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A New Hormone of the Anterior Pituitary.

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Riddle and Braucher¹ showed that the effective stimulus for the enlargement and functioning (formation of "crop-milk") of the crop-glands of pigeons is a substance derivable from the anterior hypophysis only; and the luteinizing substance derived from pregnant urine is not that substance. They were unable to decide "whether the principle activating the crop-gland is the growth, the sex maturity, or a third and now unknown anterior pituitary hormone." We have now shown (a) that the principle which evokes the crop-gland response is a third anterior pituitary hormone, and (b) have identified this same hormone, which we shall here call "Prolactin" as the hitherto undefined pituitary principle which is essential for lactation in mammals.

To prepare this hormone relatively free from the growth and gonad-stimulating principles frozen anterior pituitaries of beef or sheep were ground, defatted with acetone and alcohol and dried. This powder was extracted 3 times in aqueous medium at a pH of approximately 2.5. The acid extracts were precipitated isoelectrically. The isoelectric precipitate was redissolved and reprecipitated 3 times to free it of maturity hormone and then dried with acetone. About 10% of the original weight of dried powder is thus obtained in an acid-soluble isoelectric-insoluble form. The addition (to suspensions) of 0.2% cresol to complete the destruction of the growth principle does not markedly affect the "Prolactin".

Assays of several of our preparations, and some of the growth and gonad-stimulating extracts of others, have been made on immature common pigeons and ring doves of both sexes. Table I shows only a part of data from male ring doves. The crop-gland response is equally decisive in either species and sex; the gonad-stimulating response is more pronounced in males. Neither species has been adequately tested as to its suitability for the assay of the growth hormone; we therefore show here the absence of the "Prolactin" effect from growth hormone preparations of Drs. M. O. Lee and M. K. Schaffer, Boston, who kindly supplied very potent sam-

¹ Riddle, O., and Braucher, P. F., *Am. J. Physiol.*, 1931, **97**, 617.

TABLE I.

Intramuscular injections of anterior pituitary preparations into male ring doves showing that growth and gonad-stimulating principles do not activate the crop-gland; "prolactin", practically free of the "maturity" principle, does activate the gland.

Preparation	cc. per day	Dura- tion days	Age of bird mo.	Body wt. gm.	Testes		Single crop gland mg.
					Treated animal	Average control	
Growth hormone*	.2	5	3.1	139	28.9	10.5	99
No. 36	.4	5	3.3	142	61.7	13.9	74
	.8	5	3.3	128	168.6	13.9	128
Growth hormone No. 31 ¹	.6	5	3.1	135	35.3	10.5	73
Growth hormone ²	.4	7	2.6	155	26.1	7.0	105
No. 31 + Prolan	.4	7	3.0	145	31.2	9.5	159
Prolan ³	.2	5	3.0	143	6.9	9.5	84
	.2	7	2.9	150	10.1	8.6	120
Antuitrin	.3	9	2.7	132	67.0	7.6	96
(anterior lobe)	.3	9	2.8	144	118.3	8.5	67
"Prolactin"	.5 ⁴	6	2.9	129	8.8	8.6	740
	.5	6	2.8	167	8.9	8.5	1050
	.3	8	2.6	131	9.0	7.0	390
	.4	5	2.1	164	3.9	5.9	880
	.2	5	2.4	155	7.5	6.8	960
	.5 ⁴	4	2.6	148	7.5	7.0	985
	.5	4	2.3	123	7.4	6.3	925
	.5	4	2.1	144	8.3	5.9	765

* Lee and Schaffer; 0.4 cc. daily per 100 gm. rat gave maximum growth.

¹ Lee and Schaffer; 0.15 cc. daily per 100 gm. rat gave maximum growth.

² Each 0.2 cc. daily.

³ Antuitrin S (Parke, Davis and Co.), from pregnant urine; 100 R. U. per cc.

⁴ Represents 10 mg. of acid-soluble isoelectric-insoluble fraction.

ples assayed on hypophysectomized rats. Antuitrin (fresh) gives good gonad-stimulation in immature birds, but is devoid of the crop-gland stimulant. Prolan added to growth hormone was also without effect.

Male and female mature guinea pigs and mature female rabbits have responded to daily or twice daily subcutaneous injections of "Prolactin" by milk secretion—the males after preliminary treatment with theelin and progestin. The gonad-stimulating principle, freed of "Prolactin", fails in these tests; and the fresh growth principle is, by these and other tests, practically excluded. The secretion begins after 2-3 days in rabbits, 3-5 days in guinea pigs; the quantity is highly variable, and the term of secretion also variable. A resumption of milk secretion 5-7 days after cessation of treatment occurs in some cases.