unsymmetrical molecule, however, this would not be the case, and Raman lines would be expected, though perhaps with low intensity.

The observations of Bhagavantam [5] corroborate in a satisfactory manner our conclusions regarding asymmetry. He finds an intense Raman line with the displacement 1283 cm.$^{-1}$, and a rather weak line with the displacement 2226 cm.$^{-1}$, in very good agreement with our values for ν_1 and ν_3. The former corresponds to the intense scattering in CO_2 associated with the symmetrical and optically inactive vibration at about 1338 cm.$^{-1}$, but for the latter CO_2 has no counterpart, in spite of the fact that its strongest infra-red absorption band occurs at 2349 cm.$^{-1}$.

Because of the small energy and double weight of the first vibration state ν_2, a large fraction of the N_2O molecules (about one-eighth) are excited to this level at room temperature. The Raman displacements for light scattered by these excited molecules would be slightly different from those for normal atoms, giving rise to satellite lines. From combination relations we are able to predicate the positions of these weaker lines, not yet observed; their displacements should be 1278 cm.$^{-1}$ and 2210 cm.$^{-1}$. Lines corresponding to the stronger of these have already been observed in the Raman spectra of CO_2 and HCN precisely at the positions indicated by the infra-red observations.

E. F. BARKER.

University of Michigan,
Nov. 30.

[1] *Proc. Roy. Soc.*, A, **128**, 294; 1930.
[2] *Physical Review*, **38**, 1827; 1931
[3] *Rev. Mod. Phys.*, **3**, 280; 1931.
[4] *Z. Physik*, **70**, 84; 1931.
[5] NATURE, **127**, 817; 1931.

Selective Action of Living Tissue to Homogeneous Radiation.

A SELECTIVE action has been observed [1] when the allantoic membrane of the embryo chick is exposed to homogeneous X-radiation obtained by crystal diffraction.

The biological response, depicted in Fig. 1, *A*, may be described in terms of a series of maxima connected by an empirical formula $\lambda = kn^2$, where λ is expressed in cm., k is a constant equal to $3{\cdot}2 \times 10^{-10}$,

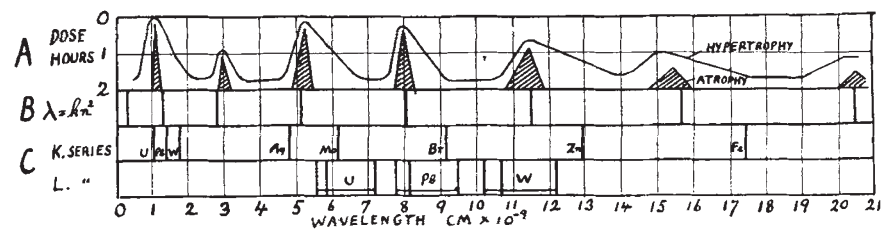

FIG. 1.

and n is given successive integral values from 2 to 8 (Fig. 1, *B*).

A 'maximum' is predicted at a wave-length of $3{\cdot}2 \times 10^{-10}$ cm. by making n equal to 1, but unfortunately the experimental investigation would be very difficult.

The position of a 'biological maximum' is only known within a margin of $\pm 0{\cdot}25 \times 10^{-9}$ cm., owing to the use of comparatively wide spectrometer slits, and the experimental evidence is somewhat scanty for high and low values of n. Nevertheless, there are great difficulties in associating the selective action with the *K* and *L* levels of heavy atoms, some of which are present in minute quantities (Fig. 1, *C*). (Tungsten, silver, and bromine are not present, but of importance in energy measurement.)

The suggestion is made that the above formula might be associated with a series of nuclear energy levels in one of the light atoms which form the main bulk of living tissues.

W. MOPPETT.

The University of Sydney,
Oct. 12.

[1] Moppett, *Proc. Roy. Soc.*, B, **105**, p. 402.

Effect of Light on the Surface Tension of Boys's Soap Solution.

IN his letter in NATURE,[1] Dr. P. Lecomte du Noüy says: "As the concentration of the *soap solution + glycerin* which he [L. D. Mahajan [2]] uses is not stated, but may be as high as 2·5 per cent—which should give a very small drop—it is indeed quite possible that illumination plays a part in this case".

Dr. du Noüy and others who are interested in the subject may be interested to know that I used Boys's soap solution and its various dilutions—even up to one per cent of the Boys's soap solution in the dilution. The minimum strength of the sodium oleate in the dilution which I studied was $2{\cdot}5 \times 10^{-4}$. In all observations the results obtained were found constant throughout for all dilutions. The details of the above work [3] are published in the *Indian Journal of Physics*.

I am now trying still higher dilutions, even up to 10^{-8}. The results are appearing hopeful again, and interesting, and will shortly be published.

L. D. MAHAJAN.

Physics Laboratory, Mohindra College,
Patiala, India, Nov. 20.

[1] P. L. du Noüy, NATURE, Oct. 17, 1931, p. 674.
[2] L. D. Mahajan, NATURE, Sept. 19, 1931, p. 496.
[3] L. D. Mahajan, *Indian J. Phys.*, Calcutta, vol. 6, part ii., pp. 147-153.

An Agricultural Pamphlet.

IN 1905, Wilfarth, Römer, and Wimmer published in the *Landw. Versuchs. Stat.*, vol. 63, a paper, "Über die Nährstoffaufnahme der Pflanzen in verschiedenen Zeiten ihres Wachstums". The importance of this paper in agricultural science was soon recognised, and before long an English translation was published in pamphlet form. Copies of this were obtained by the libraries at Rothamsted and at the Ministry of Agriculture, but not apparently by the British Museum or the Science Library.

The Rothamsted copy was obtained in the days when our library was not properly constituted; we had only very few books and no librarian, and we did not take the full bibliographical details. Our copy has long been missing, and on inquiry at the library of the Ministry of Agriculture we find that by a strange coincidence theirs also cannot be found, so that we know neither the translator nor the publisher, and consequently cannot take steps to obtain a new copy.

I should be grateful for bibliographical information, or, better still, to learn where I can now obtain another copy.

E. J. RUSSELL.

Rothamsted Experimental Station,
Harpenden, Herts,
Dec. 21.