more gently and flattened out at one-half to two-thirds the heights of similar curves for normal non-hypophysectomized controls.

The sexual development and history of the grafted females were similar in all groups regardless of the source of the transplanted tissue. Vaginal smears and exploratory examinations of the ovaries established the fact that typical cyclic oestrous phenomena occurred. The cycles in different animals varied in length from 4 to 14 days, the majority having a 5- to 7-day rhythm. The elongated cycles were due in every instance to a prolonged dioestrous interval. Ovulation was spontaneous and the resultant corpora lutea appeared normal. Thirteen pregnancies were recorded, 8 occurring among the females bearing male pituitaries. Living young were delivered at term and lactation was normal.

Females bearing a single newborn male rat pituitary grew very slowly and never became sexually mature while 5 such pituitaries per host proved very effective.

Reproductive function was sustained in males by grafts of either male or female anterior lobe tissue in the sellae, thus confirming the observation of Hill and Gardner,[8] who found that pituitary tissue of the female mouse grafted into the testis of a male would maintain the male system.

8782 C

Influence of Potassium and Calcium on Motor Discharges.

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Physico-chemical factors within neurones must be important in controlling their activity, both spontaneous and evoked. Impinging nerve impulses are the main secondary control in the latter case; the condition of the fluid milieu of the cells in the former. The prolonged motor discharges which give maintained rebound postures following stimulation of the deep cerebellar nuclei[1] are a favorable case of evoked activity grading slowly into spontaneous activity. Since K+ and Ca++ are able respectively to increase and decrease potentials in the brain,[2] these ions were tested for effects on inten-

[1] Magoun and Hare, *Am. J. Physiol.*, 1936, **116** (in press).

[2] Gerard and Dubner, *Arch. of Neurol.*, 1936, **36** (in press).

sity and duration of the motor sequelae of cerebellar stimulation.

A stimulating electrode was placed by the Horsley-Clark instrument in the nucleus fastigius of cats under light nembutal anesthesia. A stimulus was chosen to give a good, but not maximal response. During stimulation (up to 3 sec.) the crossed foreleg is flexed at the elbow; to pass into strong extension on cessation of the stimulus. This after-extension was timed and its intensity judged semiquantitatively by feel. After several repetitions had yielded constant times, 1 or 2 cc. of isotonic KCl, $CaCl_2$ or Na citrate were injected into the carotid artery and observations continued within 30 seconds. In each of 3 tests with K, responses were prolonged beyond those earlier or later by an average of 230%. (The first 3 responses in each series are averaged.) Likewise, Ca++ consistently decreased response duration on the average by

TABLE I.

Condition	Duration of Extension (sec.)
Before injection	5.5, 4.5, 4.5, 4.2
KCl—2 cc.	10.5, 11.5, 16.5, 8.0, 5.5, 3.5, 3.5
15 min. later	6.8, 5.0, 4.4, 4.2, 4.2
KCl—2 cc.	13.7, 13.3, 13.0, 6.0, 6.5, 6.0, 6.0
5 min. later	4.0, 5.0, 3.8
15 " "	5.0, 3.5, 3.8
Before Ca	23.5, 15.0, 20.0 — — —
$CaCl_2$—2 cc.	10.0, 10.8, 8.5 — — —
10 min. later	16.0, 18.5, 18.0 — — —

	——Aver. responses——	
	Exp. I	Exp. II
Control (before and after)	5.2	24.5
Calcium	2.9	13.0
Control	4.9	17.4
Potassium	13.1	25.2
Control	6.3	16.6
Citrate	8.3	17.9

51%. Sodium citrate increased durations 10 to 20%. Intensity fairly paralleled duration, being increased with K+ and decreased with Ca++.

In any series of tests under "control" conditions the first 1 or 2 responses, after a rest, may be shorter than later ones; and still later responses are again shorter. After salt injections, in each case the third test, about 1 minute after the injection, gave the extreme value—longest after K or citrate, shortest after Ca. Table I gives 2 single series and averages.