

a half hours and there was no return of pain sense. In 8 dogs the blood pressure sank to a low level but sensation of pain returned when ether was discontinued. In the remaining 6 dogs sensation was lost while the pressure was still above 95 mm. of mercury.

In 10 other dogs etherization was pushed to the point of intoxication. Interpretation of the results of this series is not simple, but it may be stated that the blood pressure, which fell in some instances to 42 mm. often continued to rise for as much as two hours after stopping the ether, eventually reaching a level above 90 mm. Pain sense sometimes returned after an even longer interval, but eventually recovered more completely than the blood pressure.

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Further observations on the nutritive factors in animal tissues.

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A recent communication¹ reported that the proteins of meat (dried skeletal muscle) and of a glandular tissue, liver, are adequate for the needs of nutrition in growth. The muscle contains a comparatively small quantity only of the water-soluble vitamine that is an essential dietary factor, whereas liver tissue, on the other hand, was found to be much richer in this. We have further observed a similar adequacy of the proteins of heart, kidney and brain tissue. The growth of rats to adult size has been secured upon diets in which these tissues, used desiccated, furnished the sole source of protein and water-soluble vitamine. In the cases of the liver, kidney and heart, at least, fat-soluble vitamine also seems to be present. The ether extract of pig's liver—liver oil—has manifested growth-promoting properties comparable to those described for butter fat and cod-liver oil; and it appears to be efficient as a curative agent for the type of eye disease which we

¹ Osborne, T. B., and Mendel, L. B., "Nutritive Factors in Animal Tissues," I, *Jour. Biol. Chem.*, 1917, XXXII, 309.

have described to occur when animals are kept on a diet deficient in the fat-soluble vitamine. The details will be published in the *Journal of Biological Chemistry*.

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The effect of continued inbreeding on the tumor rate in mice.

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In former investigations¹ we found that different strains of mice differ very much in their tumor rate and tumor age; and that these differences in tumor rate and tumor age were maintained and hereditarily transmitted to the following generations throughout the period of observation, notwithstanding the similarity of external conditions under which the animals were kept.

It was of interest to inquire how continued inbreeding of these various strains would affect the tumor rate and tumor age.

We found that while in the majority of strains the differences in tumor rate and tumor age remained constant in the successive generations, in others certain variations became noticeable as a result of the continued propagation of these strains. In a few cases an increase in the tumor rate occurred in the later generations, but in the large majority of cases in which a change was observed there was a tendency towards a decrease in the tumor rate which in some instances was very marked.

These changes in the tumor rate concomitant with continued inbreeding seem to depend on the following two factors: (1) As a result of long-continued inbreeding in mice certain characteristics of a strain may change, the strain becoming less prolific and less vigorous. These changes may be accompanied by a lowering in the tumor rate. This was especially evident in the case of the "No. 8" strain which had been inbred through the largest number of generations and through a considerable number of years. (2) In other cases it could be shown that in the course of continued

¹ A. E. C. Lathrop and Leo Loeb, *Proceed. Soc. Biol. and Medic.*, 1913, XI, 34; *Journal of Exper. Medicine*, 1915, XXII, 646, XXIII, 713.