section, as recorded by Koppányi and Weiss, and the age of the animals favors the former explanation (morphological regeneration). Further work on the problem is contemplated.

We acknowledge with pleasure our thanks to Dr. Carlson for his encouragement and support, and to Mr. Parker and Mr. Young of the Lincoln Park Zoölogical Gardens, who kindly supplied us with the fish used in these experiments.

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The relative susceptibility to x-rays of the eggs and sperm of Arbacia.

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The eggs and sperm of the sea urchin, *Arbacia punctulata,* were exposed simultaneously to the same x-rayed treatment and subsequently the x-rayed eggs were fertilized by untreated sperm, and untreated eggs were fertilized by x-rayed sperm. Untreated eggs and sperm from the same sea urchins were used in the control cultures. Two sets of experiments have been completed, one during the summer of 1923 and the other during the summer of 1924. In 1924 the conditions of the x-ray treatment were so arranged that the temperature of the water in which the eggs or sperm were kept during treatment did not vary from that of the room in which all the cultures were kept by more than 1° C. The temperature of the room during the different experiments varied from 19° to 22° C. The x-ray treatment was given with a standard Coolidge tube, tungsten target, at 50,000 volts and 3 milliamperes, the distance from the target to the eggs and sperm being 25 cm. In 1923 a portable radiator type tube with tungsten target was used and run at 50,000 volts and 2.5 milliamperes. The distance from the target to the germ cells was 11 cm. and the glass cups were surrounded by a lead box covered on the top where the x-rays entered by a thin sheet of aluminum 3 mills in thickness.

After the treatment of the eggs and sperm, fertilization was brought about in finger bowls and the larvae were reared up to forty-eight hours after fertilization, at which time samples were fixed in 2 per cent formaldehyde. In these samples where development had proceeded at the normal rate in the controls it was found that a considerable number of the pleutei were in a stage where the larger arms were appreciably longer than the rest of the body. This stage was numbered six and the development previous to this was divided into five stages as follows: 1, blastula; 2, gastrula; 3, gastrula which has become triangular and shows the beginnings of the two larger arms; 4, these two arms have developed but are appreciably shorter than the rest of the body; 5, the arms are approximately the same length as the rest of the body. In the case of each sample the stage in development of one hundred larvae was recorded. Table I shows a typical count from an experiment. It will be noticed that the variation in the stage of development at the time of examination is greater in the case of the larvae developed from an x-rayed germ cell and greatest in those developed from an egg fertilized by an x-rayed sperm. The average given in the last column is obtained by multiplying the number of larvae in each stage by the number of the stage and dividing by the number of larvae observed, *i. e.*, 100. The intervals between the stages are, of course, not the same; nevertheless, the average obtained in this way gives an approximate measure of the stage of development of the group.

In Table II are given the results of some typical experiments at different doses. It is to be noticed (1) that all the doses used, even the smallest (3 M. A., 5 min. 25 cm.) caused a retardation in development as measured by the stage reached after forty-eight hours; (2) the amount of retardation increases with the dose and was greatest for the largest dose (2.5 M. A., 60 min., 11 cm.); (3) *for the same treatment the amount of retardation is always greater when the sperm are x-rayed than when the eggs are x-rayed.*

The experiments described were carried out at the Marine Biological Laboratory, Woods Hole, Mass., and the Biological Laboratory at Union College, Schenectady, N. Y., with the assistance of a grant from the American Association for the Advancement of Science.

TABLE I.
Experiment 16, Series of 1924.

Treatment before fertilization		Stage of larva after 48 hours.						
Eggs	Sperm	1	2	3	4	5	6	Average stage
control	control	—	—	—	—	10.6	89.4	5.89
x-rayed	control	—	—	.3	6.3	64.0	29.4	5.22
control	x-rayed	—	16.0	30.0	48.0	4.0	—	3.38

TABLE II.
Typical experiment selected from the two series of x-ray experiments.

$$D = \frac{\text{milliamperes} \times \text{minutes}}{(\text{distance from target})^2}$$

x-ray dose in "D"	Average stage after 48 hours		
	Control	Eggs x-rayed	Sperm x-rayed
2.5	5.43	5.11	5.02
10.	5.36	5.11	4.68
20.	5.24	4.15	3.51
62.	5.86	3.67	2.52
124.	5.99	3.59	2.07

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Conduction in the mammalian auricle as affected by changes in hydrogen ion concentration.

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The writers have performed a series of experiments upon the hearts of dogs perfused with oxygenated Locke's solution by a modified Langendorff method. Observations were made upon the effect of changes in (1) hydrogen ion concentration and (2) oxygen content of the perfusing fluid upon the transmission of the excitatory process in the auricle. Electrical records were obtained by placing paired non-polarizable electrodes upon the auricle in such a way that the conduction interval was recorded over a single stretch of 12-16 mm. or over consecutive portions

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