

2. The injection of sodium phosphate (Na_2HPO_4) (800 c.c. of a $\frac{1}{2}$ molecular solution representing 28.5 gm. of the salt) into an animal of 11 kg. did not produce an alkalosis or increase the buffer values, whereas the injection of 750 c.c. of a $\frac{1}{2}$ molecular mixture of disodium phosphate (Na_2HPO_4) and acid potassium phosphate (KH_2PO_4) at pH 7.0 into a dog weighing 6.65 kg. produced a mild acidosis without appreciable change in buffer values.

3. The intravenous injection of 300 c.c. of a phosphate mixture at pH 7.4, together with 300 c.c. of a 4 per cent. solution of sodium bicarbonate in the case of a man dying in uremic coma, caused a change in the pH of the blood from 7.35 to 7.55, and increased the buffer for alkali but not for acid. There was no change in the clinical condition of the patient, who died two hours later.

Buffer Values in Experimental Acidosis and Alkalosis. (Tables 10 and 11). It is seen from Experiment 1 that in the acidosis produced by the intravenous injection of an inorganic acid (hydrochloric acid) the buffer values may remain practically normal, although there is a decided lowering of the alveolar carbon dioxide and a marked increase in the pH of the blood. This is in accord with what is sometimes found in the acidosis of chronic nephritis with uremia and in that of diabetes (Table 6, Cases 4 to 9, inclusive). After injection of alkali to overcome the acidosis, there is a transient diminution in the buffer for alkali, followed by a prompt return to normal values as the pH of the blood is lowered.

In experimental alkalosis the buffer for acid is first diminished. The alveolar carbon dioxide rises to unusually high figures—63.7 mm. in this animal. After injection of sufficient hydrochloric acid to overcome the alkalosis and produce a mild acidosis with lowered alveolar carbon dioxide tension, the buffer for both acid and alkali is lowered.

In the instance of mercuric chlorid poisoning (Case 4, Table 4), in which the patient received large doses of sodium bicarbonate both by mouth and intravenously, a similar condition of alkalosis was produced, though here the buffer values remained normal at this stage of the disease, and the alveolar carbon dioxide tension was still low—33.0 mm. of mercury.

SUMMARY

1. A simple method is described for determining quantitatively the buffer value of the blood. It consists in adding increasing amounts of fiftieth normal hydrochloric acid and fiftieth-normal sodium hydroxid solution to equal quantities of blood and observing the resulting changes in hydrogen-ion concentration by means of the dialysis-indicator method.