life." It will not become anything of the sort of its own volition, as scientific workers are not usually interested in broad problems outside their own particular fields, and those who have to be forced into the work are best out of it.

Functioning best begins with a real task, however difficult, before the particular community, preferably the first task which involves large sums of money, large expenditure of time and of energy, and considerable risk to human life. These tasks exist in bewildering profusion. The knowledge, without which they cannot even be stated correctly, exists also, and the prize of efficient performance cannot be won apart from its application. With human contact and the common sense of an adaptable race, tasks and knowledge can approximate each to each, and the first step in the unity of purpose which science can best bring to national life may be taken to-day in any city of the country. J. J. ROBINSON

(Secretary of the Parliamentary Committee of the British Science Guild).

6 John Street, Adelphi, London, W.C.2, January 9.

Terrestrial Magnetic Disturbances and Sun-spots.

MAY I add a few remarks on Mr. Evershed's interesting letter on this topic (NATURE, December 29, p. 566), and supplementary also to my former letter (NATURE, October 27, p. 272). The protracted magnetic storm of May 12–21, 1921, after a lull on May 18, resumed an active phase on May 19–21. In my former letter I traced a sequence of magnetic disturbances, in connection with that of May 21, which extended to October 5. I may now add that the sequence has persisted until December 24, that is for 217 days, embracing eight synodical rotations of the sun, with a mean period of 27·13 days. The corresponding mean sidereal period would be 25·25 days, or 14·26° per day. This is Carrington's rotation period for latitudes 10° to 15°, and agrees closely with the sidereal period found by Mr. Evershed for the main series of disturbances from March 22 to September 29, 1921.

With regard to the series of disturbances from January 1 to November 21, 1920, which was also recorded at this observatory, Mr. Evershed deduces the equivalent solar period as 25·22 days, which is Carrington's value for spots about latitude ±10°. He remarks: "The slight difference of period compared with that obtained from the 1921 series does not make the evidence for these sequences less convincing." To my mind, in this particular case at least, it makes the evidence more convincing, because the mean latitude of the sun-spot group observed from December, 1920, to May, 1921, was about −6°, and, in fact, in the January appearance extended from 0° to −12° in latitude. In the case of the 1921 group, May 9–17, the mean heliographic latitude was +0·8°, but it extended north of the equator at least 5° in latitude, sufficiently in accord with a synodical rotation period of 27·13 days. A. L. CORTIE.

Stonyhurst College Observatory, January 2.

Reform of the Calendar: Mean Value of the Year.

I SEE there is to be a meeting at Rome in 1922 to consider questions concerning the calendar. I should like to direct attention to the fact, apparently little known—I, at least, have never seen it in any book—that if we make the year equal to 365 218/900 days we get a very good approximation, and one which can be applied by omitting leap-years at certain complete centuries, something like what is being done under the present Gregorian rule. If we say that "a century-year shall be a leap-year only if it gives a remainder of 2 or 7 when divided by 9," we have a rule which is much more approximate than the Gregorian rule, and one which has been followed *de facto* since 1582 (year of the Gregorian reform). The new rule would not differ in its application from the Gregorian rule before the year 2400. The Gregorian year, 365 97/400 days, differs from the true tropical year by 26 seconds; if the above modified rule were introduced the difference would be reduced to 2 seconds.

The "Encyclopædia Britannica" in the article "Calendar" mentions the value 365 31/128, which, no doubt, is very approximate (difference from true year 1 second), but depends on the awkward cycle of 128 years; and, besides, its application would mean a new break in the way of introducing, or rather suppressing, leap-years. ARTHUR ROSE-INNES.

Yokohama, November 27.

Units in Aeronautics.

PLEASE allow me to protest against Mr. A. R. Low's attack in NATURE of January 5, p. 12, on the "slug," which was not introduced by Prof. Bairstow, but probably by Prof. Fleeming Jenkin about thirty years ago. The slug does not lead to any evasion of Newton's laws any more than the poundal which was introduced by Prof. James Thomson. All such terms are useful so long as they are precisely defined and correctly understood; in recent years a distinguished German mathematician has been striving to introduce Prof. Thomson's "radian" in place of "Einheitskreisbogenlänge."

The contempt common amongst chemists and physicists towards so-called "engineers' units" is without justification. The chemist or physicist derives his unit of force from a definition of mass and acceleration, whereas the engineer derives his unit of mass from a definition of force and acceleration. The engineer's reason is that his problems come to him in terms of forces, and he wants his solution in the same units. Engineers on the Continent use the kilogram as the unit of force, and derive a metric slug in terms of the metre and second.

The ideologist is fond of so-called "absolute" units, but the physical meaning of Newton's or other laws is often made more clear when units are chosen conveniently. An ordinary man cannot realise a force of a dyne, though an insect might collapse under it; and while an astronomer measures distances in light-years, the peasant uses hours of walking and the spectroscopist μ. It is unlikely that the British or foreign working-man will ever ask for his beer in cubic centimetres: the unit is inconveniently small.

Chiswick, January 9. H. S. ROWELL.

A Curious Physiological Phenomenon.

THE phenomenon to which attention is directed by Mr. F. C. Dannatt in NATURE of December 22, p. 529, is an exceedingly interesting one, and may be the explanation of what occurs in "table turning" and "hat turning." Many have, no doubt, seen the hat, upon which many fingers are resting, move in a very peculiar manner, and it is difficult to believe that those who are engaged in the exhibition are not telling the truth when they declare that they are not aware that they are the cause of the movements. An essential element of the game is that the weight of the arms should be carried by the muscles, and it is interesting to learn that such strained conditions lead to involuntary muscular movements.

R. M. DEELEY.

Tintagil, Kew Gardens Road, Kew, Surrey, December 24.

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