A practical treatise on impotence, sterility, and allied disorders of the male sexual organs / by Samuel W. Gross.

A PRACTICAL TREATISE

ON

IMPOTENCE, STERILITY,

AND

ALLIED DISORDERS

OF THE

MALE SEXUAL ORGANS.

BY

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WITH SIXTEEN ILLUSTRATIONS.

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PREFACE.

Of the affections discussed in this brochure at least two—Impotence and Spermatorrhœa—are commonly described as functional diseases of the testicles; while, according to my observations, they usually depend upon reflex disturbances of the genito-spinal centre, and are almost invariably induced or maintained by appreciable lesions of the prostatic portion of the urethra, which, as they may not be perceived by the patient, are frequently overlooked by the physician. A more extended knowledge of these pathological facts, it is hoped, will afford a more rational and simple basis for treatment.

My aim has been to supply in a compact form practical and strictly scientific information, especially adapted to the wants of the general practitioner, in regard to a class of common and grave disorders, upon the correction of which so much of human happiness depends. In the chapter on Sterility, the abnormal conditions of the semen and the causes which deprive it of its fecundating properties are fully considered—a portion of the work intended to supplement the subject of sterility in the female. From answers to letters addressed to many of the most prominent writers in this country on gynecology, I find that, with few exceptions, the woman alone commands attention in unfruitful marriages. The importance of examining the husband before subjecting the wife to operation will be best appreciated when I state that he is, as a rule, at fault in at least one instance in every six.

S. W. GROSS.

Philadelphia,
1112 Walnut Street, July, 1881.

LIST OF ILLUSTRATIONS.

IMPOTENCE, STERILITY, AND ALLIED DISORDERS OF THE MALE SEXUAL ORGANS.

CHAPTER I.

IMPOTENCE.

Sect. I. General Observations.

Impotence, or inability to copulate or perform the sexual act, is one of the most common of the derangements of the generative functions, and is due either to deficiency or absence of erection, or to congenital or acquired abnormal conditions of the genital organs, which render intromission of the penis impracticable. Hence, men who are impotent are usually sterile, the power of procreating children being dependent upon that of having connection; but as sterility, in the strict acceptation of the term, implies non-ejaculation, or emission of infertile semen, it will be discussed in a separate chapter.

For a clear comprehension of the pathology of the most frequent forms of impotence, a knowledge of the mechanism of normal erection and of the nervous centres which preside over it is essential.

Erection consists in augmentation of the volume, in

stiffness, and in rigidity of the penis, and is due to an increased flow of blood into that organ, as has been experimentally demonstrated by Eckhard.[1] Lovén,[2] who extended the investigations of Eckhard, was, however, the first to show, in opposition to former theories, that the essential factor in the phenomenon is active dilatation of the arterioles of the cavernous and spongy bodies, and not merely a stasis of blood produced by constriction of the veins, although it is certain that erection is strengthened by obstruction to the outflow of the blood through the dorsal vein by the contraction of the anterior fibres of the accelerator urinæ muscle or the compressor venæ dorsalis of Houston.

The nerves concerned in the production of erection in the dog, and there is no reason to doubt their existence in man, arise, according to Eckhard, by two roots at the sacral plexus from the first to the third sacral nerves. Electrical stimulation of these, the erigent nerves, is followed by erection and ejaculation, while their division renders erection and emission impossible. Eckhard, moreover, produced erection by excitation of the lumbar, and lower and upper segments of the cervical spinal cord, the pons, and the crura cerebri, from which he inferred that the fibres of the erigent nerves which convey the impressions for erection arose in the cerebrum, and passed down through the crura and the pons to the cord. Goltz,[3] however, discovered that, after the separation of the lumbar segment of the cord from its upper portion, irritation of the glans

[1] Beiträge zur Anat. und Phys., Bd. iii. p. 125, and Bd. vii. p. 67.

[2] Arbeiten aus der Phys. Anstatt zu Leipzig, 1866, p. i.

[3] Pflüger's Archiv, Bd. viii. p. 460.

penis provoked a full erection, from which he concluded that the lumbar cord constituted an independent reflex centre for the genital functions; and, what is important in the study of psychical impotence, he demonstrated that this centre could be acted upon inhibitorily from the brain.

From the preceding considerations it is obvious that erections in the lower animals can be produced by stimulation of the brain, the spinal cord, and the peripheral nerves; and ample observations, both in health and disease, demonstrate that they originate in the same localities in man. The influence of certain emotional conditions of the mind over erection is illustrated by its being induced by sexual desires, or even by the sight or thought of certain women; while it may be arrested or prevented by mental preoccupation, or by depressing emotions, as fear of inability to consummate the venereal act, the loss of the object of one's affections, modesty, disgust, or frigidity. Irritation of the cord, and particularly of its cervical portion,[1] from disease, concussion, effusion of blood, or fracture or dislocation of the vertebræ, frequently occasions erections; and these may constitute the first sign of incipient ataxia,[2] or general paralysis of the insane, and other spinal affections. As illustrations of erections from peripheral irritation, those arising from the morning fulness of the bladder, from affections of the rectum, and from inflammation of the prostatic urethra and of the seminal vesicles may be mentioned.

[1] Ollivier, Traité des Maladies de la Moëlle Epinière, 3d ed., t. iii. p. 316.

[2] Trousseau, Clin. Méd. de l'Hôtel-Dieu de Paris, t. ii. p. 511; and Erb, Ziemssen's Cyclopædia, Amer. ed., vol. xiii. p. 545.

The capacity for coition is most marked between the ages of twenty and forty-five years; after which it gradually declines, and usually ceases after the sixty-fifth year. Sexual vigor is, moreover, greatly diminished by bodily exertion, such as gymnastic exercises, and by close mental occupation. Desire is also obtunded by the same causes.

Impotence may arise from diminished or abolished reflex excitability of the genito-spinal centre, or from disturbances of the brain which restrain the action of that centre; or it may be symptomatic of the prolonged use of certain remedies and beverages, or of various acute and chronic diseases; or it may depend upon congenital or acquired defects of the genital organs. In accordance with its etiology it may, therefore, be described as ATONIC, PSYCHICAL, SYMPTOMATIC, and ORGANIC. Of one hundred and fifty-three cases of which I have notes, one hundred and forty-nine were atonic, one was psychical, one was symptomatic, and two were organic.

SECT. II. ATONIC IMPOTENCE.

When the lumbar reflex centre for erection fails wholly or partially to respond to the ordinary stimuli the resulting impotence may be termed atonic, in the sense that the centre is deficient in activity, mobility, excitability, or tonicity, through which the muscular walls of the arterioles

and the muscular fibres of the trabeculæ of the erectile tissues are prevented from relaxing and admitting the requisite flow of blood into the penis, and through which the contractility of the ischio-cavernous and bulbo-cavernous muscles is impaired.

Atonic impotence depends either upon, or is maintained by, inflammation and hyperæsthesia of the prostatic portion of the urethra, or upon diminished or abolished reflex excitability of the genito-spinal centre without the intervention of those lesions. Of the one hundred and forty-nine cases that have come under my observation, one hundred and thirty-seven were of the former variety, and only twelve of the latter variety.

A.—ATONIC IMPOTENCE FROM HYPERÆSTHESIA AND INFLAMMATION OF THE PROSTATIC URETHRA.

ETIOLOGY.—From independent researches, which were first published in 1877,[1] I long ago reached the conclusion that impotence was generally induced by subacute or chronic inflammation and morbid sensibility of the prostatic urethra, which were frequently associated with stricture, and which were usually due to masturbation, gonorrhœa, sexual excesses, and constant excitement of the genital organs without gratification of the passions. In subsequent papers[2] I called attention to the fact, previously noticed by other writers, that inflammation of the

[1] Medical and Surgical Reporter, May 5th, 1877, p. 391.

[2] Trans. Amer. Med. Assoc., vol. 28, p. 523; and Med. News and Library, Sept. 1880, p. 513.

prostatic urethra bears the same relation to the spinal reflexes of the male that inflammation of the uterus bears to allied disorders in the female, and that it is a constant source of irritation of the genital nerves which terminate in that locality. An enfeebled state of the lumbar division of the cord and exhaustion of the cells that minister to its reflex functions are thus finally brought about.

In thirty-seven of the cases the subjects had been confirmed masturbators, and had also suffered from gonorrhœa, so that it is impossible to say upon which of these factors the trouble depended. Of one hundred patients, however, in whom the history was clear, sixty-nine were masturbators, thirty had had gonorrhœa, and one had indulged in excessive coition. Just how often prolonged and repeatedly ungratified sexual excitement produced by toying with females, as in Case XX., is to be considered a cause of the morbid changes which induce or maintain the affection I am unable to say, since young men addicted to this habit indulge their propensities in various ways.

With regard to masturbators who either never had sexual intercourse, or had never contracted gonorrhœa, I have made some notes that are interesting and practically important. Thus, I find that one in every three has an elongated prepuce; one in every five has an inflamed meatus; one in every two-and-a-half has an exquisitely sensitive urethra; that the same proportion suffers from prostatic or abnormal seminal discharges; and that one in every ten has a small, and usually a pointed and rigid, penis. In the papers already referred to I endeavored to show that confirmed masturbation is just as sure to result in urethritis and the formation of a stricture as is gleet;

and that the failure to discover this lesion would not have occurred to the majority of writers on the subject if they had resorted to the bulbous bougie for exploring the urethra. Of the sixty-nine masturbators who suffered from atonic impotence, and of the seventy who had seminal incontinence, as will be seen in the chapter on spermatorrhœa, or of one hundred and thirty-nine in all, only eighteen were free from stricture, so that a coarctation should always be looked for in this class of subjects. In about five-sixths of the cases there is only one stricture, while in the remainder two or more are present. In about one-sixth of the entire number the contraction is situated near the meatus.

As the knowledge of the connection between stricture of the urethra from masturbation and impotence, prostatorrhœa, pollutions, and spermatorrhœa is of the utmost importance in regard to the treatment of these affections, I still further extended my investigations in this direction by an examination of fifty-six onanists in the Insane Department of the Philadelphia Hospital and the Pennsylvania Hospital for the Insane. Of twenty-seven inmates whose histories could be traced back, eighteen declared that they never had gonorrhœa. These were either epileptics, who, when their mental faculties are not enfeebled, are as capable of giving sensible accounts of themselves as others not so affected, or the subjects of chronic insanity or dementia, of whom it is characteristic that, if they remember anything at all, they can recall even the most trifling incidents that may have happened prior to the attack of insanity. In four other instances it was improbable that the patients ever had gonorrhœa, since they had been imbecile from childhood. In the

remaining five cases, the question of gonorrhœa could not be entertained, because the subjects were admitted at too early an age, and had afterwards never left the hospital. Their histories are briefly as follows:—

Case I. An epileptic, aged twenty, admitted at the age of ten, had a stricture at six inches, which was defined by a No. 18 bulbous explorer.

Case II. An epileptic, aged twenty-three, had been in the house twelve years, having been transferred from the Children's Asylum at the age of eleven. A stricture, calibre[1] 19, was detected at six inches and a half from the meatus, which was contracted; there was a gleety discharge; and the penis was large.

Case III. An epileptic, aged thirteen, an inmate for three months, suffered from phimosis, with a stricture, calibre 17, at six inches and a half, and very marked prostatic hyperæsthesia.

Case IV. An epileptic, aged nineteen, admitted at the age of eleven, had a stricture, calibre 19, at six inches, with a very sensitive urethra, and a gleety discharge.

Case V. An idiot, aged fifteen, an inmate for three years, had a gleety discharge, and a stricture, calibre 18, at five inches and three-quarters.

These five cases, occurring, as they did, in young subjects, in whom the idea of gonorrhœa must be discarded,

[1] This and the succeeding measurements are in accordance with the French catheter scale. The calibre, therefore, represents the corresponding number of millimetres in circumference, a millimetre being equal to about the one-twenty-fifth of an inch.

sustain the view heretofore expressed that organic stricture is a common lesion of masturbation. The coarctations imparted the sensation of a firm, resisting obstacle upon the withdrawal of the bulbous explorer, and were distinctly recognized by my residents, Dr. Murray and Dr. Van Valzah, by Dr. Dease, Dr. Heath, and Dr. Musser.

Exclusive of these cases, my notes show that thirteen out of every one hundred cases of stricture are due to onanism; and Otis[1] states that nine per cent. of all cases are traceable to that practice. Ricord, Phillips, Leroy, Henry Smith, Gouley, and Gross also mention masturbation as a cause of stricture; and my views are, moreover, supported by the evidence of other authors, who are more explicit in their statements than those just referred to. Thus, Black[2] reports a typical case, associated with hyperæsthesia of the prostatic urethra, for which he was consulted on account of fear of sexual incapacity. In speaking of the etiology of stricture, Wade says: "I have good reason to believe that the pernicious habit of self-abuse is a much more frequent cause of stricture than is generally supposed. In several instances of the kind, in which there has been no sexual intercourse, the strictures, which were at the bulb, proved more than usually refractory, from the extreme morbid sensitiveness of the entire urethral canal." . . . "The complication of spermatorrhœa with stricture and a highly irritable state of the urethra often proves very troublesome, and re-

[1] On Stricture of the Male Urethra. Pamphlet, New York, 1875.

[2] On the Functional Diseases of the Renal, Urinary, and Reproductive Organs, Phila. 1872, p. 196.

quires great care and gentleness in its treatment. Such strictures are, in fact, not infrequently caused by masturbation."[1] Lizars asserts that stricture "is also often produced by self-abuse, since we find, in those affected with spermatorrhœa, that there exists more or less stricture of the urethra, for which it is necessary to dilate the canal before having recourse to the porte-caustique."[2] Lallemand[3] refers to two cases in masturbators who had never had sexual intercourse, in one of which the stricture was very tight and rebellious to treatment. Three-quarters of a century ago, Sir Everard Home, in his work on the subject,[4] devoted a chapter to "Strictures brought on by Onanism," but he classified them as spasmodic. In thus recognizing spasm of the urethra as an effect of masturbation, he described a condition which is the forerunner of permanent stricture, since, as is well known, spasmodic contraction is a very common cause of organic coarctation, and is, indeed, not infrequently found in connection with it.

In addition to the foregoing lesions masturbation may be followed by other local affections, which are due mainly to the extension of the morbid action from the inflamed prostatic urethra. Among the more common of these are irritability of the neck of the bladder, prostatorrhœa, nocturnal seminal discharges, and spermatorrhœa. It may also occasion spermatocystitis, funiculitis, epididy-

[1] Stricture of the Urethra: Its Complications and Effects. 4th ed., pp. 21 and 318.

[2] Practical Observations on the Treatment of Stricture of the Urethra. 2d ed., p. 1.

[3] Des Pertes Séminales Involontaires, t. i. p. 479.

[4] Practical Observations on the Treatment, etc., vol. ii. p. 243.

mitis,[1] aspermatism[2] through obstruction of the epididymes or vasa deferentia, wasting of the testes,[3] and, as will be pointed out in the next chapter, it is a fruitful source of azoospermism.

While in persons with an inherited predisposition to nervous diseases, as insanity and epilepsy, there is no reason to doubt that onanism may hasten their appearance, I believe that in the majority of cases it should be regarded rather as the effect than as the cause of these affections. From the constant occupation of the mind with the local troubles which it induces, it certainly does, however, give rise to a bad form of hypochondrism, which is akin to insanity. Masturbation and sexual excesses are among the most common of the causes of general paralysis of the insane, and the disorder is supposed to extend upwards from the cord to the brain. An examination of four cases of this affection has convinced me that there is a source of reflex irritability of the cord in the urethra. In one, in the second stage, there was a stricture, calibre 21, at seven inches from the meatus. In another instance, in the first stage, there was a large granular patch at six inches and a half, and a gleety discharge. A similar condition was detected at six inches and a quarter, in a man in the second stage; while, in the fourth case, which was far advanced in the third stage, there was also a granular patch at six inches and a half, and the bougie brought

[1] See Case XV. p. 36.

[2] Liégeois, Medical Times and Gazette, vol. ii. 1869, p. 381; and Terrillon, Annales de Dermatologie et de Syphiligraphie, ser. 2, t. i. p. 439.

[3] Curling, Diseases of the Testes, 4th ed., p. 78; and Brodie, Lond. Med. and Phys. Journ., vol. lvi. p. 297.

away an abundant brownish fluid from the prostatic urethra. Whether these morbid states served as factors in the production of the disease, or simply maintained the nervous disturbance, I am unable to decide; but, if the former view be the correct one, functional conditions of the cord should be prevented from passing into organic changes by curing the peripheral sources of irritation in the first stage of the affection, or when the peculiar gait and slight trouble in speech are associated with extravagant ideas. I have never known insanity, dementia, or phthisis to follow onanism, as they are said to do by Ritchie, Esquirol, Pinel, Deslandes, Maudsley, Smith, Acton, and other writers, nor have I ever met with the distressing cases described by Lallemand; and I fully agree with Sir James Paget[1] in the statements that "masturbation does neither more nor less harm than sexual intercourse practised with the same frequency in the same conditions of general health, and age, and circumstances," and that the ills which result from it when indulged in by young persons are due more to the "quantity, not the method." Unfortunately, however, it is begun earlier in life[2] than coition; and, as it does not require the coöperation of the opposite sex, it can be practised to a greater extent, and at all times, and even when erection is incomplete.

Of the remaining remote causes of atonic impotence, namely, gonorrhœa and sexual excesses, which induce

[1] Clinical Lectures and Essays, p. 284.

[2] Fleischmann, in the Wiener Med. Presse, 1878, p. 9, narrates a case in which an infant began to masturbate at nine months of age, by crossing the legs and setting up rocking motions of the pelvis and body; and Barthez-Rilliet, Marjolin, Von Bambecke, Jacobi, and Morton have recorded examples in young children who were not sucklings.

and keep up hyperæsthesia and inflammation of the prostatic urethra, it need only be said that they are followed by precisely the same lesions as are met with in masturbation. In his classical writings on Diseases of the Spinal Cord, Erb[1] declares that sexual excesses and irregularities occupy a prominent position in the predisposition to, and production of, many spinal affections, among which may be mentioned spinal irritation, neurasthenia, chronic meningitis and myelitis, softening, and inflammation of the anterior horns, or poliomyelitis; and this view is held by many other distinguished authors, as Rosenthal, Hammond, and Romberg.

Classification.—Atonic impotence varies in degree, and may be divided into the following classes:

First. The erection is imperfect and of short duration, and ejaculation is frequently too precipitate, but sexual desire remains, and intercourse is possible, although incomplete.

Second. The erection is either so feeble that intromission is impossible, or it is entirely absent. As in the preceding form, desire is present.

Third. In the last phase of the affection, not only is there loss of power of erection, but desire is completely abolished.

Of the relative frequency of these three varieties of impotence, an examination of the one hundred and thirty-seven cases previously alluded to shows that one hundred and twenty-seven were examples of feeble erection and premature ejaculation; seven were instances of loss of power of erection, with retention of desire; and three

[1] Loc. cit., p. 147.

were examples of failure of both erection and desire; and I have no hesitation in declaring that the first form is more common than impotence from all other causes combined.

Clinical History.—As my readers will gain a better insight into the peculiarities of the three varieties by a narration of cases than by a general and abstract description, I append some typical examples.

Case VI. A grocer, twenty-two years of age, consulted me on the 12th of October, 1876, on account of impaired erections and premature ejaculation. He began to masturbate at the age of fourteen, and continued the practice for three years. Its abandonment was followed by nocturnal seminal emissions of an intermittent character, that is to say, they recurred almost every night for a fortnight, when there was an intermission of a week's duration. He had been under treatment for two years before coming to me, the effect of which was to improve his general health and materially lessen the frequency of the nocturnal discharges. Up to one year ago he had never had sexual intercourse. At that time he found that erection was incomplete, the gland of the penis, in particular, being soft and inelastic, and that ejaculation took place in a few seconds. The same troubles had existed ever since. During the past two months nocturnal emissions had occurred from one to five times a week, and he noticed that flakes of mucus, which he supposed to be semen, were discharged in advance of the stream of urine. He was easily fatigued, his hand was unsteady in writing, he was habitually constipated, and he suffered from dull, heavy pains in the groins and back.

Examination with the bulbous explorer disclosed slight tenderness of the urethra half an inch from the meatus, and decided tenderness at four inches and a half, which increased as the prostatic urethra was reached. On withdrawing the instrument, a stricture, calibre 10, was detected at five inches and a quarter

from the meatus. The bulb brought out a whitish fluid, which showed, under the microscope, a large amount of pus and epithelium. The urine was acid and loaded with lithates, but the genital organs were normal.

I prescribed a laxative pill, to be taken as often as it might be required, warm hip-baths, and warm enemata night and morning, and thirty grains of bromide of potassium every eight hours. The diet was restricted to perfectly bland and digestible articles; sexual intercourse and stimulating drinks were interdicted; and an injection of one drachm of Goulard's extract to ten ounces of water was directed to be thrown into the urethra three times a day.

On the 14th I passed a No. 10 steel bougie, and continued its introduction every second day until the 26th, when it was employed once every twenty-four hours by the patient himself. At first it was immediately withdrawn, but as the sensibility of the urethra became obtunded, it was permitted to remain longer, but at no time more than five minutes. The size was gradually increased, until toward the close of the treatment it reached No. 27. During the first week there were three nocturnal emissions; but from that time until I discharged the patient, on the 3d of December, when his sexual powers were entirely regained, there was only one. I saw this man again early in January, 1877, on account of a chancre, when he informed me that he had experienced no trouble whatever in sexual congress.

Case VII. A mechanic, twenty-six years of age, states that he has had intercourse with one woman three or four times every night for the past eighteen months, and that he occasionally fulfilled engagements of a similar nature with other females. He had never masturbated much, nor had he ever contracted gonorrhœa. Lately he has observed that his powers were growing feeble; and at present the erections are flabby, and the ejaculations, when penetration is possible, are precipitate. He looks pale, is easily fatigued, and suffers from pain in the back, and from frequent and painful micturition. A No. 25 explorer detects a very sensitive

urethra, and a stricture, calibre 24, seated at six inches from the meatus. The neck of the bladder is so sensitive that it contracts when the instrument comes in contact with it, so that its onward progress is momentarily arrested.

Case VIII. A weaver, thirty-seven years of age, has had gonorrhœa three times, the last attack having occurred fourteen years ago. For the past three years he has noticed that the erections were becoming more and more feeble, until they frequently passed off before intromission, and coition was always attended with hasty emission. In addition to his sexual troubles, he complains of numbness along the outer side of the left thigh, almost constant dorsal pain, and a dull, heavy pain in the back of the head, the left side of the neck, and the left shoulder, all of which localities now and then suddenly become red and hot. The suffering is aggravated by exercise and continuous work; his sleep is unrefreshing, and he has dyspeptic symptoms. He has two strictures, the first of which, calibre 17, is located at three inches and a half, and the second, calibre 15, is six inches from the meatus; and the prostatic urethra is morbidly sensitive.

In the preceding illustrations of the first variety of atonic impotence, the exciting causes were chronic hyperæsthesia and inflammation of the prostatic urethra, which were produced, respectively, by masturbation, by sexual excesses, and by gonorrhœa, and were maintained by one or more strictures. One case was complicated by nocturnal emissions, and another by inflammation of the neck of the bladder; and in all there were symptoms of neurasthenia.

In this form of the affection may be included the condition known as irritable weakness, or spasmodic spermatorrhœa, or spermaspasmos, in which, the erection being more or less complete, ejaculation occurs before penetra-

tion, simultaneously with erection, or even before erection. These points are illustrated by the following cases:—

Case IX. A merchant, thirty-seven years of age, had masturbated up to his eighteenth year, and has been in the habit of toying with women ever since. At his first attempt at connection, which took place when he was twenty-nine years old, he found that the erection was imperfect, and that ejaculation occurred before intromission; and he stated that these troubles still continued. There was a stricture, calibre 18, at six inches from the meatus, and the prostatic urethra was exquisitely sensitive.

Case X. A clerk, thirty years of age, brought me a specimen of urine for examination, which I found to contain an abundance of motionless spermatozoa, oxalate of lime, and a few pus corpuscles and epithelial cells. He never had gonorrhœa, but he had masturbated from his sixteenth to his twenty-first year, on an average, twice a day. There was a constant sticky feeling at the meatus, and he informed me that for the past three years, whenever he passed an evening with the lady upon whom he had fixed his affections, he had an erection, with a simultaneous emission. The hands and feet were habitually cold, and he had no knowledge of nocturnal emissions for five years. The explorer detected a stricture, calibre 17, at six inches and a half from the meatus, and there was marked hyperæsthesia of the prostatic urethra.

Case XI. A physician, thirty-four years of age, had masturbated from his fifteenth to his seventeenth year, and had contracted gonorrhœa eleven years ago. For ten years he was unable to have connection, in consequence of ejaculation at the moment of penetration; and for the past three years emission occurred before erection, and he had nocturnal pollutions from two to three times a week. The meatus would admit only a No. 17 explorer; but after its enlargement, a stricture, calibre 25, was discovered at six inches and one eighth, and the prostatic urethra was very sensitive.

The subjoined illustrations are good examples of the second variety of impotence, or of that in which desire is retained, but in which the power of erection is lost, and coition is impossible.

Case XII. A tavern-keeper, thirty-two years of age, of robust frame, stated that he was engaged to be married in six weeks; that he could not command an erection, although he had sexual desires; that the presence of the object of his affections, and the most lascivious books and pictures, which formerly brought on an erection, had lost that effect; and that the thought of his disability on his wedding-night was constantly preying upon his mind. This condition of affairs had existed for five months, during which time he had nocturnal seminal emissions about twice a week. He was, moreover, much alarmed at the presence of some shreds of purulent mucus in his urine, which he thought was seminal fluid. He had had three attacks of gonorrhœa, the last of which occurred seven years ago, since which period he has always had a slight gleety discharge, and for the past few months a dribbling of a few drops of urine in his clothes after the act of micturition was apparently completed. He suffered from habitual constipation, but in other respects he was the picture of health.

The bulbous explorer defined two strictures, calibre 23, located, respectively, at six inches, and at six inches and a half, from the external meatus, as well as marked hyperæsthesia of the prostatic urethra.

Case XIII. A mechanic, twenty-three years of age, at about his sixteenth year, after having been in the habit of masturbating freely for six or seven years, observed a urethral discharge. He had never had sexual intercourse until he was twenty-one; and, after a few months of moderate indulgence, the discharge had increased, and the erections had become more and more weak, until he was finally unable to consummate the act, although the desire remained. He is pale; suffers much from pain in the back, the

shoulders, the anus, and the left temporo-maxillary articulation; and is easily fatigued.

Examination with a No. 25 explorer disclosed intense hyperæsthesia of the entire urethra, and particularly of its prostatic portion, but there was no indication of a stricture. As soon as the instrument entered the passage it occasioned tremor and retraction of the testes, and when it reached the prostatic portion he shrank from the excessive suffering which it awakened, and the muscles of the lids, nose, and mouth twitched convulsively. On its withdrawal, the bulb brought away a considerable prostatic discharge. He afterwards rode to his house in the street cars, and about two hours later, after urinating, he was seized with a curious crawling sensation in his arms and legs, lost consciousness, and, when found by his friends, was lying on the floor, and his face was livid. Three days subsequently, he was placed upon thirty grains of bromide of potassium, with five drops each of juice of belladonna and tincture of gelsemium, every eight hours, and directed to take ten grains of quinia one hour before his next visit, which occurred one week ago. At that time a conical steel bougie was passed, and one-third of a grain of morphia thrown under his skin. A slight epileptoid paroxysm, as indicated by clonic spasms of the muscles of the arms and eyelids, and a feeling as if he would become unconscious, ensued; and these symptoms were followed by prostration and numbness of both hands.

In the third phase, or as it is sometimes called the paralytic form, of the affection, erection and desire are completely abolished, as is illustrated by the following instances:—

Case XIV. A medical student, twenty-four years of age, had masturbated excessively for six years, and for the past two years, during which period he had discontinued the practice, had nocturnal seminal emissions, on an average, twice a week. When I saw him he stated that he had lost all desire, and had been unable to

command an erection for three months. He was very watchful of a gleety discharge, and brought with him, for my inspection, a specimen of urine which contained little threads of mucus, which he imagined to be semen. His general health was broken; his expression was woe-begone; he was gloomy, shy, and reserved, and unable to fix his attention upon his studies, and easily fatigued. He was constantly thinking of his previous bad habit and the nocturnal emissions, and was convinced that his condition was beyond relief. In a word, he was a victim of sexual hypochondrism.

The external genital organs, and the prostate and seminal vesicles, as far as rectal touch enabled me to form an opinion, were perfectly normal; but the urinary meatus was constantly moist, and its lips were red and pouting. At five inches and three-quarters from the meatus I detected a stricture, calibre 17, and also found that the urethra behind it was extremely sensitive. Placing a little of the fluid, which was withdrawn by the explorer, under the microscope, I demonstrated to my patient that it was free from spermatozoa, and I still further endeavored to gain his confidence by assuring him that his disability was temporary, since, from its dependence upon appreciable lesions, it could be cured. Under appropriate treatment, in three weeks, the pollutions had decreased in frequency, the prostatic discharge had lessened in quantity, the hyperæsthesia had notably diminished, and he had begun to have feeble erections. At the expiration of a month I divided the stricture, and he went with me to the seashore. In three weeks, or eleven weeks from the commencement of the treatment, he had good erections, and his mental anxiety was calmed; but, unfortunately, he desired to test his powers, and had an almost instantaneous ejaculation with cessation of erection. This act, which he undertook entirely on his own responsibility, undid all the good I had effected; and it was only after the expiration of eight months that he finally recovered under the employment of galvanism.

Case XV. A druggist, twenty-four years of age, came to me on account of vesical irritability, under which he had labored for six years. He has never had sexual intercourse, but had mastur-

bated from boyhood until his twentieth year, and desire and power of erection had been abolished for nearly four years. The entire urethra and neck of the bladder were excessively sensitive, and a stricture, calibre 17, was detected at six inches and one-fifth from the meatus, which measured thirty-three millimetres in circumference. The epididymes, but especially the right, were enlarged and indurated.

In the majority of cases of atonic impotence which I have inserted for the purpose of illustrating the various phases of the affection, in addition to the lesions of the urethra, it will have been perceived that certain subjective symptoms were present, which were indicative of spinal exhaustion, the depressed form of spinal irritation, or neurasthenia. Prominent among these signs are pain in the back, which is increased by exercise, exposure to atmospheric vicissitudes, and attempts at coition, and muscular weakness of the limbs, so that the subjects are tired out by comparatively slight exertions and walking. These symptoms point, to use the term introduced by Beard,[1] to myelasthenia of the lumbar division of the cord. In a certain number of examples, as in Case VIII., there is dull, heavy pain in the back of the head, the neck, and shoulders, which now and then become flushed, signs which are indicative of exhaustion of the upper portion of the cord. In other instances the symptoms are those of cerebrasthenia, such as impairment of memory, mental debility, depression, anxiety, or irritability, a feeling of fulness in the head, asthenopia, and other disorders of the special senses; all of which are signs of enfeeblement of the functional power of the

[1] A Practical Treatise on Nervous Exhaustion, 2d ed., p. 106; and Medical Record, vol. i., 1879, p. 184.

brain, and which may readily be explained by the commissural connections between the lumbar division of the cord and the higher centres. In other cases, again, the symptoms are variously interwoven; and in all troubled and unrefreshing sleep, a feeling of heaviness on rising, coldness of the hands and feet, poor appetite, coated tongue, flatulence, a sense of weight in the epigastrium after eating, palpitation of the heart, sick headache, vertigo, and constipation, are very common. The various phenomena of neurasthenia, which are so frequently met with in the affections of the male reproductive organs, have been exhaustively investigated in this country by Beard, and his writings on that subject are well worthy of careful study.

Fig. 1.

Exploratory bulbous bougie.

Diagnosis.—The diagnosis of atonic impotence is readily made from a consideration of the preceding observations. In all cases the urethra should be examined with the view of determining the presence or absence of lesions which induce or maintain the disorder. For this purpose, the exploratory, or acorn-headed, soft bougie, represented in fig. 1, should be resorted to, as it is the only instrument with which granular patches and strictures of large calibre can be accurately defined, and with which morbid discharges can be withdrawn for minute examination. One being

selected which fills, without unpleasantly stretching, the meatus, it is well oiled and inserted as far as the bladder. If there be a coarctation, its introduction will be arrested, when smaller sizes are successively employed, until one will pass without difficulty. On its withdrawal, the abrupt shoulder of the bulb coming in contact with the posterior face of the obstruction imparts to the touch a sensation as if it had jumped over a narrow band, which is as perceptible to the patient as it is to the surgeon, and is very different from the sensation conveyed by spasm. In the latter the instrument may be grasped for a time, but the muscular contractions soon cease, or may be made to cease by carrying the bulb several times through the obstruction; while a granular patch gives the impression of a limited roughness of the canal.

Hyperæsthesia of the urethra is readily detected by the ordinary metallic bougie, catheter, or sound; and its existence should never be based upon the passage of the soft explorer alone, as the insertion of that instrument is productive of far more pain than the ordinary nickel-plated bougie. If the surgeon should deem it desirable, he may confirm his diagnosis by a resort to the endoscope, with which Grunfeld[1] has discovered hyperæmia and catarrhal swelling of the verumontanum in cases of impotence, prostatorrhœa, and spermatorrhœa. I myself never employ it, nor do I think that any additional information is to be gained from its use.

In the absence of proper instruments for exploring the urethra, the general practitioner may suspect inflamma-

[1] Endoskopische Befunde bei Erkrankungen des Samenhügels. Wien, 1880.

tion and morbid sensibility if there be painful and frequent micturition, painful ejaculation, a feeling of weight in the ano-rectal region, a gleety discharge, prostatorrhœa, abnormal nocturnal emissions, and sensibility of the prostate on pressure with the finger in the rectum.

Prognosis.—The milder forms of impotence are very amenable to treatment, as is illustrated by the following example:—

Case XVI. A carriage-builder, twenty-three years of age, came to me on the 8th of April, 1880, on account of a gleety discharge, which kept the lips of the meatus glued together, and had existed for two years and a half; of a discharge of prostatic fluid at stool; and of nocturnal seminal emissions, which were often as frequent as every night during a single week, now and then occurring to the number of three in a night, and averaging three a week. The erections were feeble, and ejaculation was premature. The bowels were costive, but he had no signs of spinal exhaustion. Examination with a No. 17 explorer disclosed a stricture one-eighth of an inch behind a contracted meatus, and a highly sensitive urethra, especially in its membranous and prostatic divisions. On withdrawing the instrument, a few drops of prostatic fluid came away. I laid open the meatus along with the stricture, and directed a pill composed of two grains of compound extract of colocynth and half a grain of extract of nux vomica at bedtime, along with the one-sixtieth of a grain of atropia in solution, and thirty grains of bromide of potassium every eight hours. The incision was prevented from closing by the passage of a No. 30 conical steel bougie, which was carried through the entire urethra every other day. On the 6th of May the hyperæsthesia had almost entirely disappeared; the gleet had ceased; there was merely a slight prostatic discharge, if the bowels were allowed to become constipated, but he had not noticed it for several days; there were nocturnal emissions on the nights of April 17 and 18, and the erec-

tions were improving in vigor. The treatment was continued, and a cure was effected in another month.

This case is not a selected one; and whenever a patient presents himself who has erections and desire, even if he has a prostatic discharge, or too frequent nocturnal pollutions, or is suffering with both of these complications, the surgeon will be perfectly justifiable in promising relief. In the second variety of the affection, in which desire remains, but in which the erections are so feeble that penetration is impossible, or are entirely absent, it is not uncommon for the man to have an erection and an emission under the influence of a voluptuous dream, thereby showing that the sexual instinct is not entirely lost. In such a case as this the prognosis is also favorable, although the patient will have to remain longer under treatment. When both desire and erection are abolished, and the man is suffering from hypochondrism, the outlook is bad, particularly if we cannot gain his confidence, and he is not open to moral treatment. In this class of cases, if there is neither hypochondrism nor neurasthenia, the prognosis is good. In Case XII., which was an example of the latter condition, I divided the strictures on the 11th of September, and placed the man upon bromide of potassium and tincture of veratrum viride, a laxative pill, as it might be required, warm sitz-baths, and a restricted diet, and enjoined abstinence from everything which was calculated to excite the genital organs. He married on the 6th of November, having in the mean while passed a No. 32 conical steel bougie every twenty-four hours until the tenderness of the prostatic urethra had disappeared, and he wrote me five days subsequently that he had had con-

nection every night. I cautioned him against committing such marital excess, lest sexual abuse might cause a relapse.

The prognosis is not so good when the disorder arises from excessive onanism commenced early in life by nervous, impressible boys. When impotence is developed after the age of forty, the patient should be made to understand that his pristine vigor can scarcely be expected to be restored, since the power to copulate naturally diminishes at that age.

Treatment.—In the management of atonic impotence, a thorough examination of the genital and associated organs should be made, with the view of getting rid of the causes which produce and maintain it. If the patient has a redundant prepuce, it should be removed; if the meatus be contracted, it should be enlarged; while herpes of the prepuce and glans, or balanitis, should be treated in the usual way. All of these lesions are capable of setting up hyperæsthesia of the prostatic portion of the urethra, or even of exciting reflex impotence without the intervention of prostatic trouble, and their relief is quite sufficient in mild cases to bring about a cure. The same statement is true of certain diseases of the bladder and rectum, so that these viscera should not be overlooked.

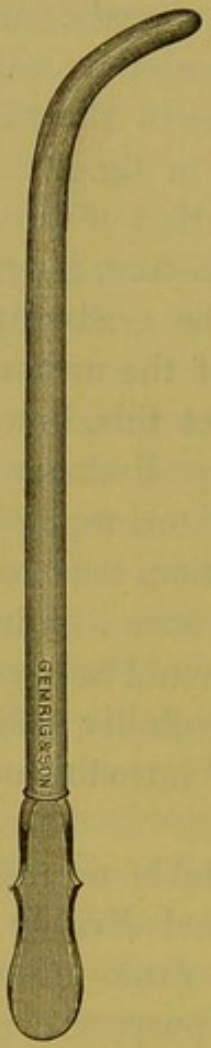
Atonic impotence usually occurs in robust subjects, in whom inflammation and morbid sensibility of the prostatic portion of the urethra have set in before the signs of myelasthenia are pronounced, the usual symptom, according to my experience, being pain in the back. Hence the treatment, whether this be local or general, must be of a sedative nature; and the patient, at the outset, should be

impressed with the importance of avoiding all sources of sexual excitement, such as masturbation, attempts at intercourse, dalliance with women, and lascivious thoughts and literature; and if his sexual propensities are marked, they should be kept under control by mental application and gymnastic exercises.

Of the *local measures* to overcome hyperæmia, inflammation, and hyperæsthesia of the prostatic urethra, not one is so universally applicable as the passage of the nickel-plated conical steel bougie represented in fig. 2. The size of the instrument is to be gauged by that of the meatus, if it be normal, or by that of the stricture, if one be present, and its circumference should be gradually increased up to that of the full capacity of the urethra, as indicated by the urethrameter. To effect this, however, the meatus will have to be enlarged as a preliminary measure; or, instead of this, my urethral dilator, represented in fig. 3, which dispenses with the operation, may be employed. At first the bougie should be at once withdrawn, and the intervals between the insertion should be seventy-two hours. With the decrease of the sensibility it should be retained longer, and the intervals of introduction be shortened until it is passed daily.

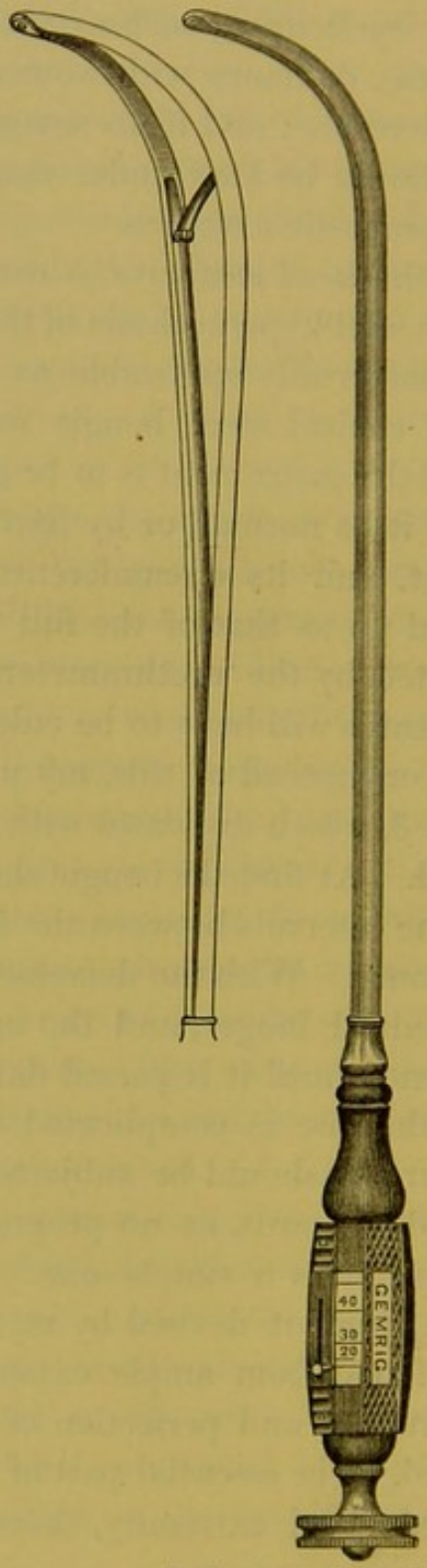
If the case is complicated by an irritable or resilient stricture, it should be subjected to internal division from behind forwards, as no progress can be made unless the contraction is a simple one. For this purpose, I prefer the instrument devised by myself several years ago, as I have found from ample experience that its simplicity of construction and perfection of action leave nothing to be desired. The essential part of the contrivance is its acorn-headed distal extremity, through which the situation of

Fig. 2.



Conical steel bougie.

Fig. 3.



Author's urethral dilator.

the coarctation is accurately determined. To use the exploratory urethrotome, the stricture having been passed, and its posterior face having been defined by the projecting shoulder of the bulb, the bulb is carried at least half an inch towards the bladder, as the object is to divide, along with the contraction, the sound tissues to that extent behind and in front of it; then the blade is protruded, as in fig. 4, and the parts cut as the instrument is withdrawn, the penis being put upon the stretch to render the urethra tense. In the event of the tissues being thick or resistant, the section may be materially aided by counter-pressure with the fingers of the left hand along the median line. The bulb is then used as an explorer to detect any undivided bands, which, if discovered, should be severed, since thorough section of all narrowed points is essential to success. In regard to the subsequent treatment, I need only refer to my views published elsewhere,[1] as its consideration would be out of place here.

Fig. 4.

Author's urethrotome.

It now and then happens, as in Case XII., that the entire urethra is so excessively sensitive that the introduction of the bougie is followed by an epileptoid paroxysm, or that the patient faints. Under these circumstances, it is wiser to desist from its use until the sensibility of the passage has been obtunded by the injection, every eight

[1] Gross on the Urinary Organs, 3d ed., p. 480; Med. Record, June 15, 1878, p. 461; and Trans. Med. Soc. State of Penna., vol. xii. part i. p. 67.

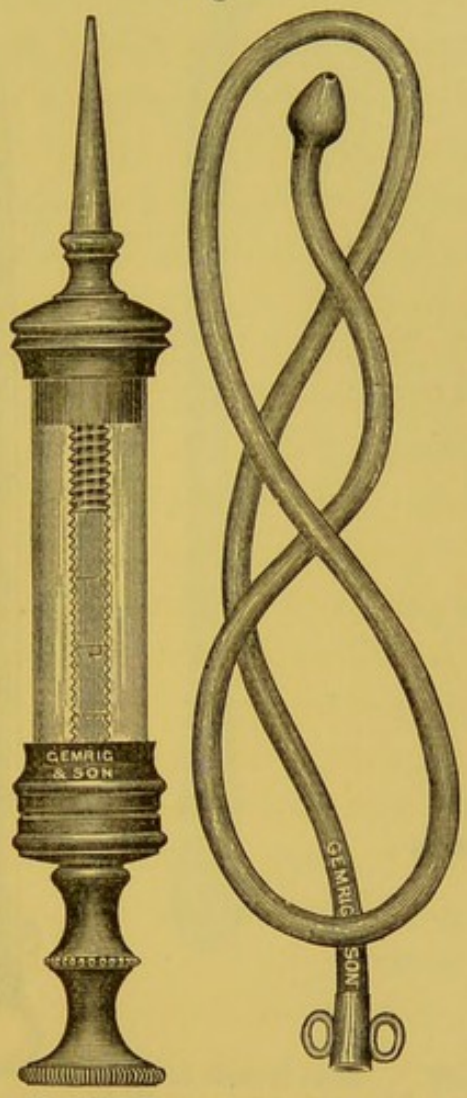
hours, of three grains of chloral, and ten grains of bromide of potassium to the ounce of water, and by the internal exhibition, at the same intervals, of thirty grains of the bromide, ten drops of tincture of cannabis indica, and five drops of tincture of gelsemium, and by sitz-baths of water as warm as it can be borne.

In many instances it will be found that the inflammation and hyperæsthesia are finally reduced to a small, and probably granular, patch, which proves rebellious to the bougie, but which usually disappears under the application of astringent remedies. Of these, I prefer a solution of nitrate of silver, carried to the tender spot by a contrivance which is essentially that of Felix Guyon,[1] and which, as is shown in fig. 5, consists of a syringe of the capacity of rather less than a drachm, and of an ordinary bulbous explorer perforated at the apex of the bulb. The syringe having been charged with the solution, and its nozzle attached to the explorer, pressure is made upon the piston, until a drop of the fluid appears at the small opening. Wiping this off, the oiled instrument is then carried down until the bulb defines the inflamed patch—and it does this with the greatest accuracy—when it is slightly withdrawn, and a few drops are deposited in the urethra. The bladder should be evacuated before the application of the instrument, and the patient should be kept in bed and use demulcent drinks for a few hours subsequently. With these precautions, the pain and desire to urinate will usually not last more than thirty minutes, but there will be some scalding during the next act of micturition. When I first adopted this practice, about ten years

[1] Bull. Gén. de Thér., 1867, p. 501.

ago, I employed ten grains of the salt to the ounce of distilled water, at intervals of one week; but from an extended experience, I now commonly use thirty grains, and repeat the injection every four days.

Fig. 5.

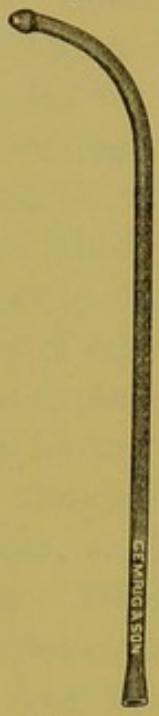


Syringe and perforated bulbous explorer.

As the soft, perforated bulbous explorers are not easily procured in this country, and as they are liable to wear out, I have had constructed a curved hard-rubber attach-

ment for the syringe, which is eight inches long, and which is provided, as is shown in fig. 6, with an acorn-shaped head

Fig. 6.



Bulbous nozzle.

Fig. 7.

Dick's catheter-syringe.

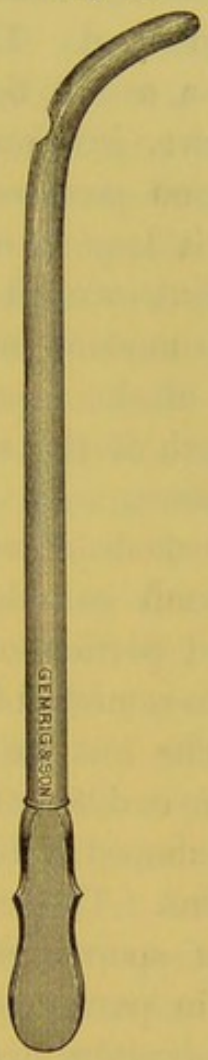
or bulb. This instrument is not quite so good in regard to accuracy of definition of the inflamed patch as the preceding one, but, with that exception, it constitutes the

best of the contrivances for the purposes to which it is adapted.

Fig. 8.

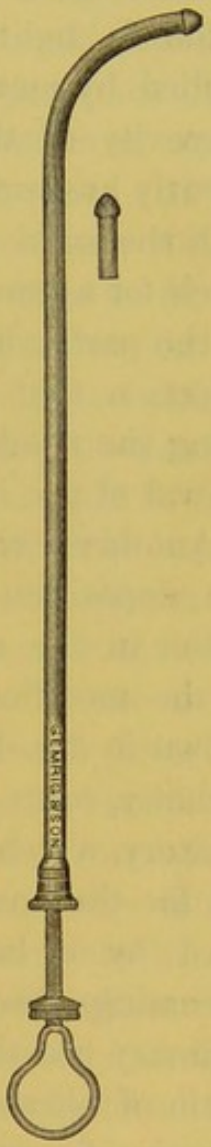
S. D. Gross's porte-caustique.

Fig. 9.



Cupped conical steel bougie.

Fig. 10.



Harrison's porte-remède.

In the absence of the foregoing instruments, Dick's catheter-syringe, fig. 7, may be employed; or the cup attached to the stylet of Gross's porte-caustique, fig. 8,

may be charged with five grains of nitrate of silver to the drachm of ointment of stramonium, which I regard as far preferable to the fused salt, as the latter exerts a destructive action on the mucous membrane unless the cauterization is lightly performed. The glycerole of tannin, applied by means of a sound, fig. 9, having a cup at the convexity of the curve, just anterior to the shaft, frequently answers a good purpose. The depression filled with the solid mass is kept in contact with the inflamed patch for a few minutes, or until it is melted by the heat of the parts; but this mode of medication is open to the objection that some of the liquefied paste is deposited along the whole length of the urethra during the withdrawal of the instrument.

Another excellent mode of applying astringents is by the deposition of small soluble suppositories of cocoa butter in the affected portion of the urethra by means of the modified porte-remède of Harrison, of Liverpool, shown in fig. 10. The instrument consists of a metallic catheter, open at the end for the reception of the suppository, which is so shaped as to form a bulbous extremity for the instrument. The exposed surface is hardened by a layer of spermaceti, so as to prevent its becoming dissolved in passing down the urethra. For ordinary use the suppository may contain a quarter of a grain of nitrate of silver, or two grains of tannin, or half a grain of acetate of lead.

When the affection proves to be more obstinate, I have found that flying blisters, made by pencilling cantharidal collodion first on the one side of the perineal raphé, and, after the surface has healed, on the opposite side, are of the utmost value. The agent should be applied in the

morning, as it is liable to prevent sleep, and great care should be taken to avoid vesication of the scrotum and anus.

Of *general remedies*, the aphrodisiacs, as cantharides, phosphorus, phosphide of zinc, strychnia, and damiana, are to be studiously avoided, since the parts are to be kept still further at rest by the administration of agents which diminish the reflex excitability of the cord and suspend sexual desires and the power of erection. Of the remedies of this class, bromide of potassium is by far the best, as it not only blunts the venereal appetite, but corrects the acidity of the urine, and exerts an anæsthetic influence upon the mucous membrane of the urethra. I am in the habit of administering thirty grains of the salt every eight hours, unless I find that it makes the patient drowsy during the day, when I order a drachm to be taken at bedtime. If it is not well borne, as is indicated by physical and mental languor, weakness of the heart, pallor, uncertain gait, acne, and other signs of bromism, its use must be discontinued for a time; or its cumulative action must be prevented by promoting its excretion by the urine by combining with it a diuretic, as ten grains of nitrate or bitartrate of potassa, as recommended by Rosenthal;[1] this combination is far better than that with Fowler's solution, which is advised by Gowers and Bartholow.[2] When the patient is anæmic, I prefer to administer a drachm at night, and give him three grains of quinine along with twenty-five drops of the tincture of the chloride of iron three times during the day. My own empirical observations in regard to the value of quinine

[1] Wiener Klinik, May, 1880, p. 159.

[2] Materia Medica and Therapeutics, 3d ed., p. 406.

in decreasing the depression produced by the bromides in asthenic subjects have recently been confirmed by Dr. Landon Carter Gray,[1] who has shown that it not only increases the sedative effects of the latter, but that it diminishes or dispels bromism.

When the patient is robust and plethoric, I frequently add to each dose of the bromide ten drops of the tincture of veratrum viride or tincture of gelsemium; or the bromide may be given in half an ounce of the infusion of digitalis; and I have every reason to be pleased with the action of the combinations. Instead of the bromide of potassium, the monobromide of camphor may be employed to the extent of about twelve grains in the twenty-four hours, but its effects are not so striking as those of the former remedy.

When the penis is cold and rigid, atropia is indicated to overcome the contraction of the muscular fibres of the trabeculæ of the erectile bodies, and to induce dilatation of the arterioles and an increased flow of blood through the organ; and its good effects are also evinced by the diminution of the number or the entire cessation of the nocturnal emissions and prostatic discharges which frequently complicate the affection. One-sixtieth of a grain in solution should be administered on rising; and when its peculiar action is denoted by dryness of the mouth, thirst, dilatation of the pupils, and slight confusion of vision, that quantity should be taken on retiring, so that the patient may sleep through its disagreeable effects.

Of the remaining anaphrodisiacs, which have been recommended in the management of impotence, camphor

[1] Archives of Medicine, October, 1880, p. 191.

and lupuline cannot be relied upon; while arsenic evinces its depressing action on the sexual functions only when administered in such large doses as to occasion objectionable disorders of the circulatory, digestive, and nervous systems.

Among the accessory measures I know of none that is more grateful to the patient, and more relaxing and soothing to the irritable organs, than a sitz-bath at a temperature of about 95° F., taken for fifteen minutes every morning and evening. In the absence of facilities for bathing, a sponge dipped in water at a temperature of about 100° F. may be applied to the perineum and the back. Cold baths, which are recommended by many authors, are to be studiously avoided, as they aggravate the local troubles.

In a large proportion of cases the bowels are habitually constipated. They should be kept in a soluble condition, particular attention being paid to the rectum. For this purpose, tepid water may be injected every morning, as it has the additional advantage of soothing the hyperæsthetic prostatic urethra. If enemata do not answer the purpose, and if there is atony of the muscular coat of the intestines, a pill composed of two grains of compound extract of colocynth, half a grain of extract of nux vomica, and the tenth of a grain of extract of belladonna may be administered on going to bed; or a wineglass of Hunyadi water, or two drachms of equal parts of Epsom and Rochelle salt, may be ordered every morning.

Any special dyspeptic symptoms are to be met by appropriate remedies. The diet should be nutritious and digestible, but unstimulating; and coffee, malt, and alcoholic liquors must be eschewed, and the last daily meal

should be light. The patient should sleep on a hard mattress, use only the lightest coverings, and empty his bladder thoroughly on retiring, and early in the morning if a more or less complete erection indicates fulness of that viscus. He is, moreover, to be warned against horse-back exercise and driving over rough streets, and all other forms of amusement which tend to produce hyperæmia of the genitalia, as well as against bodily and mental fatigue if the signs of spinal and cerebral neurasthenia be marked.

Up to this point the treatment, both local and general, has been addressed to relieving the inflammation and hyperæsthesia of the prostatic portion of the urethra. When this has been accomplished, abundant observation has convinced me that nothing more, as a rule, is required. Cases, however, do occur in which, after the local lesions have been cured, the irritability of the genital centre is still so exhausted that the erections are not sufficiently vigorous, and the ejaculations are premature. Under these circumstances, as well as in the rarer form of atonic impotence, in which the prostatic urethra is devoid of lesions, but in which a stricture, if one be present, will require preliminary treatment, the object is to restore the sexual powers to their normal condition by remedies which tone up the system at large and excite the reflex activity of the genito-spinal centre. An excellent combination is twenty-five drops of the tincture of the chloride of iron, ten drops of tincture of nux vomica, and two grains of quinia, to be taken before meals in a wineglassful of sweetened water, which may be replaced by the syrup of the phosphate of iron, quinia, and strychnia, in teaspoonful doses, or by the following combination, which is probably more efficacious than either of the preceding ones:—

℞.—Quiniæ sulph.,
Ferri sulph., āā ℈ij;
Zinci phosphidi, gr. ij;
Acidi arseniosi, gr. jss;
Strychniæ sulph., gr. $\frac{2}{3}$.
M.—Ft. pil. no. xl.
S.—Two pills every eight hours.

The fluid extract of damiana, in doses of from two to four drachms every eight hours, is said by Caldwell,[1] of Baltimore, to be a capital tonic to the nervous centres which preside over erection, and his observations are confirmed by Edwards,[2] of Richmond.

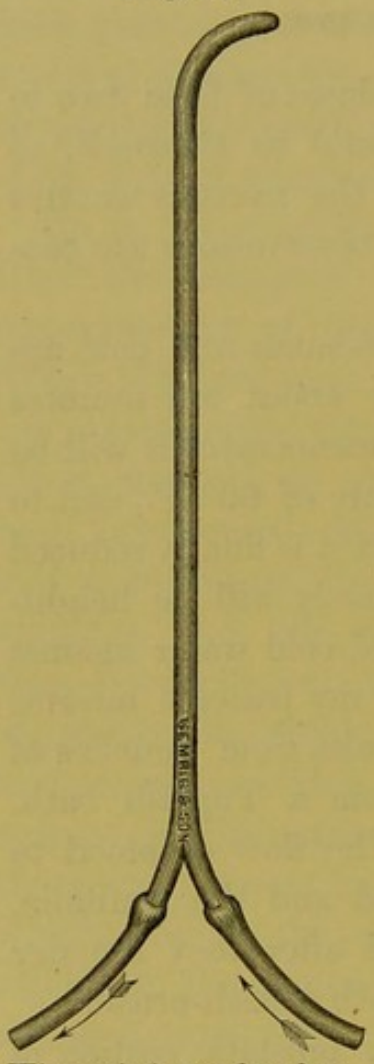
Among the tonic agents cold sitz-baths and cold applications to the lumbar region for about ten minutes hold a high position. At the commencement it will be wise to employ water at a temperature of 60° F., and to gradually lower the temperature until it is finally reduced to 46° F. The efficiency of the remedy will be heightened by gently projecting a stream of cold water against the perineum and back; and one of my patients informs me that he has derived the best results from douches of moderate volume after emerging from a Turkish bath. To promote reaction and increase the flow of blood to the lower divisions of the spinal cord and the genitalia, the parts should be briskly rubbed after they are dry with a moderately coarse towel or with a flesh-brush.

Cold may be applied directly to the prostatic portion of the urethra by means of the cooling sound or psychrophor of Winternitz,[3] represented in fig. 11, which is nothing

[1] Virginia Med. Monthly, 1879, p. 444.
[2] Ibid., p. 716.
[3] Ziemssen's Hdbch. der Allg. Ther., Bd. 11, Theil 3, 1881, p. 238.

more than a double current eyeless catheter closed at its beak. To the proximal extremities of this rubber tubes are attached, through one of which the fluid flows into, and through the other out of, the instrument. The former, provided with a stopcock, is connected with a rubber bag suspended a few feet above the patient, while the latter is received in an empty vessel placed at the patient's feet. At the outset the temperature should be about 57° F., and be gradually reduced to 52° F., and the sittings be lengthened from five to ten minutes. The device has been found to be the most beneficial when the ejaculations are too precipitate.

Fig. 11.



Winternitz's psychrophor.

Galvanism very deservedly enjoys a high reputation in the treatment of impotence. Not only are the electrotonic effects of the constant current valuable in increasing the excitability of the genito-spinal centre, but galvanization is far more serviceable in restoring the tonicity of the arterioles of the erectile tissues of the penis, and in increasing the amount of blood flowing in them, than are the measures to which I have just alluded. Although the dose of the current cannot be accurately prescribed by the number of elements of the battery, the quantity generated

by from fifteen to twenty cells will, as a rule, be found to answer the purpose. The anode, or positive electrode, which should be of large size, is placed over the lumbar spine, and the cathode carried over the gland and back of the penis, the cords, testes, and perineum. The sittings at first should be limited to two or three minutes every forty-eight hours; but they may soon be lengthened to five minutes daily. In obstinate cases, particularly if they are complicated by prostatic or seminal discharges, an insulated catheter negative electrode may be passed down to the prostatic urethra, while the anode is applied to the back, groin, or perineum, or it may be replaced by the rectal reophore. Great caution must, however, be observed in the employment of the urethral electrode, lest it awaken inflammation of the urethra, or neuralgia of the testis or cord, or even induce suppuration of the testis, as I have known to happen in one case from the use of too strong a current. In all cases it will be wise for the operator to begin with from three to five cells, and to test the current by passing it through his own temples, and cautiously to increase the number of elements to fifteen,[1] if pain is not excited. In the third or paralytic variety of the affection, or in the other varieties, if galvanism does not bring about the desired result, faradization of the erector muscles of the penis and the accelerator muscle of the urine is frequently highly serviceable. If this method fails, the interrupted current may be passed through one reophore in the urethra to the other, placed on the perineum and the genitalia, or inserted in the rectum; while some cases will improve more rapidly, if local faradization

[1] Althaus, Medical Electricity, 3d ed., p. 671.

and galvanization of the cord are employed on alternate days. When the skin of the penis is deficient in sensibility, the electrical brush is indicated. Central galvanization[1] and general faradization are beneficial when the symptoms are those of cerebral and spinal exhaustion.

In addition to the foregoing measures, a change of air, travel, exercise, amusement, sea-bathing, good food, and a glass of generous wine will do much to give tone to the parts, and the system at large.

The end having been accomplished, it remains to put the patient on his guard against marital excess, for unless he practises moderation he is liable to a relapse. In a large proportion of cases the trouble is met with in young men who are engaged to be married. Under these circumstances, matrimony should not be delayed, as regular and temperate intercourse tends to promote sexual quietude. When marriage is not contemplated, the patient should lead a continent life, and avoid all sources of sexual excitability.

B.—ATONIC IMPOTENCE WITHOUT HYPERÆSTHESIA OF THE PROSTATIC URETHRA.

Imperfect or deficient erection may arise independently of any lesion of the prostatic portion of the urethra in persons of nervous or sensitive temperaments, a class of subjects in whom diminished reflex excitability of the lumbar genital centre appears to be induced before pros-

[1] Beard and Rockwell, Med. and Surg. Uses of Electricity, 3d ed., p. 376.

tatic inflammation has had time to declare itself. In the preceding form of impotence the patients are, as a rule, robust and strong, and inflammation and hyperæsthesia of the deep urethra are set up before the functions of the genital centre have been much impaired.

Of the twelve cases that have come under my notice, eight were due to excessive masturbation, two to gonorrhœa and masturbation, and two to gonorrhœa alone. In nine a stricture was detected, while three were free from that complication, and the prostatic portion of the urethra was not morbidly sensitive in a single one. In eight of the cases the erections were feeble, and the ejaculations were precipitate; and in four intercourse was impossible, although desire was retained.

The treatment of this variety of atonic impotence is the same as that directed for the preceding form after the hyperæsthesia has been remedied.

Sect. III. Psychical Impotence.

Impotence from the restraining or inhibitory control of the brain over the genito-spinal centre is infinitely less common than the preceding variety; but that erection may fail or cease under the influence of excitement, depressing, or other emotions, or mental preoccupation, is a fact with which every one is familiar. Thus newly married men, who were previously potent, and had never indulged in sexual or unnatural excesses, are liable to be

troubled in this way, the undue stimulation of the passions at their first efforts at coition having the effect of causing the erection to cease before the act is completed, or of rendering it so feeble that penetration is impossible, or of precipitating emission, or of preventing erection altogether. Grimaud de Caux[1] relates the case of a mathematician in whom erection failed before emission, because his thoughts wandered towards the solution of an abstruse problem. Onimus and Legros[2] refer to a young man who remained impotent for years after having been surprised at the moment of connection by the husband; and Robaud[3] met with a man who had been unable to command an erection during the six months following a railway accident in which he was terribly frightened. The death of a beloved child or wife, as in the cases of Robaud[4] and Ultzmann,[5] may occasion temporary impotence; and the loss of a large sum of money,[6] or the drawing of a prize in a lottery,[7] may bring about the same result. In other cases, the impotence is, in regard to certain women, due to indifference, repugnance, or a suspicion of infidelity.

Impotence is very frequently entirely imaginary or mental, although it is based upon existing lesions. Thus too small a penis, occasional nocturnal seminal losses, stricture of the urethra, a tight prepuce, varicocele, a gleety discharge, or irritability or neuralgia of the testis, not infrequently restrain erection through fear of inability to

[1] Physiologie de l'Espèce, p. 341.
[2] Traité d'Electricité Médicale, p. 215.
[3] Traité de l'Impuissance et de la Sterilité, t. i. p. 186.
[4] Op. cit., p. 433.
[5] Wiener Klinik, May and June, 1879, p. 131.
[6] Ibid.
[7] Robaud, op. cit., p. 186.

penetrate, or of increasing the pollutions, or of impossibility of ejaculating, or of aggravating the local troubles. The same statement is true of moderate masturbators, who probably have normal nocturnal emissions which they assume to be or have been informed are indicative of a diseased condition, and who seem to regard impotence as a heritage of their vice. In not one of these conditions is there any valid reason for the trouble, but it has been ignorantly brought on by the constant thought that impotence was the natural result of the supposed infirmities.

I have already alluded to the fact that young husbands, in their eagerness to consummate the rite, not infrequently fail; and I fancy that there are few men who did not ejaculate prematurely when they had connection for the first time. In such cases, the repetition of the act soon corrects the trouble. Most writers on impotence, however, teach that it is not uncommon for newly-married men to be baffled, simply because they are afraid that they cannot accomplish the act properly, or because the mortification which results from the unfortunate attempt gives rise to so much distress and anxiety in regard to its recurrence that the otherwise healthy subjects are really rendered impotent. I am no believer in this doctrine, which is as false in fact as it is pernicious in regard to the treatment which such cases demand; but I do believe that this condition arises from overlooked lesions of the prostatic urethra which were induced, as a rule, by masturbation. An examination of the views of writers on this subject, as, for example, Van Buren and Keyes,[1] Curschmann,[2] Rosen-

[1] Genito-Urinary Diseases, with Syphilis, p. 453.

[2] Ziemssen's Cyclopædia, vol. viii. p. 892.

thal,[1] and Ultzmann,[2] will show that nervous or psychical impotence is usually met with in masturbators, subjects who are always more or less timid as to their virile powers, and many of whom are incapable of normal sexual excitement. Instead of accepting the statements of these patients, that their failure was due to natural impetuosity, timidity, or want of self-confidence, it will be wise for the surgeon to explore the urethra, since, as I have already indicated, onanism is the most fruitful source of inflammation and hyperæsthesia of the prostatic portion of the urethra, a view in which I am sustained by Rosenthal, Ultzmann, Black,[3] Acton,[4] and nearly all surgical authors. Hence, the failure to copulate in this class of patients is due to diminished reflex irritability of the centre for erection, although it is possible that undue excitement or timidity may aggravate that condition by exerting an inhibitory influence over the centre. Such cases should, therefore, be relegated to the preceding or atonic variety of impotence.

The only case of psychical impotence that I have ever met with is the following:—

Case XVII. A widower, fifty-two years of age, was engaged to be married, and, despite the fact that he had erections in the presence of the object of his affection, he was so fearful that he would disgrace himself on the night of his wedding, that he made

[1] Wiener Klinik, May, 1880, p. 137.

[2] Ibid., May and June, 1879, p. 130.

[3] On the Functional Diseases of the Renal, Urinary, and Reproductive Organs. Phila., 1872, pp. 229 and 269.

[4] The Functions and Disorders of the Reproductive Organs. 2d Amer. ed., pp. 91 and 240.

the experiment with another woman, and utterly failed. As a consequence of this unfortunate test, he constantly brooded over his imaginary trouble, for which he sought my opinion. I found that his genital organs and prostatic urethra were perfectly normal, and succeeded in obtaining his confidence by assuring him that I had met with many cases of a similar nature, and that they had always yielded readily to teaspoonful doses of fluid extract of damiana taken every eight hours for three days before marriage. As a result of this ruse, he subsequently wrote me that the remedy had acted like a charm.

The following would have been classified as cases of psychical impotence by physicians who are not in the habit of exploring the urethra in this and allied affections:—

Case XVIII. A merchant, twenty-eight years of age, stated that he was suffering from spermatorrhœa, which had so weakened his powers that, on attempting intercourse four years previously, the erection was so feeble that it passed off before the completion of the act. He had not renewed the effort, as he was convinced that he was permanently impotent. I found that the so-called spermatorrhœa consisted in an intermittent discharge of prostatic fluid at stool, and in an occasional nocturnal emission, and that the man had had gonorrhœa three years before his first attempt at coition. A stricture, calibre 25, was detected at six inches from the meatus, the prostatic urethra was excessively sensitive, and the man had almost constant pain in the back.

Case XIX. A lumberman, thirty years of age, consulted me on account of impotence, which he ascribed to undue size of his penis, as he found that on his first connection intromission was difficult, and ejaculation was precipitate and painful; and that on several subsequent efforts the erections did not come up to the proper standard. He had abstained from intercourse for about thirty months, as he was convinced that the trouble arose from the size

of the organ. He suffered from pain in the back, and weakness of vision, and informed me that he had masturbated from his fifteenth to his twenty-seventh year. There was a stricture, calibre 18, at six inches and a quarter from the meatus, and the prostatic urethra was morbidly sensitive.

Case XX. A commercial traveller, thirty-six years of age, complains that he has been married for four days, but that he has been unable to consummate the rite, in consequence of the impossibility of intromission from insufficient erections. He has never had gonorrhœa, nor did he masturbate much in his youth; but during his engagement, which preceded his marriage by seven months, his genitalia were kept in a constant state of excitement by fondling the object of his affections, and he did not have illicit intercourse to relieve his passions. The entire urethra was exquisitely sensitive; but there was no evidence of a coarctation.

In the first two of the foregoing cases an inexperienced observer might readily have assumed that the trouble depended upon brooding over conditions which the patients thought had prevented natural copulation; and he might have ascribed the failure of erections in the third case to congenital deficiency, a variety of impotence which is described by certain authors, when the causes are inexplicable. In all of these examples, however, the failure of the first attempts was due to debility of the genital centre, a lesion of which the men were naturally entirely ignorant.

I have dwelt somewhat at length upon the erroneous diagnosis which is usually made in cases of so-called psychical or nervous impotence, in order that I might call attention prominently to the importance of examining the urethra in all examples of impotence, since the prognosis is far more favorable when the trouble depends upon hyperæsthesia of its prostatic portion than when that con-

dition is absent. Had this precaution been observed by many writers on the subject, they would have been able to give a less gloomy account of psychical impotence, and have said less of the importance of gaining the patient's confidence, and of the moral treatment adapted to each case.

TREATMENT.—In the management of psychical impotence from undue sexual excitement or emotional causes, little need be done, except to administer a placebo, with the assurance that it will afford relief, since such cases usually remedy themselves. In the case of Grimaud de Caux, the wife resorted to the stratagem of slightly intoxicating the husband before connection, through which he was rendered capable of procreating.

In the variety of mental impotence in which an existing lesion has thoroughly impressed the patient with the belief that it is the source of his trouble, the treatment usually advised, namely, to gain the man's confidence, is not easily carried out. Such patients are very watchful of themselves and of their physicians, and it is useless to try to convince them that a varicocele, for example, is productive of no harm, as far as the sexual functions are concerned, or that the involuntary emissions are strictly within the limits of health. Hence, it is far better to agree with them that their imaginary infirmities demand treatment, to assure them that they are capable of relief, and above all to institute the treatment laid down in surgical works, as it will be found that they are more or less familiar with the various maladies of which they complain. A tight or redundant prepuce should, therefore, be removed, and the introduction of bougies,

or local galvanization or faradization, or other measures be resorted to, along with a bitter tonic, and a systematic regulation of the diet, bathing, and exercise. The mind is open to persuasion in this way, but not by mere assurances, or by making light of the fancied disorder. If the subject is contemplating matrimony, he should be advised to fulfil his engagement; and a placebo, such as a minute quantity of phosphorus, or a drachm of the tincture of damiana, of the presumed virtues of which he will have some knowledge, should be administered at stated intervals for a few days previously.

Sect. IV. Symptomatic Impotence.

Sexual power is now and then greatly impaired, if not absolutely destroyed, by the prolonged use of certain cerebral sedatives, as opium, morphia, chloral, bromide of potassium, and alcohol, as well as of cerebral excitants, as cannabis indica, and by the administration of or exposure to arsenic, antimony, lead, sulphide of carbon, and iodine. All of these agents are capable of exerting a harmful influence upon the entire organism, but particularly upon the nervous system and the genital organs, when pushed to an undue extent.

The anaphrodisiac action of chloral, of bromide of potassium, and of spirituous and malt liquors is too well known to require illustration. Rosenthal[1] has recorded two cases

[1] Wiener Klinik, May, 1880, p. 149.

of impotence and azoospermism from the hypodermic injection of several grains of morphia daily; and Siredey[1] states that the habitual use of hashish by the Orientals induces absolute impotence early in life. Biett,[2] Charcot,[3] Rosenthal,[4] and Rayer[5] have observed that sexual vigor diminishes and finally ceases with the increase of the dose of arsenic in the treatment of diseases of the skin; and Rosenthal[6] observed the same effect in a merchant who resided in a room covered with arsenical paper. Lohmerer[7] witnessed impotence in four men who were exposed to the fumes of antimony; and the absorption of the vapor of sulphide of carbon by workmen engaged in the manufacture of vulcanized caoutchouc is said by Delpech[8] to be followed by loss of virility. Lead poisoning may cause temporary impotence, as in the cases recorded by Siredey,[9] Portal,[10] Roubaud,[11] and Rosenthal;[12] and Bartholow[13] thinks that the prolonged use of the iodides has resulted in permanent loss of the sexual power.

Impotence is not an uncommon secondary effect of injuries of the brain and spinal cord; and it may also be symptomatic of various functional disorders and of acute and chronic affections, but particularly of the nervous, digestive, and urinary systems, as spinal irritation and weak-

[1] Dict. de Méd. et de Chir. Prat., t. xviii. p. 456. [2] Ibid.
[3] Bull. de Thér., Jan. 1864, p. 529. [4] Loc. cit., p. 151.
[5] Ibid. [6] Ibid., p. 152.
[7] Orfila, Traité de Toxicologie, t. i. p. 650.
[8] Dict. de Méd. et de Chir. Prat., t. xviii. p. 456.
[9] Ibid., p. 455. [10] Cours d'Anat. Méd., t. v. p. 434.
[11] Op. cit., p. 303. [12] Loc. cit., p. 153.
[13] Materia Medica and Therapeutics, 3d ed., p. 189.

ness, spinal meningitis and myelitis, locomotor ataxia, progressive muscular atrophy, dyspepsia, saccharine diabetes, and albuminuria. I have myself met with a case in a young man in which failure of erections was one of the earliest signs of diabetes, although the quantity of sugar in the urine was small, and the general powers of the system were not reduced. The grade of impotence in that affection, as Seegen[1] has demonstrated, is not dependent upon the amount of sugar excreted, as virility may not be impaired when the quantity is large.

In the preceding affections the form of impotence generally met with is the so-called irritable weakness, or the condition characterized by feeble erections and hasty ejaculations, which is soon followed by complete loss of erections with abolition of the sexual appetite.

Prognosis and Treatment.—When impotence arises from the excessive use of remedial agents, from saturation of the system with arsenic, lead, or other toxic substances, and from certain chronic disorders, the power of erection usually returns with the improvement in the symptoms; but when it depends upon injuries of the cerebro-spinal axis the outlook is unfavorable. When all signs of inflammation have subsided after disease or injury of the cord, and, in other cases, if the erections are insufficient after the cure of the original trouble, tonics, with a few drops of tincture of cantharides, or minute doses of phosphide of zinc, along with cold douches and galvanization of the spinal cord and testes, are indicated.

[1] Der Diabetes Mellitus, p. 112.

Sect. V. Organic Impotence.

The power of sexual intercourse may be temporarily or permanently abolished in consequence of certain congenital or acquired malformations, injuries, or diseases of the external genital organs, through which penetration is rendered impossible, or in which the loss of erection depends upon arrested secretory activity of the testes.

A.—Impotence from abnormal conditions of the penis.

α. The *malformations* of the penis, which prevent coition, are complete absence, a rudimentary condition, or division of the organ, of which vices of conformation examples have been recorded, respectively, by Goschler,[1] Fodéré,[2] and Förster.[3] A double penis, as in the case observed by Van Buren and Keyes,[4] may prevent intromission; but in the Portuguese, nineteen years of age, of whom Hart[5] gives a full account, there was considerable virile power, and the left organ was used in coition.

β. Variations in the size of the penis are causes of relative impotence. In the case of Roubaud,[6] in which the organ was only two inches long and of the circumference of the quill of a porcupine, its volume was increased and intercourse rendered practicable by a mechanical con-

[1] Prajer Vierteljahrschrift, Bd. iii., 1859, p. 89.
[2] Médecine Légale, t. i. p. 360.
[3] Klebs, Hdbch. der Path. Anat., p. 1132.
[4] Op. cit., p. 5.
[5] Lancet, vol. ii., 1865, p. 124.
[6] Op. cit., t. i. p. 160.

trivance; while in the case of Wilson,[1] in which, at the age of twenty-six, the penis and testes were scarcely larger than those of a boy of eight years, the organs acquired the usual size in twenty-four months after marriage. Nothing can be done for the stunted penis which is associated with exstrophy of the bladder. The organ may also be unfitted for use by being partially or completely buried or concealed in a large scrotal hernia, hydrocele, or elephantiasis of the scrotum, from which it may be freed by appropriate operations, or by the application of a truss if the hernia be reducible. Extreme size of the penis may also involve relative incapacity for intercourse; and inordinate bulk from elephantiasis or morbid growths of the prepuce, gland, or body of the organ, or from urethral or preputial calculi, may prevent penetration. In these lesions the prognosis is usually favorable, even if the operations for their relief necessitate the removal of the entire gland. Loss of the penis through disease or through design is irremediable.

γ. Adhesion of the penis to the scrotum, the penis palmé of the French writers, in which the former is tied down by its under surface to the latter, and is frequently incurvated, is a rare cause of impotence, but is remediable. In the more simple form of the affection liberation of the organ may be effected by division of the web of skin. When, on the other hand, the union is more considerable, and the penis is curved downwards, the combined operation of Weir[2] and Bouisson[3] holds forth excellent pros-

[1] Lectures on the Urinary and Genital Organs, p. 424.

[2] New York Med. Journ., vol. xix. p. 281.

[3] De l'Hypospadias et de son Trait. Chir., t. ii. p. 536.

pects for a good result, and is described by the former surgeon in the following terms: "An incision was made on each side of the scrotum sufficiently free from the body of the penis to afford skin enough to cover the under surface when released, and the flaps were dissected up to the penis. This constituted the first step of the operation. The second consisted in separating the urethra, with the corpus spongiosum, from the corpora cavernosa as far back as the posterior margin of the scrotum. This required but a few cuts of the scissors, as the band was only about one inch and a half long, and produced no effect upon the curvature of the penis. On stretching out the curved organ, the septum between the corpora cavernosa could be easily felt as a tense, thickened band, and its division constituted the third step in the operation. It was accomplished by a tenotomy knife, introduced, however, not so far as described by Bouisson, and cutting freely the septum in its lower part and about half way between the glans and the scrotum. Immediately after this section was made, the curve was readily abolished, and the deformity thoroughly overcome. The transverse incision made involved, however, the tissues of both corpora cavernosa, and gave rise to persistent and troublesome oozing of blood, only arrested by a ligature placed around an acupressure needle. The skin flaps were then united by a suture on the under surface of the penis, and the gaping edges of the scrotal wound brought together without tension; having, however, first carefully secured the mucous membrane of the urethra by fine sutures to the integument at the posterior angle of the wound, that is to say, at the junction of the scrotum with the perineum. The penis was laid against the abdomen,

without need of a retaining bandage, and cold water dressings were applied to the parts."

δ. *Distortion of the penis* may prevent copulation, and may be due to congenital or acquired affections of the corpus spongiosum or the corpora cavernosa.

1. The most common cause of unusual shape of the male organ, according to my observation, is *congenital shortness of the corpus spongiosum*, which acts like the string of a bow, and keeps the penis bent downwards towards the perineum. In a few examples, this is the only deformity; but in the majority there is a slight degree of hypospadias, and the gland is somewhat flattened. I have myself met with impotence from this cause in two instances, and have seen at least a dozen additional cases in the practice of Professor Gross and Professor Pancoast.

For the relief of this condition, the operation of cutting a wedge out of the corpora cavernosa, which was devised by Physick,[1] and which has been successfully practised by Gross, Pancoast, Furneaux Jordan,[2] of Birmingham, and myself, is attended with the most gratifying results. The skin of the dorsum of the penis, behind the gland, having been pinched up and divided transversely by transfixing its base, a V-shaped portion, embracing about two-thirds of the thickness of the corpora cavernosa, and of sufficient length to remedy the deformity, is excised by carrying the bistoury first from behind forwards, and then from before backwards, the second incision being made about a quarter of an inch behind the head of the penis.

[1] Gross's Surgery, 5th ed., vol. ii. p. 872.

[2] Lancet, vol. i., 1876, p. 169.

The arteries, two or three in number, having been secured by fine ligatures, the edges of the wound are approximated by three silver sutures, one of which is carried through the cut surfaces of the septum, and the other through the sides of the tunica albuginea, the edges of the wound of the skin being brought together separately. The penis is then supported upon a splint and kept covered with cold water, and the stitches are removed in eight or ten days. For some days previous to the operation, full doses of bromide of potassium should be administered, with the view to prevent erections.

2. Vicious direction of the penis is generally due to the formation of *circumscribed plates or lumps of induration in the erectile tissue and fibrous sheath of the corpora cavernosa*, an affection which was first described by La Peyronie,[1] and subsequently by Boyer,[2] Kirby,[3] Johnson,[4] Galligo,[5] Cruveilhier,[6] Gross,[7] Hewett,[8] Van Buren and Keyes,[9] Curling,[10] Scholz,[11] and other observers. The areas of induration are usually single, and confined to one of the cylinders, although, as in several examples recorded by Kirby and Galligo, they may be multiple, and be scattered throughout the organ; and, as in a case observed by

[1] Mém. de l'Acad. Roy. de Chir., t. i. 1819, p. 316.
[2] Traité des Mal. Chir., t. vi. p. 802.
[3] Dublin Med. Press, Oct. 3, 1849, p. 209.
[4] London Lancet, vol. ii. 1851, p. 481.
[5] Gaz. Méd. de Paris, 1852, p. 440.
[6] Anat. Path., t. iii. p. 593.
[7] Op. cit., vol. ii. pp. 871 and 895.
[8] British Med. Journ., Feb. 1872.
[9] New York Med. Journ., vol. xix. p. 390, and op. cit., p. 24.
[10] Op. cit., p. 462.
[11] Schmidt's Jahrb., Bd. cii. p. 33.

Curling, they may be associated with a similar lesion of the corpus spongiosum. Their consistence varies, but it is usually hard and cartilaginous. As the natural result of the obliteration of the meshes of the erectile tissue, the organ, during erection, deviates towards the lesion, so that it may be drawn upwards, downwards, or to either side, thereby materially interfering with coition, if not rendering that act impracticable. In one case reported by Van Buren and Keyes, the penis curved almost to a right angle, and in others it assumed a spiral form.

The affection is almost always met with after middle life, but its etiology is obscure. Of twenty-five examples which I have collated, in ten the cause could not be determined; in seven it was connected with the gouty diathesis; in four it resulted from injury during coition; in three it was ascribed to gonorrhœa; and in one it arose from a violent erection. Kirby, Curling, and Hewett believe that it is connected with gout; Gross has met with it most frequently in men who have committed venereal excesses; while others think that it usually arises from extension of gonorrhœal inflammation.

Of the intimate nature of the lesion, nothing is accurately known, as the condition has not been verified by post-mortem inspection. Hewett supposes that the nodules arise from clots of blood in the meshes of the corpora cavernosa; Van Buren and Keyes think that they depend essentially upon chronic inflammatory plastic obliteration of the meshes; and Klebs[1] teaches that they are the result of a combination of inflammation and thrombosis.

[1] Hdbch. der Path. Anat., p. 1152.

ε. Closely allied to the preceding affection is *cicatricial induration of the corpora cavernosa*, the effect of injury, abscess, or destructive inflammation. Thus, Curschmann[1] relates a case of upward and lateral deviation of the penis from an induration resulting from forcing the erect penis downwards. Baudens[2] records an example of gunshot wound of one corpus cavernosum, with lateral curvature. Johnson[3] met with an instance of distortion from abscess of the right corpus cavernosum; and he also describes a case in which the glans penis came in contact with the left side of the pubes from burrowing phagedæna.

ζ. *Gummata of the corpora cavernosa*, of which condition Ricord[4] has given a good description, are not infrequently attended with faulty curvature of the penis; but, as they do not evince any tendency to break down, they are indistinguishable from the patches of induration resulting from other causes.

η. *Calcification of the septum pectiniforme, or the corpora cavernosa* may give rise to impotence from upward or downward curvature of the penis. In the case of a man, fifty-two years of age, McClellan[5] relieved the deformity by removing a so-called ossified septum by an incision which extended throughout the entire length of the organ; and Regnoli[6] also restored the power of normal erection

[1] Loc. cit., p. 886.
[2] Clinique des Plaies d'Armes à Feu, p. 408.
[3] Loc. cit., p. 574.
[4] Bumstead and Taylor, Venereal Diseases, 4th ed., p. 639.
[5] Lancet, vol. i., 1828, p. 714.
[6] Petrequin, Brit. and For. Med. Rev., vol. xx. p. 136.

by excising the ossified portion, which did not include the entire thickness of the cylinders.

When distortion of the penis arises from gummata, the prospect of relief from the administration of iodide of potassium and bichloride of mercury, and from friction with mercurial ointment, is favorable. The induration resulting from laceration, or so-called fracture, of the corpora cavernosa is irremediable. The prognosis in circumscribed patches of these bodies is notoriously unfavorable, as the only cure from general measures, of which I have any knowledge, is that obtained by Scholz by the application of tincture of iodine, plaster of Vigo, and warm douches; although Curling[1] records a case in which the hardness nearly disappeared, and in which the erections were almost normal, by the internal administration of biniodide of mercury and by the local use of tincture of iodine. In a case narrated by Friedberg,[2] an induration of the corpus cavernosum as large as a hazel-nut was made to disappear by inserting a seton under the skin, and permitting it to remain in contact with the tunica albuginea for one month. Boyer and Gross recommend excision of the patches, a practice which I myself would follow if they were single, and of moderate volume. When the curvature depends upon calcification of the corpora cavernosa or its septum, the outlook is far better, since the removal of the offending substance, as in the cases of McClellan and Regnoli, is followed by the most gratifying results. After a shot wound of the right corpus cavernosum, which terminated in a hard, depressed, and adherent cicatrix,

[1] Op. cit., p. 464. [2] Prajer Vierteljahrschrift, Bd. i. 1862, p. 20.

Baudens succeeded in effecting a cure by making two incisions in the opposite cylinder, on a level with the upper and lower extremities of the scar, and exciting suppuration by the insertion of tents, through which manœuvre a compensating induration was obtained, and the curvature was remedied.

θ. The power of erection may be lost in consequence of the permanent *retention of a ball in the corpus cavernosum*, of which curious condition I have recorded an example.[1] The missile was encysted in the right cylinder, and its point presented towards the pubes, from which it was separated about one inch; but the man refused to have it removed.

ι. Impotence may depend upon congenital or acquired *shortness of the frenum*, through which the head of the penis is distorted; and coition is abstained from on account of the suffering with which the act is attended. The proper remedy is division.

κ. Finally, insufficient erections are occasioned by *varix of the dorsal vein* of the penis. In a case of this description, Parona[2] effected a rapid cure by the intravenous injection of equal parts of chloral and water; and Bartholow[3] states that he has obtained excellent results from the hypodermic injection of ergotine in the immediate vicinity of the enlarged and tortuous vein.

[1] Med. and Surg. Hist. of the War of the Rebellion, Part II., vol. ii. p. 345.

[2] Annales de Derm. et de la Syph., t. v. p. 453.

[3] Op. cit., p. 295.

B.—IMPOTENCE FROM DEFECTS AND DISEASE OF THE TESTES.

α. *Congenital bilateral anorchidism*, or absence of the testes, of which condition examples are quoted in the chapter on sterility, is necessarily attended with absolute impotence. *Cryptorchids*, or persons in whom the organs are retained in the abdomen or the groins, are on the other hand generally potent, although they are only exceptionally fertile; and arrest of development, as a rule, diminishes virility.

β. *Loss of the testes* from disease, self-mutilation, or surgical interference is presumptive of inability to copulate, although in exceptional cases the erections may continue for a considerable time, as is exemplified in the following instances.

Sir Astley Cooper removed the testis of a man two years after the other had been excised. For the first twelve months he had connections. At the end of two years the erections were more rare and imperfect, and they usually ceased under attempts at congress. Ten years subsequently he stated that he had had intercourse only once during the previous year; and twenty-eight years after the operation the penis was shrivelled and wasted, and for many years coition had been impossible.

Mr. Wilson[1] removed both testes for malignant disease, and the man survived the operation two years. He had occasional erections, and intercourse was attended with the usual feeling and with the ejaculation of some fluid.

[1] Lectures on the Urinary and Genital Organs, p. 133.

Professor Humphry[1] met with a man who had submitted to castration on account of nervous troubles, but who was able to have connections with an emission for more than a year, although less frequently than before the mutilation.

Mr. Curling[2] removed the right testis of an officer seven years after the excision of the left testis by another surgeon. At the expiration of four years and a half from the operation the officer informed Mr. Curling that he had intercourse with his wife about once a fortnight, but without an ejaculation.

γ. Progressive atrophy of the testes is very liable to be attended with impotence; and Liégeois[3] found that the power of erection was diminished in four cases out of six of atrophy of one organ.

δ. Bilateral syphilitic orchitis generally involves impotence;[4] while of forty-one examples of *double epididymitis* analyzed by Liégeois[5] and Gosselin[6] virility was diminished in only eight.

ε. Tumors, as carcinoma, and sarcoma, and *tubercle*, when they completely destroy or disorganize the parenchyma of the testes, are also attended with impotence; but the statement does not hold good when one organ alone is affected.

[1] Holmes's System of Surgery, 2d ed., vol. v. p. 160.
[2] Op. cit., 4th ed., pp. 307 and 450.
[3] Annales de Derm. et de la Syph., t. i. p. 437.
[4] Liégeois, loc. cit., p. 431.
[5] Ibid., p. 424.
[6] Archives Générales, sér. 5, t. ii. p. 267.

The power of erection after having been lost may usually be restored, when it depends upon syphilitic orchitis, by mercurial inunctions and the exhibition of iodide of potassium and bichloride of mercury. Arrest of development of the testes is sometimes overcome by the influence of sexual desires, as in the interesting example recorded by Wilson,[1] in which, at the age of twenty-six, the glands were not larger than those of a child, but in which they increased almost to the volume of those of an adult man two years after marriage. In all the remaining causes of impotence from lesions of the testes the trouble is beyond relief.

[1] Op. cit., p. 424.

CHAPTER II.

STERILITY.

Sect. I. General Observations.

The generative act on the part of the male implies the completion of sexual congress with an ejaculation of fertile semen, and its deposition in the upper part of the vagina. As we have already seen, the capacity for copulation depends upon the perfect erection of the penis, the failure of which renders the man sterile from impotence. Sterility, on the other hand, not only does not include impotence, but is usually met with in subjects who are vigorous in intercourse, and who ejaculate a fluid which, in the absence of minute examination, presents all the properties of normal semen. Hence it is difficult for these subjects to realize that they are the cause of barren marriages.

For a proper understanding of the alterations which the semen undergoes in disease, I consider it requisite to preface the consideration of sterility with a summary of the most important attributes of the normal fluid.

Semen is the mixed product of the secretions of the testes, vasa deferentia, seminal vesicles, sinus pocularis, prostate, Cowper's glands, and the mucous follicles of the urethra. The thick, white, pasty secretion of the seminiferous tubes consists mainly of spermatoblasts, or seminal cells, out of which the spermatozoa, or fertilizing elements, are developed; but the spermatozoa first make their appearance in the rete testis, and constitute at least

nine-tenths of the glutinous mass. In the epididymes and vasa deferentia the zoosperms are perfectly motionless from the density of the medium in which they are contained; but when they have reached the seminal vesicles they are in active rhythmical undulating motion. These facts are noticed because some authors have erroneously based their conclusions in regard to the productiveness of the semen upon minute examination of the parenchyma of the testes and the epididymes, or situations in which spermatozoa are only forming, or in which they have as yet not acquired mobility.

The fluid contained in the seminal vesicles is odorless, viscous, and colorless, resembling fresh honey, heavier than water, of neutral reaction, and does not coagulate. When, however, it is incorporated with the secretions of the prostatic and urethral glands, semen has an albuminous consistence, a whitish or opalescent tint, and an alkaline reaction, and it emits a peculiar faint odor which is not unlike that of the raspings of fresh horn or bone. After ejaculation it is transformed into a gelatinous mass, but it becomes more fluid after exposure to the air for a few minutes.

From the preceding considerations it is obvious that, while the testes furnish the fecundating elements of the semen, the secretions of the associated glands, and particularly the secretion of the prostate, not only render it more thin and abundant, but also impart to it its color, odor, alkalinity, and coagulability. The prostatic fluid, moreover, has a more important function than that of serving as a vehicle for the transmission of the spermatozoa to the uterus, since Kraus[1] has shown that, in its

[1] Medical Times and Gazette, vol. i., 1871, p. 170.

absence, these bodies cannot live in the uterine mucus, but that, with its aid, they often survive more than thirty-six hours, or even for eight days and a half, as has been demonstrated by Percy,[1] of New York.

As early as 1856 Dr. Marris Wilson[2] assigned the same purpose to the secretion of the prostate, and regarded the neutral phosphate of lime contained in that fluid as the element upon which the vitality of the spermatozoa depends, since it protects them against destruction by the too acid or too alkaline conditions of the secretions of the passages through which they have to pass in their progress to the ovum.

If the ejaculated semen be permitted to stand in a test tube for a few hours, it will separate into two layers, of which the upper one, or the liquor seminis, is thin, whey-like, and transparent, and contains a few epithelial cells derived from the seminal passages and detritus, while the lower one is thick, white, opaque, and consists of spermatozoa. From the thickness of the sediment, and the rapidity of its precipitation, Ultzmann[3] states that a conclusion may be drawn in regard to the number of spermatozoa in any given specimen, as will be pointed out in the consideration of azoospermism from abnormal conditions of the semen.

A drop of semen discloses under the microscope, as in fig. 12, the male elements of generation, or spermatozoa, which are constituted by a pyriform, flattened head, an intermediate portion, or the beginning of the tail, and a

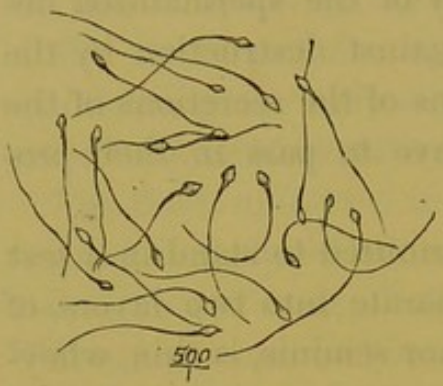
[1] Sims, Uterine Surgery, p. 374.

[2] Lancet, vol. ii., 1856, p. 483.

[3] Wiener Klinik, May and June, 1879, p. 153.

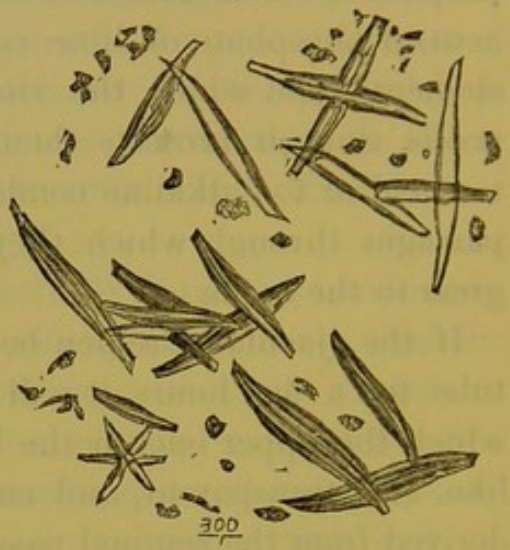
long, tapering, filiform tail, which is in rapid undulating motion, and which propels the head directly forwards. These movements should continue at least twelve hours after the fluid is ejaculated. If they are wanting, and

Fig. 12.



Spermatozoa.

Fig. 13.



Spermatic crystals.

the spermatozoa are alive, as may happen when the semen is too thick, motion may be excited by the addition of weak alkaline solutions; but if they remain motionless under this treatment they are incapable of impregnating the ovum.

Minute examination of semen which has been allowed to dry on an object glass, or of the lower layer which forms after the secretion has stood for some time, shows, on the second or third day, at first a few and later a considerable number of transparent, variously modified rhombic prisms with their bases in apposition; the ends of these occasionally terminate in fine points, but usually in rhombi, as in fig. 13. They were discovered by

Van Deen[1] and Boettcher,[2] the latter of whom termed them spermatic crystals, and regarded them as being composed of albumen. Ultzmann, however, says that they consist of phosphate of magnesia, while other observers regard them as being composed of ammonio-magnesian phosphate, a view in which I coincide, and which is verified by fig. 16. Ultzmann[3] has directed attention to the fact, which has been confirmed by Rosenthal's[4] and my own investigations, that the early and abundant formation of these crystals denotes a diminution of the number of the spermatozoa or their entire absence; and Fürbringer,[5] from an examination of the contents of the seminal vesicles and the prostatic fluid of fifty-six bodies, and of the prostatic secretion derived from twenty healthy persons, has demonstrated that the crystals occur exclusively in the latter, and that they indicate functional activity of the glands of the prostate.

Semen begins to be secreted at the epoch of puberty, and continues to be formed until an advanced age, although the sexual power is usually lost after the sixty-fifth year. Liégeois[6] examined the ejaculated fluid of eight young persons, and found abundant spermatozoa in two at fourteen years, in four at sixteen years, and in two at eighteen years. Previous to the researches of Duplay[7] in 1852, and of Dieu[8] in 1867, the opinion was very

[1] Ctrbl. für die Med. Wiss., 1864, p. 355.
[2] Virchow's Archiv, Bd. xxxii. p. 535.
[3] Loc. cit., p. 154.
[4] Wiener Klinik, May, 1880, pp. 137, 139, and 149.
[5] Ctrbl. für die Med. Wiss., 1881, p. 19.
[6] Medical Times and Gazette, vol. ii., 1869, p. 247.
[7] Archives Générales, sér. 4, t. xxx. p. 385.
[8] Journ. de l'Anat. et de Phys., 1867, p. 449.

general that the semen of old persons was as infertile as was that of impubic boys, although Wagner[1] had noted the presence of spermatozoa in sexagenarians and septenarians, and Curling[2] and Casper[3] had met with them, respectively, at eighty-seven and ninety-six years. That old men in the enjoyment of good health are as able to produce zoosperms as younger men is shown by the investigations of Liégeois,[4] who discovered them in every examination, thirteen in number, of the fluid emitted by that class of persons. When death, however, occurs from decrepitude, or without any organic lesions except those which are common to advanced age, Dieu found that the fluid of the seminal vesicles contained spermatozoa in only six, or twenty-three per cent., of twenty-three examinations. From these observations we may conclude that the secretion of semen continues to be formed in healthy old men, but that it is very liable to cease in decrepitude. These facts and the production of semen in disease will receive full attention in the succeeding section.

Classification.—Sterility includes, first, azoospermism, or the condition in which either no semen whatsoever, or unproductive semen, is secreted; secondly, aspermatism, in which spermatic fluid is not ejaculated; and, thirdly, misemission, or the failure to deposit fertile semen in the upper portion of the vagina. In the first variety intercourse and ejaculation are natural, but the essential anatomical elements are absent or dead, either because they

[1] Histoire de la Génération, p. 31.
[2] Op. cit., p. 432.
[3] Forensic Medicine, Syd. ed., 1864, p. 292.
[4] Loc. cit., p. 247.

are not formed or are imprisoned behind an obstacle seated in the epididymes or vasa deferentia, or because they are unable to live in the medium in which they are suspended. In the second variety the ability to copulate is unimpaired, but the power to ejaculate is prevented by an impediment situated between the seminal vesicles and the urinary meatus. In the third variety coition and emission are perfect; but fruitful semen fails to reach its proper destination, in consequence of congenital deficiencies of the urethra, or of fistulous openings in that canal resulting from inflammation, or of abnormal positions of the meatus.

Relative Frequency.—It is not at all uncommon for physicians to assume that a man who is potent, and who is able to ejaculate, is capable of procreating. As a result of the omission to examine the emitted fluid, and carefully to explore the male organs, little is known of the relative frequency of sterility in the two sexes; and gynecologists, with the exception of those mentioned below, do not appear to have made any contributions to the solution of this important subject. I have been able to collect one hundred and ninety-two cases in which examination of both the husband and the wife demonstrates that the former was at fault in thirty-three, or in seventeen per cent. Of this number Manningham[1] records one in thirty; Pajot[1] seven in eighty; Mondot one in ten;[1] Kehrer[2] fourteen in forty; Courty[3] one in ten; Noegge-

[1] Wiener Med. Blätter, 1879, pp. 1223 and 1271.

[2] Beiträge zur Klin. und Exper. Geburtskunde und Gynækologie, Bd. ii. p. 76.

[3] Wiener Med. Presse, 1880, p. 252.

rath[1] eight in fourteen; and I myself have found that the male was deficient in one example in eight. The cause of the sterility was azoospermism in thirty-one, and aspermatism in two. These facts show that the husband is at fault in about one case out of every six; and they convey information which should be carefully weighed before the practitioner even resorts to inspection of the female organs of generation.

Sect. II. Azoospermism.

Azoospermism may be due, first, to congenital bilateral anorchidism; secondly, to congenital bilateral deficiencies of the epididymis or vas deferens; thirdly, to cryptorchidism; fourthly, to affections of the testes; fifthly, to obliteration or obstruction of the epididymes or vasa deferentia; and, sixthly, to abnormal conditions of the semen. Hence, the affection may be congenital or acquired, and absolute or relative.

A.—BILATERAL ANORCHIDS.

Men born without testes are not only azoospermous, but, from the fact that the accessory secreting organs are rudimentary, they are unable to ejaculate a drop of any kind of fluid. From a study of four cases, Godard[2] found

[1] Trans. Amer. Gynec. Soc., vol. i. p. 287.

[2] Note sur l'Absence Congéniale du Testicule. Mémoires de la Soc. de Biologie, 1859, p. 311.

that persons in this condition resemble eunuchs mutilated early in life. They have no venereal desire, and although they may have, as an exception, erections, they are absolutely impotent and sterile. It is important to bear in mind that a distinction may be made between anorchids and cryptorchids, when the testes are retained in the abdomen, as the latter are apt at coition, and emit a fluid which is, however, as a rule, devoid of spermatozoa.

B.—CONGENITAL BILATERAL DEFICIENCY OF THE EPIDIDYMIS AND VAS DEFERENS.

Double deficiencies of the excretory apparatus of the testes prevent the elimination of the secretion of the latter, and render them useless. Rhodius[1] met with an instance of absence of the epididymes in an adult; and John Hunter[2] dissected a body in which, while the testes were normal and were contained in the scrotum, the epididymes and vasa deferentia were deficient, and the seminal vesicles did not communicate with the urethra. Although the state of the genital functions in these cases must remain a matter of conjecture, there is no reason for believing that a mere deficiency of the excretory passages between the testes and seminal vesicles engenders impotence and incapability of ejaculation, provided the seminal vesicles, ejaculatory ducts, and the prostate are normal, as, under these circumstances, the condition would not be worse than that of imprisonment of the secretion of the testes by acquired obstruction of the vasa deferentia.

[1] Quoted by Godard in his Note sur l'Absence Congéniale du Canal Excréteur et du Réservoir de la Semence, le Testicule Existant. Ibid., p. 335.

[2] Works by Palmer, vol. iv. p. 23.

C.—FAILURE OF THE TESTES TO DESCEND INTO THE SCROTUM.

When the testes fail to descend into the scrotum, and are retained in the abdomen or the groins, they are generally small and undeveloped, and now and then atrophied through fibrous or fatty degeneration. As a result of these malpositions and morbid changes, cryptorchids were, up to a comparatively recent date, declared to be absolutely sterile, although they were known to enjoy the capacity for copulation and ejaculation. Opposed to this opinion, which was maintained by Follin,[1] Gosselin,[2] Godard,[3] Liégeois,[4] and formerly by Curling,[5] are the instances recorded by Poland,[6] Cock,[7] Durham,[8] and Debrou,[9] of married cryptorchids who had procreated children. It is highly probable that fecundation in these cases was due to another source, a supposition which is strengthened by the fact that spermatozoa were not observed in the patient of Debrou after death from strangulated hernia, and that the ejaculated fluid does not appear to have been minutely examined in the others; and there is other evidence which proves that the retained testes may perform their functions. Thus, Beigel[10] nar-

[1] Archives Générales, Ser. 4, t. vi. p. 257.
[2] Ibid. sér. 5, t. ii. p. 268.
[3] Études sur la Monorchidie et la Cryptorchidie, p. 143.
[4] Medical Times and Gazette, vol. ii. 1869, p. 248.
[5] Brit. and For. Med.-Chir. Rev., April, 1864, p. 495, et seq.
[6] Guy's Hospital Reports, sér. 2, vol. i. p. 162.
[7] Curling, op. cit. 4th ed., pp. 470 and 471.
[8] Ibid. [9] Ibid.
[10] Virchow's Archiv, Bd. xxxviii. p. 144.

rates the case of a man, two-and-twenty years of age, whose testes were situated in the groins, and whose emitted semen disclosed spermatozoa; and Vallette[1] found those bodies in the vas deferentia of an inguinal cryptorchid.

On the whole, the evidence in regard to cryptorchids shows that while, as a rule, they are potent, and ejaculate a fluid which is devoid of spermatozoa, exceptional instances indicate that they may be fertile. This opinion is held by Casper;[2] but the question of fecundity should always be determined by microscopical examination of the ejaculated semen of such persons when they are contemplating matrimony.

D.—AFFECTIONS OF THE TESTES.

Disorders of the testes are liable to be accompanied with temporary or permanent absence of the spermatozoa. In six cases of bilateral atrophy Liégeois[3] found that those bodies were greatly diminished; and they are not formed when the wasting is excessive. The only instances in which the semen has been examined in the latter condition, of which I have any knowledge, are three recorded by Curling,[4] and one by Laborde and Cousrem;[5] and spermatozoa were absent in all. Simple parenchymatous orchitis, and total disorganization of the substance of the testes, from whatever cause they may arise, are followed by absolute azoospermism. Partial

[1] Pitha und Billroth's Handbuch, Bd. iii., Abth. ii., Lief. 7, p. 419.
[2] Forensic Medicine, Syd. ed., 1864, p. 256.
[3] Loc. cit., p. 541.
[4] Op. cit., pp. 69 and 83.
[5] Comptes Rendus de la Société de Biologie, 1859, p. 248.

destruction by malignant, tubercular, cystic, and other new formations, on the other hand, does not necessarily occasion sterility. Syphilitic orchitis, when pronounced, generally abolishes the functions of the organs, but spermatozoa may return under proper treatment. It need scarcely be added that loss of the testes, as from castration, renders the subject permanently azoospermous, although he may for a certain time ejaculate the fluid of the accessory glands, a phenomenon which is referred to on page 78.

Godard[1] has called attention to the singular fact, which he confirmed by examination of the ejaculated semen and of the contents of the seminal vesicles, that one tubercular testis renders the subject absolutely sterile; and, what is more astonishing, he found that the azoospermism preceded the development of the tubercular affection from one to two years. Hence he utilizes this condition for the differential diagnosis between unilateral tubercular orchitis and ordinary orchitis, in the latter of which fertile semen is secreted.

E.—BILATERAL OBLITERATION OF THE EPIDIDYMIS AND VAS DEFERENS.

By far the most frequent and important of the causes of azoospermism is bilateral obliteration of the epididymis and vas deferens, through which the proper secretion of the testes is confined and is prevented from reaching the vesiculæ seminales and the urethra, and the ejaculated fluid is of necessity deprived of spermatozoa. Oblitera-

[1] Ante.

tion of the seminal passages, as Gosselin[1] first pointed out, is usually due to gonorrhœa, when it is, with few exceptions, confined to the epididymes, the vasa deferentia alone being rarely involved. I am not aware that it has ever been traced to traumatic inflammation, as wounds and contusions are generally limited to one side. Tubercular deposits in the epididymes not uncommonly occasion sterility; and a few examples are recorded of azoospermism from bilateral sarcomatous or carcinomatous degeneration of the epididymis. I have myself witnessed the same result in a case of double syphilitic epididymitis, the indurations having made their appearance on the seventy-second day after the first observation of the initial lesion.

A most important inquiry in connection with obliterations of the excretory apparatus of the testes is, whether the functional activity of the opposite gland is abrogated when the lesion is confined to one side. Liégeois[2] found in thirteen examinations of the discharge of persons affected with unilateral epididymitis that the number of spermatozoa was greatly diminished; and he refers to three cases of Hirtz, Duplay, and Gosselin in which the spermatic fluid was entirely devoid of those bodies. As the same occurrence is witnessed in tubercular epididymitis of one side, Liégeois believes, and Ultzmann[3] agrees with him, that the testes are so closely united by reflex ties that unilateral epididymitis may abolish the functions of the opposite gland and thereby produce sterility. This conclusion is supported by five cases of unilateral

[1] Archives Générales, sér. 4, t. xiv. p. 406, and t. xv. p. 40, and sér. 5, t. ii. p. 257.

[2] Loc. cit., p. 541.

[3] Wiener Klinik, 1879, p. 156.

epididymitis in which spermatozoa were entirely absent, recorded by Kehrer;[1] but it is utterly at variance with observations based upon analogous conditions. Duplay, for example, has recorded six instances of obliteration of one vas deferens with spermatozoa in the epididymis of the opposite side; and Godard shows that congenital absence of one excretory duct, or even of one testis, exerts no effect upon the generative functions.

In bilateral gonorrhœal epididymitis the inflammatory new material may be seated in the interior of the canals, in their walls, or in the interstitial connective tissue, and the resulting obstruction or induration is very liable to be permanent and incurable, since, of eighty-three cases recorded by Gosselin, Godard, and Liégeois,[2] the spermatozoa returned in only eight. The testes themselves continue to secrete and preserve their normal volume and appearances, and as the subjects ejaculate they are not aware that they are sterile. Liégeois found in twenty-one instances that impotence was present in eight; but of twenty cases observed by Gosselin all were thoroughly potent. The former[3] states that the ejaculated fluid is rarely milky white, as in the normal condition, and that it possesses a yellowish tint when leucocytes are present in large numbers; while Gosselin[4] could not trace any variations from the natural color, quantity, odor, and consistence. In a case of azoospermism from double epididymitis, Nepveu[5] found that the discharge contained hyaline cylinders which were casts of the vasa deferentia,

[1] Op. cit., pp. 79 and 82.
[2] Loc. cit., p. 380.
[3] Loc. cit., p. 511.
[4] Archives Générales, sér. 5, t. ii. p. 267.
[5] Gazette Médicale de Paris, 1874, p. 32.

and which frequently attained a length of from three to five centimetres.

F.—ABNORMAL CONDITIONS OF THE SEMEN.

The quality and composition of the ejaculated seminal fluid are liable to be materially altered by sexual excesses, by various exhausting diseases, and by inflammatory conditions of the epididymes, vasa deferentia, seminal vesicles, and prostate, which are entitled to a detailed examination.

a. Temporary absence of the spermatozoa may be induced, in perfectly healthy men, by *sexual excesses*, and the frequent repetition of the act of coition renders the semen more and more watery and scanty, so that it consists merely of the secretions of the accessory glands. In the case of a medical student, recorded by Liégeois,[1] who indulged in three or four connections daily for ten successive days, repeated examinations of the emissions demonstrated the complete absence of spermatozoa. Some months later, after an abstinence of three weeks, they were detected in large numbers. The case of Casper[2] is so interesting in this respect that it is quoted entire: "A vigorous naturalist, sixty years of age, a married man, and father of a large family, and accustomed to the use of the microscope, whom I had interested in this question, examined with me for some time continuously his own semen after coitus. Here we found the greatest variations, which were accurately noted by both of us together. After coitus on the third day,

[1] Loc. cit., p. 247. [2] Op. cit., p. 292.

reckoning from the last performance of the act, there was a large number of very small spermatozoa; after renewed coitus on the fourth day, few and small; after a pause of only two days, none; after a pause of only one day there was only a watery sperma, in which no zoosperms were found. At another time, on the fifth day after the last coitus, the zoosperms were very numerous; another time, after a pause of six days, they were few, but large in size; four months after the last examination, and seventy-two hours after the last act, the zoosperms were comparatively very small, and at another time, on the third day after the last act, they were innumerable. Immediately after coitus, and before emptying the bladder, the urethra was twice examined. Twenty-four hours after the last act, a drop passed out of the urethra exhibited numerous small zoosperms; at another time, after a three days' interval, there was not a single zoosperm."

Permanent absence of the spermatozoa is said to occur now and then as an idiopathic affection. The only cases bearing upon this point, of which I have any knowledge, are those narrated by Hirtz.[1] Two young, robust, married, but childless men, performed coition with unusual vigor. The ejaculations were never followed by the sense of fatigue so generally experienced after intercourse, and the fluid was void of spermatozoa. While it is impossible to explain these cases satisfactorily, I am inclined to believe that the "unusual vigor" which they displayed points to their having indulged too often in proportion to their powers, and that they are to be classed among the cases of azoospermism from sexual excesses.

[1] Gazette de Strasbourg, No. 5, 1861.

β. One of the most common causes of infertile semen is *nervous exhaustion* or neurasthenia, attended with abnormal seminal and prostatic discharges, and with various degrees of impotence. This condition is usually brought about by onanism, venereal excesses, or ungratified desires, and may be regarded as an exaggerated or advanced stage of the preceding variety of azoospermism. As a result of impaired nutrition, induced by perverted innervation, the secretory activity of the testes is interfered with, and either the evolution of the spermatozoa is arrested, or their number and their activity are diminished. In addition to this factor, it is highly probable that the zoosperms are unable to exist in the altered prostatic fluid, since the microscope shows that they are motionless, and thereby confirms the view of Kraus and Wilson, to which allusion has already been made in the study of normal semen, that the vitality of the spermatozoa is dependent upon the presence of the healthy secretion of the prostate.

The investigations of Rosenthal,[1] Ultzmann,[2] and Curschmann[3] demonstrate that, when potence is as yet little affected, and pollutions are merely beginning to overstep the natural limits, the ejaculated fluid is unchanged. When the pollutions are more frequent, and there are diurnal discharges, the spermatozoa are smaller and more scanty; their movements are less active than in the normal condition, are liable to be abolished in less than an hour, and are incapable of being reawakened by

[1] Wiener Klinik, May, 1880, p. 137.

[2] Wiener Med. Presse, 1876, p. 599.

[3] Ziemssen's Cyclopædia, Amer. ed., vol. viii. p. 852.

alkaline solutions. Spermatic crystals, moreover, form more rapidly, and in greater abundance than in health. In the worst cases, or in those characterized by diurnal and nocturnal pollutions, and by the presence of semen in the urine, the spermatozoa are either entirely absent, or, if they are present, they are motionless, stunted, or variously deformed. In these advanced instances the semen is frequently seen to have undergone fatty degeneration, as indicated by granular epithelium, by molecular detritus, and even by oil globules in the protoplasm of the altered spermatozoa. Spermatic crystals are also abundant, and appear quickly.

These observations are in accord with those of Lallemand;[1] and I have been able to confirm them by the few examinations that I have made, to which I allude in the succeeding chapter, and of which the following case is a good illustration :—

Case XXI. A commercial traveller, forty-five years of age, who had masturbated a great deal in his youth, and who had contracted gonorrhœa twenty years before I saw him, states that he has been constantly annoyed for the last two years by a discharge which is increased by straining at stool, and by toying with women without gratifying his passions, a practice in which he indulged, as he feared to have sexual congress on account of feeble erections. I detected a stricture, calibre 19, at five inches and a half from the meatus, along with a granular patch immediately behind the coarctation, and hyperæsthesia of the prostatic urethra. On withdrawing the explorer, the bulb brought away a considerable gelatinous discharge, which, under the microscope, presented a few pus corpuscles, granular epithelium and detritus, and a few motionless

[1] Op. cit., 3d Amer. ed., Phila., 1858, p. 265.

and deformed spermatozoa, several of which were occupied by fat globules. On examining the slide a few hours subsequently, I also discovered numerous spermatic crystals.

Fatty degeneration of the spermatozoa has also been observed by Bianchi[1] as rod-like bodies made up of shining points, which disappeared on the addition of ether.

In a case of impotence from masturbation, complicated by spermatorrhœa, Heitzman[2] found that the heads of the zoosperms were not much wider than the tails, and that their movements were very feeble.

γ. The relation of general diseases to anomalies of the semen is a subject in regard to which widely different views are entertained. While there is no reason for believing that acute maladies impair the fertility of the semen of adults, it is quite certain that both acute and chronic affections of old age, and chronic diseases in the adult not infrequently lead to a suspension of the evolution of spermatozoa.

The investigations in this direction have been confined almost exclusively to consumptives, in whom, as is well known, the parenchyma of the testes is usually very moist, pale, and anemic, and in whom the epithelium of the tubules has not uncommonly undergone fatty degeneration. The frequency of azoospermism in phthisis, despite the changed condition of the testes, has, however, been greatly exaggerated. Lewin,[3] Davy,[4] Duplay,[5] and

[1] Schmidt's Jahrbücher, Bd. clxxxi., 1879, p. 38.
[2] New York Med. Journal, August, 1879, p. 158.
[3] Deutsche Klinik, 1861, p. 319.
[4] Edinb. Med. and Surg. Journ., July, 1839, p. 1. [5] Ante.

Dieu[1] examined the secretion of the epididymes, vasa deferentia, and vesiculæ seminales of thirty-five persons dead of pulmonary tubercle, and found spermatozoa in twenty-three, or 65.7 per cent.; and in thirteen inspections of the fluid at the orifice of the urethra, or pressed out of that passage, Lewin discovered zoosperms in eight. Hence, the semen contained fertile elements, and usually as numerous as in healthy persons, in thirty-one, or 64.5 per cent., of forty-eight subjects dead of phthisis; and what is remarkable is the fact that they were present in 62.5 per cent. of the semen of old persons, and in 65 per cent. of that of adults principally between thirty and forty years of age. Curling[2] was unable to detect spermatozoa in the fluid obtained from the substance of the testes and epididymes of the consumptive patients; but it is to be noted that the contents of the vesiculæ seminales were examined in only several of the cases, instead of in all. If these imperfect investigations be admitted into the inquiry, the ratio is reduced to 50 per cent.; but, even with this reduction, it will be seen that the semen of consumptives contains zoosperms far more frequently than certain writers would lead us to believe. Godard was of the opinion that spermatozoa were absent in persons who had become consumptive at the age corresponding to the establishment of the spermatic secretion; but that they persisted when tuberculosis began after that period.

That acute and chronic diseases do impair the fertility of the semen of persons advanced in life is well shown by the investigations of Duplay and Dieu, since of 156 in-

[1] Ante. [2] Op. cit., p. 452.

stances in which the fluid contained in the vasa deferentia or vesiculæ seminales of old men was examined, spermatozoa were found only in one-half. Dividing the cases in accordance with the periods of life—

Of 25 sexagenarians	spermatozoa	were	discovered	in 17, or 68 per ct.
" 76 septenarians	"	"	"	42, " 59.2 "
" 51 octogenarians	"	"	"	19, " 37.2 "
" 4 nonagenarians	"	"	"	0.

In none were they present after the age of eighty-six, and they decreased pari passu with advancing years.

On analyzing the causes of death, I find that spermatozoa were entirely absent in affections of the urinary organs; that they were present in only 38 per cent. of diseases of the nervous system; and that they were discovered, respectively, in 68, 70, and 81 per cent. of disorders of the lungs, the digestive organs, and the heart. Hence, we may assume that while diseases of the kidney and brain exert a most prejudicial influence upon the formation of zoosperms, affections of the other great systems interfere with their development only to a slight extent.

Of the 78 cases in which spermatozoa were found, they were abundant in 50, and fewer than usual in 28. They were perfectly formed in 54; and in 24 their tails were absent or shortened, and they varied in size. From these facts we may infer that the inability of old men to procreate arises more from impotence than from the composition of their semen; and this view is supported by the fact, based upon 51 examinations made by Duplay[1] of the

[1] Archives Générales, t. vi., sér. 5, pp. 136 and 439.

testes of men from sixty to eighty-six years, that the secreting organs are perfectly normal in structure, and only slightly diminished in size and weight.

The gross appearances of the seminal fluid of old men are worthy of notice, since, in the absence of minute examination, they afford inferential aid in deciding the question of the absence or presence of spermatozoa. When the secretion is of a more or less transparent grayish tint, thick, viscous, and abundant, it is almost always fertile; but when it is scanty, and either watery or gelatinous, spermatozoa are almost always absent; and a deep brown color, which is due to broken-down blood and pigment, favors the latter view.

Constitutional syphilis appears to exert only a slight influence upon the secretion of the testes, since Liégeois[1] detected spermatozoa in the fluid ejaculated by fifteen syphilitic subjects, and Lewin[2] found them in three out of six examinations of the contents of the excretory seminal apparatus of men dead of that affection.

Under this head may be mentioned the altered composition of the semen produced by the *excessive use of morphia*, to which attention has been called by Rosenthal.[3] A man had injected under the skin, on account of cephalalgia and insomnia, from nine to twelve grains of morphia daily for three years. Paralysis of the bladder finally ensued; and examination of the whitish fluid, which was occasionally forcibly expelled with the last drops of urine, demonstrated spermatic crystals, but no

[1] Loc. cit., p. 380.

[2] Loc. cit., p. 319.

[3] Wiener Klinik, May, 1880, p. 149.

spermatozoa. Under proper treatment, at the expiration of a month, when the morphia had disappeared from the urine, a specimen of the semen ejaculated during coition was found to contain living zoosperms, but they were not so abundant or so lively in their movements as under normal circumstances. In a second case, in which nearly eight grains of morphia had been injected daily for one year, minute examination of a nocturnal pollution disclosed a few deformed and motionless spermatozoa, which did not react on the addition of a weak alkaline solution.

δ. *Abnormal density of the semen* may render it unfit for fecundation. Beigel[1] narrates a case in which the genital organs were normal, but in which repeated examinations of the ejaculated fluid showed that it was thicker and more viscous than is usual, and that the spermatozoa were motionless and closely grouped side by side. The addition of a few drops of tepid water put them in lively motion; so that the injection of a small amount of lukewarm water into the vagina, after coition, was advised, and the woman subsequently bore several children.

ε. *Purulent semen*, which is met with principally in inflammation of the seminal vesicles, epididymes, vasa deferentia, and prostate, may occasion the death of its essential anatomical elements, as in the following case, which is at present under my care:—

Case XXII. A gentleman, thirty years of age, contracted gonorrhœa in 1870, or rather more than ten years ago, and at the end of six weeks was attacked by bilateral epididymitis, which confined him to his bed for a fortnight. Up to 1873 he had always

[1] Krank. des Weibl. Geschlechts, Bd. ii. p. 791.

had an ejaculation on coition, but during the succeeding two years he indulged so rarely that he does not remember whether he had a discharge or not. He married in 1875, and although he has always had good erections, intercourse was not completed with an emission; but by pressing along the course of the urethra he could force a drop of sticky fluid out of the meatus. Exploration discovered a stricture, calibre 14, at five inches and three-quarters, and great hyperæsthesia of the prostatic urethra. The seminal vesicles and prostate were tender on pressure with the finger in the rectum. Having detected these morbid conditions I learned, on further questioning, that intercourse was painful, and that there was a constant feeling of dull, heavy pain in the rectum which was increased at stool. On the 12th of January, 1881, he brought me the entire quantity of urine passed less than an hour after intercourse. Examination of the sediment, as well as of the discharge which I removed from the urethra with the bulbous explorer, disclosed rather abundant pus corpuscles and epithelial cells, with some of the latter undergoing fatty degeneration, crystals of oxalate of lime, spermatic crystals, and a few stunted or tailless and dead spermatozoa. The case was therefore one of sterility from aspermatism dependent upon stricture of the urethra, and of azoospermism from inflammation of the seminal vesicles.

Unilateral spermatocystitis may also prove destructive of the spermatozoa, since in a case recorded by Heitzman[1] they could be traced in all stages of transformation into pus corpuscles.

In a recent paper,[2] Terillon shows that the ejaculated fluid in acute bilateral gonorrhœal epididymitis is of a yellowish tint verging on green, and that while it contains abundant pus corpuscles and a few large granular

[1] New York Med. Journ., August, 1879, p. 158.

[2] Des Altérations du Sperme dans l'Épididymite Blennorrhagique, Annales de Dermatologie et de Syphiligraphie, sér. 2, t. i. p. 439.

corpuscles, spermatozoa are nearly always absent. Thus of twelve cases in which the semen was examined at from ten to ninety days after the implication of the second testis, or on the thirty-ninth day, on an average, there were no spermatozoa in eight, a few living ones in three, and an abundance in one. Even several years after the complete subsidence of the acute symptoms, when the epididymes and vasa deferentia are normal in volume and consistence, though tender on handling, the discharge may retain the same characters, but in a less pronounced degree; and Terillon illustrates this important statement by a case in which yellowish azoospermous semen, which contained relatively few pus corpuscles, continued to be emitted six years after the cessation of the inflammation. The man had been married four years, but had not procreated children. He also refers to a case of Marcé,[1] in which, after death, the seminal vesicle and vas deferens were filled with a purulent fluid, but in which there were no traces of spermatozoa; and he maintains, in a later publication,[2] that the absence of spermatozoa in cases of bilateral epididymitis depends more upon the persistence of catarrhal inflammation than upon obliteration of these bodies.

In the preceding examples it has been seen that the vitality and the changes in the form and dimensions of the essential anatomical elements of the semen were associated with purulent inflammation of the excretory passages of that fluid, so that the inference is justifiable that pus is destructive of their evolution and life. This

[1] Gazette des Hôpitaux, 1854, p. 59.

[2] Bull. et Mém. de la Soc. de Chir., 1881, p. 159.

view is supported by the researches of Levy[1] on the influence exerted upon the viability of the spermatozoa by the perverted secretion of the glands of the cervix in endometritis. Of fifty-seven cases in which the secretion after coition contained an abundance of pus corpuscles and epithelial cells, in not a single one were many spermatozoa detected, and in none did their movements, which were feeble from the first, continue for more than five hours; whereas he frequently found that they were vigorous in the cervical mucus of healthy women for twenty-six hours after congress. In none of these cases were the phenomena to be ascribed to the reaction of the discharge. Sims[2] states that when the cervical secretion is rich in epithelial cells it proves destructive of the spermatozoa; and he ascribes this action to its density and not to its chemical action. He[3] moreover thinks that catarrh of the prostate is as deleterious as is uterine catarrh; and there is, indeed, no reason why a muco-purulent discharge of the urethra should not kill the spermatozoa. Noeggerath[4] believes that it acts as a poison; and in a letter which I recently received from him he says, "the poison in the secretion is certainly not the pus corpuscle, but the micrococci which infest, not only the leucocyte, but also the menstruum in which it is found;" and he refers me to a paper on the subject by Neisser, which, however, is not available. While these views are hypothetical, they are worthy of further investigation, as they would seem to be substantiated by a case of sterility from diabetes mellitus

[1] Aerztliches Intelligenzblatt, Bd. xxvi., 1879, pp. 3 and 12.

[2] Uterine Surgery, p. 390.

[3] New York Med. Journ., vol. viii. p. 407.

[4] Trans. Amer. Gynec. Soc., vol. i. p. 287.

recorded by Beigel,[1] in which examination of the semen contained in the urine disclosed, in addition to fragments of spermatozoa, abundant micrococci and a few cryptococci.

Diagnosis.—The discrimination between anorchids and cryptorchids with the testes retained in the abdomen is readily made, when it is remembered that the former are impotent, while the latter complete the sexual act in the usual manner. If spermatozoa have never appeared in the discharge, the question of congenital absence of the epididymes, or of want of union of the vasa deferentia with the seminal vesicles or the epididymes, may be entertained.

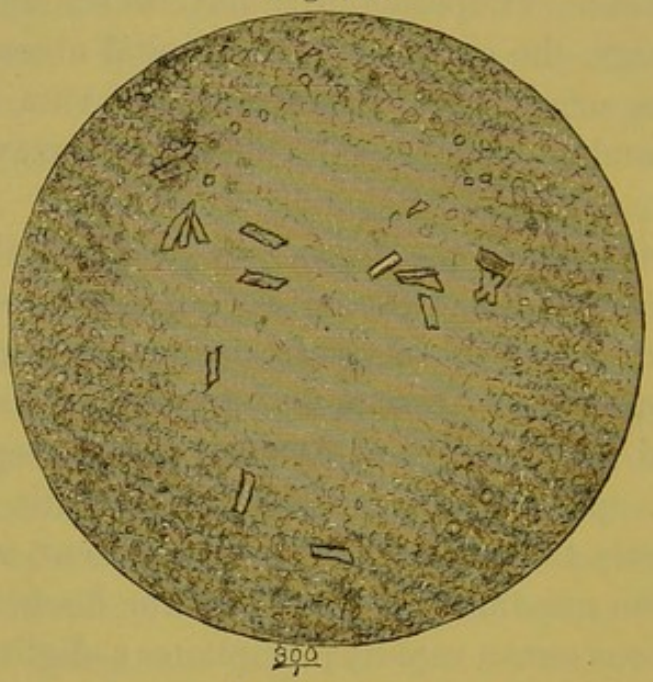
In all other cases the diagnosis is to be established by repeated examinations of the semen, since, as we have already seen, that fluid is liable to undergo various changes in sterility from sexual excesses, masturbation, ungratified venereal desire, obstruction of the epididymes, prostatitis, spermatocystitis, and epididymitis. Normal semen slowly throws down a white sediment, which constitutes from one-third to one-half of the discharge, while azoospermous semen rapidly precipitates a slight sediment. Under ordinary circumstances, the formation of spermatic crystals is delayed until the second or third day after ejaculation, and their number is small. In semen deprived of spermatozoa, on the other hand, the crystals appear in half an hour; or somewhat later, if there are few spermatozoa. The earlier, therefore, a sediment is deposited, and the more rapidly and abundantly spermatic crystals form, the less fertile is the discharge.

[1] Krank. des Weibl. Geschlechts, Bd. ii. p. 791.

Ultzmann[1] describes the following varieties of semen in which spermatozoa are not found, and his observations are confirmed by others:—

First, watery, transparent semen, which is normal in quantity, and becomes gelatinous immediately after emission, as does the normal secretion. It, however, resumes its fluid state when it is thoroughly cooled, and presents a whey-like appearance. Its relatively slight sediment

Fig. 14.



Watery semen.

shows, under the microscope, as in fig. 14, perfect spermatic crystals, a few lymph corpuscles, cylinder epithelium, and an abundance of fatty detritus.

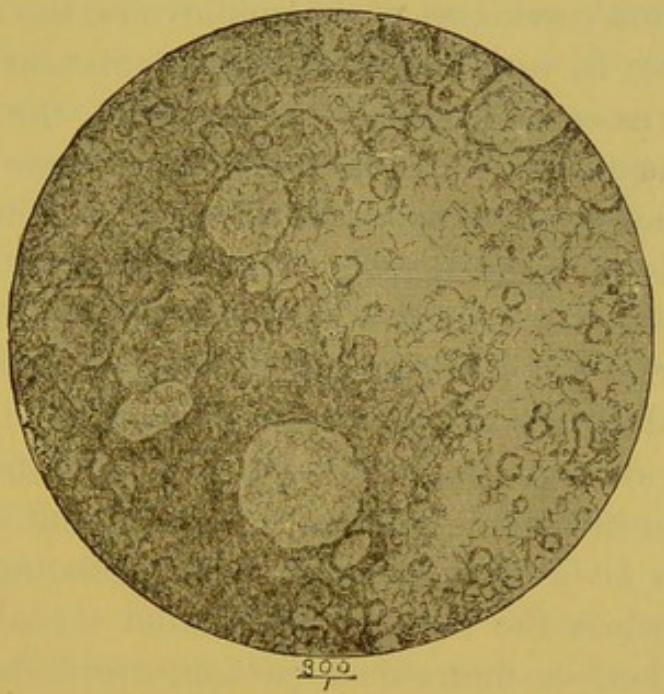
Secondly, colloid sperm, fig. 15, which differs from the normal discharge only in the absence of spermatic

[1] Wiener Med. Presse, 1876, p. 599, and 1878, p. 78; and Wiener Klinik, 1879, p. 156.

crystals and spermatozoa, and in the presence of abundant epithelium which has undergone colloid degeneration, and of laminated spherical masses of various dimensions.

Thirdly, catarrhal and purulent semen, which deposits a tolerably abundant whitish or yellowish sediment, is of normal consistence and quantity, and contains an abun-

Fig. 15.



Colloid semen.

dance of epithelium, leucocytes, and a few blood corpuscles, and occasionally a few deformed and motionless spermatozoa.

When the semen is discharged with the urine, it is to be remembered that the movements of the spermatozoa are arrested if the latter fluid is acid or ammoniacal; whereas they are not materially interfered with if the urine is neutral or slightly alkaline.

Prognosis.—Azoospermism offers, in the large majority of cases, little encouragement as regards the prospect of permanent relief; and the prognosis depends upon its exciting cause and the amenability of the cause to treatment.

In congenital absence of the testes or deficiency of their excretory passages, cryptorchidism, progressive atrophy, parenchymatous inflammation, and total disorganization from tubercle and morbid growths, as well as in tubercle, sarcoma, and carcinoma of the epididymes, the absence of spermatozoa is, with few exceptions, permanent and absolute. In cases of arrest of development, the prognosis should be guarded, since the testes may resume their proper functions under amorous influences. Thus, in the remarkable example recorded by Wilson,[1] the penis and testicles of a man, twenty-six years of age, were not larger than those of a boy of eight years of age. He had never had sexual desires until he met his intended wife; and in two years after marriage he had become a father, and the organs had increased nearly to the usual adult size. The chances in favor of a return of the fecundating elements are good when the affection arises from sexual excesses, masturbation, or ungratified passion, over-indulgence in morphia, and epididymitis from ordinary causes; while they are not promising in cases of syphilitic epididymitis and orchitis, and in gonorrhœal epididymitis. Liégeois[2] examined the semen of twenty-eight persons affected with bilateral epididymitis, and there were no spermatozoa in twenty-one. Of the seven in which spermatozoa had returned, only two were of gonorrhœal origin; so that the prognosis is

[1] Lect. on the Urin. and Gen. Organs, p. 424.

[2] Loc. cit., p. 380.

far more favorable when the induration depends upon common causes than when it follows blennorrhagia. In the gonorrhœal cases with a return of zoosperms, the induration lasted only ten days in one, and in the other only one side was seriously affected; while in those in which the azoospermism was permanent, the inflammation had lasted from fifteen to sixty days. Hence, the light cases are of far more favorable prognostic import than the intense ones. Liégeois, moreover, found that the induration persisted partially or completely in fifteen of the twenty-one cases of absolute azoospermism; but that the epididymes seemed normal to the touch in six. Of the seven in which the functions of the testes were reëstablished, five were free from induration; and in two, which were not of gonorrhœal origin, the induration persisted; so that absence of swelling and hardness is not positively indicative of a return of fertility. In such cases, the canal of the epididymes is strictured or obliterated.

As a prognostic aid, the ejaculated fluid should be examined in all cases of bilateral epididymitis. If it presents the characters of watery or colloid sperm, the absence of spermatozoa will, in all probability, be permanent.

Treatment.—The management of azoospermism is, as a rule, most unsatisfactory. When it depends upon chronic debilitating diseases and the excessive use of morphia, the remedies are to be addressed to the primary affection and to the breaking up of the habit. Abstinence is enjoined when it is due to sexual excesses or masturbation; and moderation should be observed when the functions of the testes are restored.

In advancing atrophy of the testes, provided it is not a symptom of lesions of the cerebro-spinal system, galvanism holds forth some prospect of success. The positive pole should be applied over the lumbar portion of the spinal column, and the negative pole should be passed over the affected organs, the precautions being taken to employ weak currents and to limit the daily sittings to two or three minutes.

Azoospermism in cryptorchids may be prevented if the subjects are seen sufficiently early in life, and if the testes are retained in the groins, by carrying out the suggestion of Curling[1] to promote their descent into the scrotum by gentle and repeated traction. In children the retained organs enjoy great mobility; and the manœuvres might succeed in adolescents and young adults, in whom the testes are, however, usually fixed. Sir Astley Cooper witnessed in "many cases" their descent from the thirteenth to the seventeenth year, and even as late as the twenty-first year; and I myself have known it to occur later, as in the following example:—

Case XXIII. In a widower, forty-six years of age, at present under my care for impotence, the right testis remained in the inguinal canal until six months after his marriage at the age of twenty-four, when it passed into the scrotum, and is now soft, tender, and of about one-third of the volume of its fellow. In its descent it was accompanied by a portion of the intestine.

The arrest of the evolution of spermatozoa in syphilitic orchitis may be anticipated, if the disease be recognized within a few weeks, by the internal administration of

[1] Op. cit., p. 38.

iodide of potassium and bichloride of mercury; or the latter agent may be replaced by mercurial inunctions, the testes in the meanwhile being properly supported. Syphilitic epididymitis, which I have occasionally met with as a secondary symptom, readily yields to a mercurial course.

In bilateral epididymitis early and vigorous antiphlogistic treatment will usually preserve the functions of the testes. The means upon which I place the most reliance are strict recumbency, light diet, a brisk purgative, the saline and antimonial mixture with a few drops of tincture of aconite pushed to the extent of provoking slight nausea, and keeping the parts well elevated and surrounded with absorbent cotton wet with a strong solution of acetate of lead and laudanum. If, despite these measures, indurations remain after the active symptoms have subsided, they may frequently be made to disappear under the exhibition of iodide of potassium and bichloride of mercury, along with the local use of mercurial ointment, or oleate of mercury, or an ointment composed of one drachm of iodoform, two drachms of balsam of Peru, and five drachms of cosmoline. This treatment should be steadily maintained, as the most chronic cases may terminate favorably. Thus, Gosselin, Godard, and Curling record a return of spermatozoa after eight, eighteen, and twenty-four months; and Godard even narrates an instance of cure in which the indurations had lasted for ten years. In all cases particular care should be observed to guard against recurrence of the inflammation.

Finally, when the semen is too thick, as in the case of Beigel, narrated on page 103, although nothing can be done in the way of medication as far as the man is con-

cerned, impregnation may be insured by the injection of a small quantity of saccharine or alkaline tepid water into the vagina after sexual congress.

Sect. III. Aspermatism.

Aspermatism is the variety of sterility in which sexual intercourse is not finished with an ejaculation of semen, either because that fluid does not enter the urethra, or because its forcible expulsion is prevented by some obstacle in the urethra anterior to the prostate gland. The term is, therefore, restricted to those cases in which the lesions are seated between the seminal vesicles and the urinary meatus.

Non-emission may be congenital or acquired, and permanent or temporary; and it may depend, first, upon obstruction of the ejaculatory ducts or the urethra; secondly, upon deficient excitability of the spinal ejaculatory centre; thirdly, upon abolished sensibility of the nerves of the penis; and, fourthly, upon the inhibitory action of the brain over the centre for ejaculation. Hence, in accordance with its etiology, it may be Organic, Atonic, Anæsthetic, and Psychical.

A.—Organic Aspermatism.

The discharge of seminal fluid into the urethra may be prevented, α, by congenital vices; β, by inflammatory lesions of the ejaculatory ducts and the prostate; and, γ,

by sympexions; and the escape of semen from the urethra may be due, δ, to stricture of that passage, to a tight phimosis, or to induration of the corpora cavernosa.

α. *Congenital occlusion, absence, and deviation of the ejaculatory ducts* have been rarely met with. Schmitt[1] examined a man, thirty-five years of age, who had never had an emission either when awake or asleep, although his power to cohabit was unimpaired. He had not suffered from gonorrhœa, and his external organs were perfect; but the prostate could be felt through the rectum merely as a small, flat body, and the seminal vesicles appeared to be atrophied. Ultzmann[2] records the case of a vigorous man, aged twenty-four, in whom, as in the preceding instance, there was no history of gonorrhœa, and who had never been able to ejaculate during coition or under the influence of a dream, although nothing abnormal could be discovered in regard to his reproductive organs. Munroe[3] describes a similar condition of affairs in a robust man, twenty-eight years of age. Under no circumstances had there ever been an emission; but a drop or two of clear mucus could be pressed out of the urethra after intercourse, and examination of the urine passed soon disclosed abundant spermatozoa.

While in the case of Schmitt it is highly probable that the atrophied prostate occluded the ejaculatory ducts, the cause of the trouble in that of Ultzmann must remain a matter of conjecture; but as the man never

[1] Würzburg Med. Zeitschrift, Bd. iii. 1862, p. 361.
[2] Wiener Med. Presse, 1878, p. 6.
[3] Boston Med. and Surg. Journ., Feb. 21, 1867, p. 62.

emitted seminal fluid, we may assume that the ducts were obliterated, or absent. That the latter inference is not unfair is attested by a preparation[1] in the Hunterian Museum, in which the ducts are wanting and in which the remainder of the sexual organs are completely developed. In the case of Munroe there was doubtless a congenital deviation of the orifices of the ducts, so that the semen regurgitated into the bladder during intercourse.

β. Stricture of the ejaculatory ducts and deviation of their orifices, the results of inflammation or injury, are among the most common causes of organic aspermatism, although the evidence of their existence is based, for the most part, on the symptoms presented during life. In his researches on the condition of the genital organs of old men dead of acute and chronic diseases, Duplay[2] made some interesting observations which afford post-mortem proof that the ejaculatory ducts undergo certain alterations which are capable of preventing ejaculation. In one both ducts were entirely destroyed, and were surrounded by tubercular matter from the neck of the seminal vesicles to their entrance into the thickness of the prostate; in one they were converted into small, impermeable fibrous cords, and the man had had a catheter retained in his bladder for a long time for retention of urine; in one the prostate was hypertrophied, and the ducts were narrowed but pervious to semen on pressing the seminal vesicles; in one both ducts were strictured, and the orifice of the right was completely obliterated, the prostate was

[1] Klebs, Path. Anat., p. 781.

[2] Archives Générales, sér. 5, t. vi. pp. 437 and 438.

enlarged and indurated, and the verumontanum was hard and of the size of a big pea; and, in a fifth case, the orifices of the canals were strictured, but pressure on the seminal vesicles showed that they were open. Ample observation has moreover demonstrated not only that the extension of gonorrhœal inflammation to the prostate obstructs its ducts through inspissation of the catarrhal secretion of its glands, and frequently brings about adhesion of the orifices of the ejaculatory ducts,[1] but that the latter may be occluded by the secondary contraction or by the cicatrices which result from abscess.

Cicatricial occlusion of the ducts from deeply-seated abscess has been observed by Kocher.[2] A man, forty-eight years of age, had received a blow on the perineum when twenty-eight years old, which was followed by suppuration and by induration of the tails of the epididymes. Previous to the injury his wife had borne him four children; but she afterwards failed to conceive in consequence of the inability of the husband to ejaculate.

Injury of the canals in bilateral lithotomy, or even in the lateral operation during the extraction of the calculus, is liable to terminate in aspermatism. I have myself witnessed sterility from this cause in two examples, and Teevan has recently recorded four cases.[3]

La Peyronie[4] describes the case of a man, the father of three children, who, in consequence of a neglected gonorrhœa, lost the power to ejaculate, although semen oozed

[1] Compare with Kraus, Med. Times and Gaz., vol. i. 1871, p. 272.
[2] Pitha und Billroth's Hdbch., Bd. iii. Abth. 2, Lief. 7, p. 433.
[3] Trans. Clin. Soc., London, vol. vii. p. 179.
[4] Mém. de l'Acad. Roy. de. Chir., t. i. p. 316, 1819.

away shortly after coition. On post-mortem examination, a cicatrix was discovered on the summit of the verumontanum, which had so changed the direction of the orifices of the ejaculatory ducts that they looked backwards towards the bladder. Demeaux[1] found in a man twenty-three years of age, after an abscess of the perineum from a fall, that the urine passed after an aspermous coition contained normal spermatozoa; and, as the urethra was not strictured, but the perineum was diminished in size, and the prostate was drawn down lower than usual, he properly inferred that the ejaculatory ducts had been displaced.

γ. Aspermatism may arise, as Reliquet[2] first pointed out, from *obstruction of the ejaculatory canals by sympexions*, or concretions composed of spermatozoa, concrete mucus, epithelial cells, and refracting granules, and formed in the seminal vesicles. In the three cases narrated by Reliquet, only one duct was involved, and he ascribes the loss of power to ejaculate to the compression exerted upon the pervious duct by the distended one, and to the arrest of the contraction of the former through the pain experienced at the commencement of the expulsive act. In one example, the finger in the rectum showed a bosselation of the right lobe of the prostate, near its middle, and showed the boss to be continuous with the corresponding seminal vesicle; and in a second case, a small tumor, due to retention of the semen, was discovered at the site of the ducts. Bergh,[3] of Copenhagen, met with

[1] Gaz. des Hôpitaux, No. 21, 1860.

[2] Ibid., 1879, pp. 891 and 915.

[3] Schmidt's Jahrbücher, Bd. clxxxi. 1879, p. 36.

a similar condition in a man twenty-nine years of age; but the case differed from the cases of Reliquet in that the non-ejaculation was of an intermittent character. The patient finished his first connection in the usual manner, but afterwards there was merely a sensation of distension; although, on two occasions during sleep, after dinner, there was an abundant discharge of semen. Bergh advised coition with a condom, with a view to examine the fluid, if any should be evacuated. During the act, the man felt as if something had torn, and there was a seminal discharge, which was rich in spermatozoa and sympexions. Subsequently, there was sometimes an emission, and at other times none. In an instance recorded by De Blégny,[1] the ducts were occluded with small, hard, spherical concretions as large as peas; and the verumontanum was indurated, and of the volume of a small nut. The patient, a widower, sixty years of age, and the father of several children, contracted a second marriage, but was unable to ejaculate. In this connection, it may be stated that Beckmann[2] discovered a concretion as large as a cherry in the ejaculatory duct of an old man, the organic portion of which was composed of spermatozoa, and the inorganic portion principally of phosphate and carbonate of lime. The possibility of the formation of so large a concretion, and of its effecting closure of the opposite duct, should be remembered in framing a diagnosis.

δ. The fourth division of organic aspermatism includes those cases in which the semen is discharged into the ure-

[1] Civiale, Traité Prat. sur les Maladies des Organes Génito-Urinaires, t. ii. p. 234.

[2] Virchow's Archiv, Bd. xv. p. 540.

thra, but its escape is prevented by some obstacle anterior to the prostate gland. If the impediment to its evacuation is seated in the posterior portion of the urethra, the greater part will usually flow back into the bladder, and minute examination of the urine passed after coition will disclose spermatozoa. When the obstacle, on the other hand, is situated at the external orifice, the semen will dribble away with the subsidence of the erection.

The most common cause of retention of the seminal fluid is *stricture of the urethra*, to which attention was first called by Petit;[1] and it is not difficult to conceive how an opening, which, in the flaccid condition of the penis, admits of the passage of urine, may, during erection, when the normal calibre of the urethra is naturally diminished, become so narrowed through spasm that the semen is confined in the canal between the coarctation in front and the turgid caput gallinaginis behind, so that its escape, either forwards or backwards, is prevented until the penis becomes flaccid. At page 103, I have narrated the case of a man in whom the stricture admitted a No. 14 bulbous explorer, and in whom the parts behind the coarctation were very sensitive; and I have also met with the following cases in which the contractions were not so small:—

Case XXIV. A gentleman, twenty-eight years of age, had masturbated excessively from his fourteenth to his twenty-second year, and a few months subsequently, on his first sexual intercourse, discovered that, although the act was completed with the usual sensation and spasmodic ejaculatory movements, there was no escape of semen until the erection subsided, when a few drops could be pressed out of the urethra. Examination of the urine

[1] Mém. de l'Acad. Roy. de Chir., t. i., 1819, p. 323.

passed after copulation disclosed abundant spermatozoa; and a stricture, calibre 22, was discovered at one-third of an inch behind the meatus; and a second, calibre 18, was found at five inches and three-quarters from the external orifice. The prostatic urethra was extremely sensitive, and he suffered from prostatic discharges at stool.

Case XXV. A laborer, twenty years of age, had masturbated, on an average, once every night for five years; and, on coition, six months before I saw him, he was unable to ejaculate. A stricture, calibre 19, was detected at five inches and a half from the meatus, and there was great tenderness throughout the entire curved portion of the urethra.

In these cases the fault is, in my opinion, to be ascribed less to the organic contraction than to the spasm of the muscular walls of the urethra beneath the sensitive mucous membrane, through which the opening is temporarily occluded. Hence, such cases are analogous to those of stricture in which exposure to cold and wet, or acrid conditions of the urine react on the inflamed mucous membrane, and produce retention of urine from spasmodic contraction of the muscular fibres of the urethra; and it would probably be more correct to describe them as instances of retention of semen from spasm. Since the stricture maintains the inflammation upon which the spasm depends, it is, however, needless to remove the cases from this category.

Other examples of aspermatism from stricture are recorded by Curschmann,[1] Acton,[2] and Blackwood.[3] The

[1] Loc. cit., p. 904. [2] Op. cit., 4th Amer. ed., p. 224.
[3] Proceedings of the Phila. Co. Med. Soc., vol. i. p. 4.

case of Hirtz[1] terminated by a spontaneous cure during coition, which was attended by violent pain, and followed by severe hemorrhage. The man had had repeated attacks of gonorrhœa, but never ejaculated, and spermatozoa were detected in the urine. After the removal of the obstacle, the nature of which is not clear, his wife gave birth to a child.

The second impediment to the spasmodic, forcible discharge of the semen is a tight *phimosis*, of which the following is an illustration:—

Case XXVI. A farmer, thirty-six years of age, and married for fifteen years, consulted me in April, 1880, on account of inability to procreate children. The preputial orifice, which would only admit a small probe, was seated upon the back of the head of the penis, so that the meatus was completely hidden by the integuments. He informed me not only that the urine, but that the semen when the penis became flaccid, converted the prepuce into a sac, and that their egress had to be facilitated by manipulation.

In a similar instance Blackwood[2] circumcised the patient and relieved his trouble. In the case of Amussat,[3] after a barren marriage of five years' duration, the removal of a very tight foreskin was crowned with success; and Bergh,[4] in the case of a man twenty-one years of age, effected a cure in three weeks by circumcision.

The third obstacle to the proper ejaculation of the urine is *induration of the corpora cavernosa*, to which

[1] Gazette de Strasbourg, No. 5, 1861.

[2] Loc. cit., p. 5.

[3] Virchow's Hirsch's Jahresbericht, Bd. ii., 1866, p. 169.

[4] Loc. cit., p. 37.

attention was first directed nearly a century and a quarter ago by La Peyronie.[1] As this lesion is fully considered on page 73, it need not detain us in this connection.

B.—ATONIC ASPERMATISM.

In aspermatism from atony or loss of contractility of the muscles of the seminal vesicles, ejaculatory ducts, prostate, and urethra, although there is no obstacle to the ejaculation or escape of the seminal fluid, there is never an emission during intercourse or when the patient is awake; but nocturnal pollutions under the influence of lascivious dreams are not infrequent, and are accompanied with the usual pleasurable feelings. Hence the sexual act is never completed, and the subject has to abandon his efforts merely from a sense of exhaustion. In organic aspermatism, on the other hand, except when it depends upon congenital lesions, coition is finished with a discharge which is prevented from escaping; or, if the ejaculatory ducts are closed or obstructed, the convulsive movements are experienced with the ordinary sensations.

Roubaud[2] attributes this form of aspermatism, which is termed idiopathic by Bergh,[3] and paradoxical by Rheinstaedter,[4] to spasmodic contraction of the ejaculatory ducts. This opinion cannot be entertained, as the relaxation of the spasm should be followed by the escape of semen, which never happens. Schulz,[5] Ultzmann,

[1] Mém. de l'Acad. Roy. de Chir., vol. i., 1761, p. 428.
[2] Op. cit., t. i. p. 248.
[3] Loc. cit., p. 37.
[4] Deutsche Med. Wöchenschrift, No. 26, 1879, p. 336.
[5] Ibid. 1862, pp. 769 and 787.

Rosenthal, Kocher, and other observers explain it by the absence of excitability in the lumbar reflex ejaculatory centre, a view in which I entirely concur. In many examples, the general symptoms denote neurasthenia, or the depressed form of spinal irritation, which is presumed to be due to exhaustion of the lumbar division of the spinal cord; and from the fact that the affection is most frequently met with in men who have been addicted to masturbation or venereal excesses, or who have suffered from repeated attacks of gonorrhœa, a class of subjects in whom, as I have shown in the chapter on Impotence, there are, as a rule, inflammation and hyperæsthesia of the prostatic portion of the urethra, I believe that, with few exceptions, exploration with a sound or bulbous bougie will disclose lesions which maintain, and are probably the cause of, the abolished excitability of the reflex ejaculatory centre. In the majority of the cases of aspermatism, other than of the organic variety, I find that the urethra was not examined, and that hyperæsthesia was discovered in five out of seven cases in which an instrument was passed. Hence, exploration of the canal should never be omitted, since upon its condition will depend the employment of the proper measures for the relief of the trouble.

These statements are corroborated by the following cases from my private practice:—

Case XXVII. A merchant, twenty-six years of age, had masturbated from his thirteenth to his twentieth year, and erections were provoked by merely looking at a woman, and by other slight causes. At the age of twenty he had his first connection, but

failed to ejaculate; and repeated subsequent efforts were attended with the same result. His erections were normal, and he had a nocturnal emission, with the usual sensations, about once every two weeks. The entire urethra was sensitive, and the prostatic portion excessively so; and there was a stricture, calibre 24, at six inches from the meatus.

Case XXVIII. A teacher, twenty-two years old, had gonorrhœa five years ago, which degenerated into a gleet; and for the past three years he has had a colorless discharge, particularly after erections and straining at stool. During the past eighteen months he has been unable to have an ejaculation during coition, although he prolonged the act until fatigue required him to desist. Now and then he had a nocturnal emission, which was attended with diminished sensation, and erections were provoked by trivial causes. He was continually morbid about his condition, so that he could with difficulty attend to his daily duties, being unable to fix his thoughts for any length of time upon any subject except his sexual trouble. He had pain in the back, loss of appetite, and palpitation of the heart, and was easily fatigued. A No. 25 bulbous explorer disclosed a very sensitive prostatic urethra, a linear stricture at six inches from the meatus, and a considerable prostatic discharge.

C.—ANÆSTHETIC ASPERMATISM.

The first link in the chain of the phenomena concerned in the act of ejaculation is the conduction of the sensory impressions excited by the friction of the penis against the walls of the vagina to the lumbar division of the spinal cord. If the sensory nerves fail to respond to the ordinary stimulus, reflex contraction of the ejaculatory muscles is prevented, and emission is rendered impossible. This variety of aspermatism, which may be termed anæs-

thetic, is not common, but the subjoined illustrations demonstrate the possibility of its occurrence.

As the result of concussion of the spine, a soldier was affected with insensibility of the prepuce, of the gland and skin of the penis, and of the scrotum to such a degree that pinching and pricking with pins were not perceived by him. Abundant nocturnal pollutions occurred at long intervals; but he was unable to ejaculate on coition or masturbation, the latter of which he resorted to with the vain hope of relieving priapism, from which he often suffered, and which constituted an obstacle to the discharge of the urine.[1] A gentleman, aged twenty-eight years, with congenital absence of the prepuce, was unable to complete sexual congress with an emission, although he had an occasional nocturnal pollution. Concluding that the trouble arose from a want of excitability in the nerves of the gland of the penis, Curling[2] applied the acetum cantharidis, which left the part in a very sensitive condition; and the man subsequently married, and seldom failed to finish intercourse in the normal manner.

In a second case, under the charge of the same observer,[3] a gentleman, forty-four years of age, was unable to ejaculate on account of insensibility of the gland and skin of the penis. Nearly the entire back of the organ was covered by a large, indurated scar, and the prepuce had disappeared, the lesions having been due to syphilis.

In a third case, under the charge of Curling,[4] the distension of the glans and the irritability of its sensitive nerves were prevented by occlusion of the meshes of the

[1] Lallemand, op. cit., 3d Amer. ed., p. 211.

[2] Op. cit., 4th ed., p. 483.

[3] Ibid., p. 485.

[4] Ibid., p. 460.

corpus spongiosum by inflammatory deposits, through which the glans did not enter into perfect erection.

Non-emission may also be due to obtunded sensibility of the prostatic portion of the urethra, which Van Buren and Keyes[1] regard as being the seat of pleasure in the act of copulation. They record a case in which this condition was found in a man, thirty-six years of age, who had never experienced an ejaculation during his nine years of married life, although he had had nocturnal emissions.

D.—PSYCHICAL ASPERMATISM.

That the reflex movements emanating from the lumbar genital centre are amenable to the will is illustrated by the fact that many men, to avoid impregnation, are able to retard an emission until the penis is withdrawn from the vagina; and the restraining action of the cerebrum is also proved by two curious cases of atonic aspermatism, recorded by Roubaud[2] and Hicquet,[3] in which the ejaculation instantly ceased if the patient awakened during a nocturnal pollution. Other men, through disgust, suspicion of infidelity, or loss of passion, are unable to complete sexual congress with their wives, although they succeed perfectly with other women. Hence aspermatism from the inhibitory action of the brain over the centre for ejaculation is temporary or relative, emission being possible under some circumstances and impossible under others; and it is altogether independent of organic lesions.

[1] Genito-Urinary Diseases with Syphilis, p. 466.
[2] Op. cit., p. 244.
[3] Bull. de l'Acad. Roy. de Méd. de Belgique, sér. 2, t. iv. p. 482.

Diagnosis.—The determination of the particular form of aspermatism is based upon the history of the case, upon the thorough exploration of the external and internal organs of generation, upon the examination of the urine, and upon the conclusions drawn from the effects of the remedies employed for its relief. As these points have already been more or less fully considered, little need be added in regard to them.

The existence of congenital absence or obliteration of the ejaculatory ducts is rendered almost certain if there has never been an emission under any circumstances whatsoever, if the urine is devoid of spermatozoa, and if there is no history of antecedent inflammation or injury. When, on the other hand, the urine passed after coition contains spermatozoa, and the other negative signs are present, congenital deviation of the ducts with discharge of the semen into the bladder is a perfectly fair inference.

A history of deeply-seated abscess of the perineum or lithotomy points to cicatricial occlusion of the ducts; while the detection of spermatozoa in the urine after sexual congress in persons who have suffered from perineal abscess or from neglected gonorrhœa shows that there is acquired deviation of those canals. Obstruction of the ejaculatory ducts by sympexions gives rise to the affection termed spermatic colic by Reliquet. There is always reflex contraction or loss of dilatability of the bladder. This makes itself known by difficult and very frequent urination, and by the expulsion of the last drops, which are liable to be bloody, being attended with lancinating pains which extend from the anus to the extremity of the penis. The subjects refrain from intercourse because excessive suffering is excited at the mo-

ment when ejaculation should occur; or is even induced by venereal desires or by commencing erection. Exploration through the rectum discloses a small, circumscribed tumor in the region of the prostate; and if the latter be compressed between the finger and a sound in the urethra, either the swelling will at once disappear, and the instrument be covered with semi-soft, grayish masses looking like bits of vermicelli or grains of boiled rice, or there will be an abundant discharge of semen, which contains sympexions, at the ejaculation during the first coition after the manipulations; or spermatozoa and seminal concretions will be passed at the succeeding act of micturition.

In aspermatism from stricture of the urethra the patient has nocturnal emissions, the usual convulsive movements of ejaculation and pleasurable sensations are felt during coition, and the urine passed after sexual congress contains spermatozoa. The diagnosis is confirmed by the use of the exploratory bougie, to which sufficient reference is made on page 38. When the trouble arises from a tight prepuce, its cause is obvious.

Atonic aspermatism is always to be suspected in persons who have indulged excessively in venery or in masturbation, or who have had gonorrhœa; in those who suffer from the ordinary symptoms of neurasthenia; and in subjects who ejaculate under the influence of a lascivious dream. The diagnosis is confirmed by the existence of hyperæsthesia of the prostatic urethra.

The anæsthetic form of the affection is denoted by the loss of sensibility of the gland and skin of the prepuce and penis; and non-ejaculation from emotional causes is readily determined by the history of the case.

Prognosis.—Aspermatism from congenital or acquired absence, obliteration, or deviation of the ejaculatory ducts is permanent, and nothing is to be expected from treatment. When the ducts are obstructed by sympexions, or when the affection is referable to stricture of the urethra or phimosis, a cure may be looked for. The prognosis is good when the failure to ejaculate depends upon hyperæsthesia of the prostatic portion of the urethra; but atonic aspermatism without morbid sensibility of that division of the urethra calls for a certain amount of reserve in the expression of an opinion; and the same statement holds good for the anæsthetic variety. The psychical form is temporary or relative, and capable of correction.

Treatment.—When the ejaculatory ducts are obstructed, the plan proposed and successfully practised by Reliquet in two cases is to be recommended. A sound having been introduced into the bladder, the circumscribed swelling is emptied by counter-pressure with the finger in the rectum. When the trouble depends upon stricture of the urethra, dilatation or internal division should be resorted to; and if it arises from phimosis, circumcision will afford prompt relief.

When the atonic variety of aspermatism is combined with inflammation and hyperæsthesia of the prostatic urethra, the measures should be directed to subduing the latter before attempts are made to restore the contractility of the muscles concerned in the act of ejaculation. Hence, the treatment is essentially the same as that described in pages 42–54.

If, on the other hand, the prostatic portion of the urethra is insensitive, a tonic course should be at once

instituted. The best prospects for relief are held out by quinine, iron, and strychnia, internally, cold sitz-baths,[1] and galvanism,[2] the negative catheter pole being in contact with the verumontanum, while the anode is placed over the lumbar portion of the spine or the perineum. Instead of continuous, induced currents[3] may be employed, as in the instance of Hicquet,[4] in which a cure was effected in eight days after the failure of the remedies advised by Roubaud.[5] In the case recorded by the latter author, under the idea that the affection was due to spasm of the ejaculatory ducts, normal coition was restored, after a preliminary venesection, by a pill composed of assafœtida, castoreum, extract of opium, and extract of hemlock, and by sprinkling the vesicated surface of the perineum with morphia. In another example of atonic aspermatism Hicquet[6] succeeded in curing his patient in ten days by the internal exhibition of the alcoholic extract of nux vomica, gradually increased from two to six centigrammes a day.

In anæsthetic aspermatism, the passage of the faradic brush over the penis, the anode being applied to the spine, is indicated, with the view to restore the obtunded or abolished sensibility of the nerves. In the event of the failure of this measure, the gland of the penis may be blistered with some prospect of success, as in an example from the practice of Curling.[7]

Aspermatism from disturbances of the brain, such as

[1] Consult page 55.
[2] Consult page 56.
[3] Consult page 57.
[4] Loc. cit., p. 482.
[5] Op. cit., p. 244.
[6] Loc. cit., p. 492.
[7] Op. cit., p. 483.

loss of affection for or repugnance to a certain woman, is hopeless, unless the subject undergoes a change of sentiment. Being entirely emotional, nothing can be done for him in the way of medication.

Sect. IV. Misemission.

In the preceding forms of sterility, no semen whatsoever, or unproductive semen, is secreted; or there is failure to ejaculate. In the variety under consideration, fertile semen is emitted, but it is not deposited in the upper portion of the vagina; so that it differs from aspermatism from mechanical obstruction in that the secretion has an outlet, and does not regurgitate into the bladder, or slowly ooze from the urethra when the erection has subsided. Hence, the term misemission is employed in the sense that the ejaculation has a faulty direction.

The most common causes of misemission are *vices of conformation of the urethra.* Thus, hypospadias may destroy the capacity for procreation, even when it is of light grade, as in two cases recorded by Kirsch;[1] but the deformity does not usually involve sterility, unless the opening of the urethra is situated at the peno-scrotal junction or in the perineum, and not even then, as, in exceptional instances,[2] the posterior wall of the vagina may act by replacing the deficient inferior wall of the urethra, thereby permitting the ejaculated semen to reach its des-

[1] Wiener Med. Presse, 1881, p. 214.

[2] Morgagni, Anat. Path. 1838, t. iii. p. 73, and Casper, op. cit., p. 251.

tination. The same statements are applicable to epispadias, and to fistulous openings in the urethra, the result of stricture or injury. In all of these conditions the prognosis is unfavorable, and the treatment is most unsatisfactory. If a plastic operation be practised, the precaution should be taken to make a perineal outlet for the urine.

Malposition of the meatus, through which the semen is voided backwards and downwards, or to one side, is an occasional cause of misemission, and is usually due to congenital or acquired shortening of the frenum. Guerlain[1] has reported the case of a man, thirty-five years of age, in which the penis was almost completely rotated from left to right, so that the dorsal surface reposed on the scrotum, and the meatus was situated on the side of, and about five-tenths of an inch behind, the extremity of the gland; and Guillon[2] met with a case in which the meatus opened on the side of the gland, and in which the stream of urine described almost a right angle with the penis. When the trouble arises from shortening of the frenum, the proper remedy is division of that structure. In the case of Guillon, excision of the pouch-like walls of the meatus resulted in a cure.

[1] Bull. de la Soc. Anat., sér. 2, t. iv. p. 87.

[2] Gaz. Méd. de Paris, 1843, p. 160.

CHAPTER III.

SPERMATORRHŒA.

In its restricted sense spermatorrhœa means a constant escape of seminal fluid without erection or pleasurable sensation; but the term, in a sense which has prolonged sanction, is employed in the following description of the affection to designate all the varieties of involuntary seminal losses which occur beyond the limits of health, and it is, therefore, synonymous with seminal incontinence. Under no circumstances should the affection be regarded as a "functional disorder of the testes," since in the great majority of instances it is primarily dependent upon and symptomatic of weakness or exhaustion along with increased impressibility, mobility, or excitability of the genito-spinal centre, phenomena usually induced by hyperæsthesia of the nerves which supply the prostatic portion of the urethra.

Classification.—Seminal incontinence includes three conditions which may exist separately, or pass into one another, or be combined in the advanced stage of the disorder. These conditions constitute the following varieties of the disease:—

First. Nocturnal emissions or pollutions, which occur during sleep, and are generally attended with an erection, pleasurable sensation, and an erotic dream.

Second. Diurnal pollutions, which take place when the subject is awake, are excited by slight mechanical or psychical causes, and are usually accompanied with incomplete erection and diminished sensation.

Third. Spermatorrhœa in the strict acceptation of the term, or a slight continual flow of semen from the urethra, without erection or specific sensation, without impure thoughts, or during urination or defecation. To avoid confusion I will employ the term spermorrhagia to indicate this phase of the affection.

1. Nocturnal Pollutions.—Involuntary nocturnal seminal discharges constitute the variety of the affection in regard to which physicians are usually consulted, and about which not a little ignorance prevails, as they are natural to all men, and are most common after the epoch of puberty, when the mind is more or less taken up with sexual matters. Their frequency varies in accordance with a great many circumstances, such as age, climate, habits, constitution, temperament, diet, and predisposition, it having been observed that they are very liable to occur in young men who were affected in their childhood with nocturnal incontinence of urine. Their frequency also varies greatly in the same individual; but it is impossible to determine the healthy standard merely by the intervals of their repetition, since what may be normal in one person may be morbid in another. In a general way I should say that in single men who lead a continent life and possess a sound nervous system, emissions at intervals of two weeks are indicative of excellent health. In such persons they are merely reflex signs of fulness or distention of the seminal passages, and constitute an in-

convenience of ungratified sexual instinct. Even if they occur once or twice in a week, provided they are not followed by symptoms of nervous disorder, they are not at all inconsistent with temporary good health; but, as I have just intimated, it is a question of individual tolerance and constitution, or vulnerability of the nervous system. Hence persons who consult the physician in regard to involuntary nocturnal losses should be informed that they are natural; and they should be impressed with the fact that the emissions need not awaken concern unless they are accompanied with unpleasant effects.

Nocturnal pollutions are abnormal or pathological when they are followed by headache, backache, slight enfeeblement of the functional powers of the brain, mental depression, and bodily or mental languor or lassitude; when they occur in married or single men who indulge in regular intercourse; when they take place without erections or dreams, and the patient is only made aware of them by the stains on his linen; when they attend or follow acute or chronic diseases; and when they are complicated by diurnal pollutions or spermorrhagia.

All of the preceding conditions are very liable to be attended with one of the varieties of impotence, which, indeed, may be the only indication that the emissions are pathological or one of the effects of impairment of the functions of the lumbar cord. In men of apparently the same amount of vigor and resistance, and in whom the pollutions occur with equal frequency, the associated symptoms of nervous exhaustion vary very much in degree, or they may be entirely absent. Thus, in Case VI., page 30, in which the emissions occurred from one to five times a week, the signs of neurasthenia were pronounced;

while in Case XVI., page 40, which was characterized by an excessive number of pollutions, there was not the slightest evidence of spinal weakness. In Case XI., page 33, there were no general symptoms whatsoever; while in Case XIV., page 35, the patient was a hypochondriac. In both the emissions took place at the same intervals. In the first of the following examples, which illustrate the same point, the man was in robust health; while in the second, although the patient evinced no outward evidence of impaired health, the signs of myelasthenia were marked. They are selected because they present many points in common.

Case XXIX. A student of law, aged twenty-one, had masturbated from his eleventh to his eighteenth year, and has suffered from nocturnal emissions for the past three years, on an average, three times a week. For the past five months he has had irritability of the bladder and feeble erections with premature ejaculations, for which he sought my advice. The lips of the meatus were red and pouting, and I detected a stricture, calibre 13, at five inches and a half from the meatus, along with great sensitiveness from that point as far as the neck of the bladder.

Case XXX. A bookkeeper, twenty-one years of age, has had nocturnal pollutions, which were not always accompanied by voluptuous dreams, three times a week, on an average, for four years; and he had masturbated from his tenth to his seventeenth year. On the following morning he felt greatly prostrated; and he constantly suffered from pains in the back, ano-rectal region, and top of the head, vertigo, muscular weakness of the limbs, and mental lassitude and depression. The prostatic urethra was excessively sensitive, but there was no stricture, and he passed prostatic fluid when the bowels were constipated.

2. Diurnal Pollutions.—Ejaculation of semen when the patient is awake is always morbid, and indicates a condition of irritable weakness of the genital organs and of the reflex centres which preside over them. In the lesser phase of this variety an emission is due to slight peripheral irritation, provoked by friction of the clothing, horseback exercise, driving over rough streets, or even shaving, or combing the hair,[1] or shampooing the head;[2] while in the more aggravated form the ejaculation is induced by psychical irritation, as reading libidinous books, the sight of indecent pictures, lascivious ideas, or simply looking at a female. In the former of these conditions there is a tolerable erection, but the sensation is diminished; in the latter the erection is flabby, or the penis is flaccid, and there is little or no pleasure.

3. Spermorrhagia.—When the trouble is more advanced, semen is constantly discharged without the occurrence of the orgasm; and its passive loss, which appears to be associated with dilatation of the orifices of the ejaculatory ducts from paralysis of their muscular fibres, may be the only sign of seminal incontinence. The existence of this condition is denied by some writers, but its occurrence cannot be questioned; and Case XXI, page 98, in which the gelatinous fluid brought away by the bulbous explorer contained motionless spermatozoa, and in which the discharge was increased by straining at stool, and by toying with women without gratifying the passions, affords a capital illustration of it.

[1] Townsend, Elements of the Therapeutics, vol. ii. p. 399. London, 1799.

[2] Flint, Principles and Practice of Medicine, 5th ed., p. 938.

Under this category should be included the condition in which the semen is unconsciously discharged in the acts of urination and defecation; and it likewise depends upon irritable weakness of the seminal vesicles and ejaculatory ducts. While in the majority of instances the fluid pressed out of the urethra in these ways is derived from the prostate, the microscope discloses that it is spermatic in a certain proportion of cases. Some authors are skeptical in regard to the passage of semen with the urine; but its occurrence is attested, apart from older observations, by five cases recently recorded by Beard,[1] by Case X., at page 33, and by the following additional instance from my private notes:—

Case XXXI. A clerk, twenty-eight years of age, had masturbated freely for ten years, and for the past two years has had difficulty in acquiring an erection, although he still has sexual desire. He is greatly depressed, easily fatigued, incapable of prolonged mental exertion, and has a woe-begone expression. There is a constant slight discharge of a clear, viscous fluid which causes the lips of the meatus to adhere during the night, and he is convinced that the urine contained semen. I found, on examination, that the urine was highly acid, and contained a few motionless spermatozoa, pus corpuscles, and crystals of oxalate of lime. Strictures, calibre 22, were detected at one-eighth of an inch and five inches from the meatus, and the prostatic urethra was highly sensitive.

Clinical History.—Any one of the three forms of spermatorrhœa may exist separately, but they gradually pass into each other, and are variously intermixed in the

[1] Medical Record, 1879, pp. 73, 74, and 558; and 1880, pp. 507 and 508.

advanced grade of the affection. When the case goes on from bad to worse, it usually pursues the following course, in consequence of the increase in the mobility of the ejaculatory centre, and of the advancing exhaustion of the entire nervous system. At first abnormal frequency of the nocturnal pollutions is associated with backache, headache, a sense of painful muscular fatigue, and slight paresis of the brain, as indicated by incapacity for any sustained mental effort. With the increase in the number of the emissions, the patient discovers that erections are becoming insufficient, and that ejaculation on coition is precipitate; and the general symptoms are aggravated by the addition of dulness of perception, impairment of memory, vertigo, mental dejection, weakness of vision, trembling of the limbs, palpitation of the heart, shortness of breath, a sense of oppression in the chest, flatulence, constipation, and other dyspeptic signs. Diurnal pollutions from slight mechanical or psychical causes are now superadded, and the emissions occur, with little or no erection or pleasurable sensation, or even when the penis is flaccid; and intercourse is impracticable, either from flabby erection or from anticipating ejaculation. The general symptoms also are more serious. The patient is liable to brood over his assumed lost virility, and the mental depression verges upon or passes into a condition of sexual hypochondrism. His gait is unsteady; he is subject to wandering neuralgic and rheumatoid pains; the hands and feet are habitually cold; he passes restless or sleepless nights; shuns society; fears to look one in the face; is utterly incapacitated for mental or physical exertion; and thinks of nothing but his sexual organs. With the still further increase of the irritable weakness

of the genitalia and nervous system, the semen constantly oozes out of the urethra, and its discharge is augmented during defecation and micturition. The man is converted into a confirmed hypochondriac, and if he comes from an insane family, he lapses into insanity, not, however, because of the seminal losses, but because of the disturbances of the nervous system which lead to the emissions. A person who has inherited a tendency to insanity, epilepsy, ataxia, or other nervous disorders, may, therefore, bring on those affections, the first link in the chain being functional troubles of the nervous centres, which gradually pass into organic disease, and are caused, according to my observations, in rather more than nine-tenths of all cases, by masturbation.

Of the general symptoms which are associated with abnormal seminal losses, and which indicate more or less complete exhaustion of the brain and spinal cord, an analysis of seventy-six cases, of which I have notes, indicates the following interesting facts in regard to their importance and relative frequency. There was an anxious or depressed condition of the mind in thirty-one; constant dwelling upon sexual matters in thirty-five; hypochondrism in six; mental dejection after intercourse in twenty-five; impairment of memory in twenty-three; incapacity for prolonged mental exertion in twenty-two; headache in nineteen; vertigo in fourteen; broken sleep in five; insomnia in two; drowsiness in five; irascibility in two; asthenopia, or muscæ volitantes, in fourteen; noises in the ears in eleven; muscular weakness of the limbs and fatigue in thirty-eight; trembling of the limbs in six; temporary reflex paraplegia in one; pain in the back in thirty-two; oppressed breathing in seven; pain in the

chest in three; constipation in twenty-five; dyspepsia in seventeen; palpitation of the heart in ten; subjective sensations of cold in seven, and of heat in four; loss of flesh in nine; and pallor of the face in twelve.

It will thus be perceived that constant occupation of the mind with the sexual functions, mental dejection, impairment of the memory, incapacity for mental work, headache, vertigo, muscular weakness of the limbs, pain in the back, noises in the ears, and irritability of the eyes constitute the most common of the disturbances of the cerebro-spinal axis and of the special senses; while, of the phenomena referable to the circulatory, respiratory, digestive, vaso-motor, and nutritive systems, palpitation of the heart, oppression of breathing, constipation, indigestion, chilliness, a feeling of elevated temperature, pallor, and emaciation, are the most frequent. In six cases the presence of dark spaces under the eyes formed the subject of grave apprehension.

A further analysis of the seventy-six cases shows that certain local signs are connected with seminal incontinence. There was feebleness of erection with premature ejaculation in eighteen; irritable weakness in sixteen; total failure of erection in five; elongation of the prepuce in twenty-one; relaxation of the scrotum in thirteen; irritable testis in four; varicocele in one; coldness of the genitalia in six; a feeling of heat in the genitalia in two; painful ejaculation on intercourse in two; bloody ejaculation in one; and irritability of the bladder in four. In thirteen examinations of the semen furnished by patients suffering from an aggravated form of the malady, I found that fluid to be watery, and that in three the spermatozoa were small, motionless, and variously de-

formed, and, therefore, incapable of impregnating the ovum. As the changes which the semen undergoes in spinal exhaustion have been so fully considered in the section on azoospermism, they need only be referred to in this connection.

Etiology.—Spermatorrhœa is not a distinct affection, but one of many symptoms of general and local lesions, or of both combined. In the vast majority of instances it must be regarded as a neurosis, or a functional derangement of the nervous system, which is indicated by increased susceptibility of the brain and cord, or feebleness of their powers of resistance to acts which in healthy persons would not be productive of evil consequences. Like other neuroses, it may be the result of congenital predisposition, when it is liable to be observed in several members of the same family through several generations. Under these circumstances the subject is of a nervous, excitable, or irritable temperament; and he probably suffered during his infancy from nocturnal incontinence of urine, as was first pointed out by Trousseau,[1] of which the following example is a marked illustration:—

Case XXXII. A physician, fifty years of age, consulted me, March 14, 1881, on account of nervous exhaustion, seminal losses, and dread of impotence. Up to his tenth year he was troubled with nocturnal enuresis. He was a close student at college; and at the age of eighteen began to have nocturnal emissions, and his mind dwelt constantly on sexual ideas; but he never masturbated. Up to the time he saw me, or for thirty-two years, the emissions varied from one to three a week; but he did not evince any special signs of neurasthenia for several years after their commencement,

[1] Op. cit., t. ii. p. 636.

when he observed that he was constantly drowsy, and that he was very restless, particularly in crowded assemblies and at social entertainments. He soon became easily fatigued, and was incapable of bodily exertion, and his brain was unequal to prolonged work. Three years ago he abandoned the practice of his profession, and during a visit to Europe, in the summer of 1880, he had a mild attack of reflex paraplegia, which followed a sudden rush of blood to the head. He never had sexual intercourse. He has an erection nearly every morning, but the gland of the penis is rather flabby, and he notices that the lips of the meatus are glued together by a slight gleety discharge. The prepuce is somewhat long; there is a stricture, calibre 22, one-third of an inch behind the meatus; the prostatic urethra is highly sensitive; there is a large varicocele of the left side; and there is a tendency to irritability of the bladder.

Among the predisposing causes may be mentioned erotic ideas. When constantly and involuntarily indulged in, even when the patient does not practise natural or unnatural acts, as in the preceding case, they constitute a powerful factor in the production of irritation of the genital organs and of reflex impressibility of the centres which preside over them.

Seminal incontinence is usually acquired, and is due in the great majority of instances to masturbation. Thus of the seventy-six cases of which I have a record, in only one was it the result of an inherited predisposition. Of the remaining seventy-five, in seventy, or ninety-three per cent., it was traceable to onanism; in three it arose from gonorrhœa; and in two it was met with in men who had masturbated, suffered from gonorrhœa, and had indulged their propensities in various ways. Sixty-four were single, ten were married, and one was a widower.

Seven cases occurred before the age of twenty; forty-seven between twenty and thirty; sixteen between thirty and forty; and five between forty and fifty. All of the married men were given to sexual excesses; and although three stated that they were not addicted to masturbation early in life, I believe that marital sexual excess is generally the natural result of a previously vicious habit. Of the seventy masturbators, all except fourteen had one or more strictures; and the remaining five patients were affected in the same way. In only five cases was decided hyperæsthesia of the urethra absent; so that this condition is rather less frequent in cases of spermatorrhœa than in cases of impotence, in which, as has been pointed out on page 21, it was wanting in twelve cases out of one hundred and forty-nine.

Under the influence of erotic ideas, masturbation, sexual excesses, or unsatisfied sexual excitement produced by toying with females, exaggerated irritability of the genital organs is induced, and is soon followed by chronic or subacute inflammation and hyperæsthesia of the prostatic portion of the urethra, which culminate, in bad cases, or in those characterized by diurnal pollutions and spermorrhagia, in dilatation and relaxation of the orifices of the ejaculatory ducts. As the natural result of their constant excitability, the nerves distributed to the prostatic urethra are alive to the slightest impressions. This condition induces increased mobility or irritability of the reflex cerebral and spinal genital centres, through which the motor nerves which supply the ejaculatory apparatus are thrown into action, and an emission follows. This, it seems to me, is the rational explanation of seminal incontinence.

Involuntary seminal losses are also met with during convalescence from or during the progress of certain acute and chronic diseases which are characterized by disturbances, or exhaustion, of the nervous system. Thus, it may be symptomatic of variola or phthisis,[1] typhus,[2] progressive muscular atrophy and commencing bulbar paralysis,[3] of paraplegia,[4] and of locomotor ataxia,[5] in the last of which affections Hammond[6] has recorded an example of eight nocturnal pollutions in a night. Chronic alcoholism also predisposes to their occurrence; and Mitchell[7] describes a case in which they seemed to be due to the habitual use of opium.

Of the local causes of spermatorrhœa by far the most common are hyperæsthesia and chronic inflammation of the prostatic portion of the urethra which are generally induced by masturbation; and these morbid conditions are just as important in its production as they are in the causation of impotence. In the vast majority of cases, they constitute the original source of the trouble, and tend not only to excite reflex emissions, but also to maintain the disorder by keeping the mind occupied with sexual matters. Even in cases in which the affection would seem to depend upon other local lesions, they are almost invariably present, so that associated disorders of the penis,

[1] Curschmann, loc. cit., p. 867.

[2] Nowatschek, Wiener Med. Presse, 1879, p. 1067.

[3] Stéphanides, ibid., p. 913.

[4] Roberts, Canada Med. Record, vol. vii. p. 253.

[5] Erb, op. cit., pp. 543 and 585; Trousseau, op. cit., p. 510; and Topinard, De l'Ataxie Locomotrice, p. 171.

[6] Treatise on the Diseases of the Nervous System, 6th ed., p. 593.

[7] Amer. Med. Monthly, vol. xv. p. 285.

the urethra, or the rectum merely act by intensifying them. In a few cases it is true that the hyperæsthesia is not marked, and that other abnormal states, as a congenital contraction of the meatus, are sufficient to excite reflex contraction of the seminal vesicles; but in these instances it is scarcely possible that local conditions would induce the trouble in persons who were not predisposed to it. Hence, I think that no case should be treated without a preliminary examination of the urethra, which seems to be omitted by physicians in general, and by many surgeons.

Of the local exciting causes phimosis, in the form of redundancy of the prepuce, is probably one of the most common, and it acts as a source of reflex irritation by keeping the gland moist, or by retaining the smegma. Not only is the prepuce elongated, but in many cases it will be found to constrict the gland when the penis is erect, a point which should always be looked into, as it has an important bearing upon the treatment. Herpes of the prepuce, which is far less frequently met with than the preceding condition, is another cause; so also is congenital shortness of the frenum, as in a case recorded by Heulard Darcy.[1]

Of the conditions which relate to the urethra, the most important are congenital narrowing of the meatus,[2] and organic stricture seated near the orifice, of which I have met with several examples. Zeissl[3] has quite recently declared that spasmodic stricture is a cause of very frequent pollutions. In a unique case recorded by Genaudet,[4] the removal of a polyp from the prostatic portion of

[1] Virchow-Hirsch's Jahresbericht, Bd. ii., 1866, p. 169.
[2] Hicguet, Canstatt's Jahresbericht, Bd. iii., 1860, p. 225.
[3] Med. News and Library, January, 1881, p. 41.
[4] Virchow-Hirsch's Jahresbericht, ut supra, p. 163.

the urethra was followed by the cessation of the nocturnal emissions.

Acute inflammation of the seminal vesicles is attended with frequent and painful, and it may be with bloody, pollutions. In an instance of chronic inflammation of these bodies under my care, the discharge was usually of a yellowish tint from the admixture of pus, and decidedly bloody when the pollutions followed each other in quick succession. In cases of this description the seminal losses are due to hyperæsthesia of the mucous membrane of the vesicles, so that the trouble is analogous to incontinence of urine from morbid sensibility of the lining membrane of the bladder. Liégeois[1] states that epididymitis is a fruitful source of nocturnal emissions.

Among other exciting causes of spermatorrhœa may be mentioned diseases of the rectum and anus, as piles, ascarides, fissures, pruritus, and painful eruptions; and Perrin[2] has recorded a case in which nocturnal pollutions were induced by the cauterization of internal hemorrhoids. As the rectum and anus are supplied by the same nerves as are distributed to the genitalia, it is not surprising that the reflex ejaculatory centre should respond to an impulse transmitted from them. The same statement is true of certain affections of the bladder. Habitual constipation may also excite emissions through the pressure exerted upon the seminal vesicles during the evacuation of hardened feces; but this is observed only when the orifices of the ejaculatory ducts are dilated and paralyzed. The fluid which escapes from the urethra of healthy men,

[1] Loc. cit., p. 512.

[2] Canstatt's Jahresbericht, 1857, p. 301.

under these circumstances, is not seminal, but it is usually derived from the prostate.

Anatomical Characters.—The morbid appearances which belong to spermatorrhœa in its early stage are utterly unknown as far as their verification by post-mortem inspection is concerned. That the exaltation of the sensibility of the urethra depends upon subacute or chronic inflammation of its mucous membrane, particularly in the region of the verumontanum, is rendered certain by the concomitant local symptoms, by exploration with the endoscope and the sound, aided by the finger in the rectum, and by the results of treatment. In seven aggravated cases, of which two are recorded by Lallemand,[1] one is narrated by Curling,[2] and four are collated by Kaula,[3] there was a stricture in four, injection of the mucous membrane of the deep portion of the urethra in two, dilatation of the orifices of the ejaculatory ducts in six, combined with excoriation in two, ulceration in two, and enlargement of the canals themselves in one, suppuration of the prostate in four, suppuration of the seminal vesicles in three, and chronic inflammation of those bodies in two.

As far as I am aware there have been no examinations of the nervous centres connected with the genital organs in spermatorrhœa, so that it is impossible to say whether they are the seat of structural lesions. In a case of paraplegia induced by sexual excesses, however, Sir Wil-

[1] Op. cit., Phila., 1858, pp. 37 and 42.

[2] Op. cit., 4th ed., p. 492.

[3] De la Spermatorrhée, Thèse de Paris, 1846, pp. 167–173.

liam Gull[1] was unable to detect the slightest change in the cord. The common view, that the cells which minister to the functions of the cord are completely exhausted, is, therefore, probably correct.

Diagnosis.—The only mode of determining whether the fluid which constantly moistens the urethra, is discharged at stool or with the urine, or is brought away by the bulb of the explorer, is seminal in its character, is to examine it under the microscope with a power of about four hundred diameters, with the view of discovering spermatozoa. Should they be found, there need be no doubt as to its true nature; but it must be remembered that their absence is not an evidence that the case is not one of spermatorrhœa, since, as I showed at page 97, the exhausted sexual apparatus in aggravated examples furnishes a watery fluid which may be devoid of fertilizing elements. Under these circumstances the history of the case, and the associated general symptoms are to be considered in framing the diagnosis; and this is particularly true of the examples in which a discharge is expressed at stool, and which in the majority of instances is merely the catarrhal secretion of the prostate gland. Under the microscope the albuminous, viscid prostatic fluid will be found to contain cylinder epithelium, mucous corpuscles, a few leucocytes, and minute concentric amyloid concretions; and spermatic crystals will soon make their appearance on the slide; while the thin, transparent, azoospermous semen contains cylinder epithelium, and probably epithelium which has under-

[1] Guy's Hosp. Reports, 1858, p. 175.

gone fatty or colloid degeneration, a few lymph corpuscles, an abundance of fatty detritus, and possibly a few small shining bodies which are the remains of badly evolved spermatozoa.

In the absence of minute examination the rule may be framed that the discharge which occurs during defecation in persons who are laboring merely under too frequent nocturnal pollutions is an evidence of coexisting catarrhal inflammation of the prostate; while the flocculent sediment contained in the urine, and the discharge at stool in persons who are suffering from nocturnal and diurnal pollutions, and a slight continued discharge from the urethra represent semen. In the last case the assumption that the orifices of the ejaculatory ducts are relaxed will generally be correct, and it will be strengthened if the patient is impotent.

Prognosis.—According to my experience the prognosis of seminal incontinence is far from being so unfavorable as many writers would lead one to believe. In regard to increased frequency of nocturnal emissions, the phase of the affection about which the physician is most frequently consulted, I have no hesitation in declaring that it yields readily to treatment, particularly when it is caused or kept up by appreciable local lesions, such as hyperæsthesia of the prostatic urethra, stricture, or hemorrhoids. The subject of Case XVI., page 40, is an excellent and not uncommon illustration of the truth of this statement. The pollutions had been excessive for two years, and were complicated by prostatorrhœa and a mild grade of impotence. On the 8th of April I divided a stricture which was seated just behind the meatus, and

ordered thirty grains of bromide of potassium to be taken at intervals of eight hours, along with the one-sixtieth of a grain of atropia at bedtime, and a laxative pill as it might be required. On the 6th of May, a No. 30 conical steel bougie having been passed at stated intervals to overcome the morbid sensitiveness of the prostatic urethra, the patient reported that he had emissions on the nights of April 17 and 18; and four weeks later he informed me that he had a pollution on the 22d of May. Equally rapid and gratifying results were obtained in the following example:—

Case XXXIII. A teacher, twenty-four years of age, had masturbated up to five years ago. He then began to be troubled with nocturnal emissions, which frequently occurred for five consecutive nights, when there would be an interval of freedom for ten days. For the past two years the erections have been flabby, and ejaculation has been premature; but, with the exception of pain in the back, there have been no signs of spinal exhaustion. The urethra has been very sensitive, but there has been no stricture. The measures employed were the same as those resorted to in the preceding case, with the addition of a hot sitz-bath at night. He was ordered to be awakened early in the morning, with the view to empty his bladder. The lumbar pain ceased after the fourth insertion of the bougie; and when I saw him, three weeks subsequently, he told me that he had been entirely free from pollutions.

Of the local lesions causative of nocturnal pollutions, by far the most rebellious to treatment which I have encountered is chronic inflammation of the seminal vesicles, of which the following is an instance:—

Case XXXIV. A man, twenty-two years of age, contracted gonorrhœa, which extended to the vesicles, where it set up acute

inflammation. When he came to me, the acute signs had subsided, and for three months he had had painful pollutions, which frequently occurred two and three times during the night, when they left a yellowish-red stain upon his linen. There was a constant sense of fulness and bearing-down pain in the rectum. The pain was increased by urination, defecation, and erections. The rectal touch disclosed two ovoidal, hot, and very tender bodies in the region of the vesicles; and there was a discharge of muco-purulent fluid from the urethra. Under sedative measures, and the local application of astringent solutions to the prostatic urethra, and of flying blisters to the perineum, I succeeded, after the expiration of seven months, in reducing the number of pollutions to one a week; and when I last saw him, three months afterwards, he had not had an emission for thirty days.

With the above exception, when the pollutions are maintained by local lesions, and are associated with signs of myelasthenia, the prognosis is good; but the patient will have to remain longer under treatment than when signs of nervous exhaustion are absent. The outlook is still favorable when symptoms of cerebrasthenia are present; but it is decidedly bad, if the subject is a sexual hypochondriac. Even when the emissions occur during the progress of acute or chronic general affections, the prognosis is not dismal, since I find that, in a case of progressive muscular atrophy and commencing bulbar paralysis, Stéphanides succeeded in checking them by the internal exhibition of atropia, and that Nowatschek was equally successful with the same remedy in an example of an aggravated form of spermatorrhœa, the result of typhus.

The prognosis is far better when the usual local lesion, namely, hyperæsthesia of the prostatic urethra, has been induced by gonorrhœa than when induced by masturba-

tion; and it is also more favorable when the emissions occur in mature years from sexual excesses than when they are due early in life to onanism, especially if the youthful subjects evince a tendency to inherited nervous disorders.

The outlook is more unfavorable when the pollutions occur during the day, or when the patient is awake, and when they are excited by slight mechanical or psychical causes, since under these circumstances the assumption is fair that the inflammation of the deep portion of the urethra has resulted in atony and dilatation of the muscular fibres which surround the orifices of the ejaculatory ducts. These cases are, however, quite amenable to properly directed measures, or even to the administration of atropia alone, as in the example of Nowatschek referred to above.

Treatment.—In all cases of involuntary seminal emissions certain hygienic and moral rules must be observed. The diet should be nutritious and digestible, the evening meal in particular being light and dry, and all stimulating articles of food as well as spirituous and malt liquors should be avoided. Before retiring, the bladder is to be thoroughly emptied, and the habit of sleeping on the side upon a hair mattress without much covering should be cultivated. As the morning fulness of the bladder has a very decided tendency to induce erections, and as emissions usually occur in the morning, the patient should set an alarm clock one hour before the time at which he has usually observed that the pollutions take place, in order that he may be awakened to relieve that viscus of its contents. Horseback exercise and driving over rough

roads should be interdicted. Masturbation, in which if the man be single he still in all probability indulges, and sexual intercourse must be abandoned, and the patient should be told that this enforced rest of the organs will possibly result in temporary increased frequency of the pollutions. Everything calculated to excite erotic thoughts and desire should be scrupulously avoided. With this end in view he should keep the mind and body pleasantly occupied; and if he happens to belong to the class of society that has nothing to do, and if he is still robust and vigorous, he should have recourse to gymnastic exercises, or to the close study of any subject which he may most fancy. If, on the other hand, there are commencing or marked signs of spinal exhaustion, mental and physical moderation should be enjoined.

An essential part of the treatment is the removal of any reflex or eccentric lesions or causes which predispose to the occurrence of seminal losses, or even excite them in impressible subjects. Hence the external genitalia and the anus and the rectum should be subjected to a careful examination. In many cases without the presence of a positive phimosis the redundant prepuce keeps the sensitive gland of the penis constantly moist, and favors the collection of sebaceous matter. The latter condition is very common among the lower classes, and whether circumcision be resorted to or not, and I always advise it, the greatest cleanliness should be enjoined. Herpes of the prepuce and gland usually readily yields to attention to the bowels and diet, and to dusting the parts with subnitrate of bismuth and calomel, or to touching the excoriations, if they should exist, with a five-grain solution of nitrate of silver, and dressing them afterwards with

scraped lint. If the meatus be contracted, or if a stricture be seated behind that orifice, it should be divided; and a short frenum should be clipped with the scissors. Internal piles should be ligated; external piles be opened; rectal fissure be divided or lacerated by overstretching the sphincter; and pruritus be remedied by cleanliness and the application of four grains of the bichloride of mercury to the ounce of water. A varicocele, between which and spermatorrhœa, however, I see no causal relation, should be properly suspended, or be subjected to subcutaneous ligation if it be large and annoying. Habitual constipation, which is met with in one-third of the cases, demands particular attention. If there is atony of the intestines, a pill, composed of two grains of compound extract of colocynth, half a grain of extract of nux vomica, and the tenth of a grain of extract of belladonna, may be administered at bedtime. In the majority of cases enemata of temperate water will fulfil the indication; or the patient may take two or three drachms of equal parts of Rochelle and Epsom salt in a tumbler of water before breakfast, or a wineglassful of Hunyadi water, or of an artificial mineral water composed of an ounce of sulphate of magnesia, a drachm of bitartrate of potassa, and ten grains of sulphate of iron to a quart of water. This was a favorite remedy of the late Professor Dunglison, and I can bear testimony to its efficacy.

Of the exciting causes of abnormal seminal losses by far the most constant and important are subacute or chronic inflammation and hyperæsthesia of the prostatic portion of the urethra and of the orifices of the ejaculatory ducts, conditions which are frequently maintained and aggravated by stricture of the passage anterior to them. Of

the treatment of stricture I can only refer to my views published elsewhere,[1] as its consideration would be out of place here; but I may add that, although the stricture may be palliated by dilatation, and although the emissions may entirely cease under the employment of that measure, they will be sure to recur unless the bougie is methodically employed during the remainder of life.

With regard to the inflammation and exaggerated sensibility and irritability of the prostatic urethra I need only say that the general and local measures for their relief do not differ in any respect from those indicated in the chapter on Impotence, pages 42–54.

In all cases of seminal incontinence, with rare exceptions, the remedies at the outset should be directed to overcoming the sensibility of the mucous membrane of the urethra, of the ejaculatory ducts, and of the seminal vesicles; to subduing the irritability of the muscles concerned in ejaculation; and to diminishing the reflex excitability of the genito-spinal centre. Hence, they should be of a calming and sedative nature. By the ignorant and indiscriminate employment of strychnia, cantharides, phosphorus, damiana, and cold sitz-baths or affusions during the stage of hyperæsthesia, much harm is done, and the therapeutics of spermatorrhœa are brought into disrepute. Premising the statement that the tonic should follow the sedative plan of treatment, I will now give an outline of my views as to the best management of the varieties of the affection.

Under all circumstances, thirty grains of bromide of potassium, along with about ten drops of the fluid extract

[1] Consult p. 45.

of gelsemium,[1] every eight hours, and one-sixtieth of a grain of sulphate of atropia[2] on retiring, are worth all the other internal remedies combined. In anemic subjects the bromide may be administered at night, and quinine and iron be exhibited during the day; but if the bromide be badly borne, it should be guarded in the manner which is indicated on page 51, or it may be replaced by twenty grains of chloral. Not only does atropia diminish the reflex mobility of the genito-spinal centre, but the recent researches of Keuchel, Heidenhain, and Stricker and Spina,[3] show that it paralyzes the movements of the cells of the acinous glands and checks their secretion, so that it cannot be dispensed with.

Of the local remedies, the conical steel bougie[4] occupies the first rank; but when the inflammation and tenderness are reduced to a circumscribed area which includes the openings of the ejaculatory ducts, it should give way to the application of nitrate of silver,[5] a remedy which is usually decried by physicians who appear to have no practical experience with medication of the urethra, but which is highly recommended by such men as Trousseau,[6] Niemeyer,[7] C. Handfield Jones,[8] and Rosenthal,[9] and by the most eminent surgeons. In addition to these measures, the hot sitz-bath[10] is invaluable; and Harrison[11] advises

[1] Bartholow, op. cit., p. 415.
[2] Consult page 52.
[3] Rosenthal, Wiener Klinik, May, 1880, p. 161.
[4] Consult page 43.
[5] Consult page 46.
[6] Op. cit., t. ii. p. 643.
[7] Text-Book of Practical Medicine, New York, 1870, vol. ii. p. 100.
[8] Functional Nervous Disorders, p. 733.
[9] Loc. cit., p. 162.
[10] Consult page 53.
[11] Op. cit., p. 62.

douching the lower part of the spine with water at the temperature of 120° F.

Under this course of treatment, the majority of cases of nocturnal pollutions recover; but it may happen that the reflex genital centre is still too impressible, in which case galvanization,[1] with the anode to the lumbar region and the cathode to the perineum,[2] will prove highly serviceable.

After the hyperæsthetic symptoms have subsided, if, from the occurrence of diurnal pollutions and of spermorrhagia, there is reason to suspect dilatation and atony of the mouths of the ejaculatory ducts, the continuous current, with the negative reophore in the rectum and the positive on the perineum or the lumbar vertebræ, affords the most striking results. This plan is recommended by Mobius;[3] and in one case I succeeded in affording relief in twenty days by twelve sittings. Should galvanization prove inadequate, the induced current may be passed through a negative catheter electrode in the prostatic urethra to the anode placed on the perineum or spine; but this mode of application requires great caution,[4] and care should be taken to employ a feeble power at the commencement. Hence I prefer, with Ultzmann,[5] Rosenthal,[6] and Mobius, to replace the urethral by the rectal reophore. In the absence of electrical apparatus, the tonicity of the muscles of the ejaculatory ducts may be greatly improved and even restored by the use of the psychrophor,[7] by the application of nitrate of silver, and by

[1] Consult page 56.
[2] Benedikt, Elektrotherapie, p. 466.
[3] Memorabilien, Heilbronn, 1879, 24, p. 545.
[4] Consult page 57.
[5] Wiener Med. Presse, 1876, p. 641.
[6] Loc. cit., p. 162.
[7] Consult page 55.

cold sitz-baths,[1] and the injection of cold water against the perineum. In these cases of relaxation and atony of the ducts, ergot, which, if I do not mistake, was first employed by Mitchell,[2] of New York, is also indicated, half a drachm of the fluid extract being administered in water after each meal; and strychnia should also be given in gradually increasing doses. Fifteen drops of a mixture composed of six drachms of tincture of chloride of iron and two drachms of tincture of cantharides will also prove serviceable. With the curious device of Trousseau,[3] namely, an ivory or vulcanite plug inserted into the rectum, I have had no experience, nor does it appear to have met with favor. The same writer refers to Richards' good results from forcible dilatation of the anus; and I can readily imagine that it would be productive of benefit, if there was spasm of the sphincter. Of the operation of castration, which some patients demand, and which some surgeons are weak enough to perform, I have only to say that I deem it unscientific and barbarous.

When spermatorrhœa is incident to organic lesions of the cerebro-spinal axis, or to convalescence from debilitating diseases, the treatment is that of the affection itself, with the addition of atropia and of bromide of potassium, if the latter remedy is not contraindicated.

To sum up the results of my experience in the management of abnormal seminal losses, I may add that the steel bougie, bromide of potassium, and atropia are especially adapted to cases of nocturnal emissions, and that

[1] Consult page 55.

[2] Amer. Med. Monthly, April, 1861, p. 282.

[3] Op. cit., t. ii. p. 645.

electricity, ergot, and strychnia are the most reliable agents in diurnal pollutions and spermorrhagia.

After recovery moderation in sexual intercourse should be enjoined if the patient is married; matrimony should be advised if his circumstances and inclinations warrant it; and continence in thought and in action should be observed if he remains single.

CHAPTER IV.

PROSTATORRHŒA.

Prostatorrhœa, an affection which was first described by Professor Gross,[1] signifies an excessive secretion of a clear, viscous fluid, dependent upon chronic catarrhal inflammation of the tubular glands of the prostate. It is included by some authors in their descriptions of chronic prostatitis; but it is an entirely independent disease, as it does not follow an attack of acute inflammation, nor is it attended with suppuration or other morbid changes of the parenchyma of the organ.

In the majority of examples prostatorrhœa is a complication of other disorders of the generative organs. Thus, of forty-six cases of which I have notes, in only twelve did it exist alone: while it was associated with nocturnal pollutions in two, of which Case XXX., p. 137, is an illustration; with emissions and various grades of impotence in thirty-one, of which Case XVI., page 40, is an instance; and with aspermatism in one, as in Case XXVIII., p. 125. Hence my account is limited to the disease in its pure form.

Etiology.—Of the twelve cases two began at the age of eighteen, eight between twenty and thirty, and two between thirty and forty years; while eleven of the sub-

[1] North American Med.-Chir. Rev., July, 1860, p. 693.

jects were single and one was married. In nine it was due to masturbation, in two to the extension of gonorrhœal inflammation, and in one to onanism practised early in life and to marital sexual excesses. In all there was exaggerated sensibility of the prostatic portion of the urethra, which was complicated by spasm of the compressor urethræ muscles in two, and by stricture in ten. In four there was one coarctation, which was seated within the first half an inch of the canal; and in six two strictures were detected, of which the first was near the meatus, and the second was in the bulbous urethra.

These observations correspond with those of Gross, who also states that the affection may be traced to disorders of the rectum, and that intemperance in eating and drinking, horseback exercise, drastic cathartics, cantharides, and spirits of turpentine, or, in short, whatever is likely to produce a determination of blood to the pelvic organs, tend to excite it. Ledwich[1] narrates a case in which it appears to have been occasioned by riding for several consecutive days in cold, damp weather; and both he and Lee[2] believe that the strumous diathesis predisposes to its occurrence; and others trace it to sedentary habits. While I cannot deny the accuracy of these statements, I may be permitted to express my conviction that none of the above-mentioned causes are capable of lighting up the affection independently of some preëxisting inflammation of the prostatic urethra.

Clinical History.—The most prominent symptom of the disease is the discharge of a clear, transparent, tena-

[1] Dublin Quart. Journ. of Med. Sci., vol. xxiv. p. 35.

[2] St. George's Hosp. Reps., vol. vi. p. 26.

cious fluid from the meatus, which may be constant in its appearance, but which is always expressed from the urethra during straining at stool and during the forcible expulsion of the last drops of urine, or even during sneezing, coughing, or laughing. The quantity of mucus secreted may be merely sufficient to induce an unpleasant sensation of wetness in the urethra and to agglutinate the lips of its orifice; or it may amount to a drachm or more during the twenty-four hours and keep the linen stained. However this may be, it is increased by riding, by driving, by alcoholic and malt liquors, and by the contraction of the perineal and other muscles during defecation and urination, when it may be discharged in a lump, or as a long, ropy mass. Under the microscope it will be found to

Fig. 16.

Prostatic crystals.

consist of mucous corpuscles, epithelial cells, and possibly a few leucocytes, and of minute, yellowish, concentric, amyloid concretions; and after it has slowly dried upon the slide crystals of phosphate of magnesium, as in fig.

13, page 84, or of ammonio-magnesian phosphate, as in fig. 16, from one of my patients, will make their appearance. These characters, along with the absence of spermatozoa, serve to distinguish it from semen and ordinary urethral discharges.

The escape of the fluid is occasionally attended with a pleasurable feeling of titillation; or there may be a dropping sensation in the urethra, which is due to reflex contraction of the muscular substance of the prostate induced by repletion of the glands with the secretion, and its consequent discharge into the prostatic sinus; or there may be a constant feeling of moisture in the canal. All of these abnormal sensations are increased by erections.

The only remaining local signs with which I have met were frequent and urgent desire to relieve the bladder in three; occasional scalding during urination in two; the loss of a few drops of blood at the end of the act in two; painful ejaculation in one; a sense of weight and fulness in the rectum after stool in two; and dull pains in the perineum, which were increased by exercise, especially in warm weather, in two. Hence, with the exception of pains radiating from the pelvis through the hips and thighs, and a constant sense of uneasiness about the loins, these symptoms agree with those portrayed by Adams,[1] who described the affection as "Prostatitis from Onanism," and they are confirmatory of the observations of Gross.

Prostatorrhœa differs widely from the affections which have already been considered in the absence of signs which point to nervous exhaustion, as I have met with

[1] Anatomy and Diseases of the Prostate Gland, p. 48, 1851.

them in only one example, of which the following is a brief account:—

Case XXXV. A banker, thirty-two years of age, had masturbated from his twelfth to his twenty-second year, when he married, and, to avoid having children, indulged in incomplete connection. At the expiration of six or eight months he began to be troubled with intermittent prostatic discharges at stool, and to experience fatigue on mental and physical exertion. When I saw him, ten years after the appearance of these symptoms, he was suffering from habitual constipation, indigestion, acid eructations, furred tongue, bad taste in the mouth, dizziness, muscæ volitantes, troubled and unrefreshing sleep, impairment of memory, almost constant pain in the back of the head, neck, and left shoulder, incapacity for mental exertion, muscular weakness of the limbs, constant pain in the back, a sensation of numbness along the outer side of the left thigh, and occasional flushes of heat. The prostatic discharge had been habitual for many years at the water-closet and during erections, and there was a sense of fulness and weight in the rectum. The prostatic urethra was morbidly sensitive, and the bulbous explorer defined strictures at one-third of an inch from the meatus, calibre 22, and at five inches and three-quarters, calibre 18.

Cases of a somewhat similar nature are narrated by Ledwich; but in these as well as in my own it should be remarked that the signs of nervous exhaustion were dependent upon natural and unnatural excesses, and were in no wise connected with the diseased condition of the prostate. In only two of the patients under my care were the bowels habitually costive; and in only one was there backache.

All of the twelve subjects, except that of the preceding case, consulted me under the fixed impression that they

were suffering from spermatic incontinence, so that their minds dwelt constantly on the discharge, and two were verging upon hypochondrism. I was, however, fortunate enough to convince them that the fluid was free from spermatozoa, and in this way succeeded in eliminating an element which would otherwise have perpetuated and aggravated the disease.

Pathological Characters.—In two patients, dead of phthisis, Ledwich succeeded in obtaining post-mortem examinations, and describes the appearances in the following terms: "The prostato-vesical plexus was full, and many of its branches varicose; the capsule of the prostate adhered intimately to its surface, and, on slicing the gland, it seemed soft, with large, open venous branches on the section, from which blood exuded, whilst the whole gland exhibited an augmented volume; the mucous membrane of its urethral aspect was red, soft, thickened, and villous, whilst the ducts could be distinguished with the unassisted eye; the uvula and trigone vesicæ were red and turbid, but the remainder of the bladder was healthy."

These cases, and they are the only ones on record of which I have any knowledge, demonstrate that the affection is essentially a chronic inflammation of the glandular apparatus of the prostate, with relaxation, and consequent dilatation of, the muscular fibres which surround the orifices of the ducts. Hence the discharge may be readily accounted for by the contraction of the muscular elements incited into action whenever the acini and ducts become distended by the abnormal secretion, or by the pressure exerted upon them during the first expulsive efforts of defecation and urination. This view is moreover confirmed

by the subjective and objective symptoms, of which the most characteristic is the morbid sensibility evoked by the introduction of a sound. In a few cases the urgent and frequent calls to empty the bladder, the scalding during the act, and the passage of drops of blood at its completion, point in the same direction, as does also the tumid and tender condition of the prostate, as elicited by rectal examination, with which I have met in two instances.

Diagnosis.—If the patient be requested to pass the first two or three ounces of urine in a glass, that fluid will be found to contain delicate filiform shreds, which are sometimes more than half an inch in length, and which are muco-purulent casts of the follicles and ducts of the prostate. This highly characteristic sign of the affection, when considered in connection with the local signs and the minute examination of the discharge, the composition of which has already been sufficiently considered, is quite sufficient to establish the true nature of the trouble.

Prognosis.—Prostatorrhœa is a most obstinate affection unless it is subjected to early and persevering treatment. Ordinarily the outlook, especially when the discharge is comparatively recent, is most favorable, as the disease does not evince any tendency to suppuration or other lesions of the body of the organ. This statement is substantiated by Case XVI., page 40, in which a discharge of two years' duration entirely ceased under appropriate measures in eight weeks. When mental disquietude and gloom are so great that the patient cannot be convinced that his malady is harmless, the prognosis is grave, and the management is most unsatisfactory.

TREATMENT.—When any lesion, as, for example, stricture, phimosis, or internal piles, which tends to maintain the disorder has been relieved, the therapeutics of catarrhal follicular prostatitis are essentially those of impotence and spermatorrhœa, the remedies being addressed to the relief of the morbid sensibility of the prostatic sinuses, the atony of the ducts, and the cessation of the discharge. To avoid needless repetition I will, therefore, merely indicate the measures which I have found to yield the best results.

The bowels should be kept in a soluble condition, and straining at the closet should be avoided. Driving, riding, and much walking, if prolonged exercise excites pain in the perineum, or aggravates it if it be present, alcoholic and malt liquors, and sexual intercourse and unnatural practices must be interdicted. If, however, the subject be married, and if he finds that coition is not attended with painful ejaculations, or that it does not increase the sensation of soreness in the perineum, it may be moderately indulged in.

In every instance, except two in which the affection was respectively of six and ten years' duration, the warm hip-bath,[1] the introduction of the bougie,[2] and the exhibition of bromide of potassium[3] and atropia,[4] combined with tincture of hysocyamus and bicarbonate of potassium if there were vesical irritability and scalding on urination, fulfilled the indications. Rosenthal,[5] indeed, speaks more favorably of atropia in prostatic than in seminal dis-

[1] Consult p. 53.
[2] Consult p. 43.
[3] Consult p. 51.
[4] Consult p. 52.
[5] Wiener Klinik, May, 1880, p. 160.

charges, and my own experience confirms his views. In the two exceptional cases, after the exaggerated sensibility of the prostatic urethra had been allayed by the preceding treatment, and the discharge was apparently kept up by an atonic and dilated state of the orifices of the ducts, I stopped the above-mentioned measures, but continued the atropia, and finally succeeded in effecting a cure by the administration of the fluid extract of ergot,[1] cold sitz-baths[2] morning and evening, the injection of thirty grains of nitrate of silver to the ounce,[3] and the application of flying blisters to the perineum,[4] which I consider indispensable. Winternitz recommends the psychrophor[5] for this condition, and Lederer[6] also regards it with favor; while Lee[7] relies upon the injection of a solution composed of from two to four drachms of the liquor ferri persulphatis to eight ounces of water; and Ultzmann[8] has obtained good results from the induced current with one reophore in the rectum. I have had no experience with these remedies, but think well of the last, and would employ it if the case resisted the measures which I have indicated.

[1] Consult p. 160.
[2] Consult p. 55.
[3] Consult p. 46.
[4] Consult p. 50.
[5] Consult p. 55.
[6] Weiner Med. Presse, 1879, p. 306.
[7] Loc. cit., p. 34.
[8] Wiener Klinik, May and June, 1879, p. 164.

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THE END.


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