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Non-effect of Irradiation of the Hypophysis in Sterile Monkey Females.

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Clinical literature contains numerous references to "cures" of sterility in women by means of "stimulating" doses of X-rays. Since the Carnegie Colony of rhesus monkeys has always included among its mature females a considerable percentage that were sterile because of failure to ovulate, the opportunity presented itself to put the theory of X-ray stimulation of the hypophysis to a critical test.

Thirteen animals were treated. In all treatments the following factors were constant: Kilovolts peak, 200; milliamperes, 20; target-skin distance, 50 cm; size of field, 4x5 cm; filters, ½ mm Cu + 1 mm Al; half layer value for ½ mm Cu = 1 mm Cu. The only variable was the r unit. The dosage was applied at one sitting with the animal under light nembutal anesthesia.

Pertinent data concerning the experiments are condensed in Table I.

Only animals in good general physical condition at the time of the experiments were used. It should be stated, however, No. 439 died in March, No. 489 in May.

Except for the control, No. 381, which was a regular ovulator both before and after the experimental cycle, only such animals were selected as failed to ovulate for the 2 cycles just preceding the experiment. Nos. 402, 435, and 441, however, experienced several ovulatory cycles earlier in the season.

Estimation of size of ovaries and uterus was made by palpation. While this method leaves an element of doubt in borderline cases, in the present series the diagnoses were unequivocal.

From the table it is seen that in all cases with a dosage of 60 to 160 r the effect was negative, that is, the animals that were not ovulating before radiation remained refractory and did not ovulate during the remainder of the season. Three of these animals, however, recovered full reproductive activity the following autumn, ovulating spontaneously and conceiving. Several times it was thought that the uterus had been stimulated slightly but of this one could not be certain.

With a dosage of 320 r one of 2 animals ovulated. It thus

TABLE I.

1. No.	381*	424*	428	435	439	440*	453*	489	460*	466*	402*	433*	441*
2. Wt	3640	4090	3520	3750	4750	4350	3500	5800	4330	4470	4170	3850	4090
3. Date, 1937	1/23	1/23	1/23	1/23	1/23	1/23	1/23	1/23	2/6	2/6	3/10	3/10	3/10
4. Dosage (r)	120	120	120	80	60	120	160	160	320	320	400	400	400
5. Day of Cycle	4	6	6	3	60	6	1	10	17	11	9	12	10
6. Prior Cycles (days)	28+	53—	124—	31—	28—	25—	53—	30—	61—	32—	48—	24—	33—
	23+	42—		35—	24—	20—			28—	34—		27—	35—
7. Exp. Cycle (days)	40+	31—	Amen.	Amen.	70—	21—	25—	32—	54—	38+	31—	Amen.	Amen.
8. Cycles foll. treatment (days)	20+	36—	"	"	38—	67—	27—	Amen.	Amen.	30+	15—	"	"

The animals marked with an asterisk (*) resumed the ovulatory function the following breeding season. Ovulatory cycles are indicated by means of the plus sign (+) placed after the number representing the length of the cycle; the minus sign (—) indicates non-ovulatory cycles. Amen. = amenorrhea, or cycle in excess of 100 days.

seemed possible that a higher dosage might be the answer. However, the application of 400 r to 3 animals was absolutely ineffective, though all recovered, ovulating in the next breeding season.

The series, therefore, includes one positive case. We doubt, however, that the sudden resumption of the ovulatory function in the case of No. 466 is attributable to the treatment. Two considerations favor such a conclusion: first, the absolute refractoriness of 11 other animals; and second, the fact that in the Carnegie Colony the spontaneous "recovery", with resumption of the ovulatory function, has occurred time and again. Such females often ovulate regularly for the rest of the breeding season.

If we do not feel justified in claiming a positive effect of irradiation of the hypophysis, we may conclude, on the basis of subsequent performance of the subjects, that the treatments were not in the least deleterious.

Summary. A single dose of X-ray between 60 and 400 r administered to the pituitary gland of non-ovulating rhesus monkeys failed to cause increase of ovarian size in 11 cases. The single female which ovulated might have done so without treatment as often happens in similar cases. There were no harmful sequelæ of the treatment, for in one-third of the cases spontaneous ovulation and conception occurred in the following breeding season.

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Infundibular Lesion and Pars Intermedia Activity in the Tadpole.

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Vunder[1] reported that the transplantation of a single hypophysis into an hypophysectomized Axolotl led to an excessive development of pigmentation. He ascribed this result to traumatic stimulation in the operation and supported his view by showing that the same

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[1] Vunder, P. A., *Trans. Dynamics of Develop.*, 1931, **6**, 73.