namely, that one quantum of monochromatic radiation is emitted by an atom during a transition between stationary states. If, however, the emission of light can be associated with rotation of the frame of reference, then here it is illustrated how the uniform frequency can occur during the gradual settling down of the atom after disturbance.

LEWIS SIMONS.

Birkbeck College,
University of London.
June 9.

Separation of Forms of Vitamin A based on the Antimony Trichloride Reaction

WITH reference to the recent communication from Prof. Karrer's laboratory[1] describing the separation of vitamin A into two fractions by means of calcium hydroxide, we may recall that this separation was effected by us about two years ago[2,3], using, however, fuller's earth.

Saponified liver extracts in petroleum-ether are treated with small quantities of fuller's earth. The '580' chromogene is adsorbed much more quickly, and in order to get this pure such a quantity of earth is added that part of the '580' remains in solution. The adsorbed '580' chromogene can be eluted by alcohol.

If a pure '620' chromogene is wanted, more earth is added, and as a result the '620' remains in solution (too much earth causes absorption of both chromogenes). Only the '620' chromogene shows absorption at 328 mμ and has growth promoting activity. We also found that solutions containing the fraction with only the 580mμ band (with antimony trichloride), very soon showed absorption at 620 mμ.

M. VAN EEKELEN.
A. EMMERIE.
H. W. JULIUS.
L. K. WOLFF.

Laboratory of Hygiene,
University, Utrecht.
July 5.

[1] NATURE, 132, 26, July 1, 1933.
[2] *Acta Brevia Neerlandica*, 1, 8; 1931.
[3] *Proc. Kon. Akad. Wetenschap. Amsterdam*, 35, No. 10; 1932.

Constitution of α-Carotene

RECENTLY we prepared α-carotene[1] in pure form. Ozonisation of α-carotene yields geronic and isogeronic acid. The result of the ozonisation proves that the formula III formerly proposed by us (*Helv. Chim. Acta*, 14, 617, 1931) is correct.

Our former attempts[2] to isolate these two acids from the reaction products after ozonisation undoubtedly failed because there was only a very small amount of α-carotene available at that time; moreover, the old method of repeated adsorption on fuller's earth was accompanied by considerable decomposition and change of the pigment.

P. KARRER.
R. MORF.
O. WALKER.

Chemical Institute,
University, Zurich.
July 15.

[1] *Helv. Chim. Acta*, 16, 641; 1933. NATURE, 132, 26, July 1, 1933.
[2] *Helv. Chim. Acta*, 15, 490; 1932.

Miracidia of the Liver Fluke for Laboratory Work

IN view of certain inquiries which have reached us lately it may be useful to publish briefly a procedure which has been in practice in Prof. Graham Kerr's department in Glasgow for many years.

Gall bladders from sheep livers infected with *Fasciola hepatica* are brought from the slaughter house to the laboratory and the contents of several are rinsed out with tap water into glass basins. The sediment, which contains eggs of the liver fluke, is washed with tap water until the washings are clear; this is more quickly accomplished with the aid of a slow centrifuge. The eggs are thinly spread over the bottoms of the dishes and left in tap water, the dishes covered, in a warm place. If the water becomes foul it must be changed again; this is usually necessary for several days unless the centrifuge is used. The time taken for the miracidia to develop varies with the temperature at which they are kept. At about 16° C. they should be ready to hatch in 6–8 weeks; at about 25° C. they need only 2–3 weeks. When the miracidia are ready, hatching is brought about by suddenly placing the eggs in a comparatively large quantity of water at a lower temperature—a drop of the sediment in a watch glass of cold tap water for example. This is done half an hour or so before the larvæ are required for demonstration or the infection of *Limnæa truncatula*. If the snails are to survive such treatment, care must be taken not to allow too many miracidia to attack them. Incidentally, flame cells in action may be very well seen in the active miracidium while it is still in the egg if it is examined with an oil immersion lens having a sufficiently long working distance (such as the Winkel-Zeiss 2·2 mm. lens).

It is usually stated that the incidence of liver rot in sheep is seasonal, so that it may be as well to add that we have never had any difficulty here in obtaining eggs capable of developing at any time in our academic year (October to June).

This method seems preferable to that described by Dr. N. B. Eales[1] in which the eggs were dissected out from the bodies of the flukes.

MARGARET W. JEPPS.

Department of Zoology,
The University,
Glasgow.

[1] *Eales*, N. B., NATURE, 125, 779, May 24, 1930.

Anatomy and Affinities of *Tarrasius problematicus*

Tarrasius problematicus from the Carboniferous of Glencartholm, Dumfriesshire, was first figured and described by Traquair[1]. According to him, it is a fish with the dorsal fin continuous with the caudal, and the caudal with the anal; the anterior part of the body is naked, and the posterior covered by a shagreen of minute lozenge-shaped ganoid scales, which do not overlap, and are very like those of an acanthodian; the pectoral fins are obtusely lobate and there are no pelvic fins; the notochord is persistent and the radials of the unpaired fins are greater in number than the neural arches. The structure of the skull was described very vaguely as having delicately ornamented mandibles and frontals, and large but indefinite bones in the opercular region.

The affinities of this fish have always been doubtful. Zittel[2] considered it to be a dipnoan, but Traquair[1] and others related it to the Crossopterygii.