munication,[1] together with the CO_2 combining power according to the Van Slyke method. An increase in the diastatic activity with a parallel rise in the blood sugar was observed. The anesthesia was also found to produce a decrease in the alkaline reserve of the blood as shown by the CO_2 combining power.

A number of patients showing mild or severe hyperglycemia and increased diastatic activity of the blood received 20 to 30 grams of sodium bicarbonate by mouth per day. Changes in the diastatic activity, the blood sugar and CO_2 combining power of the blood were followed for some time. The results show that as the alkali reserve increased with the alkali therapy, the activity of the diastase declined, accompanied by a proportionate fall in the blood sugar content.

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Acid development as the result of injury in nervous tissue.

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It was found possible to demonstrate the presence of acid in nervous tissue by the use of phenolsulphonephthalein as an indicator. The latter was employed in a 0.2 per cent. solution in Ringer's fluid, made slightly alkaline by the addition of one part of $M/15$ Na_2HPO_4 to four parts Ringer. Pieces of nervous tissue immersed in this solution take up sufficient dye in thirty minutes to show a striking reaction. In order to observe the reaction in brain substance, the brain of a frog was exposed by the removal of the roof of the skull, and the entire head immersed in the solution of phenolsulphonephthalein. When the preparation was examined thirty minutes later, the injured parts of the brain were bright yellow, indicating an acidity at least equivalent to PH = 6.5. The uninjured parts remained pink, but subsequent injury to them brought about the yellow coloration in a few seconds.

In similar fashion nerve trunks may be stained. The un-

[1] Killian and Myers: these Proceedings, 1916, XIV, 32; also Myers and Killian Jour. Biol. Chem , 1917, XXIX, 179.

injured parts are pink, but crushed areas and the cut ends are yellow. Microscopic examination showed the yellow color to be located in the fibers near the point of injury. If a nerve be crushed at a point previously uninjured, the development of acidity is shown at once by the change in color from pink to yellow. Stimulation of the nerve for five minutes with induction shocks causes the acid reaction to develop between the electrodes. Previous treatment with chloroform does not interfere with the reaction, but heating to 50° C. in physiological salt solution inhibits it. Killing the nerve with chloroform or by high temperatures does not cause the development of acid.

Assuming that the acid in question is either lactic or carbonic, it is possible to show that it is the latter. For this purpose, a method similar to that described by Haas[1] was used. Each tube contained 3 c.c. Ringer's solution, to which were added three drops of a 0.01 per cent. solution of the indicator. Carbon dioxide was completely driven out by aërating with carbon-dioxide-free air. The value of PH = 8.0. The tissue to be tested was put into the tube, the latter closed by clamping the short piece of rubber tube covering the end. The preparation was inverted for an instant, righted, placed in the colorimeter and a reading immediately taken. This reading is designated "start." Each subsequent reading was made in the same way. When a considerable amount of acid had been formed the tissue was removed and the solution aërated for thirty minutes with carbon-dioxide-free air. At the end of this time, in the case of nervous tissue, the H ion concentration had returned to the initial value, viz.: PH = 8.0. A piece of muscle run as a control gave off both lactic and carbonic acid, as shown by the fact that it was impossible to reduce the PH value to 8.0. These points are shown in the table, giving a set of measurements from the tissues of the same animal.

TABLE.

Brain, 72 Mg.	Sciatic Nerve, 87 Mg.	Sartorius Muscle, 63 Mg.
Blank.....PH = 8.0	Blank.....PH = 8.0	Blank.....PH = 8.0
Start.....PH = 7.8	Start.....PH = 7.8	Start.....PH = 7.8
10 min.....PH = 6.8	10 min.....PH = 7.35	10 min.....PH = 7.15
Aërated.....PH = 8.0	Aërated.....PH = 8.0	Aërated....PH = 7.6

[1] Haas, A. R., *Science*, N. S., Vol. 44, pp. 105–108, 1916.