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IV. Irregular Respiration, and the Response of Tibialis Muscle to Reflex and Direct Motor Stimulation.

HAROLD H. GAY. (Introduced by Robert Gesell.)

From the Department of Physiology, University of Michigan.

In the course of the series on reflex response of the tibialis anterior muscle several animals were found in which the respiration was very irregular. There were periods of hyperpnea followed by varying periods of apnea. In 3 experiments in which periodicity occurred during the administration of room air, hyperpnea was accompanied by increased reflex response and apnea, especially when profound and long continued, by periods of reduction or total disappearance of reflex response. In one experiment periodicity occurred during both the administration of room air and of 7% oxygen in nitrogen. The effect here was the same as in the 3 experiments above. In another, irregular respiration occurred while the animal was breathing room air and while breathing pure oxygen. Again the results were the same. The response of the muscle to direct motor nerve stimulation was similar to the reflex response of the opposite muscle.

From these and the preceding experiments it seems probable that there is no single point in the system which can be said to control the response of the anterior tibialis muscle to sensory stimulation. The evidence seems, rather, to suggest that the response may be the result of a number of factors which may vary individually. On the whole, with the exception of carbon dioxide, the reflex response and the response of the tibialis muscle to direct motor nerve stimulation varied roughly with the magnitude of respiratory movements.

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Cerebral, Head and Body Flow of Blood During Periodic Ventilation.

PAUL O. GREELEY AND CHARLES E. GREELEY.
(Introduced by Robert Gesell.)

From the Department of Physiology, University of Michigan.

Periodic ventilation was produced in dogs under morphine-urethane anesthesia by (a) increased intracranial tension and (b) blocking of cerebral arteries. Practically complete control of head