

SODIUM AND POTASSIUM CARBONATE.

The following extract from my notes shows the opposing action of these two agents :

"Fish prepared as usual. 10.15 A.M.—Sod. Carb. in solution of 5 per cent. applied. Rhythm at once gets very rapid ; diastole of ventricle very short and imperfect ; auricle proper arrested.

10.25.—Auricle has recovered, and leads the rhythm of the ventricle.

10.30.—Pot. Carb. in solution of 5 per cent applied ; (1) Auricle at once arrested ; (2) Ventricular beat enfeebled. (This preceded by an increased rhythm.) Later, auricle begins and then again stops ; an independent rhythm of auricle and ventricle.

10.36.—Rhythm of auricle 40, but weak ; rhythm of ventricle 25, and also weak."

Sod. Carb. and Pot. Carb. were alternately applied in this case several times, always producing decidedly opposite effects.

Summary of the results of the action of Sodium Carbonate and Potassium Carbonate.

Sod. Carb. and Pot. Carb. are antagonistic in action on the fish's heart ; the former quickens rhythm and diminishes diastolic relaxation, and heightens cardiac excitability, but is in this respect inferior to Atropin. Potassium Carbonate diminishes excitability, weakens the heart's action, and tends to arrest it in diastole. This agent seems to be a poison to the fish's heart.

LACTIC ACID.

In 5 per cent. solution, this acid proves a speedy poison. Its effects in 1 per cent. solution will be clear from the following extract from my notes :

Exp.—R. 56. Lactic acid 1 per cent. freely applied.

Its effects :

- (1) Slows rhythm.
- (2) Auricle affected before ventricle.
- (3) In ten minutes, whole heart arrested in well-marked diastole.
- (4) The heart cannot be excited to action by mechanical means (prick with seeker). Neither Acetate of Strychnia in 1 per cent. solution, nor Digitalin applied in the usual manner, cause any improvement.

It is thus seen that lactic acid in 5 per cent. solution is a rapid poison, while in solution of 1 per cent. it depresses the heart and gradually kills it in diastole.