

From this it follows that removal or reversal by means of cyanide, ether and chloroform, of the electrical polarity of the stem as a whole does not necessarily involve a reversal of the direction of the P.D. across the ecto-endoderm but merely an unequal decrease in its P.D. at apical and basal ends.

Alcock¹ and recently Csillag² have shown that the P.D. in the frog's skin can be reversibly decreased with suitable concentrations of ether and chloroform applied to both sides of the skin. Experiments by the writer show that cyanide also decreases reversibly this P.D. But in no case has a reversal in the direction of P.D. across the skin been obtained.

2908

An improved portable calorimeter.

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The apparatus consists of a six liter spirometer with recording drum, showing liters on the ordinate and minutes on the abscissa. Below the spirometer is a six liter glass museum jar, which in operation contains one liter of 0.1 M $\text{Ba}(\text{OH})_2$ solution, containing about 0.1 mol of BaCl_2 and 0.1 gm. phenolphthalein, and a motor-driven centrifugal pump which sprays this solution through the air in the jar at a very rapid rate. A single motor drives the pump and the recording drum.

The apparatus is filled with oxygen at the start and a mask is attached over the patient's face, one tube from which leads down into the jar below the surface of the solution; a second tube leads from the spirometer through a valve and T-tube to the mask, and a third tube passes from the jar into the spirometer to complete the closed circuit. The motor is started, writing a base line on the drum. The mask is attached to the patient's face, leaving the

¹ Alcock, N. H., *Proc. Roy. Soc., Ser. B.*, 1906, lxxvii, 159.

² Csillag, E., *Arch. f. Exp. Path. Pharm.*, 1924, ci, 296.

T-tube open so that there is free communication with the outside. At the end of an expiration, a stopper is quickly inserted into the T-tube, and at the moment the phenolphthalein is decolorized, this stopper is removed. Two and four-tenths liters of CO_2 are exhaled during the period and the oxygen is calculated from the record on the drum in the usual manner, using the temperature of the water in the spirometer as the oxygen temperature. The vapor tension of the water is subtracted from the barometric pressure. The advantage of the apparatus over the other portable calorimeters is that the respiratory quotient is determined.

2909

The dissociation constants of some indicators for the determination of the pH by the Duboscq colorimeter.

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Indicator	pH at half color	Dissociation constant
4-6-dinitro-guaiaacol	3.4	4×10^{-4}
Pinacyanol	3.7	2×10^{-4}
Ortho-chrom-T	6.7	2×10^{-7}
1-3-5-trinitrobenzene	12.8	1.6×10^{-13}

Dnitro-benzoylene-urea showed two dissociation constants and was therefore unsuitable. One of these dissociation constants was about 10^{-12} .