CXXI. A NOTE ON THE DURABILITY OF VITAMIN A OF COD-LIVER OIL.

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THE durability of vitamins is of great interest in their practical application.

As regards vitamin C, it is known that it has slight durability and that anti-scorbutic leaves or fruits lose their potency when dried. Zilva found [1923] that the destruction of the anti-scorbutic factor is favoured by alkalinity and exposure to air, but that solutions that are acidified and stored under anaerobic conditions do not show any perceptible loss in potency after storage for three months.

Interesting observations regarding vitamin B were recently published by Findlay [1923]. He found that certain Indian lentils (*Cicer arietinum*, *Phaseolus Mungo*, *Ph. radiatus* and *Ph. Cajanus*) which had been stored in canvas bags in a dry cupboard for at least 38 years, had lost the power of germination, but in daily doses of 3 g. produced adequate growth in rats which had been kept on a diet lacking in vitamin B. 2 g. daily were insufficient. According to Ghose [1922] the same species of lentil, presumably not more than two or three years old, produced growth in doses of 1 g. Smaller doses were not tried. It thus appears that at least two-thirds of potency were lost in those 38 years.

Regarding the fat-soluble vitamin, there exists, as far as I have been able to discover, only one publication [Wright, 1923] to the effect that pork containing 25 % of fat, after being kept for 9 years in a frozen condition, was found in experiments with hens to contain a sufficient quantity of the said vitamin.

A short time ago I received samples of a cod-liver oil which was produced in 1893, and had subsequently been kept in ordinary colourless, practically full glass bottles. It was tried in the usual manner upon rats, which for an adequate time had been living upon a diet that had been freed from vitamin A as far as possible. Daily doses of 2 mg. of this cod-liver oil produced growth the first week only, and later a stoppage or decrease in body weight. The effect of daily doses of 3 and 5 mg. is illustrated by the following curves (only the last week of the preparatory period is included).

The result is thus that this cod-liver oil, 31 years old, in daily doses of 3 mg. caused some growth, in doses of 5 mg. marked growth. It is naturally not possible to have any definite opinion as to whether it had preserved its original

potency. Presumably a part had been lost. In investigations of numerous samples of Norwegian medicinal cod-liver oil at this Institute in the course of the last three years, the great majority were found effective in daily doses of 2 mg., or between 1 and 2 mg., and even one in daily doses of 0.8 mg. (Fig. 2).

Fig. 1.

Fig. 2.

REFERENCES.

- Ghose (1922). *Biochem. J.* **16**, 35.
 Findlay (1923). *Biochem. J.* **17**, 887.
 Wright (1923). *J. Soc. Chem. Ind.* **42**, 509, quoted from report in *Chem. Zentr.* 1923, i, 1403.
 Zilva (1923). *Biochem. J.* **17**, 410, 416.