

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.

propagation certain families, which were more resistant to certain diseases or which were naturally more prolific or otherwise favored by accidental conditions began numerically to preponderate in later generations. In some cases such families or substrains differed in their tumor rate from the main strain and thus as a result of selection within a strain differences in the tumor rate appeared in the course of continued inbreeding.

Our further investigations confirmed and still further emphasized our previous conclusion that on the whole in the mice with a higher tumor rate the tumors appear at a relatively earlier age than in those strains in which the tumor rate is lower.

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Sulpho-conjugation as a test of hepatic function.

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It was demonstrated by Baumann and others that the toxic carbocyclic radicals split off from the proteins by the growth of intestinal bacteria are conjugated in the liver with sulphuric acid and thus detoxicated. It is also known that a portion of these aryl compounds are detoxicated by conjugation with glycuronic acid.

It is obvious that in testing for the functional capacity of the liver it is essential not only to test the glycogenic, ureogenic, biligenic etc., functions, but also to examine the detoxicating power of the hepatic tissue, in order to ascertain the complete working power of the gland. This is done in the following manner: The patient receives a dose of castor oil to evacuate his bowels. He is then kept on a known diet for two days, during which time the urine is collected, preserved and analyzed for total sulphur and ethereal sulphates. On the third day the patient receives a capsule containing 0.5 gm. thymol. The urine is collected for the next two days, preserved, and again analyzed for total sulphur and for ethereal sulphates.

If all the thymol were absorbed, and if all the thymol were