

7595 P

Ovarian Irradiation and Sexual Precocity in the Rat.

JAMES MANDEL AND E. N. GRISEWOOD. (Introduced by H. O. Haterius.)

From the Departments of Biology and Physics, New York University.

Incidental to some work with X-rays the writers have had occasion to carry out a series of experiments to determine the effects of X-ray treatment upon the time of sexual maturity in the rat as evidenced by the criteria of vaginal canalization and appearance of an oestrous smear.

Immature females, 7 to 10 days of age, were subjected to varying dosages of X-rays. One week later the same dosage in each case was repeated. The treatments were given under the following conditions: 200 k.v.p. (meter reading); 3 milliamps; 25 cm. target-to-specimen distance; 1 mm. Cu. filter. This resulted in a dosage of 41.4 roentgen units per minute as determined by a standard ionization chamber. The effective wave length, as found by the method of relative penetration of Al and Cu, was .13 Å.U. Dosages ranged from 540 to 1,240 'r' units; amounts above the latter figure proved fatal, death occurring within from a few days to as long as several weeks after the first irradiation.

Striking results were obtained in all the irradiated animals in that, regardless of dosage within the limits indicated, the vaginae opened at approximately 14 days after the first irradiation, at an average litter age of 22 days. Vaginal smears in each instance revealed a characteristic oestrous picture a day or two later, and the uterus, in each instance in which examination was made, appeared markedly distended. Twenty-three animals, representing 11 litters, showed this response. Controls, at least 1 litter mate for each experimental animal, in each case displayed vaginal opening followed by oestrus at 43-60 days—at least 3 weeks later than the irradiated animals.

The X-rayed ovaries of animals sacrificed at time of vaginal opening, 22 days of age approximately, revealed the presence of huge follicles, with enormous antra. Few follicles of small size were to be found. The ovaries of litter mate controls presented a marked contrast in appearance in that only small and medium-sized follicles were in evidence. It appears that the X-ray treatment had stimulated the growth of follicles tremendously; and that these follicles have been functionally hyperactive as well is evidenced by the fact that vaginal canalization was markedly precocious.