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A Method for Determination of Volatile Fatty Acids in Stools.

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In a previous report[1] it was shown that the volatile fatty acids, formic, acetid and butyric, could be steam distilled from a concentrated solution of magnesium sulphate at rates of 60 to 100% faster than from watery solutions. We wish to report here a method for the precipitation of stools and the application of the rapid method of steam distillation to the filtrates obtained.

Stools were collected in a volume of 10% sodium hydrate equal to that of the stool. The alkali stops fermentation almost completely, deodorizing the stool, and favors emulsification. 100 gms. of alkali stool mixture is neutralized with strong sulphuric acid and 175 to 200 cc. of a 10% mercuric chloride solution added. This amount of mercuric chloride is soluble in 1.5% hydrochloric acid. The mercury is precipitated with solid calcium hydrate, which is added until the stool is strongly alkaline to litmus. The volume is made up to 500 cc. which is centrifuged in 100 cc. centrifuge tubes. Two 100 cc. portions of supernatant fluid are measured off and made acid to litmus with sulphuric acid. Excess mercury is precipitated with hydrogen sulphide, the excess being blown off with a current of air. After filtering 100 cc., portions of filtrate are distilled in the manner reported.

These filtrates from stools are almost nitrogen free (95% being removed) and free from higher insoluble fatty acids and sugar. On distilling the stool filtrates the rates of distillation obtained closely resemble those obtained from mixtures of pure volatile fatty

[1] Olmsted, W. H., and Whitaker, W., PROC. SOC. EXP. BIOL. AND MED., 1927, xxiv, 897.

acids. When formic, acetic, propionic or butyric acids are added to stools they may be recovered to within 5 to 10%. Duplicate determinations usually agree to within 5%. From the observed rates of distillation, it is concluded that the principal volatile fatty acids in the stools are acetic and butyric.

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Changes in Thyroid Gland Following Feeding of KI and Anterior Lobe of Pituitary.

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In studies on compensatory hypertrophy following partial thyroidectomy, Loeb[1] has shown that feeding potassium iodide stimulates regenerative activity while anterior pituitary substance prevents hypertrophy and produces a hard colloid and flattening of the acinar cells. The change induced by potassium iodide in the normal intact thyroid has recently also been studied and a method devised for determining, in a quantitative manner, the proliferative activity by estimating the total number of mitoses in the thyroid gland at any given time [2,3].

These experiments were undertaken to study the effect of combined feeding of these 2 substances and to determine whether or not the inhibiting action of pituitary would render the thyroid unresponsive to the stimulating influence of potassium iodide. If complete physiological neutralization of the stimulating influence of potassium iodide and of the depressing action of pituitary should take place in animals fed with these substances, the thyroid should remain unaltered, but if one were dominant the degree of its influence could be estimated by the mitotic activity of the gland.

Three series of experiments were carried out using in all 45 guinea pigs. They were divided into 4 groups (1) animals fed KI, each receiving 0.05 gm. daily; (2) those fed one 5 grain tablet of anterior pituitary substance (Armour & Co.) every day; (3) those on

[1] Loeb, Leo, *Am. J. Path.*, 1926, ii, 19; *J. Med. Res.*, 1920, lxiv, 557; *J. Med. Res.*, 1920, lxii, 77.

[2] Gray, S. H., and Loeb, Leo., *Am. J. Path.*, 1928, iv, 257.

[3] Rabinovitch, Jacob, PROC. SOC. EXP. BIOL. AND MED., 1928, xxv, 812; *Am. J. Path.*, 1928, iv, No. 6.