9399

Hypophyseal Thyrotropic Mechanism Essential for Occurrence of Diabetes Insipidus in its Maximal Form.*

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The contention that d.i. does not occur in the absence of the pars anterior of the hypophysis has been supported by a number of recent investigations.[1] Views differ, however, as to the mechanism of action of the pars anterior in this respect. Barnes and Regan[2] and Biasotti[3] on the basis of their failure to obtain the usual diuretic effect of anterior lobe extract on thyroidectomized dogs suggested that this diuretic effect was by the thyroids through the hypophyseal thyrotropic principle. Mahoney and Sheehan's[4] elimination of d.i. by thyroidectomy strongly suggested that the polydipsia and polyuria of d.i. is dependent upon thyroid action. This concept has been questioned, to a lesser degree, by Gaebler[5] and White and Heinbecker[6] on the basis of their failure to duplicate in all respects Barnes and Regan's and Biasotti's results with anterior lobe extracts and more vigorously by Fisher and Ingram[7] on the basis of their not being able to duplicate, with cats, Mahoney and Sheehan's results on the dog.

Even if one accepts as established that functional thyroid tissue is essential for the appearance of d.i. there still remains the possibility that the thyroid may play its rôle by activation of a hypophyseal diuretic mechanism. In an attempt to elucidate further the rôle played by the pars anterior in d.i. as well as to shed light on several other questions relative to the etiology of d.i. the experiment described and illustrated below was instituted.

The abrupt elimination of a striking, well established polydipsia, by hypophysectomy, has been reported.[1(d)] In this same dog 7½ months after hypophysectomy anterior lobe extract was adminis-

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1 (a) von Hann, F., Frankfurt, *Z. f. Path.*, 1918, **21**, 337; (b) Richter, C. P., *Am. J. Physiol.*, 1934, **110**, 439; (c) Ingram, W. R., and Fisher, C., *Anat. Rec.*, 1936, **66**, 271; (d) Keller, A. D., Noble, W., and Hamilton, J. W., Jr., *Am. J. Physiol.*, 1936, **117**, 46.

2 Barnes, B. O., Regan, J. F., and Bueno, J. G., *Am. J. Physiol.*, 1933, **105**, 559.

3 Biasotti, A., *Compt. rend Soc. de biol.*, 1934, **115**, 329.

4 Mahoney, W., and Sheehan, D., *Am. J. Physiol.*, 1933, **112**, 250.

5 Gaebler, O. H., *Am. J. Physiol.*, 1935, **110**, 584.

6 White, H. L., and Heinbecker, P., *Am. J. Physiol.*, 1937, **118**.

7 Fisher, C., and Ingram, W. R., *Arch. Int. Med.*, 1936, **57**, 1067.

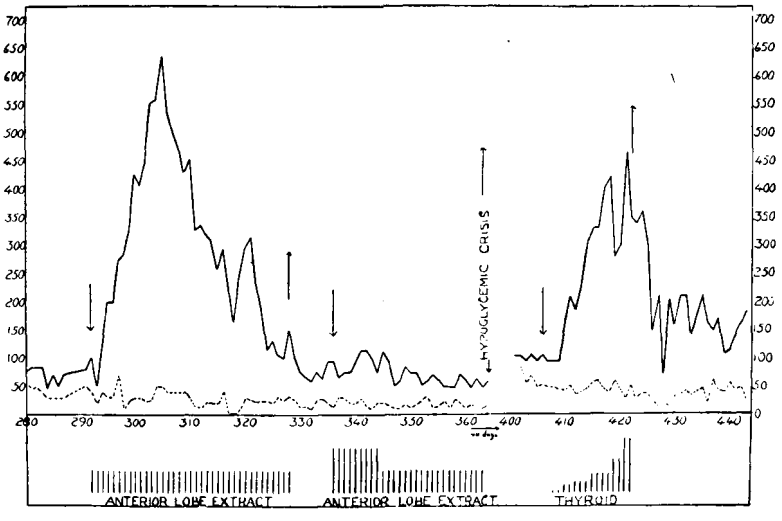

FIG. 1.

Solid line water intake, stippled line food intake (baloration). Ordinate, cc. and gm. per kilo body weight. Dog weighed 4.3 kilo. Abscissa, days after hypothalamic lesion. Hypophysectomy was performed 50 days following the hypothalamic lesion. Anterior lobe extract was administered in 1 cc. and 2 cc. amounts. Thyroid dosage ranged from .1 to 2.4 gm.

tered subcutaneously in order to test the efficacy of this extract in precipitating a polydipsia equivalent to that present before hypophysectomy. The results are graphed in Fig. 1. It is to be noted that the water intake increased after a latent period of 24 to 48 hours but that the increase was progressive over a period of 12 days in spite of a uniform dosage of extract. This is the type of response one would expect if the polydipsia was the result of reactivation of the thyroid. Further, subsequent to the 12th day of extract injections the polydipsia decreased progressively to normal in spite of continued administration of the extract. This result is again exactly the one to be expected if the polydipsia was due to activation of the thyroid by the thyrotropic principle because of the well-established fact that animals soon become thyrotropic-resistant.[8] Note also that the animal was resistant to doubling the dose of extract and that a hypoglycemic crisis resulted in spite of continued injections.

Final verification of direct thyroid action was the subsequent precipitation of a typical polydipsia by thyroid feeding in this same dog.

This experiment, we believe, supports conclusively the contention that a normal functioning anterior lobe of the hypophysis is essen-

8 Collip, J. B., and Anderson, E. M., *J. Am. Med. Assn.*, 1935, **104**, 965.

tial for the appearance of the d.i. in its maximal form which results from derangement of structures in the region of the hypophysis, and that the pars anterior plays its rôle through the thyroid by way of the thyrotropic principle. It also seems justifiable to say that the experiment further establishes d.i. as being due to a deprivation of the antidiuretic principle.[9] Certainly the nature of the experiment and particularly the time that elapsed between operations and extract injections rules out any possibility of the polydipsia being due to irritative phenomena.

9400

Pathogenic Staphylococci in the Anterior Nares: Their Incidence and Differentiation.*

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I. INCIDENCE. Because there is no recorded incidence of pathogenic staphylococci in the normal nose a study of their frequency was undertaken in order to establish a standard with which the incidence in infectious conditions might be compared. Such a standard will aid in the interpretation of the reports of Dolman,[1] Danbolt,[2] and Valentine,[3] on the rôle of the nares as a source of infection in recurrent furunculosis.

Cultures were made from the nares of 468 persons without evidence of upper respiratory infection or of staphylococcal infection elsewhere. The staphylococci isolated from these cultures were differentiated into pathogenic and non-pathogenic forms by means of the plasma-coagulation test. This test has been found by various investigators to be a reliable method for such differentiation.[4-8]

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9 Fisher, C., and Ingram, W. R., *Endocrinology*, 1936, **20**, 762.

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1 Dolman, C. E., *Lancet*, 1935, **1**, 306.

2 Danbolt, N., *Skrift. Norske Vidensk. Oslo Mat. Natur. Kl.*, 1931, Monograph, 1932; *Biol. Abst.*, 1933, **7**, 1925.

3 Valentine, F. C. O., *Lancet*, 1936, **1**, 526.

4 von Daranyi, J., *Cent. f. Bakt.*, 1926, **99**, 74.

5 Gross, H., *Klin. Wochensh.*, 1933, **12**, 304.

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7 Chapman, G. H., Berens, C., Peters, A., and Curcio, L., *J. Bact.*, 1934, **28**, 343.

8 Fisher, A. M., *Bull. Johns Hopkins Hosp.*, 1936, **54**, 393.