cases too great to be reliable. Curves of volume of urine, plotted in relation to the corresponding urea concentration, indicate that the amount of urine, even when only quantities less than 120 cc. are considered, influences the reading more than has heretofore been recognized. Urea concentration rises and falls very definitely with the volume of urine in which the urea is dissolved. This obviously affects the value of the urea concentration test as a quantitative indicator of renal function.

Again since one test is concerned with the excretion of a dye totally foreign to the body, while the other is concerned with the end product of protein metabolism normally found in the body, another factor which may influence the urea concentration reading is the amount of urea normally being excreted by the individual at the time of the test. Some idea of this can be gained by determining the concentration of urea in the urine just before the test. This was done in 38 students. Concentration varied from 0.6% to 3.4%, with an average of 1.49%. There appeared to be some relation between concentration of urea prior to the test and urea concentration 2 hours following the taking of 15 gm. of urea by mouth.

Whether by some mathematical computation the above causes of variation in the urea concentration can be allowed for and the test thus made a more quantitative measure of renal function, remains to be seen.

In one respect the tests have been quite consistent. In practically all cases the urea concentration was 2.5% or more. Likewise, phenolsulphonephthalein excretion was 40% or over in every case, and in 46 of 49 cases was above 50% at the end of 2 hours. Both tests were consistent, therefore, in indicating a healthy state of the kidneys.

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An Example of Bacterial Synergism on Endo Medium.

T. F. NICHOLSON. (Introduced by W. L. Holman.)

From the Department of Pathology and Bacteriology, University of Toronto.

Bacterial Synergism has usually been studied in fluid medium. I wish to report here an example of the association of *B. welchii* and *B. faecalis alkaligenes* on an Endo plate with a resulting change of the type of colony formed by the latter. A swab taken from the drainage wound of an acutely infected shoulder, was planted in

hormone-dextrose-broth and on blood agar. The broth showed a growth of gram negative bacilli and gram positive cocci in chains. The blood agar showed haemolytic colonies of streptococci and colonies of the coliform type. The broth culture was spread on an Endo plate and after 24 hours incubation this plate showed numerous colonies with red centers and narrow, colorless peripheries. In such isolations only colorless colonies are usually picked for further study, but because of the colorless periphery of these colonies, one was transferred to hormone broth. A smear from a 24 hour growth of this culture showed nothing but gram negative bacilli. Generous portions of the broth culture were transferred to tubes of broth containing dextrose, lactose, saccharose and salicin and to litmus milk. After 24 hours there was fermentation with the production of acid and gas in the tubes with dextrose, lactose and saccharose and the typical "stormy fermentation" of *B. welchii* in the litmus milk. Gram negative and gram positive bacilli were seen together in all the tubes, except that containing salicin.

The two organisms were isolated in pure culture. The gram negative bacillus fermented none of the carbohydrates and gave an alkaline reaction in litmus milk. The gram positive bacillus gave the typical reactions of *B. welchii* in litmus milk and grew well in Veillon agar and on blood agar plates in an anaerobic jar. It was also pathogenic for guinea pigs. The *B. faecalis alkaligenes* produced colorless colonies on Endo agar. The *B. welchii* did not grow on this medium under aerobic conditions. Mixtures of the two planted on Endo agar reproduced the red centered colony with the colorless periphery as seen in the original plate. The anaerobe apparently grows in the interior of the colony of the aerobe and here acts on the lactose and produces acid. Two other examples of this phenomenon were noted later, one from a sample of faeces from a case of suspected typhoid and another from a swab from an infected appendix.

The possibility of this association between *B. welchii* and non-lactose fermenting coliform organisms causing confusion and mistakes in the detection of *B. typhosus* is one which should be seriously considered. Moreover, in detecting *B. coli* by presumptive test it is usual to plate on Endo medium from the positive lactose tube, red colonies being considered as evidence of the presence of *B. coli*. An interesting point in my finding was that the anaerobe remained in the mixture after growing; in an open tube of dextrose-hormone-broth; in surface colonies on Endo agar; in another hormone-broth and in transfers from this to a series of aerobic culture media.