tests.[5] The second sample was fed to six rachitic rats at levels ranging from 5 to 25 per cent of the food intake. It was found that a fat level of at least 8 per cent was needed to produce a distinct line test. This may explain the results of Lesné and Vagliano, who fed only 5 per cent of the ether extract of mother's milk. We are continuing this work to ascertain if the factor is present in milk only as it is present in the food of the mother.

2906

A test of indolinones as agents for prevention and cure of polyneuritis.*

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Substances which have been reported as having a specific action in relieving experimental pigeon polyneuritis include various hydroxypyridins,[1] thyroxin and pilocarpine,[2] β-propylindolinone,[3] tyramine,[4] and histamine,[5] although the antineuritic effect of histamine has been questioned.[6] Attempts to prevent polyneu-

[5] McCollum, E. V., Simonds, N., Shipley, P. G., and Park, E. A., *J. Biol. Chem.*, 1922, li, 41.

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[1] Williams, R. R., *J. Biol. Chem.*, 1916, xxv, 437; *ibid*, 1916, xxvii, 431; *ibid*, 1917, xxix, 495.

[2] Dutcher, R. A., *J. Biol. Chem.*, 1919, xxxix, 63.

[3] Dutcher, R. A., Holm, G. E., and Bierman, H., *Science*, N. S., 1920, lii, 589.

[4] Abderhalden, E., *Arch. physiol.* (Pflüger's), 1923, cxcviii, 571; Lipschitz, W., *Z. physiol. Chem.*, 1923, cxxiv, 194.

[5] Abderhalden, E., loc. cit.

[6] Cf. Koskowski, W., *Arch. Intern. pharmocodynamie*, 1922, xxvi, 367.

ritis by histamine,[7] and pilocarpine[8] have not been successful, although success has been reported[9] with trimethyluracil and 4-phenylisocytosin.

The similarity of structure of indolinone and thyroxin[10] suggested a further study of their anti-neuritic properties, on the theory that the anti-neuritic vitamin may owe its properties to keto-enol isomerism as first suggested by Williams.[11]

The β-methylindolinone was synthesized by the method of Brunner[12] and purified by recrystallization from hot ligroin. Two lots of crystals were used, one melting at 110°-111° C. and the other at 117° C. The β-propylindolinone had been prepared previously in this laboratory. The crystals melted at 110° C. (uncorrected).

The vitamin B-like nature of these substances were tested by Seidell's[13] constant weight method and by administrating them to birds which had developed acute polyneuritis on a polished rice diet. In the tests by Seidell's method the birds were first brought into weight equilibrium by a 200 mg. dose of activated solid on alternate days, the diet being polished rice and water, *ad lib.;* the substance to be tested was then given in suitable doses in place of the vitamin B preparation. A second period of vitamin B feeding concluded the test. The curative tests were conducted in the usual manner.

Five groups of pigeons, each containing 3 birds, received β-methylindolinone on alternate days in doses equivalent to 3, 5, 10, 15, and 50 mg. daily, respectively. In all cases a marked decrease in weight occurred during the feeding of indolinone for periods varying from 6 to 18 days while either a cessation of this decline or an increase in weight accompanied the resumption of the vitamin B. One case of polyneuritis occurred during the indolinone feeding at the 10 mg. level. The same general results accompanied the feeding of β-propylindolinone in amounts equiv-

[7] Koskowski, loc cit.

[8] Arloing, F., and Dufourt, A., *Compt, rend. soc. biol.*, 1923, lxxxviii, 775.

[9] Williams, R. R., *J. Ind. Eng. Chem.*, 1921, xiii, 1107.

[10] Kendall, E. C., *Ind. Eng. Chem.*, 1925, xvii, 525.

[11] Williams, R. R., *J. Biol. Chem.*, 1916, xxv, 437.

[12] Brunner, K., *Monatsch.*, 1897, xviii, 527.

[13] Seidell, A., *U. S. Public Health Report*, No. 262 (1922). We are grateful to Dr. Seidell for the activated solid (Fuller's earth containing adsorbed vitamin B) used in our tests.

alent to 15 mg. daily. Only 3 birds were used for this compound. When thyroxin was fed at 2 mg. daily doses, the decline in weight was very rapid, as though the stimulation of metabolism accentuated the vitamin deficiency.

In the curative tests, which were limited to only a few birds, temporary relief from acute polyneuritis was obtained with β-methylindolinone after ingestion of 100 mg. in two doses. This lasted for several days. Similar tests with the other compounds were inconclusive, due to the limited number of cases observed.

2907

Control of magnitude and direction of the continuous bioelectric currents associated with organic polarity.

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In previous work it has been shown that the apical ends of isolated stem of Obelia colonies are electropositive (galvanometer circuit) to middle or basal regions of the same stem.[1] These differences of electric potential are maintained and therefore a continuous output of electrical energy occurs under normal conditions of life in sea water. The processes upon which this output of energy depends can be inhibited in a perfectly reversible manner by cyanide, ether and chloroform.

Tissues of the stem, the electric potentials of which have been repeatedly and reversibly decreased, retain their normal capacity for growth and regeneration and also their normal sequence when removed to pure sea water.

The normal electrical polarity of the stem as a whole is a result of the inequality of the P.D.s across the ecto-endoderm of the apical (young) and basal (old) ends of the stem. The ecto-endoderm of the apical end is usually the seat of the highest P.D.

[1] Lund, E. J., *J. Exp. Zool.*, 1925, lxi, 155.