

carbonate is also added to the tube containing the acid mixture. After heating for 30 minutes the color in each tube has reached its maximum and they are allowed to cool. The contents of the tubes are diluted to a suitable volume and matched against a standard solution in a colorimeter. The readings for the tube which was alkaline at the beginning of the heating represents the glucose and fructose and the other tube represents these sugars plus the invert sugar from the sucrose.

When this method is applied to solids or semisolids, such as mashed fruit pulps, 1-10 grams are taken and triturated in a mortar with 100 c.c. water including the moisture of the sample and a clear liquid obtained by filtering or centrifuging.

Picric acid may also be used as the inverting agent in the determination of cane sugar by polarizing. The picric acid has no influence on the rotation of the polarized light and in many instances it acts as a clarifier and as a remover of soluble proteins. In practice it is well to add the picric acid in the form of a saturated solution, either one or two parts to each part of sugar solution to be determined, and to heat not more than twenty minutes in the boiling water bath. Glucose and fructose are both stable under these conditions.

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The influence of anesthesia and alkali therapy on the diastatic activity and sugar of human blood.

By **JOHN A. KILLIAN** (by invitation).

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To study the effect of general anesthesia, produced by ether or chloroform, on the activity of the diastase and the sugar content of human blood, samples of blood were obtained from patients in the surgical service of the hospital, 12-24 hours before operation. A second sample of blood was drawn immediately after the operation, while the patient was still under the anesthetic. Determinations of the sugar content and diastatic activity, were made in these two specimens as described in an earlier com-

munication,¹ together with the CO₂ 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 CO₂ 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 CO₂ 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.

119 (1297)

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 $M/15$ Na₂HPO₄ 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.