## Letters to the Editor

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### Absorption Spectrum of Vitamin E

IN previous letters to NATURE[1,2] Bowden and Moore described experiments on the absorption spectrum of the unsaponifiable fraction of wheat-germ oil, which were carried out with the view of deciding whether vitamin E possesses a characteristic absorption. It was found that the absorption in the region 3200–2850 A. followed most closely the reputed biological activity. The intensity of absorption was much lower than that found in typical vitamin A concentrates, suggesting either that vitamin E absorbs much less strongly than vitamin A, or that it is present in wheat-germ oil concentrates in relatively small amounts.

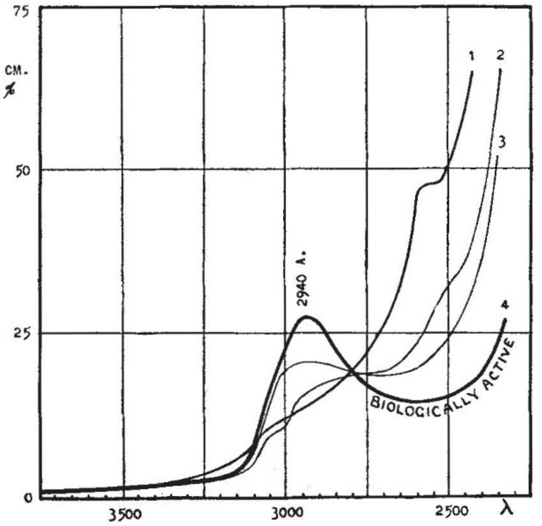

FIG. 1.

On the other hand, Olcott and Matill[3] recently failed to find any characteristic absorption in a vitamin E concentrate prepared from lettuce, and considered it unlikely that the bands examined by Bowden and Moore were connected with biological activity. This was in harmony with the previous experience of Evans and Burr[4] who had been unable to detect characteristic absorption in wheat-germ oil concentrate.

In a continuation of the work, we have prepared a wheat-germ oil concentrate by a simplified technique similar to that described by Evans and Burr[5]. After saponification, the sterol-free fraction of the non-saponifiable residue in which the vitamin is presumed to be present (that is, the fraction which is soluble in both methyl alcohol and light petroleum) was first submitted to chromatographic analysis by adsorption on alumina. The fraction least strongly adsorbed, which showed marked absorption in the region 3200–2850 A., was then sent to Dr. F. H. Carr, of British Drug Houses, Ltd., who kindly undertook to distil the concentrate in the high vacuum apparatus previously used in vitamin A distillations[6] From 5·5 gm. of concentrate the following fractions were obtained: Fract. 1: b.p. 70°–93° C., 0·7 gm. Fract. 2: 93°–110°, 0·8 gm. Fract. 3: 110°–125°, 0·85 gm. Fract. 4: 125°–130°, 1·8 gm. Residue: b.p., above 130°, 0·35 gm.

The absorption curves in ethyl alcohol given by the above distillates are shown in Fig. 1. The most volatile distillate (fraction 1, curve 1) has a relatively low absorption in the region 3200–2850 A. and a higher absorption in the further ultra-violet, with a subsidiary maximum at 2550 A. The least volatile distillate (fraction 4, curve 4) shows an increased absorption in the suspected region (3200–2850 A.) and develops a well-marked band here with a maximum at 2940 A., $E_1{}^{1\ \text{per cent}}_{\text{cm.}} = 27$. The absorption at shorter wave-lengths has decreased. Fractions 2 and 3 appear to be intermediate stages between 1 and 4. At the temperature of liquid air, the band at 2940 A. sharpens up still further, develops a slight structure, and shifts about 30 A. towards longer wave-lengths.

Biological work is still in progress, but we have already been able to detect vitamin E activity in fraction 4, 16 mgm. of which caused a female rat, which had shown characteristic resorption gestation, to produce a litter of eight live young. We have therefore succeeded in detecting a sharp, if relatively weak, absorption band in a vitamin E concentrate of proved biological activity. Whether this band is to be ascribed to the vitamin itself, or merely to accompanying impurities, remains to be decided. It is encouraging, however, that Olcott[7] has recently observed an absorption band in a concentrate prepared from cotton-seed oil in exactly the same position (2940 A.) as that observed in the case of our wheat-germ oil concentrate.

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[1] Bowden and Moore, NATURE, **131**, 512, April 8, 1933.

[2] Bowden and Moore, *ibid.*, **132**, 204, August 5, 1933.

[3] Olcott and Matill, *J. Biol. Chem*, **104**, 423; 1934.

[4] Evans and Burr, Memoirs of the University of California, **8**, 144; 1927.

[5] Evans and Burr, *ibid.*, 131.

[6] Carr and Jewell, NATURE, **131**, 92, Jan. 21, 1933.

[7] Olcott, *J. Biol. Chem.*, **105**, proc. lxv; 1934.

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### Oscillations with Hollow Quartz Cylinders cut along the Optical Axis

A. HUND and R. B. Wright[1] have tried to set into oscillation a quartz cylinder cut along the optical axis, and succeeded only in resorting to circuits which are so regenerative that they are on the verge of self-oscillation.

A careful study of the phenomenon of electrification of a quartz crystal by torsion[2] has led us to work with a co-axial cylindrical shell of quartz, the axis of the cylinder being cut along the optical axis of the crystal. With two electrodes applied to its inner and outer surfaces, such a hollow quartz cylinder constitutes a veritable cylindrical condenser, and can be easily set into oscillation in Pierce's circuit as an ordinary piezo-electric quartz plate.