

reasons, the nature of the paralysis has not been investigated, and thus it is impossible to state with any degree of certainty that the mass mortalities on the poultry ranch colloquially designated as "range paralysis" were in any way attributable to ornithosis. However, the evidence conclusively proves the existence of spontaneous latent infections with this virus in the flock, and inductively connects the barnyard fowl with human illness. The patient not only fed the chickens but she cleaned the eggs soiled with excreta and removed the entrails in dressing the carcasses. There is likewise suggestive evidence that the virus may have in an inapparent manner infected the other members of the family. The serum of the father (age 53), the daughter (27) and the oldest son (25) gave specific complement fixation reactions in dilutions of 1:4 to 1:8++++. That of the 7-year-old son was negative. Such reactions are significant since similar titers have been previously recorded in latent infections. In their broader implications to public health, these observations denote the existence of a large reservoir of psittacosis or ornithosis-like viruses in the bird kingdom. More than ever will it be the duty of the epidemiologist to study the ecology of the inhabitants of the barnyards and the pigeon lofts when he encounters a patient from which a meningo-pneumonitis-psittacosis-like virus has been isolated, or is being suspected on account of a positive serological reaction. Indirect transfer of virus with soiled feeds should not be overlooked. There is every reason to anticipate that as part of a broad evolutionary development, other birds will be found to be the hosts of an ornithosis parasite which has accompanied them through generations of their ascendancy.

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In vitro Response of Lymphocytes to Minimal Doses of X-Rays.*

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The minimal dose of X-ray that produces a significant change in activity has been investigated for several types of living cells. Las-

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nitzki and Lea¹ studied the inhibition of mitosis in hanging drop cultures of fibroblasts. The cultures were exposed to 20-2000 r. For some stages of mitosis (especially the telophase) 30 r caused a reduction of mitosis to 50% of the controls. Although no tables of data are given, from the graphs it is apparent that about 10 r produced a 10 to 15% reduction in the mitotic count. Bliss and Packard² worked out the dosage survival curve for *Drosophila* eggs exposed to a total dose of 61-500 r. A small decrease in hatchability of the eggs was caused by the low doses. Stenstrom, King and Henschel,³ in a study covering a wide range of dosage, found that a dosage of 39 r of X-rays decreased the *in vitro* migration of the lymphocytes 8.8%.

The present investigation was undertaken to determine the smallest dose of X-ray that could produce a significant decrease of migration of lymphocytes in cultures of adult mesenteric lymph nodes.

The technic used in this study was that described previously by the authors (King,⁴ Stenstrom and King,⁵ and Stenstrom, King and Henschel³). In each series the rabbit lymph node fragments were carefully separated in sets of 3 according to size, shape and color. One fragment from each set of 3 was used in the control 1 group, one in the control 2 group and the other in the experimental group. In this way there were visually identical cultures in the 3 groups. As may be noted by comparing the average values for control 1 and control 2 in Tables I and II, such "matched fragments" produce reliable quantitative results.

The fragments were suspended in serum in Carrel D₅ flasks. The flasks were placed in a special incubator and exposed to the desired X-ray dosage at 37.5°C. The control flasks were protected by ¼ inch of lead plate. After radiation the fragments were washed with sterile tyrode and planted as individual cultures in one drop of rabbit plasma and 3 drops of chick embryo-rabbit serum extract. Before the individual cultures were incubated they were given a code number so that the person who did the measurements did not know which were control and which were experimental cultures.

The cultures were incubated for 24 hours at 37.5°C as lying drops. The migration rims were measured at 24 hours of incubation under

¹ Lasnitzki, I., and Lea, D. E., *Brit. J. Radiol.*, 1940, **13** N.S., 149.

² Bliss, C. I., and Packard, C., *Am. J. Roent. and Rad. Therap.*, 1941, **46**, 400.

³ Stenstrom, W. K., King, Joseph T., and Henschel, Austin F., in press.

⁴ King, Joseph T., *Arch. f. Exp. Zellforsch.*, 1930, **9**, 341.

⁵ Stenstrom, W. K., and King, Joseph T., *Proc. Soc. Exp. Biol. and Med.*, 1937,

TABLE I.
7½ Seconds of Radiation at 155 r Per Minute.

Series	No. of cultures	Avg migration controls 1	Avg migration controls 2	Avg migration experimentals
1	30	155.5	160.5	150.0
2	30	150.0	152.0	147.5
3	30	172.5	168.5	164.5
4	30	143.0	144.5	137.0
5	30	141.5	132.0	117.0
6	30	145.0	141.0	137.0
7	30	124.5	120.0	117.0
8	30	133.0	130.0	128.0
9	30	112.5	114.0	104.0
10	30	126.5	131.5	128.5
	Avg	140.4	139.4	133.0

low power (60×) with an eye piece micrometer (114 e.p.u=1 mm).

Radiation data: 200 kv; 30 ma; filter 2 mm AL; 50 cm distance; 155 r per minute; half layer value 0.28 mm cu.

The results are given in the tables.

With 7½ seconds of radiation the average absolute difference between the experimental and control 1 is 7.4 (standard error 2.14). Inhibition in terms of control 1 is thus 5.3%.

With 3¾ seconds radiation the average absolute difference in terms of control 1 is 3.0 (standard error 0.82). However, if one uses control 2 the results are unconvincing in spite of the fact that the absolute difference is slightly greater.

Conclusion. A dosage of approximately 20 r (7½ sec at 155 r/sec) produces a significant inhibition in the migration rate of lymphocytes. At one-half this dosage the results are of questionable significance.

TABLE II.
3¾ Seconds of Radiation at 155 r Per Minute.

Series	No. of cultures	Avg migration controls 1	Avg migration controls 2	Avg migration experimentals
1	30	167.5	164.0	163.0
2	30	187.0	198.5	186.5
3	30	135.0	139.5	130.0
4	30	135.5	136.5	131.5
5	30	145.5	143.5	145.0
6	30	170.5	163.0	167.0
	Avg	156.8	157.5	153.8