in cells, and on casts. Also found, but not characteristic, are all the other varieties of casts. If death does not ensue within eighteen months, the urine is apt to assume the characteristics of the:

4. *Contracted kidney* (primary, secondary, or arterio-sclerotic), with polyuria (often several quarts; urine especially abundant at night), low specific gravity (1.010 or less). Traces of albumin and a few hyaline and granular casts occur steadily or intermittently.

CHAPTER XXI.

THE BLADDER, RECTUM, AND GENITAL ORGANS.

The Bladder.

Incidence of Bladder Disease.

(Massachusetts General Hospital, 1870–1905.)

Cystitis	829 cases.
Stone	538 "
Cancer	57 "
Papilloma	20 "
Tuberculosis	43 "

Data.

Distention, tumor, the urine, and the results obtained by *cystoscopy,* by *catheterization,* and by *sounding for stone* furnish most of our direct evidence in bladder disease. Pain in the bladder or near the end of the penis, and frequent, painful micturition with vesical tenesmus or straining, are common symptoms in various lesions of the organ, and direct our attention to it, though they do not indicate the nature of its trouble.

I. Distention of the Bladder.

In the male, distention is often wholly unknown to the patient, and may be accompanied by frequent acts of urination, especially in prostatic obstruction. A distended bladder is readily recognized by palpation as a smooth, round, firm, symmetrical tumor in the median line, above the pubes. The tumor is *dull on percussion,* and in slight degrees of distention this *dulness above the pubes* may be the only physical sign obtainable. In marked cases, which are almost invariably in males, the distended bladder may reach to the navel or even above it, and the beginner is usually astonished at its

dimensions and its firm, resistant surface (see Fig. 200). Diagnosis rests on the infrequency of other tumors of this region in men and on the result of catheterization or suprapubic aspiration. In females a history of failure to pass urine almost invariably makes the diagnosis obvious, though occasionally after operations distention of the bladder and dribbling of urine may go together in women, as they so frequently do in men.

The commonest causes of distended bladder are:

(1) Prostatic hypertrophy, alone or combined with

(2) Old strictures of the urethra.

Less common are:

(3) Spasm of the urethra in gonorrhœa.

(4) Acute prostatitis.

(5) Paralysis of the bladder, from disease or injury, after operation, and in fevers.

(6) Tumor or stone near the neck of the bladder.

The diagnosis of the cause of distention rests on the history, the result of attempts at catheterization, the rectal examination, the condition of the urine, and the physical signs in other parts of the body. A long history of frequent micturition, especially at night, in an old man, an obvious enlargement of the prostate felt by rectum, and the passage of ammoniacal urine suggest *prostatic obstruction.* The information obtained during the passage of a catheter usually clinches the diagnosis.

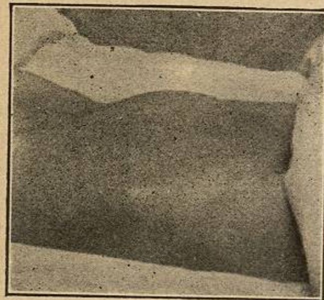

Fig. 200.—Distended Bladder Reaching Above the Navel.

Acute retention, with no previous history of frequent micturition or foul-smelling urine in a young or middle-aged man, who has had gonorrhœa and may or may not have noticed a diminution in the size of the stream of urine passed, suggests a *urethral stricture.* The catheter decides.

Spasm of the urethra may occur in acute gonorrhœa, and pro-

duces a retention which may often be overcome by hot poultices and enemata. The history and the effects of treatment suggest the cause of the retention.

Acute prostatitis, as a cause of retention following gonorrhœa, is suggested by pain and tenderness in the perineum, *painful defecation*, fever, perhaps chills, and a hot, tender prostate felt by rectum. Abscess may form and discharge by urethra or rectum.

Paralysis of the bladder, as a cause of retention, is usually obvious from the history and from the evidence of disease of the spinal cord, or of operation and semicomatose states (as in fevers and shock).

Tumors of the bladder are suggested by intermittent hæmaturia with vesical irritation, and confirmed by cystoscopic examination.

II. *The Urine as Evidence of Bladder Disease.*

This has been described above (page 435). Cystitis, acute or chronic, usually gives characteristic evidence of itself in the urine, and suggests thereby the possibility of gonorrhœa, of vesical stone, of prostatic or other obstruction to the outflow, and of vesical tuberculosis. When a urine like that of chronic interstitial nephritis occurs with chronic prostatic obstruction, the relief of the obstruction is necessary if we are to prevent progressive development of cirrhotic kidney from back pressure.

Frequent micturition is much commoner and less significant in women than in men. All sorts of "nervousness" and emotional strain produce this symptom in women, independent of any demonstrable source of irritation in the urinary tract. Aside from these conditions the symptom is oftenest met with in:

(*a*) *Cystitis*, with characteristic changes in the urine.

(*b*) *Prostatic obstruction*, with evidence of retention.

(*c*) *Gonorrhœa*, with evidence of this disease.

(*d*) *Paralysis of the bladder* (see above).

(*e*) *Overconcentration of the urine* (estimated by the color and specific gravity).

III. Stone in the Bladder.—Pain near the end of the penis, espe-

cially at the end of micturition and aggravated by jolting or active motion, frequent urination, especially in the daytime, sudden interruption of the stream of urine, and hæmaturia at the end of micturition, are the most frequent symptoms of stone, especially if they occur in boys. In old men stone may be wholly without characteristic symptoms, and at any age the symptoms can never do more than suggest the possibility of stone and the advisability of searching for it systematically with a proper sound.

IV. Tuberculosis of the Bladder.—Cystoscopy and the recognition of tubercle bacilli by animal inoculation are the only reliable means of diagnosis. A chronic cystitis in a young or middle-aged person, especially with an acid urine, is suggestive.

The Rectum.

It is not and should not be a part of routine physical examination to examine the rectum. The commonest conditions which call for such investigation are:

(*a*) Hemorrhage at stool.

(*b*) The protrusion after defecation of something which is not easily returned ("piles").

(*c*) Painful defecation or pain in the region of the rectum at other times.

(*d*) The presence of an ulcer or sinus near the rectum.

(*e*) Habitual constipation, not explained by lesions elsewhere.

(*f*) Intestinal obstruction.

(*g*) Suspected appendicitis.

(*h*) Suspected prostatitis, prostatic tumor or obstruction, or diseases of the seminal vesicles.

(*i*) Pelvic symptoms in women with tight hymen.

The diseases of the rectum which we are especially on the lookout for are: (1) Hemorrhoids; (2) fissure of the anus; (3) ischiorectal abscess; (4) fistula in ano; (5) cancer of the rectum. Less common are: (6) pruritus ani; (7) prolapse of the rectum; (8) ulceration or stricture of the rectum.

Methods.

For most examinations the finger suffices. It should be covered by a thin, rubber finger-cot, greased with vaseline, and should be introduced slowly and gently while the patient strains down as during defecation.

The examining finger should note the presence of abnormal prominences or resistance (piles, tumors) in any part of the rectum, of tender spots (ulcer, abscess), and strictures. The shape and size of the prostate gland, its consistence, and the presence or absence of tenderness in it are of importance. The normal seminal vesicles can be felt if distended. If they are hard and nodular, tuberculosis should be suspected.

High up on the right side the finger may touch a tender spot if an inflamed appendix is near the pelvic brim.

In women the uterus, especially if retroverted, may be easily felt, and most of the other details of pelvic examination (see below, page 447) can be more or less clearly made out.

For higher and more thorough examination a cylindrical speculum and a head mirror should be used, with the patient in the knee-chest position.

Hemorrhoids.—The diagnosis of *external hemorrhoids,* which can easily be brought outside the anus, is made at a glance. *Internal hemorrhoids* are best seen with a rectal speculum, and may resemble the external or may consist of "bright red, spongy, granular tumors, rarely larger than a ten-cent piece, and situated high up in the rectum" (*nævoid piles*).

Fissure of the anus is often connected with a small ulcer and with œdematous folds, which resemble an external pile but are much more tender. On separating these folds the fissure comes into sight. It produces severe pain during and after defecation.

Ischio-rectal abscess presents near the anus the ordinary signs of abscess, but may open either within or outside the rectum and results in

Fistula in ano, which is a sinus beside the rectum, opening in-

ternally, externally, or in both directions. It may be very tortuous and need examination with speculum and probe. Tuberculosis is always to be suspected in such fistulæ.

Cancer of the rectum is suggested by the occurrence of rectal pain during defecation, with blood in the stools and alternating diarrhœa and constipation, usually with some pallor and emaciation, in persons past middle life. Owing to neglect of a thorough examination many cases are at first mistaken for piles.

The examining finger reaches a hard, ulcerating mass high up, as a rule, in the rectum. It may be easier to reach if the patient stands or squats and strains down during examination.

From tuberculous or benign stricture with or without ulceration, and from benign villous growths, it may be impossible to distinguish cancer without histological examination of an excised piece. Tumors of the prostate are always on the anterior wall of the rectum and practically never ulcerate.

The Male Genitals.

Routine examination of the male genitals includes investigation of the penis for the presence of:

(*a*) Urethral discharge and its consequences.
(*b*) Chancre.
(*c*) Chancroid
(*d*) Balanitis.
(*e*) Phimosis or paraphimosis.
(*f*) Periurethral abscess.
(*g*) Malformations.
(*h*) Cancer.

In the testes and scrotum we look for:

(*a*) Epididymitis (gonorrhœal or tuberculous).
(*b*) Orchitis (traumatic, syphilitic, tuberculous, after mumps and other infections).
(*c*) Tumors of the testis (cancer or sarcoma).
(*d*) Hydrocele and hæmatocele.
(*e*) Varicocele.

(*f*) Scrotal hernia.
(*g*) Absence of one or both testes.

The Penis.

Urethral discharge, if not obvious, may often be brought to light by "stripping" the urethra forward from the prostatic region to the meatus. If Gram's stain brings out an intracellular, decolorizing diplococcus in the exudate, there is no reasonable doubt of the presence of gonorrhœa.

Chancre ("hard sore"), the primary syphilitic lesion, is a superficial, painless, indolent ulcer with an *indurated base* and a scanty serous discharge. It is usually round or oval and sharply demarked from the surrounding tissue by elevated edges. It is rarely multiple. Painless, hard, non-suppurating buboes accompany it. The glans and the inner surface of the prepuce are the commonest sites.

Chancroid ("soft sore") is like any other painful, superficial ulcer without induration, irregular in shape, often multiple, and with abundant discharge. A single, painful bubo accompanies it in about one-third of all cases.

Balanitis (inflammation of the surface of the glans penis), usually gonorrhœal, has the ordinary signs of inflammation; it often spreads to the inner surface of the prepuce.

Phimosis is a contraction of the orifice of the prepuce, so that it cannot be retracted to uncover the glans. May be hereditary or the result of gonorrhœa.

In *paraphimosis* the prepuce is caught behind the glans penis so that it cannot be brought forward. Great œdema of the neighboring parts usually results.

Peri-urethral abscess, usually a complication of gonorrhœa, appears as a small, tender swelling on the under surface of the urethra.

Malformations are chiefly *hypospadias* or congenital deficiency of some portion of the lower wall of the urethra, and *epispadias* (rare), a similar deficiency in the upper wall. A short, downward curved penis is often associated with hypospadias.