this paper suggest that the hormones regulating mammary gland growth are responsible for the elaboration or activation of the spreading factor. Even the amounts of hormone and the hormone combinations which have produced the greatest mammary gland growth were observed to produce the largest amounts of the spreading factor. Thus the amount of spreading factor present and extracted from the glands could well be related to the number of mammary gland cells present.

Summary. 1. Hormones which stimulate mammary gland growth cause elaboration or activation of the mammary gland spreading factor. 2. Increasing amounts of estradiol benzoate caused increasing amounts of the spreading factor to be elaborated or activated in the mammary glands of castrate animals, but little or no spreading factor was found to be present in the mammary gland extracts of estradiol-benzoate treated, castrate-adrenalectomized animals. 3. Increased amounts of progesterone alone caused increased production of the spreading factor, however, the largest amount of progesterone employed did not give as good response as half the level of progesterone plus a little estrogen. 4. Best elaboration or activation of the spreading factor in response to treatment was with a combination of 1 μg estradiol benzoate and 5 mg progesterone. Other combinations of estrogen and progesterone gave graded responses. The castrate-adrenalectomized animals showed as good production of the spreading factor in response to estradiol benzoate-progesterone as castrate animals. 5. An anterior pituitary extract alone produced only fair amounts of the mammary spreading factor. When a low level of estrogen was added much better response was obtained. 6. One mg level of testosterone caused production of fair amounts of the spreading factor. However, the estrogen-progesterone combination gave a better response. 7. Ten days' treatment with some combinations of hormones caused as much elaboration or activation of the mammary gland spreading factor as was extracted from rats pregnant 10 days.

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Localization of a "Feeding Center" in the Hypothalamus of the Rat. (18766)

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Development of obesity in animals following destructive lesions placed in or ventrolateral to the ventromedial nucleus of the hypothalamus is a well-established fact(1-6). This obesity has been shown to arise primarily from a marked increase in food intake, or from what has been termed "hyperphagia."

In an experimental investigation being carried out to discover the effect on food intake, etc. of small electrolytic lesions placed by the Horsley-Clarke instrument in other areas of the hypothalamus of the albino rat, a well-localized area has been found in the lateral hypothalamus, bilateral destruction of which is followed by a complete absence of eating. This area is situated in the extreme lateral portion of the lateral hypothalamus at the same rostro-caudal level (coordinate) as the ventromedial nucleus (Fig. 1). Small, bilateral, electrolytic lesions produced in this area by a current of 1 milliampere used for 15 sec, completely inhibit food intake to the point where the rat dies of starvation. On the other hand, after a unilateral lesion in this area, the animal goes on eating normally; when another

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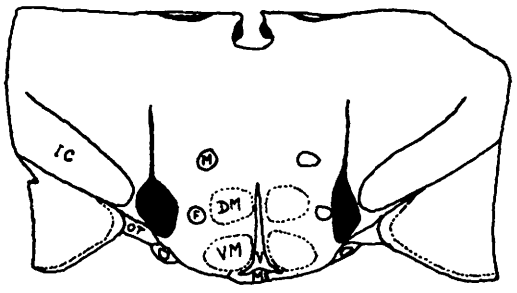

FIG. 1. Section through the rat's brain passing through the hypothalamus in the tuberal region, rostral to the pituitary stalk and caudal to the optic tract. The heavy shaded areas represent bilateral lesions in the lateral hypothalamus, lateral to the fornix and medial to the internal capsule. The dorsal prolongations represent electrode tracks. Abbreviations: D. M., dorsomedial nucleus of the hypothalamus; F., fornix; I. C., internal capsule; M., mamillo-thalamic tract; M. E., median eminence; O. T., optic tract; V., third ventricle; V. M., ventromedial nucleus of the hypothalamus.

unilateral lesion is made in the corresponding area of the opposite side, however, the animal then ceases to eat. This area is so well circumscribed that if the destructive lesion is placed even 0.5 to 1 mm away from it in any direction, this complete absence of eating does not develop. Bilateral lesions made in adjacent areas may result in either decreased eating or failure to eat for the first few days after the operation, but such animals resume eating within a short period.

If the rat is first made hyperphagic and obese by placing bilateral lesions in and around the ventromedial nucleus, and then bilateral lesions are produced in this area of the lateral hypothalamus, the hyperphagia at once yields to non-eating and such an animal also will not eat at all even though it dies of starvation. Unilateral destruction of this area in these hyperphagic animals does not stop the animal from eating but later when a lesion is also made on the other side, it at once abolishes eating. Large electrolytic lesions involving the ventromedial nucleus and spreading into any other part of the hypothalamus, whether anterior, posterior, or lateral, produce hyperphagia and obesity, provided they do not encroach upon this area laterally. If they involve these lateral areas, bilaterally, the animal does not eat.

Experimental work being done on cats has also yielded similar results.

This lateral hypothalamic area, in addition to containing some portion of the cells of the lateral hypothalamic nucleus, has a large collection of fibers passing through it, prominent among which are those from the medial forebrain bundle, stria terminalis, direct amygdalo-hypothalamic fibers, etc.(7). It is premature as yet to say whether the failure of eating is due to destruction of certain cells or some of the fibers; but as lesions produced in the adjacent areas, which might damage identical fibers, do not produce this effect, the probability is more in favor of some cells peculiar to this region. It may be mentioned here that lesions of amygdaloid nuclei in rats have not led to any change in food intake. Also, since destruction of the ventromedial nuclei and their surrounding areas produces hyperphagia and consequent obesity only if this lateral hypothalamic area is intact, the lateral area would appear to play a more important role as regards food intake than the medial hypothalamic structures. It is thus probable that of the two "centers," this lateral mechanism exerts the more basic type of control over food intake, and that its activity is regulated by the medial hypothalamic structures.

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