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### The Uretero-Vesical Valve and Experimental Production of Hydroureter Without Obstruction.

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Many observations, both experimental and clinical, have been made to support or disprove the theory that the urine flows back into the ureter from the bladder. All early writers and many of the present time maintain the "vesical-ureteral sphincter" competent to withstand any pressure. Many men have alluded to the valve mechanism as preventing reflux yet most refer again to it as a "sphincter". The oblique passage of the ureter through the bladder wall has been regarded as a sphincter in preventing reflux of urine.

Without experimental evidence, Sampson<sup>1</sup> in 1903, was the first to attribute to the intra-vesical ureter the function of a valve. He placed little value on his findings since his oblique transplants of the ureter without the valve also showed no reflux. Delbet<sup>2</sup> denies valve action to the intravesical ureter. Satani<sup>3</sup> believed that normally there is no reflux into the ureter although he found no special structures of a nature of a sphincter in the bladder. After destroying all the muscles of the bladder wall which cover the intra-parietal part of the ureter he found the ureter still fairly tight against reflux under intravesical pressure.

Excised bladders with ureters attached were used in this work in most experiments. These were obtained from human, monkey, baboon, dog, cat, rabbit and pig. Cannulae were tied in the ureters and these were attached to mercury manometers. A large brass tube, with a window at one end, into which ran inlet and outlet tubes, was fixed in the dome of the bladder, the urethra being tied off. A pressure bottle containing either normal salt solution or Ringer's solution was fastened with a long rubber tube to the inlet tube and a mercury manometer to the outlet tubes. In all bladders tested, increasing the intra-vesical pressure by raising the pressure bottle did not increase in intra-ureteral pressure even though the pressure was sufficient to rupture the bladder.

In some bladders, one intra-vesical ureter was excised completely, leaving the oblique passage of the ureter through the bladder wall intact. When the intra-vesical pressure was increased in these the ureter from which the intra-vesical portion was excised showed the

same pressure as that within the bladder, while the normal ureter showed a zero pressure. Such bladders were kept in the ice-box as long as 20 days after excision and tested from time to time. In most of these the intact valve was found competent in dog and pig bladders during the entire period. In some, however, there was re-

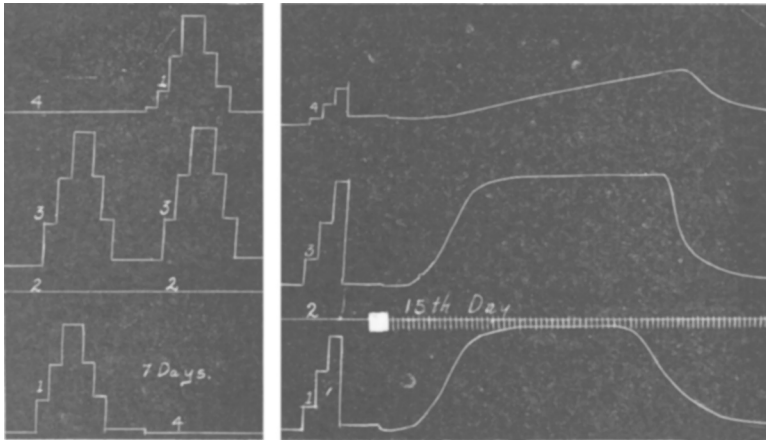


FIG. 1.

gurgitation by the so-called normal valve on the fifteenth day. Fig. 1 is such a record taken with a pig's bladder. In this figure, 1, is the changes in pressure within the ureter in mm. Hg. with the intra-vesical ureter cut; 2, horizontal line and time in 2 second intervals; 3, the change in intra-vesical pressure in mm. Hg., and 4, the change in intra-ureteral pressure with the intra-vesical ureter unaltered by operation. On the first as well as on the seventh day the intra-ureteral pressure in 1 follows closely the intra-vesical pressure, while that in 4 remains at zero. On the fifteenth day some reflux is observed also in 4. This, however, is much slower than in 1, in which the intra-vesical ureter is missing.

Unilateral enormously dilated ureters were obtained from 2 pigs. In both instances the valve to the hydro-ureter was patent. The intra-ureteral pressure without destruction of the valve became at all times the same as that in the bladder.

In dogs under ether anesthesia the intra-vesical ureter was excised on one side and the animals allowed to recover. After 5 months or longer the animals were killed and the ureters examined. In those animals in which the intra-vesical ureter was entirely removed and the ureter patent, hydro-ureters resulted.

We believe the intra-vesical ureter to serve as a true valve (ure-

tero-vesical valve) and complete excision of it leads to hydro-ureter and hydronephrosis. With an infected urine pyoureter and pyonephrosis are possible.

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<sup>1</sup> Sampson, *Johns Hopkins Hospital Bull.*, 1903, xiv, 334.

<sup>2</sup> Delbet, Poirier and Charpy, *Traité D'Anatomie Humain*, 1907, v. i, 108.

<sup>3</sup> Satani, *J. Urol.*, 1919, iii, 247; *Am. J. Physiol.*, 1919, xlix, 474; *Ibid.*, 1919, 1920, 1, 342.

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### Anatomy of Fear.

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In the study of pigeons after the ablation of various amounts of brain tissue, it appeared that when a sufficiently large amount of brain was removed, there was a corresponding amount of fear removed; the larger the portion of brain removed, the greater the portion of fear removed. This fact, that fear can be removed in stages by removing increasing portions of brain, seems to indicate that there is no definitely localized center for fear. It seems that the fear network spreads throughout the brain, and even after the removal of all of the cerebral hemispheres, there still remains in the residual brain, a functional portion of the fear network.

I give some findings from 4 pigeons of a series now under study. In all pigeons there appeared to be a gradual recovery of ability to show fear signs.

Of the 4, No. 1, had most brain left, and while showing, in nearly 12 months study, very much less fear than the normal pigeon, it showed considerably more than any of the other 3. On the 40th day, after being fed artificially, he flew from my knee onto the table, showing marked semblance of fear. On the 58th day, after being put down from the platform balance, he showed evidence of fear and flew 15 cm. up onto the other platform, as if trying to escape. On the 168th day to avoid being taken up, he ran and flew with such vigor and persistence that it required quite a chase to catch him. On the 251st day, when we tried to take him up, he ran under the table and out on the other side, flew up into the air, circled around, passed over the revolving book case and down on the other side (height of flight  $2 \pm M.$ ; length  $4 \pm M.$ ). Flying increased as time went on.