

tively. Suppose that the light after passing through this column of chlorine enters a vessel containing a mixture of hydrogen and chlorine, which combine under the influence of the light absorbed by the chlorine, it would appear to follow that the initial rates of reaction for the molecules  $\text{Cl}_{35}\text{Cl}_{35}$ ,  $\text{Cl}_{37}\text{Cl}_{35}$ , and  $\text{Cl}_{37}\text{Cl}_{37}$  should be in the ratio  $1 : 10^9 : 10^{24}$ . The hydrochloric acid thus formed should therefore consist almost entirely of  $\text{HCl}_{37}$ , if the reaction is allowed to proceed for a suitable time.

If this experiment should prove successful, it would evidently be possible to prepare a "filter" from the chlorine thus obtained which would favour the formation of  $\text{HCl}_{35}$ . It is fully recognised that there are a number of factors which may affect the success of the experiment, which is now being tried; it is hoped that results will be obtained before long, but the method seems worthy of mention as involving principles which have apparently not been considered hitherto in this connection.

THOMAS R. MERTON.

HAROLD HARTLEY.

Balliol College, Oxford.

#### Calendar Reform.

Vous avez cent fois raison de souhaiter un accord pratique entre les partisans de la réforme du calendrier, et je vous demanderai, pour ma part, la permission de répondre quelques mots à votre judicieuse invitation.

On peut lire dans mon Annuaire astronomique pour 1920 que la réforme radicale que j'ai proposée en 1879, en 1884 et en 1891 étant trop difficile à réaliser, et l'humanité étant incapable d'accepter des solutions rationnelles en quoi que ce soit, nous pourrions nous borner à la simplification suivante :

1° Douze mois partagés en 4 trimestres égaux de 30, 30 et 31 jours, le premier mois de chaque trimestre commençant un lundi et le dernier jour du troisième mois étant un dimanche.

2° Le 1<sup>er</sup> janvier étant voisin du solstice peut être conservé. Ce serait, tous les ans, un lundi.

3° La fête de Pâques pourrait être fixée au dimanche 7 avril.

4° Les quatre trimestres égaux de 91 jours chacun formant 364 jours, il y aurait un jour de fête = 0 pour les années ordinaires et deux pour les années bissextiles.

On aurait ainsi un calendrier perpétuel et universel.

CAMILLE FLAMMARION.

Paris, le 8 mars, 1920.

CALENDAR reformers will welcome M. Flammarion's alteration of his scheme to one which minimises the changes from the existing calendar, while it secures the removal of its anomalies and inconveniences. It would seem advisable to choose some day for the extra-week day that is already a public holiday. Christmas Day, New Year's Day, and Whit-Sunday have been suggested.

From the astronomical point of view the most important amendment is the placing of the leap-day at the end of the year, so that the interval from the beginning of the year to any calendar date is constant.

A. C. D. CROMMELIN.

#### On Langmuir's Theory of Atoms.

MR. S. C. BRADFORD'S criticism in NATURE of March 11 of Dr. Langmuir's theory is scarcely justifiable, considering that the latter clearly states in his paper (Journ. American Chem. Soc., vol. xli., p. 868, 1919) that the equilibrium positions of the electrons are determined in part by magnetic, and in part by

electrostatic, forces, the former necessarily implying electron rotations.

The electrons are probably rotating (some right-handedly, others left-handedly) in very small orbits about certain fixed points, e.g. the corners of each cube, the centres of such orbits being the positions of Dr. Langmuir's "stationary" electrons. Such rotations are exactly what is required for the explanation of directed valencies and the paramagnetic or diamagnetic properties of the elements. From magnetic considerations, Mr. Bradford's suggestion as to the nature of the rotation is inconceivable, since the one he prescribes would make fluorine and a number of other elements paramagnetic, contrary to experimental data. Moreover, the frequencies of such rotations, which he suggests might be identified with Bohr's spectral frequencies, would be affected by temperature changes.

Electrons rotating right- and left-handedly about definite points, in small circles the radii of which are small compared with the accepted radius of the hydrogen atom, appear to be necessary; but there is little possibility of reconciling such small orbital motions with the coplanar ones of Bohr, the radii of which are, under normal conditions, essentially of the conventional atomic size, and under certain conditions far larger.

A. E. OXLEY.

University College, London, March 12.

#### Fireball of February 4.

ON Wednesday, February 4, at 6 p.m., a very bright meteor appeared in the sky at Naini Tal (India). It travelled from west to east at an altitude of about  $60^\circ$ , and was visible for fully five seconds. The yellow fireball left a bluish-white trail, which remained hanging in the air for a considerable time, and then gradually dispersed. About half-way through its course a big puff of vapour came out of the meteor, which probably indicated the bursting. Half a minute later a thundering noise was heard, which continued to rumble for a quarter of a minute. It had been snowing an hour before, but the sky was perfectly clear at that time.

M. L. DEY.

Central Chemical Laboratory, Naini Tal,  
India, February 5.

It is curious that on the same date a large fireball was observed in England at 6.14 p.m., but in this case the object moved from east to west, i.e. in a contrary direction to the one seen by Mr. Dey. It is, however, by no means rare that two or more fireballs appear on the same night, though they are seldom members of the same meteoric system.

W. F. DENNING.

#### Buzzards and Bitterns.

IN the *Times* of March 12 it is stated that "the Lakeland buzzards are extending their breeding range . . . and that a nest was detected in the Buttermere Valley."

It would thus seem that the buzzard was finding its way by instinct to a region where, in old times, it had obtained an easy prey in the bittern, which gave its name to the mere. The early name of the bittern was "butter," and a Buttermere is mentioned in a charter ascribed to A.D. 863 as occurring in Wiltshire. There are a number of place-names in the country involving the designation of the bird, although its "bump" is no longer heard, as by Tennyson's Northern Farmer.

EDMUND McCCLURE.

80 Eccleston Square, S.W.1, March 13.