

mg. N per 100 cc.), symptoms like uremia, low plasma chlorides, and death.

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Disturbance of Carbohydrate Metabolism in Normal Dogs Injected with the Hypophyseal Growth Hormone.*

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Clinical and experimental data have been accumulating indicating a functional relationship between the anterior lobe of the hypophysis and the pancreatic islets. (See especially Houssay *et al.*) Due to the importance of such a relationship we think it justifiable to note briefly some remarkable findings bearing on this matter.

Two litters of purebred dachshund, one consisting of 2 males, the other of 2 females were secured. One male and one female were injected daily intraperitoneally with the anterior hypophyseal growth hormone,† free of gonad stimulating hormone, for a period of about 8 months. Skeletal growth and body weight greatly exceeded that of the litter-mate controls, the weight of the injected animals soon being double that of their controls. Skin overgrowth and folding were present in both but was particularly prominent in the male. After 8 months of daily injection the male developed polydipsia, polyuria, polyphagia and became emaciated. The animal suffered from skin infection with loss of hair. He was inactive and evidently sick. Fehling's test of the urine was strongly positive. Only a trace of albumin was present in the urine. Fasting blood sugar was 232 mg. %. When injection was stopped for one week the animal improved, but rapidly failed again on resumption of injection. At present, 4 months after cessation of injection, the animal still has sugar in the urine. The test for albumin is now negative. The volume of urine has decreased and the animal has almost completely recovered.

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† This was a further purified solution made from the acetone precipitate of the Evans-Simpson-Cornish extract. See Evans, Simpson and Cornish, *Proc. Soc. Exp. Biol. and Med.*, 1930, **27**, 101.

The female dachshund has now been injected one year. Though responding markedly to the growth hormone she has never shown clinical or laboratory evidence of disturbance of carbohydrate metabolism. Urine and blood sugar have remained normal.

From another litter of dogs, of shepherd breed, one female and one male were injected chronically with the same purified growth hormone. The skeletal growth in these dogs was not markedly greater than that of their control, but weight greatly increased. Skin folding was prominent in the female. After about 9 months of injection the female began excreting sugar without being conspicuously sick. She suffered from skin infections. The blood sugar was 228 mg. %. Albumin was present in the urine in a trace or was absent. When injections were stopped she became sugar-free in 2 months. The male litter-mate is still being injected after one year and though obese he is still well and the urine has always been sugar-free.

The absence (or traces only) of albumin in the urine seems to rule out general amyloid degeneration as the cause of the disturbance in sugar metabolism. The evidence indicates that the interrelation of pancreatic islets and anterior pituitary is mediated by the growth hormone and not by the gonad-stimulating principle. Insulin and the growth hormone are thus antagonists, not synergists. It is remarkable that the insular mechanism of normal animals may be injured by simple conveyance of large amounts of the growth hormone. The "constitutional" differences of animals are evident in the differing response of litter-mates to *identical* treatment for, as explained, litter-mates may show no disturbance of carbohydrate metabolism though handled concurrently and identically.

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Demonstration of the Anti-Anemic Factor in Bovine Gastric Juice.

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(Introduced by J. T. Wearn.)

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Following the observation of Castle and his coworkers^{1, 2} that normal human gastric juice activates beef to produce an anti-

¹ Castle, W. B., *Am. J. Med. Sci.*, 1929, **178**, 764.

² Castle, W. B., and Townsend, W. C., *Am. J. Med. Sci.*, 1929, **178**, 764.