solutions of ergosterol rapidly assume a deep yellow-brown tinge. Irradiated ergosterol develops the color more rapidly and more intensely than the non-irradiated sterol.

4995

Observations on the Transmissibility of Lymphoid Leucemia of Mice.*

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Two spontaneous cases of lymphoid leucemia of mice have been observed in a stock of about 300 mice (over 8 months of age) designated as strain A. The systemic enlargement of all superficial lymph nodes drew attention to this condition. The white blood count was 157,000 in one case and 315,000 in the other; in both, the spleen was very much enlarged and extensive lymphomatous infiltrations were found in the liver. Both cases have been successfully transmitted to normal mice of the same strain and of another strain named R. In about 800 mice of the latter strain, which are still alive, and in about 100 autopsied cases of the same strain (above the age of 8 months) no leucemia or lymphosarcoma has been found. Table I is a summary of the first 7 transmissions including first passages from the spontaneous cases and 2 second, one third and one fourth passage from the first case, and one second passage from the second case.

TABLE I.

	Number of mice inoculated	No. of cases of leucemia	No. of lymphosarcomas
Mice of strain A injected intraperitoneally	70	1	1
Mice of strain A injected subcutaneously	16	0	0
Mice of strain A injected intravenously	99	12	1
Mice of strain R injected intravenously	73	10	2

Lymph nodes or lymph nodes and spleen from leucemic mice were cut up with a small scissors and Locke solution was added drop by drop. After filtration through a small piece of cotton the turbid solution containing about 40,000 to 150,000 lymphocytes per cm. was injected in amounts of 0.1 to 0.2 cc. The blood of a leu-

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cemic mouse, injected into the tail veins of 5 mice caused leucemia in 3 and lymphosarcoma in one.

The incubation period of the instances of leucemia under observation varied between 14 and 33 days, the average being 26 days. The leucocyte count of the transmitted cases at the height of the leucemia varied between 239,000 and 570,000.

The older literature on attempts to transmit leucemia has been reviewed by Opie.[1] More recently Korteweg[2] succeeded in transmitting "leucosarcoma" from mice to a non-inbred stock of mice by subcutaneous and by intraperitoneal injections. Lymphosarcoma developed in about 25% of the inoculated animals, and most of these showed a terminal leucemic blood picture. Richter and McDowell[3] have failed to transmit leucemia to 145 mice of several strains in which leucemia had not appeared spontaneously, but they found that young mice of a highly inbred leucemic strain, the majority of which would develop the disease at a later age, developed it rapidly when inoculated intraperitoneally or subcutaneously.

The data presented above show that by intravenous inoculation and perhaps also occasionally by intraperitoneal injections leucemia is transmissible even to mice of a strain in which leucemia has not been known to occur.

When the onset of the experimental leucemia was closely watched a systemic enlargement of the lymph nodes was the first change observed. A characteristic hyperplasia of the lymphoid tissues apparently precedes leucemia, even if the leucemic cells are introduced into

TABLE II.

Marked lymphoid hyperplasia			Subsequent blood examinations
No. of days after inoculation	White blood count	% lymphocytes	
14	23,000	65	After 20 days† W.B.C. 141,000, 81% L.
19	17,000	41	" 24 " W.B.C. 50,000, 68% L.
			" 29 " W.B.C. 219,000, 94% L.
25	27,000	71	" 28 " W.B.C 150,000.
16	8,000	46	" 23 " W.B.C. 146,000, 79% L.
16	19,000	68*	" 23 " W.B.C. 229,000, 83% L.*
21	13,000	79	" 27 " W.B.C. 32,000, 84% L.
			" 29 " W.B.C. 125,000, 87% L.
19	21,000	30	" 26 " W.B.C. 158,000, 83% L.

* One mitotic figure. † After inoculation.

[1] Opie, E. L., *Medicine*, 1928, vii, 31.

[2] Korteweg, R., *Z. f. Krebsf.*, 1929, xxix, 455.

[3] Richter, M. N., and McDowell, E. C., PROC. SOC. EXP. BIOL. AND MED., 1929, xxvi, 362; *J. Exp. Med.*, 1930, li, 650.

the circulation of normal mice. Table II illustrates these observations.

The experience gained in study of the transmissible leucemia of mice suggests that leucemia begins with a tumor-like proliferation of lymphoid cells. Mice of any age may succumb to leucemia if leucemic cells are introduced into their body. The malignant lymphoid cells, whenever they enter the circulation, lodge and multiply chiefly in the lymphoid tissue, the blood stream being invaded only after a certain degree of hyperplasia has been attained.

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Effects of Hypophyseal Hormones Upon Amblystoma Larvae, Following Transplantation or Injection, With Special Reference to the Gonads.

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When the hypophysis of an adult western axolotl is transplanted intact into young larvae of *Amblystoma trigrinum*, 30-35 mm. in length, the graft usually establishes itself permanently. The results are soon manifested in the following order: (1) the pigmentary system responds by a gradual expansion of the melanophores and an increase in number culminating in sooty blackness; (2) a marked growth stimulation with acromegalic symptoms; (3) a hypertrophic effect upon the immature gonads, which is relatively enormous and occurs without exception in the case of the testis, but is relatively slight and frequently absent in the case of the ovary. There is a tendency to metamorphose earlier than normals reared under identical conditions of environment and nutrition.

The pigmentary reaction begins several days after implantation, and first appears as an intensification of the dark areas in the normal pattern. Soon, however, darkening of the lighter areas begins, and in 2 to 3 weeks a uniform blackness of sooty intensity is attained. This effect is attributable to the hormone produced by the pars intermedia, and is well known from the work of many, among whom may be mentioned Smith and Smith,[1] and Allen.[2] The effect upon growth is seen in a tendency to slightly greater length, greater

[1] Smith, P. E., and Smith, I. B., *Endocrinol.*, 1923, vii, 579.

[2] Allen, B. M., PROC. SOC. EXP. BIOL. AND MED., 1930, xxvii, 504.