cnemius and the sciatic plexus was stimulated at about one minute intervals by two consecutive shocks (make and break) from an induction current.

In agreement with the above mentioned statements, we found that sodium chloride reduces indirect (curare-like action) and reduces moderately also direct (Poljakoff) irritability. Both are promptly restored by the addition of a small dose of calcium. As a new fact we may mention that the irritability is more readily abolished in cooled frogs.

Although calcium *restores* indirect irritability when abolished by sodium, it *abolishes* indirect irritability when injected primarily. The dose necessary is considerably smaller than that of sodium for the same effect. Again, the indirect irritability thus abolished by primary infusion of calcium can be restored by sodium of which, however, a larger dose is required than of calcium in a secondary injection for a similar purpose.

Calcium also reduces or abolishes direct irritability, which again can be restored by sodium. The loss of indirect and direct irritability by calcium is not exactly parallel. Cooling seems to favor the effects also of calcium.

In these experiments neither sodium nor calcium exclusively increased or decreased the irritability. Both depressed in primary infusion and were mutually antagonistic in secondary infusions.

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The effects of local applications of chloride and sulphate of magnesium upon the centers in the medulla compared with those of sodium chloride.

By **J. AUER** and **S. J. MELTZER.**

[*From the Department of Physiology and Pharmacology of the Rockefeller Institute for Medical Research.*]

The three salts were applied in molecular solutions to the exposed medulla oblongata of rabbits. Both salts of magnesium abolished sooner or later all the functions depending upon the centers located in the medulla, the average time until a complete effect took place being fifteen minutes. Respiration stopped and

blood-pressure came down to forty or thirty millimeters of mercury and sometimes even lower. Strong stimulations of the sciatic nerve had now no effect upon blood-pressure. After curarin and strychnin were given stimulation of the sciatic caused some rise (spinal centers). Electric stimulation of the superior laryngeal nerves or mechanical stimulation of the pharynx caused no deglutition. Injection of fluid into the œsophagus caused no contraction of that organ (no secondary peristalsis). Intravenous injection or local application of calcium did not restore these functions. In a few cases spontaneous respiration returned after a few hours of continuous artificial respiration.

Sodium chloride had no depressing effect; on the contrary, there was a moderate stimulating effect upon the respiration and blood-pressure. There was a strikingly stimulating effect upon the center of deglutition; for eight or ten minutes the animal had to swallow every ten or fifteen seconds.

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Respiration by continuous intrapulmonary pressure without the aid of muscular action.

By **J. AUER** and **S. J. MELTZER.**

[*From the Department of Physiology and Pharmacology of the Rockefeller Institute for Medical Research.*]

Investigations of the nature of the mechanism which keeps up the respiration in the underpressure and overpressure methods of Sauerbruch and of Brauer led to the discovery that the respiration can be kept up for hours by a continuous stream of air equal to fifteen or twenty millimeters of mercury without the aid of any muscular action. The only requirement is that the air stream must reach at least the bifurcation. If the air is introduced simply through a tracheal cannula, as in the Brauer method, and curare is given, the animal dies in a few minutes. Our object was attained in three ways. In one method a slit was made in the trachea and a glass tube, filling out about two thirds of the trachea was introduced to the tracheal bifurcation or even a short distance into the right bronchus. Air entered through this tube and returned through the slit in the trachea and through the