

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.

## 6295

### Effect of Methylene Blue on CN and CO Poisoning.\*

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According to Warburg,<sup>1, 2, 3</sup> 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<sup>4, 5</sup>.

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<sup>1</sup> Warburg, O., *Z. physiol. Chem.*, 1910, **66**, 305.

<sup>2</sup> Warburg, O., *Biochem. Z.*, 1926, **177**, 471.

<sup>3</sup> Warburg, O., *Biochem. Z.*, 1923, **142**, 518.

<sup>4</sup> Barron, E. S. G., *J. Biol. Chem.*, 1929, **81**, 445.

<sup>5</sup> Barron, E. S. G., and Harrop, G. A., *J. Biol. Chem.*, 1928, **79**, 65.

It was thought that increase in oxygen consumption thus produced by redox indicators might be used to combat the effects of HCN or CO on mammals. Previous workers have confined their attention to the effects of methylene blue used in conjunction with cyanide. Among other things it was found empirically that methylene blue favored the recovery of animals poisoned by cyanide<sup>6, 7</sup>. Since CO has long been known to resemble CN in its effects on respiration it was thought of interest to see whether methylene blue also favored recovery in animals subjected to CO.

Experiments were carried out using rats which were placed one at a time in a chamber containing HCN gas or CO (about 1%). The time to unconsciousness was noted. As soon as an animal became unconscious it was removed from the chamber and given an intraperitoneal injection of methylene blue. The time required for recovery was determined using as a criterion of recovery the ability to run straight forward. Eighty rats were used; 40 controls and 40 dye-treated.

It was found that the use of methylene blue shortened the time required for recovery from HCN poisoning to about  $\frac{1}{3}$ , and that from CO to about  $\frac{1}{2}$  of that for untreated animals.

These results suggest that there is an activation of oxygen by methylene blue which manifests itself when aerobic oxidation is interfered with.

It is suggested that methylene blue injections could be used advantageously in cases of HCN or CO poisoning.

## 6296

### Utilization and Excretion of the Female Sex Hormone.

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Of importance are answers to the question of (1) what happens to the female sex hormone after injection, (2) how is it excreted, (3) can the excretion be stimulated?

1. *What happens to the female sex hormone after injection?*  
Half hourly blood samples taken from isolated adult rabbits in

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<sup>6</sup> Sahlin, Bo, *Skand. Arch. Physiol.*, 1926, **47**, 284.

<sup>7</sup> Eddy, N. B., *J. Pharm. and Exp. Ther.*, 1931, **41**, 449.