

Minnesota Section.

University of Minnesota, December 16, 1931.

5909

Unilateral Renal Agenesis in a 10 mm. Human Embryo.

EDWARD A. BOYDEN.

From the Institute of Anatomy, University of Minnesota, Minneapolis.

On *a priori* grounds, failure of the kidney to develop has long been attributed to absence of one of its 2 primordia—either the ureteric bud of the Wolffian duct or the metanephric blastema. Recently, in an instructive analysis of defective strains of mouse embryos descended from a pair of x-rayed ancestors, Brown has shown that mechanical conditions which delay or prevent the union of primordia, result in abortive kidneys or total absence of the organ.¹ It appears, however, from her published data, that in a number of cases absence of the organ might be attributed to total absence of a ureter, but there were no cases in which the blastema failed to appear.

This is in accord with the writer's earlier observations,² that when downgrowth of the Wolffian duct was interrupted, experimentally, in chick embryos, so that no ureteric bud was permitted to form, the blastema always appeared as a discrete mass of cells; which, however, failed to differentiate into tubules, in the absence of the ureter. Furthermore, from a re-study of these, and hitherto unpublished experiments with chick embryos, it seems that lesions sufficient to interrupt the downward growth of the Wolffian duct, to inhibit the formation of tubules in the lower part of the mesonephros and to injure the spinal cord, are not sufficient to prevent the appearance of the metanephric blastema.

In view of this difference in power of resistance exhibited by duct and blastema, the writer was not surprised when he found a

¹ Brown, Alice L., *Am. J. Anat.*, 1931, 47, 117.

² Boyden, E. A., *J. Exp. Zool.*, 1924, 40, 437; *Proc. Soc. Exp. Biol. and Med.*, 1927, 24, 572.

10 mm. human embryo in the Minnesota collection in which prospective absence of the left kidney could be explained on the basis of absence of the left ureter. In this specimen, which is being reconstructed for publication, the somewhat dilated left Wolffian duct terminated at the level of the pylorus. On the opposite side, the Wolffian duct had reached the cloaca and had given rise to a ureter which, in turn, had united with the blastema of that side to form the right kidney. Attached to the latter, on its left side, was the rudimentary blastema of what would normally have been the left kidney. In spite of its contact with the good kidney, the left blastema was unable to differentiate into tubules in the absence of the left ureter.

Associated with this anomaly and probably underlying it, was an arrested development of both mesonephroi. Instead of the normal 35 to 38 tubules on a side, the left Wolffian body contained 12 glomeruli, the right one 17. Below the last of the tubules, the Wolffian bodies contained progressively larger posterior cardinal veins—especially on the left side—which, in the region of the umbilical arteries were in contact with the metanephric blastemas and undoubtedly aided in bringing these anlagen together in the form of a potential horseshoe kidney.

So far as the writer is aware, this is the first description of the critical stage in the development of unilateral renal agenesis in man. This case, together with the experimental evidence cited, would seem to substantiate the theory that at least one cause of congenital absence of the kidney is lack of formation of the ureter following arrested development of the Wolffian duct and body.

5910

Simultaneous Oscillographic Records of Sound Waves and Electric Variations in the Brain During Avertin Anesthesia.

STARKE HATHAWAY AND GRANT L. RASMUSSEN.

(Introduced by A. T. Rasmussen.)

From the Department of Psychology and Department of Anatomy, University of Minnesota.

In a preliminary experiment under Avertin anesthetic the Wever-Bray experiment was repeated and their findings verified. The apparatus was an ordinary audio-frequency amplifier with head