

have demonstrated that *Streptococcus salivarius*, which requires only 5 vitamins on a synthetic medium, occurs in large numbers in the mouths and throats of normal individuals and in some cases thrives in the intestines.

Summary. Administration of Phemerol to

rats in the drinking water at a 1-1500 or 1-1200 dilution results in poor growth on a synthetic ration. Addition of 5% whole liver powder gives good growth. A combination of folic acid, para-aminobenzoic acid, and inositol does not counteract the effects of the drug.

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Alterations in Mammary Structure Following Adrenalectomy in the Immature Male Rat.*

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It has been reported that adrenalectomy in underfed intact and castrated female rats caused the mammary glands to grow more rapidly, to increase the number of bud-like growths along the course and at the ends of the ducts, and to increase the area covered by the gland.¹ In adrenalectomized lactating rats, the mammary alveoli were reported less distended than normally but were restored by NaCl therapy.² The paucity of data on the structural changes in the mammary gland subsequent to adrenal ablation suggested further investigations.

Young male rats of the Long-Evans and Sprague-Dawley strains were used, the ages ranging from 22 to 35 days at the time of adrenalectomy. An adequate stock diet plus tap water and a 1% NaCl solution was fed *ad libitum*. Bilateral adrenalectomy was performed in one operation and in experiments in which castrated males were used, the latter operation was carried out the preceding day. Autopsies were made 10-12 days later.

In some experiments, normal and castrated adrenalectomized rats, together with their controls, received 5 μ g of alpha estradiol dipropionate (Di-Ovocylin)[†] daily for 10 days.

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¹ Butcher, E. O., *Proc. Soc. Exp. Biol. and Med.*, 1939, **42**, 571.

² Levinstein, Irving, *Anat. Rec.*, 1937, **67**, 477.

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The right abdominal mammary glands were prepared as stained whole mounts for study.

Results. The most notable change in the mammary glands which followed adrenalectomy was an increase in the number of lateral buds or short branches along the duct system. This was seen in 14 of 17 young operated males compared to 9 controls. Half of the operated rats also showed an increased number of end buds, many of which were much enlarged. The gain in body weight of the adrenalectomized males averaged 14 g less than their controls but they were otherwise in an apparently good state of health. The greatest amount of gland development occurred in those operated animals which gained the most weight. Similarly, the glands in 6 of 10 adrenalectomized castrated males also showed a greater number of lateral duct buds when compared to those from 8 castrated controls. End buds were not observed to be stimulated. The areas of gland tissue in the adrenalectomized animals in both groups were not more extensive than in the controls.

When estrogen treatment was given to 5 adrenalectomized and 4 control male rats, the increased number of lateral buds in the experimental group showed a marked dilatation. The average body weight gain in the adrenalectomized injected group was only half that of the controls. As before, the degree of lateral bud proliferation varied directly with the amount of weight gained.

Similarly, if castrated animals were used, and treated with estrogen, the mammary

glands of 9 of 10 adrenalectomized rats showed more development than was found in 6 controls. In some cases, the end buds showed no enlargement, but the increased number of short lateral branches surpassed that of any mammary gland seen in these experiments.

Discussion. In some respects, these findings agree with those of Butcher¹ but differ in that they were obtained in normally fed rats. If the animals failed to gain appreciably in weight, the mammary glands did not show the specific effects of adrenalectomy. Neither did the areas of the glands from adrenalectomized rats exceed those of the controls, in contrast to the results of Butcher.¹ Estrogen stimulation superimposed on that of adrenalectomy seemed to emphasize the effect of the latter. The variation in results obtained might well be attributed to variable amounts of

functioning accessory cortical tissue known to be present. In one experimental group, in which NaCl was not given, only 2 of 5 animals showed increased lateral buds and these two gained appreciably in weight. No explanation of these mammary changes can be made at this time.

Summary. Adrenalectomy in normal or castrated immature male rats resulted in an increased number of lateral buds on the duct system of the mammary tree and in some cases increased end bud growth, particularly when body growth was not markedly inhibited. Estrogen treatment in adrenalectomized rats caused dilatation of these stimulated lateral buds or else further increased their number above that of the injected unoperated controls.

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Effect of Adrenocorticotrophic Hormone on the Insulin Content of the Rat's Pancreas.*

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In the course of investigations concerning various metabolic effects of purified anterior pituitary hormones, both lactogenic and adrenocorticotrophic hormone (ACTH) were found to increase the insulin content of the rat's pancreas.¹ The lactogenic hormone used in those studies was essentially pure while the ACTH was admittedly impure, its main contaminant being the lactogenic hormone (10 to 30%). The opinion was therefore expressed that the action of the ACTH fractions on the

pancreas might be due to their contamination with lactogenic hormone, rather than representing a function of the former hormone. Since that time purified ACTH has become available² and it has been possible to reinvestigate this problem using ACTH preparations containing less than one percent of lactogenic hormone.³

Hypophysectomized rats received the hormone preparations for 2 weeks, starting on the day following operation. The injections were given once daily, intraperitoneally; 3 injections of one-half the usual daily dose were distributed over the last 24 hours preceding autopsy, during which time all animals

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¹ Fraenkel-Conrat, H., Herring, V. V., Simpson, M. E., and Evans, H. M., *Am. J. Physiol.*, 1942, **135**, 404.

² Li, C. H., Simpson, M. E., and Evans, H. M., *Science*, 1942, **96**, 450.

³ We wish to thank Dr. C. H. Li for kindly placing at our disposal the highly purified ACTH here employed.