

**Suppression of urine : clinical descriptions and analysis of symptoms / by  
E. P. Fowler, M. D.**

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# SUPPRESSION OF URINE

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E. P. FOWLER, M. D.



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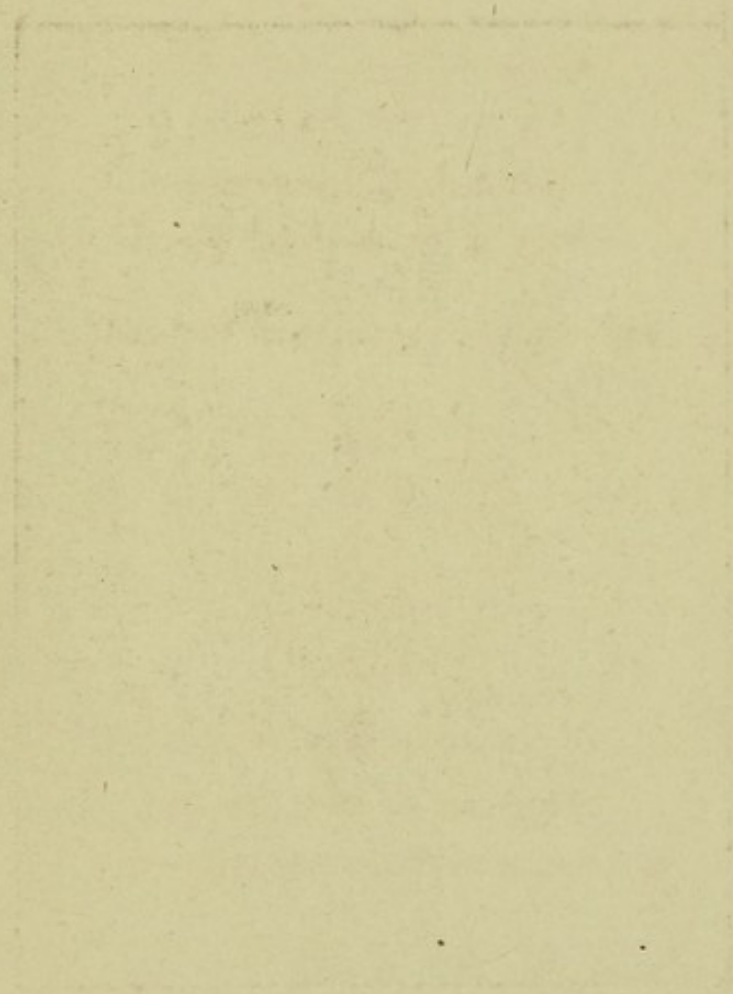
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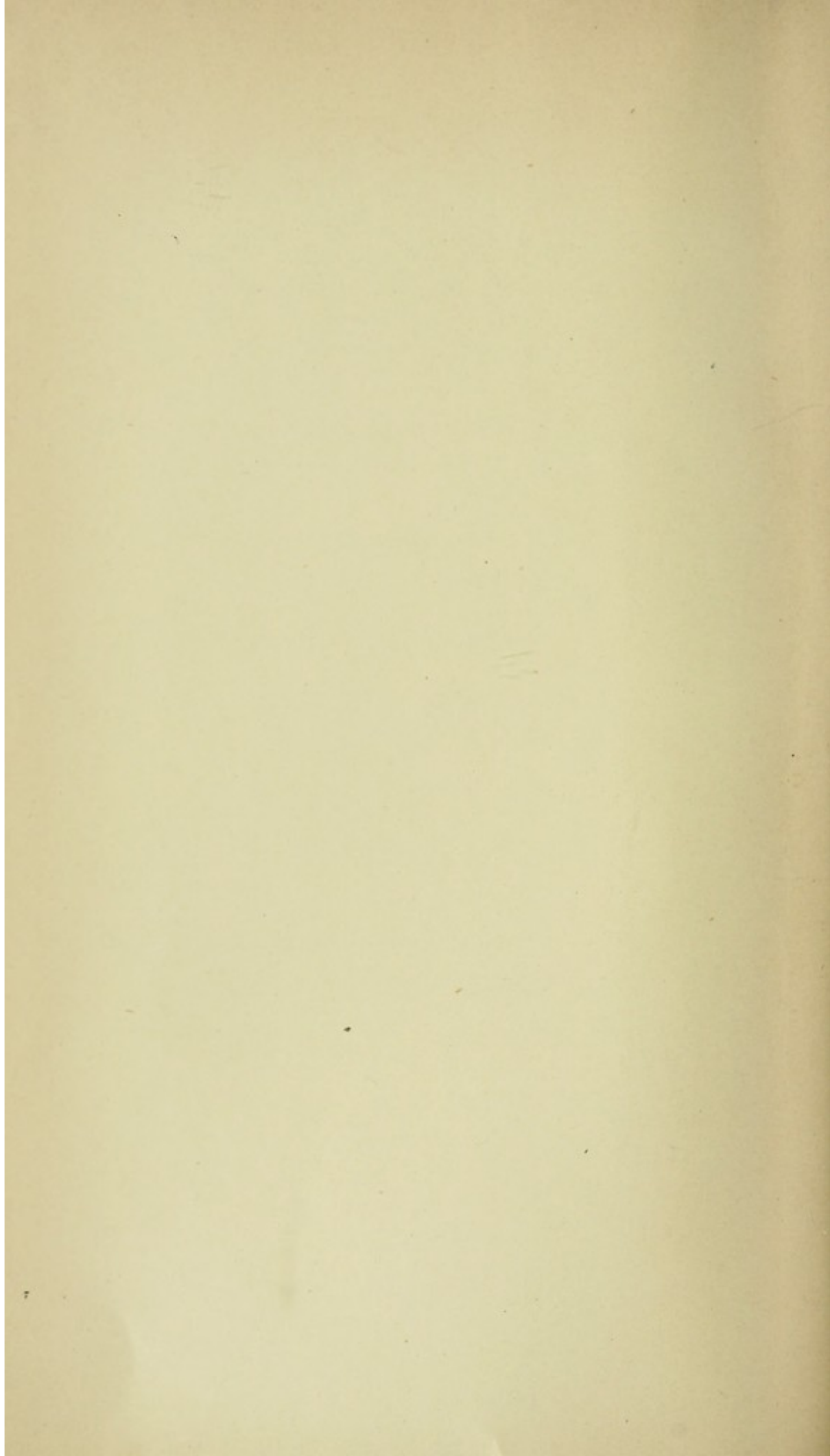
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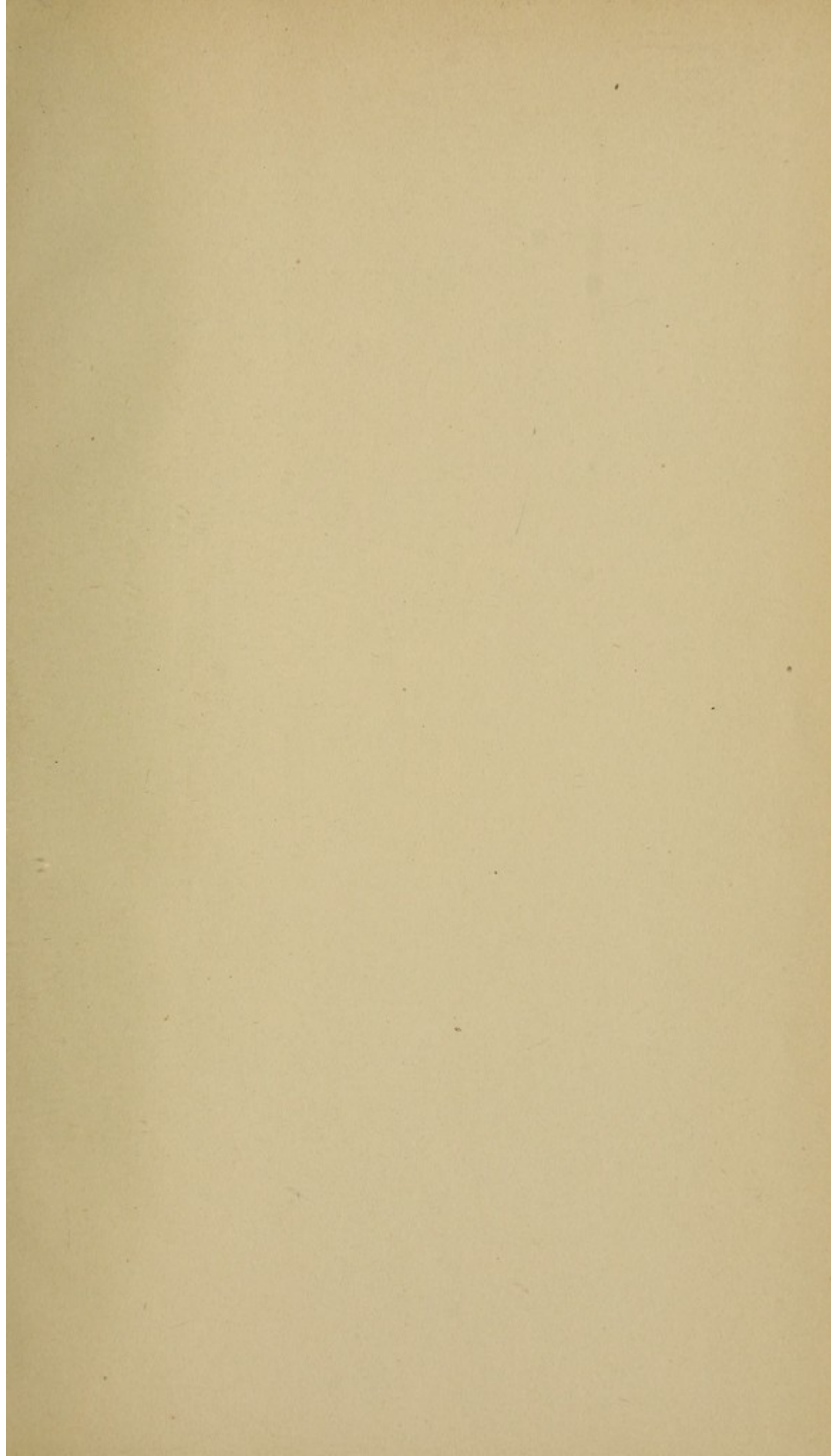
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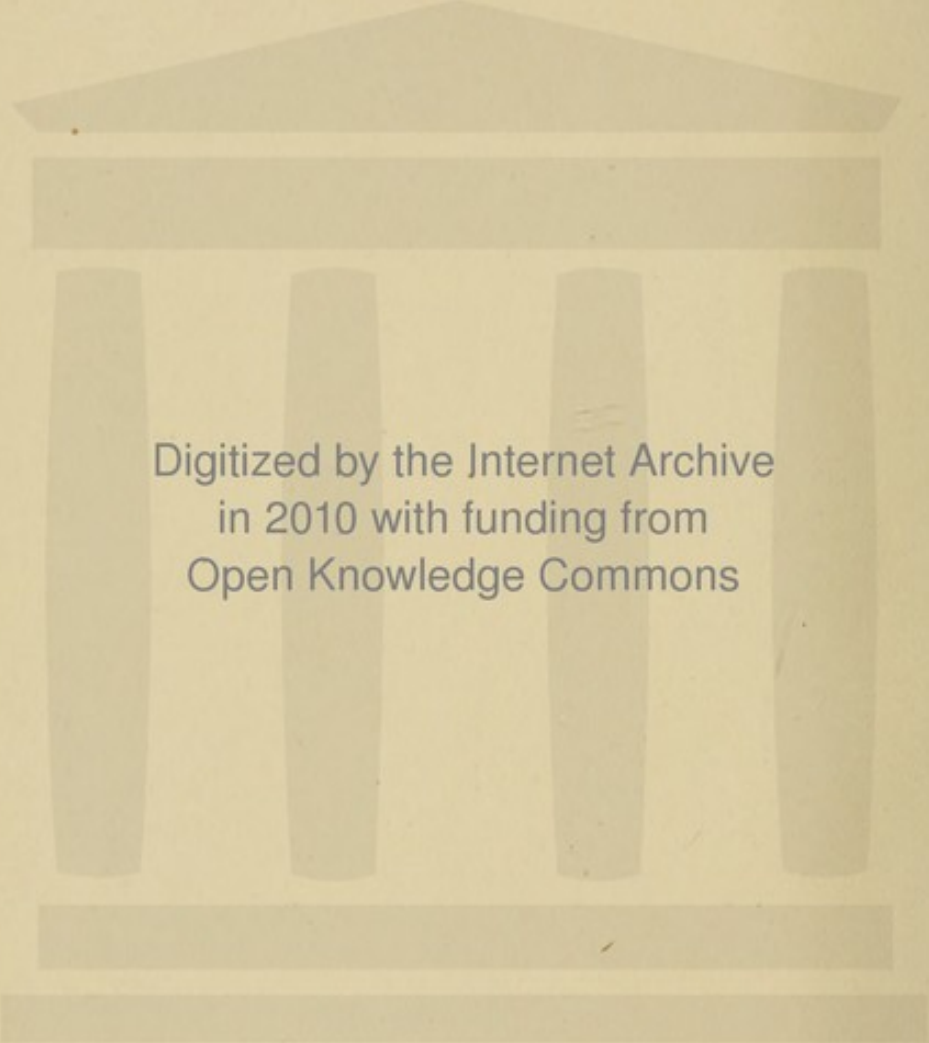




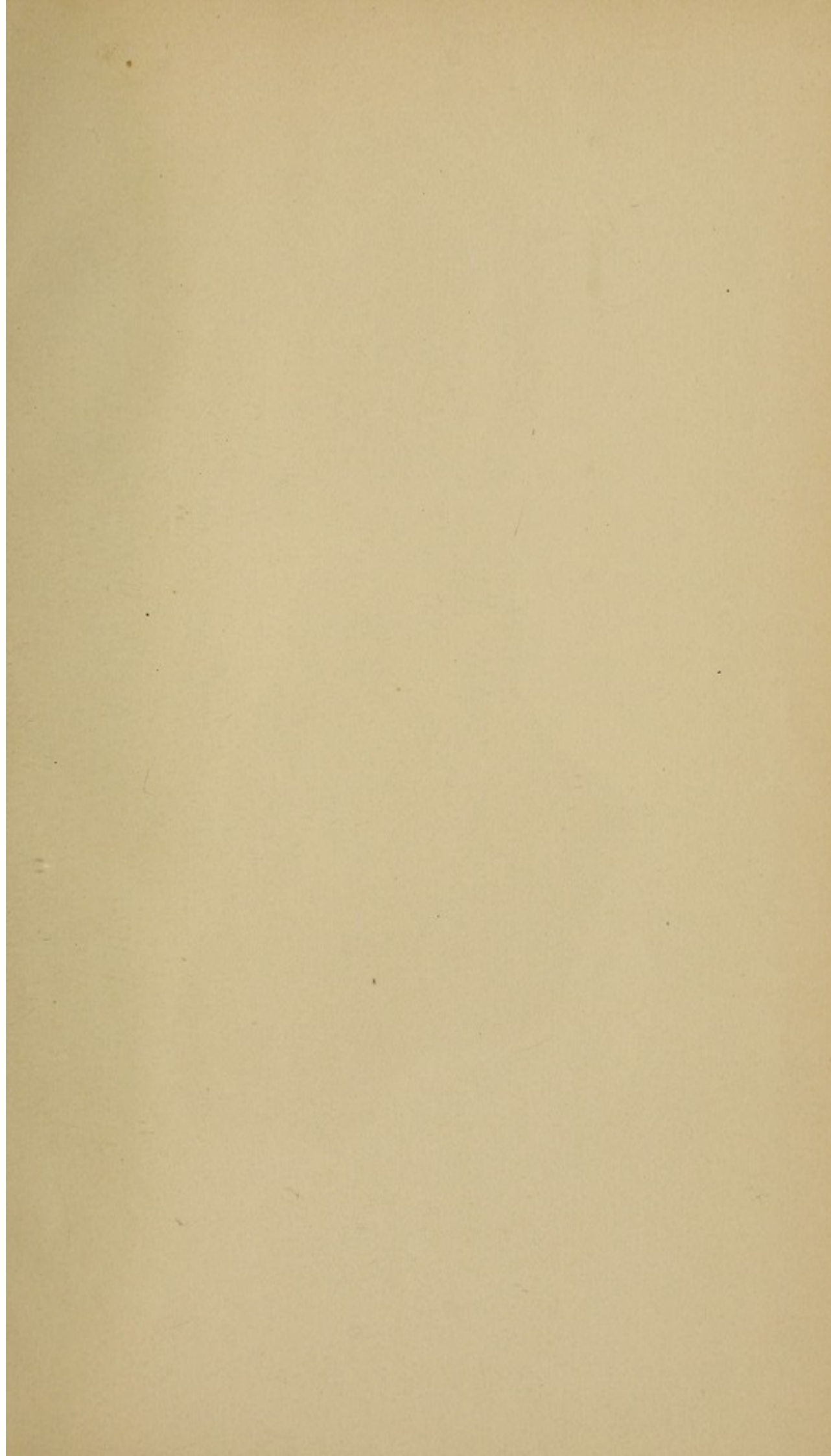




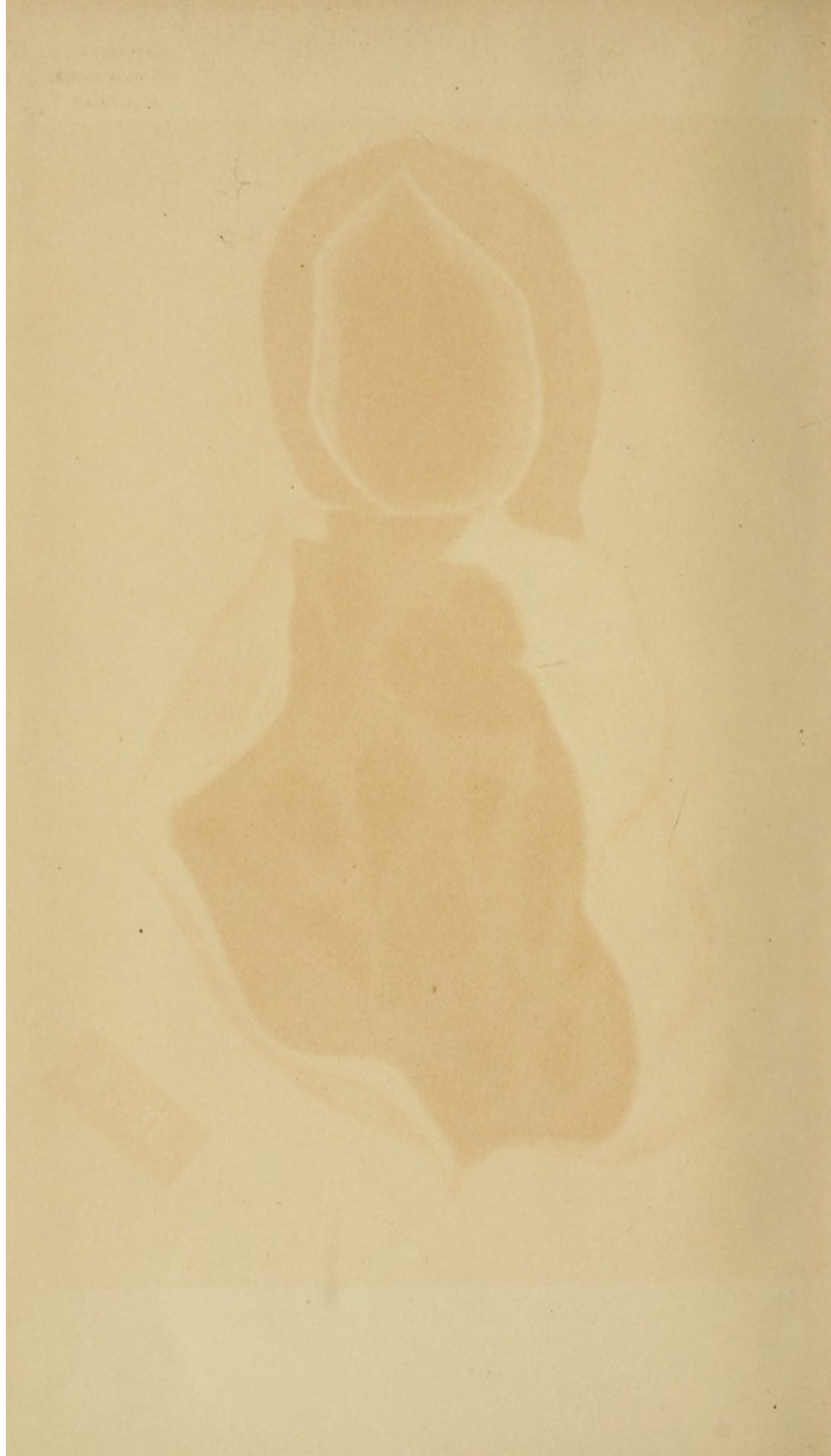




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Left kidney and supra-renal capsule.  
Cystic - degeneration.

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# SUPPRESSION OF URINE

CLINICAL DESCRIPTIONS

AND

ANALYSIS OF SYMPTOMS

BY

E. P. FOWLER, M.D.

*NINETY-THREE CLINICAL CASES, WITH ILLUSTRATIONS,  
TABLES, AND DIAGRAMS*

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*Paper presented to THE NEW YORK MEDICO-CHIRURGICAL SOCIETY, 14th December, 1880*

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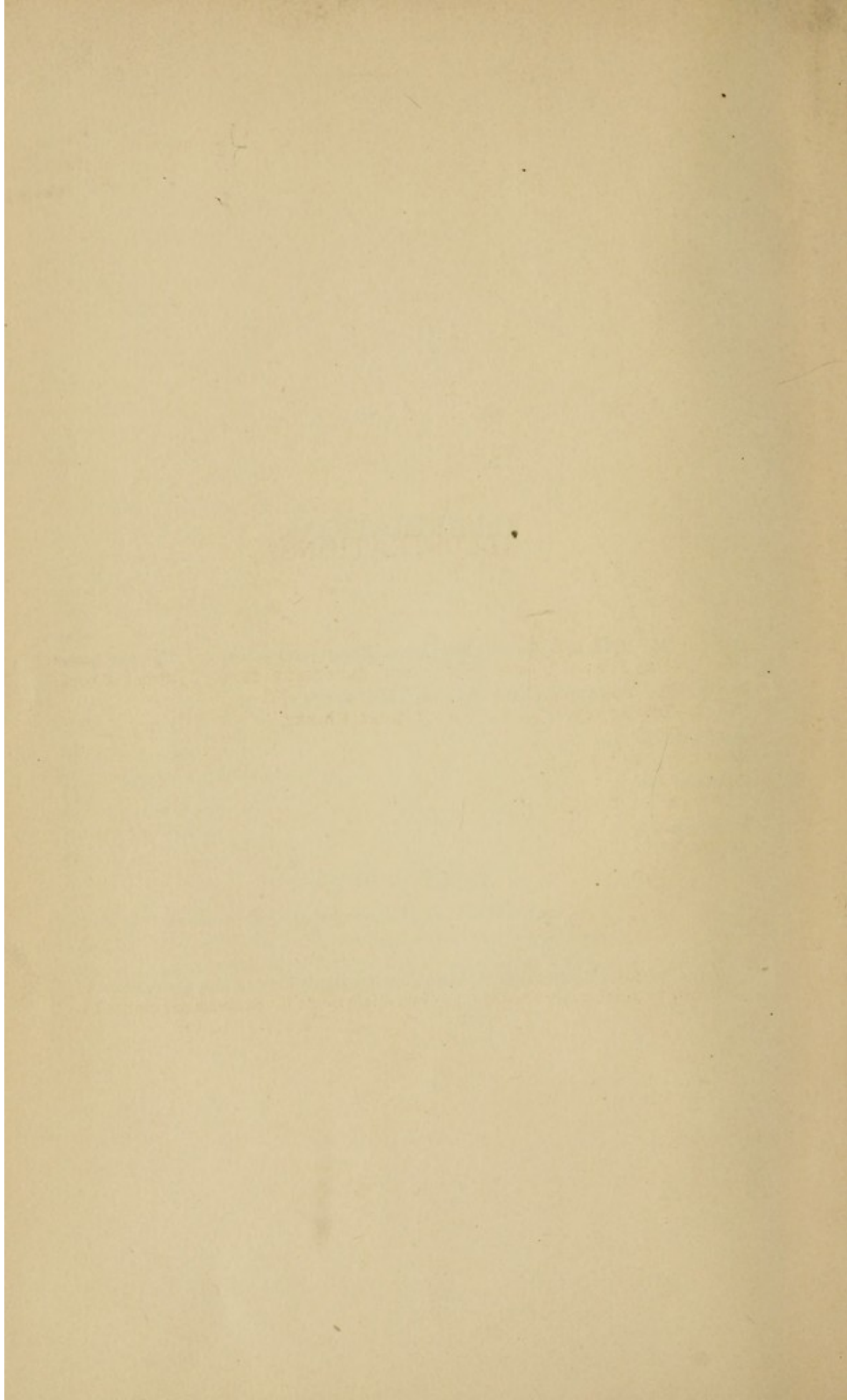


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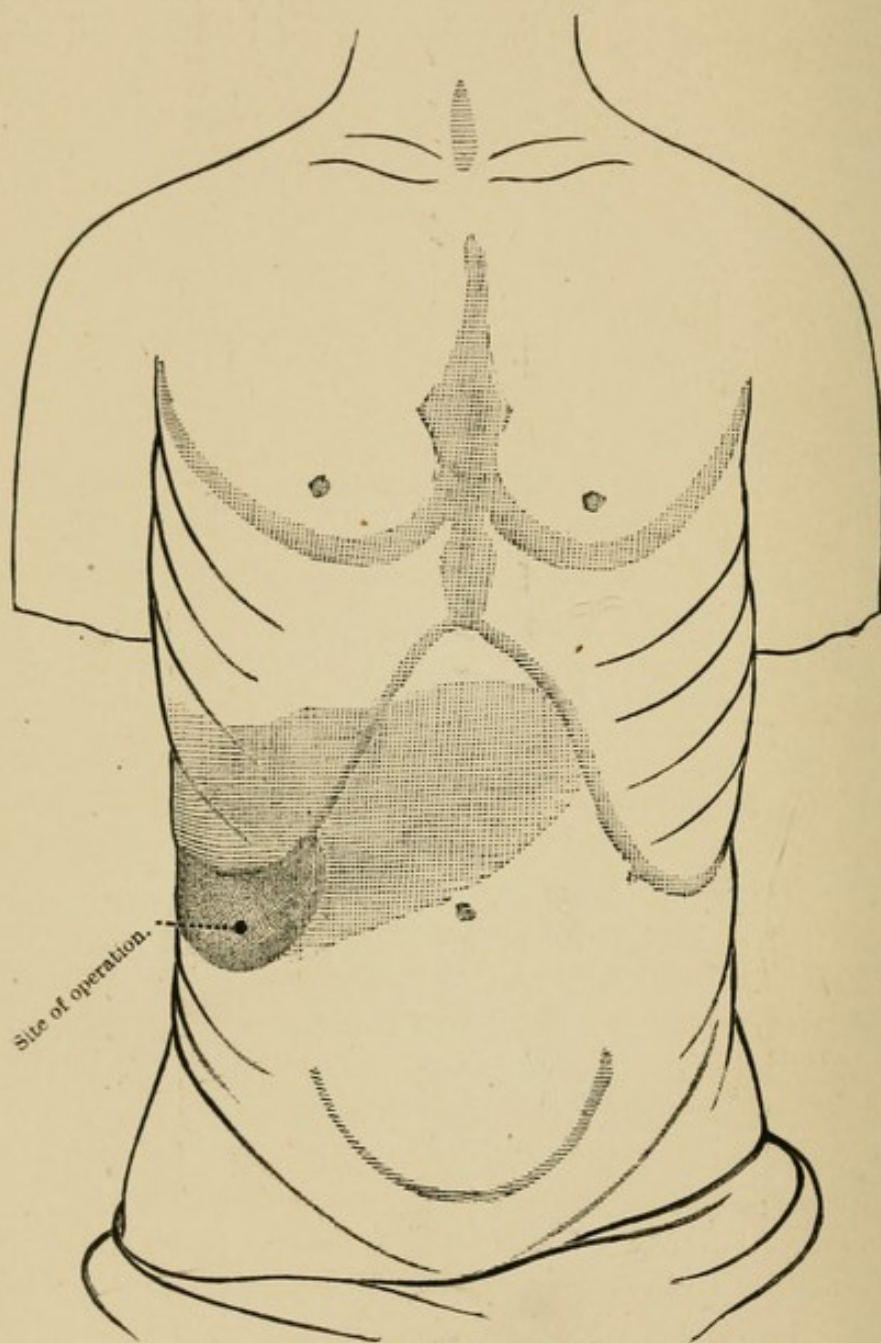
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NO. 1.—DR. FOWLER'S CASE: EXTERNAL REPRESENTATION.



# ANURIA.

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## SECTION FIRST.

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Mr. W——, aged forty-five, banker; height, five feet eight inches; brown hair, gray eyes, and clear complexion. Had been regularly under my professional care for fifteen years. During this period he suffered but two illnesses.

The first was twelve years ago, when he had a rather severe attack of diphtheria, lasting about three weeks.

The second was a week's illness from "kidney-colic," at which time he passed a small calculus. I was at the time in Europe, and unfortunately, the physician who was in attendance is not living.

With these two exceptions the patient has never complained of any serious deviation from health. For the last two or three years he has been somewhat annoyed by an increase in size of abdomen, and by occasional "uneasy sensations," which were more apt to occur at night.

On November 10th he was accidentally struck by the elbow of some one passing him. The blow was received on the right side, just above the hip. He experienced some pain, but, not regarding it as a serious matter, upon his return home he obtained the advice of a physician in the immediate neighborhood.

November 12th.—The family thought matters seemed to assume a serious aspect, and in the afternoon I was sent for. I found the patient greatly under the influence of narcotics, the use of which I stopped and waited until I could examine him in his natural condition.



Early on November 13th the picture of his case was as follows: There was an aching throughout the entire abdomen, with a centre of more actual pain just above the right ilium. No decided tenderness upon pressure. Two inches and a half above the right ilium, in a direct line to the acromial end of the clavicle, there was distinct to the touch a tumor of about the size and shape of the convex surface of half a duck's egg. The whole abdomen was distended, and percussion gave dulness over the entire region of the stomach and liver. The temperature (sublingual) was  $99.5^{\circ}$  F. (taken morning, noon, and evening); pulse, 51; respiration, 23. During the two previous nights there had been almost constant wandering of mind, and a little inclination to it throughout the day—perhaps somewhat due to the opiates. There was slight inclination to nausea, though appetite was fair. The alvine movements were regular, water free, and both of normal character.

November 14th and 15th.—There was little change. The temperature ranged from  $98^{\circ}$  to  $99^{\circ}$ ; pulse, 48 to 59; respiration, 20 to 22.

November 16th.—The “duck's-egg” tumor disappeared; otherwise no change. Temperature,  $98^{\circ}$ ; pulse, 49; respiration, 18; bowels free; water natural; the latter I had, during the preceding days, repeatedly examined, and found in every respect normal; specific gravity, 1020 to 1022. In the evening I left instructions that all the water voided from that time until the following morning should be kept for me.

November 17th.—Found that *no water had been passed since between nine and ten o'clock the night before*. The day went by with no evacuation of water and no fulness of the bladder. Between nine and ten o'clock in the evening, Dr. J. C. Minor, by my request, visited the patient, and, as no water had yet passed, he introduced the catheter, but did not obtain a drop of water. Temperature,  $99^{\circ}$ ; pulse, 48; respiration, 21.

November 19th.—No change. Drs. Carnochan and Minor saw the patient with me. Dr. Carnochan used the catheter, and later in the day I did so myself, but without getting a particle of urine. I had taken the precautions that no evacuation of *any kind* should be cast away before I had inspected it, and there was not a trace of water commingled with the faecal passages. Temperature,  $97^{\circ}$ ; pulse, 52; respiration, 20.



Mind entirely clear and placid, appetite good, and no special pain; was up and down about the room.

November 20th.—Same as yesterday; catheter used once or twice, but no water. Temperature,  $99^{\circ}$ ; pulse, 48; respiration, 22. Bowels free.

November 21st.—Catheterized; no water. Temperature,  $97.5^{\circ}$ ; pulse, 51; respiration, 19; mind very clear, collected, and calm.

November 22d.—Dr. Carnochan introduced the catheter; no water. Temperature,  $98^{\circ}$ ; pulse, 48; respiration, 18. Wind often rejected from the stomach, which had a *decided ammoniacal odor*. Mind not the least disturbed, and in every respect the nervous system seemed in complete repose.

November 23d.—A close repetition of yesterday. Temperature,  $99^{\circ}$ ; pulse, 49; respiration, 20. Seven full days of complete anuria had now elapsed, and at eleven P.M. Drs. A. L. Loomis and John C. Minor saw the patient with me.

The right side of the abdomen, between the hips and ribs, was increased in volume, and there was a tolerably distinct fluctuation. Dr. Loomis found some crepitation at the posterior surface of the lungs, especially upon the right side (the side upon which the autopsy proved the hydronephrosis to be most extended). He expressed the opinion that the fluctuation indicated the existence of a hepatic abscess; he also thought that in all probability there was occlusion of the right ureter (perhaps from gouty deposit). He had no theory whatever by which to account for the suppression of water, and concurred with the project which we entertained of aspirating, though he thought best to delay for a day or two. Insomnia.

November 24th.—Used catheter; no water. Temperature,  $99.1^{\circ}$ ; pulse, 58; respiration, 18; mind entirely clear and active. Bowels open; more abdominal pain and distention. Cupped over the right loin, taking two ounces of blood, which the family sent to Dr. Dalton for chemical analysis. Dr. Dalton declining to make the analysis, the specimen was given to me, and I placed it in the hands of Dr. G. M. Dillow for examination, who kindly sent me the following report:

*"The blood gives no evidence of the presence of urea."*

This blood was obtained on the eighth day of the anuria.

November 25th.—Catheterization; no result. Temperature,  $98.7^{\circ}$ ; pulse, 57; respiration, 18. Vomiting and diarrhœa of



dark green matter (first trouble from vomiting); mind still clear as ever; continued insomnia.

November 26th.—Temperature, 99°; pulse, 60; respiration, 22; still no water. At 8.30 A.M. Drs. Carnochan, Minor, and I met, and Dr. Minor performed aspiration, selecting for the site of operation a point two and one-half inches on a vertical line above the crest of the right ilium. When the aspirator had penetrated about two inches there was a free flow of pure blood; at the depth of four inches there came a light-colored, bloodless fluid, and the instrument was kept *in situ* until ten and one-half ounces of the fluid had escaped, when it was withdrawn. At the same depth where the blood escaped upon the entrance of the needle, it also escaped upon its withdrawal.

A few minutes after the aspirator had been taken away, the patient complained of the most agonizing pain, extending throughout the entire abdomen. The pain did not abate, and it became so unendurable that during the day it was necessary to give three hypodermic injections of morphine. Temperature, 99°; pulse, 60; respiration, 22.

*At eleven o'clock in the evening three ounces of water were taken by the catheter, there having been ten days and nearly two hours of total anuria—from Tuesday evening, November 16th, to Friday evening, November 26th. The mind had not suffered in the least, nor had there been any subsultus. The strength had remained very fair, so that the patient was able to walk about the room.*

November 27th.—Temperature, 99.1° to 100°; pulse, 85; respiration, 20. To this date the tongue had never been dry, and only slightly coated. It now, however, became dry and coated, and there commenced considerable vomiting and diarrhoea of dark green material. The abdomen was greatly distended and tender; there was aversion to food, and considerable wandering of the mind. Within the twenty-four hours after the urinary secretion commenced there passed sixty-two ounces of water: specific gravity, 1020; reaction acid; no trace of albumen, and no blood or pus. Total amount of urea was not in excess, even taking into account the almost double normal quantity of water.

*Physical examination of the urine by Dr. G. M. Dillow.—*  
“Total amount of urine passed in twenty-four hours, fifty-seven



fluid ounces; very pale yellow; slight turbidity; reaction acid; specific gravity, 1012; sediment very slight.

*“Chemical examination.*—Normal substances; coloring matters diminished; urea diminished; total quantity, 21.1 grammes (337 grains). Uric acid diminished; chlorine markedly lessened (about one-tenth of one per cent.); phosphates diminished. Entire amount of solid constituents, 47.88 grammes (normal, 60 to 70 grammes).

*“Abnormal matters.*—Albumen about one-third <sup>of one</sup> per cent.”

November 28th.—Symptoms of the previous day intensified, with the addition of extreme prostration. Temperature, 101.1°; pulse, 128; respiration, 24. Incessant vomiting and diarrhœa of dark brown matters. Voided ninety-four ounces of urine, specific gravity, 1016; no albumen or blood. From 12 m. the patient seemed moribund. The heart-action was very labored; no pulse to be detected in the extremities; the whole surface cyanotic and bathed with a cold perspiration; pinched, hippocratic expression of face. Restoration seemed to result from use of hydrocyanic acid.

November 29th.—Condition in many respects seemed much better; for example, the abdomen had become much reduced and softened, and tenderness almost gone. Some sores, which had been accidentally produced by too hot applications, commenced to heal (at the end of two days the healing was complete). Temperature, 100.9°; pulse, 106, and of fair strength at the wrist; respiration, 21; tongue moister; diarrhœa and vomiting less; skin moist and warm. The twenty-four hours gave fifty-four ounces of urine in every respect similar to that of the day before.

November 30th.—During the last night there was an unfavorable change, and it was very evident that the blood was becoming poisoned or perverted, and that the nervous structures were beginning to give way. There was constant rejection of gas from the stomach; skin blue and cold; right eye very bloodshot; suggillations upon face and neck; delirium was almost constant. Temperature, 101.8° to 102°; pulse, 108; respiration, 20. Thirty-seven ounces of urine, quality unchanged from day before; specific gravity, 1018.

December 1st.—Condition progressively worse than yesterday. Temperature, 100.5°; pulse, 123 and feeble; respiration, 22. Toward night exceedingly feeble. Passed twenty ounces of natural urine.



December 2d.—In all respects worse ; constant mental wandering ; eyes more suffused and suffering from active inflammatory process. Discharges from the bowels and bladder involuntary and almost constant. Temperature,  $101^{\circ}$  to  $101.5^{\circ}$  ; pulse, 124 to 130 ; respiration, 20.

December 3d.—Less of involuntary escapements from bowels and bladder, and clearer again in mind, and the right eye was not so red. There was, however, a *paralysis* of the *left arm* and *ptosis* of the *left eyelid*, with some *defect in ability to swallow*. *Sighing* was very constant, and the patient complained of *pain in the occiput*. Temperature,  $101^{\circ}$  ; pulse, 112 ; respiration, 20.

December 4th.—Clearer in mind, but prostration much intensified ; no more involuntary escapes ; the paralysis a little more marked ; skin very dark blue, and no pulse to be found at the wrist ; the interval between the systole and diastole of the heart not distinct ; *a white crust of crystals deposited over the face and neck, in appearance like dried salt, and greasy in feeling*, which was somewhat difficult to remove, and when removed would speedily redeposit. From ten o'clock in the morning the patient was actually dying. Temperature,  $101.9^{\circ}$  to  $102^{\circ}$  ; pulse 128 to 130 ; respiration, 20.

December 5th.—Temperature,  $101^{\circ}$  ; heart's action, 130 ; respiration, 19 ; was moribund all the morning, and finally died at 12.30 P.M., quite conscious to the last.

**Autopsy at 7 P.M. of same day :**

ABDOMEN.—Remarkably free from fluid. At the lower part of the pelvic cavity there was about a half-ounce of odorless material, having the consistency and appearance of currant-jelly.

LIVER in every respect normal.

OMENTUM.—Deeply congested and adherent to the parietal peritoneum and to the intestines.

INTESTINES.—Intensely congested, especially the ascending colon and the lower third of the ilium—almost black.

SPLEEN AND PANCREAS normal.

RIGHT KIDNEY.—Weighed fifteen and one-half ounces (Troy), nearly three times the natural size, and contained on the pelvic border, above the hilum, a cyst about three centimetres in diameter, containing a thin, amber-colored fluid. No calculi.



LEFT KIDNEY.—Had wholly disappeared in giving place to a cyst. There was not a trace of true renal structure. The cyst was of a multifid character; the chief one, which remained unopened, was punctured and gave about eight ounces of fluid which had not the characteristics of urine (nor had the fluid obtained by means of the aspirator).

The suprarenal capsule was entirely converted into another cyst, the contents of which were quite unlike those of the cysts originating from the kidney proper. The material was of a thick, pasty consistency, and chiefly composed of cholesterine and fatty substance.

LEFT URETER.—There remained a shrivelled, impervious bit of it about an inch and a half in length.

RIGHT URETER normal.

RENAL ARTERY of left side, unfortunately, was not carefully traced.

RENAL ARTERY of right side (to the practically only kidney) was conserved, and distinctly bore evidence of having been subjected to a long-continued pressure. A tract of the artery, nearly three-fourths of an inch in length, was flattened, distorted, much inflamed, and adherent to the surrounding tissues. The channel, though flattened, on section was free.

Illustrations Nos. 1 and 2 represent respectively upon the surface of the body the area of dulness, the site of aspiration, and the appearance of the contracted cyst-walls of the left kidney two days after its removal from the subject.

Illustrations Nos. 3 and 4 (microscopic) are from sections of the kidney prepared by Prof. Charles Heitzmann, showing infarctus in the kidney—produced, without doubt, by minute bits of clot coming from the point of pressure upon the renal artery (after the artery was freed from compression).

The therapeutic history, of course, has no practical import, as the sequel demonstrated that no treatment, other than the evacuation of the cyst, would have offered any chance for recovery, and the treatment subsequent to the anuria has no direct bearing upon the subject under consideration.

The ideas which suggested themselves during the course of the malady may not, however, be altogether devoid of interest or practical value to others placed under similar circumstances.

During the first four days that the patient was under my care there were some grounds for supposing that he was suf-



fering from circumscribed hepatic inflammation, with the danger of an abscess. Indeed, the "duck-egg" tumor mentioned seemed strongly to indicate that such a process was somewhat beyond mere initiation. On the other hand, a non-undulating, low temperature (at no time exceeding  $99.5^{\circ}$ ), a pulse persistently 20 beats below the normal, that is 48 to 51 (pulse in health about 70), the sudden disappearance of the "duck-egg" tumor, with no evidence of internal rupture of abscess—all combined were very telling evidence against the abscess theory. The cause of mental wandering at that stage of the illness I could not then, nor do I now understand; and a still greater mystery is the fact that with the commencement of the anuria this symptom almost entirely ceased.

From the beginning there had been a steady increase in the volume of the abdomen, but the rapidity of the increase was no greater after the onset of the anuria than it was before. Fluctuation finally became tolerably distinct, and it was placed beyond doubt that there existed a collection of some kind of *fluid* within the abdomen; but *what* the fluid was, its precise *location*, or its *source*, were all as much as ever a matter of question.

Until further developments we could but content ourselves with the fact of the existence of a fluid collection, and from the most careful examinations it seemed probable that its location was in the liver; indeed, upon the thirteenth day of illness—the commencement of the eighth day of anuria—it was Dr. Loomis' opinion that we had to deal with an abscess of the liver, and Dr. Carnochan feared that possibly there might be a soft or malignant hepatic cancer. The dulness and the apparent location of the tumor were so remote from the anatomical site of the kidneys, and there was such an absence of symptoms generally accepted as belonging to kidney disease, that the idea of such connection, although often discussed, was not to any extent adopted. With the advent of anuria, of course, came the question of its cause.

As there had been no renal colic, or any indications of renal calculi, or of kidney disease of any kind (unless low temperature and lowered cardiac action be so considered), my first thought was that of tonic spasm of the renal arteries. General arterial tension did not seem sufficiently reduced to cause the abolition of secretion, and neither digitalis, nitre, or any of the



generally used diuretics exercised their ordinary effects. The theory of spasm could be entertained, however, for only a brief space of time, as it was wholly improbable, and at variance with the facts of general observation in physiological pathology, that an absolutely uninterrupted spasm of the vasomotor nerves of any organ should endure for a series of days.

About the only reasonable conjecture left was that of complete mechanical obstruction at some point above the entrance of the ureters into the bladder.

It seemed hardly within the limits of chance that *both* ureters should become thus *completely* and *simultaneously* blocked; besides, there were no symptoms (renal colic, vomiting, etc.) such as usually attend the occlusion of the ureter. The absence of these symptoms suggested the question if the blockade could be *above* the kidneys; but here again it was quite as difficult to comprehend how *both* renal arteries could be *simultaneously* and *entirely* obstructed, as the position of the tumor did not favor the idea that pressure from it might cause obstructions of the renal arteries.

At that time I knew of no recorded instance of occlusion of the renal arteries (indeed, I still know of but one, that reported by Dr. Robert Bentley Todd—"Medico-Chirurgical Transactions," vol. xvii., pp. 302 et seq., London, 1844—where there was but one kidney and the renal artery was compressed by an aortic aneurism), and theoretically I should have expected in such case much more positive symptoms.

The tapping of the cyst at 8.30 o'clock in the morning, and the obtaining of three ounces of water by catheter at 11 o'clock in the evening, seemed fairly strong proof that between the tumor and the anuria there was in some way a relation of cause and effect, and the autopsy elucidated and completed the demonstration. The problem was entirely simplified by discovering the existence of only *one kidney*, and therefore the channel of but one renal artery required blocking, and this blocking was effected by pressure from the cyst, as upon autopsy it at once became demonstrated to the eye. After the prolonged pressure of ten days it probably required the space of fifteen hours before the vessel became sufficiently distended to allow any considerable quantity of blood to pass.

Theoretically, one would have reasoned that the supply of blood to any organ could not be denied for such a length of



time without resulting in tissue necrosis; and certainly it seems impossible that it could have eventuated otherwise had not sufficient blood for the nourishment of the kidney found its way either through the *arteria propria renalis*, or by some collateral channel.

In reviewing cases of anuria I am especially impressed with the fact that *sudden* and *total* urinary suppression, in absence of other acute illness or of poisoning, is nearly always co-existent with the presence—physiologically at least—of but one kidney; it is so much the rule that nine times out of ten I think it would be safe to express such an opinion. (It must be understood that, anatomically, both kidneys may exist, whilst previous occlusion of one ureter, for example—sometimes other considerations also—may, as concerns its physiology, reduce the organ to *nil*.)

After I had arrived at this conclusion, and while occupied in the investigation of such cases of anuria as I could find on record, I was more gratified than surprised to find an expression of the same opinion in a clinical lecture given by Jonathan Hutchinson, F.R.C.S., at the London Hospital, of which he was at the time senior surgeon. He says:

“It is probable that a majority of the rare cases of death from sudden and complete retention” (suppression is evidently meant) “of urine in previously healthy persons, occur in those who have but one usable kidney.” . . . . “It is indeed very difficult to conceive of any other condition under which sudden, complete, and permanent suppression of urine can take place.”—*London Lancet*, p. i., July 4, 1847.

Perhaps no man has had greater opportunities for observation in this field than those offered to Professor Hutchinson, and it was not a matter of dissatisfaction to me to find that I had independently arrived at a conclusion identical with the enunciation from an authority so eminent.

The peritonitis which immediately succeeded the aspiration was undoubtedly due to the escape of cystic fluid into the abdominal cavity. From the peritonitis the patient actually recovered, and the manner of his death was not such as necessarily follows or was in any degree characteristic of either anuria or peritonitis. It seemed to result from blood-poisoning or perversion such as interfered with and profoundly depressed the functions of the nervous centres at the base of the



encephalon (medulla oblongata perhaps). The only remedies which seemed to exercise any unequivocal counteracting influence were hydrocyanic acid and arsenic.

In regard to the *direction usually taken by renal cysts* in their expansion, an analysis of the cases which I have found on record (somewhat near a hundred) indicates that, as a rule, they travel over to the side of the abdominal cavity opposite the kidney from which they originate, and this naturally results from the fact that the cysts in merging from the kidney generally make their exit from its hilum or concave border. It will be readily comprehended that a cystic growth from the *left* kidney would naturally present greater difficulties in the way of diagnosis than would be offered in connection with one coming from the right, by reason of the intimate position-relations it must enter into with the liver. In the subject of this report, the liver was by all of the medical council at first supposed to be the organ containing the fluid, whereas autopsy found the liver in every respect natural and sound. The cyst from the left kidney had travelled to the right side of the abdomen, back of the intestines, down below the lower border of the liver, carrying before it a portion of the mesentery, and approached the surface only two inches above the right ilium.

This *crossed direction* seems to be, within a certain limit, very characteristic of cystic growths from the kidneys, other renal growths being more liable to confine their extension to the neighborhood of the kidney; or, if they go far away, they are quite as prone to descend upon the same side.

As relates to *low temperature, slow pulse, and respiration*, it will be observed that an analysis of the series of cases which I have added to this report indicates that, at least in uncomplicated anuria (perhaps, also, with renal cysts generally), lack of rise in temperature, an abnormally slow pulse and infrequency of respiration, would appear as somewhat characterizing features.

It is very much to be regretted that many of the clinical descriptions recorded of anuria (and the same may be said of every department of descriptive pathology), are deprived of nearly all value by the employment of ambiguous terms, and by an almost incomprehensible lack of exactitude.

If authors would be careful to use the terms SUPPRESSION, ISCHURIA RENALIS, SUPPRESSIO URINÆ, or ANURIA, as applying



to a condition where the kidneys failed to separate the water from the blood ; and, on the other hand, to employ RETENTION, RETENTIO URINÆ, or ANURESIS, to a retention of urine which had actually been secreted by the kidneys, but impeded in its outflow at some point between the kidney and the external urethral orifice, it would surely be an advantage ; it would furnish much clearer ideas to readers, and inspire writers with much more definite modes of thought and expression.

TABLE I.—STATEMENT OF TEMPERATURE, RESPIRATION, AND PROMINENT FEATURES OF THE CASE.

Date.	Temperature, Fahrenheit.	Pulse.	Respira- tion.	
Nov. 12....	99	58	20	Discomfort ; wandering.
Nov. 13....	99.5	51	23	Duck's-egg tumor ; wandering.
Nov. 14....	98	48	20	Good appetite ; sleeps ; not quite clear.
Nov. 15....	99	59	22	Good appetite ; sleeps ; not quite clear.
Nov. 16....	99.5	49	18	Duck's-egg tumor disappeared.
Nov. 17....	99	48	21	No water since last night ; catheter used.
Nov. 18....	99	54	18	No water ; catheter used ; clear in mind.
Nov. 19....	97	52	20	No water ; catheter used ; clear in mind.
Nov. 20....	99	48	22	No water ; catheter used ; clear in mind.
Nov. 21....	97.5	51	19	No water ; catheter used ; clear in mind.
Nov. 22....	98	48	18	No water ; catheter used ; clear in mind.
Nov. 23....	99	49	20	No water ; catheter used ; clear in mind.
Nov. 24....	99.1	58	18	No water ; catheter used ; clear in mind.
Nov. 25....	98.8	57	18	No water ; vomiting and diarrhœa ; clear in mind.
Nov. 26....	99	60	22	No water ; tapped 8.30 A.M. ; clear in mind.
Nov. 27....	99.1	85	20	62 ounces water ; vomiting and diarrhœa ; mind wandering.
Nov. 28....	101.1	128	24	94 ounces water ; vomiting and diarrhœa ; mind wandering.
Nov. 29....	100.9	106	21	54 ounces water ; vomiting less ; sores healing.
Nov. 30....	101.8	108	20	37 ounces water ; delirium ; suggillations on face and neck ; left eye bloodshot.
Dec. 1....	100.5	123	22	20 ounces water ; in other respects same.
Dec. 2....	101.5	124	20	Involuntary evacuations ; paralysis of left arm ; ptosis left eyelid ; defect in swallowing ; pain in occiput.
Dec. 3....	101	112	20	No involuntary evacuations ; clearer in mind ; heart-action imperfect.
Dec. 4....	101.9	128	20	No involuntary evacuations ; clearer in mind ; white crystals of urea on face and neck.
Dec. 5....	101-102	130	19	Died at 12.30 P.M. ; fully conscious to last.

To the description of this case I have added a *résumé* of ninety-three cases, which I have gleaned from the medical periodicals of the past hundred years. The source and author-

ity for each case are given, and I hope it may be of use in supplying others with just that compact collection of observations which I would have been very glad to have found ready gathered by some one else, and which has cost vastly more time and labor of reading than the meagre-appearing result would indicate.

I have arranged the cases under different heads :

*First.*—Includes all those cases where the urinary apparatus was the primary seat of trouble.

*Second.*—Embraces those instances where anuria was an accompaniment or result of some more general constitutional disturbance (scarlet fever, scirrhus, etc.), including one traumatic case.

*Third.*—Cases where anuria resulted from the action of extraneous poisons on the organism.

*Fourth.*—Comprises all cases where the causes were not precisely ascertained.



## SECTION SECOND.

## CASES OF SIMPLE CALCULUS.

No. and Duration.	Age. Sex.	By whom and where reported.	Cause.	Symptoms.	Treatment.	Result.	Autopsy.
No. 1. 15 days.	M. 56	M. Tenneson : Gazette des Hôpitaux, No. 23, p. 182, 1879; also Gazette Hebdomadaire, p. 135, Paris, 1879.	Calculi.	September 13, 1878. — For ten days no symptom excepting complete anuria. Twelfth day went to the hospital; no water in bladder. Had never suffered from kidney colic, or passed blood, or had tumor in abdomen; no rheumatism or alcoholism. With the exception of 2 c.c. of albuminous urine passed on the tenth day, the anuria was complete for about fifteen days. Uræmic symptoms first appeared on the twelfth day of anuria, continuously increasing for five days (two days after flow of water was re-established), when he died.		Death.	Right ureter completely obliterated by old calculus. Left ureter pervious, but there was a free calculus in kidney pelvis which lodged upon the upper orifice of the ureter, so as to entirely obstruct it. (Thus the left kidney had been for a long time the only usable one.)
No. 2. 13 days.	F. 63	Salgado : Ziemssen's Cyclop. Med., vol. xv., p. 711 (Am. translation).	Calculi.	No particulars given. Recovered after escape of calculi.		Recovery.	
No. 3. 6 days, then 2 days.	M. Middle age.	J. Hutchinson : London Lancet, p. 2, July 4, 1874.	Calculi.	Entire anuria four days before coming under medical treatment; no water by catheter; no symptoms of uræmia. After hot bath on evening of sixth day passed calculus and large quantity of pale urine. After twelve hours, again complete anuria for forty-eight hours. No second stone observed to pass. In two or three days patient resumed office business. (Very likely a movable calculus in pelvis of kidney.)	Diuretics; diaphoretics; purgatives.	Recovery.	

No. 4. 13 days.	M. 55	H. Bence Jones: London Lancet, p. 24, July 6, 1850.	Calculus.	Vomiting and sudden pain on left side. March 22d. — No water passed and none in bladder. March 28th. — Slight delirium and sickness; profuse perspiration. Pain and nausea to April 3d; matter vomited had no urinous odor; hiccup and drowsiness; delirium. April 4th. — Great increase of pain and sudden passing of about two pints of clear water, together with a very small calculus (oxalate). April 12th. — Was out, and June 3d reported quite well.	Not reported.	Recovery.
No. 5. 6 days, then 11 days.	M. 36	Robert Hamilton, M.R.C.S.F.; London Lancet, pp. 151, 152, February, 1854.	Calculi.	After Monday noon, November 11th, passed no urine, and catheter found none in bladder; violent pain in abdomen and sides. November 12th to 16th, inclusive. — Passed no water; pain more severe; tongue clean; pulse normal; no headache or anxious expression of face. November 17th. — Worse; feeling in loins as if lying on a pillow; bowels constipated. At 9 P.M. voided a pint of water; pain and sickness at stomach ceased. November 18th. — Micturated with ease, and for the last time, early in the morning. In a few hours all previous symptoms returned. November 23d. — Had steadily been getting worse; violent and almost constant vomiting of green fluid. November 28th. — Much worse and very prostrate; respiration rapid; abdomen distended; tongue dry; pulse weak; pain and vomiting ceased. November 29th, 11 A.M. — Died; <i>per-secuti</i> clear in mind to very last; the second period of complete anuria having lasted eleven days, and there were but two evacuations of urine in nineteen days.	Warm bath; mustard plasters; nitrate potassae.  Leeches; warm baths; spirits of turpentine; tincture canthar.; acet. potassae. Calomel and colocynth; elaterium; leeches.  Leeches; elaterium.  Galvanism; tinct. ferri muriatis.	Death.  Twenty-nine hours after death. <i>Bladder</i> quite empty and contracted. <i>Left kidney</i> much enlarged and softened. <i>Left ureter</i> , upper two-thirds double its natural capacity. At lower end of second and third was an impacted calculus. Below this, ureter normal. <i>Right kidney</i> much smaller and also softened; large cyst on its capsule. <i>Right ureter</i> enlarged in a manner similar to the left one, and at about the same distance from the kidney it was also blocked by a calculus. Below this, natural.



## CASES OF SIMPLE CALCULUS—Continued.

No and Duration.	Age. Sex.	By whom and where reported.	Cause.	Symptoms.	Treatment.	Result.	Autopsy.
No. 6. 6 days.	M. 49	Dr. Fuller: St. George's Hospital. Trans. Path. Soc., vol. xiv., pp. 192-5, Lon- don.	Calculi.	<p>Well developed, healthy-looking coun- tryman. Two years before was squeezed by a horse against the stall, which gave him pain in the loins and bloody urine. Was soon relieved.</p> <p>Four days before coming to the hos- pital had severe pain in loins, and for twenty-four hours had passed no water; then voided a considerable quantity, and pain ceased. Anuria had recommenced and lasted three days before he came to the hospital. Did not feel at all ill; skin, pulse, tongue, appetite, bowels, all right. No water in bladder (catheter used). At the end of the sixth day two ounces of pale, acid, slightly albuminous urine passed.</p> <p>On seventh day about the same. Still had the appearance of being well.</p> <p>On the ninth day began to suffer un- easiness about the loins; tongue coated; dejected; voided about two ounces of water, same in character as before. In- clined to be wakeful rather than sleepy. Tenth day: three ounces urine; vomit- ed; restless and sleepless.</p> <p>Eleventh day: looked anxious, care- worn, and old; same gravity of urine; pulse, 108; tongue furred; severe pains in loins and pubic regions.</p> <p>Twelfth day: increase of same symp- toms; vomiting more constant; bowels constipated. Passed thirteen ounces of urine. In evening pulse intermitted; respiration became difficult; and on the Thirteenth day, at 1 p.m., whilst sit- ting up in bed and conversing, he sud- denly fell back and died in the course of three minutes.</p> <p>There was at no period any indication of uræmic poisoning.</p>	<p>Diuretics; warm baths; warm fomentations.</p> <p>Dry cupping; turpen- tine stupes; poppy fomen- tations; internally, gin and opium. One-half ounce castor- oil; senna draught; en- ema.</p>	Death.	<p>Forty-eight hours after death.</p> <p><i>Left kidney</i> twice natural size, small cyst on surface, and numerous small ones within.</p> <p>In pelvis, large, triangular- shaped calculus, weighing 120 grains, apex projecting into the orifice of the ureter, fitting it so closely that there was no room left for escape of urine. The calculus must have held its position long enough for its sides to be worn smooth by friction against its walls.</p> <p><i>Right kidney</i> had an al- most fac-simile condition of left one, only that the calcu- lus on this side weighed but 98 grains, and the glandular structure of the kidney was healthy.</p> <p>The ureters were thor- oughly pervious, except at the points of described cal- culi impaction.</p> <p>Bladder contained one-half pint urine.</p>

No. 7. 28 days.	M. (?)	S. Breslau: Sammlung von Natur und Medizin, p. 219, 1720.	Calculus and fatty tumor.	Twenty-eight days of complete anuria, but no account of symptoms.	Death.	<i>Left kidney</i> , natural size, but full of membrane. <i>Left ureter</i> , greatly dilated, and at one finger's length from kidney pelvis was occluded by a calculus, size of hazel-nut. <i>Right kidney</i> , size of child's head, but more normal struc- ture than in other. <i>Right ureter</i> , mouth block- ed by a fatty tumor.
No. 8. 21 days.	M. 41	S. Breslau: Sammlung von Natur und Medizin, p. 220, 1720.	Calculi.	Vomiting; small, quick pulse. No water in bladder, but day before death passed half-pint of clear, odorless urine.	Death.	<i>Left kidney</i> , very large; renal pelvis full of small, sharp calculi, size of beans. <i>Right kidney</i> , still large and full of pus; large calculus entirely occluded the com- mencement of ureter.
No. 9. 18 days.	F. 40	S. Tulp: Med. Obs., vol. II., p. 45.	Calculi.	Ill eighteen days, and finally died in convulsions. No other history given.	Death.	<i>Left kidney</i> , filled with wa- ter and calculi, one of which firmly closed the ureter. <i>Right kidney</i> , ureter also firmly occluded by a calculus.
No. 10. 5 days.	(?) (?)	S. Blas: Obs. Med. Rarior, Part. v., Obs. 24.	Calculi.	Five days of anuria; catheter used. "Died of suppression."	Death.	<i>Left kidney</i> , double size, filled with pus, and contained two calculi, the largest one wedged into the ureter. <i>Right kidney</i> , normal; in its ureter a stone tightly im- pacted.
No. 11. 13 days.	M.	Dr. Fuller: St. George's Hosp. Med. Times and Gaz., vol. I., p. 548, London, 1863.	Calculi.	Slight pain in back; pulse quiet; tongue clear; catheter used, but bladder empty. At the end of seven days passed two ounces of pale urine of low specific gravity; once afterward passed four ounces. Had severe pain in loins. On the thirteenth day died suddenly, having had no uræmic symp- toms of any kind.	Death.	<i>Each ureter</i> occluded by a calculus.



## CASES OF SIMPLE CALCULUS—Continued.

No. and Duration.	Age. Sex.	By whom and where reported.	Cause.	Symptoms.	Result.	Autopsy.
No. 12. 7 days and 4 days.	F. 39.	Dr. J. H. Griscom: New York Med. Jour., vol. iv., p. 368, 1867.	Calculi.	One year before the last attack, reported an anuria of seven days. Not stated whether or not there were uræmic symptoms.	Death.	<i>Left kidney</i> , two large abscesses and good-sized calculus; pus seemed to fill ureter. <i>Right kidney</i> , smaller, and also contained a small abscess of recent development.
No. 13. 5 days.	M. 28	Prof. Carl Bartels, of Kiel: Sammlung klinischer Vorträge: Red. von Volkmann, No. 25; also, Ziemssen's Cy- clop. Med., vol. xv., pp. 49, 50 (Am. edi- tion).	Calculi.	Patient had previously several renal colics. On December 15, 1867, had an attack in both kidneys. Besides violent pain, had a constant sensation of choking, and continued vomiting. At end of three days pain ceased, but vomiting continued. For <i>five entire days</i> there was <i>absolute anuria</i> and empty bladder. Twenty-four hours after he passed 3.025 c.c. of urine, specific gravity, 1039; was albuminous, and contained red-blood corpuscles, cells, and epithelium from ureters and kidney pelvis, and hyaline casts. He immediately felt well; good appetite. For four days water very copious and albuminous. Six weeks afterward the patient passed a calculus about the size of a bean. There were no uræmic symptoms.	Recovery.	
No. 14. 8 days.	M. 50	Gautier and Claubry: Jour. Gén. de Méd.; also, Dict. des Scien. Méd., p. 430.	Calculi.	<i>Eight days of complete anuria.</i>	Death.	Both kidneys were filled with calculi.
No. 15. 6 days.	(?) (?)	Hufeland's Jour. der praktisch. Arzneikun- de, pp. 1-93, Dec., 1815.	Calculi.	Retentio urinae ureterica. <i>Six days complete anuria.</i>	Death.	Calculi in both ureters, about two and one-half inches from entrance into bladder.

## CALCULUS, WITH PREVIOUS DESTRUCTION OF ONE KIDNEY.

No. and Duration.	Age. Sex.	By whom and where reported.	Symptoms.	Treatment.	Result.	Autopsy.
No. 16. 13 days.	M. (?)	Anglada: Recueil des Trav. de la Soc. Méd. du Départ. d'Indre et Loire, Tri- mestre I., 1843.	<p>Than the anuria, the patient had no other illness; continued at his vocation (merchant at Tours) during the whole thirteen days, at the end of which time he all at once passed several litres of urine, and the secretion again became normal.</p> <p>A few days after was attacked with fever and died.</p>		Recovery. Afterward death from fever.	One kidney reduced to size of a bean; the other greatly hypertrophied, and its ureter exceedingly dilated down to its middle, where it was obstructed by an oblong calculus, hooked into a fold of the mucous membrane. The urine had succeeded in passing by this stone.
No. 17. 11 days.	P. 32	Dr. Southey: London Lancet, p. 11, January, 1874.	<p>April 10th to 22d.—Complete anuria. Violent headache, nausea, and bleeding hæmorrhoids; vomiting; temperature, 97.3°; pulse, 84; respiration, 24. Patient died suddenly on the 22d, perfectly conscious and clear to the last.</p>	Warm bath; senna mixture; enema; brandy; chloroform.	Death.	<p>Sixteen hours after death.</p> <p><i>Left kidney</i> weighed 19½ ounces; nodular; contained no trace of secreting surface; filled with cysts containing white, pulsatious substance.</p> <p><i>Right kidney</i> weighed 10 ounces.</p> <p><i>Ureter</i> greatly distended, and at a point on a level with brim of pelvis was occluded by a tightly impacted calculus.</p> <p><i>Bladder</i> contracted, and not containing a drop of water.</p>
No. 18. 6 days.	M. 71	Hutchinson: London Lancet, p. 1, July 4, 1874.	<p>Had received a blow on the left loin. Nausea; pulse feeble; skin cool; no urinous odor. <i>Was conscious to nearly the last, and died in convulsions.</i></p>	No diuretics; purgatives and measures to promote cutaneous action.	Death.	<p>Twenty-four hours after death.</p> <p><i>On the right side</i> no trace of kidney or ureter.</p> <p><i>Left kidney</i> twice normal size. Four inches down the ureter was an impacted calculus size of hazel nut. A few serous cysts near the surface of the kidney.</p>



## CALCULUS, WITH PREVIOUS DESTRUCTION OF ONE KIDNEY—Continued.

No. and Duration.	Age. Sex.	By whom and where reported.	Symptoms.	Treatment.	Result.	Autopsy.
No. 19. 9 days.	M. 59	Wm. Roberts: London Lancet, pp. 868 —50, June 18, 1870.	<p>In 1864 patient had symptoms of calculus in left kidney, passed two small stones, and had renal colic with several weeks' suffering. Experienced relief under Dr. Garrod's care.</p> <p>April 29, 1868, four years after the attack on the left side, had a sudden pain in the right side, with urgent desire to micturate, and at various times through the day passed water and blood, and was nauseated.</p> <p>April 30th.—Passed no water and had no inclination to; vomited; pain less.</p> <p>May 1st.—No urine; no pain; nausea; loss of appetite; extreme thirst; right loin tender to touch; pupils normal; pulse 72.</p> <p>May 2d.—Passed two ounces of urine in afternoon, specific gravity 1010, a little blood, and a trace of albumen; some epithelial cells. This was the <i>only urine voided during the nine days</i>. Patient apparently better; short naps; some vomiting; mind clear; pupils natural; pulse, 72; temperature (in axilla), 100° F.; respiration, 24.</p> <p>May 3d.—Calm and clear in mind; some nausea; not the least urinous odor to breath or sweat; pulse, 72; temperature, 99.7°; respiration, 24; no desire to urinate, and <i>no pain or tenderness in loins</i>.</p> <p>May 4th.—Very weak, but dressed and downstairs. Restless night, with much sighing; pupils normal; not much pain; frequent naps, and perspired; some headache, but not the least confusion or slowness of mind; bowels active; no nausea and no thirst. Took milk, eggs, and rice-pudding, and brandy; wants "something to make him sleep."</p> <p>Pulse, 72; temperature, 99.7°; respiration, 24.</p> <p>May 5th.—Up and dressed for an hour. No vomiting or thirst; some headache in the morning; no giddiness; pupils normal; no confusion of mind; cheerful, even jocular. Restless night; dozes, but starts upon falling asleep. For the first time slight subsultus on trunk and limbs; ate well. Pulse, 76; temperature, 98.6°; respiration, 20.</p> <p>May 6th.—No mental disturbance or indifference; constantly falls into a fitful doze and wakes with start; subsultus more marked; weaker, but rose and dressed; pupils natural; sleeplessness distressing; right loin very tender; face sunken; takes</p>	<p>Warm bath; belladonna.</p> <p>Hot baths twice a day of one-half hour; effervescing draughts, with prussic acid and five grains of calomel at night; black draught in morning.</p> <p>Continued draught and calomel; galvanized from loin to perineum.</p> <p>Effervescing draughts and calomel; galvanism, and three drops of turpentine three times a day.</p> <p>Baths; galvanism; effervescing drinks, as before; turpentine enema and black draught.</p>	<p>Death.</p>	<p>Thirty hours after death.</p> <p>All abdominal organs healthy, excepting kidneys and ureters.</p> <p><i>Right kidney</i> weighed 11½ ounces; otherwise natural. Pelvis of kidney and ureter not in the least distended; they contained about two teaspoonfuls of blood-stained urine. A small uric acid calculus, about the size and shape of a hemp-seed, was found immovably impacted in the ureter just above the bladder; it weighed 1½ grain. No other stone or loose gravel was found in the kidney or its appendages.</p> <p><i>Left kidney</i> was completely hollowed out into a lobulated sac, and about as large as a healthy kidney. It contained five ounces of white, milk-like fluid, which remained unaltered even after long standing, and consisted of myriads of needles of urate of soda floating in a highly albuminous serum. Identical in composition with softened gouty concretions. Sac tough and leathery; no remnants of cortex or pyramids.</p> <p>The <i>left ureter</i> was plugged up at its origin by a conical calculus of uric acid weighing 52 grains, and was firmly fixed, like a cork, into the funnel-shaped ureter. The remainder of ureter unaltered.</p> <p><i>Bladder</i> completely empty; no urinous or ammoniacal odor about the body.</p>

NOTE.—Nausea and vomiting, failure of muscular strength, natural pulse, natural or lowered



No. 30. 3 days and 10 days.	M. 62	Dr. Bagshawe: Trans. Path. Soc. of London, vol. xvi., pp. 176-9, 1865.	<p>food well—milk, cocoa, bread and butter, and rice-pudding. No nausea except after the turpentine; some panting; inspiration an effort; pulse, 76; temperature, 98.2°; respiration, 22.</p> <p>May 7th.—Strikingly worse; exceedingly restless; tongue dry; muscular jactitation increased and stronger; pupils more contracted; no persistent nausea. At stool voided nothing but mucus—alkaline. Much thirst; no appetite; unable to walk; when roused, intellect clear; indifferent when left alone. Falls into a dozy state, panting, and with mouth open; long pauses between inspiration and expiration; slight headache; no urinous or ammoniacal odor about breath or body; complains of numbness in hands, feet, and calves; pulse, 76; temperature, 97.4°; respiration, 21.</p> <p>May 8th.—At 6 A.M. breathing very oppressed; said he <i>could not feel his legs</i>. At 9 A.M. pulse, 80; respiration, 15; pupils strongly contracted, and incessant twitching all over the body. These symptoms became progressively intensified until one o'clock, when he asked to have his hands rubbed, and suddenly fell back dead.</p> <p>There was at no period a coma or epileptoid convulsion, or even loss of clear consciousness.</p>		<p>rate of respiration, temperature rather under than above normal (excepting a slight febrile movement at the time of impact of calculus), and insomnia, were the prominent features.</p> <p>Subsultus did not appear until the seventh day. Pupils did not contract until the ninth day.</p> <p>No convulsions, no coma, and entirely clear intellect to the last moment.</p> <p>Dr. Roberts says: "<i>Nine days will be found to be about the average duration of cases of complete suppression occurring in previously healthy persons.</i>"</p>
No. 30. 3 days and 10 days.	M. 62	Dr. Bagshawe: Trans. Path. Soc. of London, vol. xvi., pp. 176-9, 1865.	<p>House-painter; had experienced repeated attacks of <i>colica pictorum</i>.</p> <p>In January had an anuria of three days.</p> <p>February 11, 1865, voided a cupful of bloody urine, after which complete anuria with no desire to pass water; catheter used.</p> <p>February 16th (fifth day).—Ptosis of one eyelid; pulse, 84.</p> <p>February 19th (eighth day).—Desire to pass water, and was reported to have voided one-half pint of limpid urine. Dr. B. doubts the correctness of the statement. Breathing hurried; manner anxious; very restless; not drowsy; debility and subsultus; pupils contracted. Said he was dizzy and had heavy feeling in region of right kidney. Pulse, 52 to 56, and irregular; heart-sounds labored; tongue coated; skin cold and blue; abdomen tympanitic; vomiting.</p> <p>February 20th (ninth day).—Last night extremely restless; voided a few drops of blood.</p> <p>February 21st (tenth day).—Symptoms increased. Was entirely conscious and clear to the very moment of death, which was very quiet, at 6 P.M.</p>	Purgatives, emetics, and small doses of cantharides.	<p>Death.</p> <p>Marked <i>arcus senilis</i>. Posterior and middle cerebral arteries atheromatous; heart normal.</p> <p><i>Left kidney</i> much shrunken, and reduced to an aggregation of cysts. No true kidney-tissue of any kind. The smaller cysts contained clear fluid; the larger ones thick, white, like chalk-mixture, containing cholesteroline and phosphate of lime. Fluid neutral. Kidney weighed 2 ounces. Small calculus was impacted in the infundibulum.</p> <p><i>Ureter imperforatus</i> in its entire length; no trace of an orifice in bladder.</p> <p><i>Right kidney</i>, weight 7 ounces, contained four or five cysts, the largest size of a bean. General structure normal and healthy; some of the malpighian bodies contracted and capsules thickened, and with granular epithelium.</p> <p>Many of tubes in apices blocked up by dark-colored plug, rough to the touch, but not hard—calculus of uric acid.</p>



## CALCULUS, WITH PREVIOUS DESTRUCTION OF ONE KIDNEY—Continued.

No. and Duration.	Age. Sex.	By whom and where reported.	Symptoms.	Treatment.	Result.	Autopsy.
No. 21. 12 days.	F. (?)	Nunnally: Trans. Path. Soc. of London, vol. xl., pp. 145-8.	<p>At one time patient had diseased bones of right wrist. Father, mother, and one or more sister died of heart disease; one brother affected.</p> <p>February 11th.—In the morning passed water and a small calculus. This was the last urine passed. Vomiting; pain in back and loins.</p> <p>February 12th.—Same.</p> <p>February 13th.—Constant vomiting, but no pain or tenderness, and no fullness in back or abdomen; pulse natural; catheter used, but no water in bladder.</p> <p>February 17th.—Serum from blister had urinous odor; subsultus of tendons at wrist, and for three or four days afterward muscular jerking of arms and shoulders; <i>this stopped, however, two or three days before death.</i></p> <p>About the 17th (sixth day) became dull, but never lethargic; was inclined to wakefulness.</p> <p>February 21st.—Fluid from new blister had urinous odor, and also crystals of nitrate of urea; menstruation normal; growing weaker.</p> <p>She died on the afternoon of the 23d (twelfth day), and rationally answered questions one minute before death. During the entire time wholly sensible; pupils natural; pulse not above 80.</p>	<p>Calomel, opium, alkaline purgatives, croton-oil for three days, then large blister.</p> <p>Elaterium, sesquichlor. of iron; tr. lythe; kreosote; carbon. potassae; turpentine enema.</p> <p>Another blister.</p>	Death.	<p>Forty-eight hours after death. All abdominal organs, excepting kidneys, healthy.</p> <p><i>Right kidney</i>, pelvis contained a large calculus.</p> <p><i>Left kidney</i>, pelvis contained several calculi and calices much enlarged. Medullary and cortical portions hardly distinguishable, and hardly a vestige of normal urinary tubes or malpighian bodies.</p> <p><i>Heart</i>, mitral valves thickened and contracted.</p>
No. 22. 8 days.	F. 45	Hufeland's Med. Jour., p. 60, 1834.	<p>Had for several years passed small calculi.</p> <p>In fall of 1830, urine ceased suddenly, and there was no water in the bladder.</p> <p>For five days had no serious symptoms, excepting sense of weight in region of kidneys. After this, became restless and sleepless, then passed into a profound sleep, from which he could be easily roused, and thus died at the end of eight days.</p>		Death.	<p>Three days after death.</p> <p><i>Right kidney</i> filled with pus, and pus-sac closed toward the ureter; only a few fragments of kidney.</p> <p><i>Left kidney</i> inflamed and the ureter completely blocked by large calculus at kidney pelvis.</p>

No. 23. 12 days.	M. 35	Dr. Doering, of Ems: Hufeland's Med. Jour., p. 62, 1836.	Six years before jumped from a second-story window, which paralyzed lower limbs. November 8, 1835, had a passing anuria. November 13th.—Water stopped again, and none in bladder. No vomiting or perspiration; sleepless; pulse small and soft (75); used catheter at various times, with negative results. Patient died quietly on the twelfth day of anuria (November 25th), after six preceding days of symptoms of enteritis. Was perfectly clear in mind to the last.	Death.	<i>Left kidney</i> formed a long, round mass twice the natural size. Not a trace of hilus. Filled with bean-sized cysts containing milk-like fluid. <i>Right kidney</i> enlarged to the same extent; also cysts. <i>Ureter</i> pervious, except at bladder, where it was occluded.
No. 24. 11 days.	M. 60	Dr. Muhrbeck: Rust's Magazin der Heil- kunde, vol. xxxvii., p. 175, Berlin, 1832.	Cavalryman for twenty-two years. Left regiment on account of severe pain in hypochondrium after hard ride. Had suffered from renal calculi for several years. At this last attack passed no water for eleven days, and there was none in the bladder. There was free diarrhoea and copious perspiration, both strongly urinous in odor. Patient died soporose.	Death.	<i>Left kidney</i> contained a calculus completely <i>occluding the ureter</i> . Kidney about double its normal size. <i>Right kidney entirely gone</i> , and in its place a hydatid the size of a walnut, and <i>not a trace of an ureter</i> .
No. 25. 15 days and 7 days.	M. 74	Sir James Paget: Trans. Clin. Soc. of Lond., p. 171, 1867.	Farmer; had good health until June 24, 1868, when had rheumatism. April 23, 1869, passed no water, and for the week previous had passed less than usual. Had no pain or distress, or disturbance of general health. Catheter used. No change until April 29th.—Vomited green fluid and mucus; lost appetite; bowels became torpid, and some pain in left loin; pulse, 60 to 70, and full. Catheter had often been introduced. May 5th.—More inclined to sleep. May 6th (fourteenth day).—Rather difficult to wake him, and had slight convulsion. Evening night involuntary escape of urine in bed. May 8th.—No urine, and for the first time a quickened pulse. May 9th.—Spasmodic movements of anus; pulse, 84 and irregular; no urine. May 10th.—Sinking and felt ill; raised mucus tinged with blood; pulse, 110; quite conscious. May 11th.—Very drowsy; no urine; pulse, 112; muscular twitchings. He gradually sank, and died May 15th, 1 P.M., having passed <i>no urine, excepting upon the night of the 6th, for twenty-two days</i> .	Death.	<i>Right kidney</i> , structure reduced to thin shell, studded with cysts containing about one-half pint of fluid. <i>Right ureter</i> healthy and pervious throughout. <i>Left kidney</i> greatly hypertrophied, gorged with blood, and containing some cysts; no urine. <i>Left ureter</i> dilated in its upper part. Two inches from vesicle outlet blocked by a calculus.



## CALCULUS, WITH PREVIOUS DESTRUCTION OF ONE KIDNEY—Continued.

No. and Duration.	Age. Sex.	By whom and where reported.	Symptoms.	Treatment.	Result.	Autopsy.
No. 26. 6 days 10 hours.	F. 60	Dr. E. P. Fowler : Medico-Chirurg. Soc., New York, 1880.	<p>For many years had been troubled with rheumatism and gravel. Had experienced severe renal colics, and often passed calculi from the bladder. I once removed a calculus from the urethra, which measured nearly one-half inch in diameter. Several times had one or two days of anuria.</p> <p>May, 1860, had a most violent renal colic, which gradually subsided, but left a condition of frequent vomiting and entire sleeplessness. No water was passed, and I was sent for under the supposition that there was retention in the bladder. Upon using the catheter there proved to be no water in bladder, and patient had passed none for forty hours. Over four days more elapsed without any symptom more than vomiting and inability to sleep. At this time there suddenly occurred another colic, very severe, and lasting about three or four hours, when it as suddenly ceased, and within two or three hours more the urine flowed freely, mingled with blood.</p> <p>A calculus had evidently escaped from the ureter, but I never learned that it left the bladder.</p> <p>The autopsy made in March, 1862 (two years after the anuria), will throw some light upon the case. I have no record of the temperature: the pulse was seldom above 60, and respiration normal. Expecting pain and vomiting, there was no illness of any description.</p>	<p>Digitalis, nitre, opium; hot bandages to loins, cantharides, terebinth., etc.</p>	<p>Recovery.</p> <p>Death nearly two years after, from cardiac lesion.</p>	<p>(Only those post-mortem conditions which bear on the anuria are here given.)</p> <p><i>Left kidney</i> entirely absent and not a trace of left ureter or any trace of a former opening into the bladder.</p> <p><i>Right kidney</i> weighed a little over 12 ounces; contained several small cysts, and one of the pyramids was destroyed and shrivelled. The pelvis included several small calculi.</p> <p><i>Right ureter</i>, throughout its entire extent, would admit a sound three-sixteenths of an inch in diameter, but the channel was a succession of pouches, with nearly a dozen strictures placed along at irregular intervals.</p> <p><i>Bladder</i> contained about twenty calculi, the largest one-half inch in diameter and three-fourths inch long.</p> <p>Died from mitral insufficiency.</p>
No. 27. 3 days 2 hours.	M. 56	Dr. E. P. Fowler : Medico-Chirurg. Soc., New York, 1880.	<p>Patient's occupation was decorating chinaware, and had been thoroughly poisoned by fumes of gold and nitric acid. Some years previous to the anuria I attended him for genuine Bright's disease, and for several months the urine was charged with casts, tubes, glomeruli, and numerous bits of mixed tissue. I had predicted a fatal issue not far off, and when a sharp, sudden peritonitis occurred I supposed the end had come. To my surprise, after about two</p>		<p>Recovery.</p> <p>Death one year after, from fever.</p>	<p>(So far as concerns kidneys.)</p> <p><i>Left kidney</i>.—No true kidney structure and no trace of an ureter.</p> <p><i>Renal artery</i> shrivelled and intergrown with surrounding tissue.</p> <p><i>Right kidney</i> weighed 12½</p>



weeks the patient began to recover, and after about six months of gradually decreasing illness the convalescence became complete, and a pain which had for a long time been constant in the side (left) altogether disappeared, and the urine was in every way better—indeed, almost natural.

November 10, 1853, had what seemed to be a severe renal colic, with vomiting. Gave morphine, which after a little delay afforded relief, but no water was passed for three days, and the daily use of catheter found none in the bladder. At the end of three days and two hours, without any appreciable immediate reason (if we except the use of diuretics, hot baths, fomentations, etc.), the urine all at once commenced to flow. Two or three weeks after he passed by urethra a calculus about the size of a small pea. The case very promptly recovered from the colic and anuria, and beyond pain, vomiting, and wakefulness, there were no symptoms. Pulse and respiration about natural; temperature not noted.

About a year after he died from typhoid fever, and autopsy was granted.

ounces. Pelvis contained several calculi, and there was a calculus in the bladder about the size of English walnut (one and one-half inch in diameter).

### CALCULI, WITH PREVIOUS DESTRUCTION OF ONE KIDNEY.

No. 28. 10 days.	M. 64	Rayer : Maladies des Reins, vol. iii., p. 490.	<p>The patient at death was sixty-four years of age. In his twenty-second year he experienced a severe pain in the region of the right kidney, which followed the direction of the ureter toward the bladder. The urine became bloody and sometimes almost black, and the subject became very pale and thin. After a time the blood disappeared from the urine; it came to its natural quality, and full health returned.</p> <p>Some years after (1828) he contracted a bronchitis which lasted several months. In 1823 had sciatica. From 1820 had increased in size to a very great degree; the abdominal enlargement was so great as to give him trouble in walking.</p> <p>In 1834 (September 18th) he had a distress in the abdomen which obliged him to go to bed. The pains were over the entire abdomen, but especially in the region of the left kidney, where it was painful to the touch. He passed no water, and had no inclination to do so.</p> <p>There were <i>ten days of complete anuria</i>, and at the end of that time he passed only two glasses of lemon-colored water. A distinct tumor could be detected in the abdomen, extending from the right hypochondrium down toward the left iliac region. The patient became worse; tongue coated; features changed; nights restless; pulse feeble; hiccup; and at 9 A.M., October 13, 1834, he died.</p>	Death.	<p><i>Right kidney</i> was converted to a pouch, containing seven pounds and eleven ounces of viscid fluid. The convex border measured 22 inches, the concave 16, and in thickness it was <math>7\frac{1}{2}</math> inches.</p> <p><i>The right ureter</i>, at its origin, was dilated; at a short distance it suddenly contracted, at which point it was completely occluded by a small calculus. Below it was of natural size.</p> <p><i>Left kidney</i> swollen and red; pelvis dilated.</p> <p><i>Left ureter</i> like the right one; it contained a small calculus, at about five inches from the pelvis, which obstructed the urinary flow from the only remaining kidney.</p> <p><i>Bladder</i> and other abdominal organs sound and natural.</p> <p>The right kidney had undoubtedly suffered destruction during the illness which the patient had at the age of twenty-two.</p>
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## CALCULI, WITH PREVIOUS DESTRUCTION OF ONE KIDNEY—Continued.

No. and Duration.	Age. Sex.	By whom and where reported.	Symptoms.	Treatment.	Result.	Autopsy.
No. 29. 13 days. Incomplete.	M. 41	Dr. Teeling; Dublin Trans., vol. iv., 1825; also, Medico- Chirurg. Rev., vol. ii., pp. 183-4, 1825.	Gouty; sudden recovery from an attack. April 5th.—Ceased urinating; pain in left iliac re- gion; tongue clean; pulse regular. April 6th.—Pulse 70, full. April 7th.—No pain; no water in bladder; intro- duced catheter. April 8th.—Slept well and feels well; tongue clean; pulse 70; no headache. April 9th.—Slept well; no urine. April 10th.—Slept less; five or six drops of urine.  April 11th.—Gouty pain in both knees; pulse 80; a few drops of water.  April 12th.—Gums affected by mercury; passed nearly three ounces of pale yellow urine. April 13th.—Slept eight hours; passed a very little urine at stool. April 14th and 15th.—Same; no water. April 16th.—But little sleep; incoherent; pulse 80; anxiety; hicough; abdomen tympanitic; no urine. April 17th.—Stools involuntary; no urine; ex- tinction of voice; convulsions. April 18th.—Died comatose.	Castor-oil and tincture senna. Leeches, opium, aloes, cal- omel, and colocynth; tur- pentine clyster in evening. Twelve ounces of blood from arm; warm bath; blister to region of kid- neys and diuretic mixture. Fourteen ounces blood; bath; calomel and cam- phor; saline diuretic draught. Two drops of cajuput every four hours; also continued previous medi- cines; aperient. Continued remedies; six leeches to region of left kidney.	Death.	<i>Right kidney</i> .—Small-sized pel- vis filled with calculi size of small peas. Entire secreting surface of the kidney covered over with a fine kind of gravel, resembling pulverized freestone. <i>Ureter</i> in upper part blocked by a calculus about the size of an almond. <i>Left kidney</i> .—In pelvis a small quantity of urine, together with calculi same as in right kidney, but no gravelly coating. <i>Bladder</i> contained calculi.
No. 30. 4 days.	M. 67	Dr. Wm. Roberts and Mr. Mellor; Urinary and Renal Dis- eases, pp. 30-31, Roberts, 1879.	Renal colic twelve years before, and trouble in re- gion of left kidney six weeks before death. Two weeks before death had severe pain for four days, at end of which time pain ceased and anuria com- menced. <i>Third day of anuria</i> .—Calm; no pain or nausea; no desire to void water; pulse 80; tongue clean; skin dry; but no sleep for two nights. <i>Fourth day of anuria</i> .—Passed one pint of clear fluid; perspired freely, and slept some; right renal region flat.	Warm bath; saline mix- ture; course of left ureter well kneaded with use of liniment.	Death.	<i>Right kidney</i> wholly converted into a fibrous mass, studded with cysts; weighed 2½ ounces. <i>Right ureter</i> , throughout im- pervious, changed into a fibrous cord; no stone in any part of it; was thought there had been. <i>Left kidney</i> weighed ten ounces; intensely congested. <i>Left ureter</i> thick as a goose- quill and distended with urine.



At lower part three little oxalate of lime calculi, size of hemp-seeds (one-half grain), one of them tightly impacted in terminal part of the ureter, where it passed through the coats of the bladder. This was the obstruction. Ureter contained three drachms of urine, and kidney pelvis two drachms of bloody urine. *Bladder* contained six ounces of urine; coats healthy.

### CALCULI, WITH PREVIOUS ALMOST DESTRUCTION OF ONE KIDNEY.

*Fifth day of illness.*—Twelve ounces urine, specific gravity, 1010, no albumen, 1.92 grains urea per ounce; anorexia; thirst; vomiting; and slight mental confusion. Pulse, 80; respiration, 24.  
*Sixth day.*—Increased restlessness and insomnia; sixteen ounces urine, specific gravity, 1010-1011; urea, 2.80 to ounce; tongue dry; pupils contracted; hicough; evening, six ounces water, specific gravity 1011; temperature, 98.6.  
*Seventh day.*—Worse; pulse, 80 and irregular; respiration, 20 and interrupted; muscular twitchings all over the body; drowsy, but answered questions intelligently; no water for eighteen hours.  
*Eighth day.*—Death, nine and one-half days from onset of anuria; complete coma.

Next day.  
*Right kidney* normal size, but hollowed. Nothing of the kidney remained excepting a part of the cortical substance.  
*Right ureter* plugged up at its commencement by elongated uric acid calculus (22½ grains weight); ureter below the plug normal.  
*Left kidney* much enlarged and healthy.  
*Left ureter* obstructed near opening into bladder by round uric acid calculus size of a pea (1½ grains). *Bladder* empty and sound.

### CYSTIC DEGENERATION OF KIDNEYS.

Both kidneys typical examples of cystic degeneration. The right weighed 28 ounces, and the left 26 ounces.  
In right kidney not a particle of normal tissue to be found. In left, the kidney-pyramids were not wholly destroyed.

Death.

Mother of several children. Had been tolerably well to October 23d, when was suddenly attacked with almost incessant vomiting.  
October 24th. — Flow of urine ceased, and there was no water in the bladder until October 28th, when six ounces were drawn by catheter, somewhat albuminous. Patient fully conscious, but very restless, and pupils strongly contracted. In course of the night six epileptic attacks ensued.  
October 29th, and during night, there were epileptic recurrences, and on October 30th she died.

No. 31.  
5 days.  
Dr. Wm. Roberts and  
Mr. Edwards:  
Urinary and Renal Dis.,  
pp. 36-7, 1879.

M.  
40

No. 32.  
4 days.  
Drs. Wm. Roberts and  
Heathcote:  
Urinary and Renal Dis.,  
pp. 512-14, Wm. Roberts,  
1879.

F.  
48



## OBSTRUCTION OF RENAL ARTERY.

No. and Duration.	Age. Sex.	By whom and where reported.	Cause.	Symptoms.	Result.	Autopsy.
No. 33. 10 days 2 hours.	M. 45	Dr. E. P. Fowler; Medico-Chirurgical Soc., New York, 1881.  (Full account of case in commencement of this book.)	Obstruction right renal artery.	<p>Some years ago had kidney-colic, and passed a small calculus.</p> <p>November 10, 1880, received a blow on abdomen; gave some but not severe pain; discomfort increased to</p> <p>November 12th.—Patient had been narcotized. A day was occupied in letting him get free from the opiate.</p> <p>November 13th.—Swelling, size and shape of the convex half of a duck's egg, two and one-half inches above the right ilium, and in direct line with external end of clavicle; abdomen distended and dull over entire liver and stomach region; temperature (always under tongue), 99.5° (see <i>Table of Temperature, Pulse, and Respiration</i>, page 12); slight inclination to nausea, but appetite fair; inclined to wander.</p> <p>November 14th and 15th.—No marked change.</p> <p>November 16th.—Tumor suddenly disappeared; no other change; somewhat wandering.</p> <p>November 17th.—No water passed since nine o'clock last night (about six hours after the tumor disappeared), and none through the day; catheterized in evening; no result.</p> <p>November 18th.—No urine; used catheter twice; no water in bladder; tenderness less; strength increased; and mind perfectly clear and active.</p> <p>November 19th.—Same as 18th.</p> <p>November 20th to 23d.—No essential change; used catheter every day without obtaining any water; commenced to reject wind from the stomach, which had strong ammoniacal odor.</p> <p>November 24th.—Same; used catheter; no water.</p> <p>November 25th.—Vomiting and diarrhoea of dark green material; no water; still clear in mind; and quite vigorous in strength.</p> <p>November 26th.—No water; aspirated at 8.30 A.M., obtaining 10½ ounces clear, limpid fluid (analysis given on page 5); peritonitis immediately ensued. At 11 P.M. obtained 3 ounces urine by catheter, after ten days and two hours of complete anuria.</p> <p>November 27th.—Vomiting and diarrhoea; abdomen distended and tympanitic; a little wandering, but could be easily recalled; passed of himself 62 ounces of urine; only a trace of albumen, no blood or pus.</p> <p>November 28th.—Symptoms all intensified, and great prostration; incessant vomiting and diarrhoea of brown substance; voided 94 ounces of urine, specific gravity, 1016; no albumen. In afternoon appeared moribund (prussic acid seemed to restore life).</p> <p>November 29th.—Condition in some respects seemed improved;</p>	Death.	<p>Six and one-half hours after death.</p> <p><i>Right kidney</i> weighed 15½ ounces (Troy) and contained cyst about three centimetres in diameter.</p> <p><i>Left kidney</i>.—All true kidney structure had disappeared, giving place to large cysts. The largest unbroken cyst contained about eight ounces of fluid. There was only a bit of the ureter, about one and one-half inches long.</p> <p>The renal artery of this side was unfortunately not traced.</p> <p><i>Renal artery</i> of right side was conserved, and bears evidence of having been submitted to long continued pressure. Nearly three-fourths of an inch of the artery was flattened, distorted, much inflamed, and adherent to the adjacent tissues, but the lumen was pervious.</p> <p><i>Right ureter</i> entirely free and normal.</p> <p>The anuria resulted from cutting off the blood-supply (by the pressure of the tumor) from the sole remaining kidney.</p> <p>One of the consequences of the prolonged pressure upon the renal artery was the production of coagulated blood, some bits of which were carried into the kidney sub-</p>



abdomen softer; tenderness less; sores on body healing; passed 54 ounces of water, specific gravity, 1019; no albumen; clear in mind. November 30th.—Worse; constant rejection of gas from stomach; skin blue; eyes bloodshot; temperature, 102; pulse, 108; delirious; passed 37 ounces of water. December 1st.—Condition same; voided 20 ounces urine. December 2d.—Worse in every respect; water and feces involuntary. December 3d.—*Left arm paralyzed; ptosis of left eyelid; frequent sighing; pain in occiput; some difficulty in swallowing; but clearer in mind.* December 4th.—Profoundly weak; very dark blue skin; no pulse at wrists; *a white crust on face and neck; quite clear in mind.* December 5th.—Moribund all the morning, and died at 12.30 P.M., quite conscious to the last.

stance, resulting in infarctus. See cuts Nos. 3 and 4.

No. and Duration.	M.	Robert Bently Todd: Medico-Chirurg. Trans., vol. xxvii., pp. 302 et seq., London, 1844.	Obstruction both renal arteries by aneurism.	Stout, plethoric man; short neck. Anuria commenced on February 17th. February 20th.—Voided a tablespoonful of water. February 21st and 22d.—No wat. r. February 23d.—One-half pint urine. February 24th to 26th.—Water free. February 27th.—Water free; died at 12 midnight. Had no coma or convulsions.	Death.	Both renal arteries were compressed by aortic aneurism.
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### RENAL ABSCESS—PREVIOUS DESTRUCTION OF ONE KIDNEY.

No. and Duration.	Age. Sex.	By whom and where reported.	Symptoms.	Treatment.	Result.	Autopsy.
No. 25. 5 days.	M. 26	Dr. Hachenberg, of Coblenz: Berliner klin. Wochenschrift, p. 264, 1872.	Soldier; previous health good; complained for a while of pain in back, and general loss of strength. May 6th, 1871, had a severe chill and great pain in the abdomen; protrusion of left hypochondrium; was a hard, immovable tumor six inches wide, extending from pelvis to umbilicus, and about one and one-half inches across, to the right of the linea alba; vomiting. May 16th to 20th.—Complete anuria; restless; wishing to get out of bed; but entirely conscious of surroundings to the last; sight disturbed; ("foggy") pulse, 104-108; temperature, 38° to 37.8° C. May 19th.—Epistaxis and dyspnoea. May 20th.—At 7 A.M. death.	Comp. inf. senra; warm cataplasms; ten leeches.  "Gray salve embrocations"; extract colocynth; lemonade.	Death.	The tumor proved to be an enormously enlarged <i>left kidney</i> , with firm adhesions to transverse colon, mesocolon, and retroperitoneal tissue. The organ was so turned that the hilus presented toward the spine. The kidney was filled with abscesses. <i>Right kidney</i> , there was not a trace found of it. <i>Bladder</i> contained no urine. On right side of bladder no trace of an ureter opening.



## VALVULAR OCCLUSION OF URETER.

No. and Duration.	Age. Sex.	By whom and where reported.	Cause.	Symptoms.	Result.	Autopsy.
No. 36. 15 days. From birth.	M.	Dr. Thos. Ackermann: Archiv. für klinische Medicin, p. 456, 1866.	Valvular occlusion of ureters.	Child weighed twelve pounds twenty ounces, and well developed. Vomiting on the tenth day and death on the fifteenth, after a slight convulsion. No uræmic symptoms.	Death.	<i>Left kidney</i> 7 ctm. long, $3\frac{1}{2}$ wide, $1\frac{1}{2}$ thick. Large number of cysts in the cortex from size of sand-grains to that of a pea, containing clear, transparent substance. Umniferous tubes filled with sandy deposit. No distinct papillæ. <i>Right kidney</i> $3\frac{3}{4}$ ctm. long, $2\frac{1}{2}$ wide, $1\frac{1}{2}$ thick. Cysts as in the left, one the size of a hazelnut. <i>Bladder</i> empty. <i>Left ureter</i> $11\frac{1}{2}$ ctm. long. At about $2\frac{1}{2}$ ctm. from its bladder-end was occluded by a valve which closed in a direction toward the bladder. <i>Right ureter</i> closed immediately after leaving the kidney; central portion of it tubed, but closed again before reaching the bladder—complete double atresia—entering the bladder as a little cord.

No. 37. 2½ days.	M. 20	William Roberts: Urinary and Renal Dis., pp. 491-5, 1879.	Ureter obstructed by renal artery. Previous destruction of one kidney.	There had been obstruction of the bowels by hydronephrosis, and also frequent short spells of anuria, alternated with very copious flow of urine. Patient finally died in convul- sions after a complete anuria of sixty hours.	Death.	<i>Left kidney</i> 10 inches long by 7 broad; over this the intestine was stretched and thus obstructed. <i>Ureter</i> , in leaving the kidney presented a valve-like formation which obstructed flow of water until a certain degree of pressure was applied. The kidney was reduced to a thin layer, two lines in thickness, which constituted the outer boundary of the sac. There were no traces of pyramids. <i>Right kidney</i> also sacculated, but not to same degree, and it seemed to result from the pressure of an irregular branch of the renal artery upon the ureter. The aorta gave off two right renal arteries and this branch rose from the lower one.
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## ANURIA—MECHANICAL RESULTS OF SCIRRHS.

No. and Duration.	Age. Sex.	By whom and where reported.	Cause.	Symptoms.	Treatment.	Result.	Autopsy.
No. 38. 11 days.	F. 60	Hutchinson: London Hospital: London Lancet, June 3, 1871.	Scirrhus obstructing ureters.	Under hospital observation six days; scirrhus affection of vagina, uterus, and bladder; vomiting; pulse, 66 to 112; average, 80; temperature below 100°; urea in matters vomited; no water by catheterization; convulsions to the last; on day of death had convulsions.	Not stated.	Death.	<i>Ureters</i> both completely occluded by the scirrhus formation. Were distended to the size of small intestines. Right ureter and gall-blad- der both double.

No. 39. 4 days and 3 days.	M. 59	Dr. Wm. Roberts and Dr. Herbert Renshaw: Roberts' Urinary and Renal Dis., pp. 423, 1879.	Scirrhus. Previous destruction one kidney.	<p>Six months before this illness, began to suffer pains in back, loss of appetite, strength and constipation; urine pale, copious, no blood or albumen.</p> <p>One month before had <i>four days' anuria</i>; flow seemed to be restored by compulsory walking, when urine became free, no pain, and vice versa.</p> <p>July 10, 1871. — Pain in back; weak; oedema of legs; for four days water gradually diminished from two pints to eight ounces per day; slightly albuminous; specific gravity, 1009 to 1010.</p> <p>Last three days of life <i>total anuria</i>, during which time increased weakness, panting breathing, diarrhoea, muscular twitchings, rambling delirium when left to himself, but perfectly conscious to the last, if roused; no coma; no convulsions.</p>	Death.	<p>No urinous or ammoniacal odor; pelvis half filled with scirrhus mass, involving bladder and prostate gland.</p> <p>Left kidney atrophied (2½ ounces); interior hollow; no trace of pyramids or cortex; substance reduced to a rim of homogeneous appearing tissue.</p> <p>Right kidney weighed 7 ounces, was hollowed, but not so completely destroyed as the other.</p> <p>Both ureters passed for the distance of an inch through the scirrhus substance, but neither one was so completely occluded but that a probe could be gotten through them.</p>
No. 40. 8 days.	F. 30	Rust's Magazin der Heil- kunde, vol. liv., p. 175, Berlin, 1839.	Scirrhus.	<p>Confined about one month before; from time of labor had severe pains in feet and in left loin and back; pulse quick and soft. At commencement of anuria had vomiting, loss of appetite, constipation, and copious flow of mucus from vagina; for last <i>eight days anuria was complete</i>. Died from simple prostration; no sign whatever of uræmia.</p>	Death.	<p>Both kidneys bloodless.</p> <p>Both ureters contracted, and near the bladder entirely occluded by scirrhus, which invaded the surrounding parts.</p>
No. 41. 8 days.	(?)	Dr. J. W. Burton, Lee Park, Blackheath; British Medical Journal, p. 1015, 1860.	Scirrhus.	<p>October 11th to 18th. — Complete <i>anuria</i> and no water in bladder; conscious until within eight hours of death; no pain, fever, or head symptoms.</p>	Death.	<p>Bladder firmly contracted and enlarged by scirrhus deposits, which extended and occluded both ureters. No calculi in either kidneys or ureters.</p>
No. 42. 7 days.	F. 60	Dr. Wm. Roberts and Dr. Gardiner: Urinary and Renal Dis., Roberts, pp. 43-4, 1879.	Scirrhus.	<p>Scirrhus involved bladder and probably ureters.</p> <p>Had <i>complete anuria for seven days</i>; after this urine flowed naturally for four weeks, when patient died.</p> <p>During anuria there was great restlessness, insomnia, flushed and anxious face; no twitching of muscles; no convulsions; no coma.</p>	Recovery. Death four weeks after.	Not reported.



## ANURIA—MECHANICAL RESULTS OF SCIRRHUS—Continued.

No. and Duration.	Age. Sex.	By whom and where reported.	Cause.	Symptoms.	Result.	Autopsy.
No. 43. 14 days.	F. 56	Dr. Wm. Roberts and Dr. Lloyd-Roberts; Roberts' Urinary and Renal Diseases, 1879.	Scirrhus.	<p>Eighteenth month of uterine hemorrhage; due to scirrhus. January 16, 1876.—No urine passed from this date to January 20th —fourteen days of complete anuria.</p> <p>On tenth day of anuria was singularly calm, ate and slept well; tongue moist; pupils normal; pulse, 84; temperature, 99; no pain.</p> <p>Symptoms almost unchanged until the 29th (thirteenth day), when she became worse; pupils contracted; muscles of face twitched; muscular power failed rapidly, first in arms and legs, then in trunk; temperature, 97.3.</p> <p>January 30th.—Died quietly, apparently from paralysis of respira- tory muscles.</p>	Death.	Not reported.

No. 44. 17 days.		Monfalcone: Dict. des Scienc. Méd., p. 439.	Scirrhus.	Complete anuria for seventeen days.	Death.	Kidneys both scirrhus.
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## ANURIA—RESULT OF SCARLET FEVER.

No. and Duration.	Age. Sex.	By whom and where reported.	Symptoms.	Treatment.	Result.	Autopsy.
No. 45. 8 days.	F. 15	Dr. Plain, of Maldenhead. St. George's Hospit. Re- ports, vol. v., p. 11, 1870.	Dry, hot skin; natural action of bowels; no coma; no convulsions.		Death.	None.

No. 46. 9 days.	M. 4	Dr. George F. Bates: Med. Record, pp. 431-2, New York, Oct. 16, 1880.	<p>January 23d.—Waked with nausea; twice passed one-half ounce of urine, highly albuminous; temperature, 100.6°.</p> <p>January 23d.—Vomited; temperature, 101.4°. Next three days catheter used daily, but at no time obtaining a drachm of water; the little obtained was 75 per cent. albumen.</p> <p>January 24.—Temperature, 103.4°; and for the next two days (25th and 26th) ranged from this to 99°.</p> <p>January 26th.—Respiration difficult, 60.</p> <p>January 27th.—Same; no oedema; mind clear.</p> <p>January 28th.—No change.</p> <p>January 29th.—Breathing stridulous, and at 11 P.M. stertorous; pulse full.</p> <p>January 30th.—Percussion found right kidney enlarged; temperature, 10 P.M., 102.5°.</p> <p>January 31st.—Temperature, 8 A.M., 103.4°; 3 P.M., 102.2°; 8 P.M., 103.4°; respiration, 32; pulse, 120; 11 P.M., died without struggle; and clear intellect to the very last.</p> <p>During the nine days there was not secreted over one-half ounce of water, and the exhalations from the body had no urinous odor.</p>	Death.	<p>Bladder contracted to size of a small English walnut.</p> <p>Kidneys two or three times natural size. Capsules separated from cortices by brown, odorless fluid. In much of kidney-structure no uriniferous tubes, and when found there was fatty degeneration.</p> <p>(It is to be regretted that the examination was not more extended and precise.—E. P. F.)</p>
No. 47. 25 days.	M. 8	William Whitelaw: London Lancet, vol. ii., p. 460, 1877.	<p>Twelve weeks after commencement of a mild scarlet fever, <i>anuria became complete</i> (with the exception of two ounces urine on the thirteenth day) for twenty-five days. Boy was closely watched night and day. Slight headache and slight oedema; no uræmic symptoms.</p>	Recovery.	
No. 48. 4 days 23 hours and 4 days 8 hours.	M. 5½	Dr. Biermer, of Würzburg, and Drs. Archer and Bamberger: Virchow's Arch. für path. Anat., vol. xix., p. 537.	<p>Fragile; subject to otitis; fever tolerably severe for four days; remission; increase of symptoms on seventh day. May 21th (twentieth day).—Suppression of urine; slight ascites; playful; sleeps and eats well; pain in region of kidneys; <i>suppression complete for four days and twenty-two hours</i>, then voided two or three table-spoonfuls; after this there was <i>almost complete anuria for four days and eight hours</i>. The first uræmic symptoms appeared two days after the urine began to flow.</p> <p>Anuria during the last day of life (June 8th) and convulsions.</p>	Death.	<p>Diuretics; sulphur baths; calomel; mineral acids; ipecac; vin stibi camph.; musk, etc.</p>



## ANURIA—RESULT OF SCARLET FEVER—Continued.

No. and Duration.	Age. Sex.	By whom and where reported.	Symptoms.	Treatment.	Result.	Autopsy.
No. 49. 8 days.	M. 5½	Dr G. Deininger: Archiv. für klinische Medicine, p. 557, Leip- zig, 1870.	September 28, 1869.—Scarlet fever of medium inten- sity. October 11th.—No appetite; great thirst; repeated vomiting. October 13th.—Slight œdema about joints. October 17th.—Breath and perspiration had urinous odor; pulse, 128; respiration slow; and there came a white, flaky substance, like soap-foam, along the border of the hair, feeling like sand when rubbed between the fingers—afterward it appeared on other parts of the body; comatose. October 18th.—Vomiting became less; pulse better; convulsive movements less frequent, and patient became conscious. At midnight of October 18th ( <i>eight days of complete anuria</i> ) passed water judged to contain blood. October 19th.—Convulsions confined to <i>muscles of the eyes</i> ; albumen and blood in urine. From this date recovery.	Two or three warm baths daily, followed by carefully wrapping the patient.	Recovery.	

No. 50. 5 days.	M. Child.	Dr. Boeke, of Berlin: Hufeland's Journal, October, 1836.	Child had just passed through scarlet fever and caught cold. Pulse small, weak, and slow; slept constantly. Night before death became very restless and oppressed for breath. Died suddenly.	Diuretics, blisters, and hot baths.	Death.	None.
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## ANURIA FOLLOWING MEASLES.

No. and Duration.	Age. Sex.	By whom and where reported.	Symptoms.	Treatment.	Result.
No. 51. 5 days, then 51 days.	M. 13	Dr. Huebenthal, of Wietpsk. Hufeland's Journal der Prak. - Arznelkunde, vol. ii., p. 124, Berlin, 1827.	Short time before had recovered from slight attack of measles; weak and pale. One morning, drank, as was his custom, several cup- fuls of coffee; felt nausea, which continued for five days, at the end of which time he vomited and felt relieved. During the <i>entire five days there was complete anuria</i> , though he took daily large quantities of coffee, tea, beer,	Diuretics.	Recovery.

and wine and water. At the end of the five days he passed a large quantity of water, and again the flow entirely ceased.

February 10, 1827.—"The boy had not passed one drop of urine for the space of seven weeks," and had bowel evacuations only every two or three days, and never seemed to perspire. Had good appetite, and drank largely of tea, coffee, beer, and wine in water. He seemed perfectly well in every way; he was watched so closely as to preclude the possibility of deception; was at all times under strict observation.

February 22d.—Abdomen tense; used catheter, but there was no water in bladder.

February 24th.—A few drops of urine mixed with blood; one hour after passed a whole quart.

After this urination remained normal, and on March 25th was discharged cured.

(The amount of coffee, etc., habitually indulged in seems very remarkable.—F.)

R. Olei succin. .... 3 ij.  
Tereb. venet. .... 3 vj.  
Bals. copaiv. .... 3 j.  
M.—30 drops three times a day, and twice a day of tereb. to the loins. Ordered to eat vegetables rather than meat, especially asparagus, horseradish, celery, etc., and to drink beer with the horseradish.  
Remedies continued until March 8th.

## ANURIA CAUSED BY CHOLERA.

No. and Duration.	Age. Sex.	By whom and where reported.	Symptoms.	Result.	Autopsy.
No. 52. 21 days.	M. 28	Dr. H. de Leon: Baltimore Medical and Surg. Jour., July, 1824.	Patient had recovered from cholera. Had first severe pain in lumbar and bladder regions. For three weeks passed not a drop of water, but had no pain; appetite was good; able to walk; was somewhat irritable and restless; pulse variable; died two hours after having played a merry air on his flute; there was a complete absence of all uræmic symptoms.	Death.	Great swelling of right kidney; very contracted bladder. (The real immediate cause evidently overlooked.—E. P. F.)
No. 53. 4 days.	F. 34	Dr. Drysdale, of Liverpool: British Jour. of Homœopathy, vol. viii., p. 109, 1850.	July 11th.—Anuria commenced, and the characteristic discharges from cholera, of which the patient was ill, subsided. Catheter used 12th, 13th, and 14th, no water in bladder. July 14th.—Face and hands cold; pulse imperceptible; raving at times during the night; died at 7 P.M.	Death.	None.
No. 54. 5 days.	M. 33	Same as above.	Cholera purging commenced on August 23d; no urine from this time until death (five days); the purging and vomiting changed from the natural cholera to a bilious, acrid diarrhoea.	Death.	None.



## ANURIA CAUSED BY CHOLERA—Continued.

No. and Duration.	Age. Sex.	By whom and where reported.	Symptoms.	Result.	Autopsy.
No. 55. 5 days over.	M. 35	Dr. Drysdale, of Liverpool; British Jour. of Homœo- pathy, vol. viii., p. 109, 1850.	August 13th.—Suffering from cholera, and "had passed no water for a long time." After this no urine passed for five days. August 15th.—Became comatose. August 16th.—Skin warmer; pulse tolerably firm; but more profoundly comatose. August 17th.—Died at 7 A.M.	Death.	None.
No. 56. 5 days.	F. (?)	Same as above.	Cholera subsided on the third day, when anuria commenced, and continued until death on the sixth day after. Died comatose.	Death.	None.

## ANURIA, ASSOCIATED WITH HYSTERIA.

No. and Duration.	Age. Sex.	By whom and where reported.	Symptoms.	Treatment.	Result.
No. 57. 4 days 13 hours, and several times over 2 days.	F. 38	Drs. T. A. McBride and M. D. Mann; Archives of Medicine, vol. i., pp. 293-301, New York, 1879.	Patient mother of four children. Marked anuria; frequent occipital and vertex headaches; dyspnoea upon slight exertion. November, 1875.—Severe attack of occipital headache, and anuria ensued for one hundred and eight hours. For thirty-six hours had only the severe headache; then nausea and uncontrollable vomiting; pallor about mouth; face dusky; tongue moist, but dark; pulse barely discernible; temperature, 96°; great restlessness, but no impairment of consciousness; sleepless. Anuria ceased after two subcutaneous injections of morphine. There was at no time any urinous or ammoniacal odor about the patient. After this attack, others of shorter duration ensued (generally at about the period of menstruation) which would last from sixty to ninety hours, and were relieved by the morphine injections. Drs. McBride and Mann considered the case one of "hysterical anuria." On February 19, 1878, operation for laceration of cervix uteri was made, which seemed to restore natural urination.	Hot-air bath; dry cups; actual cautery; diuretics of all descriptions; then hydragogues; nitrate of amyl; rectal injections of hot water; asafetida; hypodermic injection of Magendie's solution of bicarbonate of morphia (30 gttss.), with marked relief—another of 30 gttss., and shortly after flow of urine commenced. In few hours after, same injection, same quantity, repeated.	Recovery.

No. 58. 21 days.	F. 30	Dr. H. B. Millard : From Clinical Notes.	<p>Maiden lady ; slight ; blue eyes ; dark hair ; usually in fair health ; catamenia normal. In summer, 1864, had remittent fever ; great prostration, but no vomiting ; constipation ; tongue dry and brown ; red without moisture ; no sordes. The fever continued <i>three weeks, during which time she did not pass a drop of water.</i></p> <p>The odor of the skin was most offensively urinous ; first flow of urine was very acid, and of high specific gravity ; there were no uræmic symptoms of any kind.</p> <p>She was constantly attended by two intelligent adult sisters, whose testimony could be safely relied upon, and deception on the part of the patient appeared almost a matter of impossibility.</p>	Recovery.
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## ANURIA, ASSOCIATED WITH "SPINAL IRRITATION."

No. and Duration.	Age. Sex.	By whom and where reported.	Symptoms.	Treatment.	Result.
No. 59. 25 days.	F. 21	Dr. A. W. Fontaine : Virginia Med. Gazette, vol. i., No. 7, p. 407, 1874.	<p>Girl of hysterical nature ; had fever and ague ; spine tender.</p> <p>January 15th, anuria commenced. For five days slept very little, and for five days more no material change ; catheter not tried, but there was no fulness over region of bladder ; had a kind of chill and fever every day or night ; ate very little, and scarcely slept even under opiates in large doses ; no uræa to be detected in any of the skin or bowel excretions ; menstruated ; after which catheter was tried.</p> <p>Twenty-fourth day.—Still no water.</p> <p>Twenty-fifth day.—After the second injection of cantharides and warm water, drew off by catheter two tablespoonfuls of urine, <i>there having existed twenty-five days of complete anuria.</i></p> <p>Twenty-sixth day.—Obtained one spoonful of urine by catheter.</p> <p>Twenty-seventh day.—One-half teaspoonful by catheter.</p> <p>Twenty-eighth day.—Passed over a pint without aid of instrument.</p> <p>After this the trouble entirely ceased ; appetite and strength slowly came.</p>	<p>Warm baths ; mild cathartics ; quinine ; diuretics ; anodynes in heavy doses (ordinary ones did not act).</p> <p>Cream tartar ; spirits nitre ; digitalis ; parsley tea ; turpentine ; cantharides ; juniper ; buchu, etc.</p> <p>Abandoned diuretics, and employed diaphoretics and counter-irritants ; galvanism ; purgatives, strong.</p> <p>Quinine, 30 to 120 grains per day before any specific effect ; ergot ; belladonna.</p> <p>Injected bladder with warm water and cantharides, twenty drops to the half-pint—retained one-half hour and then passed off.</p> <p>Repeated the injection.</p> <p>Repeated cantharides injection, sixty drops to pint water.</p>	Recovery.



## ANURIA--TRAUMATIC.

No. and Duration.	Age. Sex.	By whom and where reported.	Symptoms.	Result.	Autopsy.
No. 60. 2 days 19 hours.	M. 24	Dr. Ambrose L. Ranney: New York Med. Jour., vol. xxxi., p. 485, 1880.	Operation for urethrotomy. Eight hours after had a chill, and from that time passed no water. <i>Died in uræmic coma sixty-seven hours after.</i>	Death.	False passages; no severe inflammation in urinary passages; intense hyperæmia in kidneys; microscope gave no evidence of interstitial nephritis or previous renal disease.

## ANURIA FROM CALOMEL.

No. and Duration.	Age. Sex.	By whom and where reported.	Symptoms.	Result.
No. 61. 5 days.	M. 45	Dr. C. A. Tott: Hufeland's Medicin- isches Jour., vol. v., p. 93, Berlin, 1833.	Subject had "rheumatic dysentery." For three consecutive evenings took a powder composed of one grain calomel, one grain opium, and one-half grain ipecac. Became badly salivated, and during salivation, which lasted <i>five days, he did not pass a drop of water.</i> As soon as salivation ceased, the full flow of water returned. There were no uræmic symptoms. (It is not at all improbable that there existed a stage of Morbus Brightii.—F.)	Recovery.

## ANURIA ASSOCIATED WITH POISONING FROM BICHLORIDE OF MERCURY.

No. and Duration.	Age. Sex.	By whom and where reported.	Symptoms.	Result.	Autopsy.
No. 62. 5 days.	M. 19	Mr. Ward, of Bodmin: Med. Gazette, vol. viii., p. 636, London.	To divest himself of scabies, rubbed himself all over with an ointment composed of one ounce of bichloride mercury mixed with six ounces of hog's lard. Had all the usual symptoms of poisoning by corrosive sublimate; besides which he had <i>complete suppression of urine for five days</i> , at the end of which time he died.	Death.	Stomach inflamed and ulcerated; some of intestines and the lower portion of the colon and rectum mortified; bladder contracted and empty; thirty large worms, <i>alive</i> , in the stomach and intestines.

No. 63. 5 days.	M. 35	Sir James Syme : Edinb. Med. and Surg. Journal, vol. xliv., pp. 26-7, 1835.	Poisoned by corrosive sublimate rubbed in the skin. Drank freely; had no coma; was entirely sensible; and after <i>five days of complete anuria</i> recovered.	Recovery.
No. 64. 3 days.	F. 20	Dr. William Henry, of Manchester: Edinb. Med. and Surg. Journal, vol. vii., 2d ed., pp. 150-1, 1811.	Poisoned with bichloride mercury; <i>anuria of three days</i> , and death.	Death. "Bladder small and con- tracted."
No. 65. 8 days.	F. (?)	Robert Venables: London Med. Gazette, vol. viii., pp. 616-23, 1831.	Poisoned by corrosive sublimate; <i>eight days of complete anuria</i> ; died.	Death. Bladder contracted.
No. 66. 5 days.	M. 50	Dr. Arch. Blacklock, of Dumfries: Edinb. Med. and Surg. Journal, vol. xxxvi., pp. 92-4, 1831.	Poisoned by corrosive sublimate; died at end of <i>five days of complete anuria</i> .	Death. None reported.
No. 67. 4 days.	M. 38	Dr. Alfred S. Taylor: Guy's Hosp. Reports, vol. ii., pp. 24-27, 1844.	Poisoned by eating corrosive sublimate; lived <i>four days and passed no water</i> .	Death. Bladder contracted.
No. 68. 5 days 6 hours.	M. 15	Caspar: Traité des Poisons, tome ii., p. 140, 1853.	Poisoned by corrosive sublimate; <i>five days and six hours complete anuria</i> .	Death. Bladder contracted.



## ANURIA—CAUSE UNCERTAIN OR NOT GIVEN.

No. and Duration.	Age, Sex.	By whom and where reported.	Cause.	Symptoms.	Treatment.	Result.	Autopsy.
No. 69. 5 days. Incomplete.	F. 45	Sir Gilbert Blane and Dr. Daniell: "Treatise on the Prevalence and Mortality of Particular Diseases." —Sir G. Blane.	(?)	For five years had pain in region of colon (?) January 28, 1840.—No urine passed, and only one-half drachm obtained by catheter; vomiting; tenderness on right side of abdomen. February 1st.—No brain-symptoms; eyesight indistinct. February 24, 8 p.m.—Passed three drachms alkaline urine, specific gravity, 1019. February 24.—Uneasiness in left hypochondrium; in evening voided one drachm, and through the night three ounces. February 6th to March 11th.—Passed an average of ten ounces urine daily. At last date was attacked with prevailing influenza. March 15th.—Voided blood. March 17th.—Sank and died. There was no urinous odor in the material rejected from stomach or passed from the bowels. There were no head-symptoms, and the mind was perfectly clear to the last moment.	Cupped, nine ounces blood. January 31st.—Cupped, eight ounces blood. Scheele's prussic acid every three hours, and bran poultices.  Blisters; unguent acetate morphia. Restored an old closed issue in loins by nitrate silver; (—) better, prussic acid.	Death.	<i>Right lung</i> , middle lobe hepatized; tubercles. <i>Left kidney</i> small, with diseased pelvis. <i>Right kidney</i> enlarged.  (Autopsy evidently does not elucidate the nature of the disease.)
No. 70. 12 days.	M. 70	Anglada: Recueil des Trav. de la Soc. Méd. du Départ. d'Indre et Loire, Tri-mestre I., 1843.	Calculi (?)	Previous kidney-colics. May 8, 1842.—Severe pain in region of right kidney, and vomiting, with <i>cessation of urine</i> ; tenderness, but no swelling; general health good. May 16th.—Some serous collection in abdomen, and œdema about joints. May 20th.—Passed teaspoonful normal urine, and on	Bath; seltzer water; spirits nitre; catheterized, no result; embrocation of belladonna salve; eighteen leeches; cataplasms; calomel; chinin.	Death.	None; but from another case (No. 14) the author concludes that there was mechanical obstruction of one kidney, and functional stoppage of the other. (More likely <i>calculi</i> obstruction.—F.)

				<p>May 23d.—Five litres.</p> <p>After this date secretion was normal. Patient became more feeble until September 5th, then every other day ague; debility increased; and September 24th, death.</p> <p><i>Twelve days of complete anuria, and during fifteen days but one teaspoonful of water was voided.</i></p>		
No. 71. 8 days.	F. 9	Dr. Marvel, of Ambert: Gazette des Hôpitaux, Paris, 1849.	(?)	<p>Subject feeble and emaciated; brain disease.</p> <p>Suddenly attacked with acute rheumatism of knee, elbow, and hands, together with purpura hæmorrhagica.</p> <p>Urine became brown and albuminous; patient recovered for one month, excepting œdema of face; then had convulsions and loss of consciousness; recovered from these, but with trouble of speech.</p> <p>After this there followed <i>eight days of complete anuria</i>, excepting about three drops at one time.</p> <p>Medicines caused vomiting; they were stopped and replaced by ice and veal.</p> <p>When anuria ceased, breathing became difficult, and increased until death. The intellect remained perfectly clear until death.</p>	<p>Chin. sulph.</p> <p>Leeches behind ears.</p> <p>Digitalis; squills; colic; nitrum; acetate potassium, internally, externally, and by enema.</p> <p>Embrocations over loins.</p> <p>Sinapisms.</p>	<p>Death.</p> <p>None. (Encephalic disease?—E. P. F.)</p>
No. 72. 20 days.	M. 49	Jas. Russell, Dr. Rickards, and Mr. Turner: Med. Times and Gaz., London.	(?)	<p>General health good, though had suffered rheumatism; vomiting; perspired freely; pupils somewhat contracted.</p> <p>After twelfth day of anuria, some delirium at night; pulse good; feet œdematous; no defined uræmic symptoms. <i>Twenty days of complete anuria.</i></p>	<p>Seidlitz powders; brandy; ginger-beer; champagne; eggs and milk.</p>	<p>Recovery.</p>



## ANURIA—CAUSE UNCERTAIN OR NOT GIVEN—Continued.

No. and Duration.	Age. Sex.	By whom and where reported.	Cause.	Symptoms.	Treatment.	Result.	Autopsy.
No. 73. 8 days.	F. (?)	Dr. J. B. Jeaffreson, of Sirhowy; Lond. Lancet, pp. 335-6, October 1, 1859.	(?)	<p>Eighth month of gestation; was delivered on March 29th. March 30th.—Great pain in abdomen; pulse, 88; skin cool; passed no water. March 31st.—Drew one-half drachm; pain in left lumbar region, and nausea.</p> <p>April 1st.—Pain and nausea; pulse, 84. April 2d.—Same.</p> <p>April 3d.—Less pain. April 4th.—Dozed a good deal; frequent vomiting; pulse, 88. April 5th.—Less pain; dozes; abdomen distended and tender; nausea and hiccup.</p> <p>April 6th.—Drowsy; no pain; cool skin; moist tongue; pulse, 86 and small; still very sick at stomach.</p> <p>April 7th.—Weaker; tongue dry and brown; pulse, 100; and still very nauseated. At 3 p.m., died.</p> <p>Had no convulsion, and was clear in mind to moment of death; no inclination to soporoseness; no headache; no urinous odor to faeces or vomit; had no lacteal secretion or lochial discharge. <i>Complete anuria for eight days, and only one-half drachm of urine in ten days.</i></p>	<p>Laudanum and æther.</p> <p>Camphor, calomel, opium. Mix. Hydrocyanic acid, spirits nitre, nitrate potassium. Mix. Turpentine fomentation to abdomen. Calomel and compound extract colocynth. Carbonate soda, nitrous æther, tincture opium. Mix. Turpentine fomentation. Morphine, liquid acetate ammonia, spirits nitrous æther, nitrate potassium. Mix. Balsam copaiva, spirits nitrous æther, solution potassium. Mix. Gin.</p>	Death.	None.
No. 74. 5 days.	M. 28	Prof. Carl Bartels, of Kiel; Sammlung Klinischer	Calculi (?)	<p>Had previously suffered several renal colics. December 15, 1867, had colic in both kidneys; violent pain; constant sensa-</p>		Recovery.	

Vorträge, Red. von R. Volkmann, No. 25; also, Ziemssen's Med. Cyclop., vol. xv., pp. 49-50, Am. Edition.	tion of choking; and continuous vomiting. December 18th.—Pain ceased, but vomiting continued. During the next five days there was complete anuria and empty bladder. The twenty-four hours succeeding these five days he passed 3025 c.c. of urine specific gravity 1009, which was albuminous and contained red blood-corpuscles and epithelium from ureters and kidney-pelvis; also hyaline casts. He immediately felt well; good appetite. For four days water very copious and albuminous. Six weeks after, the patient passed a calculus about the size of a bean. Had no uræmic symptoms of any kind.		
No. 75. 8 days.	F. 47 Dr. H. D. Reynolds: London Lancet, p. 635, Nov. 6, 1863.	( ? )	<p>"Strong and healthy." With the exception of one wineglassful of urine, there were eight days of complete anuria; constant nausea; drowsy, but no sleep; pulse, 114; on eighth day, 80.</p> <p>Sweating; warm applications; digitalis internally, grain doses, every four hours. Poultice of digitalis leaves boiled to a pulp, wrapped about the body; after about six hours a pint of clear, pale urine came. Fresh poultice; urine continued free, and patient recovered.</p> <p>Recovery.</p>
No. 76. 60 days.	F. 16 "G. S.": London Lancet, p. 756, June 15, 1867.	To the Editor of the Lancet: Sir—Will you, or any of your numerous readers, give a professional brother advice on the following case: P. S—, a female, aged sixteen years; phthisical, not hysterical; has secreted only eight ounces of urine during two months. The last urine got to examine was loaded with blood-corpuscles and highly albuminous. It is now so scanty that only a few drops have been secreted for four days. There is no dropsy and no symptom of uræmic poisoning. I have tried warm baths, vapor-baths, sponging with tepid vinegar, cupping over kidneys, electricity, steel in all its forms, cantharides in tincture, powder, and blister; opium, strychnine, and all the ordinary diuretics. I am now at a standstill. June 5, 1867.	



## ANURIA—CAUSE UNCERTAIN OR NOT GIVEN—Continued.

No. and Duration.	Age. Sex.	By whom and where reported.	Cause.	Symptoms.	Treatment.	Result.	Autopsy.
No. 77. 9 days.	M. 23	J. D. Brown : Med. Times and Gaz., p. 86, London, 1868.	(?)	<p>"Young, healthy farmer." Severe pains in bowels and back; vomiting; anuria; and no water in bladder.</p> <p>At 4 A.M. on the tenth day of anuria, after one day's use of poultice of digitalis leaves, had passed eight ordinary chamberfuls of urine, and so continued until he died, on the second night, of exhaustion.</p>	Bleeding; sweating; blistering; warm baths. On ninth day, at 12 M., applied poultice of digitalis leaves.	Death.	None.
No. 78. 42 days.	F. 34	Dr. Gallini : Leno, Bresciano. Gazetta Med. Ital., Lombardia, July 4, 1868.	(?)	<p>Patient had amenorrhoea and leucorrhoea for five months.</p> <p>August 21, 1876, passed a few drops of dark-colored fluid by catheter.</p> <p>Pain in lumbar region and abdomen; general health remarkably fair; and, on the twenty-fifth day of anuria was able to go with her medical attendant to Brescia to consult Dr. Albertini, of Milan.</p> <p>He could make no special discovery, nor could Prof. Rodolph, of Brescia. Emmenagogues were ordered, and after a time menstrual flow followed.</p> <p>On the <i>forty-third day of complete anuria</i> the bladder became distended, and 600 grammes of water were taken by catheter.</p> <p>The next day the same, and thereafter the flow was natural.</p> <p><i>The health of the patient had not appeared in any respect to suffer from the anuria.</i></p> <p>(The features of this case bear a somewhat untrustworthy stamp.—E. P. F.)</p>	<p>Leeches to anus; obnoxious purgatives; diuretic drinks.</p> <p>After five days, more leeches; nitrate of urea; and tepid baths.</p> <p>Emmenagogues.</p>	Recovery.	

"WARREN, MAINE, December 2, 1873.

"DR. GAILLARD: Dear Sir—I have recently had a case of *complete suppression of urine for eleven days*, without any serious results. In this case there was no organ or set of organs performing the functions of the kidneys. Now, if the system can get along eleven days without any secretion by the kidneys, why not dispense with them altogether?"

"Yours, with respect,  
B. T. BUXTON, M.D."

No. 79. 11 days.	(?) (?)	Dr. B. T. Buxton: Richmond and Louisville Med. Jour., vol. xvii., p. 98, Jan., 1874.					
No. 80. 28 days.	Age. Sex. M. 10	By whom and where reported. Dr. James Alexander. Edinburgh Med. Journal, vol. v., p. 246, 1859.	Cause.	Symptoms.	Treatment.	Result.	Autopsy.
				<p>The lad had experienced no previous appreciable illness. His mother noticed that for a day he had passed no water, and as there had been in the neighborhood some cases of croup, and one of his little friends, after an attack, had died with three days' previous anuria, a little alarm was felt and Dr. Alexander was sent for. Catheter was employed, but no water in bladder.</p> <p>During the <i>entire twenty-eight days there was complete anuria</i>, notwithstanding which the general health seemed in no way impaired or disturbed; there was no urinous odor either in faeces or perspiration, the latter was not profuse.</p> <p>At the end of the month the urine began very gradually to secrete, finally reaching the normal quantity. The boy was constantly watched by his mother—a very reliable woman—and Dr. Alexander thinks the statements are beyond possible mistake.</p>	<p>Leeches, purgatives, and other remedies were actively employed.</p> <p>After third day, no special treatment, beyond warm baths and purgatives, was given.</p>	Recovery.	



## ANURIA—CAUSE UNCERTAIN OR NOT GIVEN—Continued.

No. and Duration.	Age. Sex.	By whom and where reported.	Cause.	Symptoms.	Treatment.	Result.	Autopsy.
No. 81. 11 days and 2 days.	F. 30	Dr. Sue : Michigan Med. News; also, Louisville Med. News, vol. x., No. 7, p. 83, 1880.		<p>Patient greatly prostrated; pulse, 90; temperature, 100°; pain in lumbar region, extending down both groins.</p> <p>March 24th.—Ceased to urinate; headache; nausea; constipated.</p> <p>March 26th.—Bowels had moved, but no urine nor desire to pass any; slept but little; used catheter, no water in bladder.</p> <p>March 27th.—No change, except more nausea.</p> <p>April 3d.—Had passed no water; temperature, 100° to 101°; pulse, 90 to 100. The only other abnormal conditions were insomnia, restlessness, and occasional muscular starts.</p> <p>April 4th.—Drew with catheter four ounces of urine, and no more was obtained until</p> <p>April 6th, on the morning of which day temperature rose to 112°; pulse to 100, feeble and regular; mind perfectly clear. One hour after using alcohol-bath came a profuse perspiration. In two hours' time the temperature fell to 100°; pulse, 80. In three hours drew off eight ounces of urine, and the flow thereafter continued of itself.</p> <p>In five weeks the patient was convalescent.</p> <p><i>There were eleven days of complete anuria, then a flow of eight ounces of water, and another complete anuria of two days.</i></p> <p>NOTE.—The remarkable feature of this case was the excessively high temperature on the eleventh day (112° F.), in which respect it differs from all the other observations collected.—F.</p>	<p>Bromide potass.; cathartic.</p> <p>Fifteen-drop doses fluid extract jaborandi every three hours; milk diet; hip-baths; hot fomentations to back; saline cathartics; bismuth; hydrocyanic acid.</p> <p>Alcohol-bath, and bottles of hot water to feet.</p>	Recovery.	

No. 82. 9 days.	M. Middle- aged.	Dr. William Roberts, from notes of Dr. Duigan : Roberts's Urinary and Renal Dis., pp. 41-2, 1879.	Calculi (?).	Had frequent renal colics, and passed uric acid calculi. This attack commenced by pain in both loins. <i>Complete anuria</i> <i>of nine days ensued</i> , after two or three days of which all pain ceased; catheter employed, no water in bladder; <i>no trou- ble of any kind for the entire nine days</i> , except loss of appetite. At the end of this time kidneys began to act naturally; urine clear, low specific gravity; noth- ing otherwise abnormal; passed three or four uric acid calculi, and promptly re- covered. (There can be no doubt as to the nature of the malady, but as it was insusceptible of actual demonstration, it has been classed with the "uncertain.")	Recovery.
No. 83. 9 days.	M. 35	Dr. William Roberts and Dr. Hunstone : Roberts's Urinary and Renal Dis., p. 45, 1879.		No previous history. January 11, 1869, anuria commenced; great distention of abdomen; aspirated, but obtained no fluid; supposed the existence of a dou- ble hydronephrosis. Up to the seventh day there had been no muscular twitch- ing and no contraction of pupils; was great restlessness and insomnia; the mind was entirely clear to the very last. Just before death asked to be prayed with.	Death.  None.
No. 84. 13 days.	(?) (?)	Dr. Adolph Dumas : L'Union Méd., pp. 841- 61, Paris, 1876.		Vomiting.	Death.  None.
No. 85. 9 days.	(?) (?)	Dr. Adolph Dumas : L'Union Méd., pp. 841- 61, Paris, 1876.		Convulsions.	Ipecac; ol. ricini.  Recovery.



## ANURIA—CAUSE UNCERTAIN OR NOT GIVEN—Continued.

No. and Duration.	Age, Sex.	By whom and where reported.	Cause.	Symptoms.	Treatment.	Result.	Autopsy.
No. 86. 7 days.	M. 45	Dr. Samuel J. Knaggs : Dublin Med. Journal, p. 27, July, 1873.		Patient went <i>seven days without passing a drop of water</i> ; vomiting copious; perspiration profuse and of urinous odor.		Recovery.	
No. 87. 8 days.	M. 50	J. Hutchinson : London Lancet, p. 2, July 4, 1874.		"Patient had been repeatedly laid up with somewhat indefinite illness." Weakness; nausea; insomnia; perspiration of urinous odor; tendency to wandering of mind. Died comatose.	Not stated.	Death.	None.
No. 88. 5 days.	F. (?)	Dr. J. C. Hall : London Lancet, p. 582, May, 1849.		In 1837 had pain in loins and hips. Six months after (October 1st), another attack, with fetid, stringy, and bloody urine. Five or six days before death ceased urinating, and there was no water in the bladder; had severe headache, and two days before death (October 14th) became comatose.		Death.	"Both kidneys, especially the right, were altogether disorganized." (?)
No. 89. 3 days.	M. 55	Dr. J. C. Hall : London Lancet, p. 582, May, 1849.		"Corpulent, robust farmer." Seized with rigor; had passed no urine for twenty-four hours; no pain or sense of weight in loins; no distention of abdomen; catheter found no water in bladder. Next day patient had nausea; slow pulse; was heavy and oppressed; and thirty hours after died in a stupor.		Death.	None.

No. 90. 17 days.	M. (?)	Dr. Dubuc : L'Union Méd., Paris, November 4, 1879.		<i>Complete anuria for seventeen days,</i> and died with symptoms of uræmic poi- soning.		Death.	None.
No. 91. 8 days.	M. 37	Dr. Carrier : Gazette Hebdom. de Méd. p. 204, Paris, 1879.		<p>For several years been subject to gravel; father had gravel and gout.</p> <p>April 2, 1866, after a walk of four or five kilometres, was attacked with severe colic and vomiting.</p> <p>Next day (twenty-four hours) having passed without urination, catheter was used, but no water in bladder.</p> <p>April 8th.—Surface enormously distended in region of both kidneys.</p> <p>April 10th (ninth day).—Had all symptoms of uræmic poisoning. One hour after taking the secale, passed a calculus size and shape of an oat-seed.</p> <p>Between the evening of the 10th and the morning of the 11th had passed eight and one-half litres of clear, limpid urine, with one more calculus.</p> <p>"Was one ureter blocked up, and the other without action, through sympathy?" "<i>Il est difficile de résoudre cette question.</i>" (Probably one ureter or one kidney had been already destroyed.—E. P. F.)</p> <p>The patient promptly recovered and enjoyed tolerable health for a dozen years, when, after eight or ten months of chronic nephritis, he died.</p> <p>(Although not demonstrated, there can scarcely be a doubt about the exact nature of this case.)</p>	<p>Used all ordinary remedies for such cases, but without desired result.</p> <p>Two grammes powdered ergot, to promote muscular contractions of ureters.</p>	Recovery.	



## ANURIA—CAUSE UNCERTAIN OR NOT GIVEN—Continued.

No. and Duration.	Age, Sex.	By whom and where reported.	Cause.	Symptoms.	Treatment.	Result.	Autopsy.
No. 92. 8 days.	M. 56	Dr. Wm Roberts, from notes of Dr. Allbutt : Roberts's Urinary and Renal Dis., pp. 39-41, 1879.	Hydronephrosis ?	<p>September 16, 1867.—Symptoms of descent of calculus along ureter. September 21st.—Seemed to have travelled slowly down the ureter. October 2d.—Seemed to be impacted at entrance of bladder; sudden relief; and passed two ounces of water. October 3d, 9 A.M.—No urine, and catheter found none in bladder; no pain; no uræmia; temperature, 100°. October 4th.—Same; restless; clear in mind; temperature, 98.2°.</p> <p>October 5th.—Much pain at old site, and cramp in limbs of same side; no urine; pressure gives relief; pain subsided after a few doses of ether; breath sweet; perspiration normal; mind clear intelligent; no drowsiness; pulse and temperature normal. October 6th.—Pulse, 96; temperature, 98.2°; fair night; no urine; breath not urinous; singularly clear in mind, and five hours of placid sleep; cheerful, and easily walks the room; little cough; tongue coated, but takes food (partridge, etc.); no swelling of ankles; dulness all over the hypogastrium. October 7th.—Good night; temperature, 97°; no stupor or headache; movable tumor in abdomen; teaspoonful of urine; "sickly" during the day; pulse and temperature normal; no uræmic symptoms. October 8th to 10th.—Same. October 11th.—<i>Foiled a little water</i>; mental oppression; pupils contracted (ninth day). October 12th.—<i>Four ounces of water</i>; less mental obscuration; temperature normal.</p>	<p>Hot baths and fomentations.</p> <p>Fomentations; saline purgatives and diluents; bromide potassium with a little iodide. Spirits sulphuric ether every half-hour.</p> <p>Warm bath and purge.</p>	Recovery.	





### SECTION THIRD.

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There are many other instances reported in medical literature of reputed anuria, but unaccompanied with such data as are requisite to render them of any real value; for example, Dr. Boehr, *Hufeland's Med. Jour.*, vol. iv., 1836, mentions three cases of anuria, *each lasting about fifteen days*; no particulars or account of autopsy.

*First case.*—Had only weakness and pallor.

*Second case.*—Became comatose.

*Third case.*—Perfectly clear intellect to the very last.

Dr. N. W. T. Heath, *Med. Record* (N. Y.), p. 350, September 15, 1876, reports a case of *nine or ten days' anuria* in one Mary Stines, an emigrant. The case is not properly substantiated, and the autopsy was by no means conclusive.

There are also recorded some marvellous cases as respects duration of anuria. Among others, the following three or four are mentioned, as they are derived from respectable sources, though the statements can scarcely be received as sufficiently strict and trustworthy observations.

1. In the "Philosophical Transactions," vol. li., p. 215, the case is related of a young woman who is said to have had *anuria for two years and one month*. Catheterization found no urine in the bladder. She constantly vomited urinous matter, and seemed to have urinous secretions all over the surface of the body. At length a tough, slimy substance came away from the ureters, and secretion of urine was re-established.

2. Dr. J. Senter, "Trans. College Phys. and Surg.," vol. i., p. 96, 1793, gives a case of *three years' anuria* after twenty months of much passing of gravel. The urine seemed to be eliminated by vomiting.

3. *Vieussens, Journal de Méd.*, gives case of a girl, eleven years old, who had *anuria for eighteen months* and recovered.

4. Another case is mentioned in the same journal, of a woman,



fifty years old, who had *seven years of complete anuria*, accompanied with constipation. The urine seemed to escape by the skin, which phenomenon was made much more apparent by the administration of diuretics and cathartics. In every other respect she seemed well. At the end of seven years, secretion of urine became normal and remained so for eight years, until the time of her death.

5. Dr. Racum, of Riga, *Journal der prak. Heilkunde*, relates the case of a child, twelve years old, with *seven weeks' entire suppression* and no change in health. Recovered by use of turpentine and balsam copaiva.

Mr. Guthrie, in a lecture at the Westminster Hospital in 1833 (see *London Lancet*, 1833-4, pp. 159 *et seq.*), says: "Nature can accommodate herself for several days, and sometimes for weeks, to a *total* suppression of the secretion of urine."

There are also some curious cases where the kidneys have seemed to be destroyed, and yet fluid passed off by the bladder regularly, though lacking the characteristics of normal urine.

1. In *Hufeland's Jour. der praktisch. Arzneikunde*, No. 51, pp. 3-20, 1820, Hopfengärtner makes observation of a case—a woman, forty-eight years old—where both kidneys were disorganized. The anuria was not quite complete, but the fluid passed had not the components characteristic of urine. The medullary portion of both kidneys was destroyed by suppuration, no trace of the original structure remaining. The right kidney had burst out into the surrounding cellular tissue, and a few small calculi were found in the pus which still remained in the kidney. The right ureter, two inches from kidney, contained calculus. Bladder distended by pus, and in several places eaten into. Last sickness was nineteen days, and patient died in full possession of her senses. Was troubled with insomnia.

Dr. Strange reports a case in *Beale's Archives* (p. 276, 1862), of a boy eighteen years of age, who passed about six quarts of water per day, specific gravity 1006. Autopsy found the kidneys to be mere sacs; no proper kidney-substance could be detected, and it did not appear as though there ever had been any.

An almost like case is described by Faber in the *Würtzemb. Correspondenz-Blatt*, Bd. xii., S. 266.



2. In *Hufeland's Journal*, No. iv., pp. 68-103, 1812, description is given of kidney-consumption by G. Horst, Jr., of Cologne. He reports a *total destruction of both kidneys*, and still a continued flow of water from the bladder. He asks: "Where did the water come from?" He inclines to the belief that there may have been a vicarious action of the mucous lining of the bladder, and that a fluid *similar* to urine was secreted. The patient was fifty-seven years old, mother of four children; fourteen years before she had fallen on her loins.

(A false estimation of the condition of the kidneys is rather more probable than that the mucous membrane of the bladder should perform the duties of the uriniferous tubes, glomeruli, etc., etc.)

A secretion of urine minus urea seems to have occurred in the following case, related by E. J. Shearman, in *Monthly Journal of Med. Sciences*, p. 666, Edinburgh, 1848. It is of a boy who was run over by a heavy truck, and injured in the loins. He passed large quantities of blood and urine, *but no urea*; pulse, 130; pain in region of kidneys. After two days he could not be kept awake; bled him; *blood contained urea*; urine at same time had not a trace of it. Applied mercury; urea appeared in urine, by degrees the coma was relieved, and in five weeks health was restored.



## SECTION FOURTH.

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### STATISTICS RESPECTING ANURIA AND ASSOCIATED SYMPTOMS.

Dr. John Charles Hall (*Medico-Chirurgical Review*, vol. ii., p. 122, London) says :

"The secreting office of the kidneys may be completely suspended independent of acute disease, and quite independent of any detectable alteration in the structure of those glands. *All such cases end in coma—some with and others without convulsions*—but all have evident symptoms of apoplexy." (Italizing is my own.)

It will be seen that the last part of Dr. Hall's statement—that in italics—instead of being corroborated, is most emphatically disproved by statistics.

Dr. Wm. Roberts ("Urinary and Renal Diseases," Amer. edition, p. 29, 1879), one of the most exact and trustworthy observers of recent times, says :

"When even the suppression is absolute, seven or eight days elapse before the special symptoms of uræmic poisoning make their appearance ; but when these do appear the end approaches rapidly, and death is not delayed beyond two or three days. Up to the rise of the proper uræmic symptoms the condition of the patient is, as a rule, wonderfully calm and free from distress" . . . . "functions generally proceed tranquilly and the intelligence is undisturbed. The most distinctive and invariable of the spécial uræmic signs are muscular twitchings. I believe that these are never wanting. Contraction of the pupils is also a constant sign, but later in development than the muscular twitchings. Diarrhœa (unless produced artificially) is quite exceptional, so likewise excessive vomiting. There is never any ammoniacal or urinous odor from the breath or skin, nor from the body after death." Also in note : "This seems a point of distinction from *retention* of urine."



The analysis of the observations embodied in this little monograph hardly lend unreserved support to Dr. Roberts' remarks; and, indeed, in many respects they arrive at results quite at variance with generally received ideas.

**Vomiting.**—This is the most frequent symptom accompanying anuria, although probably it is not often the direct result of it.

In the 93 cases given, it was present in 35, or a little over one-third of the entire number; 27 of these 35 instances occurred on the first day, and 1 on each day respectively of the second, fifth, sixth, eighth, and tenth days of suppression. Twice it first came only on the first day after cessation of anuria, and once four days after.

All those 27 instances where the symptom appeared on the first or second days of suppression may reasonably be regarded as purely reflex phenomena, resulting from general kidney-irritation, irrespective of any inclination to anuria. The 7 remaining cases, occurring after the fifth day of anuria, may, on the other hand, be reckoned as one of the constitutional disturbances from the suspended urinary secretion.

All cases (7) in which vomiting commenced on and after the fifth day were fatal. Of the other 28 cases (27 on the first, and 1 on the second), 18 were fatal and 10 recovered. Among the fatal cases were all (3) of those in which vomiting commenced after cessation of anuria.

Vomiting, therefore, would seem to have no special significance unless it commences after the fourth or fifth day of suppression.

TABLE II.—VOMITING (35 CASES IN 93).

Day of Anuria it commenced.	Result of Cases.	Duration of Anuria—Days.
First day .... 27 cases....	{ 18 deaths .....	{ 4, 5, 5, 5, 6, 7, 8, 8, 8, 9, 9, 9, 11,
	{ 9 recoveries .....	{ 11, 12, 12, 13, 21.
Second day... 1 case.....	Recovery .....	3, 5, 5, 6, 7, 12, 13, 13, 20.
Fifth day.... 1 case.....	Death .....	8.
Sixth day.... 1 case.....	Death .....	17.
Eighth day... 1 case.....	Death .....	22.
Tenth day.... 1 case.....	Death .....	13.
		15.
After cessation of anuria.		
First day .... 2 cases....	Death .....	4, 10.
Fourth day... 1 case.....	Death .....	6.



**Constipation and Diarrhœa.**—Of these very little can be said, because, as a rule, the medicaments first employed are generally those calculated to act upon the bowels.

There were 3 cases, however, where no such means were used, and in which there was obstinate diarrhœa.

There were 7 cases of obstinate constipation, even though cathartics were employed, and it is in various ways indicated that, except for the use of cathartics, constipation would be, if not the rule, at least a very frequent accompanying condition of anuria.

**Muscular twitchings** (*Subsultus tendinum*).—Dr. Roberts (p. 59, *op. cit.*) says that “the most distinctive and invariable of the special uræmic signs (in anuria) are muscular twitchings.”

The analysis of our cases scarcely verifies this opinion. Mention was made of muscular twitching (during anuria) in only 10 cases out of the 93. It was observed in 3 cases after the urinary secretion had returned (in all 13). Three of the 13 recovered, more than one-fifth.

The annexed table gives details, from which it would be indicated that muscular twitchings are not necessarily to be considered as immediately or ultimately associated with a fatal ending, and that they may be expected about once in nine times.

TABLE III.—MUSCULAR TWITCHINGS (13 CASES IN 93).

Day of Anuria it commenced.	Result of Cases.	Duration of Anuria—Days.
First day.....1 case.....	Death.....	7.
Fourth day.....1 case.....	Death.....	5.
Sixth day.....2 cases.....	Death.....	9, 12.
Seventh day.....1 case.....	Death.....	9.
Eighth day.....1 case.....	Death.....	10.
Eleventh day.....1 case.....	Recovery.....	12.
Thirteenth day.....1 case.....	Death.....	14.
Sixteenth day.....1 case.....	Death.....	22.
All the time.....1 case.....	Recovery.....	21.
First day after....1 case.....	Recovery.....	8.
Third day after...1 case.....	Death.....	4.
Sixth day after....1 case.....	Death.....	10.

**General Convulsions** (6 cases in 93).—From the following tabulated statement, general convulsions cannot be regarded as more frequent or significant in connection with anuria than with other maladies.



TABLE IV.—GENERAL CONVULSIONS (6 CASES IN 93).

Day of Anuria.	Result.	Duration of Anuria—Days.
Twelfth day.....1 case.....	Death.....	13.
Thirteenth day....1 case.....	Death.....	22.
Fifteenth day.....1 case.....	Death.....	15.
One day before....1 case.....	Death.....	8.
One day after.....1 case.....	Death.....	8.
? ? ? .....1 case.....	Recovery.....	8.

**Pupils, contraction of** (9 cases in 93).—Contraction of the pupils seems in no degree characteristic of anuria. The records of the 90 cases do not confirm Dr. Roberts' statement that "contractions of the pupils is also a constant sign" (*op. cit.*, p. 29). When it occurs it is quite significant of approaching death, probably for the reason that it betokens a serious process enacting at the base of the encephalon, and its appearance (when no opiates have been used) justifies more anxiety than muscular twitchings or general convulsions.

TABLE V.—PUPILS, CONTRACTION OF (8 CASES IN 93).

Day of Anuria first observed.	Result.	Duration of Anuria—Days.
Fourth day.....2 cases.....	Death.....	4, 5.
Sixth day.....1 case.....	Death.....	8.
Seventh day.....1 case.....	Death.....	9.
Eighth day.....1 case.....	Death.....	10.
Eleventh day.....1 case.....	Death.....	11.
Thirteenth day...2 cases.....	Recovery.....	14, 20.
One day after.....1 case.....	Recovery.....	8.

**Sight was affected** in two instances, both on the fourth days of anuria, but it seemed to be the result of a general reduction of vital powers rather than a symptom of specific poisoning or paralysis of the optic nerve.

The accompanying diagram indicates that there are two days upon which anuria is especially apt to end either in death or recovery: these are the fifth and eighth; next to these ranks the ninth. After the ninth day the proportion of recoveries rapidly diminishes.







**Ptosis.**—Of this there were also two instances, one on the fifth day of anuria and one seven days after cessation of anuria—both fatal cases. In the latter case the left arm was also paralyzed, and the organs of deglutition.

*Respiratory organs* were once paralyzed.

*Organs of deglutition* three times.

**Delirium**—Roberts says, *is rare*, which is emphatically true. In the 93 cases there was but one instance, on the sixth day of a thirteen-day anuria, a case which recovered.

**Insomnia.**—Notwithstanding there are only 18 cases out of the 93 in which insomnia was mentioned, this symptom must for certain reasons be regarded as characteristic, that is, when it occurs, as it does in anuria, with the distinctive feature of entire absence of fever. The insomnia of high-temperature maladies is quite different in character, and is generally joined with great irritability of temper and a marked disposition to delirium. In anuria it is a great rarity that sleeplessness eventuates in delirium; the pulse is not accelerated, nor the temperature increased, and there is a calm, placid mood of temper, a freedom from all complaint or apparent discomfort, which seldom fails to excite the wonder of those who see much of the patient. I think this peculiar type of insomnia will be found almost exclusively associated with urinary suppression.

TABLE VI.—INSOMNIA (18 CASES IN 93).

Day of Anuria first observed.	Result.	Duration of Anuria—Days.
During entire time . . 8 cases . . . . .	{ 5 deaths . . . . . 3 recoveries . . . . .	8, 12, 7, 9, 8. 25, 8, 11 and 2.
Second day . . . . . 3 cases . . . . .	{ 2 deaths . . . . . 1 recovery . . . . .	4, 5. 4½.
Fifth day . . . . . 2 cases . . . . .	Death . . . . .	4 and 3, 10.
Seventh day . . . . . 1 case . . . . .	Death . . . . .	10.
Eighth day . . . . . 2 cases . . . . .	Death . . . . .	3 and 10, 12.
Ninth day . . . . . 1 case . . . . .	Death . . . . .	7.
Four days after . . . 1 case . . . . .	Death . . . . .	6.

**Sopor.**—An excessive disposition to sleep, without tendency to coma, is not frequent. In the 93 cases it was spoken of



only 4 times: once on the fourth day of an anuria which continued five days; once on the thirteenth day of a suppression of twenty-two days; once in an eight-day; and once in an eleven-day anuria; 3 of the cases were fatal; 1 (the twenty-two-day one) recovered.

**Coma.**—Coma is more frequent than sopor, but a glance at the table will render it quite evident that coma in all these cases (10), with two exceptions, was a part of the act of dying rather than a symptom of uræmic poisoning.

Dr. Prout considered five days the limit within which coma almost invariably ensued in cases of anuria.

TABLE VII.—COMA (10 CASES IN 93).

Day of Anuria.	Result.	Duration of Anuria—Days.
Third day ..... 2 cases.....	Death.....	3, 3.
Third to fifth day.. 2 cases.....	Death.....	5, 5.
Fifth day..... 2 cases.....	Death.....	5, 5.
Seventh day..... 1 case.....	Recovery.....	8.
Eighth day..... 1 case.....	Death.....	8.
Thirteenth day..... 1 case.....	Death.....	13.
One day before..... 1 case.....	Death.....	8.

**Ammoniacal and urinous odor.**—The reports upon this particular symptom in the list of anurial cases do not confirm Dr. Roberts' opinion that "there is never any ammoniacal or urinous odor from the breath or skin, nor from the body after death" (in *Suppression*, *op. cit.*, p. 29). There are 7 cases among the 93 where very special mention is made of this circumstance, and 5 of the cases were those of anuria strictly depending upon derangement of the urinary series of organs, and where anuria was also very complete.

The two other cases were respectively one of scarlet fever and one of hysteria. In these two cases the suppression had also been complete. In all the cases there was no water received into the bladder, so that they could not be considered as in any degree belonging to urinary retention.



TABLE VIII.—AMMONIACAL AND URINOUS ODOR (7 CASES IN 93).

Duration of Odor.	Result.	Duration of Anuria—Days.	Addenda.
Entire time....1 case (11 days)...	Death ....	11.	
Entire time....1 case (8 days)...	Death ....	8.	
Entire time....1 case (8 days)...	Recovery..	8.....	White, uric acid crystals on face, neck, and hair.
Entire time....1 case (21 days)...	Recovery..	21.....	Hysteria.
Entire time....1 case (7 days)...	Recovery..	7.	
Eight days after cessation ....1 case (2 days)...	Death ....	10.2 .....	White, uric acid crystals on face and neck.
Eighth day to death .....1 case (4 days)...	Death ....	12.	

The uric acid deposits on the skin and hair, which in appearance resemble powdered salt, seem no more frequently associated with anuria than with other varieties of disease, especially kidney disease. Here and there, in periodical medical literature, mention is made of this phenomenon; see, as examples:

1. *Cannstatt's*, vol. i., p. 254, 1869, report of two cases (contracted kidneys) of uric acid crystals on face.

2. *Archiv. für klin. Med.*, vi., p. 55.—H. von Kaup and Th. Jürgensen report a case in which the crystals were so profuse that they could be gathered from the beard. There was anuria on the day of death. Left kidney was one-half, and right one-third normal size.

3. *Deutsche medicinische Wochenschrift*, p. 113, Berlin, 1878.—Dr. Seebohm relates a case (supposed kidney degeneration) of crystals gathered in large quantities so that the face looked as if powdered with flour. Analysis proved it uric acid.

4. Hirschsprung published in *Hospitals Tidende* a case which may be found translated in German in the *Wien med. Wochens.*, p. 1786, 1865, and accompanied by another case of Drache's. Dr. H. has since published a paper on the subject in Swedish, a *résumé* of which may be found in *Dublin Med. Press*, November 3 and 10, 1865; also in the *Gazette Hebdom.*, ii., No. 33, p. 526, 1865.

5. In *Arch. für physiol. Heilk.*, 1851, 1853, are some cases.

6. *Deutsches Arch. für klin. Med.*, p. 55, 1869, has two



cases by H. von Kaup and Th. Jürgensen (same in *Cannstatt*, vol. i., p. 254, 1869).

7. See also, on this subject, *Archiv für physiol. Heilk.*, p. 88, Stuttgart, 1852.

Many more cases and references could be added.

**Pulse.**—It is noticeable that in all cases where there was no alliance with diseases independent of the urinary apparatus, the pulse never at any time exceeded 99, except in two instances, where at the moment of death it mounted to 112.

The general range was decidedly below the normal, and this undoubtedly will be found always characteristic of anuria when not overshadowed by some concurrent disease.

Of the five cases showing a higher pulse, one rose to 160, but only for a few hours, the average being 90.

One case of abscess gives an abscess-pulse (104 to 108), and the 3 cases of scarlet-fever show a scarlet fever pulse (120 to 128.)

TABLE IX.—SEVENTEEN CASES IN WHICH OBSERVATIONS OF PULSE WERE CAREFULLY MADE.

No.	General Range.	Extreme Range.	Result.	Duration of Anuria—Days.
1	52 .....	52 to 56 .....	Death ....	10.
2	55 .....	48 to 60 .....	Death ...	10.2.
3	60 .....	60 to 66 (112 at death) ..	Death ....	22.
4	66 .....	66 to 70 (112 at death) ..	Death ....	11.
5	70 .....	70 to 80 .....	Death ....	13.
6	72 .....	72 to 99 .....	Death ....	9.
7	72 .....	72 to 96 .....	Death ....	8.
8	75 .....	? ? .....	Death ....	12.
9	80 .....	80 to 80 .....	Death ....	4.
10	84 .....	84 to 90 .....	Death ....	14.
11	84 .....	? ? .....	Death ....	8.
12	96 .....	90 to 96 .....	Death ....	8.
13	100 .....	90 to 160 .....	Recovery..	13.

FOUR CASES IN WHICH PULSE OBSERVED THE TYPE OF ASSOCIATED DISEASE.

14	Abscess, 104 .....	108 .....	Death ....	5.
15	Scarlet fever, 120 ..	120 .....	Death ....	5½.
16	Scarlet fever, 120 ..	128 .....	Recovery .	5½.
17	Scarlet fever, 84 ..	120 .....	Death ....	9.

**Temperature.**—In most cases the precise temperature was not given, but was referred to as being either normal or below



normal. The 10 cases more exactly reported and tabulated are sufficient to indicate that one of the most remarkable features of anuria is an absence of rise in temperature, and in many cases a lowering of it. This characteristic seems to be maintained even when the nervous-centres have evinced a condition of poisoning.

Cholera is a notable example of disease presenting low temperature, but in cholera the subject suffers great losses in fluids and is on the verge of, if not actually in general collapse; whereas in anuria, with the exception of suppression, there may be only slight notable deviation from ordinary health.

Three of the ten tabulated cases show a higher range of temperature, but it will be seen that of these one was associated with abscess, one with scarlet fever, and one was an altogether anomalous case. The remarkable temperature in this case ( $112^{\circ}$ ) continued for only three or four hours on the thirteenth day of anuria (its end), and *under the influence of an alcohol-bath*, which, it is quite possible may account for the rise in temperature.

TABLE X.—TEMPERATURE (10 OBSERVATIONS).

No.	General Temperature.	Extreme Temperature.	Result.	Duration of Anuria—Days.
1	$98^{\circ}$ .....	$97^{\circ}$ to $100^{\circ}$ .....	Death.....	9.
2	$98^{\circ}$ .....	? to ? .....	Death.....	8.
3	$99^{\circ}$ .....	? to ? .....	Death.....	14.
4	$99^{\circ}$ .....	$99^{\circ}$ to $99.5^{\circ}$ .....	Death.....	4.
5	$99^{\circ}$ .....	$98^{\circ}$ to $100^{\circ}$ .....	Death.....	9.
6	$99^{\circ}$ .....	$97^{\circ}$ to $99^{\circ}$ .....	Death.....	10.
7	$99^{\circ}$ .....	? to ? .....	Death.....	11.
8	$100^{\circ}$ .....	$100^{\circ}$ to $112^{\circ}$ .....	Recovery..	13.
9	Abscess, $100^{\circ}$ .....	$100^{\circ}$ to $100.4^{\circ}$ ...	Death.....	5.
10	Scarlet fever, $103^{\circ}$ ....	$99^{\circ}$ to $103.5^{\circ}$ ....	Death.....	9.

**Respiration.**—This is also quite characteristic, but its individuality consists not so much in frequency or slowness as in  $\alpha$ /mortality.

In frequency it is apt to be below the normal standard, even when in other respects it resembles a “panting respiration.” After anuria has existed for some days the inspirations are prone to become quick and full—a little interval ensues—and then follows a very prolonged and often laborious expiration.



The frequency of respiration generally varies within the limits of 15 to 24 per minute.

**Uræmia.**—The 19 tabulated cases are all those which presented a complete or a tolerably complete picture of the condition known as “uræmia.” There are other cases in the collection in which there were present one or more of the individual symptoms; but such cases, it is well understood, have no more claim to be ranked as “uræmia” than would simple fever, vomiting, and delirium have to be considered scarlet fever, and therefore they have not been included.

Existing statistics are of course not sufficiently numerous to justify any positive deductions, but so far as they go they would seem to imply that “uræmia” is more liable to appear at a comparatively early stage of anuria; and in comparing these statistics with those of retention of urine, “uræmia” seems more, or at least quite as apt to occur in retention as in suppression of urine.

TABLE XI.—“URÆMIA” (19 CASES IN 93).

Day of Anuria first observed.	Result.	Duration of Anuria—Days.
Second day.....1 case.....	Death.....	3.
Third day.....2 cases.....	Death.....	3, 5.
Fourth day.....2 cases.....	Death.....	5, 5.
Fifth day.....1 case.....	Death.....	5.
Sixth day.....1 case.....	Recovery.....	8.
Eighth day.....2 cases.....	Death.....	8, 8.
Eleventh day.....2 cases.....	Death.....	11, 13.
Twelfth day.....1 case.....	Death.....	15.
Thirteenth day.....1 case.....	Recovery.....	13.
Fourteenth day.....1 case.....	Death.....	15.
Seventeenth day.....1 case.....	Death.....	17.
Eighteenth day.....1 case.....	Death.....	18.
After cessation of Anuria.		
1 case.....	Recovery.....	8.
1 case.....	Death.....	4.22 and 4.8.
1 case.....	Death.....	4.

**Sex.**—In the list of 93 cases there were: of males, 57; of females, 29; not stated, 7; that is, nearly twice as many males as females.

But of those cases where the anuria was demonstrated to have resulted from uncomplicated derangement of urinary organs, there were: of males, 27; of females, 7; or more than three-fourths males.



**Age.**—The period of life most susceptible to anuria is between the ages of thirty-five and fifty years, as exhibited by the following figures.

TABLE XII.—AGES (93 CASES).

Periods of Five Years.	Number of Cases.	Exact Ages.
Birth to 5 years.....	2.....	Birth, 4.
5 to 10 years.....	4.....	5½, 5½, 8, 9.
10 to 15 years.....	2.....	10, 12.
15 to 20 years.....	4.....	15, 15, 16, 19.
20 to 25 years.....	5.....	20, 20, 21, 23, 24.
25 to 30 years.....	4.....	26, 27, 28, 28.
30 to 35 years.....	5.....	30, 30, 30, 33, 34.
35 to 40 years.....	10.....	35, 35, 35, 35, 36, 37, 37, 38, 38, 39.
40 to 45 years.....	4.....	40, 40, 41, 41.
45 to 50 years.....	10.....	45, 45, 45, 45, 45, 47, 48, 49, 49, 49.
50 to 55 years.....	5.....	50, 50, 50, 50, 52.
55 to 60 years.....	8.....	55, 55, 56, 56, 56, 56, 59.
60 to 65 years.....	7.....	60, 60, 60, 60, 62, 63, 64.
65 to 70 years.....	1.....	67.
70 to 75 years.....	3.....	70, 71, 74.
Ages unknown.....	19.....	Unknown.

If now a table be presented of the given ages of those cases in which it was *demonstrated* that the disease was primarily and entirely restricted to the urinary organs, it will appear that the acme of vulnerable age is the forties, and that of 27 cases there were only 4 outside the limits of thirty-five to sixty-five years of age.

TABLE XIII.—DERANGEMENT EXCLUSIVELY OF URINARY ORGANS (27 CASES).

Decades.	Number of Cases.	Exact Ages.
20 to 30 years.....	1.....	28.
30 to 40 years.....	4.....	35, 36, 37, 39.
40 to 50 years.....	8.....	40, 40, 41, 41, 45, 45, 45, 49.
50 to 60 years.....	6.....	50, 52, 55, 56, 56, 59.
60 to 70 years.....	6.....	62, 63, 64, 66, 66, 67.
70 to 80 years.....	2.....	71, 74.

**Causes to which anuria was ascribed.**—In 36 cases of the 93 it was demonstrated that the anuria had its origin in some condition where the urinary organs alone were affected; and of these there were but 4 recoveries.



DIAGRAM No. 2.—AGES AT WHICH ANURIA OCCURRED, RESULTING FROM VARIOUS CAUSES, AND PERCENTAGE OF DEATHS—(50 DEATHS IN 71 CASES).

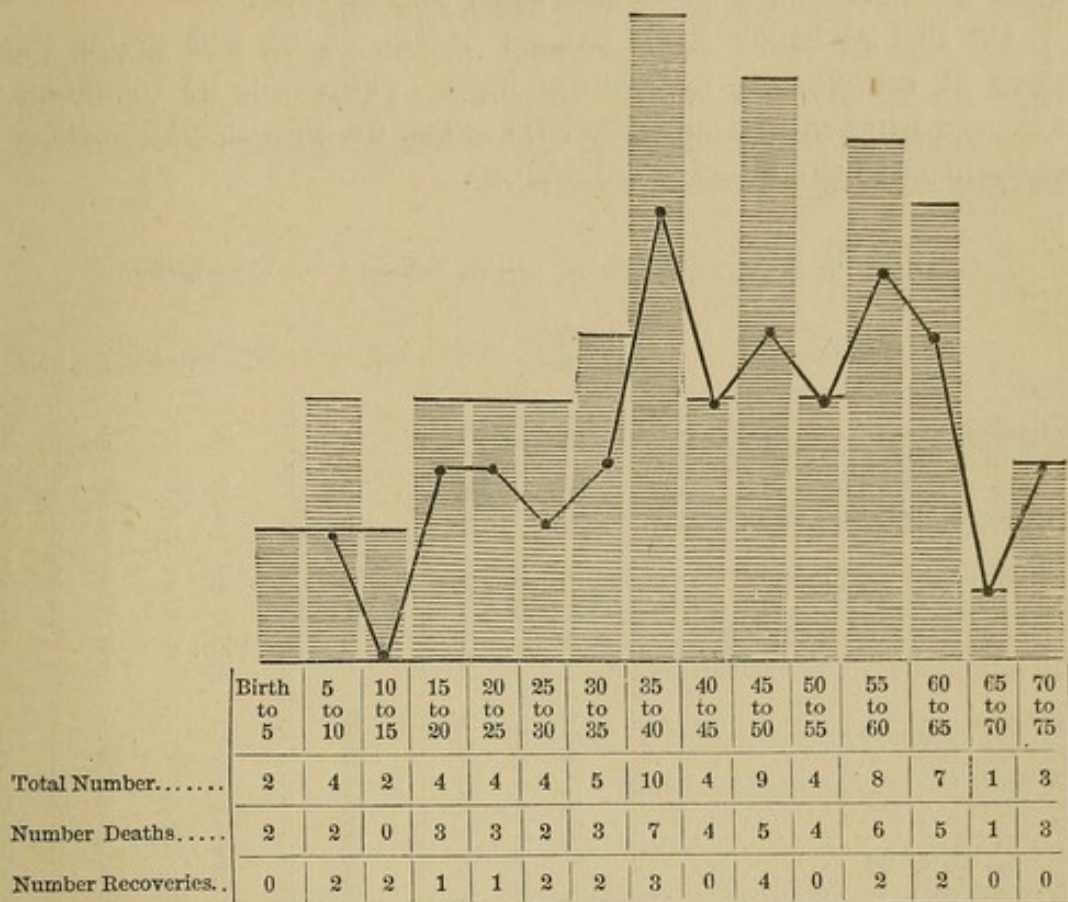
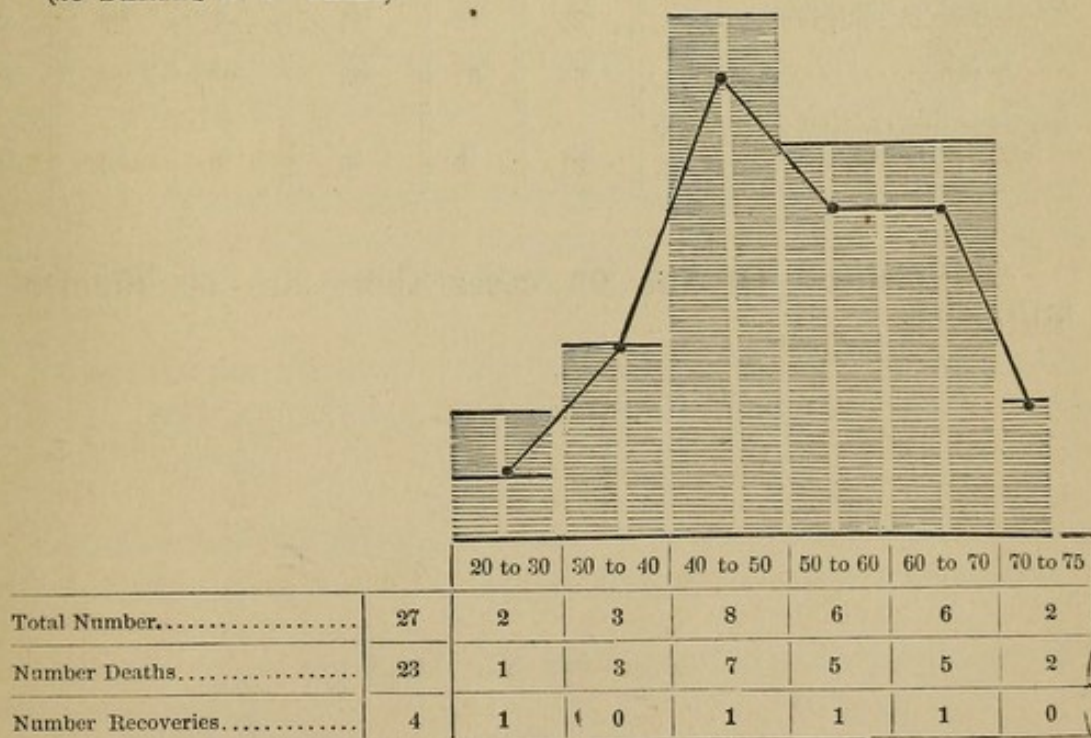


DIAGRAM No. 3.—AGES AT WHICH ANURIA OCCURRED, RESULTING EXCLUSIVELY FROM DISTURBANCE OF THE RENAL ORGANS, AND PROPORTION OF DEATHS—(23 DEATHS IN 27 CASES).





Of the 33 cases resulting from various other diseases there were 8 recoveries, a little less than one in four.

Of the 24 cases from causes unknown or not given there were 11 recoveries, nearly one-half. (The fact of recovery of course added many cases to this class, as no autopsy served to authenticate the precise condition).

TABLE XIV.—CAUSES TO WHICH ANURIA WAS ASCRIBED.

Causes.	Number of Cases.	Died.	Recovered.	Uræmia.	No Uræmia.	Not stated.
Calculus.....	15	11	4	3	6	6
Calculus, with previous destruction of one kidney.....	16	16	0	4	12	0
Cystic degeneration of kidneys..	1	1	0	1	0	..
Renal artery obstructed.....	2	2	0	0	2	0
Renal abscess.....	1	1	0	1	0	0
Ureters, valvular occlusion .....	1	1	0	0	1	0
Ureters, occlusion by renal artery.	1	1	0	0	1	..
Scirrhus.....	7	6	1	1	5	1
Scarlet fever.....	6	4	2	2	4	0
Measles .....	1	0	1	0	1	0
Cholera .....	5	5	0	2	1	2
Hysteria .....	2	0	2	0	2	0
Spinal irritation .....	1	0	1	0	1	0
Traumatic.....	1	1	0	1	0	0
Calomel .....	1	0	1	0	1	0
Corrosive sublimate.....	7	6	1	0	2	5
Uncertain or not given.....	25	14	11	6	16	3
Total.....	93	67	24	20	54	17
Previous destruction of one kidney (instances of).....	21	0	0	5	13	3

**Autopsies.** — Of the 93 cases there are 50 reports of autopsies.

## SECTION FIFTH.

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### RÉSUMÉ.

#### ALIMENTARY TRACT.

**Vomiting.**—This, upon the first or second days, has no characteristic significance.

After the fifth day it is generally the result of a profound constitutional disturbance caused by the suspended urinary secretion, and there was, amongst the 93 cases, no instance of recovery where this occurred.

**Constipation** is probably the rule, but the almost universal early administration of cathartics interferes with observation on this point.

**Diarrhœa** is exceedingly rare.

#### NERVOUS ORGANISM.

**Muscular twitchings** (*subsultus tendinum*).—These are mentioned in 13 instances, 3 of which (nearly one-fourth) recovered.

This symptom, taken independently, seems to express nothing decisive in way of prognosis. It is more apt to make its appearance after the fifth day of anuria.

**General convulsions** very seldom occur in uncomplicated anuria, and when they do it is nearly always a part of the process of death.

**Contraction of pupils** appears to be an indication of serious encephalic disturbance or lesion, and is an unfavorable sign.

**Ptosis, or paralysis of any kind**, generally associates with a fatal termination.



**Delirium.**—The rarity of delirium is a characteristic ; in the 93 cases its presence is spoken of but once, and in connection with a case which recovered.

**Insomnia.**—This, associated with a strange, unnatural tranquillity and sweet, cheerful temper, is a remarkable symptom which I have never encountered in other maladies, nor have I observed it mentioned in the literature of medicine as connected with other diseases. I should regard it as one of the pre-eminently characteristic accompaniments of anuria.

Those cases in which insomnia appears after the fifth day of anuria are amongst the most fatal.

**Sopor** is rare and without special significance.

**Coma** seldom if ever occurs except as a part of the act of death, or as a symptom properly belonging to some malady, other than anuria, from which the patient may be suffering.

**Ammoniacal or urinous odor.**—There were 7 cases in the 93 ; 4 fatal and 3 recovered.

*Uric-acid crystals on skin and hair.*—There were 2 cases : 1 death and 1 recovery. These signs, therefore, are not aids to prognosis.

#### PULSE—TEMPERATURE—RESPIRATION.

**Pulse.**—A slow pulse—frequently from 15 to 25 below the normal—is a marked characteristic of anuria.

**Temperature.**—A low temperature is equally characteristic with a slow pulse. It is not beyond the normal (except it may be in the act of death), and often falls below.

**Respiration.**—In a certain percentage of cases the respiration is also characteristic. In such cases it is generally slow, the inspiration short, a little interval ensues, then the expiration is prolonged and sometimes labored.

#### BLOOD-POISONING.

**So-called uræmia.**—When complete “uræmic symptoms” appear, death generally follows within forty-eight hours. Of the 19 cases, however, there were 3 recoveries.



"Uræmia" is not frequent between the fourth and eighth days. So far as my investigation and experience will permit me to judge, it is not as frequent in anuria as in retention of urine.

(I use the term "uræmia" in a conventional manner, as conveying by one word a certain generally recognized picture of symptoms, without thereby committing myself to any etiological theory.)

**Sex.**—Of 83 known sex there were 56 males and 27 females.

**Age.**—The age of greatest susceptibility to anuria is the forties. It seldom occurs before thirty-five or after sixty-five years of age.

**Duration of anuria.**—There seems to be two days of natural limit for anuria, upon which it is more apt to terminate either in death or recovery; these are the fifth and eighth.

There are several cases which seem properly authenticated, of complete, continuous anuria of twenty days and more, and one case (the case of measles, No. 51) of over fifty days.

The other instances of alleged great duration have not the nature of testimony.

Eleven, twelve, and thirteen days are not extraordinary periods.

**The etiology, and *modus operandi*,** in a certain proportion of cases, such as in scarlet fever, measles, hysteria, etc., etc., are most certainly questions open for further inquiry.

That there should occur a simultaneous paralysis of both kidneys is something highly improbable, nor would this prevent the flow of water; a spasm of the renal arteries, or their branches, might do so by reducing arterial pressure, and the same result may follow serious interference with the nervous system, as, for example, through irritation of the pneumogastri-  
cs, or interruption of the spinal cord or the sympathetics; or, again, any change in the composition of the blood, or any mental emotion which would serve to reduce the force of cardiac action. Mental emotion, unless extreme, would have the opposite effect, as it would increase the force of the heart's action.



The demonstration is well known by the profession, that when arterial pressure falls much below 44 mm. of mercury, all flow of urine ceases.

Upon the physiology of urine-secretion there is a very interesting article by Dr. P. Gruetzner in the *Archiv. für Physiol.*, vol. xi., p. 370 et seq., Bonn, 1875. See also Smiedeberg: *Ludwig's Arbeiten*, vol. v., p. 41, 1871; and vol. vi., p. 34, 1872.

Indeed, there is no paucity of literature upon this topic.







# OCCLUSION OF RENAL ARTERY.

		M., 45.	10.2	0	1	1	0	1	0	0	{ 7th day. }	0	0	After.	99	97-99	55	48-60	0	{ 6th day. }
33	1	M., 45.	10.2	0	1	1	0	1	0	0	0	0	0	After.	99	97-99	55	48-60	0	{ 6th day. }
34	2	M., 37.	6	0	1	1	.....	.....	.....	.....	0	.....	0							

## ABSCESS.

35	1	M., 26.	5	0	1	1	1	1	.....	.....	101.2 <sup>o</sup>	.....	.....	104-108
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URETER—VALVULAR OCCLUSION.

[illegible]

SCIRRHUS.

[illegible]

## SCARLET FEVER.

45	1	F., 15.	8	0	1	0	0	....	0	.....	0	.....	103	99-103%	.....	.....
46	2	M., 4.	9	0	1	1	1	1	.....	.....	0	.....	.....	.....	.....	0
47	3	M., 8.	25	1	0	0	0	0	0	0	0	0	0	.....	.....	0
48	4	M., 5%.	4.22 & 4.8	0	1	1	1	0	1	0	.....	.....	.....	.....	.....	.....
49	5	M., 5%.	8	1	0	0	1	.....	1	.....	.....	.....	.....	.....	128	.....
50	6	M., child.	5	0	1	1	1	1	.....	.....	1	.....	.....	.....	.....	1

## MEASLES.

[illegible]









TABLE XVI.—LIST OF CASES (AGE, SEX, DURATION OF ANURIA, CAUSE, RESULT, ETC.), TOGETHER WITH THE AUTHORS AND REFERENCES.

CALCULUS.

No. of Case.	Duration of Anuria.	Sex.	Age.	By whom reported.	Where reported.	Cause.	Uremic Poisoning or not.	Result.
1 (1)	15 days....	M.	56	Tennessee, M.....	Gazette des Hôpitaux, No. 23, p. 182, Paris, 1879.	Calculi.....	Uremic symptoms on 12th day.	Death; autopsy.
2 (2)	13 days....	F.	63	Salgado.....	Ziemss. Med. Cyc., vol. xv., p. 711 (Am. ed). London Lancet, July 4, 1874.....	Calculi.....	(?)	Recovery.
3 (3)	6 days and 2 days.	M.	Middle age.	Hutchinson, J.....	London Lancet, p. 24, 1850.....	Calculus.....	None.....	Recovery.
4 (4)	13 days....	M.	55	Jones, H. Bence, ..	London Lancet, pp. 151-2, Feb., 1854....	Calculi.....	Uremic symptoms....	Death; autopsy.
5 (5)	6 days and 11 days.	M.	36	Hamilton, Robert.....	Trans. Path. Soc., vol. xiv., pp. 192-5, London.	Calculi.....	None.....	Death; autopsy.
6 (6)	6 days.....	M.	49	Fuller, St. George's Hospital.	Sammlung von Natur und Medicin, p. 219, 1730.	Calculus and fatty tumor.	(?)	Death; autopsy.
7 (7)	28 days....	M.	(?)	Breslau, S.....	Sammlung von Natur und Medicin, p. 220, 1730.	Calculi.....	None.....	Death; autopsy.
8 (8)	21 days....	M.	41	Breslau, S.....	Med. Observations, vol. ii., p. 45.....	Calculi.....	Died in convulsions..	Death; autopsy.
9 (9)	18 days....	F.	40	Tulpi, S.....	Obs. Med. rarior. part vi., ob. 24....	Calculi.....	(?)	Death; autopsy.
10 (10)	5 days....	(?)	(?)	Blasi, S.....	Med. Times and Gazette, vol. i., p. 548, London, 1863.	Calculi.....	None.....	Death; autopsy.
11 (11)	13 days....	M.	(?)	Fuller, St. George's Hospital.	New York Med. Jour., vol. iv., p. 365, 1867.	Calculi and abscess....	(?)	Death; autopsy.
12 (12)	7 days and 4 days.	F.	39	Griscom, J. H.....	Sammlung klinischer Vorträge, Red. von R. Volkman, No. 25; also, Ziemssen's Med. Cyclop., vol. xv., pp. 49-50 (Am. edition).	Calculus.....	None.....	Recovery.
13 (13)	5 days....	M.	28	Bartels, Carl (Prof. at Kiel).	Jour. Gén. de Méd.; also, Dict. des Scien. Méd., p. 430.	Calculi.....	(?)	Death; autopsy.
14 (14)	8 days....	M.	50	Gautier and Clanbry...	Hufeland's Jour. der practisch. Arznelkunde, pp. 1-93, Dec., 1815.	Calculi.....	(?)	Death; autopsy.
15 (15)	6 days....	(?)	(?)	(?)		Calculi.....	(?)	
CALCULUS, WITH PREVIOUS DESTRUCTION OF ONE KIDNEY.								
16 (1)	13 days....	M.	(?)	Anglada.....	Recueil des Trav. de la Soc. Méd. du Départ. d'Indre et Loire, Trim. i., 1843.	Calculus, prev. des. one kidney.	None.....	Death; autopsy.
17 (2)	11 days....	F.	52	Southey.....	London Lancet, p. 11, Jan., 1874.....	Calculus, prev. des. one kidney.	None.....	Death; autopsy.

ANURIA.



18 (3)	6 days.....	M.	71	Hutchinson, J. ....	London Lancet, July 4, 1874.....	Calculus, prev. des. one kidney.	None.....	Death; autopsy.
19 (4)	9 days. ....	M.	59	Roberts, William, and Mr. Gindrod.	London Lancet, pp. 868-870, June 18, 1870.	Calculus, prev. des. one kidney.	None.....	Death; autopsy.
20 (5)	10 days.....	M.	62	Bagshawe .....	Trans. Path. Soc., vol. xvi., pp. 176-9, London, 1875.	Calculus, prev. des. one kidney.	None.....	Death; autopsy.
21 (6)	12 days.....	F.	(?)	Nunnally.....	Trans. Path. Soc., vol. ix., pp. 145-8, London.	Calculi, prev. des. one kidney.	None.....	Death; autopsy.
22 (7)	8 days.....	F.	45	(?) .....	Hufeland's Med. Jour. p. 60, Berlin, 1826.	Calculus, prev. des. one kidney.	None.....	Death; autopsy.
23 (8)	12 days ..	M.	35	Doering, of Ems.....	Hufeland's Med. Jour., p. 62, Berlin, 1826.	Ureter occluded, prev. des. one kidney.	None.....	Death; autopsy.
24 (9)	11 days.....	M.	60	Muhrbeck .....	Rust's Magazin der Heilkunde, vol. xxxvii., p. 175, Berlin, 1852.	Calculus, prev. des. one kidney.	Died soporose.....	Death; autopsy.
25 (10)	15 days and 7 days..	M.	74	Paget, Sir James .....	Trans. Clin. Soc. of London, p. 171, 1869.	Calculus, prev. des. one kidney.	Slight .....	Death; autopsy.
26 (11)	6.10 days..	F.	60	Fowler, E. P.....	New York Medico-Chir. Soc., 1880.....	Calculus, prev. des. one kidney.	None.....	Death; autopsy.
27 (12)	3.2 days....	M.	53	Fowler, E. P.....	New York Medico-Chir. Soc., 1880.....	Calculus, prev. des. one kidney.	None.....	Death; autopsy.
28 (13)	10 days.....	M.	64	Rayer .....	Maladies des Reins, vol. iii., p. 490.....	Calculi, prev. des. one kidney.	None.....	Death; autopsy.
29 (14)	13 days.....	M.	41	Teeling.....	Dublin Trans., vol. iv., 1835.....	Calculi, prev. des. one kidney.	11th day, coma and convulsions.	Death; autopsy.
30 (15)	4 days.....	M.	67	Roberts, William, and Mellor.	Roberts' Urinary and Renal Dis., pp. 30, 31, 1879.	Calculi, prev. des. one kidney.	Four days after anuria uræmic symptoms.	Death; autopsy.
31 (16)	5 days.....	M.	40	Roberts, William, and Mr. Edwards.	Roberts' Urinary and Renal Dis., pp. 36-37, 1879.	Calculi, prev. des. one kidney.	Uremia.....	Death; autopsy.

## CYSTIC DEGENERATION OF KIDNEYS.

32 (1)	4 days.....	F.	48	Roberts, William, and Heathcote.	Roberts' Urinary and Renal Dis., pp. 512-14, 1879.	Cystic degeneration of kidney.	Pupils contracted....	Death; autopsy.
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## RENAL ARTERY: (1) OBSTRUCTION OF RIGHT, AND PREVIOUS DESTRUCTION OF ONE KIDNEY; (2) OBSTRUCTION OF BOTH.

33 (1)	10.2 days..	M.	45	Fowler, E. P.....	New York Medico-Chirurg. Soc., 1881....	Obst. renal artery, prev. d. one kidney.	None.....	Death; autopsy.
34 (2)	6 days.....	M.	37	Todd, Robert Bently...	Medico-Chirurg. Trans., vol. xvii., pp. 362 et seq., London, 1844.	Obst. renal artery by aortic aneurism.	None.....	Death; autopsy.



TABLE XVI.—LIST OF CASES (AGE, SEX, DURATION OF ANURIA, CAUSE, RESULT, ETC.), TOGETHER WITH THE AUTHORS AND REFERENCES—*Continued*.  
ABSCESS, AND PREVIOUS DESTRUCTION OF ONE KIDNEY.

No. of Case.	Duration of Anuria.	Sex.	Age.	By whom reported.	Where reported.	Cause.	Uraemic Poisoning or not.	Result.
35 (1)	5 days.....	M.	26	Hachenberg, of Coblenz.	Berliner klin. Wochenschrift, p. 264, 1872.	Abscess, prev. des. one kidney.	Slight .....	Death; autopsy.
URETER—VALVULAR OCCLUSION AND PREVIOUS DESTRUCTION OF ONE KIDNEY.								
36 (1)	15 days....	M.	Birth.	Ackermann, Thomas...	Archiv für klinische Med., p. 456, Leipzig, 1866.	Valvular obstruction of ureters.	None.....	Death; autopsy.
37 (2)	4 days.....	M.	20	Roberts, William .....	Roberts' Urinary and Renal Dis., pp. 491-5, 1879.	Ureter obstructed by branch of renal artery, prev. des. one kidney.	None.....	Death; autopsy.
SCIRRHUS.								
38 (1)	11 days....	F.	60	Hutchinson, J., London Hospital.	London Lancet, June 3, 1871.....	Scirrhus.....	Convulsions on day of death; none.	Death; autopsy.
39 (2)	4 days and 3 days.....	M.	59	Notes of Dr. Duigan and Renshaw, Herbert.	Roberts' Urinary and Renal Dis., pp. 42-3, 1879.	Scirrhus, prev. des. one kidney.	Slight .....	Death; autopsy.
40 (3)	8 days.....	F.	30	(?) .....	Rust's Mag. der Heilkunde, vol. liv, p. 175, Berlin, 1839.	Scirrhus.....	None .....	Death; autopsy.
41 (4)	8 days.....	(?)	(?)	Burton, J. W. ....	Brit. Med. Jour., p. 1015, 1860.....	Scirrhus.....	None.....	Death; autopsy.
42 (5)	7 days.....	F.	60	Renshaw, Herbert, and Dr. Gardiner.	Roberts' Urinary and Renal Dis., pp. 43-4, 1879.	Scirrhus.....	None.....	Recovery.
43 (6)	14 days..	F.	56	Roberts, William, and Lloyd-Roberts.	Roberts' Urinary and Renal Dis., p. 45, 1879.	Scirrhus.....	None.....	Death; no autopsy.
44 (7)	17 days....	(?)	(?)	Monfalcone.....	Dict. des Scien. Méd., p. 429.....	Scirrhus.....	(?) .....	Death; autopsy.
SCARLET FEVER.								
45 (1)	8 days.....	F.	15	Plain, of Maidenhead..	St. George's Hosp. Reports, vol. v., p. 11, 1870.	Scarlet fever.....	None.....	Death; no autopsy.
46 (2)	9 days.....	M.	4	Bates, George F.....	Medical Record, pp. 431-2, New York, Oct. 16, 1880.	Scarlet fever.....	None.....	Death; autopsy.



47 (3)	25 days....	M.	8	Whitlaw, William....	London Lancet, vol. ii., p. 460, 1877.	Scarlet fever ....	None .....	Recovery.
48 (4)	4.22 days & 4.8 days.	M.	5½	Biermer, of Wurtzburg.	Virchow's Archiv für path. Anat., vol. xix., p. 537.	Scarlet fever .....	Uremia two days after re-establishment of flow; none.	Death; autopsy.
49 (5)	8 days .....	M.	5½	Deininger, G. ....	Archiv für klinische Med., p. 537, Leipzig, 1870.	Scarlet fever .....	Convulsive; slight...	Recovery.
50 (6)	5 days .....	M.	(?)	Boeke, of Berlin, .....	Hufeland's Jour. Med., Oct., 1826 .....	Scarlet fever .....	Uremic symptoms...	Death; no autopsy.

## MEASLES.

51 (1)	5 days and 51 days.	M.	12	Hübenthal, of Wietepok.	Hufeland's Jour. der prak. Arzneykunde, vol. ii., p. 124, Berlin, 1837.	Measles .....	None .....	Recovery.
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## CHOLERA.

52 (1)	21 days....	M.	28	De Leon, H. ....	Baltimore Med. and Surg. Jour., July, 1834.	Cholera .....	None .....	Death; autopsy.
53 (2)	4 days .....	F.	34	Drysdale, of Liverpool..	British Journal of Homoeopathy.	Cholera .....	None .....	Death; no autopsy.
54 (3)	5 days .....	M.	33	Drysdale, of Liverpool..	British Journal of Homoeopathy.	Cholera .....	(?) .....	Death; no autopsy.
55 (4)	5+ days....	M.	35	Drysdale, of Liverpool..	British Journal of Homoeopathy.	Cholera .....	Coma .....	Death; no autopsy.
56 (5)	5+ days....	F.	(?)	Drysdale, of Liverpool..	British Journal of Homoeopathy.	Cholera .....	Coma .....	Death; no autopsy.

## HYSTERIA.

57 (1)	4.12 days..	F.	38	McBride, T. A., and M. D. Mann.	Archives of Med., vol. i., pp. 293-301, New York, 1879.	Hysteria .....	None .....	Recovery.
58 (2)	21 days....	F.	30	Millard, H. B. ....	From Clinical Notes, 1864.. ..	Hysteria .....	None .....	Recovery.

## SPINAL IRRITATION.

59 (1)	25 days....	F.	21	Fontaine, A. W. ....	Virginia Med. Monthly, vol. i., No. 7, p. 407, 1874.	Spinal irritation .....	None .....	Recovery.
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## TRAUMATIC.

60 (1)	2.19 days .	M.	24	Ranney, Ambrose L ...	New York Med. Jour., vol. xxxi., p. 483.	Traumatic .....	Coma .....	Death; autopsy.
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TABLE XVI.—LIST OF CASES (AGE, SEX, DURATION OF ANURIA, CAUSE, RESULT, ETC.), TOGETHER  
WITH THE AUTHORS AND REFERENCES—Continued.

22

CALOMEL.

No. of Case.	Duration of Anuria.	Sex.	Age.	By whom reported.	Where reported.	Cause.	Uremic Poisoning or not.	Result.
61 (1)	5 days....	M.	45	Tott, C. A.....	Hufeland's medicinisches Jour., vol. v., p. 93, Berlin, 1838.	Calomel.....	None.....	Recovery.

CORROSIVE SUBLIMATE.

62 (1)	5 days.....	M.	19	Ward, of Bodmin.....	Med. Gazette, vol. viii., p. 666, London.	Bichloride mercury...	None.....	Death; autopsy.
63 (2)	5 days.....	M.	35	Syme, Sir James.....	Edinb. Med. and Surg. Jour., vol. xlv., pp. 26-7, 1835.	Bichloride mercury...	None.....	Recovery.
64 (3)	3 days.....	F.	20	Henry, William, of Manchester.....	Edinb. Med. and Surg. Jour., vol. vii., pp. 150-1, 2d edition, 1811.	Bichloride mercury...	(?)	Death; autopsy.
65 (4)	8 days.....	F.	(?)	Venables, Robert.....	London Med. Gazette, vol. viii., pp. 616-23, 1831.	Bichloride mercury...	(?)	Death; autopsy.
66 (5)	5 days.....	M.	50	Blacklock, Archibald....	Edinb. Med. and Surg. Jour., vol. xxxvi., pp. 42-4, 1831.	Bichloride mercury...	(?)	Death; no autopsy.
67 (6)	4 days.....	M.	38	Taylor, Alfred S.....	Guy's Hosp. Reports, vol. ii., pp. 24-7, 1844.	Bichloride mercury...	(?)	Death; autopsy.
68 (7)	5.6 days...	M.	15	Caspar.....	Traité des Poisons, tome ii., p. 140, 1853.	Bichloride mercury...	(?)	Death; autopsy.

ANURIA.

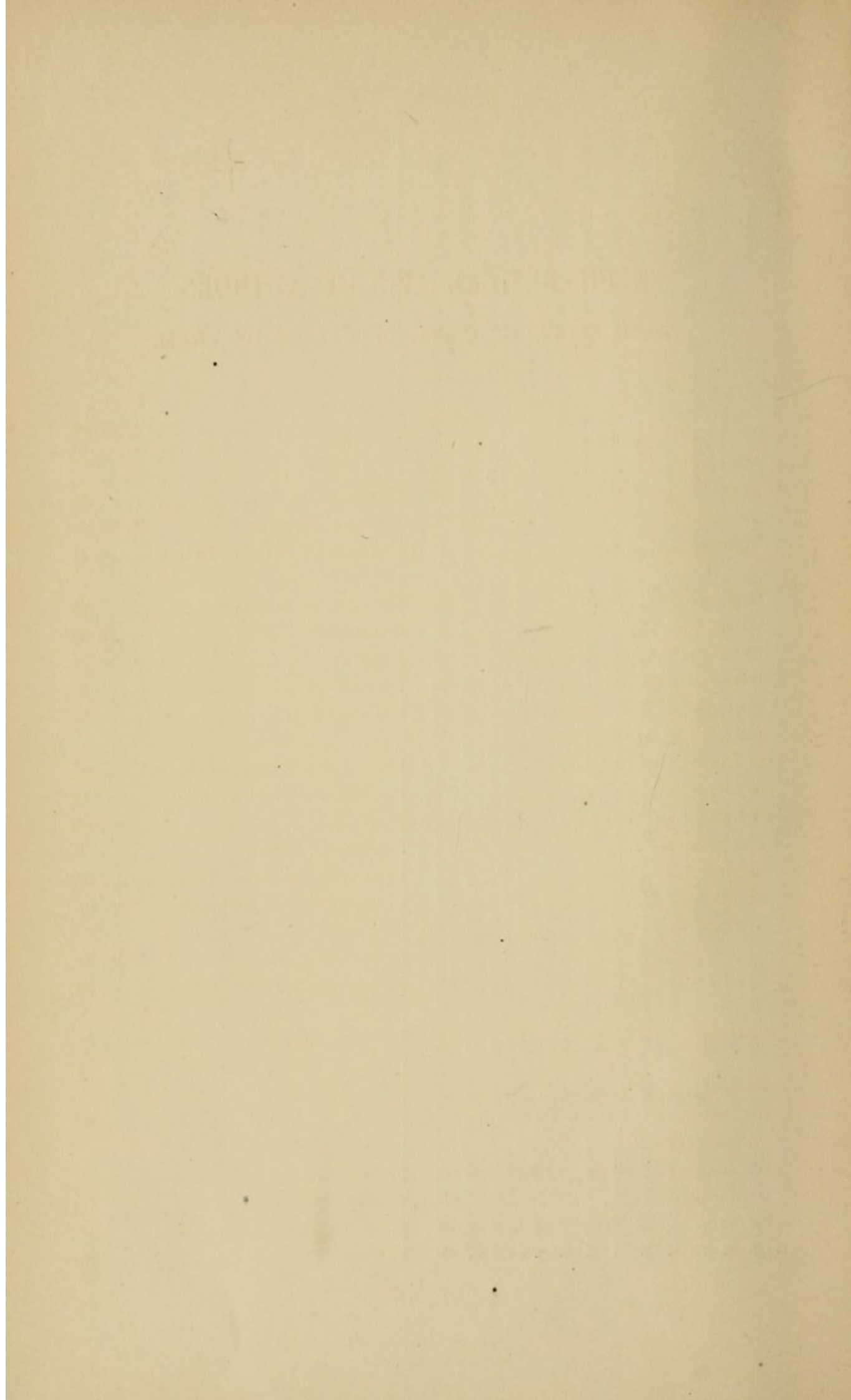
UNCERTAIN, OR NOT GIVEN.

69 (1)	5 days.....	F.	45	Blane, Sir Gilbert.....	"Treatise on the Prevalence and Mortality of Particular Diseases."	Dis. of kidneys.....	None.....	Death; autopsy.
70 (2)	12 days....	M.	70	Anglada.....	Recueil des Trav. de la Soc. Méd. du Dép. d'Indre et Loire, trim. i., 1843.	(?)	None.....	Death; no autopsy.
71 (3)	8 days.....	F.	9	Marvel, of Ambert.....	Gazette des Hôpitaux, Paris, Aug., 1849.	(?)	None.....	Death; no autopsy.
72 (4)	20 days....	M.	49	Russell, James.....	Med. Times and Gazette, London.....	(?)	None.....	Recovery.
73 (5)	8.2 days....	F.	(?)	Jeaffreson, J. B.....	London Lancet, pp. 325-6, Oct. 1, 1859.	(?)	None.....	Death; no autopsy.
74 (6)	8 days.....	M.	49	Tovey, Henry L.....	London Lancet, pp. 69-70, July 11, 1846.	(?)	None.....	Death; no autopsy.
75 (7)	8 days.....	F.	47	Reynolds, H. D.....	London Lancet, p. 635, Nov. 6, 1869.	(?)	None.....	Recovery.
76 (8)	60 days....	F.	16	"G. S.".....	London Lancet, p. 756, June 15, 1867.	(?)	None.....	(?)
77 (9)	9 days.....	M.	23	Brown, J. D.....	Med. Times and Gazette, p. 86, London, 1868.	(?)	None.....	Death; no autopsy.



78 (10)	42 days....	F.	27	Gallina, of Bresciano...	Gazetta Med. Ital. Lombardia, July 4, 1868.	(?)	.....	None.....	Recovery.
79 (11)	11 days....	(?)	(?)	Buxton, B. T.....	Richmond and Louisville Med. Jour., vol. xvii., p. 98, Jan., 1874.	(?)	.....	None.....	Recovery.
80 (12)	28 days....	M.	10	Alexander.....	Edinb. Med. Jour., vol. v., p. 246, 1859.	(?)	.....	"No symptoms of any kind."	Recovery.
81 (13)	11.2 days..	F.	30	Sue .....	Louisville Med. News, vol. x., No. 7, p. 88, 1880.	(?)	.....	None.....	Recovery.
82 (14)	9 days.....	M.	Middle aged.	Roberts, William, and Dr. Duigan.	Roberts' Urinary and Renal Dis., pp. 41-2, 1879.	(?)	.....	None.....	Recovery.
83 (15)	9 days.....	M.	35	Gardiner and Hunstone.	Roberts' Urinary and Renal Dis., p. 45, 1879.	(?)	.....	None.....	Death; no autopsy.
84 (16)	13 days....	(?)	(?)	Dumas, Adolph.....	L'Union Médicale, pp. 841-61, Paris, 1876.	(?)	.....	(?)	Death; no autopsy.
85 (17)	8 days....	(?)	(?)	Dumas, Adolph.....	L'Union Médicale, pp. 841-61, Paris, 1876.	(?)	.....	(?)	Death; no autopsy.
86 (18)	7 days....	M.	45	Knaggs, Samuel J.....	Dublin Med. Jour., p. 27, July, 1873....	(?)	.....	(?)	Recovery.
87 (19)	8 days....	M.	50	Hutchinson, J.....	London Lancet, July 4, 1874.....	Calculus (?)	.....	Comatose.....	Death; no autopsy.
88 (20)	5 days....	F.	(?)	Hall, J. C.....	London Lancet, p. 582, May, 1849.....	(?)	.....	Comatose.....	Death; autopsy.
89 (21)	3 days....	M.	55	Hall, J. C.....	London Lancet, p. 582, May, 1849.....	(?)	.....	Comatose.....	Death; no autopsy.
90 (22)	17 days....	M.	(?)	Dubuc.....	L'Union Médicale, Nov., 1879.....	(?)	.....	"Uraemic symptoms."	Death; no autopsy.
91 (23)	8 days....	M.	37	Carrier.....	Gazette Hebdomadaire de Méd., p. 204, Paris, 1879.	(?)	.....	Uraemia on last (8th) day.	Recovery.
92 (24)	8 days....	M.	56	Roberts, William, from Notes of Dr. Alburt.	Roberts' Urinary and Renal Dis., pp. 39-41, 1879.	Hydronephrosis (?)...	.....	None until after flow commenced.	Recovery.
93 (25)	5 days....	F.	50	Hayward, Geo., Boston.	American Jour. Med. Sciences, vol. v., p. 88, 1829.	"Pararia inops," contracted kidney.	.....	Sopor and coma.....	Death; autopsy.





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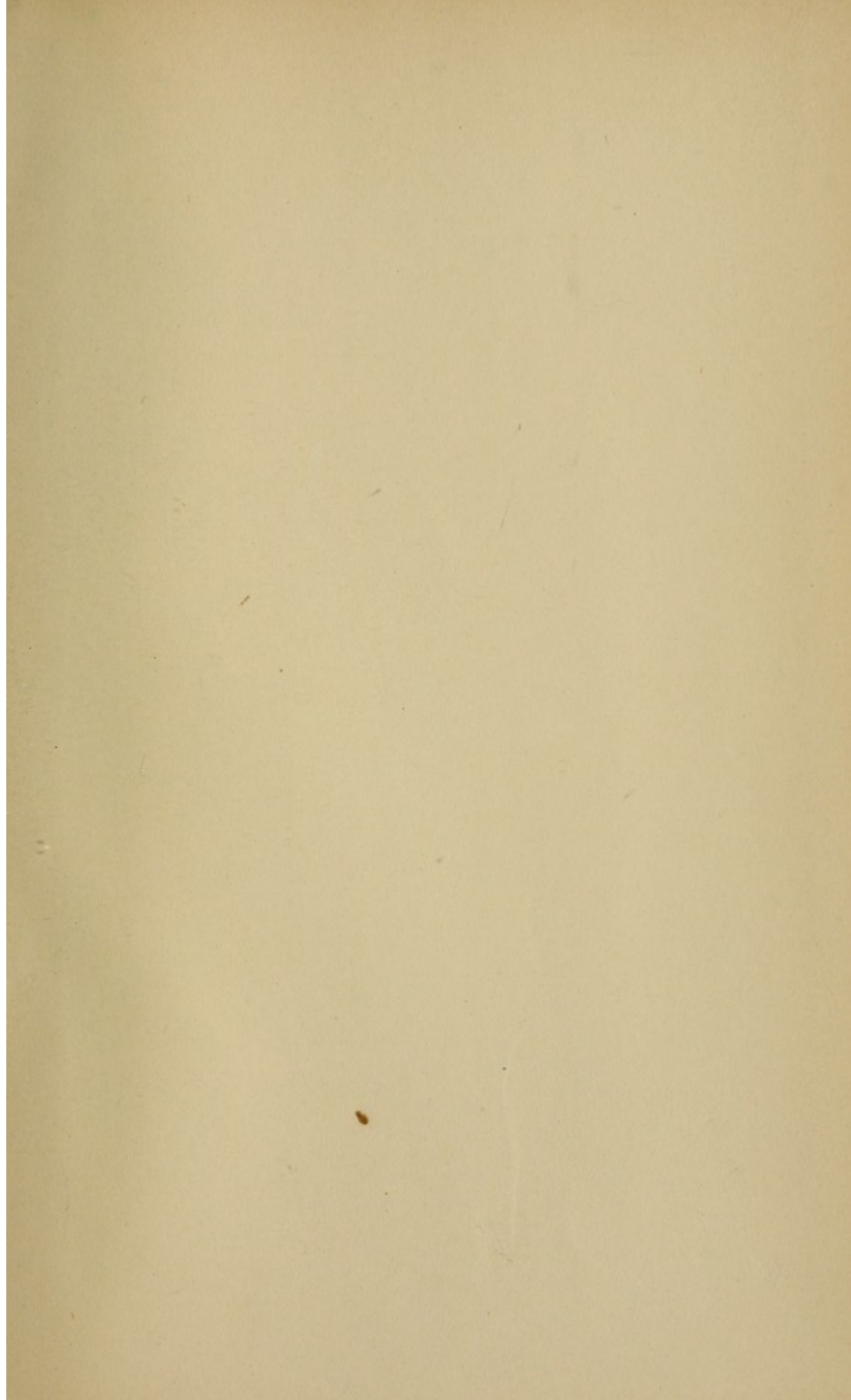
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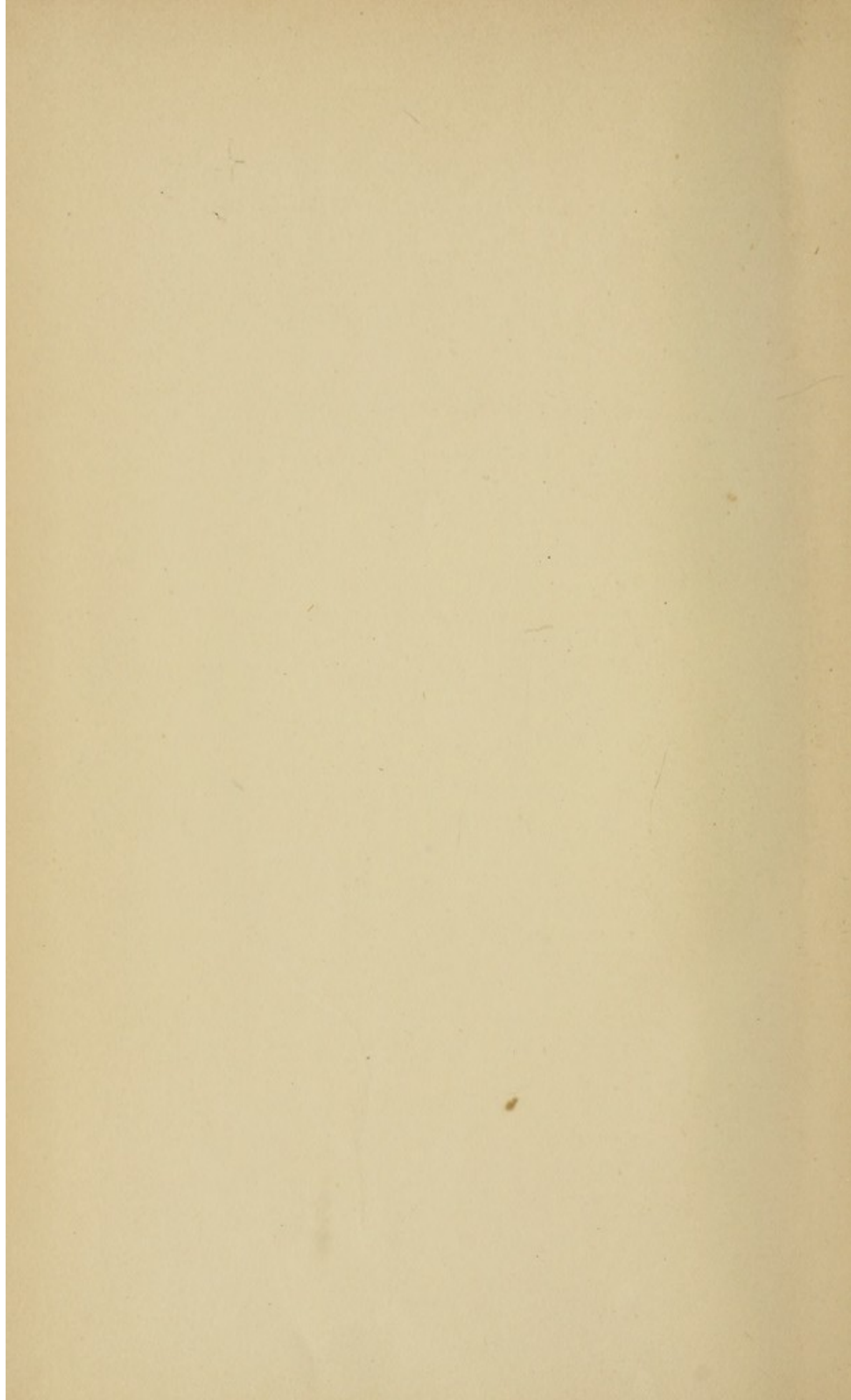
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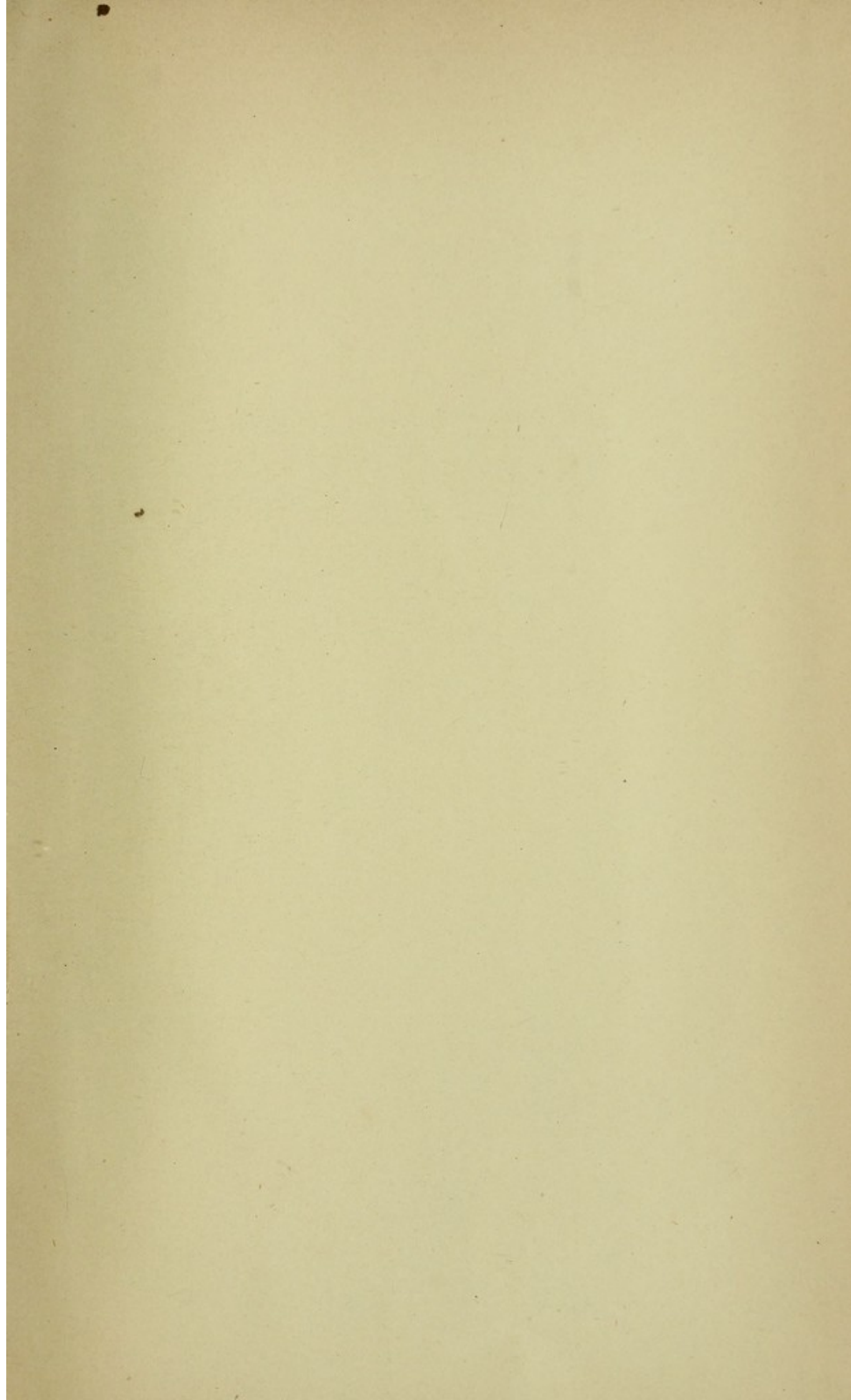
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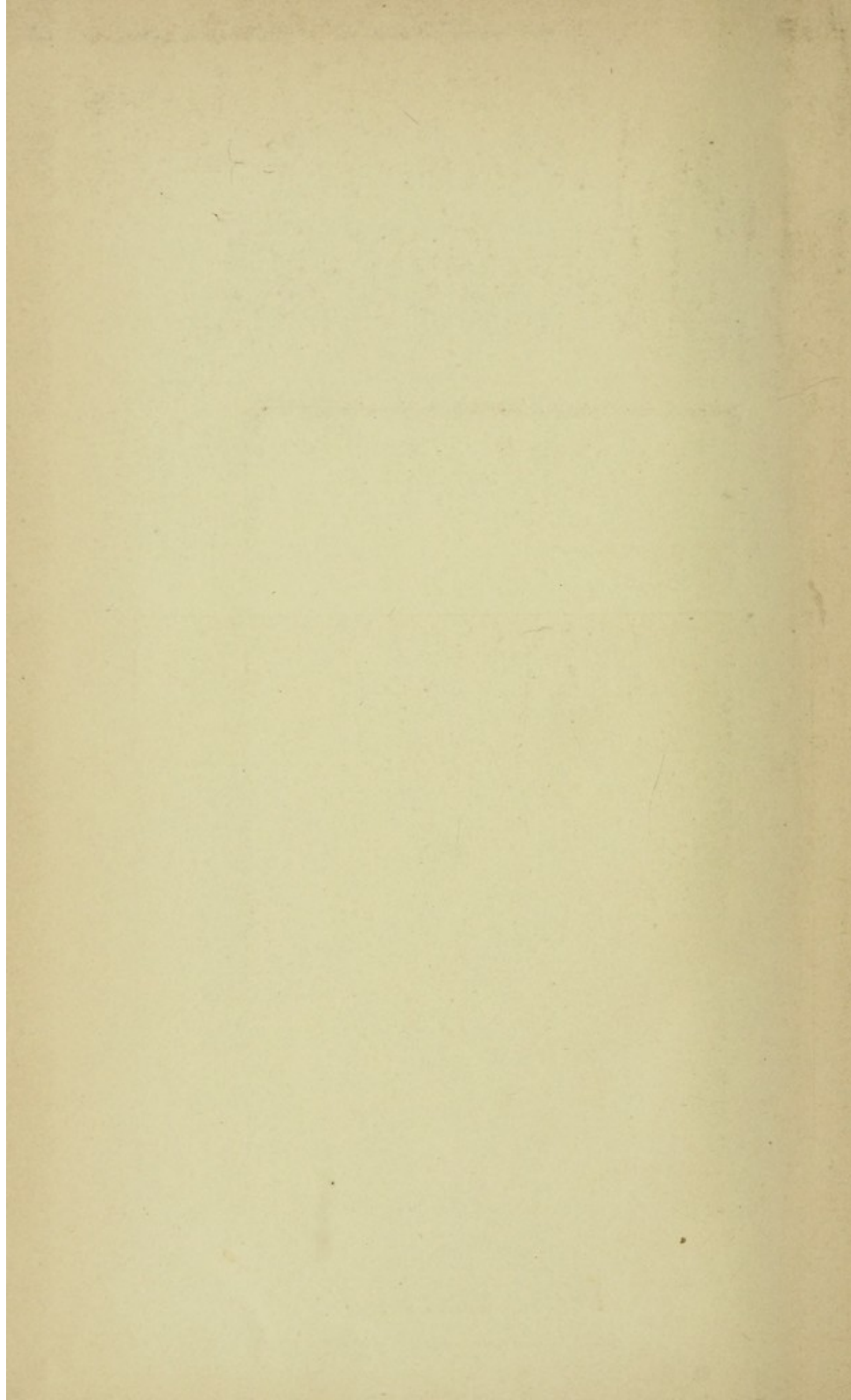












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