

fistula animals. At any rate it seems to be strongly indicated that fecal lipids do not necessarily enter the intestine by way of the bile.

3134

A preliminary study of conditioned motor reflexes in thyroidectomized sheep.

HOWARD S. LIDDELL* and ETHEL D. SIMPSON.

[*From the Department of Physiology, Cornell University Medical College, Ithaca, N. Y.*]

The investigation of habit formation in thyroidectomized sheep and goats by the maze method has yielded results difficult to analyze because of the complicated responses elicited. The conditioned motor reflex method of Bekhterev has, therefore, been adopted.

In a preliminary experiment a conditioned reflex to a tactile stimulus was established in three animals, two thyroidectomized sheep, aged three and four years respectively, and the twin control of the three year cretin. Tactile stimuli were applied to a spot on the rump, at the rate of thirty per minute, for periods varying from two to ten seconds. With the final stimulus, a faradic current was applied to the left foreleg of sufficient intensity to evoke a defensive movement. The first definite leg movement, in response to the tactile stimulus alone, occurred at the tenth combination in the control and in the three year cretin, and at the seventeenth combination in the older cretin. At the end of the ninth day and forty-fifth combination, one milligram of thyroxin was administered to each thyroidectomized animal. In spite of this, one and one half months later the younger cretin died and the training of the other animals was then discontinued, after two hundred thirty-eight combinations of conditioned and unconditioned stimuli.

After an interval of six and one half months the tactile stimulus without reenforcement evoked a vigorous conditioned reflex in both normal and cretin sheep. This is shown in Fig. 1, the

* National Research Fellow in the Biological Sciences.

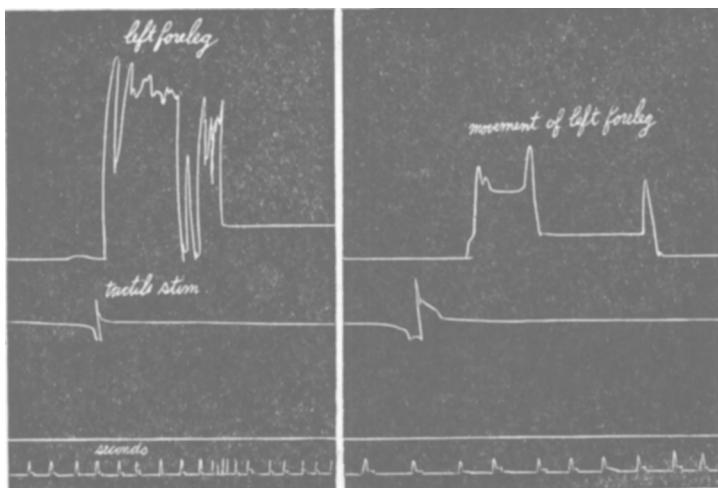


FIG. 1.

tracing from the cretin appearing at the left. Continued tactile stimulation without application of the faradic current soon elicited a less extensive response (see Fig. 2) and finally, after one hundred nine periods of stimulation, distributed over sixteen days, the conditioned reflex failed to appear in either animal on the seventeenth day. This preliminary experiment, therefore, fails to demonstrate any influence of thyroidectomy on the formation, perseveration, or extinction of the conditioned motor

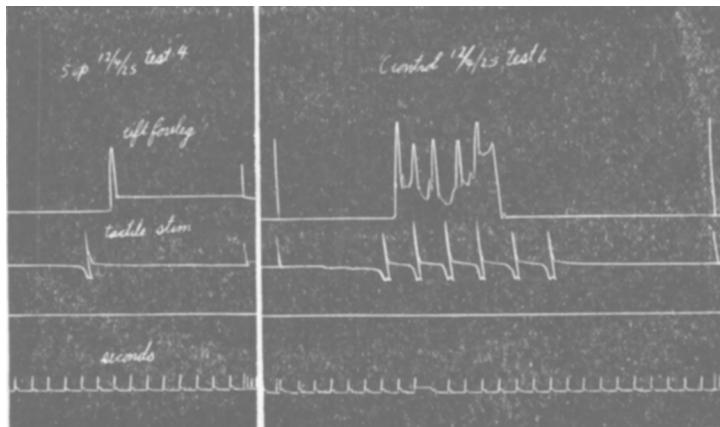


FIG. 2.

reflex of the simultaneous type. It has been shown, however, that during periods of extreme lethargy in the cretin sheep this reflex is weakened.¹

The suggestion was made¹ that the weakened muscles of the cretin might initiate defective proprioceptive impulses and thus influence behavior in escaping from the maze. The repeated movements of the cretin's foreleg in response to the conditioned tactile stimulus (Fig. 1, at the left) which are believed to be conditioned reflexes to proprioceptive stimuli of secondary origin² indicate normal functioning of the proprioceptors in the thyroid-ectomized sheep.

3135

The effect of diphtheria toxin on the adrenals.*

FRANK A. HARTMAN and J. J. MACDONALD.

[*From the Department of Physiology, University of Buffalo, Buffalo, N. Y.*]

The adrenals are remarkably susceptible to diphtheria toxin. Elliott¹ found that a sufficient dose of diphtheria toxin to produce death within seventy hours after injection usually caused a marked depletion of the epinephrin content of an adrenal with an intact nerve supply.

We have attempted to show an increased output of epinephrin after the injection of diphtheria toxin by means of the deganglionated iris (superior cervical ganglion, removed at least a week before the test). Diphtheria toxin ranging from 0.0005 cc. per kilo to 0.0119 cc. per kilo was injected intraperitoneally into fourteen cats. This was usually given in one injection.

The size of the pupil (as compared to the control), the rectal temperature and heart rate were determined at intervals after the injection.

¹ Liddell, H. S., *Am. J. Physiol.*, 1926, lxxv, 579.

² Beritoff, J. S., *Brain*, 1924, xxvii, 360.

* Aided by a grant from the Elizabeth Thompson Science Fund.

¹ Elliott, T. R., *J. Physiol.*, 1912, xliv, 374.