

to occur. I consider Morris' operation on healthy kidney tissue, of far greater importance, however, because, in addition to allowing resection of the kidney, it paved the way for the exploratory incision which now, in less than twenty years, has grown to be an operation of far-reaching diagnostic, as well as therapeutic value. In the third decade the latest step toward conservatism was made; namely, the surgery of the ureter. This somewhat limited field of surgery has, with the exception of ureterectomy for tuberculosis and septic pyelitis, no other object than to save the secreting kidney tissue above from disturbances from below, due to retention or infection. In a review of this nature, the time at my disposal will permit me to indicate only a few points in urinalysis and the present status of treatment of surgical diseases of the kidney. Tuffier's experiments on dogs have demonstrated that the minimum amount of healthy kidney tissue necessary for life, is one to one and a half grams for each kilogram of body weight. An adult man should have three hundred grams of kidney tissue; if his weight is seventy-five kilograms, or one hundred and fifty pounds, he needs only seventy-five to one hundred and twelve grams of the three hundred grams of kidney tissue; that is, he can spare two-thirds or three-fourths of the normal amount of kidney tissue before crossing the danger line, and he may live in perfect or relative health for years during the destruction of the kidneys, until the last fourth is reached, when sudden uremia sets in. When the amount of kidney tissue approaches the lowest limit, the quantity of urea diminishes, although the amount of urine may still be normal. It is, therefore, a matter of vital necessity to examine the urine for urea before operating. Compensatory hypertrophy or regeneration of kidney tissue of a healthy kidney, when its fellow has been removed or destroyed by disease, has been studied experimentally by Tuffier. After extirpation of one kidney he removed, by successive partial operations, portions of the remaining kidney aggregating in all the weight of the kidney first removed. From this he concludes that as a quantity of kidney tissue equal to both kidneys was removed without disturbing the health of the animal, at least the necessary one-fourth of the kidney tissue must have been formed by regeneration or compensatory hypertrophy.

*Examination of the Urine (bacteriological).*—After thorough cleansing of the external genital organs and of the urethra, the bladder urine must be withdrawn by a sterile catheter lubricated with boiled olive oil, and collected in sterile test tubes. If there is doubt whether the pus or blood comes from a diseased bladder or from the kidneys the bladder should be washed out and the urine collected directly from the ureter by means of a catheter left in the bladder. An aspiratory puncture with a fine needle above the symphysis and removal of the urine through an aspirator syringe.