Phosphorus. The inorganic phosphorus of the serum shows a gradual rise with the onset of symptoms but the rise is most rapid in the later stages. This increase in phosphoric acid is not sufficient, however, to account for the degree of acidosis. Other non-volatile acids undoubtedly play an important rôle. The data obtained from an extensive series of dogs clearly indicate that the cause of death following adrenal removal is acid intoxication, which appears to be due, in part at least, to failure of the kidney to eliminate certain of the acid end products of normal metabolism.

Table I shows data on four typical cases and is an attempt to correlate the corresponding deviations of the CO_2 capacity, pH, blood sugar and phosphorus with the visible characteristic symptoms.

This is a preliminary report.

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Colorimetric Estimation of Hydrogen Ion Concentration of Blood.

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Recently Myers, Schmitz and Booher[1] described a simple micro-colorimetric technique of estimating the hydrogen ion concentration of the blood plasma, based upon an adaptation of the colorimetric method of Cullen[2] to the Myers bicolorimeter.[3] The pH readings are obtained on diluted plasma at room temperature and must be corrected to the actual pH of the plasma at body temperature by a constant. This constant includes corrections for dilution, temperature

and protein error. The use of Cullen's factor of 0.22 is made in the following formula:

$$pH_{38}^{\circ} = pH_{t}^{\circ} + 0.01\ (t^{\circ}—20^{\circ}) —0.22.$$

This factor serves very well for normal human plasma. However, recently considerable doubt has arisen as to its applicability to abnormal samples.

Hastings and Sendroy[4] found that the correction used by Cullen for colorimetric determinations performed at room temperature is unnecessary when readings are made with the diluted plasma at body temperature. Austin, Stadie and Robinson[5] find that this is not consistently the case and report considerable variation between the true pH and the colorimetric value of the diluted plasma at 38°.

During the past year we have had the opportunity of studying the variation in the constants in miscellaneous hospital cases, many of whom were receiving alkali. Colorimetric values were obtained on separated plasma, both at room and body temperature, employing the method of Myers, Schmitz and Booher[1] with the introduction of certain modifications. Electrometric determinations on the undiluted separated plasma were made at 38°. Estimation of the CO_2 content was made in every case and wherever possible plasma chloride and total plasma protein figures were obtained.

In 81 samples of plasma the C correction (colorimetric pH at 20° —the electrometric pH at 38°) gives an average value of 0.226 pH. Assuming that 0.22 is correct, 50 per cent of the values are within ±0.02 pH of this value. In two cases there is a maximum deviation of 0.08 pH. The average C correction for dogs plasma in 10 samples is 0.30 pH. With one exception the values come within 0.05 pH of the average value.

The H correction, Austin, Stadie and Robinson (colorimetric pH 38°—electrometric pH 38°) of 41 samples gives an average value of 0.02 pH. The variations are from —0.07 to 0.11 pH. Twenty-two come within ±0.02 pH of the average value.

The average difference between the colorimetric value corrected to 20° and the colorimetric value at 38° of 54 samples is 0.21 pH. The variations are from 0.12 to 0.28 pH. Twenty-six come within ±0.02 pH of the average value.

Owing to the simplicity and rapidity with which colorimetric pH estimations may be made on blood plasma we have felt that this method should be saved, if possible. Although the cases studied do not include a great range of conditions, we believe there is a reason-

ably good agreement with the electrometric values. Details of this work will be reported shortly.

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Some Effects of Ultra Violet Radiation on Hydra.

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In the following experiments an attempt has been made to determine the effects of ultra violet radiation upon Hydra, with respect to (1) physiological difference between species, (2) effects on budding, (3) effects of calcium chloride and magnesium chloride, (4) heat sensitization. All experiments were performed with a Pan Ray Arc lamp with an energy distribution of approximately 15 per cent ultra violet, 59 per cent visable, and 26 per cent infra red, with a total energy equivalent to 1 gm. cal. per sq. cm. per min. at 103 cm.[1] Each organism treated was exposed in a watch-glass containing five centimeters of pond water, placed sixty centimeters from the arc. The total energy of the arc at this distance is 2.94 gm. cal. per sq. cm. per min. The temperature for each experiment was determined by immersing the thermometer in the watch-glass. For the heat sensitization experiments the water in the watch-glass was kept at a temperature which varied no more than 0.5° C. by the use of an electric fan.

Experiment I. Physiological difference between species: (A) Three species of Hydra were used: (a) *H. viridis,* (b) *H. fusca,* (c) *H. dioecia.* Six series of 6 specimens each were employed for the series of tests, making a total of 108 Hydra. Series 1 was left in pond water at room temperature; series 2 was exposed to ultra violet for 15 minutes behind a glass screen 3 mm. in thickness; series 3 was placed in an electric oven until the temperature