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The influence on basal metabolism of some derivatives of di-iodotyrosine.

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The structure of thyroxin as recently determined by Harrington[1] represents the substance as a derivative of di-iodotyrosine and as containing two benzene rings. It is, therefore, of some interest to know what effect, if any, other derivatives of di-iodotyrosine containing two aromatic nuclei, would exert on basal metabolism.

Two such substances have been examined, namely, di-iodotyrosyl-di-iodotyrosine and the cyclic anhydride (diketopiperazine) of di-iodotyrosine. The former substance may be prepared by the action of iodine in feebly alkaline solution upon tyrosyl-tyrosine, or by the regulated action of alkali on the cyclic anhydride of di-iodotyrosine. The latter substances cannot be obtained by the direct action of iodine upon tyrosine anhydride, but may be readily attained by the action of iodine chloride in acetic acid upon the anhydride. Both substances are cream colored microcrystallin compounds, which in their solubilities and general chemical deportment, colour reactions, etc., show considerable resemblance to thyroxin. The anhydride of di-iodotyrosine melts at about 245 to 250 degrees (uncorr.) while di-iodotyrosyl-di-iodotyrosine does not melt sharply but begins to decompose above 200 degrees. The substances were prepared for these experiments by H. D. Dakin.

The metabolism experiments were carried out on a normal male individual of about 101 kilos, 184.5 cm. in height. All determinations were done in triplicate under basal conditions, either the Tissot or Benedict machine being used. All substances investigated were taken intravenously.

Basal metabolic rates determined on five days during the week preceding the injection of the cyclic anhydride of di-iodotyros-

[1] Harrington, C. R., Chemistry of Thyroxin. Communications: Biochemical Society of London, March 13, 1926.

ine varied between —9 and —12 per cent. Twenty-four hours after the injection of 21 mg. of the substance the basal rate was —9 per cent, and at the end of 48 hours was —7 per cent.

Three days following this determination the injection of 10 mg. of Squibb Thyroxin was followed at 24 hours by a rise to +4 per cent, which dropped to —1 per cent at 48 hours and remained for six days between 0 and —2 per cent.

On the seventh day after thyroxin 15 mg. of di-iodotyrosyl-di-iodotyrosine were taken, the basal rate staying at —2 per cent for the next 72 hours.

The di-iodotyrosyl-di-iodotyrosine used was prepared by the action of alkali on the cyclic anhydride of di-iodotyrosine, and the cyclic anhydride used by the action of iodine chloride in acetic acid upon the anhydride of tyrosine.

It is felt that the two substances investigated have shown no calorigenic activity.

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A study of the laxative action of wheat bran.

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The physiological action of wheat bran and a number of products isolated from bran was studied on dogs, which received as a basal ration a "synthetic" diet of casein, sucrose, and lard, together with the necessary mineral salts and vitamins. The purpose of the investigation was to determine what constituents of bran are responsible for its laxative effect. After a control period of 8 days the dogs were given the basal ration, supplemented with the bran or other material, the laxative power of which was to be determined. The frequency of defecation and the total weight of air-dried feces per eight-day period served as criteria of laxation.

Washed bran (starch-free) was laxative when ingested in amounts ranging from 10 per cent to 0.5 per cent by weight of the food intake. The average minimum effective dose was about