procedures without removal of the gland. There was no effect on the carbon dioxide output.

In case 1 there was a distinct lowering of the carbon dioxide output, and a low level was established which persisted for sixteen days after the operation. At the end of this time the animal, which had previously been retaining nitrogen, was again in nitrogen equilibrium. On autopsy, an increase in fat and atrophy of the ovaries was observed. The weight of the animal had increased.

In case 2 there was a lowered carbon dioxide output, although marked emaciation followed the operation.

Case 3 lived but 48 hours after the operation. A respiration experiment was performed 24 hours after hypophysectomy. There was a markedly decreased carbon dioxide output, and an unusually low nitrogen output for the same period.

The apparatus used in these experiments was a modified Pettenkofer-Voit. The periods used for the determinations were six hours.

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The influence of calcium and of sodium in M/10 solution upon the conductivity in nerve trunks.

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In a previous communication before this Society[1] we reported that calcium chloride in an *M*/10 solution is capable of reducing or completely abolishing the direct and indirect irritability of frog muscles. The reduction or abolition is reversible; sodium chloride restores rapidly the lost irritability. It was further found that the primary action of calcium does not affect both forms of irritability in an equal manner; in a number of cases, especially under certain conditions of temperature and season, a comparatively small amount of calcium solution abolished completely the indirect irritability (from the nerve) while the direct muscle irritability still persisted in nearly its original intensity. From these experiments we concluded, among other things, that calcium af-

[1] Joseph and Meltzer, PROCEED. OF THE SOC. FOR EXPER. BIOL. AND MEDICINE, vol. vi, p. 104, 1909.

fects the motor nerve endings more readily than the muscle tissue; in other words, *calcium, like sodium, potassium, and magnesium exerts a curare-like action upon the motor nerve endings.* However, there was one link missing in the evidence in favor of the conclusion mentioned. The abolition of the indirect irritability might be due to the action of calcium upon the nerve trunk, and not upon the nerve ending. We have therefore studied the action of calcium chloride upon the nerve trunk in a short series of experiments. The results of this study form the subject of our present communication.

In our former studies the calcium solution was administered to the muscle by intravascular perfusion. For our present study bathing of the nerve in the solution was the method which had to be employed. A very small cup made of a section of glass tubing was filled with this solution, into which a loop of the sciatic nerve was immersed and kept down by a small pledget of absorbent cotton saturated with the same solution. The brim of the cup was slightly covered with vaseline to prevent the overflow of the solution. The section of the sciatic nerve between the cup and the gastrocnemius muscle was covered with a pledget of cotton saturated with Ringer. The same was the case with the lumbar plexus which was used for stimulation and kept on an appropriate electrode. The graphic registration of the contractions of the gastrocnemius muscle were obtained in the usual manner. The drum was turned by hand at arbitrary intervals. The stimulations were accomplished by single induction shocks (break) which at the beginning of the test gave a maximal contraction. Every few minutes the effect of a stimulation of the lumbar plexus was tested, comparing it sometimes with the effect of a similar stimulation of the part of the sciatic nerve peripheral to the cup.

In every experiment both legs were used at the same time: one for testing the effect of an $M/10$ calcium chloride solution and the other to study the action of an $M/10$ sodium chloride solution. Only the effect upon the conductivity was studied; the loop was never taken out of the cup to test also the effect of the solutions upon the irritability.

Ten experiments were made, nine of which gave the following uniform results which we shall state very briefly.

Primary action of calcium chloride.—In every experiment a time came when the conductivity of the nerve trunk became finally abolished; stimulation of the lumbar plexus gave no reaction, while stimulation of the distal part of the sciatic nerve brought out a good response. This, however, occurred only after prolonged bathing. Ninety minutes was the shortest period; in some cases it took 150 minutes and longer before all response from the lumbar plexus disappeared.

This result bears out our original conclusion. In our former experiments the indirect irritability disappeared after a few minutes exposure to the action of the calcium chloride. This could not have been due to the action of the calcium solution upon the nerve trunk since calcium is able to produce abolition of conductivity only after hours of bathing.

Reversible; restored by sodium chloride.—In every experiment the vanished conductivity came back after replacing the calcium solution by an *M*/10 solution of sodium chloride. The conductivity returned in a comparatively short time, probably in less than 15 minutes. After recovery, the lumbar plexus responded in a manner similar to that of the distal part of the sciatic nerve, which after several hours of exposure to the abnormal surroundings usually lost somewhat of its original irritability.

Primary action of sodium chloride.—It has been established already by Locke, and by Overton, that physiological salt solution does not affect the conductivity of the nerve trunk. Our experiments simply confirm these statements. After many hours of bathing of the nerve in an *M*/10 sodium chloride solution the lumbar plexus lost indeed some of its original irritability; but the loss was not greater than that of the distal section of the sciatic nerve which was kept covered throughout the experiment with cotton saturated in Ringer. We ought to add that the temperature of the laboratory during the period in which the experiments were carried out (November) was by no means low.