period of metamorphosis. Of these the control showed hind legs two months after the operation and the other had not developed legs four months after the operation.

Serial sections were made of eight experimental frog larvæ. The operation was seen to have prevented development of the thyroid gland in all but one case. The hypophysis as compared with that of the controls showed no changes in size or structure to be attributed to loss of the thyroid gland.

Among the *Amblystoma* larvæ none developed abnormal gills. The average growth rate of the experimental larvæ was less than that of the controls, but of the fourteen which were alive, after three months, the largest had had the thyroid removed. In none of the thirteen operated animals that were sectioned was there any regeneration of the thyroid. There were no changes in the hypophysis nor in the pigmentation of the skin following the thyroidectomy during the three months in which the operated larvæ were under observation.

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The effect of decerebration upon the quick component of labyrinthine nystagmus.

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The effects of decerebration have been variously held to show (1) that the central cells of certain reflex mechanisms are located in certain definite regions or levels of the central nervous system. and (2) that certain other reflex mechanisms do not have their central representation in the same regions or in other regions, There has been little consistency in drawing conclusions from the results of decerebration, and frequently other considerations have entered into the matter to such an extent as to outweight the experimental results of decerebration. In addition, the experimental results as reported by various investigators are not in agreement, and one notices a lack of post-mortem reports as to the extent to which destructive hemorrhages have burrowed downward from the level of transection of the brain stem, or on other conditions which may affect the interpretation of the results. And the procedure itself is supposed to produce shock through its great trauma or not to produce shock, according to the demands of the hypothesis which is to be sustained. Sherrington's[1] statement that trauma qua trauma has little or nothing to do with the onset of shock is frequently overlooked.

The various reflex mechanisms associated with the eye have been investigated largely in decerebrated animals. Mayo[2] decerebrated a pigeon leaving the optic tubercles and the crura cerebri, and then cut below the medulla oblongata. The optic and the third nerves were left intact within the cranium. On pinching the central end of the stump of the optic nerve of one side, the iris contracted. Mayo states that contraction of the pupil could be obtained immediately after decapitation—a violent surgical procedure. The conjunctival reflex in the rabbit seems to involve the myelencephalon as well as the metencephalon.[3] It persists unaffected by shock, when transection is made in front of the pons.

The slow deviation of the eyes in response to stimulation of the otic labyrinth persists after decerebration and after splitting the entire metencephalon in the mid line, but the quick component of nystagmus—the quick jerk of the eyes back to the mid line or to the line of vision—is abolished. Removal of one cerebral hemisphere abolishes the quick movement when the slow movement of the eyes is directed to that side, but does not affect the quick movement when the slow movement of the eyes is directed to the side of the remaining cerebral hemisphere.

In view of the facts that (1) decerebration does not affect the magnitude of the slow movement of the eyes in response to labyrinthine stimulation, (2) removal of one cerebral hemisphere affects the quick movement of the eyes in one direction only, (3) that the quick movement of the eyes is abolished when only the temporal and basal portion of the cerebral hemisphere of one side is re-

[1] Sherrington, "Integrative Action of the Nervous System," New York, 1906, pp. 241–243.

[2] Herbert Mayo, "Anatomical and Physiological Commentaries," London, 1823, Vol. II, pp. 4, 18, 136; cited by Sherrington, Schäfer's "Text Book of Physiology," 1900, Vol. II, p. 812.

[3] Exner, *Archiv für die gesammte Physiologie*, 1874, VIII, p. 530; Schäfer's Text Book of Physiology, 1900, II, p. 892.

moved just as when ablation of the whole hemisphere is made, (4) the natural history of nystagmus, (5) the development of nystagmus in young animals[1] and (6) the known cerebral localization of the motor cells, stimulation of which produces ocular movements, it is probable that the quick component of nystagmus is a reflex response, a part of whose path lies through the cerebral hemispheres. The reasons for invoking shock are not clear.

It is probable also that the quick component of labyrinthine nystagmus has no necessary connection with the labyrinth, but that it is a reflex[2] whose afferent impulses arise from stimulation of the afferent endings in the eye muscles.[3] The cortical end stations of fibers from these afferent endings are, as we now believe, in the temporal region. The quick component of nystagmus has developed along with the greater degree of mobility of the eyes, and brings about the return of the eyes to a position such that the original line of vision is restored when they are deflected too far to one side.

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The influence of certain conditions on the rate at which epinephrin is liberated from the adrenals into the blood.

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1. By means of the rabbit intestine and uterus segment tests, we have obtained further evidence that, under our experimental conditions at any rate, the rate of discharge of epinephrin into the blood of the adrenal veins is relatively steady and not easily influenced by such procedures as we have tried; for example, stimulation of the afferent fibers in large peripheral nerves (sciatic and brachial) or asphyxia. This is not because the discharge is already maximal owing to the necessary conditions of the experi-

[1] Prince, *American Journal of Physiology*, 1917, XIII, p. 308.

[2] Wilson and Pike, International Congress of Medicine, London, 1913, Section XLV, p. 563.

[3] Tozer and Sherrington, Proceedings Royal Society, London, B, LXXXII, 1910, p. 450.