

TABLE V.  
Relationship between percentage of acidophils and body-weight (growth) in control rats. Note similarity of weight and percentage of acidophils, but at a greater age, to treated rats in Table IV.

Sex	Age	Wt. gms.	% Acid	Control	
				Remarks	General Development
M	20	34	24.2	Better than normal	Ears 2½-3
M	21	47	30.4	Much larger than normal	Teeth 9-10
M	35	48	22.9	Below normal	Eyes 14-17
M	36	75	30.8	Very good weight	Hair 12-16
F	5	9	9.7	Less than normal	Genitals:
F	5	12	13.4	Normal	Testes 31-40
F	20	28	18.0	''	Vagina 55-62
F	20	36	29.0	Better than normal	

The correlation between rapid growth in thymus-treated animals and acidophil content of the pituitary, suggested by the first 3 tables, seems further substantiated by Tables IV and V, in which body weight in grams, irrespective of age, seems to bear a definite relationship to the acidophil count in the pituitary in both control and thymus-treated rats.

Further work is in progress to ascertain the possible significance of these findings.

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#### Relation of Oestrin and Pregnancy Urine Hormone in Influencing Uterine Motility.\*

V. J. SAGER AND S. L. LEONARD.

*From the Biology Department, Union College, Schenectady, New York.*

The relationship which exists between oestrin and progesterin in regulating uterine motility suggested the possibility of a similar relation between oestrin and pregnancy urine hormone. Reynolds and Friedman<sup>1</sup> and Reynolds<sup>2</sup> have shown that the uterine motility of the unanesthetized rabbit, as recorded by the uterine fistula method, is inhibited by intravenous injections of pregnancy urine hormone. The inhibition of uterine motility induced by pregnancy urine hormone in either normal rabbits or castrated rabbits treated with oestrin, is somewhat similar to that obtained with progesterin

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<sup>1</sup> Reynolds, S., and Friedman, M., *Am. J. Physiol.*, 1930, **94**, 705.

<sup>2</sup> Reynolds, S., *Am. J. Physiol.*, 1932, **100**, 545.

and is characterized by either a disturbance in normal rhythm, a diminished height of contraction or complete quiescence. The inhibition is transitory in the castrated rabbit and the motility returns to normal usually within 24 hours. It will be shown that if a castrated female rabbit is given sufficient amounts of oestrin, the pregnancy urine hormone in doses ordinarily capable of inhibiting uterine activity, is unable to act.

In the first series of experiments, uterine fistulae were prepared, according to the technique of Reynolds,<sup>3</sup> in 12 adult female rabbits in heat and records of uterine motility were taken 3 to 4 days after the operation. Six to 9 hours after intravenous injections of varying doses of an extract of pregnancy urine (Follutin)<sup>†</sup> or other gonad stimulating urines, 11 of the 12 rabbits responded by complete inhibition of uterine motility, Table I. Ovulation occurred

TABLE I.

No. of Rabbits	Dose	Motility
6	6 to 200 R.U. Follutin	0
2	75 and 150 cc. equiv. Teratoma urine	0
2	100 cc. equiv. Castrate urine	0
1	75 cc. equiv. Menopause urine	0
1 (2) tests	50 and 100 cc. equiv. Menopause urine	3+

in all rabbits but one, in which a loss of activity of the hormone accounted for the failure of ovulation and inhibition of motility. These results confirm Reynolds.<sup>2</sup>

In the second series of experiments, 9 adult female rabbits were castrated and the uterine fistulae prepared. They were treated intermittently with oestrin<sup>‡</sup> (in oil solution) subcutaneously for varying periods and then were injected intravenously with Follutin in doses from 10 to 500 R.U. In a series of 28 tests, it was found that 16 resulted in varying degrees of inhibition of uterine motility, but in 12 cases motility was not altered. Of the 16 positive cases, 7 showed complete inhibition and 9 showed only slight irregularities in rhythm or diminished height of contraction (1+ or 2+ motility). Protocols of several representative experiments are given in Table II.

It was noted that injections of Follutin or other gonad stimulating urine extracts consistently inhibited uterine motility to a

<sup>3</sup> Reynolds, S., *Am. J. Physiol.*, 1930, **92**, 420.

<sup>†</sup> The Follutin was obtained through the kindness of Dr. J. A. Morrell of Squibb & Co.

<sup>‡</sup> The oestrin was obtained through the kindness of Dr. W. R. Bond of The Rare Chemical Corp.

TABLE II.

*Rabbit 4.* 1/16—Castrated. 1/19 to 1/25—Given 5 R.U. oest. per day. 1/25—Fistula prepared. 1/25 to 1/27—Given 10 R.U. oest. per day. 1/28—Good motility, given 10 R.U. Foll., resulted in 3+ motility. Given 10 R.U. oest., 1/29, good motility, given 40 R.U. Foll., resulted in 3+ motility.

*Rabbit 6.* 2/1—Fistula prepared. 2/17—Castrated. 2/17 to 2/20—Given 5 R.U. oest. daily. No oest. 2/21 to 2/25. 2/26—Good motility, given 10 R.U. Foll., motility 1+. 2/27 to 3/1—given 5 R.U. oest. daily. 3/2—Good motility, given 10 R.U. Foll., motility 3+. 3/3—Good motility, given 40 R.U. Foll., motility 3+.

*Rabbit 9.* 4/20—Fistula prepared. 4/27—Castrated, given 5 R.U. oest. 4/28—Good motility, given 60 R.U. Foll., motility 1+. 4/29—Given 5 R.U. oest. 4/30—Good motility, given 100 R.U. Foll., motility 0.

*Rabbit 21.* 7/31—Castrated. 8/3—Fistula prepared. 7/31 to 8/23 given 5 R.U. oest. daily. 8/24—Good motility, given 10 R.U. Foll., motility 3+.

0	motility	No activity in uterus.
1+	''	Slight motility, no rhythm.
2+	''	Moderate activity, some rhythm.
3+	''	Marked activity of pre-injection type.

more marked degree in the normal rabbit than in the oestrin-treated castrated rabbit. In the 11 positive cases in normal rabbits, including the 6 treated with Follutin, complete quiescence resulted. However, in the oestrin-treated castrated rabbits injected with comparable doses of Follutin, complete quiescence was obtained in only 7 of the 28 tests. Because of the relative ease in obtaining complete quiescence of uterine motility in the normal rabbit in heat with Follutin, it seems that possibly the presence of the ovaries may favor in some way, the inhibiting reaction. Reynolds<sup>2</sup> has suggested this possibility based on his own observations. Recently, Donnet<sup>4</sup> has shown that, in the normal rabbit, large doses of oestrin will cause the cessation of spontaneous uterine motility and loss of sensitivity to pituitrin.

Follutin failed to inhibit uterine motility in 12 tests out of 28 when oestrin-treated castrated rabbits were used. On examining the protocols of each rabbit, it was observed that whenever there was a failure of Follutin to inhibit uterine motility, the oestrin level was high or the amount of Follutin administered was relatively small. For example, in rabbit 6, Table II, it is seen that 10 R.U. of Follutin was sufficient at one time to inhibit motility, yet after further oestrin treatment, this amount of Follutin failed to do so. No quantitative studies were made relative to the amounts of oestrin necessary to negate the influence of Follutin because of the intermittent methods of giving oestrin in these experiments.

It is concluded, therefore, that oestrin, if present in sufficient quantities, can override the inhibitory action of pregnancy urine hormone on uterine motility in the castrated rabbit.

<sup>4</sup> Donnet, V., *Comp. Rend. Soc. Biol.*, 1936, **121**, 65.