

## VESICO-INTESTINAL FISTULÆ.\*

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THE term enterovesical has been employed by many writers, but we have discarded it, because of hybrid Greek and Latin origin, and have adopted the etymologically more correct designation, vesico-intestinal fistulæ, as the title of this paper.

This is a comprehensive term, including all cases where a communication, direct or indirect, exists between the bladder and any portion of the intestinal lumen from pyloric orifice above to anus below. Appendiculovesical fistulæ have not been excluded from this consideration, but no thorough search of the literature has been made for this variety of communication. Some sixty odd cases are, perhaps, to be found scattered through the literature, many of which have not been available for the purpose of this communication. Some are so closely related to the cases under discussion that they have been utilized to illustrate certain phases of the subject.

The literature of vesico-intestinal fistulæ has been quite meager and, with the exception of a few articles, almost inaccessible to English readers. The materials for this paper have been drawn chiefly from Harrison Cripps, who wrote a monograph in 1888, based on 63 cases; Chavannaz, who published an excellent statistical study in 1897 of 95 cases; Kelly and MacCallum, on "Pneumaturia" in 1898; and Pascal, who published his "Doctorate Thesis" in 1900 on "Acquired Vesico-Intestinal Fistulæ," in which he brings the

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number up to 346 cases, including those of Cripps, Chavannaz and others collected from many sources. To these should be added the interesting case of Jewett's, referred to in Kelly and MacCallum's article.

We have searched the literature for cases appearing since 1900 and, as will be seen by the table appended, have added 38 cases, making the total 385 cases to date, including our own, a few conveyed in personal communication, and six cases found in an article by W. Sachs,\* of Mülhausen, published in December, 1908.

From the earliest times there are occasional references to communications between intestine and bladder, but the condition was not at all carefully studied until about 1800. The first attempt at collecting and classifying the reported cases appears to have been made by Blanquinque in 1870.

The older writers considered the condition beyond the reach of the art and the first suggestion as to a rational treatment seems to have been made by Barbier de Melle, who, in 1843, believing the site of the fistula always to be in the cæcum, proposed colotomy as a means of cure. Pennell in 1850, and Curling in 1852, were the first to put this procedure into practice, but up to 1870 only six colostomies had been done for vesico-intestinal fistulæ. Pascal claims this as an essentially French operation, but admits that it obtained its greatest success in England.

In 1871 Simon operated on two cases of rectovesical fistulæ, sectioning the sphincter and making a direct suture of the rectal orifice; once with success. Billroth in the same year operated by the same method, but failed to relieve the patient. His observation was not published until 1879.

Dumenil, reporting a case before the French Surgical Congress at Rouen in 1884, highly extolled colostomy, and its popularization as a means of relief of this distressing malady is probably due largely to him.

These two operative principles combined—colostomy and later section of sphincter with suture of fistula—have since

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\* *Deutsche Ztschrift. f. Chir.*, Dec., 1908.

been the chief methods for attacking rectovesical fistulæ, until rather recent times.

Le Dentu, in 1884, before the Society of Surgery in Paris, suggested suprapubic cystotomy followed by intravesical suture of the bladder opening. This was carried out by Pousson in 1895, with temporary success but ultimate failure, and, as was to be expected, this plan has had few followers. Kelly and MacCallum in 1898, and Reginald Harrison in 1895, enumerate this among the surgical procedures, and one of us in 1897 in a case reported here did the same thing unsuccessfully.

In 1887, Czerny did the first laparotomy, but his patient died. The third and first successful one was done by Boiffin in 1891. Since then the principles of modern abdominal surgery have been freely utilized in such conditions. Cripps, however, writing in 1888 on a basis of 63 cases, takes a gloomy view of the prognosis and is in favor of colostomy rather than laparotomy—or rectal suture.

The best etiological classification seems to be:

Unknown

Traumatic

{ Accidental  
Surgical

Non-Traumatic

{	Inflammatory, including	{ Abscess Stricture Stone Ulcer
	Malignant	
	Tuberculosis	
	Syphilis	
	Actinomycosis	

Many of the cases, especially the older ones, are so vague that the cause cannot be determined.

The traumatic fistulæ fall into two categories; accidental, by gunshot and stab wounds, falling on stakes, etc., of which the majority are caused by gunshot wounds; and surgical, following the lateral operation for stone, puncture of bladder by rectum, etc. Many such accidents must have followed surgical intervention in former days, but doubtless were not reported.

As a rule fistulæ due to traumatism are developed promptly, but in a minority of the cases they have followed secondarily, either owing to inflammatory action or to the irritation produced by a retained foreign body, bone, etc.

Again, spontaneous cure often follows traumatic fistulæ. Inflammation, cancer and tuberculosis are responsible for the greater number of non-traumatic fistulæ. Rarely one finds *actinomycosis* or *syphilis* as the cause.

*Pascal, in his Thesis of 1900, gives the following table of non-traumatic cases, classified in this manner:*

	Per cent.	No. of cases.
1. Origin in bladder, prostate, vesicles....	18	54
2. Origin in intestine.....	35	105
3. Origin in vicinity of bladder.....	16	48

It is impossible to do more than to give a general picture of the various changes met with at autopsy. The usual findings are those of chronic localized peritonitis, dense adhesions between intestines and intestines and bladder, and masses of indurated thickened tissue, in which may be found cavities containing pus and fæces; to which are added the special features of the causative agent—tuberculosis or neoplasm. Occasionally one finds a simple fistulous tract separating gut and bladder, or again a distinct purulent pouch, into which bladder and intestine empty—the “foyer intermédiaire” of Chavannaz.

The bladder is usually contracted, very rarely dilated. Its inner surface, in addition to the abnormal orifice, presents the lesions of chronic cystitis with varied changes in mucous membrane and musculature. Pascal, under the influence of the French school, seems to think that cystitis is not constant, and secondary ascending infection rare. But from the history of the cases and those that we have seen, cystitis seems to be a constant concomitant in some degree, and out of 25 autopsies in which the condition of the kidneys was stated, 18 times they were diseased, and of these 15 were bilateral infections. Of these 18 cases, 6 were due to cancer, 3 to tuberculosis, and 9 to inflammatory processes. Kelly and

MacCallum state that renal symptoms are comparatively rare considering the state of the bladder.

The symptoms are naturally divided into those associated with the primitive lesion, and those dependent upon the fistulous condition. One is struck by the remarkable similarity in the clinical course of the collected cases. One follows another presenting practically the same phenomena, and only differing in causation and unimportant detail.

*In the non-traumatic cases there is an antecedent history of intestinal or urinary disease, which ends either abruptly or insidiously by the passage of fecal matter and gas per urethram or liquid stools. As a generality the onset is insidious. Indeed, it is often a distinct surprise to the patient when he suddenly passes gas or fæces. Often the condition is only discovered accidentally, and rarely, though it has been so recorded, one is unaware of this condition.*

Once the fistula established there is usually a period of calm, transient or prolonged, then vesical infection ensues and frequent, painful, perhaps, difficult, urination torment the unfortunate. With this there is much mental anxiety and perturbation; digestive troubles, malaise, deterioration in health progressively until the end which comes through general infection or the advancement of the original disease, be it carcinoma or tuberculosis.

Rarely, the patient experiences no discomfort, suffers no impairment of health and lives his life in spite of his condition.

When seen by the physician the prominent symptoms are the passage of gas or fæces per urethram, or liquid uriferous stools and vesical or rectal disturbances: these suffice to characterize the malady.

It is impossible to read the monographs of Cripps, Chavanaz and Pascal, or to consider the outcome of the collected cases without realizing the gravity of this affection.

In 81 cases which Pascal analyzed he found the mean duration of life, after the appearance of the fistula, to be three years. He also states that out of 300 cases only 19 recovered spontaneously, 15 recovered under expectant treatment, and 24 were cured by operative measures.

Fistulæ situated in the small intestine are unfavorable, as nutrition is interfered with. Those, whose orifices are guarded by papillæ or valves, offer a longer life, as the bladder is partially protected from constant inroads of fecal matter. The amount of disturbance depends largely upon the size of the communicating opening, small perforations oftentimes causing little discomfort. If the urine is passed per rectum rather than *fæces per urethram* the outlook is much better; and finally any obstruction to urination materially increases the danger as it favors renal infection.

Cancer and tuberculosis appear to be uniformly fatal, when causative agents of this condition.

The complications usually met with are of inflammatory origin or due to secondary calculus deposits in bladder.

While the prognosis is always serious, surgery offers a large hope that the future will see a greatly lessened mortality.

It would seem, at first glance, that the diagnosis of intestino-vesical fistula would be easy, but in practice many cases are overlooked at first. The diagnosis to be complete must explain (1) the condition; (2) the cause; (3) the location of the fistula, (*a*) in bladder, (*b*) in intestine; (4) the mode of communication between the viscera, direct or indirect.

The differential diagnosis lies between (1) intestino-vesical fistulæ; (2) uretero-intestinal fistulæ; (3) reno-intestinal fistulæ; (4) urethrorectal fistulæ; (5) pneumaturia.

In general, the passage of gas and fecal material by the urethra or liquid uriferous stools, coupled with the finding of vegetable or animal tissue in the urine, complete the gross picture. Communication between the renal pelvis and intestine, or between ureter and intestine is to be made out by cystoscopic examination, showing (1) Absence of abnormal opening in bladder wall. (2) Seeing cloudy, and especially, fecal urine escaping from an ureteral orifice. (3) Catheterization of the ureters in every case of doubt. Segregation will be of use, but is unreliable, as an opening on one side of bladder might be confused with fecal flow into bladder through the ureter. The cause must be determined by the

history, physical examination, tuberculin reaction, examination of urine, etc. Confirmations may be had by the administration of bismuth or charcoal by mouth and their appearance in the urine.

A few words must be said on the question of gas passing per urethram. There are conditions, other than intestino-vesical fistulæ, in which this phenomenon occurs: (1) After instrumental vesical manipulation, litholapaxy, etc. (2) In certain neuropathic conditions. (3) In glycosuric conditions.\* These excluded, the passage of gas through the urethra is pathognomonic.

In the bladder the perforation is usually single, occasionally double, very rarely multiple. It is usually small. The position varies, but in almost one-half the cases the abnormal orifice is formed on the base or posterior wall. The summit is the next most frequent position, and only exceptionally the anterior wall. But the location in the intestine is even more important and more difficult to decide on. The site of the opening determines to a great extent the operative measures for relief. Keen's case well illustrates the difficulties attending the definite location of the position of the fistula. The position of the fistula may be ascertained by (1) Cystoscopy. (2) Proctoscopy with digital exploration of rectum. (3) Introduction of plain, colored, or chemical solution or gases via bladder or rectum and their recovery from the opposite organ. (4) Character of food material in urine, as regards the stage of digestion. The elements of the food could be distinguished in Jewett's case indicating location near stomach, afterwards confirmed. By these means the gut can be explored as high as the sigmoid and the bladder in totality. If one is unable to locate the intestinal position of the fistula by these methods, there only remain conjecture and exploratory laparotomy.

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\* In Kelly and MacCallum's article on "Pneumaturia," this subject is very thoroughly discussed. Heurly Fenwick also considers it at some length in his work on "Clinical Cystoscopy." See also Dumenil, *Rev. de Chir.*, p. 241; Guignard *Jour. des mal. des org. gen.*, 1883, p. 242.

Chavannaz gives the following percentages indicating the location of the fistulæ: Rectum, 44.44; sigmoid, 24.07; colon, 11.11; colon and ileum, 7.40; appendix, 1.85.

The treatment is either medical or surgical.

**Medical:** Including rectal and vesical irrigation, local treatment of fistula where possible by curettage and cauterization, urinary and intestinal antiseptics, specific medication, and all measures of general hygiene. Under such regime a certain proportion of cases have recovered; 36 out of 58 recoveries recorded by Pascal.

**Surgical** treatment may be either palliative or curative. The palliative measures are directed toward the amelioration of the distressing secondary symptoms resulting from stone, stricture, etc. While not designed to cure, this sometimes results in a relief of the condition. The extraction of a stone by lithotomy or lithotrity, the dilating of strictures in a few instances have been followed by healing of a fistula. Under this head may also be placed colostomy, intestino-anastomosis and lumbar transplantation of the ureters. When colostomy is decided upon it is necessary that it should be done so as to fulfil two conditions. First, it must be above the fistula; second, it must be complete, so as to have no connection between the upper and lower segments of the intestine. Moreover, the upper end of the lower segment must be left open and frequent irrigation through and through this segment must be practiced. Ballance lost two cases by closing the lower segment, and Madelung lost two cases where he closed the inferior end and dropped it into the cavity.

Intestino-anastomosis as first practiced by Boiffin and the procedure of Wassilief, or its modification suggested by Lardennois with the Murphy button might be considered in certain rare cases. This procedure of intestino-anastomosis has resulted in cure in a few cases. Intestinorectostomy, intraperitoneal, may be done 7 cm. above the sphincter.

*Curative Treatment:* Radical treatment has for its object separation of the abnormal openings between intestine and bladder and the restoration of their lumina by separate closure



of the openings. The operative approach may be made via (1) the rectum, (2) the perineum, (3) the sacrum, (4) the bladder, (5) the abdomen, or by combination of two or more of these methods. Rectovesical fistula situated within  $4\frac{1}{2}$  inches of the anal orifice may be best attacked by one of the perineal operations. This will usually be better than operating through the rectum. The operations of Marion Sims, Desault and others, through the rectum have given good results, and for certain fistulæ low down, are, perhaps to be preferred with, or without, section of the sphincter, primary or secondary. Perineal incision of Zuckerkandl is to be preferred to that of Simon as giving better access. If the suture is made in several layers, the last being of catgut, as suggested by Hugh Young, with suprapubic bladder drainage there will be good chance of success. The anterior transpelvic procedures of Langenbeck, Niehans and Helferich, Ollier and Chalot, are exceptional and will scarcely ever be necessary for closure of these fistulæ. Posterior transpelvic, or sacral operations, however, must be seriously considered in some of these rectovesical fistulæ situated too high for the rectoperineal operation. Of these we should give the preference to the osteoplastic resection. Where more than the coccyx is to be removed the best type of this operation is the Rehn-Rydgier. The transvesical, or intravesical operation suggested by Le Dentu is hardly to be recommended. Only one case, that of Duplay, Case 332, was successful. In one of the cases reported by us it was tried with only temporary success. In another case, that of Fowler, (Case 316), the bladder was merely opened suprapubically and drained, but no attempt was made to suture the fistulous opening in the bladder. Cure followed this simple procedure. All the others, Cases 304, 310, 329, 333, 334, 335, and our own, 378, were either absolute failures or only temporary successes.

Finally the intraperitoneal or transperitoneal operations are to be considered. One of these procedures is to be recommended in all cases where the milder operations have been either tried or are clearly inapplicable. Exploratory laparotomy often affords the only reliable means of informing one's

self thoroughly as to the true condition and its cause, and enables the surgeon to decide upon the best procedure from actual observation. Then, too, if nothing can be done, it may be easily terminated by the palliative operation of colostomy. If the point of adhesion or communication can be found and separated, the radical operation is the procedure of choice. In some cases it may be advisable to close only the intestinal opening, draining the intermediary pouch, or sometimes a simple drain may be put in, without closure of either opening. One case is reported cured in this way. (Terrier, Case 301.) If the adhesions are such as to make it impracticable to separate the viscera, the radical operation may have to be abandoned and intestino-anastomosis, or bilateral exclusion of the involved intestinal loop, or colostomy done as a last resort.

Sachs, in *Deutsche Zeitschrift für Chir.*, December, 1908, reports a case in which he successfully operated by excluding totally the portion of involved intestine, 15 cm. in length, turning in both ends of this, and re-establishing the intestinal continuity by end-to-end approximation with Murphy button. This procedure, the suggestion of which he credits to Salzer\* has been carried out in only one other case, that of Eiselsberg (Case 384) which died five days after operation. While so brilliantly successful as in Sachs' case, it nevertheless is open to such serious objection that we must agree with Payr in asking yet more light upon the later course of cases so treated, before we can give it our unreserved endorsement. It is true that cases like those of Bryant and Harrison, in which autopsy some years subsequent to a colostomy for rectovesical fistula showed complete obliteration of all that part below the artificial anus, afford justification for the operation of complete intestinal exclusion as done by Sachs, but, as he points out, we cannot always be sure that urine or natural secretion in the excluded section may not accumulate and furnish a positive menace to life. Where the communication is with the lower part of colon, sigmoid or rectum, the flow of urine into the bowel is made evident by its escape from the anus:

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\* "Festschrift Billroth," p. 536.

in such cases one would hesitate to resort to this operation of complete intestinal exclusion. Further, in cases of high intestinal involvement one may never be sure that there is no flow of urine from bladder to intestine, because even where it does occur it may be absorbed or be so mixed with *fæces* as not to be apparent in the stools. It would seem, then, until further investigation is made, that complete intestinal exclusion should only be carried out in those cases where we may be reasonably sure that the flow is only in the direction of the bladder, not from it into intestine. We think, with Sachs, that this problem calls for experimental investigation in animals to determine in how far bilateral, or complete, intestinal exclusion may be considered a safe surgical procedure.

#### CONCLUSIONS:

1. Establish clearly the nature of the lesion.
2. Determine the location of the opening in the bladder and in the intestine, when possible; this can usually be done by the modern methods of exploration of the rectum and bladder, and by a study of the intestinal contents passed per urethram.
3. Medical treatment is always to be tried for a reasonable time, as some cases have recovered under such management, and certain fistulæ of syphilitic origin have been absolutely cured by appropriate treatment.
4. The prognosis of cases untreated is generally bad and spontaneous cures are rare.
5. Ascending infection of the kidneys is one of the most important sequellæ, and this is always to be feared in cases that do not recover within a reasonable time.
6. Colostomy relieves the symptoms though it does not cure the condition, but is to be tried in all cases where a radical procedure is not possible.
7. Radical operation is always to be preferred when practicable; from below, when the fistula is situated within  $4\frac{1}{2}$  inches of the sphincter in suitable cases; intraperitoneally, for high-placed fistulæ, the viscera being separated and direct suture of each opening done.
8. Where the radical operation cannot be done, bilateral

or total exclusion of the portion of intestine involved, as practiced by Sachs in Case 385, may be done when there is no urinary flow into the bowel; this not being advisable, one of the shunting anastomosis procedures should be done, or simple drainage of an intermediary pouch resorted to.

9. The suprapubic intravesical suture of the bladder orifice is not to be recommended, because difficult of execution and uncertain in result.

10. Exploratory laparotomy is indicated in all cases in doubt to determine the location of the fistula and the operation of choice. Colostomy is to be regarded as an operation of last resort and applicable only in those cases where the artificial anus may with certainty be placed above the fistulous communication with the bladder.

DR. PARHAM'S CASE OF *Vesicorectal Fistula*.

J. L., 48 years of age, a native of Louisiana, consulted me in 1895, complaining of great irritability of bladder due to the passing of fecal matter.

Family history: Father died of pneumonia at the age of 52, mother died at age of 27, shortly after his birth. Both grandfathers died about the age of 60. Does not know anything of grandmother. One sister and two brothers are living and in good health, one half brother by father died of lung trouble at age of 36, one sister died at 52 years of heart trouble, two half sisters of yellow fever.

Personal history: Has been much afflicted with fevers since childhood, periodical in character. In 1889 had severe jaundice with stomach trouble. Had measles and whooping cough when a child. No history of chronic cough. Twenty-five years ago had severe dysentery lasting a month.

History of present disease: In October, 1892, suffered with constipation and pains in lower part of abdomen on left side, accompanied by frequent micturition, followed after each urination by burning sensation in the urethra. This continued about three weeks, when he took 10 grains of calomel followed by Epsom salts. Violent pains in lower abdomen attended the purgative action. In November, 1892, being still much troubled, he came to New Orleans and was treated by Dr. Chassaignac for two months. He thinks he passed some bowel contents occa-

sionally by urethra during this time, attended by much bladder disturbance. He went home much improved. Four months later he was so much better he was able to resume his duties as road and levee inspector in his country district, although he would have at times more or less bowel and bladder disturbance.

In November, 1893, he had an attack of dysentery, and was much worse with his urinary troubles. He came to New Orleans and was again under Dr. Chassaignac's care for three weeks. Under this treatment he improved and was well as before. He thinks he passed occasionally some fecal matter. After this, he continued to improve, the symptoms all disappearing except the frequent urination. He got much stronger and would have considered himself well, but for the occasional pains in the lower abdomen on the left side. He seems to have remained well for a long time after this, but in June, 1895, he became ill again with fever, colic in the lower abdomen, left side especially, followed some hours later by the passage of gas and fecal matter per urethram. He entered the Charity Hospital and was treated by Dr. Brickell for four weeks. Under treatment he improved very much. He would frequently urinate fecal matter. During constipation he would not pass fecal matter by urine for sometimes three or four days. He went home in June, 1895. In November, the symptoms of his old malady returned in aggravated form, preceded by diarrhœa. Fecal matter came now in increased quantity with the urine. This condition of things continued until his admission to my service at the Charity Hospital on November 18, 1895. His condition at this time was as follows:

Has lost much flesh, though not emaciated. General appearance good, complexion clear with slight conjunctival injection and some jaundice. Tongue fissured and slightly coated. Has good appetite and would sleep well were he not disturbed by frequent urination. Temperature, pulse and respiration normal.

Examination of abdomen, rectum and urinary organs: Somewhat constipated but consistence of passages normal. Has had no diarrhœa since his admission. Belly-wall loose and not retracted. Nothing revealed by palpation, except slight tenderness over region of bladder. In left inguinal region nothing, but in right inguinal region a reducible scrotal hernia. On standing right side of scrotum filled well with the descended bowel.

History of this hernia: Has been present as long as he can

recollect. Always suffered more or less, but never wore a truss until 1883, when one gave him considerable relief. In November, 1893, the truss being old had to be drawn very tight, but he is not sure that this had anything to do with the pains which came on in the lower abdomen.

November 30, 1895: Filled bladder with sterilized fuchsin solution; none came into rectum. Then emptied bladder and filled with uncolored fluid and threw methyl blue solution into rectum and allowed the bladder to empty through a catheter introduced, the patient being in knee-elbow position. No bluish coloring of the water was observed. Digital examination of rectum revealed moderately enlarged prostate, tender. Several hours afterwards a chill followed by fever to 103 degrees.

December 6: Is passing fecal matter freely, fecal odor, no undigested particles. Bowels have been somewhat disturbed during the night.

December 29: Assisted by Drs. Chassaignac, Matas, Martin and Delaup, I opened the abdomen in the middle line below the umbilicus. The upper part of the rectum and lower part of the sigmoid was adherent on the bladder wall. A large, hard mass could be felt here. We concluded it was an inoperable neoplasm and closed the abdomen.

January 13, 1896: Fecal matter is passing in increased quantity.

February 4, 1896: The condition being aggravated and radical operation being out of the question, I did an inguinal colostomy in two stages, the second stage being completed by the formation of the artificial anus three days later. The section of bowel was complete.

February 9, 1896: The stitches were all removed and the anus was well established. The lower segment of bowel was irrigated daily. Amelioration of the bladder symptoms was prompt and decided.

February 17, 1898: I determined now to make an effort to close the bladder opening and, if successful, to restore the continuity of bowel, where broken by the artificial anus.

Accordingly, on February 17, 1898, at the New Orleans Sanitarium, I opened the bladder above the pubic symphysis. I found the opening without much difficulty on the superior wall and sutured it with catgut, inserting four sutures. Dawbarn's intermittent siphonage was employed to protect the line of suturing.

(In another case I should use a de Pezzer catheter per urethram.) For a time it seemed that we would succeed, but the sutures gave way and the opening became re-established. The supra-pubic wound gradually healed and he was allowed to go back to his home in the country, no further effort being made to close the bladder fistula.

I have not seen him now for many years but have occasional letters from him. He wrote me during May of last year, reporting himself as comfortable and enjoying good health. The artificial anus is easily managed, giving him little inconvenience except when bowels are loose.\*

DR. HUME'S CASE. Mr. H. H., M. W., aged 39 years, married; has 5 children. Jan. 22, 1908: complaint, pus in urine and bladder trouble.

Family history: Two uncles, paternal, died of T. B. Past history: Mumps as a child, no orchitis. Malaria, no hæmaturia with it. Some inflammation of bowels 10 years ago. Does not know what it was; some thought it appendicitis; was in bed one month. General health good; constipated: average weight 153 pounds; 8 to 10 pounds below it now. Venereal history. Soft sore 20 years ago; no secondaries. Denies gonorrhœa.

Present illness: Patient well till one year ago. Then, when in a malarial attack, his urine was examined and pus was found in it, also albumin. Since then seen by several doctors who considered he had kidney trouble, probably tuberculosis. Patient has no symptoms save from frequency of urination and a "sputtering," as if air was in his urine, on urination. Every two to four weeks he gets depressed, feels drowsy, occasionally has chill with fever. Has pain in back low down in middle of spine. He is then sick with fever for a few days, and his urine seems worse at such times. He has had these attacks for twenty years, five or six a year at first, later every two to six weeks. Duration one to eight days. Considered as malarial or bilious attacks and treated by purging.

*Examination.*—Patient, well-built male; prematurely gray and aged to eye. Tongue furred. Thorax negative, abdomen negative save for slight pain in (1) left iliac fossa, (2) right

\* It is not infrequently true that a mass suspected after abdomen is open to be malignant, is proven, as in this case, by the lapse of time to be merely inflammatory infiltration (see also Mayo's article on Diverticulitis).

TABLE OF CASES

u x r = Urine by rectum.      r f = Either or both ways.      2 I = Two orifices in intestine.  
 f x u = Feces by urethra.      F. I. = Foyce intermediate.      2 B = Two orifices in bladder.  
 A. = Autopsy.

No.	Age and Sex	Cause	Location and number	Urine and Feces	Treatment	Result	Duration
1	M	Cancer of rectum	Rectum and bladder-neck. 1	u x r f x u		Autopsy	12 yrs.
2	M						
3	M 12	Cancer of bladder	Rectum and bladder. 1	u x r f x u	Medical	Recovery	3 mos.
4	M 80	Traumatic		u x r		Death	
5	F	Cutting for stone	Rectum and bladder. 1	u x r	Medical	A., cancer of Bladder	
6	M 50			u x r		Recovery	
7	M			f x u		A., ulceration of bladder	
8	M			u x r		A., cancer of bladder-neck	
9	M			u x r		A., ulceration found	
10	M	Stone (?)	Bladder and rectum	u x r		Failure	
11	M	Gonorrhoea (?)	Rectum and bladder	f x u	Medical	Death	6 mos.
12	M	Stone	Colon and bladder	f x u		A., abscess in left iliac fossa	
13	M 50						
14	M						
15	M 60	Stone	(Kidneys diseased)	f x u		Autopsy	
16	M 7	Traumatic	Rectum and bladder	u x r	Medical	Recovery	
17	M 69	Stone		u x r	Medical	Death	
18	M 50	Cancer (?)		u x r		A., rectum not examined	
19	M		Rectum and bladder	u x r		Death	
20	M	Ulceration		u x r		Death	
21	M			f x u		Death	
22	M 50			u x r		Death	



23	M 73	Stricture of sigmoid	Colon and bladder. F. I.	f x u	Medical	Autopsy	.....
24	F 60	Cancer (?)	Colon and bladder	rf	.....	Death	3 mos.
25	M 60	Stone (?)	.....	f x u	.....	Autopsy	8 mos.
26	M 63	Ulcer of rectum	.....	u x r	.....	Recovery (?)	.....
27	M 62	Stricture (?)	.....	u x r	.....	.....	.....
28	M 60	Traumatic. Punc-	Ileum and bladder	f x u	.....	Autopsy	1 mo.
29	M 60	ture of bladder by	Rectum and bladder	u x r	.....	.....	10 yrs.
30	M	rectum	.....	.....	.....	.....	.....
31	M 50	Traumatic. Punc-	.....	u x r	.....	A., Suppurated	11 da.
32	M 50	ture of bladder by	.....	.....	.....	.....	.....
33	M 50	rectum	.....	f x u	Medical	Death	5 mos.
34	M 50	Stricture of rectum	.....	f x u	.....	Recovery	.....
35	M 50	Abscess between	.....	.....	.....	.....	.....
36	M 50	bladder and rectum	.....	.....	.....	.....	.....
37	M 50	Inflammation	Sigmoid and bladder. F. I.	f x u	.....	Autopsy	1 mo.
38	M 50	Cutting for stone	.....	u x r	.....	Not cured	.....
39	M 50	Cutting for stone	.....	u x r	.....	Death, peritonitis	6 da.
40	M 50	Gun shot. Traumatic	.....	u x r	.....	.....	30 da.
41	M 50	Stricture	Rectum and bladder	f x u	.....	Autopsy	.....
42	M 50	Cancer (?)	Colon and bladder	f x u	.....	Autopsy	5 mos.
43	M 50	Stricture	Sigmoid and bladder	f x u	.....	Autopsy	.....
44	M 50	Inflammatory	Rectum and bladder	u x r	.....	Autopsy	1 mo.
45	M 50	Inflammatory	Sigmoid and bladder	rf	.....	Autopsy	.....
46	M 50	Inflammatory	F. I.	.....	.....	.....	.....
47	M 50	Child-birth. Inflam-	Rectum and bladder	f x u	.....	Autopsy	3 mos.
48	M 50	matory	.....	.....	.....	.....	.....
49	M 50	Child-birth	Rectum and bladder	.....	.....	.....	.....
50	M 50	Tubercular (?)	Colon and bladder. F. I.	f x u	.....	Autopsy	2 1/2 mos
51	M 50	Cancer	Colon and bladder	f x u	.....	Autopsy	4 yrs.
52	M 50	Inflammatory	Rectum and bladder	u x r	Medical	Recovery, cured	2 mos.
53	M 50	Cancer	Rectum and bladder	f x u	.....	Autopsy	.....
54	M 50	Cancer	Rectum and bladder	f x u	.....	.....	.....
55	M 50	Stone	Rectum and bladder	f x u	.....	Death	.....
56	M 50	Cancer	Sigmoid and bladder	f x u	.....	.....	.....

TABLE OF CASES—Continued

No.	Age and Sex	Cause	Location and number	Urine and feces	Treatment	Result	Duration
50	M 7	Stone (?)	Ap. and bladder. 2B.	f x u		Death	8 mos.
51	F 65	Cancer	(Kidneys diseased). Ileum and bladder	f x u		Death	4 yrs.
52	F 41	Syphilis	Rectum and bladder	u x r		Autopsy	
53	Child		Rectum and bladder	u x r			
54		Stricture	Rectum and bladder	f x u			
55		Ileum and bladder		f x u		Lived 5 months	
56	F 68	Stricture	Colon, rectum, ileum, and bladder	f x u	Colotomy	Death	
57	M 62	Stricture	Colon and bladder	f x u		Autopsy	
58		Stricture of sigmoid	Colon and bladder				
59	M 38	Traumatic	Rectum and bladder	f x u	Medical	Autopsy	17 da.
60	M 50	Puncture of bladder	Rectum and bladder	u x r	Medical	Improvement	
61	M 64	Traumatic	Jejunum and bladder (Kidneys diseased?)			Autopsy	
62		Abscess	Rectum and bladder				
63	F 23		Rectum and bladder	f x u		Death	
64	F	Abscess of ovary (?)	Sigmoid and bladder. F. I. (Stone in kidney.)			Death	
65	F 35	Inflammatory	Appendix, cecum and bladder. F. I.	f x u		Autopsy	
66	M 40	Inflammatory	Colon and bladder	f x u		Autopsy	6 mos.
67	F		Colon and bladder. 2 I. F. I.				3 wks.
68	F 54		Bladder, sigmoid and ileum	rf		Autopsy	3 yrs.
69	F	Child-birth	Rectum and bladder	f x u		Autopsy	
70		Cancer of cecum	Cecum and bladder			Autopsy	
71		Tuberculosis (?)	Sigmoid and bladder	f x u		Autopsy	

72	M	Inflammatory	Rectum and bladder. (Kidneys diseased.)	f x u	.....	.....	.....	.....
73	M 25	Stricture of rectum	Rectum and bladder	f x u	.....	Autopsy	.....	2 yrs.
74	F 45	.....	.....	f x u	.....	Improved	.....	.....
75	M 64	Stricture of sigmoid	.....	f x u	.....	Death	.....	.....
76	M 64	Stricture of sigmoid	Sigmoid in bladder	rf	.....	Improved	.....	.....
77	M	Stone (?)	.....	f x u	.....	.....	.....	.....
78	M	Urethral stricture	.....	f x u	.....	Death	.....	1 mo.
79	M 79	Stricture of urethra (?)	.....	f x u	.....	.....	.....	.....
80	M 44	T. B. of prostate and stricture of urethra	Rectum and bladder. 2 B. (Kidneys dis- eased)	u x r	.....	Autopsy	.....	.....
81	F 18	Inflammatory	Cæcum and bladder. F.I.	f x u	.....	Autopsy	.....	.....
82	M 37	.....	.....	f x u	.....	.....	.....	.....
83	M 33	Tuberculosis	.....	f x u	.....	Death	.....	.....
84	M 56	Stricture of sigmoid	Sigmoid and bladder. F.I.	f x u	.....	Autopsy after operation	.....	17 da.
85	F	Inflammatory	.....	f x u	.....	Recovery	.....	.....
86	33	Tuberculosis (?)	.....	f x u	.....	.....	.....	.....
87	59	Abscess	Large intestine and bladder	f x u	.....	Autopsy	.....	.....
88	F 20	.....	.....	u x r	.....	Recovery	.....	.....
89	F 43	Abscess	Intum and bladder. (Kidneys congested)	f x u	.....	Autopsy	.....	2 mos.
90	56	.....	Rectum and bladder	f x u	.....	Death	.....	5 mos.
91	M 35	.....	.....	f x u	.....	Death	.....	14 yrs.
92	.....	.....	.....	f x u	.....	Death	.....	.....
93	54	Cancer of rectum	Rectum and bladder	f x u	.....	Autopsy	.....	2 wks.
94	M old	Tuberculosis	Cæcum and bladder. 2B.	f x u	.....	Autopsy	.....	6 wks.
95	M old	Obstruction	.....	f x u	.....	Death	.....	22 yrs.
96	F 48	Inflammatory and tubercular	Cæcum and bladder. F. I. (Right kidney diseased.)	f x u	.....	Autopsy	.....	.....
97	F 28	Cancer (?)	Large intestine and bladder	rf	.....	.....	.....	.....

TABLE OF CASES—Continued

No.	Age and Sex	Cause	Location and number	Urine and Pieces	Treatment	Result	Duration
98	M 43	Abscess	Cecum, ileum and bladder. F. I.	f x u	.....	Autopsy	.....
99	M 60	.....	Appendix and bladder	f x u	.....	Autopsy	.....
100	M 42	Syphilis (?)	Rectum and bladder	.....	.....	Recovery	10 da.
101	M 34	Cutting for stone	.....	f x u	.....	.....	.....
102	M	.....	.....	.....	.....	.....	.....
103	F	.....	.....	f x u	.....	.....	.....
104	F	.....	.....	f x u	.....	.....	.....
105	.....	.....	.....	f x u	.....	.....	.....
106	M	Inflammatory	.....	f x u	.....	.....	.....
107	(This number omitted in F 57)	Inflammatory	Pascal)	f x u	No case	Recovery	12 da.
108	F 57	Inflammatory	.....	f x u	.....	Death	.....
109	F 15	Tuberculosis	.....	f x u	.....	Death	.....
110	35	Obstruction	.....	.....	.....	Death	.....
111	.....	Abscess	.....	f x u	.....	Autopsy	.....
112	M 32	Abscess of prostate; tuberculosis	Rectum and bladder. (Kidneys diseased)	rf	.....	.....	.....
113	F	Cancer of rectum	.....	u x f	Operation, colotomy	Death	.....
114	M 85	Ulceration of rectum	Large intestine and bladder	f x u	Operation, colotomy	Death	.....
115	M 51	Ulceration	Sigmoid, cecum and bladder	rf	Operation, colotomy	Autopsy	.....
116	M 55	Cancer of bladder	Rectum and bladder	rf	.....	Autopsy	.....
117	M 37	.....	.....	f x u	.....	.....	.....
118	M 8	Inflammatory	Appendix and bladder F. I	u x r	Operation for stone	Autopsy	.....
119	F	Inflammatory	Bladder and intestine and skin	.....	.....	.....	.....
120	M 35	.....	.....	u x r	.....	Death	.....

121	M 44	Tuberculosis	Cæcum and bladder. F. I.	f x u	.....	Autopsy	7 mos.
122	.....	Rectal ulceration	Rectum and bladder	u x r	.....	.....	.....
123	.....	Rectum and bladder	Rectum and bladder	.....	Bougie	Improvement	.....
124	F	T. B. or Lues	Rectum and bladder. F. I. 2 R (Kidney diseased).	.....	.....	Autopsy	.....
125	M 40	Inflammation	Rectum and bladder	f x u	Local	Recovery	.....
126	M	Inflammatory	Colon and bladder	f x u	Suture of fistule by rectum	Suicide; autopsy	26 yrs. after.
127	F 41	Cancer of uterus	Rectum and bladder. F. I.	.....	.....	Autopsy	.....
128	F 69	Cancer of uterus	Rectum and bladder	.....	.....	Autopsy	.....
129	F 63	Cancer of uterus	Rectum and bladder	.....	.....	Autopsy	.....
130	F 45	Cancer of uterus	Rectum and bladder	.....	.....	Autopsy	.....
131	F 59	Cancer of uterus	Rectum and bladder	.....	.....	Autopsy	.....
132	F 52	Cancer of uterus	Rectum and bladder. (Right kidney, cancer)	.....	.....	Autopsy	.....
133	F 43	Cancer of uterus	Rectum and bladder	.....	.....	Autopsy	.....
134	M 62	Cancer of rectum	Rectum and bladder	.....	.....	Autopsy	.....
135	M 61	Cancer of bladder	Rectum and bladder	.....	.....	Autopsy	.....
136	M 60	Rectal stricture	Rectum and bladder	.....	Colotomy	Death	.....
137	M 60	Rectal ulceration	Rectum and bladder	.....	Colotomy	Death	.....
138	M 59	Ulceration	Sigmoid and bladder	.....	Colotomy	Improvement	.....
139	M 20	Stricture of rectum	Rectum and bladder	rf	.....	Autopsy	.....
140	M	.....	Colon and bladder	f x u	.....	Death	.....
141	M 79	.....	Colon and bladder.	u x r	.....	Autopsy	.....
142	M 65	.....	Colon and bladder. F. I. (Kidneys dis- eased.)	.....	.....	.....	.....
143	M 44	Inflammatory	Rectum and bladder	f x u	.....	Improvement	.....
144	M 44	Traumatic	Rectum and bladder	u x r	Operation for stone	Death	.....
145	M 54	Cancer of rectum	Rectum and bladder	rf	Colotomy	Death in 6 weeks	.....

TABLE OF CASES—Continued

No.	Age and Sex	Cause	Location and number	Urine and Feces	Treatment	Result	Duration
146	M 55	Traumatic; rectal puncture	Rectum and bladder	u x r	External urethra	Improvement	.....
147	M 60	Inflammatory (?)	Colon and bladder	f x u	.....	Autopsy	.....
148	M	Tubercular	Rectum and bladder	.....	.....	Autopsy	.....
149	M	Traumatic	Rectum and bladder. 4 B. F. I.	u x r	Operation for stone	Autopsy	.....
150	M 30	Traumatic. Bullet wound	Rectum and bladder	.....	.....	Autopsy	.....
151	M	.....	.....	f x u	.....	Improved	.....
152	M 72	.....	Colon and bladder	.....	.....	.....	.....
153	M	Traumatic	Colon and bladder	.....	.....	.....	.....
154	M 25	.....	.....	f x u	.....	.....	.....
155	M 49	Rectum ulceration	Rectum and bladder	f x u	Colotomy	Death	.....
156	F 55	Inflammation	Rectum and bladder	f x u	Opening of abscess	Recovery	.....
157	F 23	Pelvic abscess	Rectum and bladder	f x u	.....	Death	4 yrs.
158	F	Ovarian abscess	Sigmoid and bladder. F. I.	f x u	.....	Autopsy	1 yr.
159	M	Gunshot wound	Rectum and bladder	.....	Division of sphincter	Recovery	.....
160	F	Child-birth	Rectum and bladder	.....	.....	.....	.....
161	M 27	Gunshot wound	Rectum and bladder	u x r	Catheter	Improvement	.....
162	M 40	Traumatic	Rectum and bladder	u x r	Medical	Recovery	.....
163	M 27	Tuberculosis (?)	Rectum and bladder	rf	Colotomy	Death in 3 weeks	.....
164	M 52	Inflammatory	Colon and bladder	f x u	.....	Autopsy	.....
165	M 58	Cancer of rectum	Rectum and bladder	rf	Colotomy	Death	.....
166	M 60?	Cancer of rectum	Rectum and bladder	f x u	Colotomy	Death	.....
167	F	Child-birth	Rectum and bladder	f x u	Colotomy	Recovery	.....
168	.....	.....	.....	f x u	.....	Death	.....
169	.....	.....	Colon and bladder	.....	.....	Autopsy	.....

170	76	Child-birth	Cancer of sigmoid	f x u	Autopsy	.....
171	F	Inflammatory stricture of rectum	Rectum and bladder F. I.	f x u	Autopsy	.....
172	M 50	.....	Rectum and bladder.	f x u	Autopsy	.....
173	M 60	Cancer of colon	Colon and bladder	f x u	Death	.....
174	M 58	.....	Colon and bladder.	f x u	Autopsy	.....
176	M 67	Stricture	Sigmoid (Kidneys diseased)	f x u	Autopsy	.....
177	M 16	Traumatic	a B. F. I.	u x r	Recovery	.....
178	M 46	Traumatic	Rectum and bladder	Medical	Recovery	.....
179	M	Traumatic	Rectum and bladder	Medical	Recovery	.....
180	M	Traumatic	Rectum and bladder	Catheter	Recovery	.....
181	M 55	Traumatic	Rectum and bladder	.....	Recovery	.....
182	M	Traumatic	Rectum and bladder	.....	Recovery	.....
183	M	Gunshot wound	Rectum and bladder	Operation for sec-	Recovery	.....
184	M	Gunshot wound	Rectum and bladder	ondary stone	Recovery	.....
185	M	Gunshot wound	Rectum and bladder	.....	Recovery	.....
186	M	Gunshot wound	Rectum and bladder	.....	Recovery	.....
187	M	Gunshot wound	Rectum and bladder	.....	Recovery	.....
188	M	Gunshot wound	Rectum and bladder	Catheter	Recovery	.....
189	M	Gunshot wound	Rectum and bladder	.....	Recovery	.....
190	M	Gunshot wound	Rectum and bladder	.....	Recovery	.....
191	M	Gunshot wound	Rectum and bladder	.....	Fistula persisted	.....
192	M 23	Gunshot wound	Rectum and bladder	.....	Recovery	.....
193	M	Gunshot wound	Rectum and bladder	Secondary operation	Recovery	.....
194	M	Gunshot wound	Rectum and bladder	for stone	Recovery	.....
195	M 26	Gunshot wound	Rectum and bladder	Catheter.	Recovery	.....
196	M 35	Gunshot wound	Rectum and bladder	.....	Recovery	.....
197	M	Gunshot wound	Rectum and bladder	.....	Fistula persisted. Death	13 mos.
198	M 34	Gunshot wound	Rectum and bladder	.....	Recovery	.....
199	M 30	Gunshot wound	Rectum and bladder	Secondary operation	Fistula persisted	.....
				for stone	Pistula persisted	8 yrs.

TABLE OF CASES—Continued

No.	Age and Sex	Cause	Location and number	Urine and Feces	Treatment	Result	Duration
200	M	Gunshot wound	Rectum and bladder			Fistula persisted	
201	M	Gunshot wound	Rectum and bladder			Recovery	
202	M	Gunshot wound	Rectum and bladder			Recovery	
203	M 29	Gunshot wound	Rectum and bladder		Secondary operation for stone		
204	M	Gunshot wound	Rectum and bladder			Recovery	
205	M	Gunshot wound	Rectum and bladder			Death	
206	M	Gunshot wound	Rectum and bladder	u x r		Death	27 da.
207	M 27	Gunshot wound				Recovery	
208	M 22	Gunshot wound	Rectum and bladder			Fistula persisted	
209	M 39	Gunshot wound	Rectum and bladder			Fistula persisted	
210	F	Gunshot wound	Jejunum and bladder			Autopsy	
211	M 23	Traumatic		rf	Secondary operation for stone	Recovery	
212	M 26	Tuberculosis	Large intestine and bladder. F. I. (Kidneys healthy).	f x u		Autopsy	
213	F 52	Inflammatory	Duodenum and bladder	f x u	Canterization of bladder orifice	Recovery	
214	M	Operation for stone	Rectum and bladder. (Bright's disease)	u x r	Division of sphincter twice	Death	
215	M	Inflammation (?)	Rectum and bladder	f x u		Autopsy	
216	M	Traumatic	Rectum and bladder	f x u			
217	M 70		Colon and bladder	f x u			8 yrs.
218	M	Typhoid fever (?)	Colon and bladder	f x u			
219	M	T. B. (?)	Colon and bladder	f x u			
220	M	Cancer of prostate	Rectum and bladder	u x r		Recovery (?)	
221	M						
222	M 28	Operation for stone					



223	M 53	Cancer of rectum	Intestine and bladder.	f x u	Colotomy	Recovery	24 yrs.
224	F	Inflammation following child-birth	2 B. (Kidneys normal.)	f x u		Autopsy	
225	F 50	Stone	Colon and bladder	f x u	Operation	Improvement	
226	F	Stone	Ileum and bladder	rf	Operation	Recovery	
227	M 4	Sarcoma of ileum	Colon and bladder	f x u		Autopsy	
228	F	Tumor of uterus	Large intestine and bladder	f x u		Death from T. B.	
229	F	Inflammatory					
230	M 27	Stricture of rectum	Large intestine and bladder		Colotomy, rt.	Autopsy 10th day	16 mos.
231	F	Child-birth	Rectum and bladder	f x u		Recovery	
232	F 25	Child-birth	Rectum and bladder	f x u	Colotomy	Death	
233	F 30	Inflammatory	Colon and bladder. F. I.	f x u	Colotomy	Autopsy	
234	M 50			f x u		Improvement	
235	M		Rectum and bladder		Catheter; sphincter cut		
236	M 69	Tuberculosis	Ileum and bladder	f x u		Autopsy	
237	M 85	Ulceration	Rectum and bladder	f x u		Autopsy	6-7 mos.
238		Cancer	Rectum and bladder	f x u		Autopsy	2 yrs.
239		Cancer	Rectum and bladder			Autopsy	
240		Cancer	Rectum and bladder	u x r		Autopsy	
241	M 79	Inflammatory	Rectum and bladder			Autopsy	
242		Cancer	Rectum and bladder			Death. Specimen	
243		Ulceration	Rectum and bladder				
244		Traumatic	Rectum and bladder				
245	M 22		Rectum and bladder	rf	Operation, stone removed; suture	Recovery	
246		Operation for stone	Rectum, bladder and urethra				
247		Operation for stone	Rectum, bladder and urethra				
248			Sigmoid and bladder. F. I. 2 B			Autopsy	

TABLE OF CASES—Continued

No.	Age and Sex	Cause	Location and number	Urine and feces	Treatment	Result	Duration
249	.....	Ulceration	Rectum and bladder. 5 R	f x u	.....	Autopsy	.....
250	M	Stricture of sigmoid	Colon and bladder	f x u	.....	Autopsy	.....
251	M	Gunshot wound	Rectum and bladder	f x u	.....	.....	.....
252	M 33	Cancer of bladder	Colon and bladder	u x r	.....	Autopsy	.....
253	M 23	Traumatic	Rectum and bladder	f x u	Sphincter cut	Improvement	.....
254	M 44	Stricture of sigmoid	Rectum and bladder. (Kidneys diseased).	f x u	Sphincter cut; fistula explored	Autopsy	.....
255	M 52	Tuberculosis of prostate	Rectum and bladder. (Right kidney healthy left T. B.)	u x r	.....	Autopsy	.....
256	.....	Operation for stone	Rectum and bladder	.....	Operation	Not cured	.....
257	M	Traumatic	.....	.....	Operation	Recovery	.....
258	.....	Inflammation	Colon and bladder. (Kidneys diseased)	f x u	Laparotomy; suture, colotomy	Recovery	.....
259	M 48	.....	Rectum and bladder	.....	Operation	Autopsy	.....
260	M	Stone	.....	.....	.....	Recovery with repeated catheterization	.....
261	M 69	Cancer of prostate(?)	Rectum and bladder	f x u	.....	Death	.....
262	M 50	Cancer of rectum	.....	f x u	Colotomy	Improvement	.....
263	F 60	.....	.....	f x u	.....	Autopsy	.....
264	F 50	Cancer of rectum	Ileum, colon and bladder	f x u	Sphincter cut, no catheter	Recovery	.....
265	.....	Traumatic	Rectum and bladder	.....	.....	Improvement	.....
266	F 25	Inflammatory (?)	.....	f x u	Medical	.....	.....
267	F	Perityphlitis	.....	.....	Operation	Improvement	.....
268	.....	Sarcoma of bladder	Colon and bladder. F.I.	f x u	Operation	Autopsy	.....
269	M 41	Appendicitis	(Kidneys normal.)	f x u	.....	.....	.....

270	F 23	Child-birth	Rectum, bladder and vagina	u x r	Operation	Improved	.....
271	F	Child-birth	Rectum, bladder and vagina	.....	.....	.....	.....
272	F 36	Cancer of rectum	Rectum and bladder	.....	Colotomy	Autopsy 2 years later	.....
273	F 36	Inflammatory	Sigmoid and bladder	f x u	.....	Spontaneous cure in 5 months	.....
274	M 25	Syphilis	Large intestine and bladder	f x u	Medical	Recovery	.....
275	F	Inflammatory	.....	f x u	Hydrogen gas diagnosis	.....	.....
276	M 19	.....	Rectum and bladder	.....	Colotomy	Autopsy. Death in 3 yrs	.....
277	M 28	.....	.....	rf	.....	.....	.....
278	M 50	.....	(Kidneys diseased)	f x u	.....	.....	.....
279	M 61	.....	Colon and bladder	f x u	.....	Autopsy	.....
280	M 60	.....	.....	f x u	.....	.....	.....
281	M 50	.....	Rectum and bladder	.....	Colotomy	.....	.....
282	Adult	.....	Sigmoid and bladder	f x u	Irrigation	Great improvement	.....
283	.....	.....	.....	.....	.....	.....	.....
284	F 32	Syphilis and rectal stricture	Rectum and bladder	rf	Medical	Cured	.....
285	M	Inflammatory	Rectum and bladder	f x u	Laparotomy and colotomy	Death in 8 days	.....
286	F 34	Stone and inflammation	Colon and bladder.	.....	.....	Autopsy	.....
287	F	Peritonitis	F. I.	.....	Vomited urine and feces	Death	.....
288	M	Gunshot wound	.....	.....	Catheter and irrigation	Recovery	.....
288	M 24	Gonorrhea and inflammation	Rectum and bladder.	u x r	Sphincter cut and sutured; catheter	Autopsy	.....
289	M 28	Cancer	(Kidneys diseased)	.....	.....	.....	.....
290	M 28	Appendicitis	Intestine and bladder	.....	.....	.....	.....
291	F	Cancer of uterus	Rectum and bladder	f x u	Laparotomy	Recovery (?)	.....
			Bladder and ileum	.....	.....	Death	.....

TABLE OF CASES—Continued

No.	Age and Sex	Cause	Location and number	Urine on Faces	Treatment	Result	Duration
202	F 28	Inflammatory (?)		f x u			
203	M 5 mo.	Operation for anal stricture		f x u	Operation	Recovery	
204	F 33	Stricture of rectum	Rectum and bladder	rf	Proposed cystotomy refused		
205	M 35	Cancer of intestine	Sigmoid and bladder	f x u	Laparotomy	Death in 4 days	
206	M 50	Tuberculosis	Rectum and bladder, F. I.	f x u			
207	M 36	Cancer of sigmoid	Sigmoid and bladder, (Kidneys diseased)	f x u	Laparotomy	Autopsy	
208	43	Inflammatory	Colon and bladder	f x u		Autopsy	
209	17	Traumatic		u x r		Recovery	
300	7			f x u			
301		Inflammatory		f x u	Laparotomy, no suture. Simple drain	Recovery	
302	M 27	Traumatic and gonorrhoea	Rectum and bladder, F. I.	rf	Ext. uret (2); sphincter cut; rectum sutured (3); cath. failed; rectum pulled down and attached to end of sacrum after resection of coccyx	Recovery	
303	M 36	Traumatic and gonorrhoea	Rectum and bladder	u x r	Perineal dissection, sphincter cut; bladder drained	Recovery	
304	M 29	Inflammatory	Colon and bladder	f x u	Cystoscope and operation, suprapubic suture of orifice	Improved	

395	F 43	Rectal stricture	Rectum and bladder	f x u	Colotomy; laparotomy 2 yrs. later	Improved	.....
396	F 17	Inflammatory	Appendix and bladder (?)	f x u	Cystoscopy; laparotomy	Recovery	.....
397	F	Typhoid fever	.....	f x u	Medical	Death	.....
398	F 62	Diverticulæ of Meckel's I. B.	Ileum and bladder	f x u	Laparotomy	Recovery	.....
399	M	Cancer (?)	.....	f x u	Laparotomy twice	Death	.....
310	M 43	Cancer of sigmoid	.....	f x u	Laparotomy, resection and erroneous union	Autopsy	.....
311	F 52	Cancer of sigmoid	Sigmoid and bladder	f x u	.....	.....	.....
312	F 33	Postpuerperal inflammation	.....	f x u	cystoscopy; orifice found	.....	.....
313	F 42	Fibroma	.....	f x u	Hysterectomy; laparotomy	Great improvement	.....
314	F 60	Inflammatory	Sigmoid and bladder	f x u	cystoscopy; laparotomy	Recovery	.....
315	F 57	Inflammatory	Rectum and bladder	f x u	cystoscopy; orifice found; suture of orifice; laparotomy	Death	.....
316	M 62	Appendicitis	Appendix and bladder, P. I.	f x u	Suprapubic stone removed	Improvement	.....
317	M 25	Appendicitis	Appendix and bladder	f x u	Operations: (1) perineal section; (2) colotomy; (3) laparotomy; (4) colotomy closed	Rec. Death in 24 days from obstruction	.....
318	F 40	Inflammatory	Ileum and bladder	f x u	Cystoscopy; orifice found; laparotomy	Recovery	.....
319	M	Tuberculosis	Rectum and bladder	u x r	.....	.....	.....
320	.....	Inflammatory	Rectum and bladder	f x u	Irrigation	Cured	.....
321	F 30	Actinomycosis	Rectum and bladder (Kidneys diseased)	f x u	.....	Autopsy. Abdom. fistula; great adhesions; numerous fistula	.....
322	F 32	Actinomycosis	Rectum and bladder	f x u	Medical	Autopsy	.....

TABLE OF CASES—Continued

No.	Age and Sex	Cause	Location and number	Urine and Feces	Treatment	Result	Duration
323	M 35	Actinomycosis	Appendix and bladder. (Right ureter diseased)			Autopsy	.....
324	M 34	Vesical tumor	Large intestine and bladder. (Kidneys diseased)	f x u		Autopsy	.....
325	F 28	Inflammatory	Sigmoid and bladder. (Kidneys diseased)	f x u	Laparotomy; cystotomy; orifice found	Improvement, then death	.....
326	M 67			rf	Cystoscoped; orifice removed	Death 2 years later	.....
327	F 42		Rectum and bladder	rf	suprapubic; stone found	No change	.....
328	M 41	Cancer of intestine		f x u	Cystoscoped; nothing found	Death	.....
329	M 61	Inflammatory	Colon and bladder, 3 B. II. (Kidneys healthy)	f x u	Suprapubic	Autopsy	.....
330	F 44	Inflammatory	Cecum and bladder	f x u	Cystoscoped; orifice found. Laparotomy. Bladder sutured; intestine not sutured	Death	.....
331	F	Inflammatory	Colon and bladder		Suprapubic; suture	Recovery	.....
332					Suprapubic; suture	Not cured	.....
333	M 60	Cancer of sigmoid(?)		f x u	Suprapubic; bladder orifice sutured; 15 days later operation repeated, again failure	Death	.....
334							.....

335	M	Syphilis (?)	Large intestine and bladder	f x u	Suprapubic; orifice not found, 2nd suprapubic failure. Laparotomy. Intestine sutured; bladder not sutured	Death	.....
336	M 65	Cancer diagnosed (?)	.....	f x u	Cystoscoped; nothing found	No change	.....
337	M 40	Inflammatory	.....	f x u	Cystoscopy; orifices found	Death	.....
338	M 56	Inflammatory	.....	f x u	Cystoscopy; supra-pubic	No improvement	.....
339	M 62	Tumor of bladder	.....	f x u	Cystoscopy; supra-pubic	Death	.....
340	M 13	Operation for stone	Rectum and bladder	u x r	(1) 6 ops., failures— <i>i.e.</i> perineal approach; (2) Colotomy and suprapubic; (3) Fistula op. 4 times	Cured	.....
341	F 33	Abdominal operation	Bladder and colon. F.I.	f x u	Stone removed	Autopsy	.....
342	F 40	Abdominal operation	Sigmoid, bladder and skin. 31	f x u	Laparotomy; bladder sutured, intestine resected and sutured. Drainage	Autopsy	.....
343	M 49	Inflammatory	.....	f x u	.....	Spontaneous recovery of fistula	.....
344	F 45	Inflammatory (?)	.....	f x u	Phosphatic stone found	Result unknown	.....
345	F 67	.....	.....	f x u	Sec. stone found	Result unknown	.....
346	F 42	Inflammatory	.....	f x u	.....	Spontaneous cure	.....
347	M 32	Cancer of bladder	Large intestine and bladder. (Kidneys diseased). 21	f x u	Cystoscopy; ulcer found	Autopsy	.....
347	F	.....	Sigmoid and bladder	.....	.....	Autopsy	.....

TABLE OF CASES—Continued

No.	Age and Sex	Cause	Location and number	Urine and Feces	Treatment	Result	Duration
348	M 64	Inflammatory	Colon and bladder	f x u	Colotomy	Relieved	.....
349	M 49	Inflammatory	Colon and bladder	f x u	Colotomy	Relieved. Death	2 mos.
350	.....	Inflammatory	Small intestine and bladder	.....	.....	.....	.....
351	M 50	.....	.....	f x u	.....	8 years in good health; nothing done	.....
352	M	Inflammatory	Sigmoid and bladder	f x u	Colotomy	Death	.....
353	M	Cancer of rectum	.....	f x u	.....	.....	.....
354	M 54	Inflammatory	.....	f x u	Colotomy	Relieved. Well for 11 years so far	.....
355	M 48	Inflammatory	.....	f x u	Colotomy	Relieved for 3 years so far. T. B. of testicles 3 years later	.....
356	M	Traumatic	Rectum and bladder	rf	Medical; no cath.	Recovery with sinuses	.....
357	M	Traumatic	Rectum and bladder	u x v	Removal of foreign body from bladder	Recovery	.....
358	M 53	Traumatic	Rectum and bladder	.....	Medical	Spontaneous cure; later, stone removed and recovery	.....
359	M 37	Traumatic	Rectum and bladder(?)	u x	Sinuses in groin. Cath.	Recovery	.....
360	F 65	Inflammatory	Sigmoid and bladder	f x u	Laparotomy. Adhesions, mass in left iliac fossa; considered not malignant. Colotomy	Recovered to die 6 months later from pneumonia	2 yrs. and 6 mos.
361	F	Child-birth	Rectum, vagina and bladder	f x u vag.	.....	Death by sepsis in 28 days	.....



362	M 28	Appendix abscess	Rectum, bladder and cecum. Purulent cavity orifices. †	f x u	Medical. (Kidneys not found diseased)	Autopsy	3 yrs. 3 mos.
363	M 39	Inflammatory	Rectum and bladder	f x u	Cystoscoped orifice found. Medical, in- cluding curettage and cauterization	Improved	.....
364	F 60	Cancer	.....	f x u	None; cystoscoped; orifice found	Death	.....
365	M 45	Inflammatory	.....	rf	Cyst.; orifice found. Operation for sec- ondary stone	.....	.....
366	F 18	Inflammatory (?)	.....	rf	Cyst.; orifice found. Gut resected	Death	.....
367	F	Tubal pregnancy	.....	.....	Orifice found. Lapa- rotomy	Death	.....
368	M 54	Inflammation of bowel	Sigmoid and bladder	rf	Cyst.; circular ulcer found. Lap.; feces in wound. Lap. suture and drain- age	Death in 6 days	10 mo.
369	F 45	Swallowed pin 11 years previously. Passed pin by ure- thra	Sigmoid and bladder. †	f x u	Laparotomy; nil	Improved	6 mos.
370	M ?	Lithotomy 21 years before	Rectum and bladder	u x r and f x u	Perineal incision. Suture of rectum. Bladder left open.	Not stated	Not stated
371	M 28	Calculus (vesical). Size of hen's egg, passed by R. age of 7 years	Sigmoid and bladder. (Kidneys diseased). Surgical. †	u x r	Abd. oper. (†). Re- moval of stone (?)	Died	Many years.
372	F 59	Inflammatory	Sigmoid and bladder. †	f x u	Cystoscoped; lapa- rotomy; Suture both openings	Cured	.....

TABLE OF CASES—Concluded

No.	Age and Sex	Cause	Location and number	Urine and Feces	Treatment	Result	Duration
373	M 35	Inflammatory	Sigmoid and bladder	f x u	Bichloride irrigation	Died 1 year later	16 yrs.
374	F 64	Lifting heavy weight	Rectum and bladder	f x u	Diagnosis by cystoscopy; rad. suture	Cured	14 mo.
375	M 44	Inflammatory	Sigmoid and bladder	f x u	Laparotomy; rad. suture	Cured 6 months; stone 2½ x 2 inches	?
376	F	Inflammatory	Rectum and bladder	f x u	Suture	Cured	
377	F 60	Inflammatory	Sigmoid and bladder	f x u	Application Ag. No. 3 fistulous tract by vagina	Improved	13 yrs.
378	M 48	Inflammatory	Sigmoid and bladder	f x u	Colostomy	Improved	13 yrs.
379		Inflammatory	Ileum and bladder	f x u	Simple incision of skin-phlegmon	Spontaneous healing	
380		Inflammatory	Rectum and bladder		Laparotomy; resection and suture	Died	
381		Inflammatory; diverticulum	Sigmoid and bladder		Laparotomy; separation and suture	Cure.	
382		Inflammatory; diverticulum	Rectum and bladder		Suture of both openings	Cure.	
383		Inflammatory; diverticulum			Laparotomy; separation. Suture of both openings	Cure.	
384		Inflammatory	Cecum; bladder; abdominal wall		Both openings	Died.	
385		Inflammatory strangulated hernia	Small intestine and bladder		Bilateral exclusion	Cured 8 years	

costal area. On palpation, at times, the lower pole of right kidney can be caught. Skin and glands negative. Reflexes normal; genitalia normal; considerable arteriosclerosis at radials.

Urine: First, cloudy with shreds; second, ditto. Composite examination of 30 specimens. Alkaline, albumin, trace or none, no sugar. Sp. gr. 1012-1017; pus, epith., cocci and bacilli (colon). No. T. B.; rarely blood cells; at intervals a few cylinders and hyaline casts; *vegetable cells*. Urethra takes No. 26 French sound with ease, hyperæsthesia posteriorly. Prostate—small, soft. Vesicles, right, normal; left, thickened and tender. Mixed secretion, pus and bacilli. Definite thickening of posterior vesical structures.

Patient put on silver nitrate irrigations, urotropin preparatory to further examination.

February 15, 1908: Remarkable change; gain of 18 pounds in weight; urine almost clear: pus reduced; albumin, trace or none; rare hyaline casts; no blood; vegetable cells. Cystoscoped with Nitze cystoscope. Bladder wall healthy except at trigone. The changes are about interureteral muscle which is raised up; very granular and hyperæmic. The ureteral orifices cannot be seen. On right lateral side of the bladder there is an appearance of a crater with puffed reddened lips, projecting into bladder and about this many cyst-like bodies, described by Fenwick as "bunches of grapes." Left side, double oedematous projections with crater-like opening between the lips. In other words, there may be two orifices of fistulæ.

*Proctoscopy.* Just below last valve and  $\frac{1}{2}$  inch to right of median line two small polypoid villi can be seen. A probe introduced between these villi enters into a canal which runs into the bladder. This can be just reached by finger. Bismuth subnitrate and charcoal by mouth can be recovered in urine.

*Diagnosis.* Rectovesical fistula. A possible slight secondary pyelitis (right); also arteriosclerosis and possible cirrhosis of liver. Based on (1) history, (2) symptoms, (3) cystoscopy, (4) proctoscopy, (5) recovery of bismuth and charcoal in urine.

On account of general condition of patient, *i.e.*, (1) signs of cirrhosis of liver with a possible hepatic infection, arteriosclerosis (2) and lack of discomfort, local treatment was advised; *i.e.* urinary and intestinal antiseptics and bi-daily vesical irrigations. In addition, fistula to be gently curetted and touched with

silver nitrate, via rectum, with some improvement, *i.e.* no fæces for nine days, gas only three times in same period. Urine: acid, 1016, slightly cloudy. No sugar, no albumin, slight pus, bacilli (colon), rare hyaline casts.

October 20, 1908: Patient is better than he has been for years. Has had no attacks of fever since May 1, has gained to 158 pounds, and his urine is clear, free from smell, and only rarely does he pass appreciable fæces. Gas is still fairly constant.

May, 1909: Patient is in splendid health, no fæces for three months, and air only twice in the same time. Is on daily intra-vesical irrigations. Still under treatment.

A table of cases collected from Chavannaz, Cripps, Pascal, Sachs, from the literature and from personal communications, is printed on pages 266-284.

## SUMMARY OF RESULTS.

Pascal's cases analyzed.....	346
To which are added.....	39
Total No. of cases.....	385
Medical .....	267
Spontaneous cure .....	5
Surgical .....	110
Unknown .....	3
Total .....	385

	Cured	Impr.	Unimpr.	Not known	Deaths	Total
Medical and Spontaneous	48	17	12	63	132	272
Surgical .....	36	16	4	7	47	110
Unknown .....				3		3
Total .....	84	33	16	73	179	385
Operative cases * .....	32	11	3	4	41	91
Colostomies .....	9	2		2	20	33
Laparotomies .....	13	3		1	17	34
Kidneys diseased † .....						25
Cystoscopies .....	Cases 13	Orifices found 8	Nothing found 2	Not stated 2	Ulcer 1	

\* Including all operative procedures, cutting of strictures, lithotomies, sphincteromies (primary and secondary). Deaths are considered operative when dead within three months.

† In 25 autopsies in which condition of kidneys was stated, there was ascending infection 18 times and 15 of these were bilateral.