deposition is calculated by L. M. Kurbatov. For one specimen, from the Kara Sea, this comes out at 5,300–5,500 years, and for another specimen from Lake Uksche, Karelia, at about 2,000 years.

The ash-coloured soils of forest-land have a 'profile' or structure consisting of an upper leached ('podsolised') layer (A) and a lower coloured layer (B) enriched by iron oxides and humus. Prof. G. W. Robinson suggests that in the case of 'truncated' soils, where the upper siliceous (A) layer is lacking, this has not necessarily been removed by rapid ('catastrophic') erosion following upon deforestation and cultivation, but that it may have been brought about by normal erosion involving the lateral removal of the finer fractions of the soil constituents.

P. Gombás calculates the heat of evaporation of potassium, rubidium and cæsium metals from data referring to the energy of the metal electrons and the simply charged ions ; he finds good agreement with the experimentally determined values.

Experimental results on the effect of the presence of a small hole on the strength of a rotating disk are described by H. C. Pollock and C. H. Collie. They find that, contrary to theoretical deductions, which state that an axial hole however small should halve the strength of the disk, a small axial hole reduces only slightly the breaking point ; a radial hole was found to reduce the strength to less than half.

The practice of 'levirate' (according to which a widow must marry a brother of the deceased husband) by various tribes in Assam is discussed by J. K. Bose. He concludes that this custom originated in Assam by a combination of social and economic factors different from those to which it has been ascribed in other countries.

Two formulæ giving the relation between the vibrational frequencies that affect the Raman spectra and the masses of isotopic molecules (molecules of equal mass) are given by H. Tompa. These formulæ, the author indicates, may be useful in connexion with the problem of the structure of benzene.