dosages were much greater than those of Lendrum and Hisaw. In other respects the endometrium showed a simple estrin response, the glands being straight with no cystic or "swiss cheese" effects. No stratified squamous cells were associated with the columnar uterine cells, although, with the exception of animals 14, 59 and 5 marked epidermization occurred in the cervix of the injected animals.

8815 C

Studies of Prolactin in the Fowl Pituitary. I. Broody Hens Compared With Laying Hens and Males.

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Riddle, Bates, and Lahr[1] have shown that the injection of prolactin into the fowl will produce broodiness. It seems to be a logical assumption that the pituitaries of broody hens would have a higher prolactin content than the pituitaries of laying hens or males. The present investigation was undertaken to ascertain if these differences in prolactin content of fowl pituitaries actually exist, and, if so, what their magnitude might be.

The pituitaries of broody hens, laying hens and males were implanted over the crop glands of 8- to 10-weeks-old White King pigeons (age computed from time of conception) according to the method of W. R. Lyons as described by McQueen-Williams[2] and the extent of local stimulation of the crop gland was accepted as a relative measure of the prolactin content of the pituitaries.

In all instances the pituitaries were implanted in pairs, *i. e.*, the pituitaries of two birds, either a broody hen and a laying hen or a broody hen and a male, were implanted into one pigeon; one over the right crop gland and one over the left crop gland.

In all but one of the pairs of implants in which a broody hen and a laying hen were represented, the reaction indicated that there was more prolactin in the pituitary of the broody hen than in that of the laying hen. The reactions were observed and graded with plus signs; 2 pluses being given where the reaction was regarded as being

[1] Riddle, O., Bates, Robert W., and Lahr, Earnest L., *Am. J. Physiol.*, 1935, **8**, 352.

[2] McQueen-Williams, M., PROC. SOC. EXP. BIOL. AND MED., 1935, **33**, 406.

TABLE I.

The prolactin-like reaction on the pigeon crop gland as shown by pairs of pituitaries implanted from broody hens and laying hens, and from broody hens and males.

Pigeon No.	Pituitary from broody hen No. of pluses	Pituitary from laying hen No. of pluses
4895	4	2
4281*	3	0
46†	4	3
22	5	2
67	5	4
19	6	3
71	3	1
16	2	1
13	3	0
10†	5	2
32	3	0
4	3	1
4675*	0	0
Aver.	3.54	1.46
		Pituitary from male
4709†	7	0
6808†	7	0
6616†	6	0
4142†	5	0
2776†	5	3
4566†	5	3
Aver.	5.83	1.00
4555†	4	
6077*	0	

*Broody hens that were nearly over their broody period.
†Broody hens that were just becoming broody.

twice that of a reaction designated by 1 plus, 3 pluses where the reaction was regarded as being three times as great as that of a reaction designated by 1 plus, etc. See Fig. 1.

In 13 cases of implants from broody hens paired with laying hens the average number of pluses recorded for the pituitaries of the broody hens is 3.54 and for the pituitaries of laying hens 1.46. The average number of pluses recorded for pairs of broody hens and males are 5.83 for the broody hens and 1.00 for the males.

Some of the broody hens were selected at the first sign of broodiness, others were at some indefinite stage of broodiness. Three hens whose pituitaries were used in pigeons Nos. 4281, 4675, and 6077 were found to be almost at the end of their broody period and this may account for the faint reaction obtained from one of them and the negative results from the other two.

Although it is obvious from the data in the table that the prolactin content of the pituitaries of broody hens is greater than that of the pituitaries of laying hens or males, the indication that there is more prolactin in the pituitary of a hen in early broodiness than in that

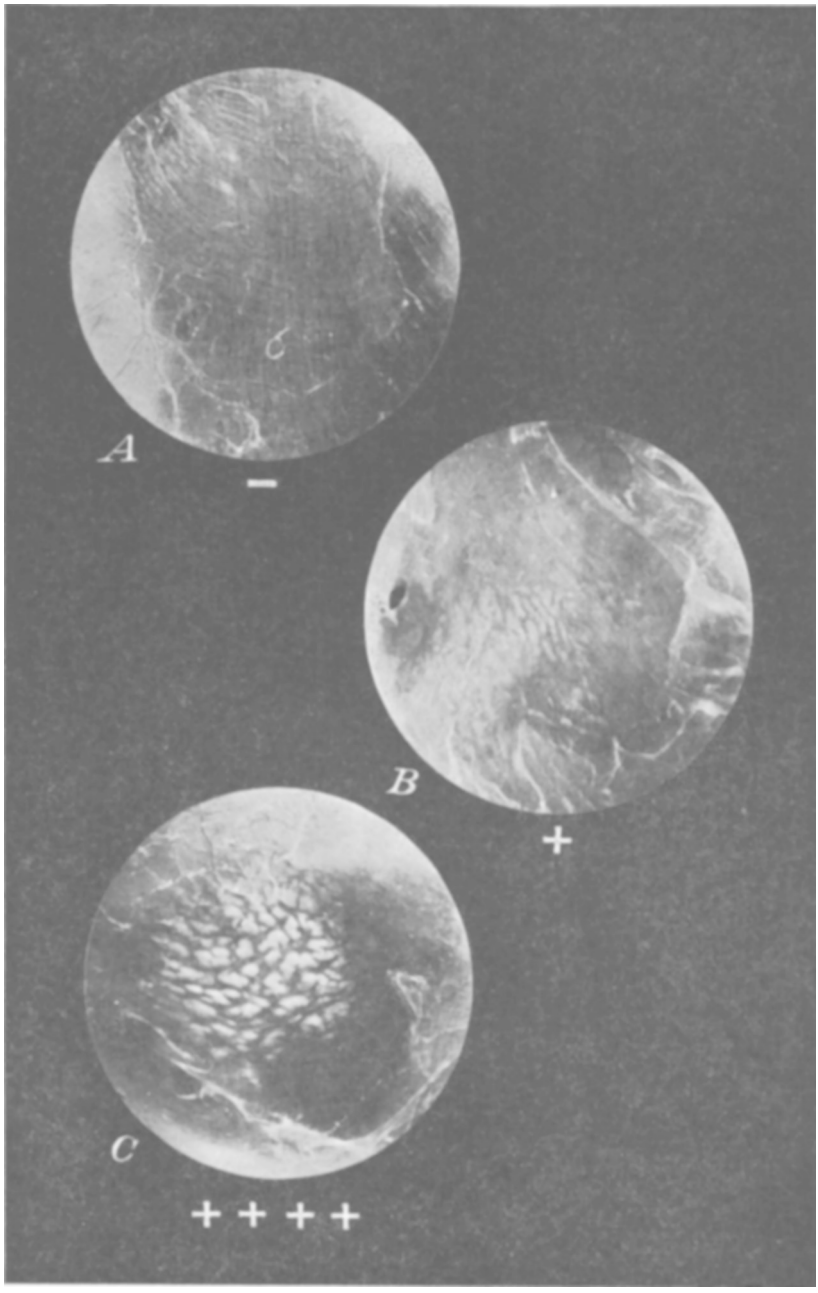

FIG. 1.
Typical reaction of pigeon crop glands to implanted fowl pituitaries. (A) Negative. (B) Slightest reaction classed as positive. (C) Considered as being 4 times greater reaction than that shown in B.

of one nearly over brooding can be only a surmise until more data are available.

Conclusions. It has been found that single fowl pituitaries implanted over the crop glands of 8- to 10-weeks-old pigeons (age computed from time of conception) will, in many instances, cause a prolactin-like reaction. It is assumed that this reaction is caused by prolactin in the pituitaries of the donating fowls.

Pituitaries from broody hens cause a greater reaction of the pigeon crop gland than the pituitaries of laying hens. Pituitaries from males cause a reaction about equal to, or slightly less, than the pituitaries from laying hens.

It was noted in a few cases that the pituitaries of hens just becoming broody gave a greater reaction than those of hens nearly over their broody period. More data are being gathered on this point.

8816 C

Studies of Prolactin in the Fowl Pituitary. II. Effects of Genetic Constitution With Respect to Broodiness on Prolactin Content.

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Broodiness was induced in laying fowls of broody races by the injection of prolactin, by Riddle, Bates, and Lahr.[1] After prolactin injections laying fowl of non-broody races and males of a broody race became only partially broody, usually clucking without nesting. Burrows and Byerly[2] showed that pituitaries from broody fowl have a much greater prolactin content than those from laying fowl and from males, as judged by local pigeon crop-gland response to pituitary implantation.

The present work was undertaken to determine the relative potency of fowl pituitaries with respect to genetic constitution of the fowls. White King pigeons of 8-10 weeks conception age were used as recipients for the fowl pituitaries. The local implantation technique of Lyons as described by McQueen-Williams[3] was used. The crop-gland responses were recorded as "plus" when any visible

[1] Riddle, O., Bates, R. W., and Lahr, E. L., *Am. J. Physiol.*, 1935, **111**, 352.

[2] Burrows, W. H., and Byerly, T. C., PROC. SOC. EXP. BIOL. AND MED., 1936, **34**, 841.

[3] McQueen-Williams, M., PROC. SOC. EXP. BIOL. AND MED., 1935, **33**, 406.