

as animals in which the production of F.S.H. has not yet been initiated. When anterior pituitary hormones, or extracts of this tissue, are injected into these birds it must be granted that their action is obtained on an intact organism free from follicle-stimulating hormone, and that the injected material serves neither to reduce nor to induce an output of F.S.H. from the bird's own pituitary.

8199 C

Effects of Complete and Incomplete Hypophysectomy on Basal Metabolism of Pigeons.*

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The use of pigeons in the assay of anterior pituitary hormones makes it desirable to measure and record the effect of hypophysectomy upon the basal heat production of these animals. Earlier data for the dog, recently reviewed by Houssay,¹ indicate an average decrease of 16% as a result of this operation; in the rat —35% is reported by Foster and Smith,² and —26 by Collip.³ The present measurements were made at 2 environmental temperatures—one series being done at the critical temperature for the pigeon (30°C.), the other at 20°C. The data obtained show that the percentage change in B.M.R. following complete hypophysectomy in the pigeon is much influenced by the environmental temperature at which the measurements (pre- and post-operative) are made. Measured at 30° such pigeons show a 33% decrease; at 20° the decrease is only half that amount, or 17%. That these differences are not chance and spurious resultants of few measurements made on variable material is further attested by much unpublished data dealing with the capacity of individual anterior lobe hormones to affect the B.M.R. of hypophysectomized pigeons at these 2 temperatures.

Adult pigeons of various races were used. At 10-20 days after operation the completely hypophysectomized pigeons had lost about 25% of their previous body weight. The post-operative metabolism measurements were made 10-20 days after the operation, in a mul-

* Aided by a grant from the Carnegie Corporation of New York.

¹ Houssay, B. A., *Endocrinology*, 1934, **18**, 409.

² Foster, G. L., and Smith, P. E., *J. A. M. A.*, 1926, **87**, 2151.

³ Collip, J. B., *J. Mt. Sinai Hosp.*, 1934, **1**, 28.

multiple-chamber apparatus, with technique earlier described;⁴ this includes housing the birds during their 24-hour fasting period in a large constant temperature glass cage kept at the same temperature at which the B.M.R. is to be measured. The data were obtained from February to August. In only a few birds was a comparison made of the rectal temperatures at pre- and post-operative periods; in these cases no definite change in body temperature was noted. At autopsy the sella and its contents were examined in serial microscopic sections, except in 3 cases observed only under dissecting microscope. When traces of anterior pituitary tissue were found, measurements and calculations were made to determine the percentage of tissue present. These histological studies provide the classification used for summary presentation in Table I, and suggest that anterior pituitary tissue in the pigeon has no regenerative power. Some pigeons with minute pituitary fragments had been operated as much as 10 months before autopsy.

TABLE I.
Effects of Complete and of Partial Hypophysectomy on the Basal Heat Production of Common Pigeons.

Completeness of operation	No. of tests	Calories per kilo per hr. before operation	Percentage decrease of B.M.R. — after hypophysectomy —		
			Min.	Max.	Aver.
Measurements made at 30° C.					
Complete	9	3.86	13	50	33
0.3-4.0% in	7	3.78	15	43	28
10-23% in	5	3.96	18*	40	18
Measurements made at 20° C.					
Complete	7	4.29	1*	36	17
1.3-10.0% in	4	4.36	13	31	19
13-20% in	4	4.19	4	41	19

* These values are +18 and +1.

The data permit a tentative statement concerning effects of partial hypophysectomy on the B.M.R. It is found, in measurements made at 30°, that when less than 4% of the gland is present there is little or no difference from complete hypophysectomy; 10-20% of this tissue usually effect a partial but incomplete restoration of the pre-operative B.M.R. In our measurements made at 20° the metabolism is decreased to an equal extent irrespective of whether the hypophysectomy was complete or incomplete. The results obtained in the 30°C. tests practically parallel Smith's findings on the capacity of graded amounts of pituitary tissue to sustain the structural normality of thyroids, adrenals and gonads in partially hypophysectomized rats.⁵

⁴ Benedict, F. G., and Riddle, O., *J. Nutr.*, 1929, **1**, 497.

⁵ Smith, P. E., *Anat. Rec.*, 1932, **52**, 191.

Summary. Within 10-20 days after complete hypophysectomy the B.M.R. of the adult pigeon undergoes a pronounced decrease, but the extent of the indicated decrease is much influenced by the environmental temperature at which measurement is made. At the critical temperature (30°C.) the B.M.R. of 9 pigeons was decreased by 33%; in 7 pigeons measured at 20°C. the decrease was only half as much, or 17%. Seven incompletely hypophysectomized birds (less than 4% of pituitary present) measured at 30° provide data which confirm the important rôle of temperature and further indicate that the B.M.R. of such birds is practically the same as that of the completely hypophysectomized pigeon. Pituitary fragments representing 10-25% of the total gland usually only partially sustain the normal rate of heat production. B.M.R. measurements made at 20° did not distinguish partial from complete hypophysectomies, and this provides a further indication that a truer measure of effect of hypophysectomy is obtained from tests made at the animal's critical temperature.

8200 P

Heparin as an Anticoagulant in the Brucella Phagocytic Index Test.

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In a previous publication,¹ the application of the Brucella phagocytic index test to the study of epidemiology of undulant fever was discussed. Tests carried out on over 1,000 people seemed to indicate that the test was of value in the detection of passed, latent and present infections with the Brucella organisms.

When the same technic was applied to the natural hosts, goats and cattle, the differences between the normal and the infected animals were not striking. Although positive indices were obtained in some of the smaller laboratory rodents, in larger animals the phagocytic activity of the leucocytes, despite the presence of Brucella organisms in the tissues, was either absent or very low. The indices of the infected or immunized animals were, however, consistently high, when, instead of whole citrated blood, the sedimented cells thorough-

¹ Meyer, Stewart, Veazie, and Eddie, *Proc. Soc. Exp. Biol. and Med.*, 1934, **32**, 284.