

Added to these are symptoms almost identical with those of stone in the bladder. There is the same frequency of urination, less urgent on some days than on others; the urine contains pus and blood; blood sometimes flows at the end of the stream; pain is felt on urination, both at the neck of the bladder and, especially toward the close of the act, at the end of the penis, along the under surface of the urethra; the patient has a tendency to pull and tickle the prepuce and urethra; the tender prostate, squeezed at the end of urination by the contracting bladder, is the seat of extreme sensibility. The bladder is liable to expel its contents spasmodically. The cut-off muscles of the membranous urethra participate in the general irritability of the part, sometimes interrupting the stream suddenly. As a rule, however, this "cut-off" does not come until near the end of the act of urination, and is a sort of premature *coup de piston*.

With these symptoms the patient is feverish and irritable, unable to get about, as all motion aggravates his symptoms. He chafes under confinement, is perhaps listless and depressed; perhaps has an excellent appetite, and very little constitutional disturbance. In chronic cases the mental depression is a feature of the disease out of all proportion to its gravity. A slight gleet discharge accompanies this condition. It may escape observation, from the fact that the frequent acts of urination wash it away before it has had time to collect sufficiently to show itself at the meatus. The finger in the rectum may find slight enlargement and heat of the prostate, and at times detect extra sensibility. The element of hyperæsthesia of the cut-off muscles often accompanies and outlasts this form of prostatic inflammation, keeping up the symptoms perhaps after the parts have returned to a nearly normal condition. In these cases it is sometimes impossible to decide that there is no stone. Search for stone should be instituted. None will be found, but the prostatic urethra will manifest extraordinary sensibility, and the patient will be much worse after the search than before.

Treatment.—In follicular prostatitis no remedy is so efficacious as repeated mild blistering of the perinæum. It is best applied by painting cantharideal collodion upon one side of the perinæum, confining the patient for forty-eight hours to bed, and painting the other side of the raphe, as soon as the soreness of the first application begins to subside. This course, aided by alkaline diluents, will usually master the affection in a few weeks. In applying the collodion, great care is necessary to avoid involving the scrotum and anus, as the former drops over the blistered portion, while the serum from the blister runs down over the latter. This is best accomplished by binding the scrotum up tightly, and covering the blistered surface from the start with cold cream and lint, anointing also the anus and scrotum. Where the disease is of particularly obstinate character, and of long duration, the blisters may require to be continued for many weeks. The rectum must be kept unloaded

in chronic prostatitis. With blisters should also be combined a supporting diet and tonics. Bumstead speaks highly of drachm-doses of dilute phosphoric acid containing a small amount of strychnine in solution. If the affection prove obstinate, injecting the prostatic sinus with a mild solution of nitrate of silver, five to ten grains, with an appropriate instrument (Figs. 22, 23) may perhaps be of service, or the application of tannin with the cupped sound (Fig. 130).

*TUBERCULAR PROSTATITIS.*¹—A form of chronic prostatitis occurs in tubercular, scrofulous, debilitated subjects, the chief feature of which is cheesy degeneration, situated primarily in the ducts and follicles of the organ. True miliary tubercle does not seem to occur in the prostate. It may be that opportunities of observing it have not presented themselves. The cheesy nodule has thus far alone been found. The disease is rare.

The symptoms are those of severe chronic prostatitis. If the cheesy matter be small in extent, and situated around the prostatic sinus only, it cannot be diagnosticated; but if the same deposit abound in the substance of the organ, so that the contour of the latter can be felt to be lumpy from the rectum, or, as is more commonly the case, if the course of one or both vasa deferentia can be traced out as an infiltrated hard tube, joined to a distinctly-enlarged, knobbed, indurated seminal vesicle, then we may safely assert that tubercular prostatitis exists. In such cases one or both epididymes are also usually the seat of so-called tubercular deposit, and there may be tuberculoid foci in the lungs or elsewhere. Tubercularization of the prostate not uncommonly follows similar morbid changes in the kidneys.

The course of tubercular prostatitis is very slow. From time to time the symptoms become spontaneously better or worse, but the general tendency is toward steady aggravation. The cheesy masses ulcerate out, form abscesses which break in all directions, leaving open cavities or fistulae. Such cavities evince no tendency to heal. Slight hæmorrhage from the urethra from time to time is a pretty constant symptom, but the hæmorrhage is followed by no relief (*see Case XXXVII.*).

Prognosis is bad. Death occurs from the gradual running down of the patient, or from tubercular disease elsewhere; the latter, perhaps, being of the true miliary type. Occasionally recoveries are made under the continued efficient action of hygienic conditions and proper food. The course of the malady is always exceedingly slow.

¹ The term tubercular disease is retained in this treatise, whether the lesion be miliary tubercle or not. Histological pathologists are still discussing the merits of cheesy degeneration *versus* tubercle. That cheesy degeneration may occur where there has been no tubercle is undoubted; but that, because no miliary granulations are found in a given case, there has been no tubercle is not always so clear. In the testicle, for example, it would seem that cheesy epididymitis is often truly a tubercular neoplasm (*Rindfleisch*), even where no miliary masses are found. Clinically there is a connection between certain cheesy degenerations and tubercle; and, for the present, it is perhaps better to abide by the classical titles (tubercular prostatitis, tubercular testis, etc.) than to originate others resting upon a foundation not yet clearly defined.

Treatment.—Curative treatment consists of general rather than local means. For local treatment, the same rules apply here as those laid down for chronic follicular prostatitis. The general measures are hygiene, fatty food, tonics, proper clothing, life out-of-doors, traveling, change of climate, anti-strumous medication. These means, intelligently combined, sometimes effect a cure.

CANCER OF THE PROSTATE.

Primary cancer of the prostate is exceedingly rare. More usually it is secondary to advanced malignant disease elsewhere—especially in the kidney or testicle. As to the relative frequency of this disease, Tanchoû,¹ out of 8,289 cases of fatal cancer, sets down only three for the prostate. Scirrhus, melanotic, and medullary disease, have all been noted; the latter most frequently. Cancer occurs chiefly in advanced life, sometimes as a complication of already existing hypertrophy, and doubtless some of these cases have not been recognized. Medullary cancer, as a primary affection, has been observed in the prostate of young children. Pitha saw one fatal case in a stout man of thirty.

Symptoms.—The symptoms of cancer of the prostate are at first simply those caused by the increased size of the organ, obstruction to urination, frequency of the act, and pain. Increase in size does not occur as rapidly, or with as acute symptoms, as does inflammatory enlargement; but more painfully and more rapidly than senile hypertrophy. When cancer becomes engrafted upon an hypertrophied prostate, its diagnosis during the early stages is impossible. The diagnosis with hydatids or cysts (dilated follicles—of quite common occurrence, but of no pathological importance) is made by the progress of the affection. The symptoms, then, of cancer of the prostate are not pathognomonic at first, but there are certain important aids to correct diagnosis. Thus, if the affection be scirrhus, the peculiar hardness will be significant; if medullary cancer, the enlargement felt through the rectum is usually less uniform than in hypertrophy, and certain spots may often be felt softer than others, sometimes amounting to a feeling of deep fluctuation. The pain on pressure by the rectum is less decided than in inflammation, but more positive than in hypertrophy. The glands in the pelvis and in the groin sooner or later enlarge, and assume cancerous characters. Hence the existence of obscure swellings along the course of the iliac vessels, felt through the abdomen, is an important aid to diagnosis. Cancerous cachexia is slow to appear. Its presence clears up any doubts which may have existed.

The importance of the existence of cancerous growths elsewhere is evident, and especially is this true of cancer of the testicle or kidney. The pain felt in cancer of the prostate is noticed largely in the rectum

¹ Quoted by Pitha, *op. cit.*

and about the sacrum, or radiating into the back, or down the thighs. Hæmorrhage from the urethra is a symptom liable to appear both early and late in this affection. The blood flows freely, is arterial in character, and often excessive in amount. It may appear spontaneously, or, more frequently, during urination. A certain amount of relief to the symptoms is apt to follow such hæmorrhage. The urine is troubled, purulent, often containing considerable *débris* of tissue. Sometimes a shred of tissue of considerable size is passed, or pulled away in the eye of a catheter. From such a shred a diagnosis of cancer can sometimes be made by the microscope. Diagnosis based on finding so-called cancer-cells in the urine is entirely unreliable. Retention is apt to occur from obliteration of the prostatic urethra by cancerous growth. In such cases catheterization is difficult and exceedingly painful, while the operation is pretty sure to provoke considerable bleeding. Hypertrophy of the bladder with dilatation, and perhaps stone, may come on, as in other obstructive prostatic disease. The duration of the disease is set down, from first appearance of symptoms to fatal termination, at from one and a half to five years for adults, three to nine months for children.¹

Treatment.—This is symptomatic, and consists in the careful employment of the catheter, if required, or even the establishment of a permanent opening above the pubes, with alkaline diluents, tonics, and anodynes in suppository, and by the stomach. Patients do not recover from this disease.

Simple cysts in the prostate are not uncommon; hydatids are rare.

PROSTATIC CONCRETIONS.

The adult prostate contains certain bodies known as prostatic concretions. They are visible with the microscope at any time after puberty, but do not attain considerable size until adult or advanced age. Thompson² has described them minutely. They are not to be confounded with stone of urinary formation. They are often found of very small size in the voided urine. In such cases they have no pathological significance. During their forming stage (when they measure from the one-thousandth to the one-hundredth of an inch) they appear under the microscope of an oval or slightly angular form, of pearly lustre, and in varying shades of light-yellow color. This color increases in the larger concretions to a deep orange. They have a cellular appearance, but no nucleus, and, as they become larger, exhibit concentric rings of different thickness. Often, in the larger concretions, many of the smaller bodies seem to have been lying together, and to have become surrounded by concentric layers of yellowish material to form one mass. Often, lines are seen radiating from the centre toward the circumference, and in the direction of these lines cleavage takes place, when the

¹ Holmes's "System of Surgery."

² "The Enlarged Prostate."

masses are subjected to pressure. When young they are very soft, but, as they increase in size, they become exceedingly hard and stony. The young cell-like bodies are not affected by acids, or alkalies, or ether; but the larger dark bodies are rendered somewhat more translucent by alkalies, while the mineral acids (especially sulphuric) usually occasion liberation of bubbles of gas (carbonic acid) and some shrinkage in size, sometimes disintegrating them into a mass of amorphous matter, which still retains its color and bulk. Hot nitric acid dissolves them, producing a faint yellow color.

The larger concretions consist of a protein substance, with phosphate and carbonate of lime. They are often found, visible to the naked eye, in the urethra, around the veru montanum, chiefly after the age of fifty. It may be necessary to make a section of the prostate to find them, placing the milky fluid scraped from the cut surface under the microscope. In one case, Thompson estimated the number to be seen by the naked eye as amounting to several thousand. These bodies occupy, anatomically, the ducts and follicles of the secreting structure of the prostate. The earthy salts are added to them as they grow. They sometimes attain the size of a pea or small nut. As they enlarge by new accretions upon their circumference, they press upon and cause the absorption of the duct or follicle in which they originated, and several of them may be found adhering to each other in a single sac or cyst.

From the above description it may be gathered that these concretions resemble salivary or biliary concretions rather than true stone. When they become large enough to constitute sources of irritation, dense, opaque, earthy matter deposits upon them, and they then become true prostatic calculi, and may go on indefinitely increasing in size. These prostatic calculi are met with of all sizes and shapes. Several of them may be found separated from each other, perhaps embedded in cysts, which are dilated follicles, or, if many of them are present, causing atrophy of prostatic substance, until the prostate resembles a sack full of small stones, which may be felt rubbing against each other on pressure *per rectum*, giving an emphysematous-like crackling (Adams). In bad cases, prostatic calculi tend to unite, projecting into the urethra and forming curiously-distorted, branched masses, dipping down into the substance of the prostate, and extending forward into the canal of the urethra, and backward perhaps into the bladder. Such masses have been found four or five inches long. One, removed by T. Herbert Barker, is referred to by Thompson as being composed of nine portions, weighing, collectively, three ounces, four drachms, and one grain.

Prostatic stones are exceedingly hard, and have a polished surface. They may be brilliantly white, resembling porcelain, or of a fawn or pale-brown color. They are composed mainly of phosphate of lime, with a small admixture (derived from the urine) of the triple (ammonio-magnesian) phosphate. They very rarely give trouble during life, but

when of large size they may give rise to all the symptoms of prostatic obstruction, in an aggravated form, leading, in the same manner, to chronic cystitis, hypertrophy, and sacculation of the bladder. When these calculi project into the urethra, a metallic instrument, introduced into the bladder, may be felt to grate upon them in passing.

Treatment.—The natural mode of elimination of these masses is by the formation of abscess. They may ulcerate out through the rectum, or perinæum, or into the urethra, or even into the bladder. Stone in the bladder not uncommonly coexists with them. When they become large enough to give rise to distressing symptoms, an attempt may be made to remove them with the long urethral forceps (Brodie), but the best method is to cut down through the perinæum in the median line, and extract every thing of a calculous nature which can be found. If any portion be left it becomes at once a nucleus for further incrustation. During such an operation the bladder should always be searched for stone. In exceptional cases where prostatic stones can be felt in the substance of the prostate through the rectum, an incision may be made through the walls of the latter, and their removal thus effected. Certain concretions found in the dilated veins around an old prostate and known as phlebolites, must not be confounded with prostatic calculi. They are not infrequently detected after death, and are small white or colored smooth bodies, perhaps as large as a pea, such as are formed in dilated veins elsewhere. The calcareous remains of old abscesses which have been absorbed, and which in rare instances are found in the prostate, must not be confounded with calculi. Finally, a true urinary calculus may become lodged in the prostatic sinus when small, and continue to grow there by deposits of urinary salts, causing absorption of prostatic tissue, and finally becoming embedded in that organ (Meckel, Adams). Such stones may grow backward into the bladder (prostatico-vesical calculi, Vidal), or true stone in the bladder, becoming attached near the neck of the latter, may grow forward into the prostatic urethra (vesico-prostatic calculus).

NEURALGIA OF THE PROSTATIC URETHRA.

This is a disease rarely recognized as such. It is confounded with inflammatory congestion and other morbid conditions of the bladder. It has been described by authors, with especial accuracy by Civiale,¹ under the general head of nervous affections of the neck of the bladder. Civiale, however, states that the cause is often unknown, and in his cases frequently omits to state the age of the patient and the condition of his sexual relations and requirements. It is to bring this fact into prominent notice that the affection is mentioned under the head of prostatic diseases. It would involve needless repetition to describe it here. Its mainly

¹ "Maladies du Col de la Vessie et de la Prostate."

prominent symptom is frequent (perhaps painful) desire to urinate, with no lesion; in other words, simple irritability of the bladder. Its description will be found under the title of "Neuralgia of the Vesical Neck." As will be there laid down, the sexual function is most often at fault in its causation, and not only the neck of the bladder, but the prostatic and membranous urethra, and even the whole canal at times, is involved, sensitive, irritable, congested, prone to contract, while hypochondriacal despondency and perverted intellectual function hold an important place in the picture of the disease. The connection of this affection with sexual causes has never been insisted upon, and yet this cause is, perhaps of all, the most prominent. It will be fully considered under the head of etiology of irritability of the bladder.

SYPHILIS OF THE PROSTATE.—Although it is possible for syphilis to cause its peculiar deposit in the prostate, yet it rarely, if ever, does so. There is certainly no syphilitic condition of the prostate which can be diagnosed except by analogy.

CHAPTER XII.

DISEASES OF THE BLADDER.

Anatomy.—Anomalies and Deformities, Extrophy.—Hernia of Bladder.—Hypertrophy.—Atrophy.—Wounds.—Rupture of the Bladder.—Foreign Bodies.—Retention of Urine.—Incontinence: in Children, in Adults.—Tenesmus.—Chorea.—Hæmaturia.—Neuralgia of the Vesical Neck.—Cause.—Symptoms.—Diagnosis.—Treatment.

ANATOMY.—The bladder is a muscular sac lying, in the male, between the rectum and pubes when empty, and distending, when full, into an oval bag occupying more or less of the hypogastrium. Its position is fixed below by the urethra, but mainly by the pelvic fascia, which, after having lined the cavity of the true pelvis, is reflected upward and lost on the bladder and rectum (as pubo-prostatic and inferior vesical ligaments) and the recto-vesical fascia which binds the prostate and neck of the bladder to the rectum. Above and on the sides the peritonæum covers the bladder, but is attached loosely, especially at the base, so as to offer no obstacle to any change in shape or position of the viscus. A knowledge of the reflections of the peritonæum upon the bladder is essential to a correct understanding of the methods of relieving retention by puncture. When the bladder is empty, it lies contracted behind the pubes; the peritonæum leaves the abdominal walls at the symphysis and passes at once to the bladder, over which it is spread, and then reflected upon the rectum from the base of the bladder, so that, when the latter is absolutely contracted upon itself, that portion of its base lying between

the seminal vesicles is also covered by peritonæum, and there is, properly speaking, no direct relation between the bladder and rectum. Very different, however, is the condition when the viscus is distended. Then, as its cavity fills up, the peritonæum is carried with it. The recto-vesical *cul-de-sac* of the peritonæum is deepened and all that portion of the base of the bladder situated between the seminal vesicles lies directly in contact with the rectum. When the bladder is greatly distended, its base becomes thus uncovered for a distance, roughly estimated, of two inches behind the posterior margin of the prostate. In the same way the distended bladder carries up the peritonæum in front, so that a distance of one to two inches, or even more, above the symphysis becomes bare of peritonæum in extreme retention. Hence the election of these two uncovered spots for puncture.

The medium capacity of the adult bladder is eight ounces, subject to extensive variations from habit or disease. The bladder may become so contracted as to contain only a few drachms, or again capable of holding, without rupture, the better part of a gallon.

The muscular coat of the bladder is composed of a set of external fibres which run mainly longitudinally, some of them being continued up the urachus, and an internal set whose general direction is circular. These latter, greatly reënforced in number, encircle the neck of the bladder and internal orifice of the urethra, and pass under the general name of sphincter of the bladder. Certain fibres, running across the base of the trigonum Lieutaudii, serve to pull upon and open the mouths of the ureters.

The mucous membrane of the bladder is of a pale salmon color, remarkably insensitive in health, covered by a stratified pavement epithelium, and lying in folds when the bladder is contracted. The glands are not numerous, except on the trigone and near the neck. Their office is to secrete lubricating mucus. They are exceedingly small, and composed of simple clusters of follicles. The coats of the bladder are united by connective tissue which is everywhere loose, except at the trigone.

The vesical arteries come from the hypogastric. The veins terminate in a thick plexus about the prostate and sides of the base of the bladder, emptying finally into the hypogastric veins. The lymphatics lead to the hypogastric ganglia. The nerves, partly sympathetic and partly spinal, come from the hypogastric plexus.

The neck of the bladder is that portion surrounded by the sphincter and base of the prostate, limited anteriorly by the ridge, more or less prominent in the adult, which maps out the posterior limit of the prostatic sinus.

The trigone (of Lieutaud) is a triangular space lying between the neck of the bladder and the orifices of the ureters. The muscular coat is here transverse, thick, adherent to the mucous membrane. Its poste-