

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, Loeb¹ 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.

combined feeding receiving daily both 5 grain pituitary tablet and the 0.05 gm. pill of KI. (4) Control animals. One series consisting of 5 animals in each group were fed for 20 days; the other 2 series were both fed for 15 days.

Serial sections were made from all glands and the number of mitoses in each estimated by counting those in every tenth section. In studying the sections the size of the acini, the consistency of the colloid and the character of the epithelial cells, in the different groups, were compared.

I. *The number of mitoses.* The average number of mitoses per gland for all the animals fed KI was 1208; for the pituitary fed group, the average was 62; the group on combined feeding of KI and pituitary substance showed an average of 150; and the control group averaged 170 mitoses per gland.

II. *Histological character of the thyroids. KI fed animals.* The acini are larger than in controls. The epithelial cells are slightly hypertrophied in the 15 days series and at this time, especially, they show many mitotic figures. The colloid is often softer and stains less intensely than in controls. There are many phagocytes within the colloid in some of the acini especially in the 20 day series.

Anterior pituitary fed animals. There is a striking contrast in structure between this group and the controls. The acini are smaller and more crowded together. They are filled with a very dense non-vacuolar colloid completely filling the acini and compressing the lining epithelium into a slender strand of flattened cells.

Combined feeding with KI and pituitary. The acini are slightly larger than the pituitary fed animals and are not so crowded together. The colloid is solid but not as dense as in the preceding groups and extends to, but does not compress the cells which are almost as tall as in normal glands.

These thyroids stand midway between the appearance of those from animals fed pituitary and from controls. They resemble the latter in that the acini are of about normal size and are separated by thin strands of connective tissue and in that the epithelium is almost of normal height. The mitotic index is also within normal limits. The hardness of the colloid and the manner in which it completely fills the acini without the occurrence of vacuoles suggest the influence of pituitary substance. It seems likely that the relative dosage of these 2 substances could be so balanced that the thyroids would remain unchanged and show the influence of neither.