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Nitrogenous Constituents of Blood Following Transplantation of Ureters Into Different Levels of Intestine.

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In an attempt to study the effect on the kidney of the presence of large amounts of normal urinary constituents in the blood, we transplanted the ureters into different portions of the intestine. A simplified surgical technic was employed and the results were for the most part satisfactory. In most instances the only demonstrable change in the ureter and kidney was slight dilatation of the ureter and pelvis of the kidney, while microscopic examination of the renal tissue revealed but minor changes. In some cases, however, hydroureter and hydronephrosis with subsequent pyonephrosis developed. These cases furnished an interesting comparison to uncomplicated ureteral transplantation.

A single ureter was transplanted into the jejunum, ileum, colon, and rectum in different dogs. When the other kidney and ureter was not disturbed practically no change was observed in the nitrogenous constituents of the blood over a period of several weeks following operation. Bilateral transplantation of the ureters or single transplantation with removal of the kidney on the opposite side produced some very interesting changes in the constituents of the blood. Drainage of the ureters into the rectum produced in most instances a marked rise in the blood urea for from several days to six weeks after operation and a subsequent return of the level of urea in the blood to a figure which is within normal limits. No changes were found in the creatinine, creatine, uric acid, or amino-acid content of the blood. Following ureteral transplantation into the colon there was a similar rise in the blood urea nitrogen without significant changes in the other nitrogenous blood constituents studied. One of these animals maintained a level of urea nitrogen in the blood of slightly more than 400 mg. for each 100 cc. without elevation in the creatinine content of the blood over a period of six days; there was a gradual return to normal about two months after operation.

Ureteral transplantation into the jejunum or ileum elicited a more constant picture. For the first five to seven days there was a rapid rise in the urea nitrogen content of the blood with no appreciable changes in the creatinine, creatine, uric acid, or amino acid

content of the blood. In some cases extremely high values for the blood urea nitrogen were obtained. In one animal about two weeks after operation there was 808 mg. urea nitrogen for each 100 cc. of blood. Subsequently the blood urea decreased considerably with the onset of symptoms of uremia, the animals surviving this type of transplantation for from 14 to 20 days. These animals demonstrate the non-toxic nature of urea, since extreme values of blood urea are found without the presence of any symptoms of uremia. The rapid rise of the urea in the blood is in marked contrast with the absence of any appreciable increase in the creatinine content of the blood. This would appear to indicate that creatinine is not readily absorbed from the intestine under these conditions. It was also noted that definite increases in the creatinine content of the blood occurred when the kidney was greatly injured by infection.

This is a preliminary report.

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Measurement by Vreeland Oscillator of Minimum Time Required to Stimulate Muscle or Nerve.

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Nernst's law of stimulation (stimulus = current$\sqrt{}$time) has been proven for currents from 0.0002 to 0.001 seconds duration, but Lapique showed that a minimum time was necessary and was different for different tissues. A minimal current flowing infinitely which just causes a contraction is called the rheobase, the rheobase is then doubled and the time for stimulation is measured, this time is called the chronaxie. Owing to the uncertainties of the form of many of the currents used in determining chronaxie or to the undesirability of the form of the current (asymptotic) we have adopted a different procedure.

Our studies of the electric stimulation of muscle with alternating current have led us to believe that what is called the "summation of stimulus" is due to the direct current component of the alternating current. The induction coil gives a current having a unidirectional competent, as shown by Washburn, who inserted a silver coulometer in series with the secondary of an induction coil and obtained a deposit of silver.