

Electrical Units and the I.E.C.

PROF. E. W. MARCHANT, who was one of the British representatives at the recent meeting of the I.E.C. at Brussels, has sent me an account of the proceedings in connexion with the proposed introduction of the M.K.S. system, which he authorises me to publish. I should be greatly obliged if space could be found for it in NATURE.

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DEAR SIR RICHARD GLAZEBROOK,

Dr. Rayner has written to me regarding the meetings of the E.M.M.U. at Scheveningen. It was agreed that the M.K.S. system should have units which were consistent with the C.G.S. system, and all the representatives of the different countries agreed that it was very desirable that the present practical system should be extended so as to make it a coherent system of units. When the matter came up for discussion at the Committee of E.M.M.U., the question under discussion was divided into two. The first was concerned solely with the desirability of a coherent M.K.S. system without specifying the fourth unit, and the second with the choice of the fourth fundamental unit. On the first question, all the

members declared themselves in favour of the adoption of an M.K.S. system with four fundamental units, except the representative of Norway, who abstained. On the second question, the Committee decided to consult, on one hand the Consultative Committee of the B.I.P.M., and on the other hand, the S.U.N. Dr. Lombardi was asked to prepare the question to submit to the Consultative Committee of the B.I.P.M., and Dr. Kennelly to prepare that to be submitted to the S.U.N. Although there is nothing in the minutes of the proceedings stating that the basis of the decision regarding the fourth unit should be that the permeability of free space should be taken as unity, that point was repeatedly raised in the discussion, and the way in which the matter was left, was that the committees to be consulted should be asked to give a value for the fourth unit which was consistent with the value of the permeability of free space being equal to unity.

It was agreed by everyone that the fourth unit to be adopted (either a unit of quantity of electricity or a unit of resistance) must be consistent with the C.G.S. system of units, and the reason why the question of the fourth unit was referred to the two committees concerned, was that the Commission was anxious that whatever unit was chosen should be consistent with the C.G.S. system of units.

Yours very truly,

E. W. MARCHANT.

Points from Foregoing Letters

DR. J. K. MARSH and Prof. S. Sugden describe and tabulate results obtained by bombarding rare earth elements with neutrons. Radioactivity of varying intensities, with half-life from a few minutes to two days, was produced in nine out of thirteen elements. Europium, dysprosium and holmium were found particularly active; it is suggested that these elements may be useful as neutron detectors. Prof. G. Hevesy and Miss Hilde Levi give a similar table for the radioactivity induced in eleven rare earth elements. The two tables are not in entire agreement, owing, as both groups of investigators point out, to the difficulty of obtaining the rare earths in a pure state. Neodymium and gadolinium, the activity of which is given as zero by Marsh and Sugden, are said, by Hevesy and Levi, to have a slight activity; the values for the intensity and half-life in the case of several other elements also differ in the two tables.

The rate at which molecules of heavy hydrogen gas are exchanged for the hydrogen atoms of water molecules in a suspension containing lactic acid bacteria varies with pressure, the velocity constant being inversely proportional to the square root of the pressure, according to Messrs. G. H. Bottomley, B. Cavanagh and M. Polanyi. The active catalytic agent is an enzyme equally active whether the bacteria are dead or alive.

M. A. Pérard describes the methods employed in determining the length of the national prototypes of the standard metre, and concludes that in spite of the raggedness of one of the fiduciary lines, an accuracy of 0.2 microns is possible. Dr. W. E. Williams emphasises the fact that accuracy would be greater if an optical gauge were used in place of the line standard. He still believes it possible that a discrepancy of 0.56 microns in the length of the British and German standards may exist.

F. Watson, Jr., reviews critically theories dealing with the origin of tektites, which are small glassy particles of lens-like, pear or dumb-bell shape, found at various places on the earth's surface. He concludes that no satisfactory meteoric theory of their origin is as yet available.

Prof. W. C. O. Hill records that a specimen of loris, one of the Indo-Malayan lemurs, was born in captivity in Colombo, and describes the breeding habits and period of gestation of the species.

A histological study of the carotid swelling in the South African bullfrog, *Pyxicephalus adspersus*, by Dr. G. Eloff, has shown that it is a much elaborated artery with a relatively thick media. Before the internal carotid artery leaves the swelling, the common carotid breaks up into a *rete mirabile*, in which melanophores occur abundantly, and probably also nerve-cells. Constriction of the carotid swellings did not affect the heart-rate.

The formation of a loop during the conjugation of heterozygous chromosomes (derived from unlike parents) of the fruit-fly, *Drosophila melanogaster*, during fertilisation is described and illustrated by Messrs. B. N. Sidorov, N. N. Sokolov and I. E. Trofimov. In order that homologous portions of the chromosomes may lie side by side notwithstanding the presence of an inversion in the order of the genes in one of the chromosomes, a 'loop' is formed as a result of a single crossing-over in an inverted region.

Prof. C. Białobrzęski and I. Adamczewski have found that the use of liquid dielectrics is advantageous for the study of the cosmic ray bursts. In an ionisation chamber of 1 litre capacity filled with carefully purified hexane, they observed 37 bursts in 13 hours. Several bursts are double or even of more complicated structure.