

### Relationship Between the Reaction and Phosphate Concentration of Urine Specimens Collected Over Short Periods.

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Charts and tables showing relationships between the urinary reaction and phosphate concentration in short period experiments on subjects taking normal diets and eating a standard meal were prepared. The experimental technique has been described elsewhere.<sup>1</sup> The Bell-Doisy method was used in determining the phosphate concentration.<sup>2</sup> When equal reactions were found on 2 specimens of urine obtained at about the same time the actual pH values were usually fairly low, but there was a second, smaller group in which they were more alkaline. The reactions of relatively few specimens fell between pH values of 6.0 and 7.0. The authors believe that the former, larger group, probably represents a true physiological constancy of the reaction, while the smaller one where the reaction is more alkaline they think frequently contains instances in which those changes in the reaction of urine which take place after a specimen has been voided<sup>3</sup> have taken place under approximately constant conditions, and have produced a constancy of reaction which may have little physiological significance. The phosphate concentration was much higher in the more acid than in the more alkaline group.

Further study of the material brought out the following points: 1, when the reactions of 2 specimens of urine obtained from the same patient differed by 0.2 pH or less the average of the means of the phosphate concentration in the urine was about 20% higher than in the whole series; 2, when the reactions of 2 specimens differed by more than 2.0 pH the average of the means was 50% lower than in the series considered as a whole; 3, when the mean phosphate concentration was high very few specimens showed differences in reaction which were greater than 0.2 pH; 4, when the mean phosphate concentration was low about half of the specimens, even from patients with achlorhydria, showed differences in reaction greater than 0.2 pH; 5, the average mean pH was lower when the

<sup>1</sup> Munford, S. A., and Hubbard, R. S., *J. Am. Med. Assn.*, 1926, lxxxvii, 922.

<sup>2</sup> Bell, R. D., and Doisy, E. A., *J. Biol. Chem.*, 1920, xlv, 55.

<sup>3</sup> Marshall, E. K., Jr., *J. Biol. Chem.*, 1922, li, 3.

phosphate concentration was low than when it was high; 6, in many individual experiments there was little or no correlation between changes in reaction and in phosphate concentration; 7, the average phosphate concentration was higher in achlorhydria, possibly due to the small hourly volume of urine excreted, than it was in a short control series.

It seems probable, therefore, that the phosphate concentration produced in the course of ordinary metabolism modifies the urinary reaction as do the variations produced by various experimental methods.<sup>4</sup> The relationship between phosphate concentration and the urinary reaction is not, we believe, an essential one. High concentrations of phosphate tend to decrease, and low ones to exaggerate variations in the urinary reaction due to various causes. Part of this buffer effect is almost certainly concerned in the changes in the reaction of the urine which take place after it is voided, but what proportion of the relationships noted should be attributed to this cause cannot be decided. It seems probable that variations in the phosphate concentration may explain some of the unusual findings noted in our studies upon the alkaline tide in urine; it seems possible, also, that the high degree of constancy of urinary reaction frequently found in patients with achlorhydria may result, not only from the relative constancy of the acid-base metabolism in these subjects, but also from the fact that the phosphate concentration in their urine tends to be high.

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**Experimental Production of Cervical Cellulitis Resembling  
Ludwig's Angina.**

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Infections in the floor of the mouth may extend into the deep facial planes of the neck and produce a cellulitis which has a decided tendency to terminate in gangrene or abscess formation. Ludwig originally described the condition as a gangrenous induration of the neck; Vincent refers to the disease as a foetid para-buccal abscess. The primary focus occurs about the teeth in most in-

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<sup>4</sup> Rannenbergh, E., *Arch. f. d. ges. Physiol.*, 1925, cexii, 601.