Uterine bleeding from the interval endometrium with proportionately less tissue loss, and the passing of red cells through the epithelium by diapedesis may not be a homologous process.

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The Question of Synthesis of the Antirachitic Vitamin by the Cod.

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Ever since the recognition of the antirachitic factor, the question has been raised as to whether cod fish synthesize this factor or whether the marked potency of their liver oil is due to antirachitic vitamin taken in with the food. Investigations have been few and inconclusive. Wejdling[1] has drawn attention to the fact that diatoms, which may form a part of the diet of the cod, contain the antirachitic vitamin. On the other hand, Bills[2] has demonstrated that caplin, which are consumed in enormous quantity by the Newfoundland cod, are not rich in the D factor, and suggested that some of the vitamin may be formed by synthesis within the fish.

Some years ago we carried out experiments designed to ascertain whether the livers of cod fish which were fed large amounts of non-activated ergosterol by mouth contained exceptional amounts of the antirachitic factor. Cod fish were given, by means of a pipette, 5 feedings of 10 mg. each of ergosterol suspended in cottonseed oil. The fish were kept in tanks in New York Bay and feedings were given at 2-day intervals, the last one being given about 36 hours before the fish were killed. The result may be summarized by the statement that the livers of the fish which received the ergosterol were found, on biological assay, to contain the antirachitic vitamin in no greater amount than the control fish which were kept under similar conditions, but which had not been given ergosterol. Two series of experiments were carried out with the same result.

Last December this subject was approached from a somewhat different point of view. Instead of giving ergosterol by mouth, it was injected intramuscularly. Three injections were given of 1 mg. dissolved in 5 cc. of corn oil; there was an interval of 2 days be-

[1] Wejdling, K., *Acta paed.*, 1928, **7**, Suppl. II, 259.

[2] Bills, C. E., *J. Biol. Chem.*, 1927, **72**, 751.

tween each injection and 2 days elapsed before killing the fish. In March of this year a second experiment of this kind was carried out, as it was thought that it would be of advantage to make tests at 2 different seasons of the year for the oil in the liver of the cod undergoes marked seasonal variations. These 2 tests comprised 14 fish, 6 of which were injected and 8 served as controls. The first lot varied in weight from 4 to 4½ pounds and the later series from 2½ to 9½ pounds. The group contained about an equal number of male and female fish. Among the females in the March group, some were found to have spawned and some contained new roe. The males were spent.

These experiments gave no indication that the cod is able to activate ergosterol, in other words to elaborate antirachitic vitamin from ordinary ergosterol. The potency of the livers, in the group which was inoculated, ranged between 90 and 280 international units and in the non-inoculated group between 90 and 250 units. It may be added that the average cod liver oil used for therapeutic purposes contains about 80 international units per gm. These experiments furnish no evidence that ergosterol, whether given by mouth or intramuscularly, is utilized by the cod in the elaboration of vitamin D, but do not preclude the ability of these fish to synthesize this vitamin under different conditions.

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Effect of Methylene Blue on CN and CO Poisoning.*

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According to Warburg,[1, 2, 3], both KCN and CO inhibit aerobic respiration but not glycolysis. When aerobic respiration is inhibited, it becomes possible to show that certain redox indicators, such as methylene blue, accelerate aerobic glycolysis as indicated by increased oxygen consumption[4, 5].

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[1] Warburg, O., *Z. physiol. Chem.*, 1910, **66**, 305.

[2] Warburg, O., *Biochem. Z.*, 1926, **177**, 471.

[3] Warburg, O., *Biochem. Z.*, 1923, **142**, 518.

[4] Barron, E. S. G., *J. Biol. Chem.*, 1929, **81**, 445.

[5] Barron, E. S. G., and Harrop, G. A., *J. Biol. Chem.*, 1928, **79**, 65.