

The above data take into account only the bisexual fraternities. In addition to these, 1,111 sisterless males were produced by 48 females which had been paired with x-rayed males. The mean number of progeny per female per vial for this group is $4.94 \pm .1777$. Since the matings of these females had been observed just as carefully as those of the controls (which produced practically no unisexual fraternities), and since the mean number of progeny per female per vial for this group is significantly lower than that of either group of bisexual fraternities, whereas unisexual fraternities regularly include much larger numbers of individuals than do bisexual, we are justified in concluding that the absence of biparentals is not due to the lack of viable sperm, but rather to the presence of sperm capable of fertilizing the eggs and of preventing development. These "unisexual" fraternities thus are not comparable with unisexual fraternities from unmated females. They are initially bisexual, from which all the biparentals have been culled by the lethal effects of the sperm in fertilization.

These data show clearly that we have to do, not with lethal action of x-rays on gametes, but with a true zygotic dominant lethal effect.

Certain data reported by Raymond J. Greb⁴ tend to corroborate the conclusion reached from the above findings. While investigating the effects of x-radiation of mated females upon the rate of production of mosaic males in *Habrobracon*, Greb found that the number of sons per mother (in bisexual fraternities) was reduced slightly in the group of treated mated females, but that the percentage of females among the offspring was reduced significantly (20.8 per cent.) and that the total number of offspring per mother was also significantly lowered (37.32 per cent.). The points to be noted here are: first, that while the number of females was considerably lowered among the progeny of treated, the number of males produced did not increase to the extent of preserving the same average number of progeny per mother as that for the controls; and, second, that although this lowering of the general fecundity among the treated may not stand alone as conclusive evidence for the production of dominant lethals (because of the uncertainty as to the extent to which the direct effects of x-radiation on the eggs contributed to this diminished fecundity), they are in accord with the results obtained from the investigation in which the males alone were x-rayed.

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⁴ Raymond J. Greb, "Effects of X-radiation on Production of Mosaic Males and on Sex Ratio in *Habrobracon*." In press.

A NOTE ON ELECTRICAL POTENTIAL AND THE PHYSIOLOGICAL GRADIENT

THE known facts about physiological gradients have been experimentally discovered, chiefly, as with Child's *Planaria*, by the study of teratological forms produced by subjecting the growing plant or animal to a differential of environment. This differential has usually been determined chemically, electrically or by the action of heat or of light. The electric current or potential has been found as yet to have three effects upon growth, namely, inhibition, reversal or retardation. The following experiment with hens' eggs was carried out as a feeler in order to indicate what might be expected in a fuller study of the effect of electrical potential on the development of the chicken embryo.

Five dozen eggs (White Leghorn) served in the experiment. Twenty-eight of these served as a control group, being hatched in the same incubator as the experimental group, but subject to no electrical potential. The remainder were divided into four groups as follows:

- 6 eggs with field in direction of minor axis.
- 8 eggs with field in direction of major axis.
- 9 eggs with vertical field—positive above.
- 9 eggs with vertical field—negative above.

These eggs during the period of incubation were set between metal plates carrying a steady potential difference of 81 volts, which was provided by two dry batteries. The eggs were insulated from the plates by sheets of cardboard.

Twenty-one chicks were obtained from the control group at the end of twenty-two days.

The eggs in the horizontal fields were retarded about 36 hours, 10 chicks being obtained from the 15 eggs, these chicks being, as far as could be determined, quite normal.

Of those in the vertical fields none emerged, even after 28 days; but on the 23rd day these were "candled" and found to be at the stage of maturation which is normally reached on the 18th day, and one broken up was seen to be alive

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BOOKS RECEIVED

- MORGAN, THOMAS H. *The Scientific Basis of Evolution*. Pp. ix + 285. 40 figures. Norton. \$3.50.
SANDON, H. *The Food of Protozoa*. Pp. 187. The Egyptian University. Piastres 20.
SNIDER, LUTHER C. *Earth History*. Pp. xiii + 683. 333 figures. Century. \$4.50.
STONE, RALPH W. *Pennsylvania Caves*. Pp. 143. 67 figures. Topographic and Geologic Survey, Harrisburg.