tolerance previously noted in fish maintained under constant temperature conditions are photoperiodically controlled, probably through the pituitary gland. The endocrinology and biochemistry of the fish are now being investigated.

WILLIAM S. HOAR

University of British Columbia,
Vancouver.

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Hormonal Depression due to Treatment of Animals with Chlorpromazine

IN an earlier paper, we have shown that in human patients chlorpromazine impairs the hypothalamus and through it the anterior pituitary lobe[1]. This depressing effect balances itself in accordance with the push–pull principle so far as the following tropins are concerned: follicle-stimulating hormone, luteinizing hormone, adrenocorticotropic hormone and thyroid-stimulating hormone, since they produce secondary hormones. This is impossible, however, with regard to luteotropic hormone and somatotrophic hormone, as neither of them produces peripheral secondary hormones.

The present communication describes the endocrine effects after three months of continuous treatment with chlorpromazine in animals which received subcutaneously 10 mgm./kgm. daily. For every group, five rats were used and the weights of their organs are given as average values. A detailed histological report on these effects will be published in collaboration with Prof. H. Ungar.

Follicle-stimulating hormone. (*a*) In infantile female rats it is only partly suppressed, as evidenced by spontaneous opening of the vagina on maturation and later by a tendency to permanent œstrous; the ovaries weighed 35 mgm. (controls 90 mgm.).

(*b*) In the male rat, the suppression is strong enough to produce atrophy of the testes (700 mgm. instead of 1,500 mgm.).

Luteinizing hormone. (*a*) In the female rat, suppression is complete, as no corpora lutea are formed.

(*b*) In the male rat, the suppression of interstitial-cell stimulating hormone is also complete, as the prostate and seminal vesicles become atrophied (500 mgm. instead of 2,000 mgm.).

Adrenocorticotropic hormone. In both sexes, the suppression is marked, as the adrenals weighed on an average 35 mgm. (control 45 mgm.).

Thyroid-stimulating hormone. In both sexes suppression is slight, since the thyroid glands weighed 28 mgm. as compared with the control (34 mgm.).

Somatotrophic hormone. In both sexes growth was definitely stunted by treatment. The females reached a steady weight at 95 gm. (controls, 125 gm.); the males at 125 gm. (controls, 200 gm.).

Subcutaneous injections of 5 rabbit units somatotrophic hormone (Wilson) daily along with the chlorpromazine treatment restored the weight within two months.

Luteotropic hormone. This hormone was tested in rabbits which received daily 0·5 mgm. progesterone. The second phase of the endometrium, which disappears normally after seventeen days treatment, was preserved for thirty-four days and longer by additional injections of chlorpromazine. This seems to indicate endogenous production of luteotropic hormone. Hence luteotropic hormone shows a pattern of reaction different from that of all other tropins[2].

After three months treatment there are no differences in pituitary weights between the animals treated with chlorpromazine and their controls (10 mgm.).

The fact that chlorpromazine was able to suppress the growth hormone may indicate that somatotrophic hormone is balanced by a secondary peripheral hormone. It has been suggested that such a relation exists with glucagon.

The above findings confirm the current view that chlorpromazine depresses the function of the hypothalamus. The endocrine disturbances thus brought about in the pituitary of animals may also appear in man if dosage is excessive.

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F. G. SULMAN
H. Z. WINNIK
Department of Applied Pharmacology, and
Department of Psychiatry,
Hebrew University-Hadassah Medical School
and School of Pharmacy,
Jerusalem.

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Intracellular Distribution of Choline Acetylase

WITH the development of methods for the measurement of choline acetylase independently of the enzymic formation of acetyl-coenzyme A[1–3], it has become possible to determine the intracellular distribution of the enzyme. In the present experiments, rabbit brain homogenates in 0·25 *M* sucrose were fractionated by differential centrifugation. In exp. 1 the procedure of Brody and Bain[4] was followed; in exp. 2, somewhat different centrifugal forces were applied as shown in Table 1. Each particulate fraction was washed by resuspension in 0·25 *M* sucrose and recentrifugation at the same speed; the washings were then pooled with the original supernatant for the next stage of the centrifugation.

Choline acetylase activity was determined by incubating the fractions in a system in which the substrate acetyl-coenzyme A had already been formed during a preliminary incubation at 37° C. of aged pigeon liver enzyme with citrate, acetate, choline acetylase and adenosine triphosphate[2,3]. After this induction period of 10 min. for the formation of acetyl-coenzyme A, the brain fraction to be tested was added to the system, incubation continued for a further 60 min. and the amount of acetylcholine formed determined by assay (frog rectus abdominis).

Whole homogenates tested in this way have only one-quarter to one-half of the activity of extracts made from acetone-dried brain. However, when they are treated with ether (0·2 ml./ml.), a procedure used in earlier studies on the synthesis of acetylcholine[5,6], the activity of the homogenates is equivalent to that obtained with acetone powders. The