

of the so-called functional efficiency of the kidneys by means of examination of the blood and of the urines collected from each kidney separately and simultaneously, (4) the use of the X-rays, (5) the use of the X-rays in combination with ureteral catheterization, X-ray bougies, pyelography, etc.

Perhaps Henry Fenwick is the greatest advocate of cystoscopy pure and simple, as a means of diagnosing renal disease. Through observation of the ureteral meatus we are frequently enabled to detect œdema, dilatation, congestion, ulceration and scarring and retraction, which with alterations in the urinary stream discharging from the meatus may suffice to lead to a correct diagnosis. Thus, in tuberculosis of the kidney, as Casper has pointed out, a marked bullous œdema may completely conceal the ureteral mouth, later this may give place to ulceration and definite tubercles may appear—definite evidence of tubercular disease of the kidney of the corresponding side. So, too, through the use of methylen blue or indigo-carmin injections we can colour the urine blue and by observation of the orifices and a determination of the time taken for such coloration of the urine to occur we are frequently enabled to determine the affected kidney and to some extent to estimate the degree to which it is diseased.

But while such methods are of great use, and while in instances where bladder disease is widespread and we are unable to go farther and catheterize the ureters, we must depend on such examination, yet we feel that we should, where it is possible, go farther, and by making use of the ureteral catheter secure much more complete and accurate data on which to found our diagnosis. The objections raised are first, that one is liable to carry infection up the ureter and may thus infect a sound kidney. Secondly, it is difficult, or at least requires more skill than simple cystoscopy, and in addition causes the patient more discomfort.

To these objections it is perhaps best to reply in the light of one's own experience, which happily coincides with that of those who have given this practice a far wider trial. My experience then would show that the additional discomfort caused by catheterization is minimal, and that in our series of cases, now numbering some hundreds, we can find no single instance where infection of a sound kidney could be referred to our interference. It is therefore, especially, the use of the ureteral catheter and the so-called functional diagnosis, or determination of the functional capacity of the kidneys, to which we wish to call your attention to-day.

The means of measuring the function of the kidneys are the following: (1) the observation of the time required to excrete a given quantity of indigocarmin (e.g. 4 cc. 4% sol.) (Voelcker and Joseph) or methylen blue (Achard and Castaigne). This is given subcutaneously