pothalamic stimulation is strongly influenced by the frequency of the stimulus used. High frequency stimuli (60/sec. or more) usually cause bladder relaxation, low frequency stimuli (3.5/sec.) usually bladder contraction. A reversal of the bladder response is frequently obtained by changing the frequency of the stimulus.

Points yielding excitation and inhibition of the bladder are found scattered throughout the whole preoptic and hypothalamic area but points giving bladder contraction seem to be concentrated in the rostral parts of the diencephalon.

## 15741 P

## Mitotic Activity in Hypophysis of Pregnant Rat after Injections of Estrogen.

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Division of cells by mitosis increases in the hypophysis of young mature rats in the late estrous phase of the sexual cycle.[1] That this is due to the increase in the level of estrogen is shown by the fact that mitoses can be increased by injections of estrogenic hormones.[2] Thus, 25 μg of estradiol benzoate (Progynon-B)* injected into 3-month-old ovariectomized rats 72 and 48 hours before death will result in an average mitotic activity of 22.09 mitoses per square mm of section. During pregnancy, however, even though there is a continued production of estrogenic hormone, mitoses are rare in the hypophysis after the 3rd day.[3] Just what level of estrogen occurs during pregnancy is not known, and it seems possible that either the level is not sufficiently high to cause an increased mitotic activity or that there is some substance that inhibits the mitosis-stimulating effect of the estrogen that is produced.

In order to test this point, a group of 22 pregnant animals approximately 3 months of age were injected with 25 μg of estradiol benzoate, 72 and 48 hours before death. In addition to these, 3 others that did not receive injections were killed on the 13th day of pregnancy to serve as controls. Of the pregnant animals that received injections of estradiol benzoate, 9 were killed on the 6th, 7th or 8th day of pregnancy and 13 on the 12th, 13th, 14th or 15th day. Of those killed early in pregnancy, 3 animals showed evidence that implantation had occurred but in 2 of these abortion had apparently occurred. Those killed later in pregnancy all had living fetuses.

To determine the mitotic activity, all mitotic figures were counted in a 3-micra coronal section of known area from each hypophysis.

The results are summarized in Table I. Animals receiving injections before implantation of ova (Group 1) have an average of 17.33 mitoses per sq mm. This is not significantly different ($P. > .4$) from the results obtained by injecting ovariectomized animals (Group 4),[2] and, as with the latter group, there is a considerable range in mitotic activity. The animal having the lowest count (3.3 mitoses per sq mm) was the only one that showed normal implantation sites.

Animals injected later in pregnancy and killed from the 12th to the 15th day have an average mitotic activity of 4.35 per sq mm (Group 2). Nine of the 13 animals have consistently low counts (average 1.5), the other 4 falling within the range found for

[1] Hunt, T. E., *Anat. Rec.*, 1942, **82**, 263; *Endocrinology*, 1943, **32**, 334.

[2] Hunt, T. E., *Anat. Rec.*, in press.

* The estradiol benzoate (Progynon-B) was kindly furnished by the Schering Corporation, Bloomfield, N.J.

[3] Hunt, T. E., *Anat. Rec.*, 1943, **85**, 32.

TABLE I.
Mitotic Activity in the Hypophysis of Rats.

| Group | | No. | Age, avg and range, days | Mitoses per mm² Mean ± S.E. |
|---|---|---|---|---|
| 1 | Pregnant 6-8 days with estrogen | 9 | 92 (89-93) | 17.33 ± 3.27 |
| 2 | Pregnant 12-15 days with estrogen | 13 | 94 (83-106) | 4.35 ± 1.41 |
| 3 | Pregnant without estrogen | 3 | 95 (94-98) | .72 ± .64 |
| 4 | Ovariectomized with estrogen | 10 | 83 (76-90) | 22.09 ± 5.46 |

the injected ovariectomized Group 4. In comparing Groups 2 and 4, the difference is definitely significant statistically ($P. < .01$).

The 3 animals not receiving injections and killed on the 13th day have an average mitotic activity of .72. This is essentially the same as the low mitotic activity found previously in somewhat older animals after the 3rd day of pregnancy[3] and is also not significantly different from the average found in ovariectomized animals of the same age.[2]

The results show that during pregnancy something is produced that, in most cases, suppresses the mitosis-stimulating effect of estrogen. The fact that the suppression does not occur until after implantation suggests that the placenta produces the inhibiting substance. Since, in some cases, the mitotic activity in the hypophysis is not suppressed, it is necessary to assume either that the inhibiting effect may be overcome or that the cells of the hypophysis are less refractory to mitosis-stimulating substances in some animals.

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## The Use of a Resistance Wire, Strain Gauge Manometer to Measure Intraarterial Pressure.

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For use in measurement of intraarterial pressure in man under ordinary circumstances in the laboratory or clinic, the high frequency. hypodermic manometer developed by Hamilton and his associates[1] has not been excelled in respect to its combination of accuracy and simplicity of operation. In certain unusual situations, however, this manometer is inconvenient to use, because it must be rigidly fixed with respect to the recording camera and records must be made within a few feet of the subject. Attempts to overcome these disadvantages have led to development of means of converting pressure to electrical energy,[2-4] so that arterial blood pressure might be recorded with more freedom at some distance from the subject by means of a galvanometer. The purpose of this paper is to describe the use of a resistance wire, strain gauge pressure transmitter to accomplish electrical translation in measurement of arterial blood pressure.

The strain gauge pressure transmitter*,[5] consists of a balanced Wheatstone bridge

[1] Hamilton, W. F., Brewer, G., and Brotman, I., *Am. J. Physiol.*, 1934, **107**, 427.

[2] Rein, H., *Arch. f. d. ges. Physiol.*, 1940, **243**, 329.

[3] Hampel, A., *Arch. f. d. ges. Physiol.*, 1940, **224**, 171.

[4] Lilly, J. C., *Rev. Scient. Instruments*, 1942, **13**, 34.

* Manufactured by Statham Laboratories, 8222 Beverly Blvd., Los Angeles, Calif.

[5] Meyer, R. D., *Instruments*, 1946, **19**, No. 3.