

Gray and Speakman's results are of special interest because they occur in a particularly simple system, and thus afford opportunity for studying the mechanism of this effect, which, if Miss Laing's hypothesis is correct, must account for gelatinisation, even in the most complicated systems. J. W. MCBAIN.

University of Bristol, July 19.

Science and Civilisation.

CAPT. B. J. MARDEN'S letter in NATURE of July 14 (p. 623) raises a question which must be exercising the minds of many of the readers of NATURE to-day. That question is: How can scientific workers collectively obtain such control of the product of their work—new knowledge—as to secure that it shall be used for the development of a better order of society out of the existing chaos? Science—knowledge—alone can create this new order and save Europe from relapsing into barbarism. If this be accepted as a true statement of fact, we are led naturally to inquire: What are the best methods to pursue to secure that science shall be so applied?

The time is now ripe for scientific workers to set to work to devise a practicable scheme which will give to science its proper place in shaping the future destinies of the world. This is one of the chief purposes for which the National Union of Scientific Workers exists. Capt. Marden's idea seems to involve a sort of international Syndicalism applied to scientific workers and to scientific work. (Those readers who know about Syndicalism only from the daily Press will find a clear exposition of the Syndicalist position in Mr. Bertrand Russell's "Roads to Freedom," chap. iii., Geo. Allen and Unwin, 3s. 6d.) Such an organisation would offer no adequate security against the tyranny of a group over the rest of the community; and a dictatorship of scientific workers might be almost as great an evil as a dictatorship of miners, or of food producers, or of financiers. We should like to urge Capt. Marden and others who may have thought out schemes for the proper utilisation of science for the salvaging of what is worth preserving in our civilisation, and particularly those who have thought them out in the light of the large and growing volume of literature on the problem of the rôle of the producer (whether a producer of knowledge or of other essentials) in the future society, to publish their ideas in detail.

J. HENDERSON SMITH,
Chairman of Executive.

A. G. CHURCH,
Secretary.

National Union of Scientific Workers,
25 Victoria Street, Westminster,
S.W.1, July 19.

Bees and Scarlet-Runner Beans.

IN NATURE of August 12, 1920 (vol. cv., p. 742), a letter was published from me on the behaviour of bees visiting the flowers of the runner bean, *Phaseolus multiflorus*, to the effect that almost invariably the nectar was obtained from the flower by penetrating the calyx and corolla close to the position of the nectaries, the humble bees with their stronger mandibles biting through the sepals, while the honey bees took advantage of this pioneer work of their stronger relatives.

To my surprise, this year I find no such depredations made on the blossoms, but all the numerous humble bees are getting the nectar in a legitimate way, that apparently indicated by Nature, viz. by clinging to the more open left side of the flower and intruding the proboscis beside the pistil and stamens down to the nectar at the base of the petals. No

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honey bees have yet been seen on the flowers, but whether because of their scarcity or by reason of their being now unable to reach the honey is not clear.

As the jasmine flower is still bitten by the humble bees, it would appear that the hot and dry season has caused the change in the behaviour of the bees towards the bean flower, probably by hardening the calyx and making it more difficult to penetrate, while causing the bloom to be less in size and depth, so that the nectar can be more easily reached from a frontal approach.

HARFORD J. LOWE.

Torquay.

A New Theorem on the Double Pendulum.

THE following interesting relation is believed to be new:—

Let M and m be the masses of the bobs of a double pendulum, and let A and B be their respective amplitudes with suffixes 1 and 2 to denote the modes. Then

$$\frac{A_1 A_2}{B_1 B_2} = \frac{-m}{M}$$

The negative sign merely indicates that in one mode the bobs are opposed, and it may therefore be ignored if the absolute values of the amplitudes are considered.

It is noteworthy that the product of the amplitude ratios is inversely as the mass ratio—that is, directly as the respective distances of the bobs from their centre of gravity. It is striking that the product of the amplitude ratios is independent of the lengths of the pendulums, *i.e.* independent of the relative position of the bobs and the point of support.

When the bobs are of equal mass it follows from the foregoing that the lower pendulum is divided by the vertical through the point of support into segments the ratio of which in one mode is the reciprocal of the ratio in the other mode, *i.e.* if one point of section be overbent or swung about the middle of the lower pendulum through 180° , the two bobs and the two points of section then form a harmonic range which has many well-known properties.

H. S. ROWELL.

15 Bolton Road, Chiswick, W.4, July 18.

Ochreous Flint Artefacts from Sheringham.

I HAVE recently paid another visit to Sheringham, and have again devoted my attention to the ferruginous "pan" which, for a distance of more than a quarter of a mile, is exposed in places in the base of the cliff forming Beeston Hill. From different areas of this "pan" I have taken fifteen more examples of the ochreous flints such as occur upon the foreshore exposed at low water. The specimens, as would have been clear to anyone examining the deposit intelligently, were, without question, *in situ*, and were embedded prior to the deposition of the great masses of glacial and other strata of which the cliff is composed.

J. REID MOIR.

One House, Ipswich, July 22.

The Drought and Underground Water.

THE present drought affords an excellent opportunity for studying natural underground drainage in limestone (including chalk) districts. In many streams part of the flow takes place underground, but the fact cannot readily be ascertained while a surface flow continues. The flow of small streams is now so much reduced that the whole stream may be swallowed in the limestone and may reappear lower down. It is to be hoped that geologists in limestone districts will seize this opportunity to make observations.

BERNARD HOBSON.

Thornton, Hallamgate Road, Sheffield,

July 22.