

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.**

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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

mouth and nose. In the second method a short tracheal cannula was tightly ligated into the upper part of the trachea and a narrow tube was introduced through a small slit in the lower part of the trachea into the right bronchus. The air entered through the tracheal cannula and had to reach the lower end of the glass tube before it could make its exit. Finally in a third method a long O'Dwyer tube bent at right angles was introduced into the larynx, the pharynx and mouth were packed with gauze, and a long soft rubber catheter was introduced through the O'Dwyer tube deep into the trachea so that its lower end reached the bifurcation. By means of a T-tube the air entered through the O'Dwyer tube into the trachea and had no other escape than through the side openings at the lower end of the catheter (the air passed through an ether bottle; the animals also received morphin). By any of these methods the animals (dogs and rabbits) continued to live for a long time after their muscular action was completely eliminated by curare. The thorax was wide open in most of the experiments and the widely distended lungs showed only the vibrations due to the heart beats. In many cases the lungs lost their pink color. Opening the ether bottle for a second or two permitted a momentary collapse of the lungs and in an instant they again looked pink.

Besides the principle which is demonstrated by this new observation and the possibility of its practical application, it offers a very convenient method for the study of the heart movements without any interference from the respiratory movements.

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**Note on the production of kidney insufficiency by reduction of the arterial circulation of the kidney.**

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In order to obtain an insufficiency of the renal functions, I attempted to find a method simpler and more practical than the reduction of renal substance used by Tuffier, Bradford, Pearce and others. This new method consists of reducing the renal circula-