

on intraportal injection of 15%, as compared to the 28% and 46% averages of Bürger and Kramer. Our results, however, are confirmatory of the ones reported in regard to the occurrence of a rise.

Through the kindness of Doctor Geiling we were able to secure some crystalline insulin prepared in the Johns Hopkins laboratory, and we have repeated our experiments, using instead of the Lilly insulin, the crystalline product in corresponding dosages.

When this crystalline insulin is injected intrajugularly, or intraportally in dosages of 0.1 unit or 2 to 3.5 units per kilo a fall of blood sugar comes on within 6 to 10 minutes with no rise at 3 to 6 minute intervals after the injection. Since the only difference in procedure here is in the form in which the insulin is administered, it appears that the hyperglycemia when obtained, is not a true insulin action, but is due to some substance in the commercial products, which acts particularly on the liver. Fisher's<sup>3</sup> experiments in which he showed that there could be obtained from the pancreas and other tissues, a toxic substance which among other actions, caused a rise in blood sugar, are of interest in this connection.

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### Influence of Acid and Base-Forming Feeding on Growth.

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Lack of accord between infant feeding practice and metabolic principles has led to the present investigation. The effects of natural acid- and base-forming diets on the growth and metabolism of young rats have been studied from the physical, chemical and pathological standpoints.

Comparative studies were made on 2 groups of 22 and 25 young albino rats weighing between 30 and 35 gm. Litters of the same stock and age were maintained on acid- and base-forming dietaries, in sunlight and in darkness, during all the seasons.

At the end of 28 weeks the dietary acidity and alkalinity showed marked effect on the animals. The acid-forming diet depressed on the average the serum phosphorus from 6.1 to 5.7, the alkaline reserve from 48 to 44 vol. per cent, and total base from 148 to 137

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<sup>3</sup> Fisher, N. F., *Am. J. Physiol.*, 1923, lxxvii, 57.

with a compensatory rise in the chloride from 280 to 305 and cholesterol from 140 to 150. The base-forming diet produced the converse changes, serum phosphorus from 6.1 to 7.5, alkaline reserve from 48 to 56 vol. per cent, total base from 148 to 154 vol. per cent. The albumin-globulin ratios, percentage fat and iodine numbers of the fat were all normal. The hemotological data were also unaltered in both groups.

The animals maintained on acid-forming diets showed rickets clinically and histologically while those fed on base-forming diets showed normal bones. The animals on the base-forming diet in particular showed the greater percentage of ash, 61%, and had heavier bones while those on the acid-forming diet showed 54% of ash according to analyses of the femora. The animals that had been exposed to the light showed a higher ash content, 54% compared with 49% of those in darkness. The rats on base-forming diets showed a more marked gain in weight, 17 gm. per week as compared with 7 gm. per week for the animals on the acid-forming diets. This weight contrast was striking for the summer, less so for the spring and least for the winter.

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### Effect of Division of Dorsal Roots of Cervical Nerves Upon Diaphragmatic Respiratory Movements.

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In a study of the neuro-muscular mechanism of respiration, carried out on cats, it has been observed that, in many cases, division of the vagi is followed not only by a marked decrease of the respiratory rate, but also by a diminution in amplitude of diaphragmatic movements, while costal movements increase in depth. Subsequent section of the dorsal cervical (phrenic) nerve roots in these cats is attended by very little further change in respiratory rate or movement.

When, on reversing the order of experimental procedure, the dorsal roots of the cervical nerves (iii, iv, v, vi) are divided first, both a diminution in amplitude of diaphragmatic contractions and slowing in rate ensues, and subsequent division of the vagi brings about almost no further change in respiratory rate.