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Electrical stimulation and CO_2 production in nervous tissue.

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With his barium carbonate precipitation method, Tashiro[1] found that the CO_2 output of a frog's nerve more than doubled when stimulated with induction shocks for 10 minutes. In order to avoid certain objections to Tashiro's method, viz., heating effect of the current,[2] and death changes due to the drying of the tissue, the indicator method previously described[3] has been employed. This method permits the tissue to be frequently or even continuously bathed with the Ringer's solution during the experiment. Stimulation was obtained by means of platinum electrodes passed through the cork closing the test-tube, and bent in the form of hooks so that they served as holders. The secondary coil of the Harvard inductorium stood at 12.

Small strips of the sartorius muscle of the frog served as controls. During stimulation with the tetanizing current such a strip was allowed to contract isotonically. In this condition the muscle showed no increase in the rate of CO_2 production, but upon relaxation, immediately following stimulation, the rate was approximately doubled. With sciatic nerves and the medulla, however, it was not found possible to produce any significant change in CO_2 production of the tissue with 1–2 minutes stimulation.

[1] Tashiro, S., "A Chemical Sign of Life," Chicago, 1917, p. 38.

[2] Lucas, K., "The Conduction of the Nervous Impulse," London, 1917, p. 26.

[3] Moore, A. R., PROC. SOC. EXP. BIOL. AND MED., vol. 16, pp. 35–39, 1918.