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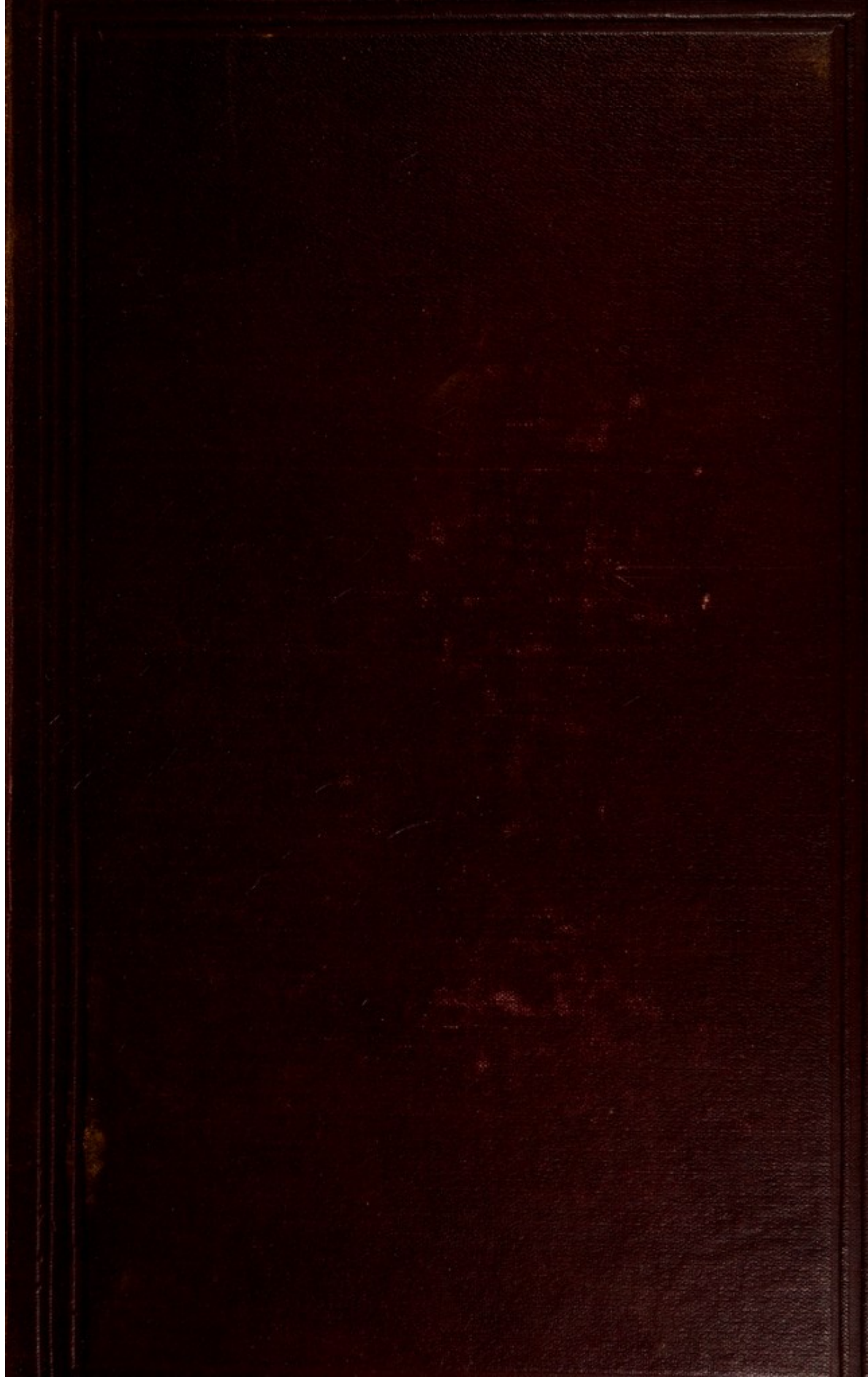
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A

PRACTICAL TREATISE
ON
SEXUAL DISORDERS
OF THE
MALE AND FEMALE.

BY

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CLINICAL PROFESSOR OF VENEREAL DISEASES AT THE COLLEGE OF PHYSICIANS AND SURGEONS
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PREFACE.

THE aim of the author of this volume has been to portray the various forms of sexual disorder in the male on the basis of advanced knowledge of the anatomy, physiology, and pathology of the various portions of the sexual sphere. The failure of antecedent treatises on this subject to present to the reader clearly cut and practical information on these disorders rests on the fact that symptoms of sexual debility—termed functional disturbances and sensory and motor neuroses—overmastered the minds of the writers, and, as a result, no completeness of description whatever was attained; but, on the contrary, unimportant points were unduly magnified, essential ones slurred over or wrongly presented, gross errors were made, and a standard of real progress was not attained. Just so long as an author is biased by visionary theories and entrammelled by his study and descriptions of such symptoms as abnormal seminal losses, spermatorrhœa, pollutions, sexual weakness and irritability, etc., he can be expected to produce an incomplete and unscientific treatise. The trend of thought and study of sexual and genito-urinary diseases within the last few years has been in the direction of acquiring knowledge of the internal structure and functions of the various portions of the urinary and sexual apparatus, and of the nature and course of the various morbid processes which attack this highly important system, and much useful information has been gained. This spirit has dominated the writer in the preparation of this volume; and while by classic custom it has become an author's duty to treat of the various forms of sexual debility prominently as symptoms, the underlying anatomical and physiological conditions have never been lost sight of, and the light of pathology has been thrown on the picture as fully as our present experience will warrant.

The endeavor has been made to fully describe the anatomy and physiology of the sexual apparatus in a scientific and philosophical manner, and in so doing the results of extended personal investigations have been incorporated. The importance of urethral inflam-

mations as an underlying cause of sexual impairment has been duly emphasized. Much care has been bestowed on the description of chronic affections of the prostate (an organ when damaged so often the cause of sexual debility), and in this chapter there is much that is new which has been developed by the investigations of the author. The conditions of the seminal vesicles and their relation, when diseased, to sexual disorders have been fully elaborated, and much information based on personal investigation is here given. In fact, the basis of the study of genito-urinary diseases will be found in this book.

Such subjects as varicocele, sexual neurasthenia, conjugal onanism, priapism, sexual erethism, and sexual perversion have been considered in a concise and practical manner.

In the matter of therapeutics much care and elaboration have been exercised, with the intent to clearly bring out practical and efficient methods of treatment indicated by the pathological conditions producing the trouble.

The subject of sterility in women is considered in a general manner with the idea of conveying to the mind of the reader the conditions which tend to render a woman unfertile.

The description of the various vulvar and vaginal lesions, concerning which there is such a general lack of definite knowledge, is here quite fully given, and it is hoped that the results of many years' personal study of this subject may be the means of placing it on a clear and scientific foundation.

I have availed myself of the skill of Dr. James Ewing in some important histological questions, and of the friendship of my chief of clinic, Dr. J. R. Hayden, in following up a series of cases seen in my clinic (Vanderbilt Clinic), and I hereby tender them my thanks.

With the exception of seven, all the illustrations of anatomical and pathological conditions herein presented are original.

Finally, I venture to hope that this volume will prove a helpful manual to the general practitioner in the management of a very large group of cases which has heretofore been ill understood and even avoided by them.

ROBERT W. TAYLOR.

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SEXUAL DISORDERS

OF THE

MALE AND THE FEMALE.

CHAPTER I.

THE ANATOMY, STRUCTURE, AND PHYSIOLOGY OF THE MALE SEXUAL APPARATUS.

FOR a thorough understanding of male sexual disorders more knowledge is required than is generally supposed. In the first place, well-grounded knowledge of general medicine and a general understanding of the anatomy, physiology, and pathology of the nervous system are absolutely necessary. Then it is very important that the surgeon should have practical experience in diseases of the genito-urinary system. And in addition to the foregoing requirements, thorough acquaintance with the anatomy, structure, and physiology of the sexual tract is absolutely required as a basis for study, observation, and treatment. And, still further, the surgeon needs a clear understanding of the nature and course of syphilis, of the pathology of gonorrhœal infection, and of all acute and chronic infective processes. And, in addition to this long list of requirements, the knowledge of the use of the microscope in the examination of the urine and of the various secretions of the body is absolutely essential. When studied

on these broad lines, diseases which in former years were vaguely if at all understood, and even shunned by medical men, can now be discussed on scientific and practical grounds.

Appreciating the absolute necessity for an accurate knowledge of the anatomy of the sexual organs, the subject has been very carefully gone over in a practical way in the dead-house, and the aid of the microscope has been made use of to elucidate facts as to the intimate structure, secretions, and functions of the various subdivisions of the sexual apparatus.

THE PENIS.

The penis consists of a root, body, and glans. It is the organ of urination and copulation, and through it three-fourths of the urethra runs. It is composed of two bodies lying side by side, called the corpora cavernosa, and of a third lying in a groove on the under surface of the former, which is called the corpus spongiosum, and by some authors the corpus cavernosum urethræ. These parts are enveloped by a loose tegumentary sheath, while the glans penis is covered with a firm, very adherent mucous membrane over which the muco-cutaneous prepuce glides.

Erectile Tissues of the Penis.

The structure and functions of these three parts are peculiar and interesting. They consist of elastic erectile tissue which, owing to its anatomical arrangement, is susceptible of great engorgement. The glans penis, which includes the distal or expanded portion of the organ, is composed of a mass of erectile tissue which begins at the bulbous expansion of the urethra, and,

extending forward, constitutes the corpus spongiosum. This part, which is largely concerned in erection, has in the main the same anatomical structure as the corpora cavernosa present; the latter, however, consist of a rather denser fibrous arrangement. The corpora cavernosa form the larger part of the body of the penis. They consist of a labyrinthine arrangement of trabeculæ, which are composed of connective tissue, elastic fibres, and more or less unstriped muscular tissue. These trabeculæ are spaces of various sizes which serve as blood-sinuses, and are distended in erection and collapsed in the quiescent state of the penis.

Arterial capillaries ramify in the walls of these trabeculæ, and from them the blood pours in moments of sexual excitement. In some cases the arterial twigs open into the trabecular cavity itself.

The arterial supply to the cavernous and spongy bodies of the penis is derived from branches of the pudic arteries and the dorsal artery of the penis.

Nerves of the Penis.

There are different classes of nerves in the penis concerned in erection and ejaculation. Those of the first order are the sensory nerves, which are most abundant in the glans penis; but they are also present in the integument of the organ, and transmit irritations, stimulation, and impressions backward to the sexual centre. In the second order, anatomically speaking, but more important, perhaps, in a physiological sense, are the excitor nerves.

These nerves, called the *nervi erigentes* or excitor nerves, are derived from the first and second and sometimes from the third sacral nerves. It is thought that these nerves originate in the sexual centre, which is

supposed to be seated in the lumbo-sacral portion of the spinal column. Experiments on animals have shown that stimulation of these nerves causes erection of the penis, which is, therefore, essentially due to the vasodilator action upon the arterioles.

The facts are well established that in the human subject mental impressions are transmitted down the spinal cord, probably in its lateral columns, to the sexual centre, which undergoes excitation, which is thereupon further transmitted through the *nervi erigentes* to the penis and accessory parts of the sexual apparatus. Peripheral excitation of the sensory nerves in the glans penis and penis itself is conducted back by them to the spinal sexual centre, which, in turn, by reflex action through the *nervi erigentes*, acts upon the sexual sphere and induces erection.

Certain facts derived from experimental physiology, and supported by clinical observation, go to show that it is probable that besides the excitor nerves there are inhibitory nerves of erection which originate in the brain and pass down the lateral columns of the cord to the sexual centre. As will be shown in subsequent sections, erection may be materially modified or extinguished by mental impressions, and it is very probable that this restraining effect is due to these inhibitory nerves.

In the glans penis the nervous supply is peculiarly exuberant, and many of the nerves end in Paccinian bodies, while others have at their ends peculiar bulb-like expansions. This rich nerve-supply also exists in and about the *frænum*, and it is to it that the excessive sensitiveness of these parts is due.

The foregoing facts certainly warrant the opinion that the sensorium commune of the external male genitals is

seated in the glans penis, which includes in its territory the regions of the frænum and of the fossa navicularis.

It is claimed by some that at the bulb of the urethra the nerve-supply resembles that of the glans. Certain it is that in this region the blood-supply is particularly copious. The integument of the penis, the scrotum, and urethra are also abundantly supplied by nerves.

As might be expected from the structure and function of the corpora cavernosa and corpus spongiosum, these parts are freely supplied by fibres of the sympathetic nerves which are derived from the pelvic or inferior hypogastric plexus. It is claimed by some investigators that the entire sympathetic nerve-supply goes to these erectile bodies.

In the consideration of the nerve-supply to the penis particular attention should be paid to the verumontanum. In this structure, composed of mucous membrane, erectile tissue, and muscular tissue richly supplied by bloodvessels, the nervous supply is particularly abundant; hence this part is usually exquisitely sensitive, is the seat of the pleasurable sensations in coitus, and in disease becomes a factor of much importance and gravity.

It will thus be seen that while there is an external sensorium commune of the sexual apparatus, seated at the distal part of the penis, there is also an internal sensorium, seated in the middle of the prostatic urethra.

MUCOUS SECRETION AND THE FOLLICLES AND GLANDS OF THE URETHRA.

In healthy individuals in moments of sexual excitement a few or many drops of a clear and mucous secretion escape from the meatus. In some forms of sexual

ill-health the secretion may become much more abundant than normal; and both in health and in ill-health it is sometimes the cause of much mental anxiety. It is necessary, therefore, to understand clearly the nature and origin of this mucous secretion.

FIG. 1.

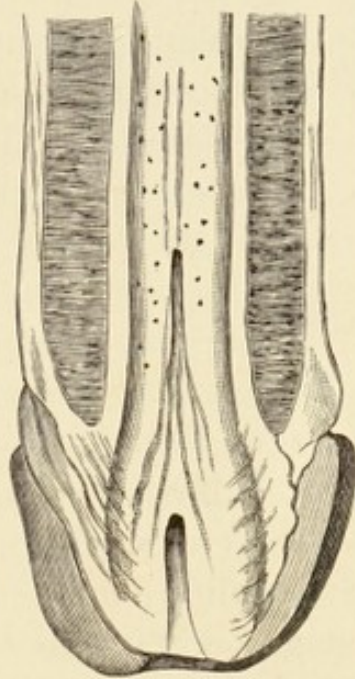


One of the mucous glands or follicles of Littre opening into the lumen of the urethra: *x y*, lateral branches of main duct with their more superficially situated acini; *z z*, continuation of main duct with deeply seated acini; *s s*, trabeculae of the cavernous tissue; *w w*, tunica albuginea. (Drawn from nature.)

Into the anterior urethra, which includes that part of the canal in front of the triangular ligament, three orders of muciparous glands open by means of ducts. These are the follicles of Littre, the lacunæ or crypts of Morgagni, and Cowper's glands. All these glands are of the compound racemose type, consisting of acini which open

into a common duct. (See Fig. 1.) The follicles of Littre are structurally the same as the crypts of Morgagni, but are smaller in dimensions. The lacuna magna in the fossa navicularis is a good illustration of a typical Morgagni's crypt. As shown in Fig. 2, it is a valve-

FIG. 2.



Showing the lacuna magna and a deeper valve-like pocket and the orifices of numerous mucous glands.

like structure at the bottom of which the duct of the gland opens. There may be several of these crypts along the roof of the urethra, but they are usually not found deeper than three inches. In Fig. 2 two of these valve-like pockets may be seen.

Littre's follicles are quite numerous, and are seated mostly on the floor of the urethra and sometimes, though in less numbers, on its roof. The ducts of these follicles open obliquely forward toward the meatus, and by the naked eye or by the aid of a magnifying-glass may be seen as very minute depressions in the mucous

FIG. 3.



Showing roof of the urethra with bristles passed into Littre's follicles.

membrane. In Fig. 3 these follicles are indicated by the many minute bristles which have been passed into their ducts.

Cowper's glands are two compound racemose bodies, seated just behind the anterior layer of the triangular ligament in the substance of the compressor urethræ muscle. (See Fig. 7.) Their ducts are about three-quarters of an inch in length, and they pass obliquely forward through the anterior layer of the triangular ligament and open separately into the bulbous urethra. (See Fig. 5.)

All these glands and follicles secrete a clear, viscid mucus of alkaline reaction, which resembles glycerin in appearance. It is probable the secretion of Littre's follicles and Morgagni's crypts is mostly developed for the lubrication of the urethral mucous membrane; but this fluid is also quite abundantly produced during the sexual act. By some it is thought that the acidity of the urine left in the canal after micturition is neutralized by these secretions. The secretion of Cowper's glands is quite copious and similar in character to that just described. It forms part of the seminal discharge in coitus, and is frequently found in cases of sexual

excitement without orgasm. This secretion plays an important part in certain sexual disturbances to be considered later.

THE PROSTATE GLAND AND THE PROSTATIC URETHRA.

The prostate gland¹ is an accessory sexual organ of much importance, which also is employed in urination. In order to obtain a clear idea of this sexual gland it is necessary to study its structure microscopically in young subjects, both children and animals, and then to trace its development at later periods of life. Such studies develop the following facts:

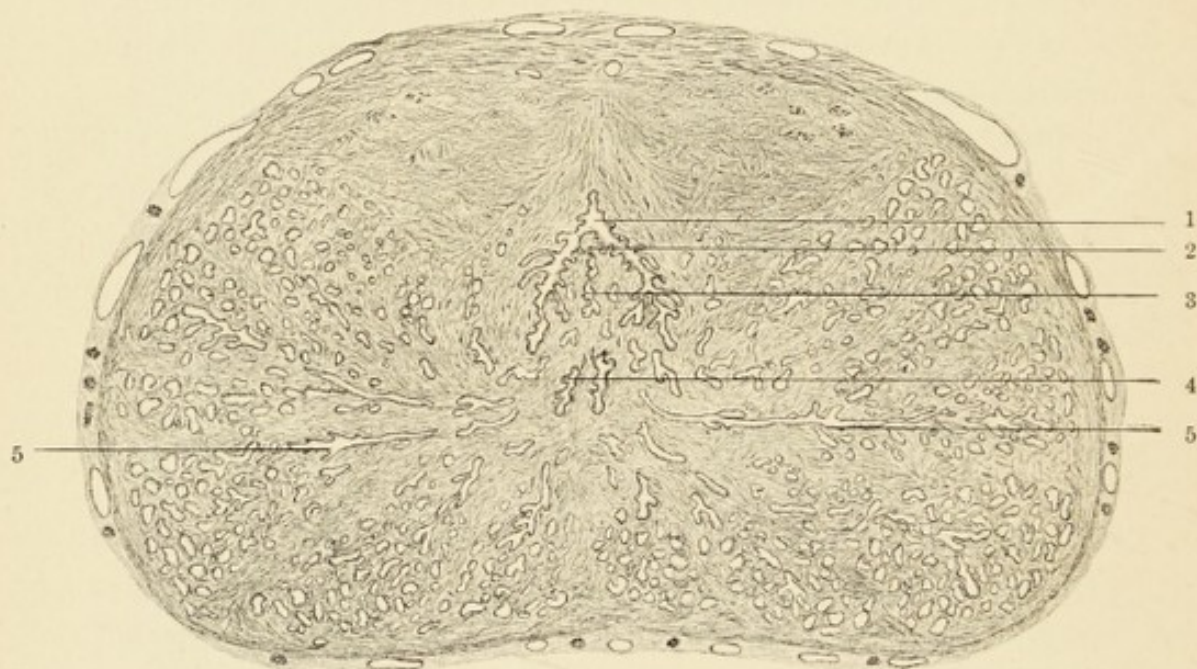
The prostate is essentially a glandular organ, and the chief function of its other component tissues, namely, the fibrous connective-tissue framework and the unstriped muscular fibres, are: 1, to form a nidus for the lodgement of the glands, and, 2, to assist in their normal action. The glands are of the compound tubular type, and end in short ducts which open into the prostatic urethra. The ducts are merely fibrous tubes lined with columnar epithelium. The secreting portions of the glands are the tubules and the gland alveoli, which consist of longer or shorter, wavy, convoluted, branched tubes which terminate in saccular blind extremities. To some glands there are short lateral club-shaped branchlets. The secreting portions of these glands are lined by long slender cells which are surrounded by a delicate

¹ I have availed myself freely of the admirable studies upon the nature and structure of the prostate made by Joseph Griffiths, M.B.C.M. Edin., entitled "Observations on the Anatomy of the Prostate Gland." *Journal of Anatomy and Physiology*, 1888-'89, vol. xxiii. p. 374 et seq., and vol. xxiv. p. 27 et seq., and p. 236 et seq.

connective-tissue basement-membrane in which blood-vessels, lymphatics, and nerves are seated. Outside the gland proper there are bundles of unstriated muscular fibres, some of which are circularly arranged, while others cross each other in various directions. By the contraction of these muscular rings the secretion of these glands is thrown into the urethra.

In the young normal prostate the glands are grouped in tolerably well-defined lobules. This is well shown in Fig. 4, in which can be well made out eleven distinct

FIG. 4.



Showing section of normal prostate of a subject aged nineteen years, made through middle of verumontanum: 1, urethra; 2, verumontanum; 3, sinus pocularis; 4, ejaculatory ducts; 5, prostatic glands. (Drawn from the Erdinger projection apparatus.)

lobular groups of prostatic glands. In these lobules the tubular glands are inexplicably mixed up with each other very much as a bunch of earth-worms are, but all their ducts point toward the urethra. In the figure

the irregular spaces in white are the glands cut through; but there are very many long tubules shown which in the section happen to have been cut in the continuity of the glands.

There is no muscular investment of the ducts of the glands, and it is probably owing to this condition that these outlets sometimes become plugged up with amyloid bodies, concretions, and calculi, which in all probability would be expelled by circular muscular fibres if they were present.

There is no reservoir in the prostate gland for storing up or retaining its secretion. The latter in the sexual act is very copiously elaborated, and is quickly thrown into the prostatic urethra by means of the muscular mechanism, which is so admirably adapted to that purpose.

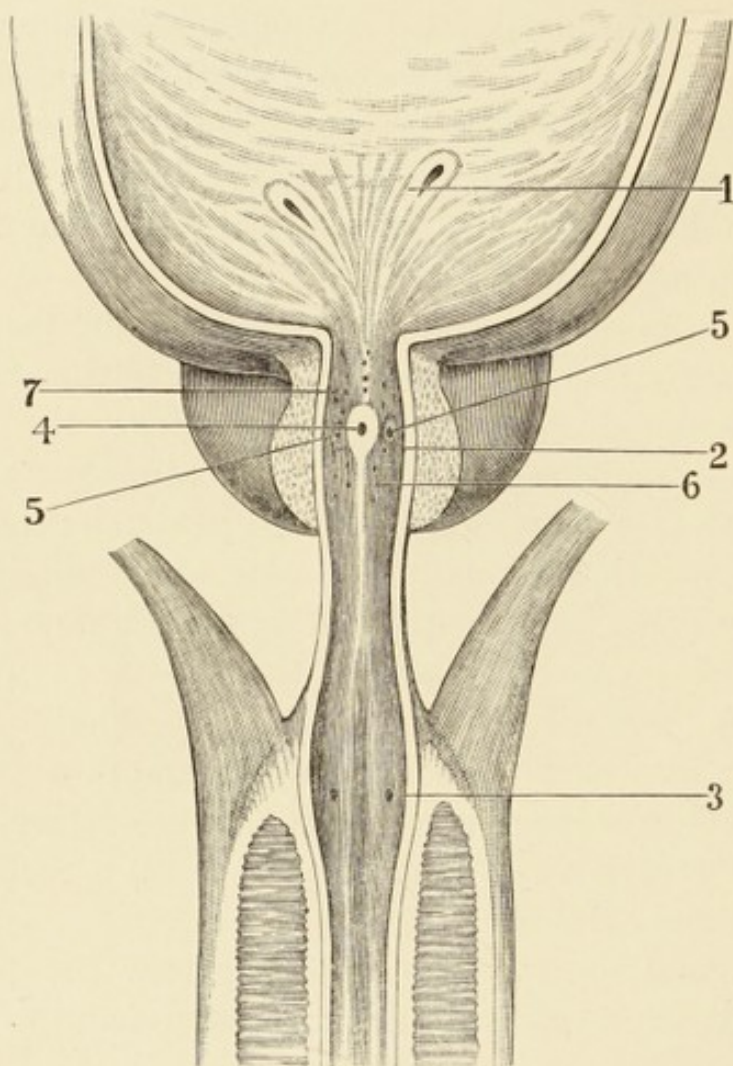
The prostatic urethra is normally about an inch and a quarter or an inch and a half in length, and extends from the apex to the base of the prostate. It has a calibre of 30 F. at the apex, 45 in its middle portion, and 33 at its vesical end. It tunnels the prostate gland one-third nearer its upper than its lower surface, and its direction is downward and forward until it reaches the membranous urethra.¹

When laid open on its upper surface the prostatic urethra is found to be of fusiform shape and to present certain anatomical peculiarities. (See Fig. 5.) On its floor is a narrow, longitudinal, wedge-shaped ridge called the verumontanum, the caput gallinaginis or crista galli. This structure, which is from one-half to three-quarters of an inch in length, and one or two lines in height, is

¹ The usual anatomical descriptions of the prostatic urethra are based on the position of the canal as found in the cadaver when it is laid flat on its back. In strict accuracy, the prostatic urethra in the living male, as he stands up, has an anterior and a posterior wall which are nearly in accord with the vertical axis of the body.

composed of erectile tissue and muscular fibres and many tubular glands, all of which are covered with a

FIG. 5.



Showing bladder and urethra opened on the upper surface: 1, the trigone and openings of ureters; 2, prostate and prostatic urethra; 3, bulb of the urethra, with openings of Cowper's glands; 4, verumontanum, with orifice of sinus pocularis; 5, openings of ejaculatory ducts; 6, linear series of openings of prostatic ducts; 7, groups of openings of prostatic ducts behind verumontanum. (Drawn from nature.)

dense mucous membrane. At each side and at the base of the verumontanum is a depression which is called the prostatic sinus, and it is upon the surface of these

sinuses, right and left, that in a tolerably regular linear arrangement many prostatic ducts open, usually about twelve, and in some instances as many as twenty or thirty.

THE SINUS POCULARIS. On the summit of the verumontanum, sometimes at its forepart and sometimes about its middle, a slit-like depression may be seen, which leads to a cul-de-sac or flask-shaped pouch about one-quarter to three-quarters of an inch in length and of a calibre of about three millimetres, which is directed upward and backward in the axis of the prostatic gland. This cul-de-sac, which is called the uterus masculinus, or sinus pocularis, is really a separate structure and distinct from, but surrounded by, the prostate. It consists of a secreting surface of columnar epithelial cells surrounded by connective tissue and bloodvessels and circular layers of unstriped muscular fibres. It may or may not have blind diverticula.

The function of the sinus pocularis is not known. It is thought by some that by reason of its position between the ejaculatory ducts, its round shape, and its well-developed musculature, in coitus it so contracts that it draws upon the openings of the ejaculatory ducts, and thus renders them so patulous that the semen readily passes through.

PROSTATIC TUBULES. Upward and beyond the verumontanum there is a small mass of gland-tissue enveloped in a connective-tissue stroma and covered with mucous membrane which is pierced by the orifices of many gland-ducts. This tissue-mass is seated between the two lateral lobes, and it ends at the orifice of the bladder. In some subjects the development of this glandular area is very sparse, in others more luxuriant, while in a more limited class of subjects it is very ex-

uberant. This mass of glandular tissue plays an important part in many young and middle-aged subjects in being the seat of a low grade of chronic inflammatory process, and in later life it may undergo such marked hyperplasia that a third lobe of the prostate is formed, which, becoming invested by a capsule derived from and continuous with that of the rest of the gland, offers more or less impediment to the passage of the urine.

It will thus be seen that some of the ducts of the prostate gland open on each side of the verumontanum in a linear manner, and that there is also a group of them clustered in the tissue beyond this structure as far as the vesical orifice. (See Fig. 5.)

In the mucous membrane lying laterally beyond the region just mentioned we frequently find scattered here and there orifices of gland-ducts, but never in large number.

On each side of the orifice of the sinus pocularis, or uterus masculinus, in the vertical walls of the verumontanum, are the slit-like openings of the ejaculatory ducts. In some cases one or both of these ducts open into the cavity of the sinus pocularis.

In the anterior wall of the prostatic urethra, near its middle portion, are numerous venous channels, almost amounting to a plexus, which are superficially seated in a dense submucous tissue and covered only with mucous membrane. It is the injury of this plexus by careless sounding which sometimes gives rise to severe hemorrhage.

There are three layers of unstriped muscular fibres in the prostatic urethra: (1) an internal circular layer immediately beneath the mucous membrane; (2) a middle longitudinal layer which forms an imperfect sheet of muscle; and (3) an outer, annular coat, which is

continuous with the circular muscular fibres of the bladder. There are, in addition to the foregoing, the external and internal sphincters of unstriped muscular fibres of Henle, and in the capsule of the gland beneath the striped muscle is an independent, thin layer of non-striped muscle, from which fasciculi pass inward and invest the ultimate groups of tubules. (See Fig. 4.)

The arterial supply of the prostate is very considerable, and is derived from branches of the internal pudic, vesical, and hemorrhoidal arteries. The veins are correspondingly large, and they end in a plexus which is situated at the side and base of the gland. There is also an abundant distribution of medullated and non-medullated nerves to these parts, which are derived from the pelvic plexus.

In and about the verumontanum there is an abundant supply of nerves of peculiar sensibility, and here it is thought that the seat of pleasure in the sexual act is centred. This part may be called the internal sensorium sexuale.

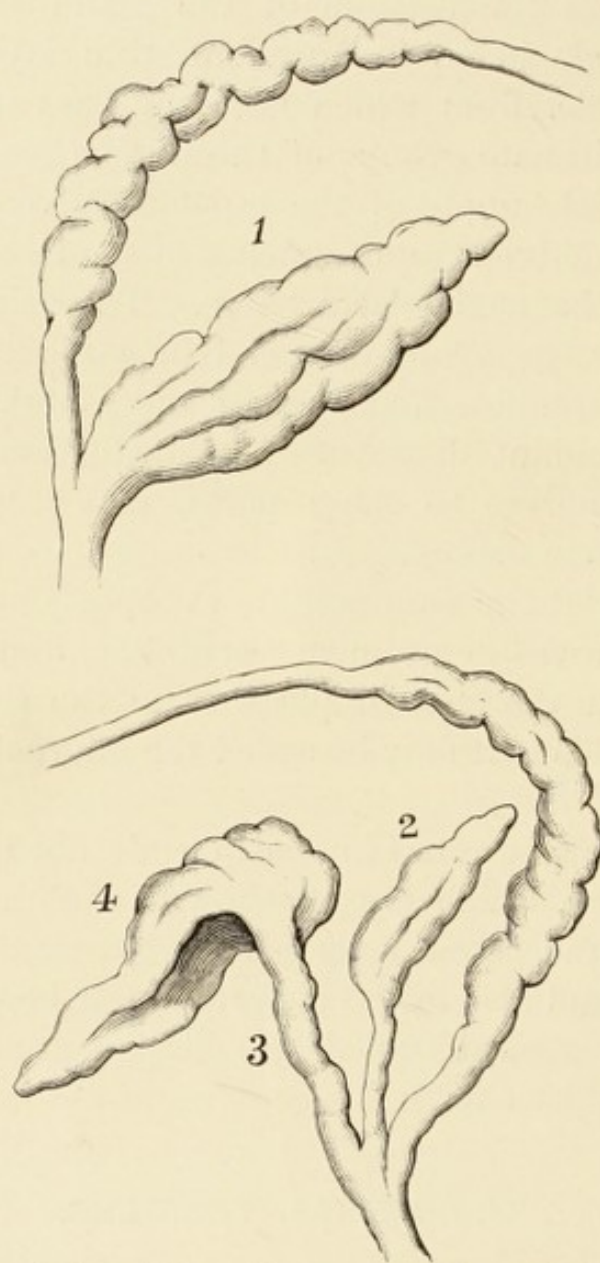
The prostatic urethra in health ends abruptly at the vesical orifice, which is well shown in Fig. 5. When the gland undergoes enlargement, particularly in its third lobe, and also in the lateral lobe, it begins to pass beyond this vesical orifice, and may eventually extend into the bladder cavity.

THE SEMINAL VESICLES.

The seminal vesicles are two elongated and lobulated membranous pouches situated at the base of the bladder just beyond the prostate and in front of the rectum. The seminal vesicles have been erroneously and variously described as convoluted tubes, as little sacculated

bladders, and as racemose glands. They are really blind-ending tubes with diverticula of various sizes.

FIG. 6.



Showing the relation of the various parts of the seminal vesicles to each other and the ampullations: 1, seminal vesicle; 2, inner tube; 3, second tube; 4, outer or third tube, or handle of the jack-knife. (Drawn from nature.)

This can be seen by a study of Fig. 6. On the right-hand side the vesicle (1) is portrayed divested of its

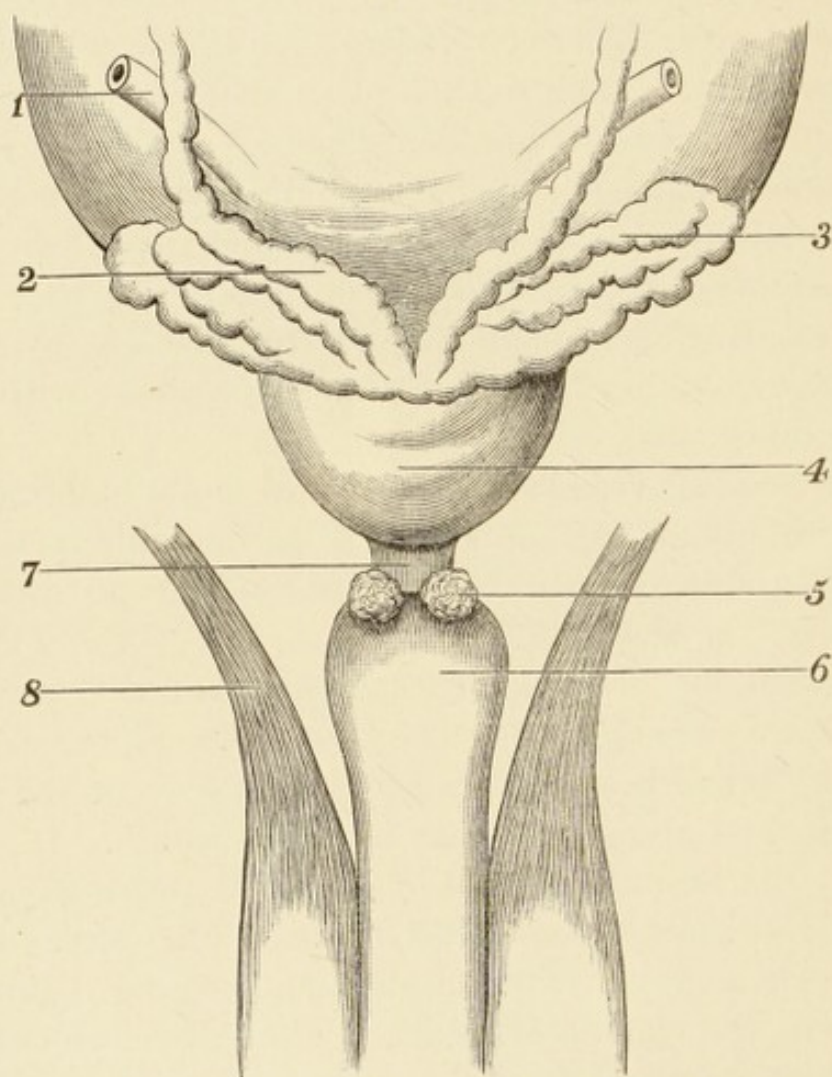
loose connective tissue, and its three tubes are quite distinct to view. The ampullation of the vas deferens is also shown. On the left side the tubes are shown dissected apart. The inner or first tube (2) is seen to have a decided distal enlargement. The middle or second tube (3) is seen to join the outer or third tube (4) at right-angles. These two tubes (the third and fourth) bear the same relation to each other that the blade of a jack-knife bears to its handle. The outer enlarged tube, of dog's-ear shape, is called the handle of the jack-knife, and the middle tube is its blade. When placed in natural coaptation the knife-blade fits snugly in the concavity existing in the handle, and these lie side by side, all welded together by dense connective tissue with the first or inner tube.

Each seminal vesicle measures two and a half inches in length, about half an inch (sometimes an inch) in breadth, and a quarter to a third or half an inch in thickness. (See Fig. 7.)

The anterior or pointed extremities of the seminal vesicles are situated, when the bladder is empty, within a finger's breadth of each other on each side of the median line just above the base of the prostate. In this interval the ampullated end of each vas deferens joins the anterior pointed extremity or outlet duct of the seminal vesicle at a very acute angle, and, merging together, they form the ejaculatory duct. Thus there are two of these ducts—one on the right of the median line and one on the left—lying very near to one another. These ejaculatory ducts enter the prostate at its base, tunnel its structure side by side (see Figs. 10 and 11), pass downward and upward, and enter the prostatic urethra either on the sides of the sinus pocularis or into its cavity.

Although the seminal vesicles and the ampullated extremities of the vasa deferentia lie very close to one another when the bladder is empty, when that viscus is normally distended these structures are separated from

FIG. 7



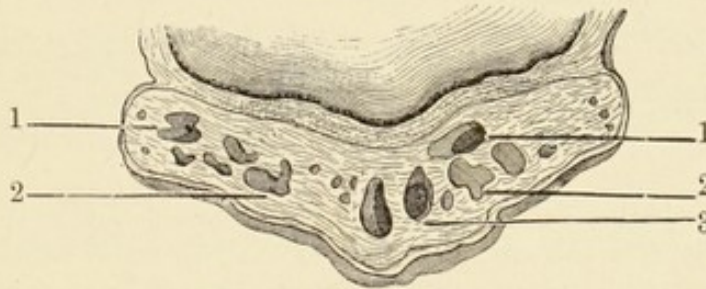
Under view of bladder and sexual apparatus and of urethra and prostate:
 1, ureter; 2, ampullation of vas deferens; 3, seminal vesicle; 4, prostate;
 5, Cowper's glands; 6, bulb of urethra; 7, membranous urethra; and, 8,
 crus penis. (Drawn from nature.)

each other so that they form the letter V on the outside of the vesical wall. (See Fig. 7.) On the inside of the bladder at its base a V-shaped space, corresponding to

the external one just described, exists, which is called the trigone. (See Fig. 5.) It will be seen that in this figure, which is accurately drawn, the orifices of the ureters are unsymmetrically placed.

The seminal vesicles have the usual muscular connective-tissue and mucous membrane coats. Each portion of the vesicles has a calibre varying from 10 to 18 of the French scale (and in some young and vigorous subjects 30 French), while its outlet duct has a calibre of about 4 to 6 French, and sometimes less. (See Fig. 8.)

FIG. 8.



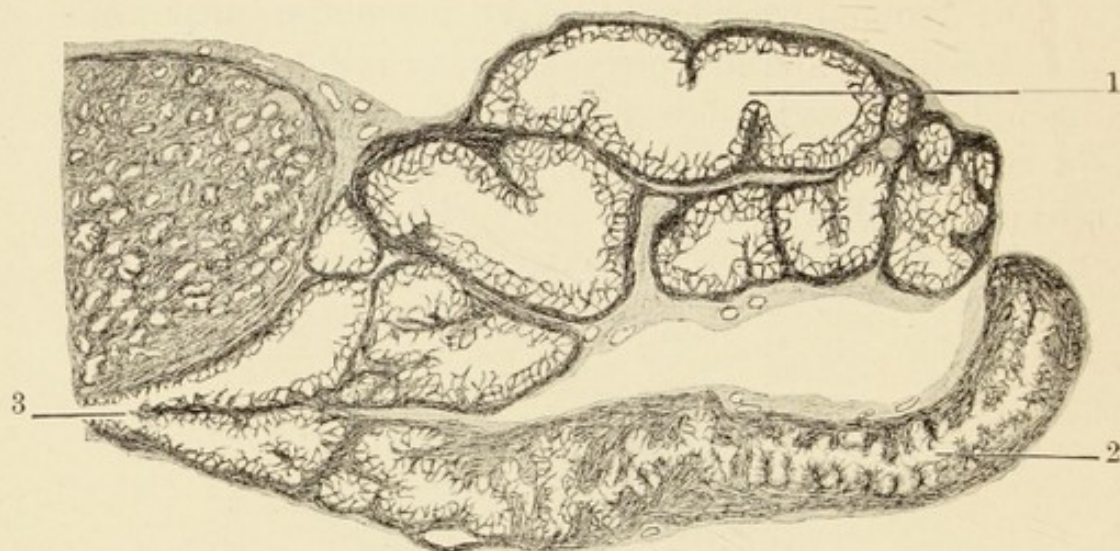
Transverse section of the base of the bladder just behind the prostate, showing the relation of the seminal vesicles and the ampullations, which are embedded in a dense connective-tissue stroma: 1 and 2, chambers of seminal vesicles; 3, ampullations of the vasa deferentia.

The epithelium lining the vesicles is of the columnar and cuboidal varieties. The mucous membrane, which is studded with the orifices of numerous tubular glands, is thrown into folds by which its extent is greatly increased. Thus the muscular layers form trabeculae, which produce many depressions and diverticula. (See Fig. 9.) In structure the seminal vesicles have thicker and denser walls than the ampullated parts of the vasa deferentia. They also have an abundant musculature, by the contraction of which the secretion is promptly expelled.

The seminal vesicles are firmly welded to the prostate by means of dense, fibrous connective tissue, which,

besides completely investing the sacs, so adjusts the anatomical relation of the parts that the normal position of the ejaculatory ducts is always preserved, and there

FIG. 9.



Showing the internal structure of the seminal vesicle and of the ampullation of the vas deferens, and the union of the two ducts which form the ejaculatory ducts: 1, interior of seminal vesicle; 2, interior of ampulla; 3, junction of the ducts forming the ejaculatory duct. (The section is taken in transverse diameter of the prostate and in the long axis of the seminal vesicles and vas deferens. Drawn from the Erdinger projection apparatus.)

is never danger of their being accidentally bent, twisted, or compressed. This condition of affairs is most important in coitus, since by it any hindrance to ejaculation is prevented.

This perivesicular connective tissue is also interesting in clinical practice, since in some cases inflammatory action extends beyond the vesicles themselves and involves it more or less extensively.

The arterial and venous distribution of the seminal vesicles is very rich, and is derived from the middle and the inferior vesical and middle hemorrhoidal trunks.

The nerve-supply is abundant, and is furnished by the pelvic plexus.

It has been very generally believed and taught that the seminal vesicles are the reservoirs of the semen, and that their secretion serves the purpose of fructifying the spermatic cells. Recent very extensive and carefully conducted studies into the anatomy and physiology of these sacs have been made by my friend, Prof. George S. Huntington, both upon the human cadaver and also upon animals, and, although not absolutely conclusive, are worthy of close attention. As a result of these studies Dr. Huntington is convinced that the semen never reaches the seminal vesicles. He thinks that those observers who have found after death semen in these sacs, and have concluded that it was normally present there, were undoubtedly deceived by accidental conditions. In removing the base of the bladder and its appendages, which is a rather delicate task, the parts undoubtedly, in these instances, have been carelessly handled and so cut and disturbed in the manipulation that the semen has been forced into the vesicles. This can readily occur in the flabby dead subject. If one looks at the anatomical relation which exists between the outlet duct of the seminal vesicles and that of the vasa deferentia, it will be seen that they join at a most acute angle. There are no signs in the distal end of either duct of a valve, nor is there any evidence whatever of any mechanism by which semen can be sucked into the vesicles or forced from the ampullæ into them. In all probability in the quiescent condition the ducts of the seminal vesicles and of the ampullæ and the ejaculatory ducts become collapsed, and are then closed tubes by means of the folds of mucous membrane, a condition rendered more effective by muscular action.

Now, for the semen to pass into the vesicle it must turn a very sharp corner and go upward and backward

and distribute itself into the cavity of that sac, a procedure for which there is no structural mechanism, and which is not in accord with any process known in human anatomy.

To my mind, the chief function of the seminal vesicles is the elaboration of a peculiar mucus in large quantity, which, in coitus, by its volume and force, carries along with it without impediment the seminal fluid, which exists in much more sparing quantity in the ampullations of the vasa deferentia.

In this connection it is well to call to mind the position and function of the seminal vesicles and of the ampullæ, their immediate surroundings, and the conditions to which they are subjected in health, since such an understanding renders clear many pathological conditions which are now obscure.

In health these seminal reservoirs, when the man is in the erect position, are seated nearly in a vertical position—that is, they are bags with their bodies high up and with their outlet ducts low down, looking downward and slightly forward. From their position one might think that their mucous contents might readily escape in obedience to the laws of gravitation. But we find that the secretion is retained in health in its reservoirs by wonderful provisions of nature. The healthy seminal secretion of these parts is very viscid, consequently it is not prone to leak out of the outlet ducts. In ill health it is more fluid, and then it tends to escape. Then we must consider the interior structure of these receptacles. They are not simply cavities like an egg-shell, but are composed of intricately arranged chambers with decidedly deep trabeculæ and diverticula, all of which tend to keep the secretion pent up until discharged by the functional activity of the parts. Then

at the orifices of the outlet duct such is the compactness of the structure of the circular muscular fibres that they possess a certain tonus which prevents the escape of the contained secretion. It is probable also that in a measure the normal action of the musculature of the ejaculatory ducts so compresses these tubes that escape of secretion through them is prevented. The reduplicatures of the mucous membrane also help to stop up these tubes. Therefore we see that the conditions inherent in the secretions themselves and of the parts which hold them ready for discharge all tend to keep them well stored up until they are thrown out in ejaculation. In disease all this is changed, and tonus is replaced by lack of normal contractile power, and a general flabbiness and inertness of the parts are present. Then, with secretions less viscid than normal and with loss of tonus and functional activity in the reservoirs and their outlet ducts, it is readily seen why these secretions escape.

We must further fully consider the various influences to which the seminal vesicles and ampullæ are constantly subjected. Welded as they are to the base of the bladder, they undergo more or less expansion and contraction, according as that viscus is full or empty. In the act of urination, when the size of the bladder diminishes until it becomes a mere ball, there must be some pressure exerted upon these seminal appendages; but in health, as a general rule, no expression of their contents is produced. Then, again, we must remember that the bladder and all structures connected with it are necessarily more or less acted upon by intra-abdominal pressure (the weight of the intestines and their distention after eating, the distention of the rectum by gas or by feces, and abdominal fat), which in health does not, with very few exceptions, produce any change either in the vesicles

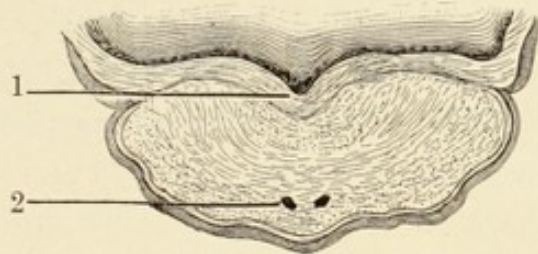
or the ampullæ. Further than this, in the expulsive and contractile efforts of the rectum, which lies immediately behind them, in defecation, particularly if the fecal mass is large and firm, considerable pressure must be exerted upon these intimately connected parts, particularly when there is strong contraction of the levator ani muscle. Even with all these surrounding and neighboring forces acting upon the vesicles and ampullæ, they, as a rule, remain unaffected and their secretion is not in any way abnormally disturbed. When these facts are fully understood much advance is made toward a clear and scientific comprehension of the nature and extent of seminal losses.

The Ampullations of the Vasa Deferentia and the Ejaculatory Ducts.

The ampullated ends of the vasa deferentia are really expansions developed in these true spermatic canals at their point of juncture with the inner or first tube of the seminal vesicles at the niche in the base of the prostate. They have the same histological structure and the same glandular supply as the seminal vesicles, except that their fibrous and muscular tissues are rather less copious, but they are nevertheless firm and strong. The calibre of the ampullations of the vasa deferentia varies between 6 and 10 French, but in vigorous young men it may be much larger. The internal structure of these dilated extremities of the spermatic canals is trabeculated like that of the vesicles, by which arrangement a greater amount of secreting surface is produced. (See Fig. 9.) There are present numerous tubular muciparous glands throughout their extent. These ampullæ become narrowed just at the base of the prostate, and they then form a tube into which a bristle or a knitting-

needle will pass without the use of much force. Around the orifices of these ducts the muscular tissue is somewhat increased in quantity, so that a not very well developed sphincter is formed. This duct is then joined by a duct of similar calibre, which is the prostatic end of the inner or first seminal vesicle tube. (See Fig. 9.) In this manner are formed the ejaculatory ducts, which are about three-quarters of an inch in length and have a calibre of

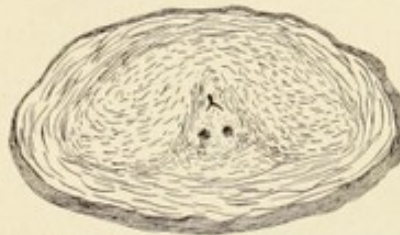
FIG. 10.



Showing the position of the ejaculatory ducts in the upper part of the prostate and behind the urethra: 1, vesical orifice of the urethra; 2, ejaculatory ducts. (Drawn from nature.)

about two millimetres. They run, as has already been stated, through the prostate downward and upward and open on each side of the verumontanum. (See Figs. 10 and 11.) The mucous membrane of the ejaculatory ducts

FIG. 11.



Showing the position of the ejaculatory ducts in the middle of the prostate under the verumontanum just before they turn upward and end in the prostatic urethra. (Drawn from nature.)

contains tubular glands, is somewhat trabeculated, and from it numerous diverticula and duplicatures are developed.

Microscopical study of the structure of the ejaculatory ducts shows that their fibrous coat is not very thick, heavy, or condensed, and that their muscular coat is correspondingly sparse and weak. A careful examination of these structures will convince the observer, I think, that their *role* in ejaculation is either passive or their function is to contract moderately after the ejaculate has passed through them. There are no such firmness and density of structure of the ejaculatory ducts as there are in the vesicles and ampullæ, whose expulsive power is very great, owing to the preponderating amount of unstriped muscular tissue. In the rhythmical process of ejaculation the secretion passes from above through the ejaculatory ducts, which then remain patulous, and it enters the prostatic urethra, and just as this occurs the prostate contracts quickly, firmly, and synchronously. The ejaculatory ducts then contract as strongly as their feeble structure will allow them. Thus the ejaculate is thrown forward.

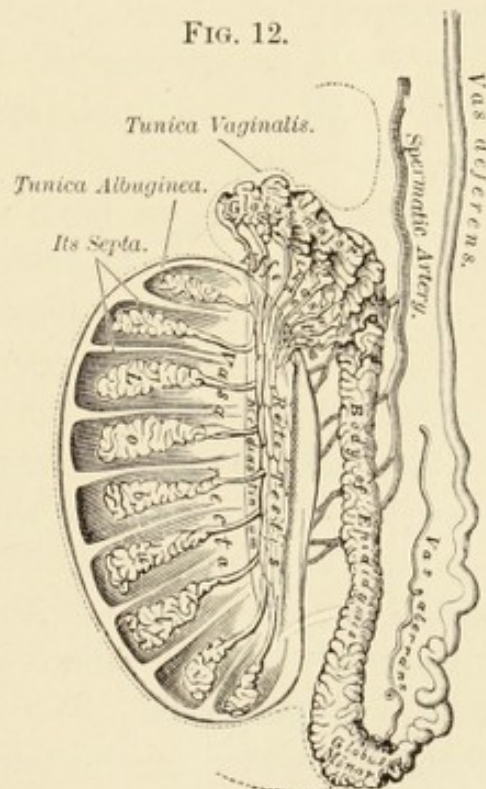
The chief function of the ejaculatory ducts, however, seems to be secondary to that of the orifices of the seminal vesicle and ampullæ. The sphincteric action of these orifices is quite powerful, owing to the goodly quantity of circular muscular fibres. Now, added to this, we have the secondary sphincteric action of the ejaculatory ducts, which closely compresses the lumen of these canals. It must be remembered that there is no fibrous and firm tube to occlude, but there are so many trabeculations and reduplications in the mucous membrane of these ducts that by their coaptation alone the lumen is occluded, and by this condition, aided by moderate muscular contraction, they may be said to become normally plugged up, and thus offer a bar to the escape of secretions from above. In disease these parts

become flabby and their muscular tonus is more or less lost.

THE TESTES AND THE VASA DEFERENTIA.

It is unnecessary in this work to give an elaborate and technical description of the minute structure of the testes, but certain general facts concerning these glands should be emphasized. In the glandular portion of these organs we find the conical-shaped lobules whose apices end in the mediastinum testis. These lobules are formed of convoluted *seminiferous tubules* in which are developed the seminal cells and the spermatoblasts. (See Fig. 12.)

FIG. 12.



Showing intimate structure of the testis. (From Gray's *Anatomy*.)

Each lobule is inclosed in fibrous tissue which forms the framework of the gland, its outer coat being the dense tunica albuginea, and its inner portion, less dense,

being the mediastinum testis, through which the seminiferous tubes pass, turn upward at right-angles and perforate the upper inner portion of the tunica albuginea. Here they become much enlarged and convoluted and form the globus major or head of the epididymis. All these minute seminal tubules then merge into one tube, which becomes much convoluted on itself and forms the body of the epididymis, which is the narrowed portion just below the globus major. This convoluted tube then forms a large mass, which is called the globus minor or tail of the epididymis. From the globus minor the tube ascends, growing less and less convoluted, and then forms the nearly straight tube, the vas deferens, which, with the vessels, lymphatics, and nerves, and its connective-tissue sheath, constitutes the spermatic cord, which begins at the tail of the epididymis and ends at the internal abdominal ring.

It is well to remember that in health the spermatic veins coming from the back of the testes become convoluted and form the pampiniform plexus. In disease this tortuosity of the veins is more or less increased, and we have the condition known as varicocele.

At the internal abdominal ring the vas deferens turns and descends into the pelvis, crosses the external iliac artery, curves around the bladder on the outer side of the epigastric artery and inner side of the ureter, backward and downward to its base, where it becomes amputated, as we have already seen.

A survey of the structure of the testes shows that pathological changes which destroy the tubules and the lobules may give rise to sterility. In such an event, however, it would be necessary that all the glandular tissues of the organ should be destroyed. But it will

be seen that the more vulnerable points are the mediastinum testis, and the head, body, and tail of the epididymis. In these parts such infiltration and compression may take place that the efferent ducts are obliterated, and thus no spermatie cells or spermatozoa can escape from the testes.

CHAPTER II.

THE PHYSIOLOGY OF THE MALE SEXUAL FUNCTION.

HAVING acquired a clear knowledge of the anatomy and structure of the sexual apparatus, it is now necessary to study in detail the physiology of the sexual function. To this end it is necessary to describe in a lucid and concise manner the mechanism of erection, the mechanism of ejaculation, and the nature and composition of the seminal fluid.

THE MECHANISM OF ERECTION.

In order to understand the mechanism of erection, or that state of rigidity of the penis necessary for intromission and copulation, the facts connected with the anatomy and physiology of the genital apparatus already brought out should be recalled to mind. Concisely stated, this condition of erection may be induced by psychical or tactile influences, or by the combination of both.

Sexual impulses, as we have seen, originate in a sexual centre which is seated in the lower lumbar part of the spinal cord. This centre is stimulated into functional activity by impressions or sensations which originate in the brain, and are transmitted through the pedunculi cerebri and the pons down the spinal cord to it, and also by excitation and frictional influences, which are applied to some part of the penis—*i. e.*, glans, frænum, fossa navicularis, or integument. In the first place, the men-

tal excitation throws the genital centre into a condition of erethism which immediately acts upon the penis and its accessory sexual organs by means of the *nervi erigentes*, and causes its rigid condition. In the second case, the peripheral nerve irritation is transmitted backward to the genital centre by means of the sensory nerves, which throws the centre into a condition of excitation which is reflected or carried outward to the penis by the *nervi erigentes*, and erection follows.

It is thought by some authors that, besides the sexual centre which governs erection, there is also a centre for ejaculation. This view is mainly based on the not very uncommon occurrence of erection without ejaculation. In many cases in which coitus is thus interrupted some inhibitive influence is undoubtedly transmitted from the brain, and in these cases at least there seems to be no necessity for supposing that there is an ejaculatory centre the function of which is disturbed.

Thus we see that the requirements for erection are: first, a healthy and stable condition of the genital centre; secondly, a perfect competence on the part of the nerves which originate in the brain and of the *erigentes* and sensory nerves to transmit the influences of excitation which are communicated to them.

Stimulation of the sexual centres with resulting erection may also occur through influences brought to bear upon the prostatic urethra. Thus friction of this point by instruments and appliances passed down the urethral canal, either by the surgeon or by the individual himself for erotic purposes, excites the genital centre, which reacts through the *nervi erigentes* upon the penis. Calculi in the prostatic urethra and distention of the canal by urine also produce a similar effect.

Then, again, injury or disease of the lower part of the

spinal cord may cause erections by means of the irritation transmitted from the sexual centre to the penis.

The physiological actions involved in erection of the penis are very instructive and interesting. Under the influence of stimulation of the *nervi erigentes* derived, as we have seen, from the sexual centre in the lumbar part of the spinal cord, a vaso-dilator action takes place in all the erectile tissues of the penis. Coincidentally with the nervous excitation and vaso-dilator action relaxation of the muscular bundles and fibres of the *trabeculæ* of the cavernous and spongy bodies occurs, and thus the full distention of the blood sinuses and cavities is rendered possible. In proportion, therefore, as the afflux of blood from the arterial capillaries is abundant and the muscular relaxation is complete, so is the erection moderate or very firm.

Although little is said on the subject by authors, it is possible that the sympathetic nerves of the erectile tissues play an important part in the production of erections. The function of these sympathetic nerves is in immediate reciprocal relation with that of the cerebro-spinal nerves. The former induce relaxation of tissues and a vascular dilatation, while the latter, the excitor nerves, are concerned in the prompt and full supply of blood to the *trabeculæ*. If, however, the condition of the blood-supply were not safe-guarded, and if an impediment were not provided against immediate escape and return of that fluid to the body by the veins, erections would in all cases be abortive or of very short duration. But perfect stability is insured and maintained by certain anatomical conditions. With the filling of the *trabeculæ* there naturally occurs an engorgement of the venous sinuses, which, in its turn, so compresses the large longitudinal veins of the penis that

decided stasis occurs, and thus the volume of distention of the penis is materially increased and maintained until orgasm or ejaculation has occurred.

Further than this, the engorgement of the penis is also materially enhanced by the direct action of various extrinsic muscles, namely, the bulbo-cavernous muscle, which compresses the erectile tissue of the bulb as well as the dorsal vein of the penis, and of the erector penis and the transversus perinei, which compress the crus penis and retard the return-supply of blood. The levator ani also acts as a powerful extrinsic compressor of the parts.

The mechanism of erection, therefore, depends on a peculiar nervous stimulation which results in a well-defined temporary blood-engorgement of the penis.

THE MECHANISM OF EJACULATION.

The combined physiological processes which take place in the production of erection are preparatory to the completion of the sexual act, which culminates, in coitus, with emission or ejaculation. The emission of semen is produced by a series of complex but correlated agencies involving the whole sexual sphere. Whether there is a special sexual centre for ejaculation, as has been stated before, is doubtful. With the development of the erotic impression and the erection of the penis the testicles are, in all probability thrown into a condition of increased functional activity. The first visible evidence of the participation of these glands in copulation or sexual erethism is the strong action of the cremaster muscles, which draw them quite tightly up to the internal abdominal rings. Synchronously semen escapes from the coni vasculosi

of the epididymes and reaches the vasa deferentia. Arrived in these tubes, the strong circular muscular fibres contract powerfully and rhythmically, and the fluid is forced up to the ampullations of these tubes, which then become very much distended. At this moment the seminal vesicles become functionally active, and they contract and expel part of their contents synchronously with a similar action of the ampullations of the vasa deferentia. The seminal fluid in relatively small quantity is thus mingled with the copious ejaculate of the seminal vesicles, and the mixture thus produced is thrown through the ejaculatory ducts, the mucous membranes of which take on functional activity and add their quota of mucous fluid, by strong muscular action into the prostatic urethra. While this part of the function has been going on the follicles of the prostate and the sinus pocularis have been active in the elaboration and expulsion of their secretions into the prostatic urethra. At this moment the caput gallinaginis becomes swollen and erect, and it so adjusts itself that in the normal state the seminal fluid must go forward through the now patulous orifices of the ejaculatory ducts, and cannot pass backward. At this time the compressor urethræ muscle is so relaxed that it offers no impediment to the escape of the semen, which is thrown out of the prostatic urethra by means of the complex but powerful musculature of this gland. At this crisis it is believed that the peculiar sensation of the sexual orgasm is experienced. The combined secretion of the ampullations, of the vasa deferentia, of the seminal vesicles, of the prostate, of the sinus pocularis, and of the ejaculatory ducts then flows into and distends the bulbous urethra, being there mixed with the secretion of Cowper's glands. Then the circular muscular fibres of this por-

tion of the urethra contract forcibly, and at the same time the accelerator urinæ muscles contract upon the bulbous urethra, and thus the ejaculate is quite forcibly thrown along the urethra and out of the meatus. In its passage through the penile urethra the ejaculation of the seminal fluid is further accelerated by the rhythmical contraction of the circular muscular fibres of the corpus spongiosum. The secretion of Littre's follicles and Morgagni's crypts lubricates the urethral canal and adds somewhat to the volume of the ejaculate. In the act of ejaculation it can be seen that unstriated muscular fibres, the intrinsic muscular tissue of the sexual apparatus, play a very important part; but the completion of the act is largely aided by the powerful contraction of the extrinsic muscles, the levator ani, the external sphincter of Henle, the ischio-cavernous muscle, and the transversus perinei. As stated by Foster,¹ "A contraction begins in the external sphincter ani, extends to the levator ani, and then passes to the other muscles, progressing in a wave-like manner from behind forward, and is repeated in a more or less distinctly rhythmic manner until all the semen is ejected from the urethra."

¹ A Text-book of Physiology. Part iv. p. 373. London, 1891.

CHAPTER III.

NATURE AND COMPOSITION OF THE SEMINAL FLUID.

THE proper performance of the sexual function in the human race, the natural outcome of which is the propagation of the species, requires not only the integrity of the composite mechanism of the sexual apparatus, but also the elaboration of healthy seminal fluid in normal quantity. A clear knowledge of the nature and composition of this secretion in health is absolutely necessary to the understanding of the changes which take place in it as a result of disease.

THE SEMEN.

The semen is a composite liquid of a whitish, opaline color, somewhat resembling starch paste, alkaline in reaction, and viscid and ropy in consistence. It emits a peculiar odor, like that of sawed bone. It is the combined secretion of the testicles, of the seminal vesicles, of the prostate gland, of Cowper's glands, and of the muciparous glands of the urethra. According to Miescher,¹ whose conclusions have been accepted by the best authorities, the composition of semen is as follows: water, 82 to 90 per cent., the remainder composed of serum albumin, alkali albuminate, hemialbuminose, nuclein, lecithin, guanin, hypoxanthin, protomin, fat, cholesterin, inorganic salts and phosphoric acid, muriatic

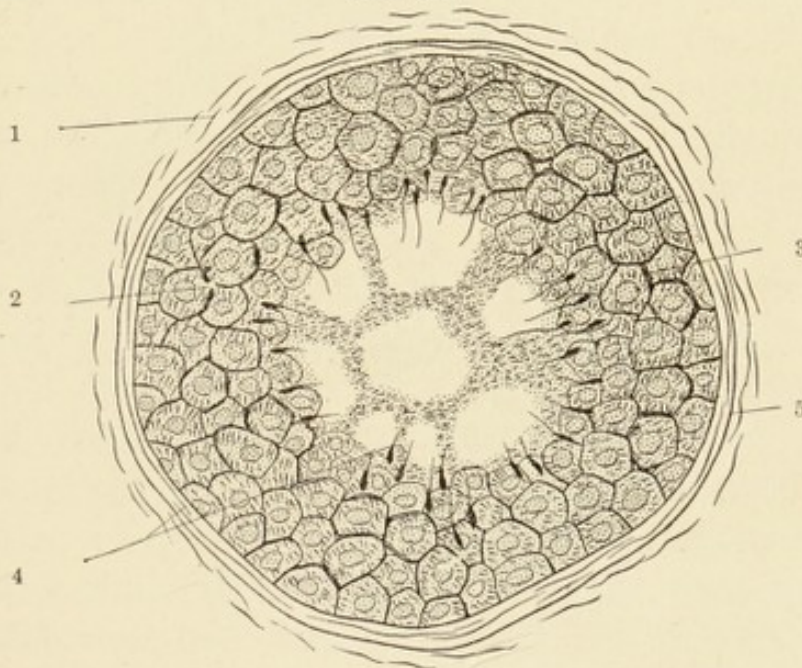
¹ Verhandl. der Naturfor. Gesellschaft zu Basel, 1874, vol. vi. Heft 21, p. 138.

acid in combination with inorganic salts, and organic bases.

When semen is examined under the microscope we find spermatozoa, seminal bodies, and very fine seminal granules, with, perhaps, a few epithelial cells and crystals of phosphates, chiefly of magnesia and lime.

SPERMATOGENESIS. It is important here to call to mind the essential facts concerning spermatogenesis. Upon the endothelioid basement-membrane of the convoluted seminiferous tubules the nucleated parietal cells are seated, the outermost layer of which is composed of

FIG. 13.



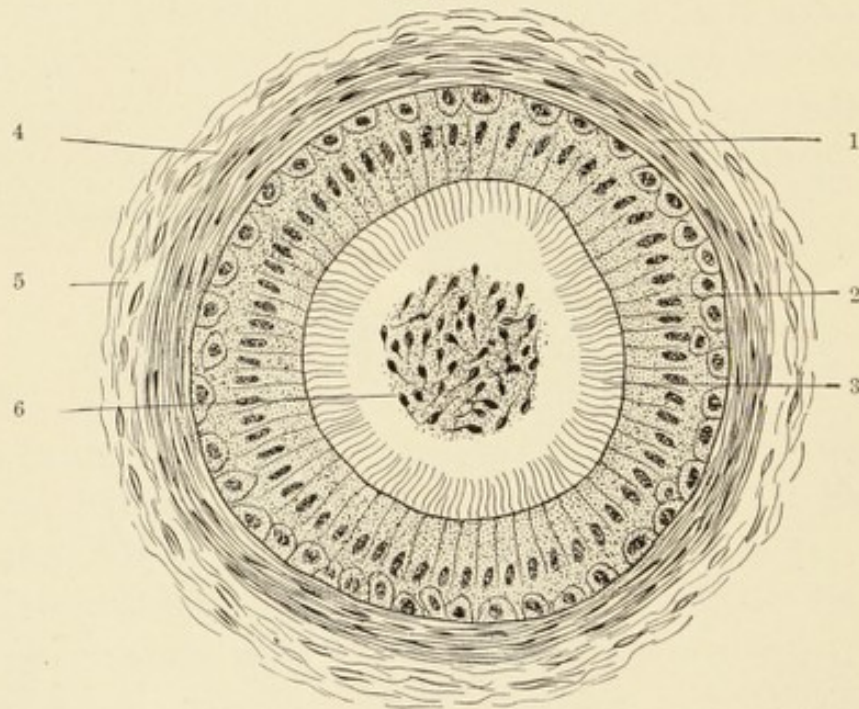
Showing transverse section of human seminiferous tubule: 1, membrana propria; 2, zone of parietal cells; 3, mother-cells undergoing division; 4, partially developed spermatozoa; 5, enveloping connective tissue. (After PEARSON.)

sustentacular cells, which are not concerned in producing spermatogenic elements. Inside and on the foregoing layer are the spermatogenic cells, of which the outer ones are the longer, or mother-cells, and the inner ones

the smaller, or daughter-cells. From the nuclei of the latter cells spermatoblasts are developed, and from these structures the spermatozoa are directly formed. (See Fig. 13.)

The spermatoblasts are closely packed together side by side in a finely granular semigelatinous substance. They gradually become elongated and bean-shaped, and finally are elaborated into fully developed spermatozoa. Pearsol and others state that each spermatozoon is developed from the nucleus of a spermatoblast.

FIG. 14.



Showing section of a tubule of the human epididymis: 1, membrana propria; 2, columnar cells crowned with, 3, long cilia; 4, layer of non-striated muscular fibres; 5, intertubular connective tissue; 6, masses of spermatozoa in the lumen of the tube. (After PEARSOL.)

The secreting portion of the testes is confined to the convoluted seminiferous tubules. From this part of the organ the spermatozoa enter the straight tubes or canals, pass into the vasa efferentia, and from there

through all the manifold convolutions of the epididymis until they reach the vas deferens, which they traverse until they arrive at the deferential ampullations, where they remain until ejaculation occurs. The migration of spermatozoa, probably, is effected by their own vibratile movements, but there are certain delicate vital and mechanical aids which speed them on their journey. From the beginning of the straight tubules up to the ampullated expansions the seminal canals are lined with ciliated columnar epithelium and surrounded by circular layers of unstriped muscular fibres, so that, in addition to their own motility, these bodies receive propulsion from the motion of the cilia, and also by the rhythmical contraction of the muscular rings. (See Fig. 14.) It will thus be seen that the process of spermatogenesis is a most delicate and elaborate one, and that the mechanism of transportation of these vitalized bodies is wonderfully intricate and effective.

The spermatozoa are highly vitalized elements composed of a head and a cilium or tail, and in their shape resemble tadpoles. The head viewed on its broad surface is oval in shape, but when examined on its side it appears somewhat triangular or wedge-shaped. The length of a spermatozoon is 50–60 μ , of which the head is 3–5 μ , while the rest consists of the thin, tapering tail. The seminal bodies or cells are of considerable size, have a well-defined outline and granular appearance, and contain nuclei. The smaller cells are about four times the size of pus-corpuscles, and contain a large nucleus and much granular protoplasm. The large cells are oval or irregular in shape, and they may contain several nuclei. Under high powers seminal cells show a fibrous structure. In my examinations I have mostly encountered the seminal cells in the

semen of young men and in those of early middle age. It is not, I think, common to observe them in the semen of men past fifty years of age. In such subjects we usually find spermatozoa and seminal granules.

The seminal granules are extremely minute and fine, sometimes presenting a yellowish color, again having a greasy appearance. They have a much less refractive capacity than amorphous phosphates and carbonates, are very much smaller, and are scattered evenly over the microscopic picture.

When healthy semen is allowed to stand in a test-tube the tissue-elements slowly settle to the bottom, and in about twelve hours we find that it presents two layers of equal bulk, an upper one, which is of the consistence of semen, and may be slightly turbid or perfectly clear, and a lower one, which is opaque and looks like starch or tragacanth paste. The lower layer is composed almost wholly of spermatozoa.

According to Méhu,¹ healthy semen should on evaporation yield 10 per cent. of its weight in organic and inorganic matters. With the change in the composition of the fluid due to disease, local or general, this quantity is proportionately lowered. In azoospermatic semen the solid constituents are diminished about one-half in quantity.

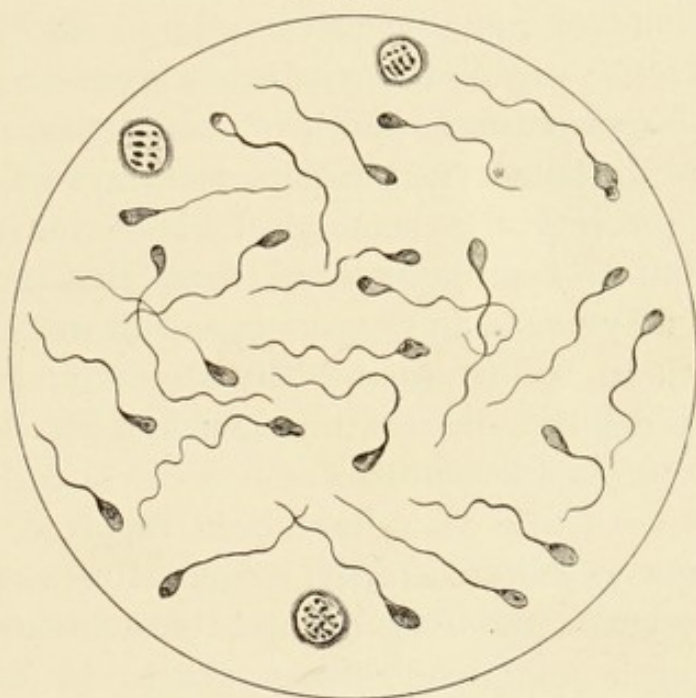
The microscopic picture of fresh healthy semen presents a bewildering appearance. It looks, as Ultzmann says, "as if an ant-hill had been stirred up with a stick." The spermatozoa squirm about in the most lively manner, and there being so many of them, and all of them going in zigzags, the eye may become confused by the

¹ Remarques sur les Variations de la Composition du Sperme dans quelques cas pathologiques. *Annales des Mal. des Org. Gén.-urin.*, vol. i. pp. 303 et seq.

sight. Their propulsive power is sometimes well shown when they easily push crystals of inorganic salts several times their size, and scattered over the field, out of their way.

As a rule, it may be stated that in spermatozoa which have died after ejaculation the tail is well outstretched or slightly bent at the end; whereas, when they have been discharged dead, the tail is usually curled up or much twisted. In Fig. 15 spermatozoa are shown as

FIG. 15.



Showing spermatozoa and seminal cells.

they appear under the microscope in life. The specimen from which this figure was made was secured from a spermatocyst in a vigorous young man. The heat applied to the object-glass in the drying process necessary to staining suddenly killed the zoosperms when they were wriggling in a very lively manner over the field. These spermatozoa, which are very large and have

very long tails, are good examples of these bodies in strong, healthy men.

In weak, anæmic persons and in old men spermatozoa may be smaller than normal, having strikingly small and thin heads and short tails, and showing much less vigor of motion. On the other hand, in some young and robust men they may be of exceptional size and very vigorous in their movements. In water spermatozoa soon become motionless, but in alkaline or salt solutions, as well as in those containing sugar, albumin, and urea, they seem very vigorous. Cold, acids, and solutions of metallic salts quite quickly kill these bodies. In the vagina the conditions seem favorable for the life of spermatozoa, and it is stated that they have been found in the cervical canal seven days after coitus.

Up to puberty the seminal fluid contains seminal granules but no spermatozoa, and from that period until the age of fifty years, and even beyond in well-preserved subjects, these bodies are healthy and abundant. Toward sixty decrease in size, number, and vital energy is usually noted in spermatozoa.

Though authentic cases have been reported in which spermatozoa were found in the semen of men of seventy and eighty years, and even beyond these advanced ages, and although men over ninety years old have been known to procreate children, such occurrences cannot be taken to constitute a rule, and they must be looked upon as very exceptional. A fair average, I think, of the limit of many men's virility in general is between sixty and seventy, or even seventy-five years, though there are very many men whose sexual powers and desires cease much earlier. It must be remembered that although spermatozoa may be found in the semen of aged men, it does not follow that they possess the

vital energy necessary to the fructification of the female ovule.

The number of spermatozoa, as well as their structure and virility, varies according to the constitution of the producer. In vigorous, robust men they are found in abundance in a healthy condition.

Lode,¹ by computation, estimates that at each normal ejaculation a man discharges two hundred and twenty-five million spermatozoa. Guelliot,² however, thinks that this estimate is too small, and claims that in his researches the figures reached were four hundred and twelve millions five hundred thousand spermatozoa.

In less robust persons these bodies are less abundant and have less vital energy, while in weak and debilitated individuals they are usually small in quantity and feeble in vitality. In some persons they are after ejaculation rapidly replaced by a new crop, while in others their generation is slow and meagre. During acute illness of various kinds the function of the testicle is not performed, and in chronic diseases the development of spermatozoa is slow, intermittent, and slightly productive.

At my request, Dr. James Ewing examined the seminal vesicles and the ampullæ in ten post-mortem cases, with the purpose of finding out the condition and the composition and quantities of their contents. From these studies it appeared that the more nearly normal the sexual organs and function are at the time of death the greater is the number of spermatozoa in the seminal vesicles and the ampullæ of the vas deferens.

¹ Ueber spermaproduction beim Menschen und Hunde. Wien. klin. Wochenschrift, 1891, vol. iv. p. 907.

² La Numeration des Spermatozoïdes. Annales des Mal. des Org. Gén.-urin., 1892, vol. x. pp. 77 et seq.

In one case of miliary tuberculosis, in a patient aged fifty-five years, the seminal vesicles were found contracted, their cavities closed and entirely devoid of spermatozoa. In a case of tubercular peritonitis and in one of chronic uræmia no spermatozoa were found in either ampulla or vesicle. All of these cases had been in very low general condition for from two to four weeks before death.

In two cases of pneumonia there were distinctly more spermatozoa in the ampullæ than in the seminal vesicles.

In five cases the spermatozoa in the ampullæ and vesicles were very numerous and nearly equal in number. These cases include: fracture of the skull, age twenty-two years; cerebral hemorrhage, age fifty years; acute uræmia, age nineteen years; acute purulent arthritis, age thirty-eight years; acute broncho-pneumonia, age forty-five years. With the exception of the case of purulent arthritis terminating in septicæmia, all of the subjects died after a short illness arising during a period of comparatively good health.

It is very probable that in the first coitus of a healthy subject, continent for several days, the number of spermatozoa ejaculated is quite large, and that in successive repetitions of the act these bodies become more and more sparse in the ejaculate, until they can no longer be found. Liégois's well-known observation on this point is worthy of remembrance. The semen of a student who had had three or four connections daily for ten successive days was carefully examined, and no spermatozoa could be discovered; but several months later, after three weeks of continence, these bodies were found in enormous number.

No definite statement can be made as to the amount of semen discharged at each ejaculation. On an average,

in healthy young men, two drachms is about the quantity emitted, but it may be more, or even less. In middle-aged men, with some exceptions, the quantity is usually about a drachm, or perhaps more. In old men it may amount to a drachm, or even less. Exceptionally the quantity discharged is very copious, since in some well-observed cases it was from four to six drachms, and in a case reported by Ultzmann¹ it was found to be over thirty-five grammes (about eight and three-quarters drachms). In such instances as those just related, while there may be a larger discharge of spermatozoa than the average, the bulk of the ejaculation is composed of the secretions of the seminal vesicles, prostate gland, and the muciparous glands.

Urine which contains seminal fluid has a whitish, cloudy, or opalescent appearance, and in it small, dimly shining flakes usually may be seen. Such urine becomes clear very slowly, since the cellular elements, being very light in structure, float as a cloud for several hours before settling at the bottom of the glass.

Semen dries upon linen in patches of irregular shape with anfractuous border. It causes the fabric to become stiffened and to assume a dull-gray color.

A few cases are on record whose histories seem to show that in some men the production of spermatozoa by the testicle does not take place. This condition, called aspermatism, however, is a very rare one. Obliteration of the ejaculatory ducts is sometimes the cause of a mechanical aspermatism. Semen may in some cases have a red or reddish-brown or a brownish-yellow color, due to the admixture of blood derived from some deep part of the sexual tract.

¹ *The Neuroses of the Genito-urinary System in the Male.* Translated by Gardiner W. Allen, M.D., 1889, pp. 86 et seq.

A yellow tinge is not infrequently imparted to the secretion from contamination with pus, secreted either by the seminal vesicles, the ejaculatory ducts, the prostate gland, or the urethra.

Indigo mixed with the semen gives it either a violaceous or a blue tint. According to Ultzmann,¹ such abnormalities in the shape and development of spermatozoa as the following may be found: 1, the heads of these bodies may be hydrocephalic; 2, they may have two heads; and, 3, they may have two tails. These anomalies may be found among normally shaped zoosperms.

It is now necessary to consider the other secretions which go to make up the seminal ejaculate.

The Secretion of the Seminal Vesicles.

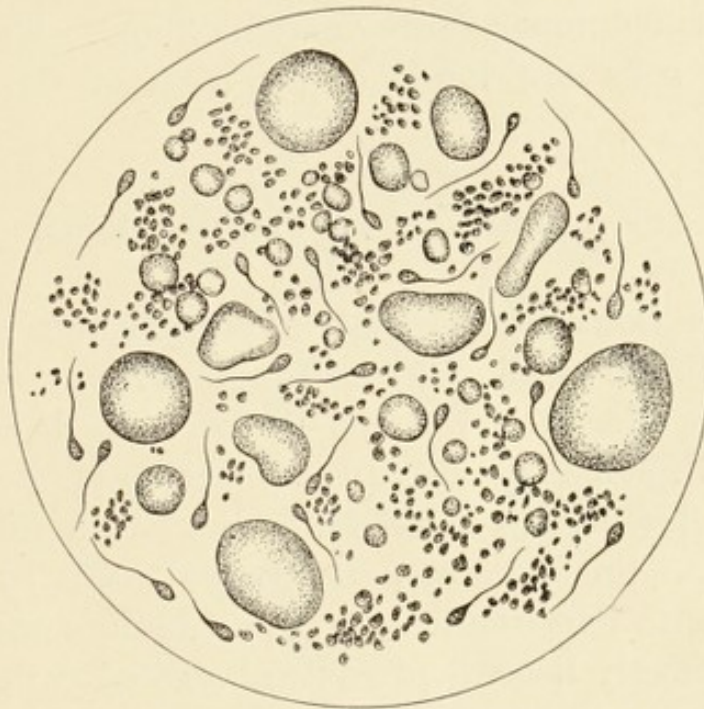
This secretion constitutes the major part of the seminal fluid. It is an inodorous, mucous, viscid, and gelatinous liquid, of a grayish or a light-brownish tint, of alkaline reaction and high specific gravity. It is secreted by the tubular glands of the vesicles, and is formed of a globulin substance, which, upon the addition of a strong alkaline solution (soda or potash), is converted into a tough white mass.

When the secretion of the seminal vesicles is examined under the microscope it is found to present a very striking picture. (See Fig. 16.) The greater part of the field is covered with large, medium-sized, and small globular masses of mucus, which, when once recognized, will afterward be readily detected. These globular masses are well shown in Fig. 16. It can be seen that

¹ *Op. cit.*, p. 135.

they have no structure, and they may be mistaken for globules of oil or air-bubbles. They are less refractive of light than air or oil, and sometimes they have a whitish tint, like that of moonstones. They may be of oval or of irregular shapes. They are surrounded by

FIG. 16.



Normal secretion of the seminal vesicles.

small quantities of granular phosphates, and spermatozoa may be seen intermingled with them. It is important to have a clear idea of the composition of this secretion in health, in order to compare it with the appearances found in disease.

The secretion of the seminal vesicles is relatively quite copious, and by its viscosity, large quantity, and the force of its propulsion in coitus, it carries the spermatozoa along in the rushing current toward the prostatic urethra. Besides this function, this secretion serves as a very efficient diluting agent in the seminal ejaculate.

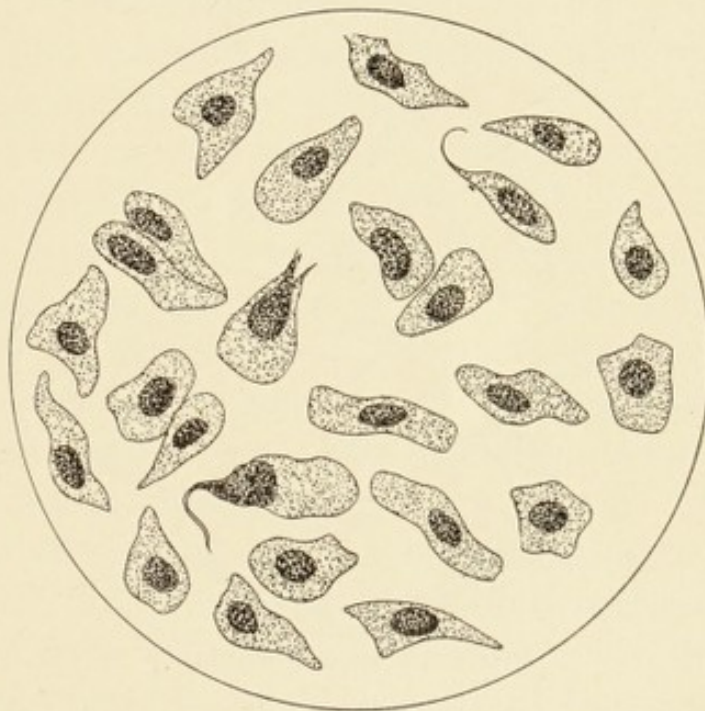
Even in health, but usually as a result of a chronic inflammatory process, we may find calcareous concretions and certain little yellowish masses, presumably of organic or inorganic origin, composed probably of phosphates and mucus, which are called symplexia. Blood-corpuscles also may be noted as an accidental admixture. In some instances, under the microscope epithelial cells of the columnar variety may be found. No ciliated epithelial cells are found in any part of the seminal vesicles.

The Secretion of the Prostate Gland.

The secretion of the prostate gland in a state of health is a thin liquid of alkaline reaction and milky color, and from it the odor of the semen is derived. It serves to dilute and render less viscid the secretion of the ampullations and seminal vesicles, and to exert a nutritional influence on the spermatozoa. When taken by aspiration and with care that there be no foreign admixture, from a perfectly healthy prostate of a recently dead individual, the liquid has the appearance just described, and under the microscope it is found to contain cylindrical cells and some granular phosphates. The amount of mucus in the secretion is not great. In Fig. 17 the microscopic picture of the prostatic fluid taken immediately after the sudden death of a young man whose gland was in a state of perfect health is well shown. Many examinations have convinced me that this is a typical microscopic picture of the normal prostatic secretion. In health the granular phosphates are seen to be not very copious in the secretion under the microscope, but in disease these granules become very copious. (See Fig. 17, also Fig. 51.)

The prostate has no apparatus for storing its secretion, therefore the latter is elaborated in periods of functional activity and of sexual excitement. There is usually a very moderate amount of secretion in the tubules in the quiescent state, and this can be obtained in small quantities after death, provided great care is taken in the removal of the sexual organs from the pelvic cavity.

FIG. 17.



Showing normal prostatic secretion of a young man.

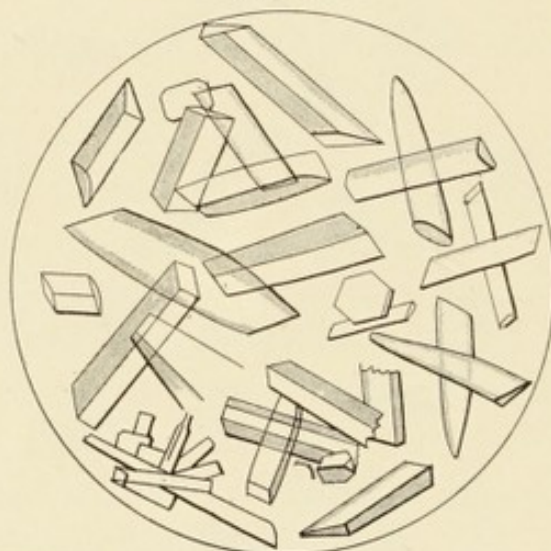
It is claimed by a number of writers that the prostatic secretion contains an organic base, which, when acted upon by a chemical solution, becomes converted into what are known as Böttcher's sperma-crystals.

BÖTTCHER'S SPERMA-CRYSTALS. These crystals are interesting curiosities rather than valuable diagnostic indices. They are obtained by mixing about equal parts of azoospermatus semen and a 1 per cent. watery solution of phosphate of ammonium. In this

combination these crystals quite quickly form in great numbers. When normal semen is mixed with the phosphate of ammonium solution these crystals form quite slowly and may be somewhat smaller in size. It is not uncommon to look in vain for them in this combination, since they are not invariably formed.

Sperma-crystals are colorless, very transparent, and of quite large size. The dominating forms of these crystals (see Fig. 18) are in the shape of daggers or of cuttle-

FIG. 18.



Böttcher's sperma-crystals.

fish. In the first there is a median elevation, or ridge, which slopes gradually to the sides of the crystals; in the second the surface is moderately convex. In many crystals the dagger's point is broken off, and in others it does not exist, as each end of the crystal is cut off at an oblique angle. These crystals are sometimes so long that their whole length cannot be viewed in one microscopic field. In some crystals a very fine longitudinal striation can be made out. When fractured these long crystals sometimes have jagged ends, like a broken piece of wood. There is a marked tendency of the crystals to

group together, to lie side by side and upon and across one another, and they sometimes appear to pierce and fuse with each other, and without break or fissure to form a cross. It is not uncommon to find a rosette-like arrangement of crystals which is very pretty. Then, again, we may find rhomboidal forms, and even thick, square crystals. Although sperma-crystals suggest to the eye the appearance of ammonio-magnesian phosphate, a little examination will soon show that they are rather less translucent and brilliant and more uniformly dagger-shaped.

The interest in these crystals centres in the fact that they are supposed to be the result of a combination of an organic base with an ammonio-phosphate salt. The organic base is, by Böttcher, Schreiner, and Poehl, thought to be derived from the seminal fluid, and is called by the latter spermin. Furbringer claims that this organic base exists only in the prostatic fluid; therefore, when these crystals are formed after the addition of the ammonio-phosphate solution to a secretion derived from the sexual tract that secretion must have come from the prostate. On the other hand, the more recent observations of Lubarsch¹ have convinced him that Furbringer is wrong, and that these crystals have as their organic base the epithelial cells of the testicles.

Seeing that we now have reliable descriptions and facts as to the microscopic appearance of the secretion of the seminal vesicles, of the ampullæ, and of the prostate, it is no longer necessary to endeavor to fortify the diagnosis by the development and discovery of Böttcher's crystals, the opportunity of which very often fails, while

¹ Deut. med. Wochenschrift, 1896, No. 47.

the experiment in many instances comes to naught. It may be of interest here to state the fact that the crystals depicted in Fig. 18 were found in the azoospermatic semen of a man, aged thirty-four, treated in the usual way by me, which secretion, when unmixed with the chemical, contained very many seminal cells, all of which disappeared with the development of Böttcher's crystals. This, though a single well-studied observation, is in striking support of Lubarsch's contention.

The secretion of the ejaculatory ducts and of the sinus pocularis is in all probability simple mucus, and is not very copiously produced.

The Secretion of Littre's Follicles, of the Crypts of
Morgagni, and of Cowper's Glands.

In periods of sexual excitement Littre's follicles, Morgagni's crypts, and Cowper's glands give forth a quite abundant secretion of clear, viscid, thready, alkaline mucus, which looks like the white of an egg (unboiled) or glycerin. This secretion differs markedly from the secretion furnished by the deeper parts of the sexual apparatus. It is thrown into the urethra anterior to the triangular ligament, and is very frequently found without any admixture of secretion from the deeper parts. This secretion seems to be concerned in the dilution of the semen. Its chief function, however, is to neutralize the anterior urethra, which is usually rendered acid by the passage of urine. It also acts as an efficient lubricant in preparing the urethra for the transmission of the seminal discharges. A portion at least of the secretion of the glands under consideration appears during erection and before ejaculation in the shape of one or two clear drops, which are seen at the orifice of the meatus.

Under the microscope we find in this secretion strings of mucin, flat or cylindrical epithelial cells, and perhaps a few coffin-shaped crystals of phosphate of magnesia or lime. This secretion, which is known when abundant under the name *urethorrhœa ex libidine*, is usually of no significance whatever. It is found, as a rule, in cases of sexual excitement, especially when it is great and prolonged. It may also be observed in cases of excessive sexual indulgence and of masturbation in young men, and is seen in cases in which men, for various reasons, injuriously and frequently press the glans penis between the thumb and forefinger.

This secretion first appears as a thin cloud in the urine, and then slowly settles to the bottom of the glass, from which it may be secured for microscopic examination by means of the pipette as a small clear gelatinous mass.

If the man has had a recent seminal emission or has indulged in coitus within a few hours, some spermatozoa may have been left in the urethra and have become entangled in this secretion. This accidental occurrence may perhaps not be recognized by the microscope, and erroneous ideas as to the nature of the secretion are liable then to be formed. This fact should be remembered in clinical practice.

CHAPTER IV.

IMPOTENCE IN THE MALE.

By the term impotence is understood a diminution or complete loss of power to perform normal coitus. In the sexual act the most essential factors are the natural desire and a state of erection of the penis, without which intromission is impossible.

Normal sexual intercourse varies very greatly in different individuals. In some men a condition of marked virility exists, while in others the sexual appetite and power are much less fully developed. As a broad general rule, men having strong, robust constitutions are sexually very potent, and in proportion as the general standard of health is lessened, so are the sexual appetite and power diminished. Exceptions to this general average are sometimes seen in neurotic and lustful persons, who, though not physically strong, have a constant desire for sexual indulgence. In these cases, however, decline sets in sooner or later, and impotence in varying degrees may then be present.

Sexual vigor, therefore, is a relative term, since what might be called full virility in one man would feebly compare with the marked sexual capacity in another. In order to understand the various features of sexual impotence in the male it is necessary, as I have already said, for the reader to have a clear knowledge of the anatomy and physiology of the sexual organs, of the mechanism of the sexual act, and of the nature of the seminal fluid. (See Chapters I., II., and III.)

By the term impotence a number of closely connected conditions and functions are included which demand a systematic recital. In the first place, the controlling influence or sexual desire must be present, and this requirement can only be fulfilled when the brain is undisturbed and when the environment of the patient is calm and satisfactory. The second essential is the erection, which depends upon the integrity of the brain and the sexual system and upon the harmonious working of the vascular and nervous systems. When these intricate and correlated conditions are in perfect accord the consummation of the sexual act in orgasm and ejaculation takes place, and the man may be said to be sexually potent.

Impairment of sexual desire may result from many causes and conditions, soon to be considered. Imperfect erections may be due to mental causes or to a number of physical conditions, which even with erection may interfere with the sexual act and render it premature, weak, or even prevent its consummation. When impotence in the male is considered in detail it is found that: 1, there may be absence or impairment of desire; 2, absence of the power of erection and intromission; 3, absence or diminution of the power of ejaculating the seminal fluid; and, 4, a lowered standard of or an entire absence of orgasm.

In most cases of male impotence the fertility of the semen remains intact, and impregnation of the female is reasonably probable if the male organ is sufficiently potent to discharge it in the proper place. In the event of partial intromission, even when of short duration, impregnation of the female may occur; but when intromission is impossible a man naturally becomes sterile, although his semen may be fertile.

When the whole subject of male impotence is carefully gone over, it is found that the various cases may be conveniently subdivided and arranged in four distinct groups. To the first, in which brain-impressions play a prominent part, we may apply the term *Psychical Impotence*. The second class of cases, in which some damage, limited to one or more portions of the sexual sphere, is the underlying cause, and the impotence a symptom thereof, the term *Symptomatic Impotence* is applicable. When impotence is due to impairment of the sexually controlling parts of the nervous system, owing to various depressing causes, it may very properly be designated *Atonic Impotence*. And, fourthly, when any structural defect or disease so disturbs or cripples the penis that intromission is interfered with or rendered impossible, the condition may be termed *Organic Impotence*.

CHAPTER V.

PSYCHICAL IMPOTENCE.

THE term psychical impotence is applied to certain conditions of sexual weakness or inability in which mental impressions interfere more or less with sexual desire and with erection and ejaculation. In many cases of this form of impotence the sexual organs are in a perfectly normal condition; in others there may be some mild abnormality, but the dominating cause in all arises in the brain and in the impressions which it conveys. Whatever may be the condition operating on the mind, an inhibitory effect is produced upon the sexual centre, which impairs or paralyzes its action and that of the *nervi erigentes*.

Cases of psychical impotence are not uncommon, and are found more frequently in young men about the date of puberty, and much less commonly in men up to the fiftieth year.

These cases present very many and widely different clinical pictures, while the one underlying symptom is the sexual weakness or impotence.

It is not uncommon for young men who have lived chaste lives to find that at the first coitus they become so much excited that the penis does not become erect, and that it may even shrivel up. In some of these cases there may be partial erection and even a dribbling ejaculation. The result of this dismal failure varies in different individuals. Some men look at the matter calmly and philosophically, reason with themselves that they

are sexually impetuous, and they wait and try again. Others (and they are in the majority) become very much depressed in mind and go post-haste to the surgeon. In all these cases it is usually found that a little good advice and wholesome common-sense put the man's mind at ease, so that he can soon perform the function satisfactorily. But in many cases a sense of timidity or fear is induced which, for a long or short time, renders the man sexually weak or impotent. Such cases, if properly treated, can be cured.

Another class of cases of supposed impotence is found among young men who constantly see and fondle their *fiancées*, and who naturally become sexually excited. As a result, such a person notices that a few drops of clear mucus escape from the meatus, and that he may have queer but mild sensations in the penis and testes. In many of these cases the mind is not at all disturbed, but in some such is the sexual erethism and the impaired mental state that the man is unfitted for business and knows no comfort or pleasure. He feels certain that he is losing semen, and as a result of his worry his erections, which usually occurred in the morning and in times of loving dalliance, are no longer present; but the so-called spermatorrhœa, which is only an escape of normal mucous secretion (*urethorrhœa ex libidine*), keeps up. In this state of mind he dreads the thought of marriage, and feels certain that he cannot perform the sexual act. In many cases when the courtship is prolonged, and the courting *séances* are frequent and protracted, the lot of these young men is a very unhappy one. They are constantly and regularly exposed to a sexual erethism for which there is no legitimate relief at hand. After a time erections may not occur when in the company of his betrothed, and they may or may not occur

at other times. As a general rule, though erections are not experienced, the escape of mucus occurs at each loving interview, and there may be pollutions at night. Many young men thus tried remain steadfast and loyal, and by the help of the surgeon (and sometimes by the patience and tact of the wife) soon after marriage lose their fear and enter into normal sexual life. Others, however, are less scrupulous, and essay coitus with public women. In many cases that I have known these men have found relief, and have by practice convinced themselves that they were potent, and they became correspondingly happy. Many of these backsliding men I have known to become faithful and uxorious husbands and happy fathers of healthy children. Other men may have a less fortuitous experience. They resolve to test their sexual capacity with some other female, and when the critical moment arrives their morbid fear, increased, perhaps, by feelings of shame or remorse at their unfaithfulness, so preys on their mind that sexual desire is absent and erection does not occur. The result is that the man is still more unhappy and his fear troubles him incessantly. In many of these cases men have sexual desire and erections and perhaps emissions when away from their prospective brides. To some this evidence of sexual activity is very reassuring, but to others the irregularity and abnormality of the condition are a source of even greater dejection. Under the stimulus of kindly encouragement and by the aid of judicious advice these men sooner or later may enter into a happy matrimonial state.

Many young men who have had more or less frequent and normal coitus before marriage, during courtship become fearful that they may not be potent in the marriage-bed. They very often go with their doubts to the

surgeon, who should always advise them to entertain no fear in their mind, and should positively assure them that, notwithstanding they may have a few initial failures in their new relations, they will be competent. In some of these cases tonics and hygienic influences very often play a very useful part.

We sometimes see cases in which nervous over-sensitiveness or religious scruples so act upon a man's mind that when he attempts coitus with a female he loses all desire and retires in disgust. Then, again, some young men are so fastidious, and perhaps so scrupulous, that they cannot associate, much less have sexual intercourse, with public women. In general these cases in time right themselves, but in some instances an abiding fear of sexual weakness or impotence is left which may prevent a man from contracting matrimony. In none of these cases is there anything seriously wrong, and a happy outcome can be induced if the patient be properly advised and judiciously comforted. As a rule, marriage to a congenial helpmate soon leads to normal sexual contact.

A goodly number of cases of sexual impotence are observed in young and even middle-aged men who are submitted to severe mental strain. In these cases there is usually an evidence of general ill health, even of neurasthenia. Such men may be overtaxed in their professional duties (lawyers, civil engineers, mathematicians, etc.), or they, in their eager efforts to make money quickly, are continually in a state of excitement and doubt which disturbs their whole economy. As a result, they may lose all sexual desire, and if they force themselves to coitus they experience failure, or they may simply become sexually weak, and coitus is with them unsatisfactory and feeble in character. In cases in

which the sexual organs were previously healthy this temporary disability ceases after a time, and the patient again becomes virile. When, however, the sexual tract has been the seat of inflammation (posterior urethra, prostate, ampullations, and seminal vesicles) the return to the normal state may be slow and halting.

A large contingent of impotent young men is composed of those who have been addicted to long-continued masturbation and to sexual excesses.

The impotence which follows in the course of masturbation is sometimes very difficult to cure, and amounts to what may be termed irritable weakness. These patients have so long practised this solitary vice that it is often difficult to (as one may say) switch them off into natural habits. Not only do they, in many instances, become averse to intimate relations with a woman, but they experience a sense of shame and are very fearful that they will fail in coitus. Such men frequently have nocturnal pollutions, which have a very damaging effect upon them mentally. In these cases there is very frequently more or less damage to the deep sexual parts, and as a result the disability is more pronounced.

In very many cases of impotence incalculable harm is done the patient by the mendacious exaggerations of quacks; but this bad effect is especially well marked in psychically impotent men who have practised masturbation.

Sexual excesses naturally lead to reaction in which the sexual desire is much less keen than formerly. This condition very often preys on the patient's mind, and he fears that he has lost his virility.

It is natural in these cases for a condition of sexual inertia to ensue, but except in very bad cases sexual

power is not wholly destroyed. Rest and general hygiene usually bring the men out of their slough of despond.

Men apparently vigorous in mind and body and of more advanced age sometimes consult the surgeon for very insufficient reasons. They have had one or several attacks of gonorrhœa, perhaps, many years before, which in their cases have left no damage to the urethra and prostate, but lately they had convinced themselves that their sexual capacity was less vigorous than formerly, and that it must be due to their old trouble. In many of these cases the real condition is one of less keen sexual appetite and vigor, caused, in many cases, by mental and physical overtaxing, than was possessed in earlier years.

In all these cases it is incumbent on the surgeon to carefully explore the whole genital tract and remove any abnormalities present. The psychical effects of varicocele in inducing impotence are described in Chapter XXI.

As a rule, most men suffer from psychical impotence at some period of their life for a longer or shorter time. Seeing that the mind exerts such a far-reaching and controlling influence on the sexual act, it can be readily understood that in the multiplicity of disturbing causes which may operate on the brain a temporary impotence may be induced. Pleasant conditions and surroundings are absolutely necessary for normal sexual contact, and when in any manner these are disturbed the function is either interfered with or held wholly in check. Thus, a man may be disturbed by ominous sounds, by unpleasant odors, and by the necessity for haste, and by fear of discovery. Certain physical defects in the woman may abort all sexual desire. There may be a flabby vulva,

or a very large vagina, laceration of the perineum, or great redness of the vulva, or the presence of a purulent discharge. Warts or red or eczematous patches in and about the labia majora and minora have been known to cause a sudden inhibitory effect. The fear of contracting a venereal disease often puts an end to the attempt of a man at coitus with a public woman. Then, again, a man may be indifferent or may feel a repugnance to a woman, or a husband may entertain a suspicion as to the fidelity of his wife. All these conditions may produce a disturbing effect on the brain and sexual centre.

In some cases the loss of a beloved wife or mistress so preys on a man's mind that for a time he has an aversion to the female sex, and he may be temporarily impotent. Cases have been reported in which men, in order to perform vigorous coitus with a woman to whom they were rather indifferent, have had to fix their minds during the act upon the voluptuousness of another and highly prized consort. Many men are very vigorous with some women and have only unsatisfactory coitus with others. Alcoholics, as a rule, stimulate the brain and sexual centre, and in cases of psychical impotence they (as we may say) "help many a lame dog over the stile." A case, however, has been reported in which a drunken man failed to copulate with a woman of the town, and when informed of the fact he was so depressed that for a time he was impotent. A curious case is on record of a man who had normal coitus with other women, but could only cohabit with his wife when he was much enraged. Many women have little sexual desire; to some sexual contact is unpleasant and even revolting; while others reluctantly consent to it, and wonder at their husband's carnal lust. Such frigidity on the part of

the wife naturally reacts powerfully on the husband, who may become sexually weak or even impotent.

Some men have a predilection for certain women; one likes a blonde, another a brunette, while still another yearns for a fiery auburn consort, and none of these men can have full and satisfactory sexual intercourse unless congenially mated.

We occasionally meet with cases in which there exists what may be termed sexual apathy, due, perhaps, to some condition of the brain and sexual centre. In all of these cases (and I have seen fully a dozen) the virility of the man has never been up to the standard of normal development. As boys they may or may not have masturbated for a few times and generally at long intervals, and very often as a result of curiosity inspired by other boys. At and after puberty they may have infrequent sexual intercourse, which gives them little or no pleasure. Then the sexual desire ceases, and they bother themselves no longer with the matter. In most of these cases the patients are hard workers mentally or physically, or in both directions, but they never become melancholic.

Finally, there is a class of cases of men who are temporarily impotent for the reason that they have got out of practice. Thus, a husband is away for a long period from or loses a beloved wife, and for a time so cherishes her memory that his sexuality is dormant. Or a man may lose a very congenial mistress, and for a time sexual desire seems extinct. Then, again, for various causes some men suddenly cease to have sexual intercourse, and for a longer or shorter time are much occupied mentally or are greatly worried. In these cases very often a feeling of doubt and timidity is developed and the man refrains from sexual intercourse. According to my ob-

servation, in the course of time most of these men, when not very old, find congenial females as wives or consorts, and then the supposed sexual incapacity soon gives way to gratifying vigor.

The prognosis in these cases is good.

Treatment. In all cases of psychical impotence the surgeon should seek out the cause and then give directions as to its removal. Patients thus affected need kindly advice, encouragement, and a plain statement of the exact facts in their case. They should be firmly assured that they are in no danger of losing their virile power, and that they must under no circumstances give way to doubts and dreads.

In the cases of men who become much excited and have a mucous discharge while near or fondling women, speedy marriage should be recommended. It is always most important that excesses in coitus should not be indulged in, and that when the act is performed the surroundings should be pleasant and satisfactory.

If in these cases any morbid condition is found in the sexual tract, it should receive proper attention and treatment. Good hygiene, avoidance of exposure to sexual excitement, plenty of fresh air, outdoor exercises, and wholesome food, all of these will contribute largely to the patient's well being.

Iron, quinine, strychnine, coca, kola, arsenic, and the animal extracts may be used when the necessity for them is indicated.

It is most important to invigorate the nervous system of these patients and for them to keep up their courage.

CHAPTER VI.

SYMPTOMATIC IMPOTENCE.

IN a considerable proportion of cases of impotence certain morbid conditions of the end of the penis, of the bulbous urethra, of the prostatic urethra, and prostate gland, and perhaps of the seminal vesicles, so react on the sexual sphere that a condition of diminished vitality and function is induced. Unfortunately, in these cases we possess no facts derived from the post-mortem study of the conditions of the sensory sexual nerves or of the sexual centre. Our knowledge of the morbid changes in the sexual tract is quite full and tolerably clear, but how these changes operate on the nerves and the spinal cord centre, and what structural conditions they produce, are mysteries to us. Whatever the morbid change may be, the effects in many cases are very apparent, and the thought suggests itself that some temporary damage has been done to the sensory nerves or the sexual centre, by which their function is more or less impaired.

Impotence being symptomatic of the above-mentioned well-defined morbid conditions of the sexual tract, it seems to me more natural to designate this disability as symptomatic impotence rather than as atonic impotence, the term which is used by several authors. We are certain as to the symptoms, but we do not know about the atony. A clear and systematic presentation of this subject can only be given by adopting an anatomical basis by which the various sources of irritation may be studied seriatim, and their effects may then be lucidly traced.

PERIPHERAL IRRITATION.

Impairment of the sexual function, even to the extent of decided impotence, may be due to congenital and acquired malformations of the prepuce and glans penis. The following case presents interesting features :

A man, twenty-six years old, who had never had gonorrhœa, and who had practised masturbation very slightly, was married to a very attractive and congenial lady of his own age. During a period of six months the man had many times indulged in coitus which on no occasion was satisfactory. His erections were at first nearly normal, but ejaculation was always premature, and the sexual act was never completed. This state of affairs went on until just before the patient consulted me. He was then very much worried, and physically was below par. Examination of the urethra, prostate, and seminal vesicles showed these parts to be in normal condition. But the condition of the distal part of the penis demonstrated the cause of the trouble. The prepuce was long and tight, and its orifice, which was very much reddened, was abnormally small. When by some force the prepuce was retracted a reddened, pouting condition of the meatus was found, which extended into the urethra. The glans penis was red and very tender. The diagnosis of extreme peripheral irritation of the penis was made and circumcision was, with the patient's consent, performed. Within six weeks erections became normal and coitus was satisfactorily indulged in. In this case there was not any subsequent impairment of the sexual power.

I have seen several cases in which erections were flabby and ejaculations were premature, which resulted from adherence of the prepuce, which had existed from

birth and which gave rise to venous stasis of the prepuce and glans.

In like manner I have several times seen a short, fibrous frænum, with long, tight prepuce, give rise to symptoms which convinced the patient that he was impotent. Smallness of the meatus, both congenital and acquired from chancroidal or syphilitic ulceration, not infrequently, in my experience, has caused such impairment in the commencement of the sexual act that its full performance became impossible. In this connection it is well to add that in the case of a nervous young man who had a halo of soft small vegetations in the coronal sulcus, such was their tenderness that on intromission of the penis the erections instantly ceased and ejaculations took place at once.

As a rule, cases of partial or complete impotence, due to these malformations of the penis, are promptly cured by operation, and the probable existence of these causes shows how important it is in every case to carefully examine the virile organ.

In these cases just considered there may be little or no mental suffering, or the patient's condition may give him serious concern. But, as a rule, operation gives such prompt and decided relief that mental depression is soon dispelled.

Unfortunately, in some of these cases of irritation of the prepuce and the glans there is a history of early, energetic, and long-continued masturbation, which has caused chronic congestion in the posterior urethra, together with emissions and imperfect erections. In these cases relief is sometimes somewhat slow in coming on, and, besides operations on the prepuce and glans, careful treatment of the urethra is necessary.

It happens, though quite rarely, in some of these cases

that a condition of morbid fear remains for some time, which prevents normal coitus, but cheering and comforting advice supplemented by tonics, fresh air, and sea and cold baths, generally tends to restore the confidence and virility of the patient.

CHRONIC BULBOUS URETHRITIS AND STRICTURE.

Chronic inflammation of the bulbous urethra alone furnishes quite a large contingent of sexually weak and impotent men. These patients may or may not have been addicted to masturbation and sexual excesses. They usually give a history of an early and severe attack of gonorrhœa, followed by a more or less persistent gleet, and perhaps other attacks of gonorrhœa. They are usually men between thirty and fifty years of age, and they present themselves with a history of waning erections, premature ejaculations, and lessened desire. Many of these men say that their attention was first called to the disturbed sexual function by their inability to promptly produce normal ejaculations. The sexual act in these cases is at first somewhat prolonged, and this dilatoriness gradually becomes more pronounced. Then deficiency in erection is noticed, together with feeble and flabby ejaculations, and, perhaps, premature emissions. I have many times been much surprised at the patience and equanimity with which these patients regarded their disability. In my experience in this particular class of cases mental worry is not often observed, and sexual neurasthenia is very exceptional indeed.

In many of these cases we find submucous cell-infiltration around the bulbous urethra, which may be contracted to 25 or even 20 of the French scale. In some cases

the new cell-formation is soft and succulent; in others it is more dense. I have very many times carefully examined these cases as to the condition of the anterior and posterior urethra, and found that the morbid process was localized in the bulbous urethra, and that the prostate and seminal vesicles were healthy.

As a rule, these patients can be benefited and cured if they will refrain from sexual excitement and excesses in other directions than coitus, but not otherwise.

A more pronounced class of cases is seen in men who have true stricture at the bulb. The less severe class of cases is found, as a rule, in men about thirty to thirty-five years of age, in which the stricture-tissue is not, as yet, very firm and dense. The severer form includes those cases in which much fibroid infiltration, even to the extent of nodulation, is present.

In many of these cases, before the difficulty in urination is experienced, or when it is very slight and mild, the patients begin to experience the same sexual debility that sufferers from chronic bulbous urethritis complain of, as we have already seen. In this condition gradual dilatation is indicated, and, if well borne, with the increasing size of the canal improvement in sexual desire and power is induced sometimes in a surprising degree; but in some men, particularly those in whom the sexual appetite has never been very active, the desire and power in coitus return slowly and with halting intervals. When the stricture is very dense and tight the return of sexual activity may be quite slow; but, in general, a guardedly favorable prognosis may be ventured.

When the stricture is very small an impediment to the escape of semen is produced, and then, in addition to impotence, the patient is aspermatous.

CHRONIC BULBOUS AND POSTERIOR URETHRITIS.

Chronic inflammation of the bulbous and posterior urethra is a not uncommon cause of sexual weakness and impotence. This condition is well shown in the following case :

A man, aged thirty-two years, thin, nervous, and somewhat worried, had masturbated from his seventeenth year until shortly before his marriage two years previously, having had gonorrhœa in a mild form and of short duration when he was twenty-four years old. Several months before the ceremony he began to suffer from emissions, which occurred several times a week. He found coitus impossible, though he had partial erections in the morning. Physical examination showed intense congestion of the bulbous and prostatic urethra, with considerable thickening of the former and a scanty muco-purulent secretion. Rectal examination of the prostate gave no results. By the careful use of moderate-sized sounds, beginning with one of calibre 24, French scale, chilled in ice-water, and nitrate of silver instillations, together with hygiene and tonics, this unpromising case slowly improved. At first the erections were not perfect and were of short duration, but later on they became normal.

As a rule, cases of sexual debility like the foregoing, in which the bulbous and posterior urethra is involved, are quite refractory to treatment, and they demand much care and attention from the surgeon.

CHRONIC BULBOUS AND POSTERIOR URETHRITIS
WITH PROSTATITIS.

A more advanced class of cases is sometimes observed in which the bulbous and posterior urethra, as well as

the prostate, is involved. This combination and its effects are well shown in the following case:

A man, aged thirty-two, of good physique and sound mind, had indulged freely, and at times excessively, in sexual intercourse since his eighteenth year. He had mild gonorrhœa when twenty years old, and again when twenty-eight. For two years prior to his first visit to me he had noticed a small muco-purulent globule at the meatus every morning, and had felt an uneasy, dull burning pain in the perineum and near the anus. There were increased frequency of urination, and moderate discomfort at the end of the act. His sexual desire and activity had been going from bad to worse for a year. The first jet of urine contained threads of pus, mucus, and epithelium. Examination of the urethra revealed great tenderness in the bulbous and prostatic portions, with so much thickening of the walls as to hug quite firmly a *bougie a boule*, No. 25 French scale. The prostate was somewhat enlarged and tender in all directions, particularly on the left side, and after massage a milky mucoid fluid peculiar to chronic tubular prostatitis escaped from the meatus. In this case cold sounds of increasing size, with nitrate of silver instillations, alternating with moderate lavage of the posterior urethra with a solution of permanganate of potassium (1 to 2000), cured the local process, and coincidentally the sexual function became more vigorous until the normal standard was reached.

In the foregoing case there was only a moderate amount of mental uneasiness regarding the urethral and sexual troubles. In some of these cases, however, the mental trouble is quite severe, and in exceptional instances true sexual neurasthenia is observed.

CHRONIC POSTERIOR URETHRITIS.

Cases of sexual debility and of impotence are sometimes observed in which the underlying morbid process is seated in the posterior urethra, and in which the prostate itself is not involved. The post-mortem examinations made by Finger,¹ and verified by his microscopic research, have clearly shown that gonorrhœal inflammation may be strictly limited to the epithelium and the submucous connective-tissue layer of the posterior urethra—notably that portion covering the verumontanum. I have carefully examined the urethra and the urine of very many cases in which all signs pointed to posterior urethral involvement alone, and the most thorough examination of the prostate by the aid of the finger in the rectum failed to reveal any evidence of disease. To further confirm the diagnosis, the urine passed after the prostatic massage was microscopically examined, and the characteristic tissue-elements and phosphatic salts were not found. I am thus emphatic and precise in details, for the reason that there is a tendency, on the part of some writers, to ascribe all symptomatic (or, as they term it, atonic) impotence to lesions of the prostate, and to deny to posterior urethritis any pathogenic influence.

Cases of sexual debility and impotence in which chronic posterior urethritis is found as the probable morbid factor, present, as a rule, the symptoms peculiar to that disease. Such patients give a history of gonorrhœa which has left in its wake a tendency to frequent micturition, with, perhaps, more or less uneasiness at

¹ Beiträge zur Pathologischen Anatomie der Blennorrhoe der Männlichen Sexual-organe. Ergänzungshefte zum Archiv für Dermat. und Syphilis, 1893, pp. 52 et seq.

the end of the act. In some cases there is, besides, a history of recurrent slight hæmaturia; in others, of a sensation of deep pelvic and rectal uneasiness. Some of these patients have noticed that their urine, particularly that which is first passed in the morning, contained gonorrhœal threads. In these cases the development of the sexual debility is usually slow, and it begins with feeble erections, protracted sexual act, and dribbling and perhaps premature ejaculations, without or with a diminution in the intensity of the customary orgasm. Beginning in this manner, the disability becomes more or less pronounced until an impotent state is reached.

Patients who suffer from this form of impotence are usually men of thirty years and beyond—even to fifty years. It is sometimes seen in men between the ages of twenty and thirty.

As a rule, this form of impotence is more or less promptly relieved by treatment; and although some men suffering from it become worried and dejected, and even neurasthenic, in my experience they, in general, regard the matter quietly and philosophically, and aid the surgeon in his efforts to cure them.

Many of these patients have been guilty of sexual excesses, and such subjects should be made to clearly understand that a return to their old practices will be followed by more permanent impotence.

Knowing, as we do, that so many sensory nerves end in the verumontanum, and that this part is so constantly and severely involved in chronic posterior urethritis, the question suggests itself: whether this form of impotence is caused by the irritation of the ends of these nerves which is conveyed backward to the sexual centre, and there, after a period of excitation, produces a condition of sedation?

CHRONIC PROSTATITIS.

A very large proportion of the cases of symptomatic impotence are found in men who are suffering from chronic prostatitis. In almost all of these cases the disease of the prostate has been caused by early and long-continued masturbation, by sexual excesses, by sexual excitement without natural relief, by coitus reservatus, and as a result of gonorrhœa.

The patients suffering from this form of impotence may be young (and they are in the majority), middle-aged, or old. They complain of various conditions of disability, namely, of lack of desire (and in some impetuous desire), of imperfect erections or absolute want of erections, of feeble and protracted coitus, or of premature ejaculations. They often have nocturnal emissions, and some have fairly good erections when they are not near women, but these usually fail them when they come to close quarters.

Young men in particular who are thus affected constitute the large army of sufferers from so-called spermatorrhœa. They complain that their semen escapes either after urination and defecation, and during severe physical exercise, or involuntarily. In many of these cases, particularly in young and middle-aged subjects, there are observed mental worry, hypochondriasis, and even neurasthenia.

Many of these cases are very amenable to treatment, others yield less readily, while not a few are very refractory. In some cases intense sexual erethism is very persistent and damaging in its effects. Such patients may endeavor to force themselves to coitus, and usually fail, or they may subject themselves to sexual excitement, or to unnatural practices, and always with bad

effect. It is only necessary here to give this general outline of what we may call prostatic impotence, and to refer the reader to the chapter on Chronic Prostatitis for more minute details as to the varieties of cases and their symptoms.

INFLAMMATION OF THE SEMINAL VESICLES.

There is a tendency nowadays to ascribe many cases of sexual weakness and impotence to inflammation of the seminal vesicles, and to deny that the prostate is in any way a pathogenic factor. In order to gain true and clear views as to the probable influence of spermato-cystitis on the sexual functions, I have made many observations and examinations, and have supplemented them by long-continued and extended microscopical study of the urine, of the semen, and of abnormal discharges from the urethra in these cases. These studies have been unbiased by any theory, and have not been prejudiced by any peculiar ideas or views; my aim has been not to theorize, but to put a proper interpretation on the facts carefully elicited and the appearances presented. As a result of extended observations and close study I am led to believe that disease in the seminal vesicles is rather rare, and that seminal vesiculitis plays a subsidiary *rôle* in the production of impotence. It is rather uncommon to find any trouble beyond the prostate in young and impotent men, particularly in masturbators and those who have not suffered from chronic gonorrhœa; and if the seminal vesicles seem involved, it is only as a concomitant or, perhaps we may say, a complication of chronic prostatitis. In a number of middle-aged men, and in some past fifty years of age, who have suffered from impo-

tence, I have found direct evidence of chronic inflammation of the seminal vesicles, but in every case there was unmistakable evidence, either on rectal palpation or in the microscopic examination of the expressed secretion, that the prostate was also the seat of disease. In the light of my present experience I am led to think that in some (not numerous) cases of masturbation and gonorrhœa in young impotent men the prostate and seminal vesicles are involved, but that in general this symptom-complex is found in men of forty years of age and beyond, who have been masturbators, have had chronic posterior urethritis, and who throughout life have been very vigorous sexually, or have indulged to excess and perhaps abnormally. In this restricted manner I am disposed to look upon seminal vesiculitis as a cause or factor in the development of symptomatic impotence.

For the details of the treatment of symptomatic impotence in addition to those given in this chapter the reader is referred to Chapters XVI., XII., and XVIII.

CHAPTER VII.

ATONIC IMPOTENCE.

SEXUAL weakness, and even impotence, not uncommonly are complained of by patients who have suffered from various adynamic diseases and by those afflicted with brain or spinal-cord diseases, and they are said by some authors to be more or less remotely caused by the action of a number of drugs.

This form of impotence has been described by some authors as symptomatic impotence, but I think the term atonic impotence is more correct, for the reason that in these cases there are impaired nervous function and stimulus, due to devitalizing causes, brain and spinal cord lesions, and the depressing action of drugs. In all cases the underlying cause is the atonic state of the brain, spinal cord, and sexual centre.

In the various forms of anæmia such is the general lowered standard of the vital processes and of metabolism that the function of no organ is perfectly performed, and with the resulting depression to the cerebro-spinal system the sexual function is more or less torpid, and it may even be temporarily extinguished. In neurasthenia the supply of nervous force required for the essential vital functions (chiefly circulation, respiration, and alimentation) is so much drawn upon that none is left for a function like that of copulation, which is only occasionally called into use, and can, without detriment to the patient, be absent or in abeyance for varying periods. After diphtheria, erysipelas, influenza, typhoid fever,

pneumonia, rheumatic fever, and in the course of malaria and uræmia, sexual weakness, more or less pronounced, is often observed, and the question suggests itself to one's mind whether the underlying cause is the impaired or depressed nutrition of the nervous centres, or whether the toxæmic condition incident to these diseases is the essential cause?

Many persons who suffer severely from gastric and gastro-intestinal disorders are not infrequently weak sexually, and their impotent condition is readily explained by the malnutrition, which produces nervous atony, which in itself is increased by the worry incident to these affections.

In some cases of diabetes a well-marked, and even permanent state of sexual impotence may be produced, being sometimes a first and premonitory symptom, caused, in all probability, by the general bad state of nutrition of the patient. In some of these cases, coinciding with the diminution in the amount of sugar in the urine and the general improvement in health (when it occurs), the sexual function may become more or less active. With the severe development of the general systemic disorder this function soon becomes less active, and then perhaps extinct.

In many functional and organic affections of the brain a more or less complete and permanent form of impotence sometimes is seen. In cases of cerebral excitement and exhaustion from various causes, of spinal irritation, cerebro-spinal meningitis, spinal meningitis, syphilis of the brain and spinal cord, myelitis and locomotor ataxia, the abatement of sexual power is soon seen, sometimes after a period of great erethism, and in the course of time it is entirely destroyed.

It is not uncommon to observe patients who suffer

from atonic impotence who may be said to be sexually worn out. Such patients may or may not have had gonorrhœa or syphilis, but were in their early days virile and persistent in sexual intercourse. Living, as they usually do, a fast life, they keep late hours, drink and smoke to excess, and are in many instances immoderately given to sexual excesses in unnatural methods (chiefly *coitus ab ore*), and also naturally. Toward forty-five and fifty years of age (and sometimes earlier) these men begin to decline in sexual power (in some the retrograde process is slow, in others rapid), and, as a rule, in spite of careful treatment and general reformation, they lose desire and power until the end is reached in utterly incurable impotence. An old, persistent syphilitic dyscrasia, in combination with alcoholism and the indulgence in sexual excesses, leads in many instances to permanent impotence.

It is said that in the East Indies there is scarcely a virile man over twenty-five years of age. The sexual decay in these men is due to the practice of long-protracted coitus. While in the act they keep ready at each hand a basin of cold water or some cold object with which they constantly cool their hands just before the orgasm comes on. In this way they greatly prolong the sexual act, and in so doing wear out their sexual centre and perhaps damage other nervous parts.

In America the unnatural prolongation of coitus (for the alleged reason of greater gratification to the female) is very often the cause of a more or less persistent form of atonic impotence, and also of neurasthenia.

In chronic morphine- and opium-addiction, loss of sexual desire and power is an early result, and it remains as long as the use of the drug is continued.

Bromide of potassium has been claimed as a frequent

cause of sexual weakness and decay, but our knowledge of its action in this direction does not rest on a solid basis. Cases undoubtedly have occurred in which it seemed probable that the long-continued use of the drug had impaired the sexual function, but sufficient prominence has not been given to the morbid conditions for which the therapeutic agent was administered and to the probable anaphrodisiac influence of these morbid states. It is very probable that decline in the sexual function may follow the long-continued use of this drug in a healthy individual, for the reason that it acts as a sedative to the sexual organs, but on this point we have no reliable information.

Large and long-continued doses of iodide of potassium are said to cause atrophy of the testes and sexual impotence. Here, again, no distinction is made between the action of the drug and the affection for which it is administered. While, therefore, it is probable that iodide of potassium may, when used for long periods, cause diminution in a man's virility, we have not to-day sufficient trustworthy evidence to prove the point.

Alcoholic excesses at first increase the sexual desire, but later on this stimulant ceases to stimulate, and it produces an obtunding and devitalizing effect on the nerves of generation.

In chronic lead-poisoning sexual impotence is said to be a quite constant and prominent symptom. The use of camphor and turpentine is said to produce an anaphrodisiac effect. It is claimed that excessive use of tobacco and cigarettes may cause sexual torpor and inability, and if it does, it is by reason of the depressing effect of the poison on the nervous centres.

The excessive use of coffee and absinthe has been

cited as a cause of impotence, but it should be remembered that when such claims are made full details of the alleged cases are absolutely necessary.

Nervous impressions transmitted to the sexual centre from the testes undoubtedly have much influence upon the sexual function, although our knowledge of its action is very limited. Structural affections of the testes and the vasa deferentia may lead to azoospermatisms, and it is very probable that when mild or severe morbid changes take place in these organs a depressing effect is produced in the spinal cord and the sensory nerves. In cases of exhaustion, of overwork, and of adynamic disease the structural vitality of the testes is much interfered with, and it is probable that the nerve-impressions conveyed to the body under these circumstances in a greater or less degree produce a condition of sexual torpor or impotence. This point is worthy of careful thought. We have become so accustomed to look for causes of impotence in the sexual tract itself that we really pay little heed to the probable depressing effects of testicular troubles upon the central nervous system.

In the newly proposed operation of castration for prostatic hypertrophy the fact has been clearly brought out that in some cases the removal of the testes is followed by mental depression and unbalancing, as if a normal stimulus had been suddenly withdrawn. This fact suggests to us that very probably in health and disease some indeterminate impressions are conveyed from the testes to the central nervous system which are necessary to its full integrity.

TREATMENT. As atonic impotence is only one of many symptoms incident to anæmia and various other adynamic conditions, brain affections, and chronic systemic poisoning, the first indication is to determine

what is the morbid factor, and when discovered to treat it on general medical principles.

In some of these cases much mental and perhaps some physical benefit may follow the judicious instillation of strong nitrate of silver solutions into the prostatic urethra. Likewise the passage of a sound once a week or more frequently may be of benefit. Damiana has failed to prove an efficient aphrodisiac remedy, and cantharides is so irritating to the stomach and the urinary tract that it cannot be given in sufficiently large doses to excite the sexual centre.

If any affection of the testicle be present, it should receive proper attention.

CHAPTER VIII.

ORGANIC IMPOTENCE.

MANY cases of impotence depend on certain structural defects, anomalies, changes, and distortions of the penis, which are of congenital or acquired origin.

In many cases of malformation of the penis coitus is impossible; in others, intromission is more or less interfered with; while in still others the urethra is so misplaced backward that fecundation cannot be accomplished. In this division are included cases of absence of the penis, hypospadias and epispadias, abnormalities in size, and double penis.

Ulcerative and other destructive processes in some cases so damage and distort the penis that a man may become actually impotent as a result. Then, again, the size, structure, and shape of the organ may be rendered so abnormal by benign hyperplastic processes and by malignant new-growths and preputial calculi that coitus cannot be performed. In this morbid category belong cases of destructive lesions of the skin of the penis and of the whole organ, exuberant vegetations, horny growths, lymphoid connective-tissue hyperplasia, and cancer of the penis.

In another class of cases of organic impotence we find degenerative and hyperplastic changes in the corpora cavernosa, and morbid conditions of these structures due to curvature and fracture of the penis.

CHAPTER IX.

ORGANIC IMPOTENCE FROM CONGENITAL DEFECTS AND MALFORMATIONS OF THE PENIS.

A MAN may be rendered impotent by certain organic and congenital conditions of the penis which impede or wholly prevent intromission and fecundation. He is, however, not necessarily sterile, since the functional activity of the testes may not be at all impaired. He therefore preserves the procreative power (*potentia generandi*), while he lacks the faculty and power of performing coitus (*potentia cœundi*).

In this form of organic impotence are classified cases of absence of the penis, hypospadias and epispadias, abnormalities in the size of the organ, and some cases of double penis. Some men having two penes, however, are perfectly able to perform coitus, in some instances with both organs seriatim.

ABSENCE OF THE PENIS.

This anomaly, when congenital, is very rare, while cases of rudimentary penis of the infantile type are not especially uncommon.

Goschler's¹ case of congenital absence of the penis is very interesting. The patient was a well and otherwise fully developed man of twenty-seven years of age. The scrotum was well formed, and the testes and cords were

¹ Vierteljahresschrift für Prakt. Heilkunde. Prague, 1857, vol. lxiii. pp. 89 et seq.

normal (the left testis was at time of observation inflamed). No trace of the penis could be discovered, but on the anterior wall of the rectum, about four inches above the anus in the median line, was a rounded orifice from which urine escaped. A sound introduced into the rectum could be passed through a urethra one and half inches long into the bladder. In front of the anus was a fold of skin which consisted largely of erectile tissue, and which became turgid in sexual excitement. There was no incontinence of urine in this case.

Révolat's¹ case was that of a newborn child in whom there were no external genitals. There were spina bifida and umbilical hernia, below which the urine and meconium escaped through a transverse opening.

Nélaton² has reported a case of a child, two years old, in which there was no penis, though the scrotum and testes were present. The urine was passed through the rectum. Cases similar to this have also been reported.

Cases of apparent absence of the penis have been reported. In Bouteiller's case the penis could not be seen, though on careful palpation a small, wormlike body was felt beneath the skin, which dissection showed was a small penis. Murphey³ records a somewhat similar case, in which there was a well-formed scrotum and apparently no penis, the urine escaping from the lower part of the abdomen. Deep pressure revealed a body which, when dissected out, proved to be a small penis, for which the reporter ventured to entertain the hope that it would later on be equal to all requirements.

Absence of the penis may result from the phagedena of hard and soft chancres and from gangrene. In

¹ *Journal de Sédillot*, vol. xxxii. p. 370.

² Demarquay: *Maladies Chirurg. du Penis*, 1877, p. 539.

³ *British Med. Journal*, 1885, vol. ii. p. 62.

cancer of the penis more or less of its continuity is removed by amputation. Strangulation of the penis by self-inflicted ligature has been known to produce absence of the organ.

In some cases of enormous hydrocele and of scrotal hernia the penis is forced backward, and appears to be absent. In some of these cases the organ is so enveloped that even in erection intromission is rendered impossible. This condition also obtains in elephantiasis of the scrotum.

HYPOSPADIAS AND EPISPADIAS, AND TORSION OF THE PENIS.

These rare malformations will not here be described in full, but will only be considered in their relation to the sexual act.

Hypospadias really consists of a greater or less deficiency of the corpus spongiosum and of the urethra. When the urethra ends at the base of or in the glans the condition is called balanic hypospadias. In this condition the semen may be discharged into the vagina, and impregnation may result.

When the urethra ends in the course of the penis, provided it is not too far back, the condition, which is called penile hypospadias, may not prevent fructification of the female ovule, as the semen is then discharged into the vagina. When it ends quite far back the semen escapes over the external genitals. This also occurs in peno-scrotal hypospadias, in which the urethral orifice is at the angle formed by the penis and scrotum.

In scrotal and perineo-scrotal hypospadias the semen does not come near the genitals of the woman, hence it has no opportunity for fructification. Men thus affected are necessarily sterile.

In epispadias the urethra opens on the upper surface of a malformed penis, either in its glandular portion, in the continuity of the organ, or just at the symphysis pubis. In cases of glandular epispadias impregnation of the female may occur, and the chances of this event become more remote in proportion as the opening of the urethra occurs at points further back. When the urethra opens at the symphysis pubis the semen is thrown outside the vulva, and as a fecundating fluid it is lost.

Total absence of the urethra is a very rare malformation. Occlusion of the canal when it occurs near the glans is remediable by operation, and even when seated further back the calibre of the canal may be so restored that on intromission fecundation of the female ovule may result.

Torsion of the penis is a very rare condition, complicating hypo- and epispadias. The penis is so twisted on its axis that the urethral orifice is abnormally placed.

ABNORMALITIES IN THE SIZE OF THE PENIS.

Cases of rudimentary penis have been recorded as well as those of the infantile type; they are, however, of rare occurrence. A case of bifid penis, in which the glans and a part of the body of the organ were split and the urethral opening was seated back and behind the bifurcation, is on record as a classical illustration of this rare anomaly.

Rudimentary penis is of rare occurrence, and is usually coexistent with cryptorchism or some other sexual anomaly. A case has been reported by Dummreicher in which a boy of twelve had a penis which was only three-fourths of an inch long and as thick as a goose-quill. The corpora cavernosa were absent.

PLATE I



Double Penis.

We sometimes meet cases of men of various ages in which the penis is no larger than that of a child, and in which, as a rule, the testes are very small. In some of these cases a decided increase in the size of the organ takes place when coitus is regularly indulged in. I have seen a number of instances of decidedly undersized penes with long, tight prepuce, which became much larger after the parts were circumcised.

Cases of enlargement of the penis so that it constitutes a monstrosity are relatively rare. I know of an individual in whom the organ when erect was said to be fourteen inches long and proportionally thick. This man had two wives who died of uterine disease, while a third applied for a divorce very soon after marriage.

In the average run of cases of penis of excessive size the man may have connection with some women without injury to them, provided care and tact are observed. I had under my care many years ago a man who had been shot in the groin and in whom injury to the lymphatics had been produced. Following this wound the penis began to swell and grow in length until it measured eleven inches in the supple state.

Elephantiasis of the penis leads to large deformities. In phimosis, particularly when intrapreputial chancres and chancroids are present, the penis often becomes of large size. When the hard œdema of syphilis attacks this organ it becomes greatly enlarged in all directions.

DOUBLE PENIS.

This anomaly is very rare, and is usually found in cases of that monstrosity called foetal inclusion.

In Plate I. are portrayed the genital organs of a man¹

¹ *Revue Photographique des Hôpitaux*, 1869, vol. i. p. 103.

who was exhibited in all the large clinics of France and Spain. It will be seen that between the two legs a third hangs down, the insertion of which is seated between the scrotum and anus. This supernumerary limb is atrophied and its joints are ankylosed. There are two well-developed penes, and to each one a scrotum containing a normal testis is furnished, the two sacs being joined in the median line. These penes became erect at the same time, and either one could be used in coitus. Ejaculation or micturition occurred from each organ synchronously.

Van Buren and Keyes¹ report a case in which there was no foetal inclusion. It was that of a healthy man of forty-two, who had two distinct penes of normal size, each attached by its root to the pubic symphysis. Each penis was well developed, and the two were enclosed as far as the base of the glans in a common integumentary sheath. The right meatus was normal, the urine escaping from it and also from a point behind in the perineum. On elevating the penes the orifice of a large, healthy canal was seen just where the root of the scrotum should have been attached. On the right side of this orifice was a prominence which contained a rather under-sized testis, while the left organ lay over the tendon of origin of the adductor longus in the left groin. Both penes became erect at the same time. In this case the left lower limb was shorter than the right, a deformity which was congenital.

¹ A Practical Treatise on the Surgical Diseases of the Genito-urinary Organs, etc., New York, 1874, p. 5.

CHAPTER X.

ORGANIC IMPOTENCE FROM DESTRUCTION OF THE INTEGUMENT OF THE PENIS, AND FROM BENIGN AND MALIGNANT NEW-GROWTHS AND PREPUTIAL CALCULI.

DESTRUCTIVE LESIONS OF THE INTEGUMENT OF THE PENIS.

THE integument of the penis may, in consequence of disease or traumatism, be so much destroyed that when cicatrization is complete intromission of the organ may be either much impaired or wholly prevented.

Chancroidal Ulceration.

Chancroidal ulceration may be so severe and extensive that much of the tegumentary sheath of the penis is destroyed. In Fig. 19 is portrayed a penis which had been the seat of several large chancroids. After healing, the organ was so curved downward and twisted at its end that coitus was practically impossible. I have seen many instances of this kind, some of which were more pronounced than the one here mentioned.

Phagedena in Syphilis.

Phagedena may attack the initial lesion when seated on the penis, and so destroy or distort that organ that coitus is rendered impossible. In general, the destructive action occurs in the glans penis or in the prepuce, and the process is arrested before serious damage is

produced. It sometimes happens, particularly in cases of phimosis, that a sub-preputial initial lesion becomes attacked by phagedena, and, owing to want of care, or

FIG. 19.



Cicatrization of integument of the penis following chancroids.

poor care, more or less of the organ is destroyed. In these days of strict antisepsis phagedena is not a common complication of primary syphilitic lesions, and

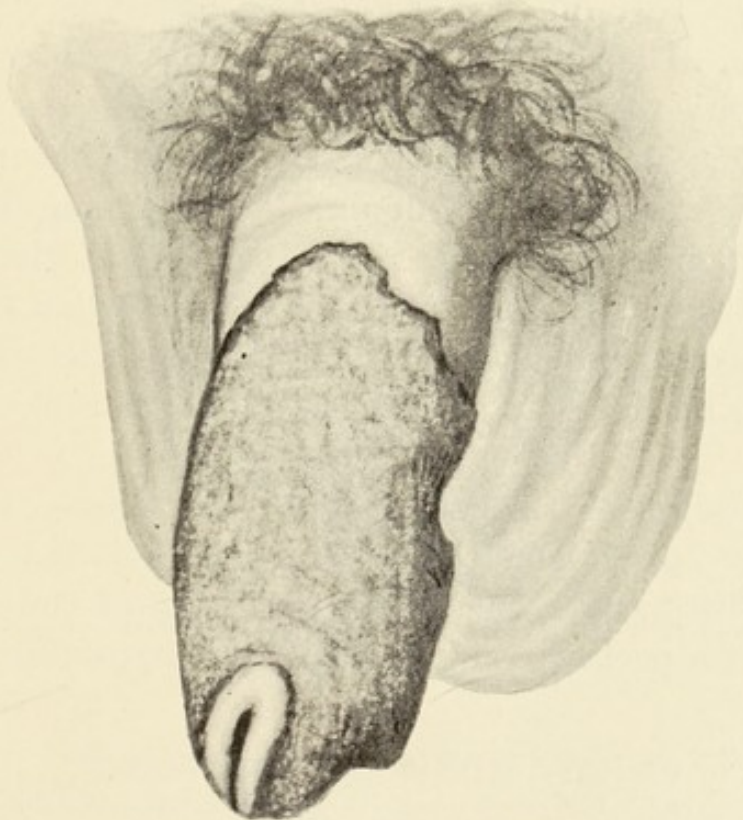
in the event of its occurrence it is much more promptly checked than it was twenty years ago.

Phagedena has been known to attack the urethra and to run down the canal for short or long distances, even to the peno-scrotal angle. In these rare cases, of which I have seen several, organic impotence was produced. I have several times been able to avert this process before it had extended much beyond the meatus. In these latter cases a dense fibrous stricture is usually produced.

Gangrene of the Penis.

It usually happens that gangrene primarily attacks and destroys some part of the integument of the penis,

FIG. 20.



Gangrene of the integument of the penis.

commonly the glans, with, perhaps, some of the tissue beyond. The result of gangrene of the penis is

well shown in Fig. 20, in which the greater portion of the skin of the organ, beginning near the preputial orifice and extending almost to the abdomen, was destroyed. When full healing had taken place in this case the penis was so pushed backward to the abdomen by the sclerosing cicatrization that erections were abortive and penetration was rendered impossible. I have seen other instances in which gangrene of the penis was followed by such deformity that coitus became difficult or incomplete.

Traumatism.

Injury to the integument of the penis, beyond mere bruises, is not very common. Laceration of these parts is of very infrequent occurrence.

In Fig. 21 is shown an example of a lacerated wound of the penis of much extent and severity. As a result of his being struck by a revolving wheel, the penis of this patient was nearly denuded of its integument in its whole circumference. In cases like this the resulting cicatrix is so dense and firm that the organ becomes somewhat twisted, and on erection it is so distorted that intromission is either very difficult, painful, or impossible.

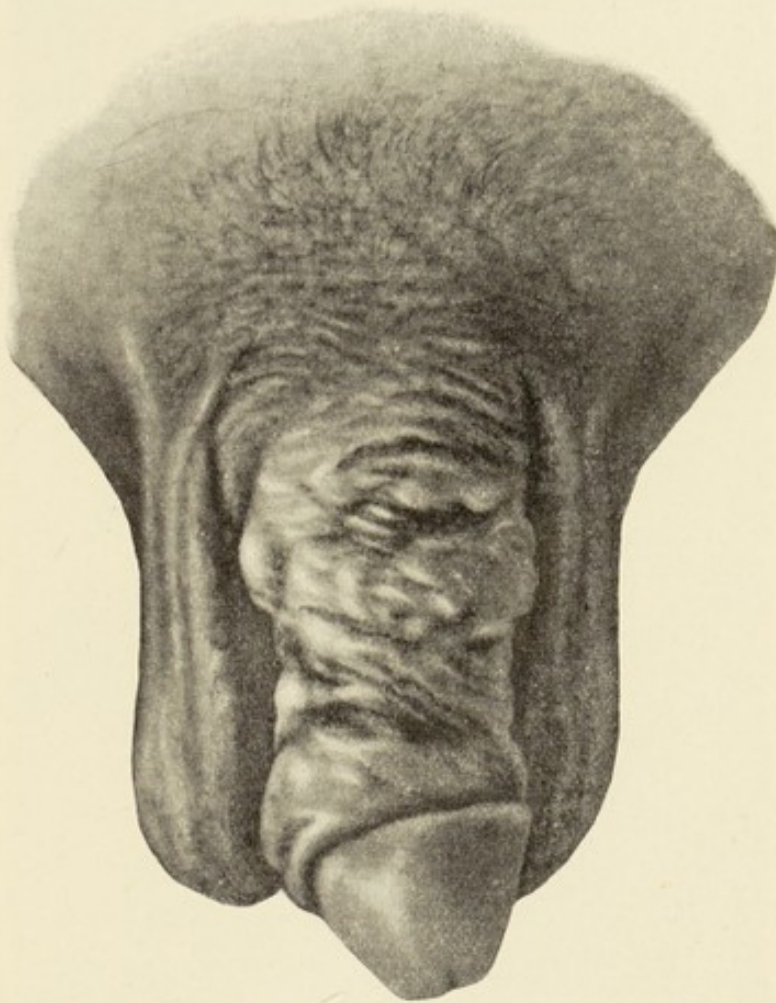
In these cases the affected surfaces are so studded with micro-organisms that skin-grafts will fail to take root. Then, again, the mobile condition of the penis is such that a perfect result is rendered impossible.

VEGETATIONS OF THE PENIS.

Vegetations are papillary new-growths, due to hyperplasia of the connective tissue and of the epidermis. They are developed on the mucous membrane of the

penis and at its junction with the skin, in consequence of the irritation produced by decomposing secretions and by pus. The hyperæmia left by chancres and chancroids on the glans or prepuce may lead to the development of vegetations.

FIG. 21.



Showing destruction of the integument of the penis resulting from traumatism.

These lesions begin as little red spots, which soon become salient, and from a papular condition they grow rapidly and exuberantly until papillomatous or cauliflower-like growths are produced. They may be rounded and sessile, or pedunculated, or Indian-club-

shaped. They form masses like strawberries, and large aggregations of them very much resemble cauliflower growths. In color they may be very red, or of a pink or even grayish tint.

FIG. 22.



Vegetations of the penis.

The sites more frequently attacked by vegetations are the coronal sulcus, the inner surface of the prepuce, the region of the frænum, and the lips of the meatus.

When small, these lesions may not be impediments to coitus ; but when they become large, and constitute fun

gating masses and cauliflower excrescences, they render intromission impossible.

In cases of long and tight prepuce they often lead to phimosis, which may end in perforation of that appendage and to gangrene and hemorrhage.

In Fig. 22, vegetations of the coronal sulcus, the whole of the mucous layer of the prepuce and of the meatus is clearly shown. In this case coitus was impossible and urination was much hindered.

The *diagnosis* of warts is usually very readily made. In some cases of condylomata lata papillomatous exuberance may occur, and the lesions may look like simple vegetations. Since condylomata lata are usually found about and around the anus and the inner surface of the thighs and on the scrotum, it is well when large, flat warts are found on these sites to inquire into the history of the case in order to determine whether syphilis may be present as a morbid factor.

The prognosis of warts of the penis is usually good, provided intelligent treatment is instituted. In old subjects, both male and female, the occurrence of warts about the genitals should always suggest to the mind of the surgeon the predisposition of these lesions to malignant degeneration, and their removal should be promptly accomplished.

TREATMENT. The treatment of warts of the penis when they are small is very simple. The penis should be thoroughly cleansed and anæsthetized with cocaine and the lesions removed with the curette. Absolute cleanliness and dryness of the penis are necessary to prevent a relapse. Destructive cauterization by the acid nitrate of mercury, tincture of iodine, solutions of chloride or subsulphate of iron, chloro-acetic or lactic

acid may be employed when the warts are small and sharply localized.

Whenever possible the curette should be used, and when the lesions are large, particularly when pedunculated, they may be ablated by means of the galvanocautery loup.

When the meatus is the seat of warts care should be taken that the lips be not damaged, since stenosis may follow.

HORNY GROWTHS OF THE PENIS.

This form of new growths on the penis is very rare, but its existence always proves a bar to coitus.

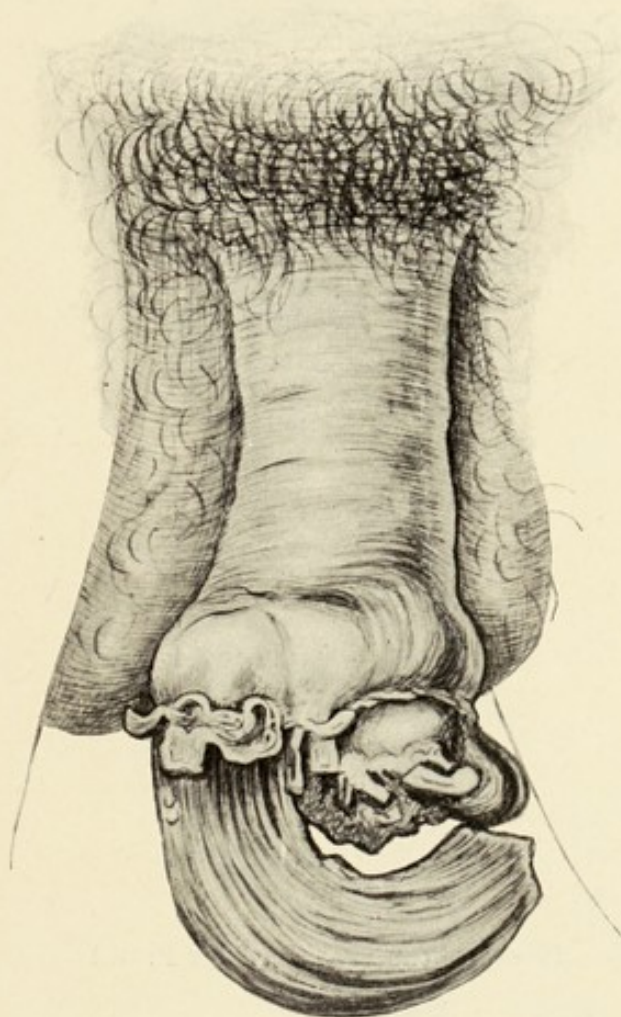
Horns of the penis take their origin at the corona in the coronal sulcus and on the inner aspect of the prepuce, particularly near the frænum. These horns are usually developed from warts in persons in whom there has been some chronic irritative process on the prepuce or glans.

In Figs. 23 and 24 are portrayed the features of the remarkably striking case of Pick.¹ The large horn sprang from the prepuce and glans, its base being imbedded like a nail in its matrix on the right side down toward the frænum. From its base the horn jutted downward and upward to the left and in front of the meatus. From the base of the glans several small horns sprang and showed a tendency to come upward in front of the glans. When the penis was placed in line with the abdomen the large horn presented an appearance not unlike the crest of a dragoon's helmet. The horn was two and a half inches long. In other reported cases

¹ Vierteljahrs. für Derm. und Syphilis. 1875, vol. ii. pp. 315 et seq.

these excrescences have been noted as being one-half to one and three-quarters inches in length. Their breadth is usually less than an inch, and they are generally some-

FIG. 23.



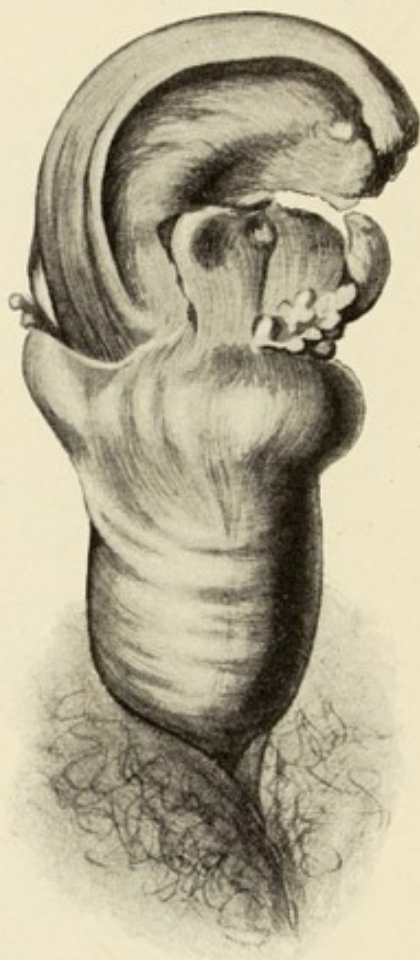
Horns of the penis. (After PICK.)

what tapered in shape toward their ends, which are usually truncated. In color they are brown, greenish-brown, and black, and in structure hard, firm, and brittle.

TREATMENT. These growths should be thoroughly removed, and more or less of the glans should be ablated

if necessary. They sometimes return after removal, and they are rather infrequently the precursors of malignant degeneration.

FIG. 24.



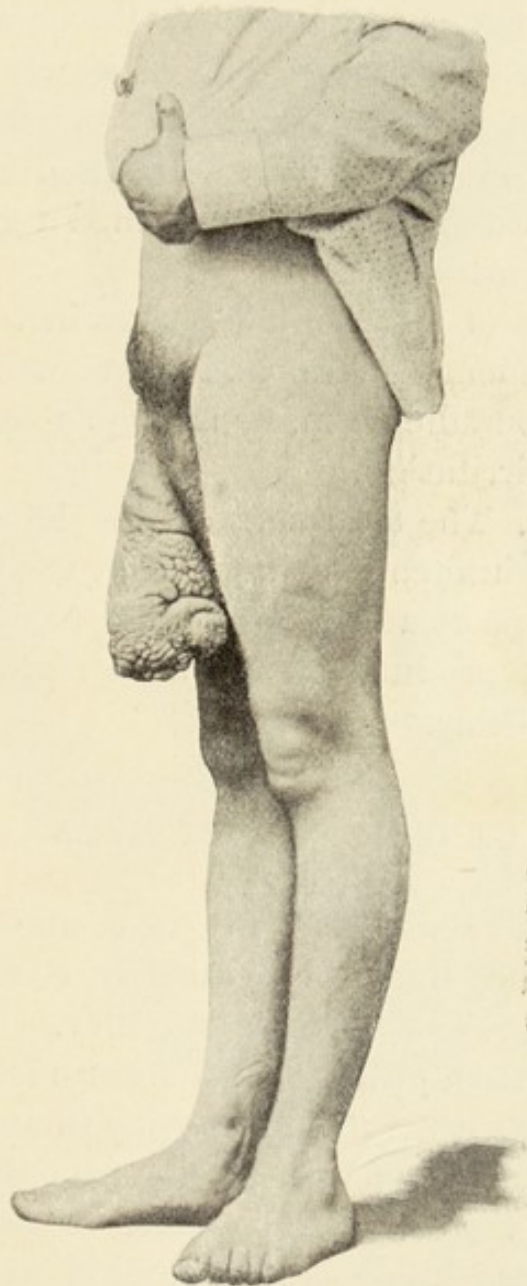
Horns of the penis. (After PICK.)

ELEPHANTIASIS OF THE PENIS AND SCROTUM.

In some cases elephantiasis of the penis exists independently of the scrotum, in others the two parts are attacked. The scrotum alone is involved in some rare cases. In such cases there is an impediment to the sexual act, and in many its accomplishment is utterly impossible.

The penis becomes much enlarged, so that it may reach to the knees, and its diameter is many times increased. The skin becomes more dense and thicker than normal,

FIG. 25.



Elephantiasis of the penis.

has a firm brawny feel, and is channelled by numerous furrows, which run in various directions. The prepuce

becomes involved early, and the glans recedes behind its opening and cannot be pushed through it. (See Fig. 25.)

Elephantiasis of the scrotum consists of a lymphoid and fibrous infiltration into the entire thickness of the tissue. The sac becomes large and heavy and drags down the abdominal skin, and as the morbid process goes on the penis disappears and is slowly engulfed in the scrotal mass. In this event the prepuce forms a fictitious urethra, which ends in a depression in the median line of the scrotum, in which is formed a gutter for the passage of the urine.

Elephantiasis of the genitals occurs in tropical countries in an endemic form, and very rarely in colder countries in sporadic form, usually as a result of some traumatism or irritation.

TREATMENT. The treatment of this deformity, which renders sexual intercourse impossible, is the ablation of the redundant parts according to the topography, with the purpose of producing as symmetrical a penis and scrotum as possible.

CANCER OF THE PENIS.

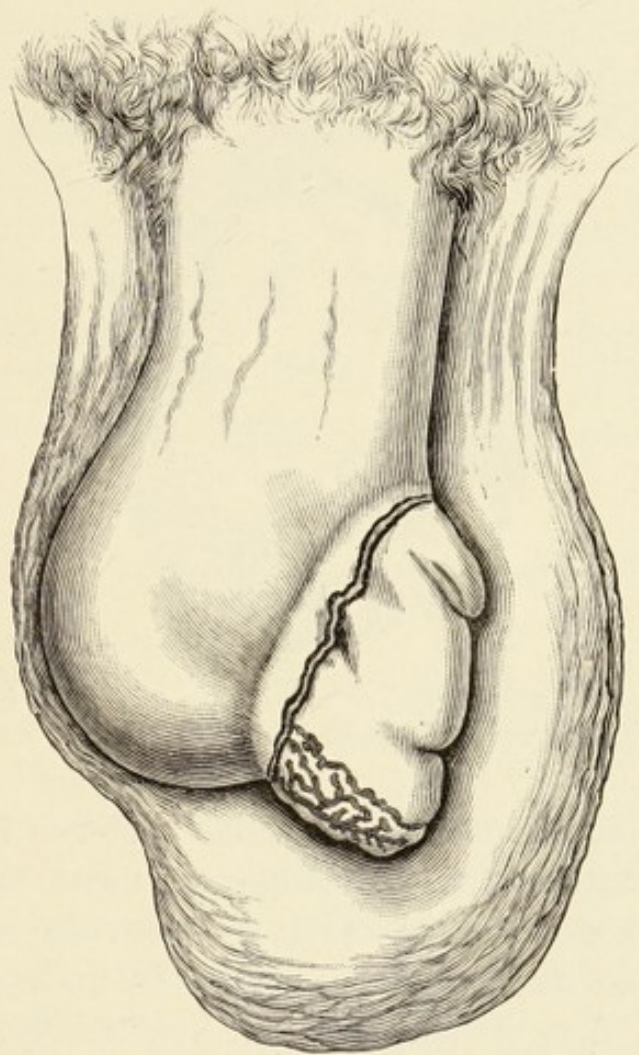
Cancer of the penis, as a rule, is an affection peculiar to advanced life, but less frequently is found in men between the ages of twenty and fifty. Between the fortieth and fiftieth years it is far from uncommon.

Cancer of the penis usually begins in an insignificant manner, as a little wart, a thickened patch of epithelium, and as a small chronic ulcer or fissure. As a rule, the primary lesion is so devoid of symptoms that it causes no mental or physical uneasiness, and its development is usually very slow.

It begins either in the coronal sulcus or on the corona

near the frænum, on the inner surface of the prepuce, and very exceptionally in the urethra. When the prepuce is long there may be mild pruritus or a sensation of heat, due to the irritation of the secretions of the parts.

FIG. 26.

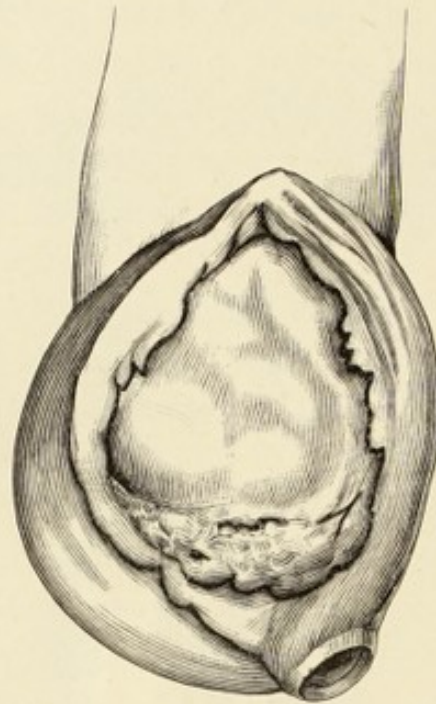


Showing epitheliomatous degeneration of glans penis bursting through the prepuce, which was phimotic.

Usually after a chronic period of quiescence exuberant growth occurs and the penis becomes much enlarged and distorted toward its end by fleshy masses and exuberant cauliflower-like tumors. As a result, deformi-

ties and distortions of varying appearance are produced (see Figs. 26 and 27), coitus becomes impossible, and urination is much impeded.

FIG. 27.



Showing the under-surface of case shown in Fig. 26, with new growth and stenosed preputial orifice.

When epithelioma of the penis becomes fully developed lancinating and persistent pains are complained of, and hemorrhage, more or less severe, may occur. As time goes on the general health is undermined and the patient dies of marasmus or, very rarely, of metastasis. As the lesion of the penis progresses implication of the inguinal ganglia occurs, and palpation shows these organs to be large, hard, painless, and indolent.

The diagnosis of cancer of the penis when fully developed is usually very easy. Any chronic nodule or ulcer with hard and perhaps exuberantly developed base or surroundings, particularly in men over forty

years of age, should be regarded with much suspicion, carefully watched, and treated early. It is necessary to remember that in younger men the initial lesion may be very exuberant, dense in structure, and perhaps more or less fungating on its surface, and that it may be mistaken for cancer.

The prognosis of cancer of the penis depends entirely on the fact of its early recognition and thorough removal, together with all the ganglia in the groins and perhaps in the thighs.

The treatment of cancer of the penis, according to the extent and severity of the lesion, consists in either amputation or extirpation. (For a full account of this affection see my treatise on *The Pathology and Treatment of Venereal Diseases*. Philadelphia, 1895, pp. 442 *et seq.*)

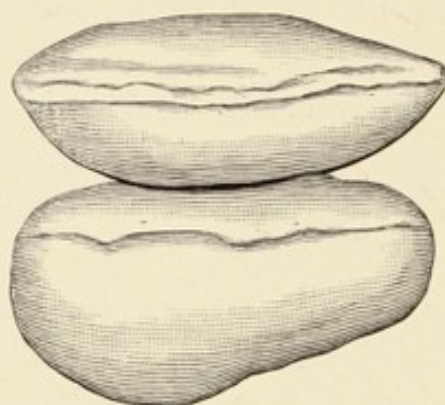
PREPUTIAL CALCULI.

A peculiar form of distortion of the penis which, when well marked, produces organic impotence is caused by the presence of calculi in the preputial sac. There may be one, two, or three calculi present, and the distortion of the organ varies according to their number and size. As a rule, intromission of the penis becomes impossible and coitus so painful that it is usually not indulged in by these sufferers.

Preputial calculi may be seated side by side and may then be symmetrically faceted to each other, or one stone may be seated on the top of the other in a concavity in which the convex base of its upper fellow is smoothly placed. It is said that preputial calculi are not very uncommon in China, particularly in the persons of the natives. In Fig. 28 are well shown two

preputial calculi, which were removed from a Chinaman in Canton, China, by my friend, Dr. J. A. Andrews.

FIG. 28.



Preputial calculi.

I have seen two instances in which such a large quantity of dried smegma was present in cases of phimotic prepuce that intromission was difficult or impossible.

CHAPTER XI.

ORGANIC IMPOTENCE DUE TO DEGENERATIVE, HYPER-PLASTIC AND TRAUMATIC CHANGES IN THE CORPORA CAVERNOSA.

IN this category are included ossification of the penis, fibroid sclerosis, syphilitic nodes, together with curvature and fracture of the organ.

OSSIFICATION OF THE PENIS.

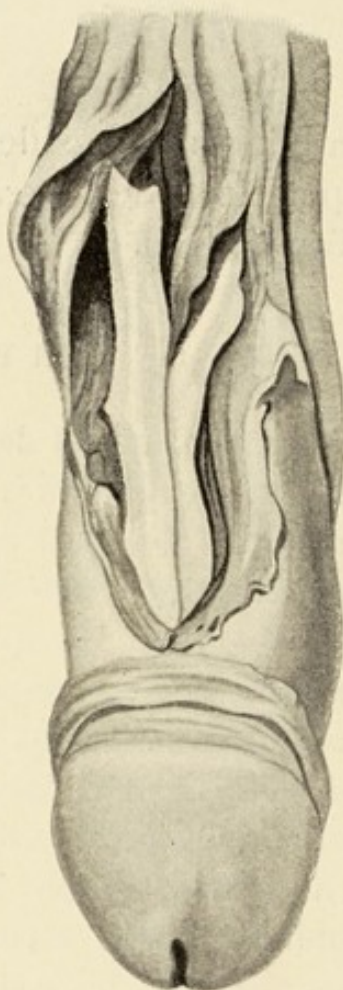
This affection is very rare, and is denominated calcification by some authors. It occurs in middle-aged and old men; hence, as a rule, it does not cause much mental disturbance, though it may interfere with and even entirely prevent coitus. The parts involved are the sheaths of the corpora cavernosa and the septum pectiniforme. The bony growth may be in plates, as it is usually found in the superficies of the corpora cavernosa or in rod-shape when the septum pectiniforme is attacked.

Ossification of the penis, which is always partial, takes place very insidiously and without pain, and the patient first becomes aware of its existence by the impediment it offers to coitus or the curvature which it causes to the organ. In a case reported by MacClenan,¹ in which there was so much distortion of the penis that urination was accomplished with the greatest difficulty, the whole length of the septum was ossified, and coitus was rendered impossible. This bony mass was

¹ Phila. Monthly Journal of Medicine and Surgery, 1827, p. 256.

dissected out and a fairly good result was obtained in remedying the curvature and restoring the function of the organ. In Fig. 29 is well shown an example of longitudinal bony growth in the median line of the penis,

FIG. 29.



Bony growths of the penis, shown as white bands in the middle of dorsum.
(After DEMARQUAY.)

which was observed by Demarquay¹ in the Pathological Museum of Vienna. No facts concerning the case were obtained.

The curvature produced by ossification of the penis

¹ Op. cit., p. 353.

may be either upward or downward. In this affection erections are painful, manipulation of the penis causes suffering, and in its quiescent state the organ is more than normally sensitive.

In some of these cases, when the plates are superficial and the bony median cords accessible to the knife, removal may be effected by operation, and improvement of the patient's condition produced. Internal or external medication is worse than useless.

According to Demarquay, there is a case on record in which an oxdriver had a penis which was wholly ossified, always in erection, and the cause of great suffering to his wife. The same author mentions a case observed by Velpeau, in which a bony growth sprang from the pubic bone and invaded the left side of the penis for a distance of fifteen lines.

TREATMENT. Nothing but removal by means of the knife is indicated in these cases, and it is probable that the cicatrix resulting from the wound may lead to bad distortion of the penis. The affection is practically incurable.

FIBROID SCLEROSIS OF THE CORPORA CAVERNOSA.

This affection has heretofore been described under the title of chronic circumscribed inflammation of the corpora cavernosa, an obvious misnomer, since no one has ever observed any inflammatory condition connected with it.

This affection begins slowly, painlessly, and insidiously, and, as a rule, is first recognized by the patient as a little bean-like lump or plate of tissue in the sheath of the corpora cavernosa, which may be slightly painful on pressure or during erection.

In exceptional cases I have noted that the patient complained of pain in the penis, particularly on erection,

when on careful palpation no change in the corpora cavernosa could be made out, even after several examinations. In these cases the only evidences of lesion were the tendency of the penis to curve upward and the presence of pain when an attempt was made to straighten the curved organ. In these cases the fibroid proliferation was well under way, but it had not become sufficiently compact to cause such a change in the tissues as to be perceptible to the fingers.

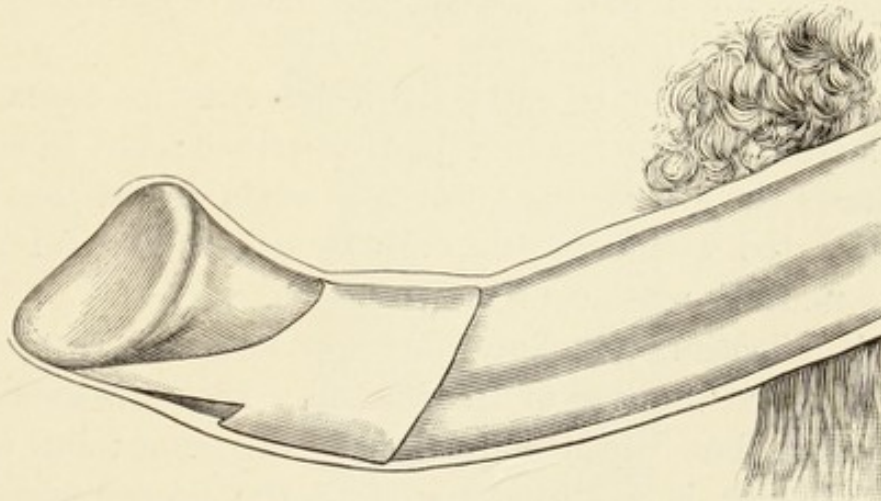
As a rule, the sclerosis is tolerably well advanced when the surgeon is consulted, and he finds a hard, firm plate of tissue a line or two in thickness, perhaps the size of one's thumb-nail or larger, seated in the superficial portion of the corpora cavernosa, about equally on each side of the median line, like a saddle. Its margins are usually sharply defined and regular, or they may exceptionally be uneven, slightly nodulated, and perhaps thickened. The deeper parts are, as a rule, free from the disease, but exceptionally we find that the morbid process has extended downward into the trabeculæ. The induration of the plate is variable; in the early stages it is usually not very dense, but in older cases it may be of cartilaginous hardness. Usually these plates have a kind of elasticity which gives to the finger a sensation quite different from that offered by the bony and cartilaginous plates sometimes found here. As, however, these plates grow old, they may become very dense and wholly inelastic.

The lesion may occupy one corpus cavernosum, or both; but it almost always seems to begin on the dorsum of the penis, particularly near the median line. I have recently seen four cases in which the plates began on the sides of the penis near the line of apposition of the corpora cavernosa with the corpus spongiosum. In

two cases symmetrical plates over an inch long were found, one on each side of the penis. In a third case there was a large, firm plate on one side, and a smaller and more elastic one on the other side of the penis. In the fourth case there was but one small plate on the left side of the penis. In all these cases the curvature of the penis was well marked and downward in direction.

In general, these plates are found to be the shape of a saddle, usually symmetrically placed over the cavernous bodies and well welded together in the median line. While this arrangement is the one most commonly found, I have seen two exceptional cases, in which there seemed to be a little sulcus directly in the middle line of the penis, where the two plates met but did not join together. This depressed line seemed to be composed of unaffected tissue, and it acted as a hinge upon which either of the two plates could be slightly moved or tilted upward or downward.

FIG. 30.



Fibroid sclerosis of the corpora cavernosa.

The smaller plates are ovoid, and they have been found as long as two and even three inches and as small as half an inch. As a rule, the sclerosis attacks the

corpora cavernosa, but quite exceptionally it involves the corpus spongiosum. This is shown in Fig. 30, which is a schematic representation of a case once under my care, in which on each side of the penis there was an offshoot extending around to the frænum along the course of the lymphatics.

In some rare cases in which the lesion is unilaterally developed its inner edge usually impinges on the median dorsal line of the penis.

As a rule, we find but one saddle-like plate, but in some instances I have seen two, one just behind the glans penis, and the other further up the organ, near its root. Another anomalous form of this affection consists in the usual saddle-like lesion with one or two small plaques seated on one or both sides of the corpora cavernosa.

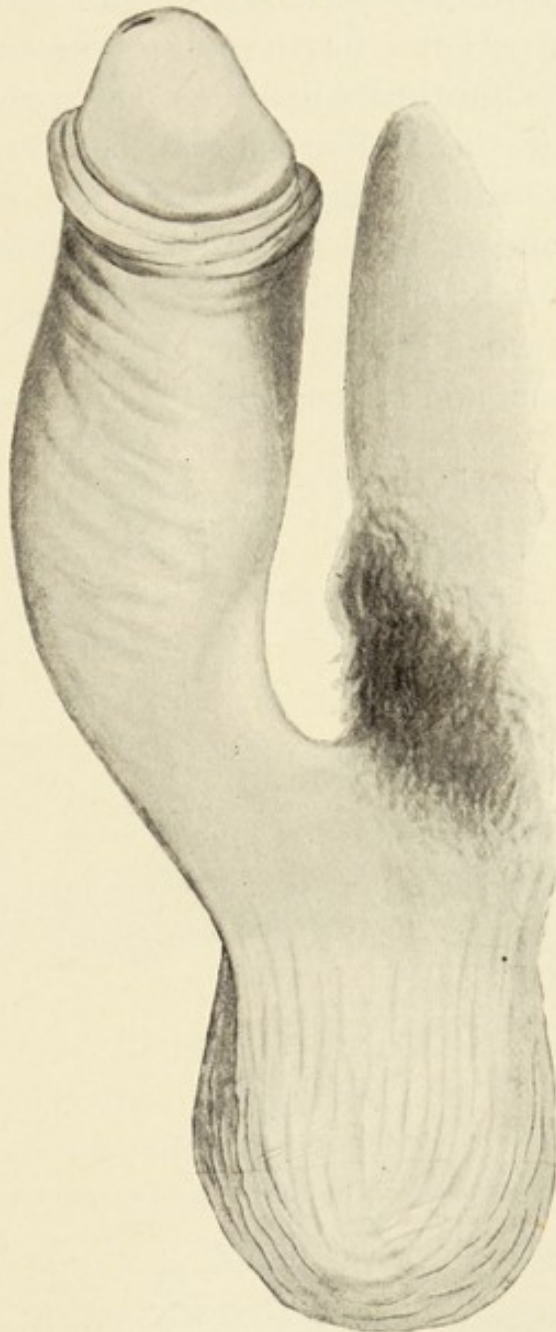
These plates may grow in all the directions of their margin, but usually to a greater extent in an antero-posterior direction. They not infrequently remain stationary for a long period, but usually extend quite slowly and insidiously.

In the majority of cases the lesion runs its course in the flat superficial manner just described; but in some instances the sclerosing process extends deeper into the trabeculated tissue of the corpora cavernosa and produces nodular masses of varying size.

This affection interferes more or less with erection, according to the size of the plaque. If this is small, it may cause but slight distortion of the penis; but as it grows larger it so interferes with the proper erection of the organ that it is bent exceptionally almost to a right-angle, but usually upward and toward the affected side, or it may be somewhat twisted. In most cases the erectile tissue underlying the lesion in the whole

length of the organ becomes hard and firm during erection. When, however, the trabeculated tissues have

FIG. 31.



Fibroid sclerosis of the corpora cavernosa.

been attacked by these sclerotic infiltrations, the penis beyond them is not at all congested, while the erection

in the proximal part is complete. In this event the organ may resemble a flail, the firm part near the body being the handle, and the distal part or swingel hanging flaccid, perhaps nearly at a right-angle.

In general, patients having plates in the dorsum of the penis complain that when erect the end of the organ stands so near the abdominal wall that intromission is rendered impossible, and any attempt at straightening it out is attended with severe pain. This feature is shown in the schematic drawing made by a patient of his own penis when erect. (See Fig. 31.) In this case a very curious and exceptional condition existed—

FIG. 32.



Fibroid sclerosis of the corpora cavernosa.

namely, the organ became distended and erect in its distal and unaffected four-fifths, whereas at its proximal sclerotic portion near the body it became much less distended and was somewhat limber. In this condition intromission was only possible (and then with much difficulty) when the vagina was very large and moist.

The appearances presented by another exceptional case are shown in Fig. 32, which is taken from a drawing furnished by the patient of his penis in a state of erection. The distal third of the corpora cavernosa behind the glans was the seat of two long plates which greatly reduced the size of the penis and gave it a decided upward curvature. The unaffected part behind became normally enlarged, but engorgement never took place in the glans penis. In his description of his case this patient said that his penis when rigid resembled a plucked turkey, the head being the glans, the affected portion the neck, and the body being the proximal part of the penis, which swelled out during erection. In this case intercourse was painful and unsatisfactory. In some cases the glans and the penis itself may feel cold, and the glans may be so anæsthetic that there is no vigor in coitus, and as a result such a patient may be aspermatous by reason of the non-occurrence of ejaculation.

This affection is peculiar to those of middle and advanced age. I have seen it once at thirty, in another case at thirty-five, and in several cases at the fortieth year. As a rule, these patients present themselves when about fifty years old, and from that time on to sixty or seventy years. Close interrogation of intelligent patients thus affected usually brings out no facts as to its origin. In some exceptional cases there is a vague recollection of traumatism, but as a rule nothing can be learned from the patient as to the cause of his trouble.

ETIOLOGY. We have no precise knowledge as to the cause of this affection. By some it is thought to be the result of a gouty condition, and by others that it is caused by diabetes. Notwithstanding that Verneuil and Tuffier¹ in twenty-six cases found fifteen patients

¹ *Annales des Mal. des Org. Gén.-urin.*, 1885, pp. 401 et seq.

to be gouty and eleven to be diabetic, it does not follow that these conditions were true etiological factors. I have seen so many cases of this affection in absolutely healthy men, who were not gouty and whose urine did not contain sugar, that I am very skeptical as to the influence of a diathesis in producing this peculiar sclerosing process. In all probability the origin is local, perhaps the result of traumatism.

The euphemistic diagnosis of gout in the penis is very gratifying to some old men.

PATHOLOGY. According to Tuffier and Leloir, these nodules resemble microscopically keloid, there being a fibrous network of tissue like that of scars, with few vessels and islets of embryonic cells, showing a tendency to fibrous transformation. In short, the process is a chronic fibroid sclerosis. The statement that this affection is caused by thrombosis of the venous spaces is not supported by any scientific evidence.

PROGNOSIS. The prognosis of this affection is very unsatisfactory. There is no case on record in which this sclerosis has disappeared. It has been stated that in some cases the affection crept backward, and then interfered less with erections than it did when it was more distally placed. In the very many cases I have seen and studied no such auspicious turn of affairs took place. As this trouble is peculiar to men who are growing old, and who are in general no longer eager for sexual activity, it is in most cases complacently borne, and the patients do the best they can in their crippled condition. They at least have the satisfaction of knowing that their trouble will not lead to malignant degeneration. The suspicion is warranted that the cases in which induration of the corpora cavernosa underwent involution were of syphilitic origin.

TREATMENT. Little can be done for this affection. Most patients desire at least to make an effort to remove their disability. In this spirit mild blisters, mercurial inunctions, applications of iodine, and the use of the constant current may be tried, and for a time iodide of potassium may be given internally. Such, however, is the uncertainty of ultimate favorable results that one is not warranted in causing these patients inconvenience or suffering.

SYPHILITIC NODES IN THE CORPORA CAVERNOSA AND CORPUS SPONGIOSUM.

In the tertiary, and very exceptionally in the secondary, period of syphilis the erectile tissues of the penis may be attacked by localized gummatous infiltrations. The parts attacked are the corpora cavernosa and the corpus spongiosum. The involvement of these structures by syphilis is very rare, and one part is attacked about as frequently as the others.

When the corpora cavernosa are attacked usually one of the bodies is the seat of the lesion, and very exceptionally two are involved. As a rule, the patient experiences no pain, and he finds by accident a nodule of the size of a pea or a nutmeg, or even of larger dimensions in the meshes of the erectile tissue. These nodules are sharply defined, of roundish shape, of firm consistence, and they may even reveal a quite dense hardness. Usually, in this, as we may term it, syphilitic cavernitis, the theca of the parts is not involved, and the nodule can be felt as a deep-seated tumor. Exceptionally I have seen such a nodule adherent to a goodly sized plaque in the theca, and still more exceptionally I have seen a flat gummatous infiltration into the theca, with

progressive involvement of the areolæ of the cavernous tissue.

Pea- or nutmeg-sized nodules of the corpus spongiosum, in most cases involving the whole of the circumference, and exceptionally limited to the upper or lower wall, are also somewhat rarely seen. These lesions are quite firm, but not cartilaginous in consistence, and their outline can usually be quite sharply defined by the fingers.

All these lesions run an indolent course, and, as a rule, do not soften and form abscesses. They cause trouble and disquietude to patients by reason of the curvature of the penis which they produce, which may be upward or downward or to the sides. Thus interference with coitus may be produced, and in many instances intromission may be rendered impossible.

These lesions of the corpora cavernosa run an indolent course, with little tendency to involution. In some cases they soften and are gradually absorbed, and then distinct loss of tissue is left. In other cases the breaking-down of the tumor leads to an abscess which may be slow in healing. In either of these events loss of tissue and curvature of the penis result. If the case is seen early, and vigorous treatment is instituted, these nodules promptly show signs of resolution, and they may disappear without perceptible damage to the part. In some cases a slight fibroid thickening may be felt.

Syphilitic nodules of the corpus spongiosum run a similar course to those of the cavernous bodies. In the event of spontaneous resolution, of softening, or of abscess formation, there is danger of the formation of a dense fibroid stricture of the urethra. If, however, the case is seen early, the treatment may promptly cause the absorption of the infiltration, and little, if any, damage to the urethra and spongy body may be left. In

some cases slight thickening of the urethral wall is produced.

DIAGNOSIS. In general, the deep-seated nodular form of syphilitic infiltration in the corpora cavernosa is so well marked that no mistake in diagnosis will occur. When there is a plaque-like infiltration of the theca of the cavernous bodies the existence of fibroid sclerosis may be suspected. In all cases of doubt we must depend on the history and on the results of antisymphilitic treatment, which is usually promptly curative in the specific affection and powerless in that of simple origin. The nodules of the corpus spongiosum, as a rule, readily disappear under treatment.

PROGNOSIS. When these syphilitic nodules are seen early and vigorously treated they will promptly undergo resolution, and perhaps leave little damage. In old, neglected cases the integrity of the tissues is more or less impaired.

TREATMENT. An active mixed treatment should be administered internally, and mercurial ointment or plaster should be kept over the site of the lesion.

CURVATURE OF THE PENIS.

This condition is sometimes found in patients whose organ has not been injured. In some cases the curvature is slight and upward; in others, moderately downward, while in some there is a decided twist of the organ, usually to the left. In none of these cases is there any material interference with coitus. I have seen decided lateral twists in the penis in confirmed masturbators, which were probably due to the abuse to which the organ had been subjected.

Various abnormalities of the penis may be accom-

panied by curvature of the organ. The most common cause of slight curvature is shortness of the frænum, which, as a rule, is readily relieved by operation.

In some rare cases the septum of the corpora cavernosa forms a distinct string or cord just above the corpus spongiosum, and it draws down the penis toward the scrotum. This condition also may be relieved by operation.

Hypospadias, with adhesion to the scrotum, is a rare condition, and is usually complicated with curvature of the penis, due in some cases to the cord-like condition of the septum of the corpora cavernosa. This condition may be much improved or relieved by operation.¹

Congenital adhesion of the penis without hypospadias is sometimes found. In this state the penis is either wholly enveloped by the scrotal tissue, or it is attached by its inferior surface to the bag by means of a webbed band of integument (called by the French "*Pénis palmé*"—webbed penis). The glans is usually free, and from the meatus the urine dribbles downward. The penis being thus bound down, when it becomes erect it is curved downward, and intromission is impossible.

Curvature of the penis from shortness of the corpus spongiosum is quite rare. A dense and inelastic condition of the spongy body, either congenital or the result of gonorrhœal inflammation, in some rare cases leads to downward curvature, which cannot be thoroughly relieved by operation.

Injury to the corpora cavernosa from abscess, gum-

¹ The technique of the operation for curvature of the penis and for hypospadias with scrotal adhesions is well given by Gouley: *Urethro-plastic Operation to remedy Hypospadias, etc.*, Medical Record, February 19, 1886; and by Weir: *Two Cases of Congenital Curvature of the Penis*, New York Medical Journal, March, 1874.

matous infiltration, partial or complete fracture, and thrombosis may result in curvature of the penis. In fibroid sclerosis and ossification of these structures this deformity is a permanent symptom.

Temporary curvature of the penis may occur during phimosis and paraphimosis.

Within the past twenty years, in which extremely large incisions into and over-dilatation of the urethra have been so extensively practised, it has not been uncommon to see many distressing cases of curvature of the penis, in some of which intromission was impossible, while in others coitus could be indulged in with great difficulty and discomfort. In many of these cases the distress of the patient was increased by the resulting sexual debility, which in some cases amounted to impotence. As a rule, curvature of the penis, the result of intemperate instrumentation, is permanent and wholly refractory to medical and surgical treatment.

FRACTURE OF THE PENIS.

This accident is quite uncommon, and generally occurs in coitus and exceptionally during sleep. It may be complete, in which case the cavernous bodies and spongy body are totally broken or incomplete, in which condition one cavernous body or the spongy body alone may be fractured.

The first symptom is a sudden stabbing pain, and then swelling of the organ rapidly supervenes. When the corpora cavernosa are involved the swelling is on the dorsum and sides of the penis, and, according to the amount of extravasation of blood, is large or small. Pain, distention, and unwieldiness are prominent symptoms. In some cases the fractured ends have been

found, and on motion crepitation was produced. Veazey¹ reports the case of a young man who, in violent coitus fractured the penis except its integument so that the two fragments could be moved over each other, and when pulled apart a distinct sulcus could be felt. I have had under my care a similar case.

Fracture of the corpus spongiosum may occur as the result of a blow on the penis when curved in chordee; it more commonly, however, is the result of violent efforts in coitus, sometimes in the bridal bed, but generally as an incident in a drunken debauch. In the case of fracture of the spongy body the parts rapidly swell, owing to the escape of blood, and, unless prevented by the prompt use of the catheter, extravasation of urine occurs, in which event the penis is greatly swollen from the base to the glans. In cases of urethral rupture retention of urine is a frequent and troublesome symptom. The retention may occur as the result of swelling and the resulting pressure on the canal, or it may be due, as claimed by Watson,² to the valve-like action of the torn mucous membrane.

The local disturbance and the consecutive symptoms vary in different cases. In all there is more or less hemorrhage, and when the urethra is involved there may be, in addition, as just stated, extravasation of urine. Fever is usually present in a pronounced form, and in some cases pyæmia, even so severe as to cause death, supervenes. As local effects, abscess, destructive ulceration of the tissues, and gangrene may occur, in which events urinary or urethral fistulæ may be left.

Fracture of the penis is observed in young and old subjects. In advanced life the sheath of the corpora

¹ New Orleans Med. and Surg. Journal, October, 1884.

² Boston Med. and Surg. Journal, 1885, vol. cxiii. p. 463.

cavernosa is sometimes more condensed and brittle than normal, and it is then more liable to fracture. I saw such a case in the person of a very old man, who, during sleep, rolled over on a very erect penis and broke the corpora cavernosa as sharply as if they had been cut with a knife.

The prognosis of fracture of the penis varies according to the extent and seat of the injury. When the cavernous bodies, one or both, are fractured, the parts may heal, and erections may thereafter be perfect, or erection may only occur in the proximal part of the penis, while the distal part remains flaccid. Veazey noted in his case that this condition was present at first, but that later on perfect erections occurred.

The outcome in cases of rupture of the corpus spongiosum is usually a traumatic stricture of rapid growth and much density.

TREATMENT. In mild cases rest in the recumbent position and the application of cooling lotions or ice-water may be all that is necessary, except the introduction of a soft catheter to empty the bladder. When the extravasation of blood is very great, it may be necessary to make a free incision, and then treat the wound aseptically. Ulceration and gangrene of the parts should be treated on the regular surgical lines. All collections of pus should be incised and the parts antiseptically dressed.

Rupture of the corpus spongiosum usually requires the regular passage of a catheter, and perhaps its retention for a longer or shorter period. Free incisions should be made when extravasation of urine has occurred, and when blood-extravasation is extensive, particularly when it exerts injurious pressure. As the swelling in these cases is usually so great that the

urethra cannot be reached and promptly stitched, it is necessary to await events, and when the stricture is forming to endeavor to restore the urethral calibre by the introduction of sounds, and, in the failure of this effort, to resort to internal urethrotomy.

CHAPTER XII.

STERILITY IN THE MALE.

It is only within the past twenty-five years that the subject of sterility in men has been carefully studied and that clear ideas have been entertained concerning it. In earlier years unfruitful marriages were generally, by common consent, ascribed to the fault of the wife, who in many instances was energetically and needlessly submitted to much gynecological treatment, discomfort, and trouble. In those earlier days, if a man seemed well developed sexually, if he was able to copulate properly, and if he had what seemed to be normal ejaculations, he was deemed potent, and if he was married and without issue, the fault was not laid at his door. But with the advance in medical science, the condition of the semen and of the seminal tracts has been carefully studied, with the result of proving that in many cases, although to the unaided eye this secretion seemed normal, yet by the aid of the microscope it was found to contain unfertile spermatozoa or no spermatozoa at all, although all the other constituents of the secretion might be present. As a net result of the observations of many investigators, it may be stated, in general, that in cases of unfruitful marriage the husband is the sterile partner about one time in six.

Two conditions have been found to be the cause of sterility in the male. The first is called azoöspERMATISM, in which, although the man can properly perform the sexual act, his semen is unfertile, for the reasons: 1,

that it is lacking in spermatozoa; 2, that these highly vitalized bodies are of imperfect development; or, 3, that they cannot reach the sexual tract. When the cause of this condition is investigated it is found to reside in some structural change in the testes and the epididymes, by which the secretory function of these glands is either destroyed, or temporarily impaired, or that an impediment is offered to the escape of the spermatozoa, either in the epididymes or in some part of the vasa deferentia.

The second condition producing sterility in the male is called aspermatism, in which, although the power of normal coitus exists, there is no ejaculation of semen, or the quantity of semen is deficient, or its emission is imperfect or impeded. Aspermatism is caused by a blocking up of the sexual tract in some part between the seminal vesicles and the ampullæ and the meatus urinaris or the preputial orifice.

CHAPTER XIII.

AZOÖSPERMATISM.

THE term azoöspermatism is applied to that condition in which a man retains the power of copulation, while in his ejaculations spermatozoa are either wholly absent or present in small quantity, or they are so poorly developed, or functionally inactive, or unfertile, that he is of necessity sterile. Azoöspermatous men may, therefore, possess the *potentia cœundi* and lack the *potentia generandi*. In azoöspermatism the absence of spermatozoa is due to some abnormality of the testes or to some blocking up of the vasa deferentia as far up as their ampullations. Azoöspermatism, therefore, differs decidedly from aspermatism, in which condition the obstructive changes take place in the seminal tract between the seminal vesicles and deferential ampullations and the meatus urinarius.

Azoöspermatism results from a variety of abnormal and morbid conditions of the testes. In the front rank of abnormal states are the various forms of testicular misplacement and of absence of the testes or some part of their excretory canals. Gonorrhœal inflammation plays an important part in this form of disorder by the stenosing and destructive lesions which it produces in the epididymes, testes, and vasa deferentia. True azoöspermatism is induced when the organs of each side are involved; but in the event of the trouble being unilateral it then constitutes a menace to the man's future virility, since he has but one testis left, and the function of this one

may be and is very frequently destroyed. Syphilis is very often an important factor in this condition, since it may attack any or all portions of the testis or cord.

Chronic testicular inflammation, due to some lesion of the genital tract or to some infective process, is very often the underlying cause of a man's sterility, which may also result from orchitis due to muscular effort or strangulation of the cord and gangrene of the testis.

The functional activity of the testes may be so impaired, or even destroyed, by the existence of hydrocele or hematocele that a man is temporarily or permanently azoöspermatous.

Tuberculosis of the testis is a not uncommon cause of destruction of the organ, while under various circumstances and in different conditions atrophy of these glands may result in the loss of their function. Tuberculosis of the prostate and of the seminal vesicles and ampullations may so alter or poison the secretions of these organs that the spermatozoa are killed.

While it is true that many of the conditions thus outlined may attack but one testis, in which event a man is not azoöspermatous, there is always a liability that the second organ may become involved, either by the original morbid process or by one of different nature and origin. These considerations have convinced me that the subject of azoöspermatism can best be satisfactorily presented by a clear and concise description of all abnormal states and morbid conditions which may lead to the impairment or destruction of the functions of the testes and of their canals.

ECTOPIA TESTIS.

It is necessary to recall to mind that in cases of abnormal position of the testis, known under the general term

ectopia, the organ is either retained in the abdominal cavity or it becomes misplaced in its descent. This condition is also called cryptorchism, especially when both testicles are misplaced, and the bearers of this deformity are called cryptorchids.

Thus, we find the testes in abdominal ectopia either near the posterior wall of the abdomen or in one of the iliac fossæ. In cases of imperfect descent it may be retained: 1, in the inguinal canal; 2, in the fold between the scrotum and the thigh; or, 3, it may pass under Poupart's ligament through the crural ring and become lodged in the thigh; or, 4, it may pass down and become fixed in the perineum in front and to the side of the anus.

These misplaced testes, all of which are usually abnormally small, seem to be rather prone to undergo malignant degeneration.

Ectopia testis has been by some authors considered to be an undoubted cause of sterility, assuming that the function of the other or free testis has been damaged. Curling¹ reports several cases in which no spermatozoa were found in the semen after very careful microscopic examination. The facts of the case are, however, as stated by Monod and Terrillon² and by Monod and Arthaud.³ In early years the spermatogenetic power of the retained or misplaced organ is unimpaired, but as time goes on the tissues either decay by fatty degeneration or by fibroid infiltration, and the function of the gland is then destroyed.

Ectopia of the testis, therefore, may lead to such dis-

¹ Diseases of the Testis. London, 1866, pp. 424 et seq.

² Traité des Maladies du Testicule, etc. Paris, 1889, pp. 45 et seq.

³ Contribution de l'Étude des Alterations du Testicule Ectopique, etc. Arch. Gén. de Med., 1887, vol. ii. pp. 641 et seq.

organization of the gland that spermatozoa are no longer developed in it. If in such a case the other testis is in any way diseased or destroyed, the bearer is sterile. This point is well brought out by a case reported by Godard,¹ in which a man having an undescended testis had a child by a mistress, and who, after an attack of epididymo-orchitis on the opposite side, was twice married and had no progeny. Many years after, this man's semen was found to be destitute of spermatozoa.

In the rare cases of congenital absence of the testes, or of part of the vasa deferentia, the subject is azoöspermatous.

TREATMENT. This consists in dissecting out the misplaced testis, if accessible, and in anchoring it by sutures in the scrotum.

CHANGES IN THE EPIDIDYMIS, TESTIS, AND VAS DEFERENS, DUE TO GONORRHŒA.

Gonorrhœal Epididymitis.

As a result of the gonorrhœal process in some cases certain structural changes take place, principally in the epididymis, and also in the vas deferens, which either temporarily or permanently prevent the escape of spermatozoa from the testis. In these cases sterility may result if both epididymes are attacked, or if the affection is unilateral and one is otherwise damaged.

The most important post-mortem studies and microscopical examinations into the testicular structures and into the condition of the semen in cases presenting these

¹ Études sur la Monorchidie et la Cryptorchidie chez l'homme. Mém. de la Société de Biologie, 1857, p. 105.

lesions have been made by Gosselin,¹ Liégois,² and Terrillon,³ and their essays furnish a basis for the study of this subject.

Gonorrhœal inflammation usually attacks the lower part or tail of the epididymis or globus minor, and less commonly the head or globus major, and gives rise to an indurated mass which may obliterate the efferent canal, which at this part of the organ consists of one very much convoluted tube. When this condition is produced no spermatozoa can pass into the vas deferens so long as it lasts. If the head of the epididymis is attacked with indurating hyperplasia, there is a chance that some of the numerous vasa efferentia may not be involved, in which event the escape of spermatozoa may not wholly be prevented. For these reasons, therefore, induration of the tail of the epididymis is a much more serious matter than implication of its head.

In cases where obliteration of the spermatic canal has occurred, even when both sides are attacked, no perceptible change seems to take place in the testes.

In cases where both epididymes are attacked patients seem to be sexually unaffected, being capable of coitus and having complete erections and ejaculations. The semen, however, is destitute of spermatozoa, and, therefore, is infertile.

In the early stage of this form of testicular trouble the semen is less viscid than normally, and it has a yellowish or yellowish-green tint, due to the admixture of pus-cells

¹ Nouvelles Études sur l'obliteration des Voies Spermatiques et sur la Sterilité consecutive à l'épididymite bilaterale. Arch. Gén. de Méd., September, 1853.

² Influence des Maladies du Testicule et de l'épididyme sur la composition du Sperme. Annales de Dermat. et de Syphiligr., 1869, pp. 410 et seq.

³ Des alterations du Sperme dans l'épididymite blennorrhagique. Ibid., 2d Series, vol. i. pp. 439 et seq.

and granular globules, the origin of which is not known.

Terrillon observed this yellow tint of the semen in a case of unilateral induration of the spermatic canal, and when this fluid was examined under the microscope spermatozoa were seen vigorously wriggling around among pus-cells.

As the induration in bilateral cases grows older and necessarily becomes more stenosing, the pus-cells gradually disappear, but the spermatozoa do not reappear. The man, therefore, though capable of coitus, is sterile. When, however, one testicle has remained unaffected the bearer possesses the power of fecundation.

It has been claimed by some authors that gonorrhœal, tubercular, and other morbid affections of one testicle or epididymis may in some occult way so affect its fellow that it also becomes incapable of producing spermatozoa, and that as a result the man becomes sterile. There is, however, no scientific evidence to support this contention, which probably is the outcome of faulty clinical investigation and deduction.

Liégois has very clearly shown by his studies that in proportion as the induration of the globus minor softens and disappears spermatozoa show themselves in the semen in increasing numbers until the normal condition of that fluid is reached. This author, among three hundred cases of epididymitis, did not observe a single case of genuine atrophy of the testis, although he observed a slight diminution in volume in six or seven instances. In only eight cases did he note loss of virile power, while in several it was notably increased.

The conclusions, therefore, warranted by the foregoing considerations are as follows: 1. In all cases of unilateral epididymitis treatment should not cease with the

decline of the acute stage, but active measures should be taken to cause the absorption of the induration. 2. When bilateral epididymitis exists, even if of prolonged duration, energetic and long-continued treatment should be adopted, with the hope of dissipating the induration. 3. In cases of recent involvement much hope may be entertained of perfect cure.

My experience has convinced me that the existence of chronic gonorrhœal epididymitis, unilateral or bilateral, even with unfertile semen, may in many instances be so much relieved that virility is restored to the man.

Luckily for the human race, the tendency in most cases of gonorrhœal epididymitis is toward resolution, at any rate, to the degree of rendering the spermatic canal patulous.

Post-mortem investigations in cases of gonorrhœal induration of the epididymis have confirmed the facts brought out by clinical observation. Hardy endeavored to force an injection-fluid through the tail of an indurated epididymis and failed.¹ In like manner Delaporte,² was unsuccessful in a case of epididymitis which had only existed five weeks.

Gonorrhœal Orchitis.

Though its occurrence is denied by some authors, there can be no doubt that in some cases of gonorrhœal epididymitis there is true inflammation of the testis proper. In the majority of cases, however, of so-called gonorrhœal epididymo-orchitis there is simply a hyperæmic and quasi-inflammatory condition analogous to

¹ Études sur l'inflammation du testicule et principalement sur l'épididymite et l'orchite blennorrhagique. Thèse de Paris, 1860, p. 15.

² De l'orchite aiguë blennorrhagique. Thèse de Paris, 1866, p. 12.

the congestion of the prostate, which may occur in acute gonorrhœal posterior urethritis.

As a rule, testicular involvement in gonorrhœal epididymitis quickly disappears, and the gland seems normal upon palpation.

In some cases, however, chronic parenchymatous orchitis is developed, which may lead to the disorganization of the gland. The essential change is cell-proliferation into the connective tissue around the seminal tubules, as a result of which the development of spermatozoa ceases and the tubules become filled with granular matter and cholesterin crystals. While at first the gland is more or less increased in size, as the degenerative changes grow old, condensation and atrophy occur even to the extent of destroying all evidence of glandular structure and transforming the organ into a mass of dense fibrous tissue. I have seen two well-marked examples of atrophy of the testis from acute gonorrhœa, and Róna¹ has published the history of a very interesting case.

Gonorrhœal Funiculitis, or Deferentitis.²

In some cases the gonorrhœal process does not reach the epididymis, but centres itself in a segment of the vas deferens, usually near the testis, or at any part up to the external abdominal ring. In such cases a goodly sized, round or oval tumor is formed, which is the seat of pain. After the inflammation subsides a hard nodule is left, which may block up the calibre of the canal, and if the resulting stenosis is permanent spermatozoa can-

¹ Monatshefte für Prak. Dermat., vol. v. 1886, pp. 360 et seq.

² The reader is referred to a very interesting case reported by Gosselin, entitled *Inflammation du canal deferent ou deferentite blennorrhagique*. *Gazette des Hôpitaux*, 1868, No. 66.

not pass from the testes. When this condition exists in the course of both vasa deferentia the bearer is sterile. Such cases, however, are very rare.

The vas deferens may be attacked within the pelvis, and more or less damage to its lumen may follow. Instances of this affection are very uncommon.

TREATMENT. Active efforts should be made to cause the absorption of the cellular infiltration, wherever it may be. In some cases, repeated small blisters with cantharidal collodion are beneficial. As a rule, strapping the testis should be practised until it is demonstrated that good results follow or that no effect is produced. Applications of mercurial ointment, of iodine ointment, of iodide of lead ointment (one drachm to one ounce of cerate), or of ichthyol ointment (one drachm to two drachms of cerate) may be tried, and their use should be persisted in. In every case the condition of the urethra should be ascertained, and if chronic inflammation be present it should be thoroughly treated.

CHANGES IN THE EPIDIDYMISS, TESTIS, AND VAS DEFERENS, DUE TO SYPHILIS.

Syphilitic Epididymitis.

Syphilis may attack the epididymis, both in its early and late stages. In the early months of the infection it is not uncommon to find the globus major, and less frequently the globus minor, of the testis to be swollen, hard, and moderately painful, especially when compressed. This condition also occurs at any time during the first and second years of the disease.

The size of the tumor, which has a smooth surface and firm consistency, varies between that of a pea and

a hickory-nut. Uninfluenced by treatment, this indurated nodule will remain in an indolent condition for a long period, and will ultimately produce disorganization of the head of the epididymis. But if local and general treatment is promptly adopted, resolution soon follows, and the integrity of the parts is restored.

In some cases both epididymes are attacked, either simultaneously, or, as more commonly occurs, after a longer or shorter interval.

It sometimes happens that an epididymis previously indurated by gonorrhœal inflammation becomes attacked by syphilis, in which event resolution may be very slow, and in the end some condensation of tissue may remain.

The diagnostic point that gonorrhœa attacks the tail of the epididymis, and that syphilis is more prone to invade the head, may be observed in the greater number of cases.

In late secondary and in tertiary syphilis the epididymis is sometimes attacked in a slow, painless way by a chronic infiltrative process, which leads to a smooth or nodular bulbous expansion of the affected segment, usually the head of the appendage.

This late form of syphilitic epididymitis is usually unilateral, but it may be bilateral. Tertiary syphilitic inflammation may attack an epididymis the seat of gonorrhœal induration, and then stenosis of the spermatic canal is to be feared. Late syphilitic epididymitis does not yield to treatment as promptly as the early form does; therefore it is important that medication should be commenced as early as possible, and pushed with care and vigor.

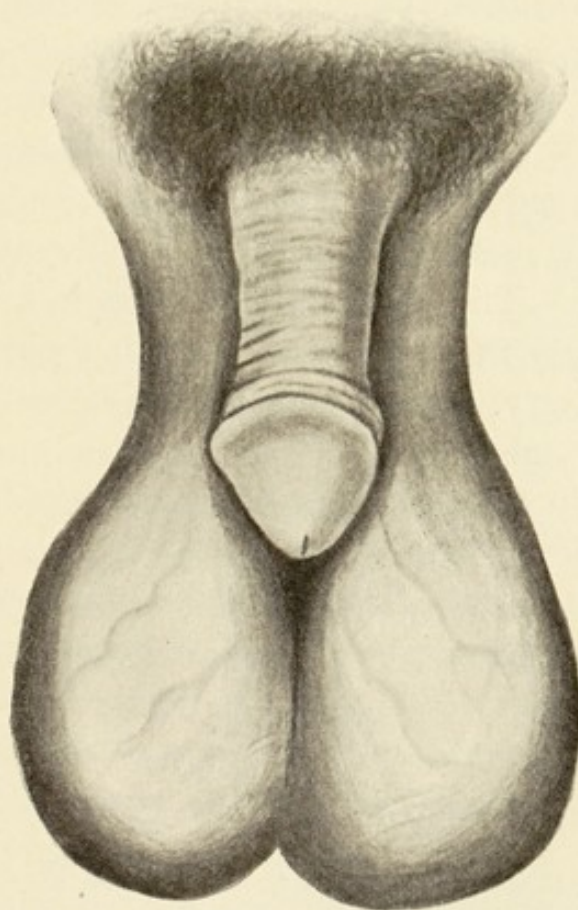
In very rare cases syphilitic nodules form in the vas deferens in the scrotum, and they may, if left alone, lead to stenosis of that tube.

When occlusion of one spermatic canal is produced by the foregoing processes a man's virility is not destroyed, provided the other testis is competent; but if permanent stenosis of both spermatic canals is developed, sterility inevitably follows. In these cases much hope can be entertained, hence treatment should not be precipitately abandoned.

Syphilitic Orchitis.

Late in the secondary and during the tertiary period the body of the testis may become attacked by a slow,

FIG. 33.



Double syphilitic orchitis, or sarcocoele.

painless, and insidious fibroid or gummatous infiltration. The organ becomes uniformly swollen, hard, firm, less

sensitive than normal, and usually smooth on its surface. In some cases large nodular masses may be found in the organ, as a result of gummatous infiltration.

As a rule, the testis at first retains its normal shape, but as time goes on it enlarges very considerably, even to the size of a big fist, and becomes of a decidedly pear-shape, or ovoid or globular. Usually one testis, but not infrequently two glands, are involved. (See Fig. 33.)

This form of orchitis, or sarcocele, as it is called, runs a chronic, uneventful course if left to itself; but it will yield in a surprising manner if treatment is instituted early. The danger in the affection is that the seminal lobules will be destroyed by the fibroid or gummatous tissue which develops in the fibrous stroma in which they lie. When this occurs the development of spermatozoa inevitably comes to an end. In addition, the efferent tubules may be destroyed by fibroid stenosis or degeneration. Therefore this affection is a very serious one, as it tends from the first to destroy the spermatogenic capacity. Degenerative changes may occur and abscess may be produced, or the testis may be transformed into a fungating mass—fungus testis.

In exceptional cases the testis in tertiary syphilis becomes suddenly swollen and painful, and presents points of resemblance to gonorrhœal epididymo-orchitis, except that the epididymis is very rarely attacked. This syphilitic orchitis¹ of brusque invasion is usually attended with pain in the groins and loins. The acute-

¹ Broca has published an interesting case of this kind (*Syphilis testiculaire bilatérale à début brusque et douloureux*: *Gazette Hebdom.*, 1883, vol. x. pp. 181 et seq.), and Carsine has published a number of cases (*Du Sarcocèle Syphilitique à début inflammatoire et douloureux*: *Thèse de Paris*, 1886) in which the testicular lesion was accompanied by severe secondary manifestations.

ness and severity of the symptoms may last a week or two, and then the process gradually subsides until the typical indolent condition is observed. In these acute cases involvement of both glands is to be very much feared. Effusion of fluid into the tunica vaginalis is sometimes to be found in cases of this testicular lesion.

This form of orchitis is very likely to lead to destruction of one or both testes and to partial or total sterility.

Nearly all patients suffering from syphilitic sarcocele become very anxious and apprehensive, fearing that as a result they may become sterile. When but one testis is attacked the patient's ejaculation will contain fertile spermatozoa, provided the other gland is unaffected and competent. Even when both glands are attacked it is often surprising to see how promptly resolution occurs and how soon the semen again becomes fertile. I have seen many such cases, in which, after bilateral syphilitic sarcocele, a cure has been produced and the man has begotten healthy children. In these cases, therefore, it is well to be very hopeful, and to press the treatment as vigorously as possible, since a perfect cure and restored virility may occur even when the case appears desperate. It seems remarkable that the seminiferous tubes may be so profoundly and chronically affected, and yet they may regain their function perfectly. However, when syphilitic sarcocele has existed for very long periods, such as one or several years, there is danger of the destruction of the function of the organ, and that on resolution atrophy may result.

In all cases in which syphilitic sarcocele is complicated with exuberant fungoid development the spermatogenic function of the gland is destroyed.

There is a class of quite rare cases, to which attention

was first directed by Laroyenne,¹ of syphilitic men who, without perceptible lesion of the testes, are sterile. In these cases there is no history of testicular involvement, nor are there any symptoms pointing to disturbance in the gland. I have examined the semen in several of these cases, and have been struck by the entire absence of spermatozoa in that fluid. This azoöspermatisms may be seen in persons in the secondary stage of syphilis and in those in whom the infection had not shown any evidence for a few or many years. Laroyenne thinks that in these cases syphilitic cell-infiltration of a mild degree has so compressed the tubules that the function of spermatogenesis is destroyed. This view is also entertained by Bryson,² who, in a series of cases, found absence of spermatozoa in the seminal fluid.

As a rule, in this form of syphilitic azoöspermatisms treatment fails to afford any relief; but in one case I was surprised and pleased at the reappearance of spermatozoa after an absence of three years, in consequence of a prolonged and vigorous course of treatment.

Syphilitic Funiculitis, or Deferentitis.

Syphilitic infiltration in and around the vas deferens is very rare, and shows itself as nodular or moniliform swellings of indolent course. If left to themselves, these lesions undergo degeneration and the lumen of the canal is occluded.

Hereditary Syphilis of the Testis.

In syphilitic infants and young children the testicle may become indolently and painlessly swollen to the

¹ De l'infécondité d'origine syphilitique: *Lyon Médical*, 1875, No. 4.

² Syphilitic Azoöspermism: *St. Louis Courier of Medicine*, 1882, vol. vii. pp. 495 et seq.

size of a pigeon's egg or of a walnut. The epididymis may also be synchronously attacked, and in very rare instances the vas deferens is enlarged to a greater or less extent. These testicular alterations, due to hereditary syphilis, may, if promptly treated, end in full resolution. In some cases, however, atrophy, necrosis, abscess, and fungoid degeneration lead to the incompetence of the gland as a factor in the sexual function. In these cases a round or irregular nodule of fibrous tissue remains, and the virility of the person, should he reach puberty, depends upon the integrity of the remaining testis. Unfortunately, in hereditary syphilis both testes frequently may be attacked, and with their destruction the ultimate sterility of the patient is inevitable. In some cases of syphilitic orchitis in the young subject tubercular infection attacks the affected tissue and thus adds a factor of malignancy to the case.

Lewin¹ reports the case of a lad, eighteen years old, who was puerile in demeanor and very boyish-looking, whose testicles were of the size of those of an infant, as a result of hereditary syphilis in infancy. Réclus² speaks of the case of a patient (age not given), considered by Parrot and Fournier to be the victim of hereditary syphilis, in whom a testis of the size of a small nut, and of great firmness, was present. I have seen a case in which the gland was reduced to a small mass of fibrous tissue. When we find such a sequela in an adult the suspicion of antecedent hereditary syphilis of the testicle is warranted.

TREATMENT. In all cases of syphilis of the testis and epididymis an energetic and prolonged treatment by mercury and iodide of potassium should be adopted. In

¹ Berl. klin. Wochens., 1876, Nos. 2 and 3.

² De la Syphilis du Testicule. Paris, 1882, pp. 149 et seq.

these cases the local use of mercury in the form of gray ointment should be instituted at once, and persisted in. It is a good rule to begin with goodly doses of the iodide (10 to 20 grains, *ter in die*), and to increase the quantity until two or three drachms are taken three or four times a day. This drug may also be given in combination with iodide of mercury. Testicular lesions in infants should be treated in the same manner, except that smaller doses should be given. Many brilliantly successful results follow active treatment.

CHRONIC ORCHITIS AND EPIDIDYMITIS.

The testis and the epididymis are liable to be attacked by such a degree of chronic inflammation in young, middle-aged, and old subjects that the function of the gland may be destroyed by the indurating and atrophic processes which supervene. In many of these cases there has existed as a starting-point gonorrhœal epididymitis, or epididymo-orchitis; in some, however, the gland had previously been healthy.

In some cases of chronic posterior urethritis and of stricture of the urethra, usually in careless sexually indulgent subjects, the epididymis is attacked by a mild form of inflammation, which does not cause the patient to go to bed, or the epididymis to become much swollen or painful. Such an attack usually soon subsides, and is followed at a greater or less interval of time by a recrudescence, which in its turn is followed by another attack, and so the case continues for years. Some relapses are more severe and inflammatory than others. When examined, such an epididymis is found to be enlarged usually in its whole length, the swelling being quite uniform and diffuse and not nodulated at any point.

Thus is produced a hard, firm, perhaps painless, sclerotic crescent, which is attached to the back and upper and lower part of the gland. The lesion not being of a tubercular nature, degenerative changes, such as abscesses and necrosis, are not observed, but as time goes on the sclerosis gradually destroys the efferent spermatic tubes and produces azoöspERMATISM of one and not infrequently of both sides. The testis may become rather larger than normal or it may decrease in size. As a rule, patients thus affected being young and well, and observing for a long period no diminution in their sexual desires and in their ability for copulation, pay little heed to their testicular trouble. Later on, in cases of double epididymitis or epididymo-orchitis, the sexual appetite and the capacity for coitus may begin to wane, and the affection becomes a source of anxiety and apprehension. In the case of unilateral involvement there may be no functional impairment unless the unaffected testis becomes diseased from any cause.

This form of chronic epididymo-orchitis being so persistent, so liable to undergo exacerbation, and so rebellious to treatment, is really a serious affair, and it calls for careful local and urethral treatment.

The clinical picture above portrayed will apply to cases of young and old subjects usually having chronic gonorrhœa or stricture of the urethra, in whom it is necessary to pass for long periods of time urethral instruments; also to cases in which lithotripsy, litholapaxy, and lithotomy have been performed. In these cases, however, abscess of the testis may occur.

In some old men having hypertrophy of the prostate, cystitis, and that low-grade form of chronic gonorrhœa which is not uncommon, a slow, usually painless fibroid enlargement of the whole epididymis, and per-

haps of the testis, may not uncommonly be observed. When double, this affection soon extinguishes the process of spermatogenesis, and coincidently the sexual desire may become less keen. When the trouble is unilateral there may be no perceptible impairment of the sexual function for a long time.

The tendency of this affection is to produce permanent sclerosis of the parts attacked.

ORCHITIS AND EPIDIDYMO-ORCHITIS, DUE TO GENERAL INFECTIVE PROCESSES.

Testicular inflammation is not uncommonly observed as a complication of a number of infective processes, and it may lead to such structural changes that the integrity of the testis, of the epididymis, or of both, may be destroyed. These infective testicular lesions, as a rule, attack but one gland, but it is not uncommon to see both glands affected. As a rule, the testis is the part attacked, and with it the epididymis may be involved. It is not common to find infective epididymitis without involvement of the testis.

Mump-orchitis.

During the course of mumps the testicle, especially in young subjects, may be attacked by severe inflammation, and the clinical picture of blennorrhagic epididymo-orchitis may then be counterfeited. The invasion of this affection is brusque and its course rapid. Exceptionally, the two testes are attacked. Full resolution may occur, but it is not at all uncommon to observe total atrophy of a gland, and, exceptionally, of both glands. Many men become sterile owing to the destruction of one testis by mumps and of the other by

some other morbid change. The reciprocal relation between the testes and the parotid glands is shown in certain rare cases, in which, after the removal of these glands, the parotids become acutely swollen and inflamed.

Tonsillar Orchitis.

This condition may occur during the course of tonsillitis, with acute invasion and usually with prompt resolution. Abscess may destroy the testis.

Variola-orchitis.

In some cases of smallpox the testis, epididymis, and tunica vaginalis may become rapidly and severely inflamed. Resolution usually occurs, but in some cases atrophy or abscess of either or all of these structures ensues.

Scarlatina-orchitis.

This form of orchitis may occur in children and adolescents, and it is usually of an active type. Resolution may take place, but atrophy may result.

Malarial Orchitis.

During the course of malaria the testis may become inflamed, even in subjects who have not had gonorrhœa and its testicular trouble. In the cases thus far reported it has been noted that exceptionally atrophy of the testis and induration of the epididymis have followed this malarial phlegmasia.

Grip-orchitis.

Involvement of a testis which previously had been healthy, or which had been the seat of gonorrhœal in-

flammation, has been observed in quite a number of instances. Resolution usually occurs, but atrophy, epididymal induration, and gangrene are liable to follow.

During the course of whooping-cough, pneumonia, typhoid fever, pyæmia, and of grave phlegmonous inflammation of bones, the testis and perhaps the epididymis may become the seat of inflammation. In such cases resolution may take place or degeneration of the testis or of the epididymis may be produced.

The danger of these infectious testicular inflammations lies in the fact that they occur chiefly in young subjects, and that when they are severe destruction of the gland is complete. Should the unaffected testis later on become involved by one of the many morbid conditions which are liable to attack it, the result is sterility in its bearer.

The treatment is that used for gonorrhœal epididymo-orchitis.

ORCHITIS DUE TO MUSCULAR EFFORT.

This form of traumatic orchitis is moderately common. It may be a simple and ephemeral condition, or such changes may be produced by the injury that the epididymis may be much enlarged and indurated, or the testis may be so disorganized that atrophy may result. In either of these events unilateral azoöspERMATISM may follow the injury to the epididymis or the testis.

The clinical picture of orchitis from muscular effort is that of gonorrhœal epididymo-orchitis, usually with a preponderance of the testicular trouble. Under the influence of rest and suitable local applications resolu-

tion usually occurs quite promptly, but the testis may remain tender and somewhat swollen for some time. Terrillon¹ reports a case of this form of orchitis in which atrophy occurred, and this process was attended by so much pain that castration was resorted to.

In all probability orchitis from muscular effort is due primarily to sudden and strong abdominal pressure upon the spermatic plexus of veins in persons who have lifted heavy weights, who have slipped with violence, or who by any means have been rudely shaken, as in jumping a great distance, or even hurriedly alighting from a car in motion. Tenuity of the walls of the veins may be the underlying condition favorable to the development of this accident.

It is only in severe cases that this traumatism may cause degeneration of the testicle, which of itself would not lead to sterility if the other testis be sound. The lesion produced in the testis and epididymis is, first, effusion of blood, and, second, the changes produced by the compression thus exerted.

The treatment is that employed in epididymo-orchitis.

STRANGULATION OF THE TESTIS AND EPIDIDYMISS FROM TORSION OF THE CORD.

This form of traumatism is very uncommon, and occurs in subjects (mostly young ones) whose testicular apparatus is somewhat malformed. There is usually a history or evidence of undescended or imperfectly descended testis; consequently, as a rule, the swelling is found in the inguinal canal or just within the upper part of the scrotum. There are present localized swelling, œdema, and redness, and such subjective symptoms

¹ *Annales des Mal. des Org. Gén.-urin.*, 1885, vol. iii. p. 239.

as may point to strangulated hernia, traumatism, or appendicitis. The position and quite sharp localization of the tumor, the absence of the testis from the scrotum, and the history of the case will usually point to its nature. The diagnosis, however, is as a rule confirmed when an exploratory incision has been made. Then the testis and epididymis are found to be swollen, of a deep blue or even black color, and sometimes they are gangrenous. In most cases the testis is entirely destroyed.

In some cases excessive and violent strain causes a twisting of the cord, which produces this trouble. In others no exciting cause can be ascertained. The twist of the cord may be partial or complete, or the cord may be twisted several turns. The essential and underlying cause of torsion of the cord is disturbance in the development of the vaginal process of the peritoneum, in which the mesorchium is either too slender or too long, and hence does not give the testis the necessary amount of fixation. The mesorchium then allows greater movement than normal, and the testis may, as a result, encounter difficulty in entering the inguinal canal and impediment in traversing it. When it is in the inguinal canal the flat condition of the testis militates against its replacement and renders this impossible when inflammation has been established. In the scrotum the torsion may be reduced. Usually such testes require prompt extirpation. Provided the other testicle is competent, the sterility of the man is not lost.

Hydrocele.

In some cases of old hydrocele such pressure is exerted upon the testis and the epididymis that the spermatogenic function is much impaired, and it is even tem-

porarily suspended. In some old cases in which the tunica albuginea and the epididymis are much thickened and contracted by fibroid sclerosis fertile spermatozoa are no longer produced.

Lannelongue¹ and Marimon² have in cases of old and voluminous hydrocele found such alterations in the structure of the epididymis and the efferent tubes so injuriously compressed that the escape of semen was profoundly interfered with. A very important fact has been noted by Roubaud³ in the case of a young man who had very large double hydrocele. He was then sterile, and no spermatozoa were found in his semen. After puncture of the two sacs spermatozoa reappeared in the semen, disappeared when they became filled and distended again, and reappeared after a second tapping of the two hydroceles.

Out of twenty-three cases of hydrocele in which the semen was examined by Lannelongue no spermatozoa were found in five.

Desmaroux⁴ reports the case of a man, fifty-seven years old, who had double hydrocele and was sterile, but who became potent after puncture and iodine injection of the tunica vaginalis. It is well, therefore, not to forget that hydrocele may be at least a temporary and, exceptionally, a permanent cause of sterility.

TREATMENT. Palliative measures consist of tapping the vaginal cavity as often as it becomes full. In cases where the function of the testis is impaired by hydrocele the best procedure is to perform Von Bergmann's

¹ Bulletin de la Soc. de Chirurgie, 1873, 3d Série, vol. ii. p. 421.

² Recherches sur l'Anatomie pathologique des grosses Hydrocèles. Thèse de Paris, 1874.

³ Traité de l'Impuissance, etc., 1876, p. 576.

⁴ Gazette des Hôpitaux, 1883, vol. lvi. p. 762.

operation, in which all the parietal layer of the tunica vaginalis is cut away.

Hematocele.

In severe cases of hydrocele such damage is inflicted upon the testicle and such injury is produced by the effusion of blood and the subsequent changes that the function of the gland is destroyed. If its mate, however, is competent, sterility does not necessarily follow, but in case it is damaged the bearer is sterile.

Kocher¹ has shown that the seminiferous tubules may be altered and even obliterated by hyperplasia of fibrous tissue, and that the whole gland may undergo fibroid degeneration after hematocele. Pilliet² has clearly shown that the sclerosis begins in the tunica albuginea and spreads inward and invades the coats of the tubes and the vessels, and thus destroys the glandular structure.

It is well, therefore, to bear in mind that besides being a source of pain and annoyance hematocele may, if left untreated, lead to such damage of the testis that its function will be wholly lost.

TREATMENT. In recent cases antiphlogistic treatment should be adopted. In chronic cases compression may be tried, and mercurial or ichthyol ointment may be applied.

TUBERCULOSIS OF THE TESTIS.

Tubercular infiltration is one of the most common affections which attack the testis and destroy its function. It is observed chiefly at and during puberty and

¹ Die Krankheiten der Männlichen Geschlechtsorgane. Stuttgart, 1887, pp. 100 et seq.

² Note sur l'état du Testicule dans l'Hématocele Vaginale. Compt. rend. du Soc. de Biologie, 1887, Series 8, vol. iv. pp. 324 et seq.

in adult life, but may be found in infants, and much less frequently in middle-aged and elderly men.

In all probability, tubercle of the testis is developed secondarily to some other focus of infection of the body, and it is chiefly noted as being found in association with tuberculosis of the prostate, seminal vesicles, and bladder and ureters and kidneys. Though some cases, from a clinical standpoint, seem to be instances of primary testicular tuberculosis, it is not well to venture such a diagnosis with much positiveness, since lurking and perhaps dormant foci of infection may exist in some part of the body which can only be detected by post-mortem examination.

As to the avenues by which the testis is invaded, it may be stated that clinical, anatomical, and pathological facts point to the bloodvessels as the carriers of the infective material.

There is no scientific evidence at hand in favor of the view that infection through the urethral canal may occur and lead to testicular invasion.

There is good reason for supposing that infection of the seminal vesicles and prostate may occur through the vesico-rectal peritoneal fold from tuberculosis of the peritoneum.

In clinical practice we find two quite clearly marked forms of tubercle of the testis—namely, the acute and the chronic forms. Besides these forms we find mixed varieties, in which acuity and chronicity are blended.

The acute form of tuberculosis of the testis presents somewhat the same clinical picture as is offered by acute gonorrhœal epididymitis. The patient may have given evidence of tuberculosis in some other and perhaps remote organ; he may or may not have complained of bladder, prostate, or urethral disorder; and he may

or may not have suffered from gonorrhœal epididymo-orchitis. He may have previously enjoyed good or fairly good health, or the testicular lesion may appear as the only local evidence of disease in a man who is pale, weak, and sickly, and who, perhaps, has within a short time lost flesh. In many cases traumatism seems to be the exciting cause.

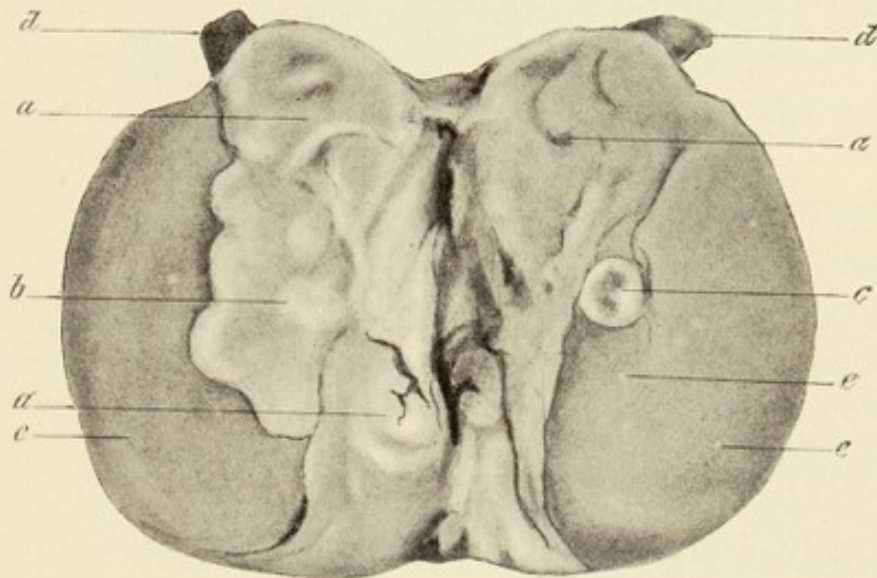
Usually the first symptom is pain seated in the head or the tail of the epididymis, and very soon the segment involved swells to considerable size. In some galloping cases the whole epididymis is much swollen in all directions, is spontaneously painful and on slight pressure, and is covered with an acutely inflamed area of scrotal tissue in a day or two. In other cases several days, or even two or three weeks, elapse before such an acute condition is reached. In these cases there is usually more or less fever and malaise. It sometimes happens that the seminal fluid becomes of a rose-color from blood admixture, probably derived from some part of the testis. When palpated in this state the epididymis usually does not present any diagnostic points, and the conclusion may be reached, if there is any evidence of urethral discharge, that the case is one of gonorrhœal epididymo-orchitis in the declining or chronic stage. When the entire absence of any urethral discharge or affection is determined the suspicion of tubercular invasion may be entertained.

In a few days, or in a week or two, upon the subsidence of the severe inflammatory reaction (in cases in which an abscess has not been formed, and in which vaginalitis has not developed), the surgeon can carefully examine the organ, and then, or perhaps later, a nodular or bossy condition of the head and tail and perhaps of the body of the epididymis may be clearly

made out. At this time the testis may appear uninvolved, but later on it may become more or less enlarged, and on its surface small or large nodulations, just as if small shot or split pease were seated in the tissue, can be felt.

Abscess may sooner or later develop, usually at the head of the epididymis, and also at the tail. When the tail of the epididymis is attacked it is not uncommon to find a mass of suppurating tissue about an inch or less from it and connected by a fibrous strand in the loose scrotal tissue. These extra-epididymal abscesses seem to be due to infecting pus which escapes from the involved epididymis.

FIG. 34.



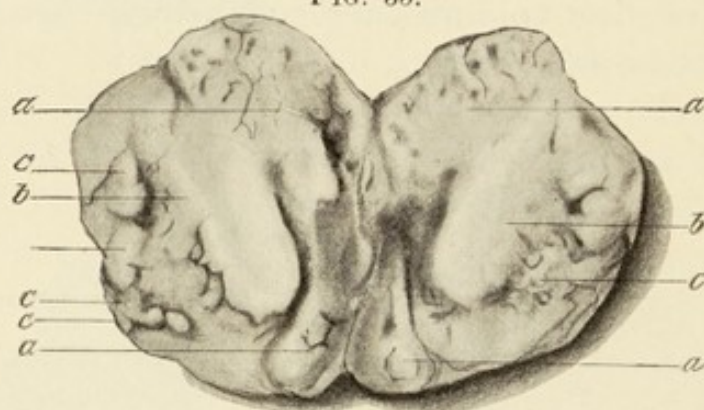
Tuberculosis of the testis.

The larger portion of the epididymis lies on the right side. *a*. Cheesy epididymis. *b*. Whitish mass occupying the mediastinum. *c*. Isolated tubercle with cheesy centre. *d*. Small cyst at the summit of globus major. *e*. Larger and smaller opaque spots scattered over the surface of the testicle.

Abscess is the direct outcome of the caseation and softening of the tubercular inflammation. The non-

vascular cellular nodules produced by the infective process, and the infiltration which surrounds, compresses, and destroys the seminal tubules and leads to a chronic diffuse orchitis, break down and give issue through one or several fistulæ to a thin fluid streaked with pus and small grumous masses. The scrotal wall becomes of a deep red, even of a bluish-red, color, and the orifices of the fistulæ look very unhealthy. In the cases thus briefly described there is usually more or less destruction of the testis proper, but the function of the gland is

FIG. 35.



Tuberculosis of the testis.

The testicle is cut so that the larger part of the epididymis lies in the right half. *a*. Swollen and cheesy epididymis. *b*. Mass of confluent tubercles at the mediastinum, extending outward into the testicle and united above with the globus major. *c*. Larger and smaller tubercles, some with cheesy centres, in the testicle tissue.

promptly destroyed by the deadly infective invasion which attacks it in its centre and on both flanks.¹ The development of tuberculosis of the epididymis is well shown in Fig. 34, and its extensive invasion of the testis proper is admirably portrayed in Fig. 35. One testis may be thus attacked, but not very frequently the other one is sooner or later involved.

¹ For an account of the pathology of tubercle of the testis, see my essay in the *American Journal of the Medical Sciences*, January, 1888.

In the chronic form of tuberculosis of the testis many clinical pictures are presented. In some cases, in apparently healthy or in sickly-looking subjects, with or without coexisting urethral, prostatic, and vesicular involvement, the epididymis (tail or head) swells painlessly, and the patient by accident discovers a small pea-sized or hickory-nut-sized nodule of irregular outline. This condition may slowly increase, and as it does the infiltration becomes more rugose upon its surface, and it may extend to the whole epididymis, converting it into a fibrous mass. In this painless, indolent state it may remain for a long time—months or years—or caseation, softening, and fluctuation may be discovered, or abscess or fistula may develop. On removal of such a testis the epididymis is found to be very tough and fibrous, with here and there cavities in which degeneration has occurred. Very often no evidence of invasion of the testis can be found.

In other chronic cases there may be synchronously observed separate nodules of small or large size in the head and tail of the epididymis, with what is then most common, the involvement of the whole mediastinum testis. In these cases the disease may remain latent and indolent for varying periods (often quite long ones), or exacerbations may occur, and the case in its course may then resemble those of acute development. In general, however, the infective process goes on, the chronic epididymo-orchitis keeps on its course, and then we find a much enlarged epididymis, which is hard, knobby, and irregular. In some cases the lesion in the epididymis preponderates, and then that appendage is very large indeed, and the, as yet, uninvaded testis forms but a small portion of the morbid tumor. Then, again, the growth in the testis keeps pace with the

process in the epididymis, and a large mass is produced.

Hydrocele is observed in about one-third of the cases of tubercle of the testis. In some exceptional cases tuberculosis of the testis (one or both) presents the same clinical picture as is offered by syphilitic sarcocele. By slow degrees, with some or little pain, the testis and epididymis enlarge and form an ovoid or pear-shaped tumor, which has a smooth surface and hard, firm consistence, and which may be mistaken for syphilitic sarcocele or cystic sarcoma of the testis. These tubercular testes may be as large as a good-sized pear or as a large fist. They may remain intact for a long period, and they may become the seat of abscess and fistula and of fungoid development. In some of these cases I have observed small and large rounded nodulations on the surface of the testis. It is always difficult and often impossible in this form of tuberculosis of the testis to discover the epididymis or to settle in one's mind how much it contributes to the general swelling, since the parts are so intimately merged together. The life-history of patients suffering from tubercle of the testis is that of tuberculosis in general. In some cases the patients live for years after the extirpation of the organ or organs; in others death follows sooner or later from extension of the disease to vital organs.

Besides the strikingly well-marked features presented by the affected testis, there is, in most cases, evidence of prostatic involvement in the shape of enlargement and large and small nodulations, and perhaps of irregular infiltrations in the ampullated ends of the vasa deferentia and of the seminal vesicles, which may be ascertained by digital examination in the rectum.

In many cases of tubercular testis the scrotal part of

the vas deferens is more or less attacked. There may be slight thickening and enlargement, circumscribed or diffuse, or the tube may be so nodulated that it feels like a string of beads of various sizes. A testis attacked by tuberculosis soon ceases to possess the spermatogenic function.

In all probability, tubercular invasion of the epididymis and testis destroys the function of the gland much sooner and more frequently than we have heretofore thought. It must be remembered that even in mild and indolent cases the development of toxins occurs in association with the morbid tissue-changes, and these poisons permeate the structures of the testis and destroy the delicate arrangement by which the spermatogenic function is performed. In very acute cases the extensive swelling and hyperæmia are, undoubtedly, largely due to the diffusion of the poisons through the whole gland. It is fair to assume that this condition destroys the function of the testis at once. Then, in addition to this diffusible poison, the cell-changes so destroy the integrity of the gland that it soon becomes useless as a producer of spermatozoa.

Involvement of the two glands carries with it sterility. The foregoing considerations show what a widely deleterious influence tuberculosis exerts upon the sexual function.

TREATMENT. Though it is claimed that removal of the testis is unnecessary and ineffective, as it constitutes but one part of a far-spreading disease, I am firm in the conviction that ablation of the organ, as a rule, is good practice. In some cases we may temporize by curetting and removing the diseased tissue; but in general, if the patient lives, we have later on to resort to extirpation.

Pathological anatomy forcibly teaches us that from the outset of the attack the integrity of the organ is so much impaired, and even destroyed, that it is useless as a factor in fertile coitus. The prompt spreading of the infection to the body of the testis also seems to point to the advisability of the removal of an active focus of further infection.

It is obvious that tuberculosis of the prostate may cause azoöspERMATISM from obliteration of the ejaculatory ducts. In the event of the infection attacking the seminal vesicles and the ampullations of the vas deferens it is very probable that the toxins¹ there developed by the morbid process will kill the accumulated spermatozoa. Very probably, in tuberculosis of the vas deferens outside of the body, the spermatozoa are killed as they ascend that canal, assuming that the testis still retains its spermatogenic function.

ATROPHY OF THE TESTIS.

As has been shown in the foregoing sections, atrophy of the testis is very common, and it is due to a great variety of causes.

In the young subject the gland may become dwarfed by reason of abnormal retention and of malposition or ectopia. In old subjects, senile changes begin earlier in the testis than in other parts of the body, and the organ may be reduced to a mere mass of fibrous tissue without any trace of glandular structure.

¹ Tuffier (De la Virulence du liquide de l'hydrocèle symptomatique de la tuberculose testiculaire. *Annales des Mal. des Org. Gén.-urin.*, 1891, vol. ix. pp. 701 et seq.) injected the hydrocele fluid of tubercular testes (which did not contain bacilli) into the peritoneal cavity of guinea-pigs, and produced in them fatal tuberculosis.

Arthaud¹ has shown that in the testes of men beyond fifty years of age atrophic changes usually become established. The essential lesion is a peritubular sclerosis, which leads to the gradual disappearance of the epithelium. As a result the seminiferous tubules are destroyed, and sometimes cysts are developed. The underlying causes are vascular interference and insufficient nutrition of the glands.

Desnos² has further shown that in old men the epididymal veins become much dilated, and that this process slowly goes on until the veins of the parenchyma of the epididymis are involved. The result of this pressure is the mechanical obliteration of the efferent seminal vessels and the transformation of these structures into dense, fibrous tissue. Desnos further claims that hydrocele, which is not uncommonly found in old men, causes by its compression atrophy of the testis.

By way of recapitulation we may briefly refer to the following facts, and also call attention to several rather infrequent causes of atrophy of the testis. As a complication in the course of a number of infectious diseases the testis is not infrequently involved, and the outcome is very often atrophy or structural degeneration.

Gonorrhœa may, in rather exceptional cases, end in testicular atrophy, but its danger to the sexual capacity resides in its tendency to occlude the spermatic tubes.

Syphilis is a potent and frequent factor in the production of atrophy of the testis and of the epididymis, and occupies a prominent place in the category of causes of sexual impairment and sterility.

Hydrocele and hematocele may lead to moderate and

¹ Étude sur le testicule senile. Thèse de Paris, 1885.

² Recherches sur l'appareil génital des Vieillards. Annales des Mal. des Org. Gén.-urin., 1886, vol. iv. pp. 72 et seq.

temporary or permanent azoöspermatism by reason of the structural changes which they produce in the testis and epididymis.

It is doubtful whether varicocele produces true atrophy of the testis, except in very rare instances.

In a certain number of cases of elephantiasis of the scrotum true atrophy of the testis has been observed. In some forms of hemiplegia, general paresis, and in some cases of traumatism of the skull, brain, cerebellum, medulla oblongata, and spinal cord, wasting of the testes is observed. In these cases the spinal sexual centre is so affected that its function is destroyed. The long-continued use of iodide and bromide of potassium and belladonna has been stated to be the cause of atrophy of the testes.

CHAPTER XIV.

AZOÖSPERMATISM DUE TO ABNORMAL CONDITIONS OF THE SEMEN.

As has already been shown in a previous chapter, in healthy men each ejaculation of semen, after some days of continence, contains many millions of spermatozoa. There is, as has already been stated, much variation in the structure and vital activity of these bodies in different men. In the strong and vigorous they are large and long and very lively, and from this standard (see Fig. 15) they decrease both in size and in vital energy. In all probability there are in man, as in animals, periods in which the process of spermatogenesis is less active than at other times, and that intervals of rest may actually occur. In some men this function is most active and continuous, and as a result the sexual desire is very keen. In others it is more sluggish, and has intervals of repose, and the sexual activity of the man is less pronounced; while in still others the production of spermatozoa is very slow, halting, and feeble, and these vitalized bodies are much less developed and active than they are in very vigorous men. We thus find that the development of spermatozoa represents a sliding scale from full, vigorous structures down to puny and almost inanimate bodies.

THE EFFECTS OF REPEATED AND EXCESSIVE COITUS.

The observation of Liégois, already quoted (see p. 60), which has the support of many other investi-

gators, goes to show that after excesses in coitus there is for a time absence of spermatozoa from the seminal fluid. Recovery from this condition is speedy in some men, and more or less delayed in others. In Liégois' case it was found by the microscope that after abstinence from coitus for three weeks large numbers of these bodies were found. The most extended series of observations as to the effect of coitus upon the size and number of spermatozoa is that contained in the case reported by Casper,¹ which is very instructive. Casper says: "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, 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 zoösperms were found. At another time, on the fifth day after the last coitus, the zoösperms 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 zoösperms 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 nu-

¹ Forensic Medicine. Sydenham Society's edition, 1864, p. 292.

merous small zoösperms; at another time, after a three days' interval, there was not a single zoösperm."

In the event of repeated coitus it is probable that the supply of spermatozoa is exhausted after the first few acts, and that thereafter in cases of excess the secretion comes from the seminal vesicles (perhaps a little from the prostate), and from Cowper's and the muciparous glands of the urethra. In the observation reported by Guelliot,¹ in which a man had coitus eleven times in one afternoon, it is noted that after the eighth encounter the secretion consisted only of turbid serosity (*sérosité louche*).

These careful observations have been fully confirmed by experiments upon animals by means of electrical stimulation of the spinal centre. It is reasonable to suppose from what has thus far been presented that the semen of men who are addicted to long-continued sexual excesses is, as a rule, unfertile, and that the power of fecundation (*potentia generandi*) can only be repaired by continence and as the result of the restoration of vigorous health.

INFLUENCE OF THE PROSTATIC SECRETION.

Any morbid condition which interferes with the integrity of the prostatic secretion is liable to so alter the condition of the semen that its fructifying elements may become unfertile. These morbid conditions are mainly chronic posterior urethritis and chronic inflammation of the prostatic tubules, and in the same category may be included the plugging of the prostatic ducts with concretions, destruction, more or less great, of the gland

¹ Des Vesicules Séminales, etc., pp. 214, 215.

following gonorrhœal abscesses, and the late developing small cell, submucous infiltration resulting from chronic posterior urethritis, which so scleroses the tissues that the ducts cannot perform their function. As causes of these morbid conditions besides gonorrhœa, may be mentioned masturbation, excesses, and unsatisfied sexual desire, which cause congestion of the prostatic tubules, with the consequent loss or impairment of their secretory function. Since all of these morbid conditions may lead to sexual neurasthenia and impotence, a further impairment of the integrity of the semen may arise in the exhausted condition of the system, which for a time may hold in abeyance the process of spermatogenesis. I have myself made many observations upon this class of cases, and have found that the spermatozoa are very small and dwarfed in size, scanty in numbers, and very feeble and languid in their movements. When, however, the integrity of the function of the prostate is restored, and with it the establishment of a renewal of health, the conditions of the zoösperms gradually change until they assume normal proportions and become vigorously active.

My observations and studies have convinced me that to the normal chemical composition of the prostatic fluid the healthy condition of the semen is largely due. On this subject I can do no better than quote the words of Marris Wilson,¹ since they are in entire accord with my own views:

“The mucus secreted by the prostate gland is charged with more or less of the phosphates of lime and soda, and it is secreted and poured out in a situation where

¹ On Diseases of the Vesiculæ Seminales, etc. Philadelphia, 1858, pp. 343 et seq. (This essay is appended to the American translation of Lallemand's Treatise on Spermatorrhœa.)

the peculiar properties of the neutralizing salts are likely to be more available for an immediate use. I cannot, therefore, believe that this secretion is purposeless in reference to fertilization, or that it merely supplies the additional portion of mucus; nor that in that situation the salts are simply the excretion of effete matter. For these reasons, then, it appears to me that the special office it has to perform is that of counteracting the injurious effects likely to arise from the presence of the abnormal acid and alkaline conditions of the secretions of that portion of the mucous membrane appropriated for the reception and conveyance of the seminal fluid. Thus, though not actually taking a primary and direct part in the act of fecundation, it nevertheless serves a secondary office, so important as to make that function depend materially on its presence."

In the chronic subacute prostatitis which follows excessive masturbation and sexual excesses it is not uncommon to find the granular phosphates in superabundant quantity suspended in a rather thick gelatinous mucus. Now, in the semen of many of these cases I have observed that the zoösperms were little frail bodies, having scarcely any activity. The pertinent question, therefore, suggests itself whether this great excess of alkaline admixture has a devitalizing effect on the spermatozoa? Several husbands whom I have known to be thus affected were childless, although they had vigorous and florid wives.

Absence or scantiness of the prostatic secretion in the ejaculate may lead to sterility or *impotentia generandi*, by reason of the non-occurrence of the normal fluidity of the secretion. We have already seen that the dense, lumpy, viscid secretions of the ampullations of the vasa deferentia and of the seminal vesicles are partially lique-

fied by the admixture of the alkaline prostatic secretion, and that then the spermatozoa have nothing to impede their vital activity or to prevent their invasion of the genital canals of the female. When this partial liquefaction does not occur the zoösperms are, so to speak, held prisoners, and they cannot go on their way to the fertilization of the female ovule. I have seen several cases in which men's ejaculate has been a little grayish, lumpy mass, of considerable consistence, about the size of two peas, in which, even when very recently voided, the spermatozoa were thin, puny, and almost lifeless. In these cases some of the men were in bad health, and in others there was chronic prostatic involvement.

Beigel¹ has reported a case in which this variety of semen was present, and in which fecundation occurred as a result of throwing a small amount of warm water into the vagina after coitus. If this measure is to be of benefit in the melting down of the seminal mass, it seems to me that the most rational solvent would be a very dilute, watery solution of phosphate of lime and soda (1 to 100 or 200) slightly warmed. In my cases benefit followed topical treatment of the genital tract.

Pus-admixture.

In acute gonorrhœa of the urethra the seminal fluid is more or less contaminated by pus-admixture, and the spermatozoa are found to be lifeless or capable of very little motion, as I have seen in numerous microscopic examinations. It is very probable that gonorrhœa or its toxins exert a deleterious or even deadly influ-

¹ *Krankheiten des Weiblichen Geschlechts*, etc. Erlangen, 1874, B. ii. p. 791.

ence on these frail bodies. Terrillon¹ has clearly shown that in bilateral gonorrhœal epididymitis the semen is mixed with pus and that spermatozoa are absent. His observations go to show that as long as pus is produced in the epididymis, even in small quantity, its effect is so lethal to spermatozoa that the semen remains infertile. In all probability healthy spermatozoa are killed in the female genitals by pus or its poisons. In some cases failure of impregnation undoubtedly is due to the presence of the thick, viscid plug of mucus or muco-pus in the uterine neck, which, by its density, offers a barrier to the spermatic invasion.

The extent of the influence of acute or chronic gonorrhœal seminal vesiculitis and gonorrhœal inflammation of the deferential ampullations is really not well known, and most of the reported cases of this morbid condition are fragmentary and unsatisfactory. Just after recovery from acute gonorrhœal seminal vesiculitis it is positively known, as I can affirm from observation, that the semen is a thin, turbid, yellowish secretion, more copious than in health, containing few, if any, spermatozoa, and more or less pus. Now, in these cases it is probable that the spermatozoa have been killed by gonococci or toxins. How long this condition lasts we are unable to say, but it is fair to assume that healthy spermatozoa can only live in these secretions when they are normal and free from toxic admixture. In chronic seminal vesiculitis, though the pus may be less in quantity and the toxins less virulent, such is the effect of their presence that the nutritive media of the spermatozoa (the secretions of the ampullations and the seminal vesicles (?)) are so altered that these organisms are either dwarfed or killed outright.

¹ Op. cit., p. 439.

Whether a purulent inflammation of the ejaculatory ducts can so alter the composition of the semen as to render it unfertile we are not able to say, but it is obvious that gonorrhœal pus-admixture is a dangerous factor, even when present in small quantity.

When we reflect upon the foregoing considerations the conviction forces itself on our minds that pus in the deep sexual parts may have much to do in causing temporary or permanent azoöspermatism.

Blood-admixture: Bloody Ejaculations.

The semen may become mixed or streaked with blood, owing to a morbid condition of some part of the sexual tract. It is difficult to determine how far blood-admixture tends to induce or produce azoöspermatism. To settle the question it is necessary to understand the nature of the processes which lead to or cause the escape of the blood, and to ascertain whether this fluid can exert a morbid effect on the zoösperms. Experience and study seem to show quite clearly that a small amount of blood mixed with the semen does not destroy its fecundating property. Large amounts, however, may so dilute this fluid that its germinative faculty is lost, probably through dilution. In tuberculosis of the testis the semen may become thoroughly mixed with blood, and may then resemble red currant jelly (rose semen). Such semen is, as a rule, unfertile, as a result of toxin-action, and the blood-admixture has probably little effect on its integrity.

In acute and chronic gonorrhœal inflammation of the seminal vesicles and deferential ampullations the escape of blood is not uncommon. But in these cases there is an underlying virulent process, which may by its poisons

kill the spermatozoa. Bloody semen in these conditions may have a fresh red color or it may have a decided rusty tint. The intermixture of blood and semen is in these cases usually intimate and well blended. It is very probable, as claimed by Jamin,¹ that a passive congestion of the seminal vesicles (and, I would add, the ampullations) may result, without gonorrhœal infection, from excessive coitus, masturbation, and perhaps even from prolonged continence, and that this congestion may give rise to little hemorrhages and blood-admixture. When this occurs the semen has the rusty color already mentioned. We have no knowledge as to whether such semen is fertile.

In cases of gonorrhœa involving the ejaculatory ducts small hemorrhages in and around these tubes have been found, on post-mortem examination, to have occurred. It is fair, therefore, to assume that in some cases the semen may become streaked with blood in its passage through these canals. In its acute declining stage and in chronic gonorrhœal posterior urethritis, more or less copious hemorrhages may occur in coitus or in pollutions, and as a result the semen is streaked with bright red blood. In like manner in acute or chronic gonorrhœa of the bulb of the urethra hemorrhages sometimes occur in coitus or pollutions, and in some instances they are very copious. I have seen several men in whom the flow of blood was quite severe, and who when in coitus thought it was due to incipient menstruation in the female.

In all probability blood itself is not noxious to the vitality of the spermatozoa, but the gonorrhœal process is distinctly so. In large quantity, however, the blood

¹ *Considerations Pathogeniques sur l'Hémospermie d'Origine non-inflammatoire.* Annales des Mal. des Org. Gén.-urin., 1891, pp. 765 et seq.

may so dilute the seminal fluid that the fecundating power of the zoösperms is lost.

It is very rare that lesions seated in the course of the pendulous urethra cause enough bleeding to tinge the semen *in transitu*.

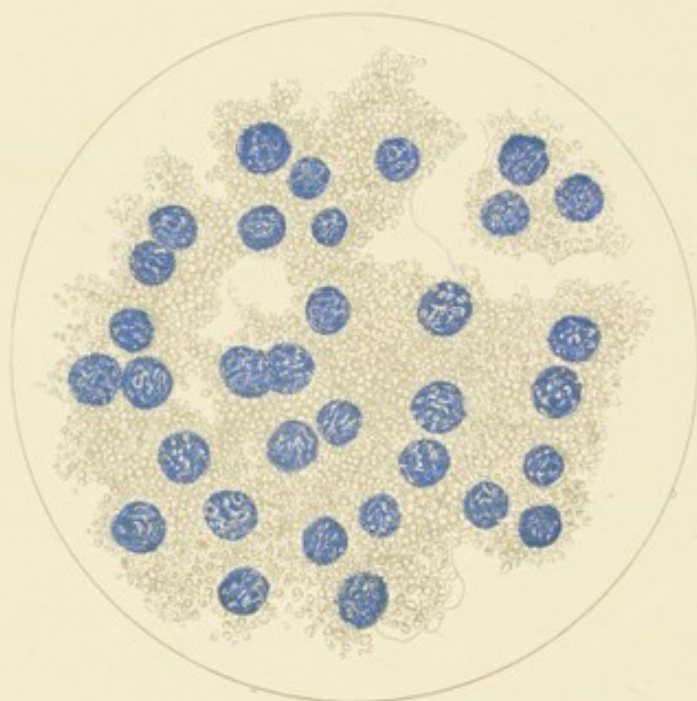
THE INFLUENCE OF GENERAL MORBID CONDITIONS.

In sexual neurasthenia it is not uncommon to find azoöspermatism, which may be due to the general malnutrition of the patient or to the local lesion which is the main cause of the nervous state. In general, in this class of cases there is some form of chronic prostatic affection or disease of the ampullations and of the seminal vesicles which leads to an unfertile condition of the semen.

It is no longer contended that all persons suffering from tuberculosis are azoöspermatous, since spermatozoa have been found in the deep sexual parts of many men who died of phthisis. When the testes or epididymes are invaded by tubercular inflammation the spermatozoa are probably killed by the toxins developed. In several instances I have seen such viscosity and lumpiness of the semen of consumptive men that I have been certain that the puny and sometimes fatty-degenerated spermatozoa were incapable of impregnation. I have seen several instances in which such men have cohabited for long periods with perfectly healthy women who did not become pregnant, although they had taken absolutely no measures to avoid that condition.

In all probability, when phthisis causes azoöspermatism it is by its local lesions in the testes and epididymes,

PLATE II.



Seminal Cells and Granular Phosphates from Azoöspematous Semen.

in the ampullations and seminal vesicles, and in the prostate or by its general adynamic effect, which dwarfs the production of healthy zoösperms and prevents the formation of a mucus of proper nutritive quality and of normal specific gravity. The influence of syphilis on spermatogenesis has already been considered. (See page 155 *et seq.*) It may be added, however, that perhaps in the early stage, when the poison is very active and abundant, it may interfere with the delicate process of zoösperm development. It is not uncommon, however, to see men in whom syphilis is yet active impregnate healthy women, nor is it rare to see recently syphilitic women become pregnant by healthy or syphilitic men.

We have no scientific evidence as to the influence of general infective processes upon the formation of the semen. It is probable that during the activity of the disease, and perhaps for some time afterward, spermatogenesis ceases.

No general statement can be made as to the effect of old age upon the production of semen, since there is so much variation in the sexual activity and capacity of different men. In some instances fertile semen is present in men of sixty-five, seventy-five, and even beyond ninety years. In general, however, a gradual or rapid decline in the productivity of the testes begins at or before the sixtieth year. In some men, however, the spermatogenic function is lost much earlier in life.

Any cause, therefore, which deranges the structure of the testis impairs its function, and as a result spermatozoa may not be produced, and the seminal cells may be present in, or they may be absent from, the semen. In Plate II. azoöspermatous semen from a patient who

suffered from chronic gonorrhœal epididymo-orchitis is depicted in which seminal cells are present.

Watery Semen and. Colloid Semen.

Though special mention is made of these forms of semen, they are in reality only symptomatic of some chronic affection of the ampullations of the seminal vesicles, of the prostate, or of the testes.

Watery semen is usually of a slightly yellowish, turbid color, and consists of a thin mucus in which are suspended living or dead spermatozoa in small quantity, with perhaps some pus-cells and granular phosphates. In some cases it has been observed that watery semen is very copious, since as much as one or two table-spoonfuls, or even two ounces, have been discharged at one ejaculation, a condition which is called polyspermia. In such cases impregnation can scarcely occur, since the spermatozoa cannot obtain a hold on the vaginal mucous membrane, but are carried away in the flood.

Watery semen is the direct result of morbid changes in the ampullations and in the seminal vesicles, which so impair the functions of the muciparous glands that a very diluted secretion is produced instead of the normal viscid and heavy mucus. Following double gonorrhœal epididymitis, watery semen may be ejaculated for varying periods of time.

A colloid condition of the semen is, as a rule, observed in cases in which the prostatic secretion is not thrown into the urethra at the time of emission. It is therefore the direct outcome of chronic morbid processes in the prostate gland. Normally, as we have seen (p. 62), the secretion of the ampullations and the seminal vesicles is viscid and lumpy, as shown in Fig. 16, in which

the round, oval, and irregular, small, large, and very large masses of glairy and glassy mucus are shown. This lumpy condition is rapidly liquefied and broken up when the prostatic fluid is mixed in the prostatic urethra with the secretions from behind—*e. g.*, from the ampullations and the seminal vesicles.

In this colloid condition of the semen the movements of the spermatozoa, even if healthy, are so hindered that they cannot bring about their irruption into the uterine cavity, hence the semen is, by reason of a mechanical cause, unfertile. With the cure of the prostatic infirmity and the re-establishment of the secretory function of that gland the colloid condition of the semen ceases, and it again becomes a fertile fluid. In the semen of persons addicted to the opium-habit spermatozoa are either absent or poorly developed.

Diminished Quantity of Semen.

When the spermatic ejaculate of a man is very small he is said to be suffering from the condition uneuphoni-ously called *oligospermia*. This condition is found in feeble and old men, in consumptives, or persons who have committed sexual excesses, and, exceptionally, in chronic, seminal-vesicular, and deferential disease. In some men, even in those seemingly very healthy, the secretion of semen is normally very small, even to the amount of a few drops; in others the quantity is larger, and so on the scale rises until the normal free ejaculation is present.

PROGNOSIS. In order to give a patient an intelligent and honest forecast as to his sexual future in cases of diseased or imperfect semen, it is absolutely necessary to get a clear and accurate history of his sexual habits,

and to clearly ascertain the morbid condition underlying his infirmity. In cases of sexual excess of any kind the prognosis depends entirely upon the docility and future good conduct of the patient. When urethral, prostatic, seminal-vesicular, and ampullation morbid conditions are the direct causes, the future of the case intimately depends upon the accuracy of the diagnosis and the efficiency of the treatment.

In tuberculosis we cannot hold out bright hopes of sexual restoration; but in neurasthenia, in general debility, and in syphilis it is fair to assume that appropriate treatment, together with good hygiene in its broadest sense, will bring about improvement, and even cure. In all cases in which gonorrhœa is an active factor the outcome depends on the ability of the surgeon to remove the morbid process.

TREATMENT. It is unnecessary here to do other than refer to the therapeutic sections of the chapters on diseases of the testes, on chronic posterior urethritis, prostatitis, and seminal vesiculitis.

CHAPTER XV.

ASPERMATISM.

THE term aspermatism is applied to that condition in which the power of normal coitus exists, but in which the ejaculation of semen does not occur either in that act or during sexual excitement. In such cases the final period of the sexual act is absent. Patients thus afflicted say that the contractions of the perineal muscles which complete ejaculation are absent. The term is further used to embrace cases in which there is a deficiency in the quantity of semen ejaculated, and also those cases in which there is impeded, defective, or imperfect ejaculation.

This condition is much rarer than azoöspERMATISM, and it depends on lesions seated between the deferential ampullations and the seminal vesicles, and the meatus urinarius or the preputial orifice.

The essential cause of aspermatism is the stenosis, or blocking up, or destruction of some part of the sexual tract to such an extent that in the rhythmical movements of ejaculation the seminal fluid is either directed from or dammed back in the course of the urethra. The impediment may occur in the seminal vesicles, the deferential ampullations, the ejaculatory ducts, the prostate gland, the urethral canal, at the meatus urinarius, or the preputial orifice.

Aspermatism may be either permanent and absolute or temporary and relative.

LESIONS OF THE SEMINAL VESICLES AND
DEFERENTIAL AMPULLATIONS.

Aspermatism due to fistulous tracts passing from the seminal vesicles to the rectum or bladder is so rare that such a case would be looked upon as a curiosity. Several such cases are on record in which the fistulæ resulted from bladder or lithotomy operations. In these cases the semen was ejaculated into the rectum. It is possible that sympexia may become lodged in the orifice of the seminal vesicle or in that of the deferential ampullations; in general, however, the plugging up occurs in the ejaculatory ducts.

LESIONS OF THE EJACULATORY DUCTS.

A variety of morbid conditions may occur in and around the ejaculatory ducts which may result in aspermatism. The plugging up of these minute canals by sympexia is of rather rare occurrence. A most striking instance of this accident is presented by Reliquet's¹ case. It was that of a man, aged thirty-five, who in coitus was seized with a severe pain in the deep urethra which radiated to the anus and perineum. Afterward defecation and urination became painful and coitus was so agonizing that it was not indulged in. By rectal examination the left seminal vesicle was found swollen. The man was examined by means of a lithotrite, and after withdrawal the patient experienced severe pain in the penis, which was followed by the discharge from the urethra of a large quantity of sympexia. After this relief the performance of the sexual function was perfect.

It is very probable that in this and in similar cases

¹ Picard: *Traité des Maladies de la Prostate*, Paris, 1877, p. 129.

the great distention of one ejaculatory duct blocks the other one up very effectually, as these canals lie so close together in the prostate.

Cases have been reported in which, on post-mortem examination, the ejaculatory ducts have been found to be plugged by concretions as large as a pea or a cherry, which were composed of carbonate and phosphate of lime, and mucus and spermatozoa. Chronic gonorrhœa has been found to produce a stenosing condition of the ejaculatory ducts, chiefly by its round-cell infiltration of the submucous connective tissue of the verumontanum, which it attacks more severely than other portions of the posterior urethra. Round-cell infiltration around the ducts producing stenosis has been found in the dead subject.

Dense fibrous bands upon and behind the verumontanum have been seen to so compress or distort the ejaculatory ducts that either stenosis has been produced, or a deviation in the course of the ducts or of their orifices has resulted. In the former event the semen was dammed backward; in the latter it was in coitus thrown backward into the bladder.

Arch-like bands of fibrous tissue have been found seated saddle-like across the summit of the verumontanum, and as a consequence one or both ducts were obliterated. Gonorrhœa may cause abscess-formation in some or many of the prostatic tubules, which may result in such scar-tissue development that the ejaculatory ducts are destroyed.

In some cases of chronic gonorrhœa the involvement of the tubules has ended in cystic degeneration, which was produced by sclerosis of the tissues and obliteration of the ducts.

Cases are on record in which traumatism of the pros-

tate and verumontanum, resulting from the passage of, or retention of, sounds and catheters, has been so severe that the ejaculatory ducts have either been compressed or the direction of their orifices has been thrown so much out of place that they have looked backward to the bladder. This retroversion of the orifices may be partial and only cause them to look upward, or it may be complete, in which event the discharge of semen occurs directly backward.

Displacement of the ducts and of the prostate has been known to follow abscesses of and injury of the perineum (from falls, blows, and infectious processes), which caused a dense fibrous cicatricial mass to draw that gland downward and to much distort the ano-perineal and rectal regions.

In tuberculous inflammation of the prostate the ejaculatory ducts may be compressed or destroyed.

In old men these canals may, when the prostate becomes hypertrophied, either be narrowed or entirely stenosed.

Calculi and concretions in the prostate may cause compression or stenosis of the ejaculatory ducts, and aspermatism may result. It is probable that when many prostatic tubules and their ducts are plugged up by lime, salts, mucus, and amyloid bodies, injurious compression may be exerted upon the ducts.

Abscess of the prostate with its (in favorable cases) subsequent cicatricial development and resulting contraction may utterly obliterate these little canals. A very interesting case was reported many years ago by Dugas,¹ which is worthy of a brief summary. A man, aged twenty-six years, was attacked after a long horse-

¹ Thèse de Montpellier. 1832.

back ride with pain and tenesmus in urination and shooting twinges in the rectum. He had fever and was delirious. The prostate was found, upon rectal examination, to be very large and painful, and an abscess was suspected. The operator, with his left index-finger in the rectum, firmly supported the prostate, while with the other hand he introduced a sound into the urethra, the tip of which, on abutting against the abscess, ruptured it and a quantity of pus soon escaped. Two months after this the man complained of an acute pain during ejaculation, and stated that his emission was only half as copious as it was before his sickness. In all probability one of the ejaculatory ducts of this patient was obliterated, for it was noted after healing had taken place that the prostate had lost one-third of its volume.

Diminution in size and distortion of the shape of the organ are generally found after abscess of the prostate.

It is not uncommon for abscess of the prostate to open into the rectum, into which the urine and semen are for long or short periods discharged. In this event temporary or permanent aspermatism may result. This may occur also when the abscess opens into the bladder, the inguinal region, and the sciatic notch.

Perineal fistulæ may result from abscess of the prostate, and in this event if the ejaculatory ducts be not obliterated the emission will probably pass through the false passages and ooze out at the perineum.

Permanent aspermatism may result from injury of the ejaculatory ducts in the operations of lateral or bilateral lithotomy. There are a number of well-reported cases on record, and two have recently been added by Dr. Orville Horwitz.¹

¹ Journal of the American Medical Association, April 8, 1893.

In the rare event of congenital absence or atrophy of the prostate semen cannot reach the urethra, for the reason that there are no ejaculatory ducts to transmit it.

STRICTURE OF THE URETHRA AND URETHRAL CALCULI.

Stricture of the urethra is not uncommonly the cause of aspermatisms, and also of impeded or imperfect ejaculation. It is to be remembered that in normal coitus the semen having been thrown into the bulbous urethra, the intrinsic and extrinsic muscles of this segment of the canal then forcibly contract and throw the ejaculate toward the meatus. (See p. 51.) For the proper performance of this part of ejaculation it is necessary that the integrity of the urethra outside of the triangular ligament should be retained. Whenever, therefore, any considerable contraction of the bulbous urethra is produced (and it is generally caused by gonorrhœa), the ejaculatory act will be lame and halting at this part. Thus it is not uncommon for men having soft strictures, down to 15 or 20 of the French scale, to complain of disability and a sense of some impediment being present at the end of coitus in the bulbar region. In some of these cases the ejaculation is weak and prolonged; in others it is more or less incomplete, and as the penis becomes flaccid the emission slowly dribbles from the meatus.

In the case of a tight stricture at the bulb there may be no emission at all in coitus, but a dribbling discharge may occur some time after the completion of the act. In this event the semen is dammed backward in the membranous urethra and in the anterior portions of the prostatic urethra, and it slowly flows forward after a

short or quite long interval. Men thus afflicted sometimes complain of pain, due to slight spasm of the compressor urethræ muscle and to the abnormal distention of the canal. In other cases a sense of fulness is experienced, and such a check is produced in the rhythmical contractions of the sexual tract that the typical sensation is obtunded or is absent.

In very old and extensive inodular strictures of the bulbo-membranous junction there is no post-coital flow of semen, and this secretion then passes backward into the bladder and is mixed and expelled with the urine, which then has a very milky appearance. When these cases are complicated with one or more perineal fistulæ the semen passes into the tracts and oozes over the ano-perineal region.

Strictures at the peno-scrotal angle and in the anterior urethra cause impediment to the escape of semen in proportion to the smallness of their calibre. When the contraction is very slight little hindrance to ejaculation is offered, but when it reaches the degree of reduction in calibre of 10 or 15 French then imperfect and defective expulsion may be produced, and post-coital dribbling may occur. In these cases, even when the stenosis of the urethra is quite complete, there is no reflux of semen into the bladder, and it, when the parts become relaxed, slowly dribbles from the meatus. In several of these cases the patients have told me that after coitus they experienced a sensation of fulness in the perineum, which was only relieved by compressive manipulation, which caused the semen to gradually escape forward.

In those somewhat rare cases in which the whole anterior urethra is the seat of tight stricture ejaculation is very imperfect and halting, and such subjects are practically aspermatous.

Stricture at the meatus, which is the result usually of chancroids, chancres, gangrene, warts, chemical and instrumental traumatism, and perhaps of gonorrhœa, may lead to the various grades of aspermatism, from slight and feeble discharge to post-coital dribbling, or even to the damming back of the ejaculate. In these cases the urine usually escapes in a fine stream, but in coitus, with its turgescence of the mucous membrane and a secretion of much greater density passing through the stricture, the conditions are so altered that more or less perfect aspermatism results.

Stenosis, or smallness of the preputial orifice, whether congenital or acquired, is not infrequently the cause of varying degrees of aspermatism. Patients having this form of phimosis usually state that in their earlier sexual years ejaculations were satisfactory and, to their mind, unimpeded. As they grow old the stenosed condition usually becomes more pronounced, and with the diminishing calibre of the preputial orifice the various grades of morbid emission, from defective and impeded ejaculation up to complete aspermatism, are produced.

The probable explanation of these cases of stenosis of the meatus urinarius and of the prepuce, which are quite permeable to the escape of urine and which offer an impediment to spermatic emission, is that the urine is a much thinner fluid than the semen, and that in urination the *vis a tergo* is greater than in coitus.

It is well to remember that after coitus, in almost all cases of aspermatism, there is the escape of a few drops of clear mucus from the meatus, which is secreted by the urethral muciparous follicles and crypts and by Cowper's glands.

Preputial calculi may be the cause of organic impotence or of temporary aspermatism.

Calculi are sometimes found in the urethra, where they may increase to such a size that blocking up of the canal is produced. In such cases the impediment to urination may be well marked, but the escape of semen is so much retarded that incomplete or difficult ejaculations, or actual aspermatism, may result. These calculi may be seated in the bulbous urethra at the peno-scrotal angle or in the course of the anterior urethra. Many men suffering from priapism, while capable of intromission, fail in the act of ejaculation. They are, therefore, temporarily at least, aspermatous.

ANOMALOUS CASES OF ASPERMATISM.

Two anomalous cases of aspermatism have been reported by Ultzmann.¹ The first was that of a man, forty years of age, who, though married, had never been able to produce semen. During coitus this man experienced the sensation of ejaculation and felt a kind of satisfaction. His testicles were small, but his genital organs were pronounced by Ultzmann to be perfect. It was proved by examination of the urine that the semen in coitus did not regurgitate into the bladder.

The second case was that of a robust man, aged twenty-four years, who was potent as to coitus, but had never had an ejaculation or a pollution. He had never had any sexual desire, and his genital organs were pronounced to be normal. He remained permanently aspermatous.

Such cases as the foregoing are paradoxes, and the attempt to explain them on the ground of non-excitability of the reflex centre of ejaculation (the existence of which has not been proved) is very unsatisfactory.

¹ *Op. cit.*, pp. 116 et seq.

Cases have been reported, however, in which it is probable that disease or traumatism of the nervous system resulted in aspermatism. Thus the old-time case of the soldier, who, following concussion of the spine, was affected with complete anæsthesia of the external genitals, and aspermatism in coitus or after masturbation, although he had nocturnal pollutions, presents a clear and intelligible clinical picture. Other cases are on record in which anæsthesia of the glans penis was the cause of temporary aspermatism, but they are so lacking in essential details as to possess but little value.

In fibroid stenosis of the corpora cavernosa anæsthesia of the glans sometimes occurs, together with non-turgescence of the parts in sexual excitement and coitus. In such cases ejaculation may be difficult, incomplete, or entirely absent.

In cases of destruction of the distal portion of the penis from chancroids, chancres, gangrene, and phagedæna, such has been the anæsthesia or the insensitiveness of the parts produced that more or less complete aspermatism has followed, although the calibre of the urethra was not materially stenosed.

Mutilating Meatotomy and Damage to the Urethra.

I have seen two cases in which, after extensive and greatly deforming meatotomy, an aspermatous condition was produced which the patients accounted for on the ground of unnatural insensitiveness of the glans penis. In several cases of so-called stricture of large calibre, which were very much overdilated and deeply cut by zealous surgeons, besides suffering from decided curvature of the penis, these patients experienced such queer and annoying sensations (tingling feelings and darting

pains) in the urethra in coitus that partial ejaculation only occurred after very prolonged and tiresome efforts.

Partial Aspermatism.

Some men are temporarily aspermatous in consequence of the inhibitory action of the brain. In these cases men may have satisfactory coitus with some women and cannot complete the act with others. In other instances apathy, loss of affection, fear, disgust, peculiar environments and situations, unattractiveness of or some objectionable condition or habit in the female so affect a man's mind that, although erection occurs, ejaculation is impossible. These cases resemble in some particulars psychical impotence. (See p. 73.) In many of them the semen dribbles away after sexual excitement has subsided.

Debility and Lack of Nerve-force.

Then, again, some men are so weak and so much debilitated or mentally worried, that although erection, partial or complete, occurs, there is not sufficient nerve-force in them to call into vigorous action the intrinsic and extrinsic muscles of the sexual apparatus. This condition has been designated atonic aspermatism, and it is not of necessity of permanent duration. In most cases it has been preceded by a period of full sexual activity.

DIAGNOSIS. In every case of aspermatism it is absolutely necessary to get a full history of the symptoms and antecedents of the case, and then to make a discriminating examination of all the segments of the sexual tract. In all cases a thorough examination of the urine should be made. When the symptoms point to

lesions of the ampullæ and seminal vesicles, exploration of these parts and examination of the urine are necessary. If the trouble is seated in the ejaculatory ducts, the question arises, Has the patient had gonorrhœa, or abscess of the prostate, or is the disability due to plugging up by concretions or calculi? An intelligent and searching inquiry on these subjects will usually elicit important information. Lesions of the prostate being so often the cause of aspermatism, inquiry into the antecedents of the case and rectal examination of that gland are to be made.

In most cases of stricture of the urethra symptoms referable to that condition will coexist with the aspermatism, and then a careful exploration of the urethral canal should be made. These same remarks apply to instances of urethral calculi.

In the cases which in this chapter have been denominated anomalous the most searching inquiry into and exploration of the sexual sphere should be made, in order to find out whether there are any malformations or obscure conditions produced by disease. It is usually very easy to learn concerning nerve-traumatism, and when mutilation or destruction of the penis exists careful examination will reveal its nature and extent.

PROGNOSIS. In general, the prognosis of aspermatism is not encouraging, particularly if due to malformations. When great structural damage has been done (seminal vesicles, ampullæ, ejaculatory ducts, and prostate gland) little hope can be offered to the patient of his reacquiring good sexual ability.

Calculi in the prostate or ejaculatory ducts can be removed by operation. In the milder forms of stricture of the urethra, and even in severe forms, cure of aspermatism can be brought about by the re-establish-

ment of the calibre of the urethra. In the very old cases of inodular stricture at the bulbo-membranous junction, particularly when complicated by perineal fistulæ, it is hazardous to give a favorable prognosis.

When the meatus or the urethra has been permanently damaged by ill-advised surgical procedures surgery offers very little in the way of relief. In some cases of very extensive meatotomy the parts may be restored by proper surgical technique.

TREATMENT. In all the foregoing cases in which serious structural changes are present in the deep sexual tract little of real benefit can be done by surgical means.

Calculi may be removed from the deep urethra, the prostate, and ejaculatory ducts either by the urethral forceps, the lithotrite, or by external urethrotomy.

Stricture of the urethra, if of the soft variety, may be cured by instillations of nitrate of silver and by careful gradual dilatation. Inodular strictures and quite dense annular strictures call for either internal or external urethrotomy.

Cases of aspermatism due to the inhibitory influence of the brain should be carefully inquired into, and when the exciting cause is ascertained, its avoidance or removal will, in all probability, be promptly followed by normal ejaculation.

When severe stenosis of the meatus urinarius is present the resulting aspermatism may be promptly relieved by a properly graduated meatotomy. In like manner, in cases of pinhole-sized preputial orifice, circumcision is followed by very gratifying results.

CHAPTER XVI.

CHRONIC INFLAMMATION OF THE BULBOUS AND PROSTATIC URETHRA, STENOSIS, AND STRICTURES.

So many cases of sexual weakness and impotence are due to structural changes in the deep portions of the urethra that a knowledge of these morbid conditions and of the methods of their scientific treatment is absolutely necessary.

CHRONIC INFLAMMATION OF THE BULBOUS URETHRA.

In the bulbous urethra the gonorrhœal process shows a marked tendency to become chronic, and its persistency causes it to be very rebellious to treatment. In this part of the urethra the vascular supply is so great, the tissues are so succulent and, we may say, relaxed, that every condition favorable to chronic inflammation is there present.

Chronic urethritis of the bulbous urethra may give rise to no secretion visible at the meatus. Then, again, the pus may be so copious and fluid in consistence that it may glue up the meatus in the morning and perhaps during the day, or may escape once a day or oftener as a decided drop. Owing to the fact that the bulbous portion is in direct continuity with the membranous urethra this portion may be the seat of hyperæmia or inflammation in bulbous urethritis.

Chronic urethritis of the bulb runs a markedly pro-

tracted course. For a time there may be no impediment to urination, and the only symptoms may be the slight discharge, or even gonorrhœal threads, in the morning urine, and perhaps uneasy, even burning, sensation in the perineum. In many cases early in the chronic stage there may be no disturbance in the sexual function; but as time goes on, and the calibre of the bulbous urethra becomes lessened, more or less sexual debility may occur. It is well, however, to emphasize the fact that in many cases in which the bulb is much involved no sexual weakness is noted.

At the bulbous portion of the urethra, with the expanded and much thicker spongy body encircling it, the round-cell infiltration into the submucous connective-tissue layer, caused by gonorrhœa, becomes more exuberant than elsewhere. The tissues are here soft and succulent, and the blood-supply is copious. Moreover, there is no firm, fibrous capsule around the bulb; therefore there is not that hindrance to profuse hyperæmia and inflammation that there would be if the parts were quite firmly invested in a capsule of dense tissue. For these reasons the post-gonorrhœal inflammatory process is severe and long-lasting, and its resulting cell-infiltration exuberant and extensive. In the bulb, therefore, the infiltration is at first in the submucous connective tissue, and later on it becomes inextricably mixed with muscular and elastic fibres and vessels, and the condition called soft stricture then results. The morbid condition then consists of round-cell infiltration with a tendency to the development of fibrous tissue. When this fibrous tissue is developed, and when tolerably copious and intermixed with the round-cell infiltration, the resulting contraction is of semi-fibrous structure. Then, as time goes on and the morbid process increases

very decidedly in extent and depth, the newly formed fibrous tissue takes the place of the erectile and vascular tissues, the areolæ are obliterated, and the normal structure of the parts becomes wholly lost and replaced by a uniform sclerotic and atrophic fibrous tissue, white, firm, and homogeneous in structure, which constitutes what is called inodular stricture.

It will thus be seen that in the bulbous portion of the urethra we find varying grades in the extent and the intensity of the same morbid process. The determination of the existence of these morbid stages is to be arrived at by means of urethral examinations with the *bougie à boule* or the olivary bougie.

No precise statements can be made as to the rapidity of growth of the gonorrhœal infiltration into the bulbous urethra.

In some quite exceptional cases the cell-proliferation is quite active, and in about six months the calibre of the canal at this point may be reduced to 15 of the French scale, or even to smaller size. In cases of loss of calibre there may be experienced some inability to normally expel the urine. As a rule, the process grows more slowly, and months, and even years, may elapse before very marked contraction occurs. In many such cases there may be some loss of sexual desire. In general, however, when these patients complain of an impediment in the sexual function, they say that toward the end of ejaculation something seems wrong, and that the act is not performed so promptly and satisfactorily as in earlier days. The reason for this functional impairment is largely a mechanical one. As we have already seen (see page 50), in ejaculation the secretion is thrown from the prostate into the capacious bulb of the urethra, and that then the intrinsic and extrinsic muscles contract

powerfully and send the ejaculate out of the meatus. Now, in chronic urethritis of the bulbous portion the walls of the canal at this part become more and more rigid, and consequently less expansible, and the involuntary muscular fibres, which usually exert a powerful action, lose more or less of their contractile force. Therefore, when the copious ejaculate reaches this segment of the canal the latter can only be moderately, if at all, expanded by the volume of the secretion, and, thus crippled, can only exert a moderate, if indeed any, expulsive force upon it. Thus ejaculation becomes lame and halting just before its completion, and this impediment may cause much disturbance in the mind of the patient.

With the increasing diminution in the calibre of the urethra at this point the difficulty in urination increases, and there is a total loss of extensibility and of contraction of the canal during coitus.

As the soft stricture tissue increases in quantity and density the rigidity and inextensibility of the canal become more marked in the semifibrous and fibrous stages. Then, as the stenosis of the canal increases until an inodular stricture is produced, its calibre becomes so small that urine may escape with difficulty in a small stream or in drops, and the seminal ejaculate in coitus may be so barred that it cannot go forward, and flows back into the bladder. In this event the patient is aspermatous.

In many cases of this chronic, gradually stenosing inflammation of the bulbous urethra, besides the increasing impediment to the sexual act, there seems to be developed some peculiar reflex condition, perhaps in the sexual centre, which results in a greater or less condition of impotence. This form of impotence usually

develops slowly, and in very many cases it disappears more or less promptly when proper treatment is instituted and faithfully followed up.

CHRONIC POSTERIOR URETHRITIS.

Chronic posterior urethritis follows in many cases the subsidence of the acute process. Owing to the complexity of structure of the posterior urethra the symptomatology of this affection is often well marked. When there is simply uncomplicated chronic inflammation of the mucous membrane the symptoms may be negative or very slight in character. But when the prostatic sinuses, the orifices of the ejaculatory ducts, the utriculus masculinus, and the caput gallinaginis are, together or in part, the seat of trouble, we find a varied group of symptoms referable to the sexual apparatus and its function.

In chronic urethritis distinctly limited to the posterior urethra there is usually no escape of pus into the anterior portion, for the reason that it is small in quantity and viscid in consistency. There are, however, border-line cases in the extreme terminal stage of the acute affection in which the pus is still rather copious, and it escapes through the membranous urethra and passes toward the glans. The compressor urethræ muscle does not, as claimed by some authors, usually contract the lumen of the urethra to a hair-sized calibre, and in general it is a moderately patulous canal at this point. There certainly is not, in the majority of cases, such a tonicity of the compressor urethræ muscle as will keep back a quite copious discharge. While in many cases, owing to its small quantity, the pus may be retained in the posterior urethra by the cut-off muscle, in some cases it certainly

is not thus dammed backward. The cases of chronic posterior urethritis in which a discharge reaches the meatus are very rare, but they occur.

In very many cases of posterior urethritis, there being no visible discharge and the patient complaining of no symptoms referable to the deep urethra, the affection remains dormant, latent, and unrecognized. Thus the cases may drag on for one or more, and even five, ten, and fifteen, years without giving any indication of lurking trouble. In some of these cases an exacerbation may occur, and then the patient realizes that he has had an uncured gonorrhœa. In many cases the first disturbing symptom is a greater or less loss of or defect in the sexual function, and examination shows that chronic posterior urethritis has existed perhaps for a long time.

In some instances the exacerbation of the posterior urethritis is subacute in character, attended only with mild or insignificant symptoms, and its presence would not be suspected or sought for had not an attack of epididymitis or epididymo-orchitis developed as a complication. In many cases of this deep-seated urethritis, in which epididymitis or epididymo-orchitis was developed in the initial attack, recrudescences in the testicular trouble are frequently developed at late and remote periods as a result of an exacerbation in the posterior urethra. In these cases sexual debility may result from the urethral trouble, while the recurring inflammation of the testis and epididymis may cause azoöspERMATISM.

In somewhat rare instances chronic posterior urethritis, usually as a result of excesses, becomes developed into a true acute attack with all its symptoms and its discomforts. It may then run its course, but in some cases the inflammatory process extends forward into the anterior urethra, which also becomes the seat of an acute phleg-

masia. In these cases, when the discharge is well established in the anterior urethra, the sufferings of the patient, experienced when the posterior segment alone was affected, cease, and the case then takes on the features of gonorrhœa of the totality of the urethra in its declining stage.

SYMPTOMS. The symptoms of chronic posterior urethritis are many and varied, mild and severe.

This affection was formerly rather vaguely understood, and to it the names neuralgia of the bladder, neuralgia of the neck of the bladder, irritability of the bladder, *cystite du col*, and *contracture du col de la vessie* have been given. In the light of modern study all these names may be dispensed with, and the term "chronic posterior urethritis" may be retained.

Cases of this affection may be, for purposes of study, separated into groups according to the nature and severity of their symptoms.

There are found in practice a goodly number of cases in which a frequent desire to urinate and some uneasiness at the end of the act, and sometimes at its beginning, are the only symptoms complained of. In some of these cases the increased frequency in urination is not much above normal; in others it is well marked. In some cases the pain is slight and dull, or of a quick, stabbing, but very ephemeral character. In others it is dull, heavy, perhaps spasmodic, and radiates into the rectum, pelvis, testes, and groins. In these cases the act of urination may go on smoothly, or it may be interrupted by slight or severe spasm of the compressor urethræ muscle or of the detrusor vesicæ muscles. This condition has been called "cysto-spasmus." It is liable to occur after coitus or difficult defecation. In other cases there is no disturbance of urination at all, but

patients complain of dull or aching pain in the perineum, deep in the pelvis and prostate, and in the rectum. Sometimes these patients complain of pain over the pubes, and of uneasy, vague pains in the cord and testes. In some cases mild and even severe neuralgic pains are complained of in the loins, groins, and thighs. These painful symptoms, particularly when severe, are fortunately not always present. They vary from day to day, so that the patient has intervals of comparative comfort.

Chronic posterior urethritis may exist for many years (five to twenty), and yet the patient may regard himself as free from all gonorrhœal sequelæ. In some of these cases sexual and alcoholic excesses excite exacerbations of the urethritis, which usually yield quite readily to treatment. In other and exceptional cases the first symptom of the existence of the chronic trouble is more or less profuse hæmaturia, which, as a rule, occurs after or toward the end of urination. In some cases the onset of sexual weakness is the first sign of disease in the posterior urethra.

DIAGNOSIS. The diagnosis of chronic posterior urethritis can usually be clearly established by eliciting the history of an earlier acute affection.

In chronic posterior urethritis the amount of morbid secretion is usually very small, hence the two-glass test of the urine, which gives such clear indications in acute posterior urethritis, cannot be relied upon as an infallible guide. If this test is used in the chronic affection, the first part of the morning urine will contain threads, while the second will be clear; but in such an examination it may occur that tissue-elements from the anterior urethra will also be present in the urine. The best plan is to carefully wash out the anterior urethra as far as

the bulb with warm water; then, when the urine is passed, if it contains threads, it is quite certain that they come from the posterior urethra.

In this connection it is well to remember that small, comma-like, fleecy plugs or threads, which are thought to be formed in the excretory ducts of the prostatic glands and voided with the last drops of urine, being pressed out by muscular and prostatic contraction, are quite diagnostic of chronic posterior urethritis. (See Fig. 36.)

FIG. 36.



Showing the microscopical appearance of the secretion of posterior urethritis.

Perhaps the most serious and, for the physician, trying cases of posterior urethritis, even in those in

which no trouble of the prostate can be found on careful examination, are those in which there is some disturbance of the sexual function. Some patients complain of a severe stabbing pain at the moment of or after ejaculation of the semen. Others state that all pleasurable sensations are either absent or lessened in degree in sexual intercourse, and they are thereby much worried. In still other cases the ejaculations occur before intromission or shortly afterward.

In some cases pollutions are frequent, and with their occurrence diminution in the sexual appetite may be felt. Many of these patients become weak, nervous, and apprehensive. Their digestion becomes poor, and they suffer from constipation. Then the passage of a hard fecal plug presses the prostate and expels the accumulated muco-pus, which appears at the meatus, causing the patient to think he is losing semen. In some of these cases some of the secretion of the seminal vesicles is at the same time expelled, and this also to many is convincing proof that they are suffering from spermatorrhœa. Occasionally these patients are much alarmed at the occurrence of bloody pollutions, which are due to great hyperæmia of the ejaculatory ducts. In any of these cases of disturbance of the sexual function we are liable to find more or less deterioration of the health. This may consist simply of weakness and lassitude, and it may be a condition of great nervousness, of melancholia, or even of true neurasthenia. Between these two extremes there are many degrees of bodily and mental debility.

The foregoing symptom-complex may be found in cases in which, as has been stated before, careful examination will show that the prostate is not synchronously the seat of chronic inflammation. But in other cases

true posterior urethritis with chronic prostatitis may exist, and the patient may complain of the symptoms as just now detailed.

PATHOLOGICAL APPEARANCES. The most constant morbid condition seen in chronic bulbous urethritis is a rather deep-red, even purplish, color of the mucous membrane, which is more or less thickened. This redness may involve a segment of the canal or a limited portion on one or two sides. In these cases more or less pus, thin or inspissated, may be seen in the examination. Thickened, red, circumscribed spots or plaques of chronic inflammation are very common. Another appearance quite commonly seen is called by some granular urethritis. The membrane is thickened, red, even purplish in streaks, and rough and studded with small projections, which consist either of epithelial hyperplasia or of little eminences caused by the growth of new capillary vessels. This condition is frequently found in the bulbous urethra and also in the pendulous portion.

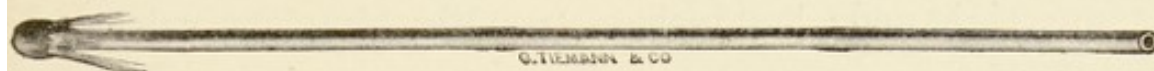
The morbid appearances of the mucous membrane of the posterior urethra are conspicuously striking. They consist of thickening, more or less papillation, together with increased redness. Frequently the caput gallinaginis and the orifices of the prostatic ducts are seen to be swollen. The underlying pathological process is precisely similar to that of the anterior urethra.

TREATMENT. It is better to give here the treatment of chronic posterior urethritis from the period of decline of the gonorrhœal process than to begin with the very late stages of posterior urethritis.

The duration of the urethritis has an important bearing upon its treatment. Let us first consider the cases in which the disease has lasted only a few months. Such

patients may complain only of the morning drop, or they may state that they seem well so long as they use an injection, abstain from coitus, and do not drink beer and alcoholics or eat highly seasoned food. When they cease injecting and indulge in creature comforts and excesses the morning drop reappears, with perhaps a more or less

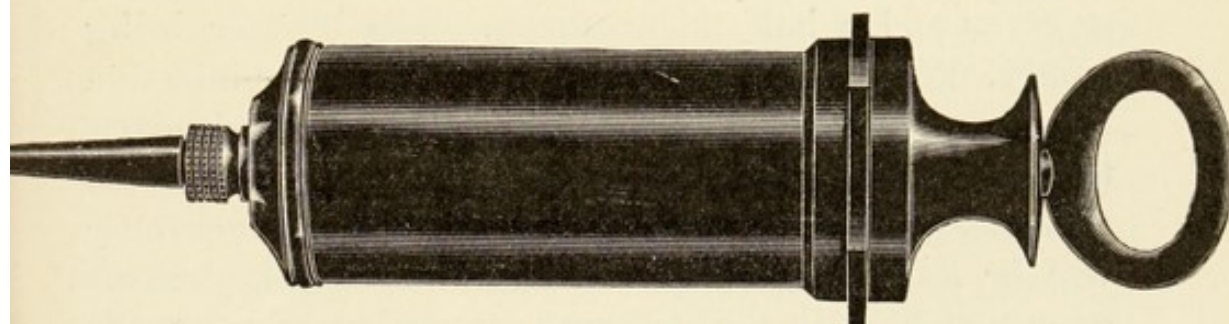
FIG. 37.



Reflux catheter.

profuse discharge during the whole day. Examination of the urethra in these cases shows a catarrhal and exudative condition from the bulb forward, perhaps nearly to the meatus. In many of these cases the posterior urethra is also involved. The morning urine is rather cloudy, like turbid cider, contains much mucus and some long, thin or thick threads (sometimes three or

FIG. 38.



Hand-syringe.

four inches long). There may or may not be a few gonococci present. In these cases the best treatment is irrigation of the posterior and anterior urethra, using at first warm solutions of alum and sulphate of zinc or permanganate of potassium, beginning with a strength of 1 : 500, and increasing according to the result obtained.

The instrument necessary for these instillations of the bulbous urethra are a soft-rubber reflux catheter of a calibre of about 14 to 16 French scale (see Fig. 37) and an Ultzmann hand-syringe. (See Fig. 38.) The end of the catheter should be passed down to the bulb, and then the nozzle of the syringe is inserted and the injection is given. For injecting the prostatic urethra the ordinary soft catheter should be cut off so that it measures eight and a half inches. (See Fig. 39.) This rubber

FIG. 39.



Soft-rubber catheter.

catheter (10 to 15 F.), lubricated with glycerin, is passed down the urethra until the urine flows, which will usually occur when the instrument has got as far as seven or seven and a half inches down. The bladder being empty, pressure on the piston then throws the injection into the prostatic urethra. It is well now to withdraw the catheter a little until its end is in the membranous urethra; then on pressing the piston gently resistance will be felt and no fluid will flow. This tells the surgeon that he is in the membranous urethra, and that the irritation of his procedure has caused the contraction of the compressor urethræ muscle. Then push the catheter inward about half an inch and inject again, when the fluid will readily pass. By this manœuvre the eye of the catheter is placed just at the apex of the prostate and at the very beginning of the prostatic urethra. The injection is then slowly thrown in, and it passes through

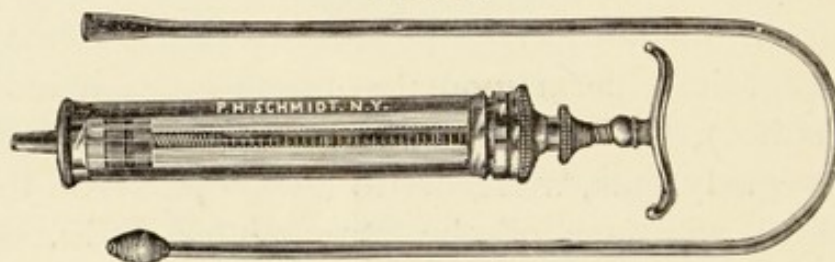
the whole of the prostatic urethra into the bladder. If only a rather small injection is to be given, about one-half of the contents of the syringe may be used posteriorly. Then, while still pressing the piston, the surgeon gently draws out the catheter, and finds that as its eye passes through the membranous urethra the flow stops again, but is at once resumed when the eye reaches the bulbous urethra, which is then irrigated with the remainder of the fluid.

Usually one irrigation several times a week is sufficient, but perhaps one each day may be well borne. The sensations of the patient and the condition of the urine are infallible guides as to the required frequency of treatment. As a general rule, after one or two weeks' treatment these irrigations seem to lose their efficacy, having done some good, but not having produced a cure. Perhaps in these conditions permanganate-of-potassium irrigations (always hot), 1:200 or 1:300, may bring about a cure. If this remedy fails, we resort to nitrate of silver, beginning with solutions of the strength of 1:16,000 or 1:8000, and sometimes even weaker; and this usually results in a cure if the treatment is carefully administered. If the morbid process is more severe in the anterior urethra, the bulbous reflux catheter should be introduced as far as the bulb, and one or two syringefuls of the irrigating fluid should be injected. The posterior urethra should then be similarly treated. Sometimes it is necessary to finish with quite strong, deep injections. In these cases much pain is frequently produced by the passing of sounds, particularly of large ones. This fact should always be borne in mind, since many patients thus treated suffer severely, while in others the disease is so aggravated that it is most difficult to cure. Some of these cases are thus rendered practically incurable

even when the most judicious and prolonged treatment is followed. Too much attention cannot be paid to the fact that in some cases of chronic gonorrhœa sounds may be productive of incalculable harm when used too early.

When the disease is limited to the bulbous portion, where it shows a great tendency to remain indefinitely, the retrojections of alum, sulphate of zinc, and nitrate of silver may be used. These injections will materially modify the morbid process, and sometimes cure it, but they often fail to bring about a thorough cure. In that event it is well to make direct local applications of solutions of nitrate of silver, beginning with a solution of

FIG. 40.

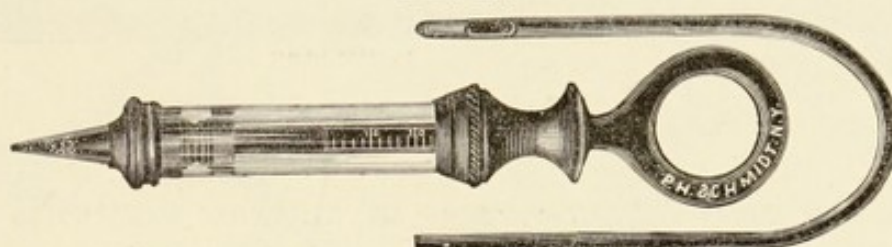


Guyon's syringe.

1:2000, and perhaps going as high as 2:500. Guyon and his followers advocate very strong solutions of this drug, such as 1:30, 20, and 10. My experience has taught me that we get better results and cause less pain by using weaker solutions. For the treatment of chronic gonorrhœa of the bulbous urethra Guyon's syringe is a very useful instrument. It consists of a Pravaz syringe with a screw piston, to which is attached a conical canula, grooved screw-like on its external surface to insure its retention in the expanded proximal end of the *bougie à boule*. The bulbs of the bougie vary in size from 10 to 20 French. By turning the handle of

the piston once around two drops are expelled from the syringe. It is well, before the introduction of the bougie, to turn the handle until it is filled with the liquid and all air is expelled. A less complicated and perfectly effective syringe is the one generally used by me. There is nothing whatever original about this syringe. It is simply a well-made instrument, very easily worked, having a ring and shoulders for the thumb and fingers, and a very conical nozzle, which will fit into a small soft catheter. The piston is marked with numbers to regu-

FIG. 41.

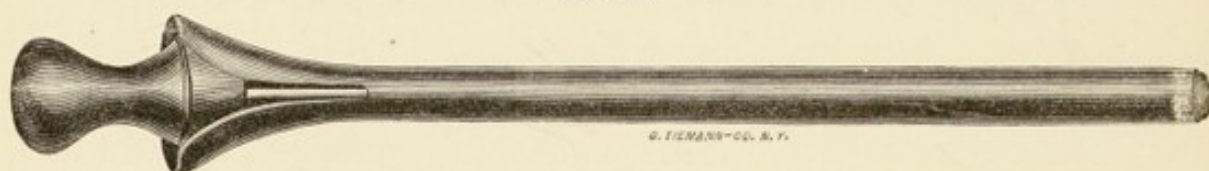


Author's syringe.

late the drops. The injecting medium is any well-made soft-rubber catheter, 10 to 12 or 14 French, cut off to measure eight and a half inches in length. When the catheter is introduced six or six and a half inches its end is in the sinus of the bulb, and the very slight impediment it encounters there shows the operator that he is just at the opening in the triangular ligament. This little catheter, being slowly passed, causes no pain or irritation. Then ten or fifteen drops of the silver-nitrate solution may be thrown into the urethra. This treatment may sometimes be varied by using 1, 2, or 3 per cent. sulphate of copper solution, or 3 to 6 per cent. sulphate of thallin solution. This treatment may be administered by the surgeon every five days or twice a week, and perhaps oftener if the indications of the case point to the necessity of increased frequency. In the inter-

vals the patient may use mild stimulant and astringent injections by means of a penis-syringe. This form of chronic urethritis being very rebellious, it is sometimes necessary to pass an endoscopic tube down to the bulb, and having ascertained the morbid appearances, to sparingly apply on cotton at the end of an applicator or *porte remède* a strong solution of silver nitrate (thirty to sixty grains to one ounce of water).

FIG. 42.



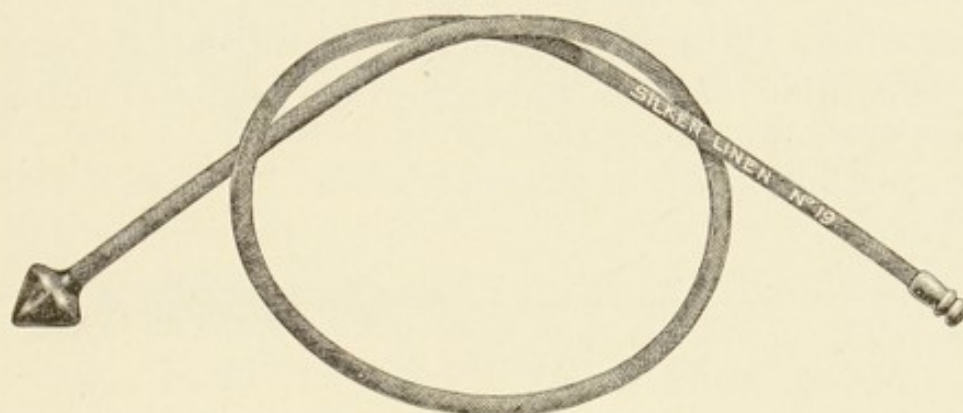
Endoscopic tube.

In the more chronic cases of anterior urethritis we find spots, patches, and areas of inflammation at the peno-scrotal angle (sometimes seemingly caused by the pressure of the suspensory worn during the declining stage) and in the pendulous urethra as far as its beginning.

The first essential in the treatment of these cases is to locate the trouble and to determine its nature. Now, in this part we find subepithelial infiltration, with or without a greater or less epithelial hyperplasia, erosions, and superficial ulcerations, always accompanied with submucous thickenings and follicular inflammation. The thickened mucosa may be granular, villous, or papillomatous. The urine can do little in enlightening us as to the exact nature of the morbid process unless it contains old flabby and fatty epithelial cells, which point to an old ulcer which is in too atonic a condition to heal of itself. In these cases much aid can be obtained as to location by the *bougie à boule*. This instru-

ment consists of a conical or acorn-shaped head with a well-marked sharp but gently rounded shoulder, which is attached to a flexible gum-elastic staff. (See Fig. 43.) For the cases under consideration we may need these *bougies à boule* in size ranging from 18 to 30 French. For strictures we may use the smaller sizes, which begin as small as 8 or 10 French.

FIG. 43.



Bougie à boule.

In the treatment of posterior urethritis with or without anterior urethritis great care is required to determine as nearly as possible the exact condition of affairs. In the more recent cases we sometimes find some evidence of bladder incompetence (the urine showing no involvement of that viscus), which shows itself by the escape of a little (two drachms to one-half ounce or more) residual urine when the eye of the catheter reaches the neck of the bladder. In these rather early cases mild irrigations of the astringents and of permanganate of potassium may be used, and perhaps with benefit. The most uniformly effective agent here also is the nitrate of silver, which may at first be used well diluted, 1:16,000 or 1:8000, in the form of hot irrigations. These may result in cure, but if the result is not

perfect injections of the same drug may be used. For injecting the posterior urethra the Guyon syringe, to my mind, is objectionable, for the reason that its bulbs, particularly when the larger ones are employed, cause more or less spasm of the compressor urethræ muscle, and as a result an uneasy and even painful sensation is left after its withdrawal.

Instillations may be given by means of the little syringe which I have devised to take the place of Ultzmann's syringe. (Fig. 44.) By this minute quantities of fluid may be thrown into the posterior urethra

FIG. 44.



Author's syringe for very strong injections.

with much accuracy. In my opinion, the use of this instrument should be confined to the purpose of applying a few drops of very strong silver-nitrate solution to the posterior urethra and verumontanum. My preference is decidedly in favor, in most cases, of the simple little syringe with the small-calibre soft-rubber catheter already described. When it is necessary to inject the posterior urethra, using the small catheter cut off at eight and a half inches, this tube should be introduced about seven or seven and a half inches, when, in the majority of cases, the eye of the instrument will be just at the beginning of the prostatic urethra. In men with very long urethræ a catheter thus introduced might only reach the membranous urethra, and then pressure on the piston would not be followed by the expulsion of any fluid, owing to the compression exerted on the catheter. In this event it is only necessary to push

the catheter a little farther onward, into the prostatic urethra, where no obstacle will be encountered. By this syringe we can inject ten or twenty drops of a silver-nitrate solution, beginning in the more recent cases with 1:2000 or 1:1000, making an injection once a day, every second day, or at longer intervals, according to the result produced and the patient's sensations. It will rarely be necessary to use stronger solutions than 1: or 2:500. As these cases progress gradual dilatation may afford aid, provided great care and caution are used. If this little operation causes pain, and if the urine shows more pus- or tissue-elements than it did before, it is well to desist and keep on with the injections.

For older and very chronic cases of posterior urethritis the stronger silver-nitrate injections, 1:500 or 250, may be used. In my experience, fifteen drops or more of these solutions produce better effects than a more sparing injection of stronger solutions. These injections should be given every third or fourth day. They may, however, produce benefit in some cases if made more frequently. Daily injections are liable to cause acute suppuration, which means irritation, and that must be avoided.

Posterior urethritis, accompanied by sexual disability, premature ejaculations, pollutions, and absence of erections and loss of sexual desire, usually requires the injection of a few drops of the stronger solutions just mentioned.

Treatment of Stenosis and Strictures of the Bulbous Urethra.

Stenosis and strictures of the bulbous portion of the urethra may be soft, semifibrous, fibrous, and inodular, all of which require appropriate treatment.

Soft and semifibrous strictures should, as a rule, never be incised until milder means have been tried and failed.

The diagnosis having been carefully made, the calibre of the stricture is to be determined. Now, on this point no rule can be laid down, since cases differ so strikingly. Thus in some patients the canal may be reduced to 20 or 15 F., and yet these strictures are of the soft variety. In others, with similar calibres, they may be semifibrous or fibrous. Then, again, it is not very uncommon to find a urethra reduced to even 6 or 8 F. by an exudative hyperplasia, which we call soft stricture. These various and varying conditions have to be ascertained, and as the surgeon grows in experience he will become more and more expert in recognizing them.

GRADUAL DILATATION. When the stricture in the bulbous urethra is yet in the soft, or even in the semifibrous, stage, the aim should be to remove as far as possible the cell-infiltration, and thus, in a manner, to restore the mucous membrane to its natural condition. This can be done in many cases by careful and gradual dilatation.

Seeing that a soft stricture may contract the urethral lumen even as low as 7 or 8 F., and that in many cases where the calibre is 15 or 20 F. the infiltration is yet soft and succulent, it is always well to make the attempt to cure by the introduction of the bougie or sound before the knife is resorted to. When, however, a fibrous or inodular stricture of small calibre is discovered our chief thought is not toward gradual dilatation.

I have in so many instances been able to restore the urethra, even when contracted to 7 or 8, to 30 F., that I am always loath to operate more radically.

In the process of gradual dilatation much care, patience, and good judgment are necessary. The operation

should always be carefully and slowly performed in a manner to cause no pain or uneasiness and no damage to the tissues. By the pressure and stimulation of the distending instrument we hope to cause the absorption of the exudation and to give tone and resiliency to the dilated vessels. It will thus be seen that we are always liable to cause inflammation, and this condition will either delay the cure or perhaps thwart our efforts. In cases where the contraction is as great as 7 or 8 F., and also where the calibre of the stricture is much larger, there may be posterior urethritis or even urethro-cystitis, and these conditions should then receive proper treatment.

FIG. 45.



Flexible olivary bougie.

Beginning with a small olivary bougie (see Fig. 45), the surgeon should gradually and slowly increase the size of the instrument as the progress of the case will indicate to him. In the early part of the treatment the bougie may be introduced once a week, and then in favorable conditions the interval may be fixed at about five days. It is almost always well to allow this interval of time to elapse between the *séances* of treatment. Many men have failed in this method of treating stricture by the too frequent introduction of the instrument, and many patients have not received the benefit they would have had if there had been less haste. In gradual dilatation, particularly in the early stages, the sensations of the patient should be carefully considered and the urine regularly and methodically examined. If the operation causes uneasiness and pain in the perineum and over the pubes and continued frequency in urination, and if the

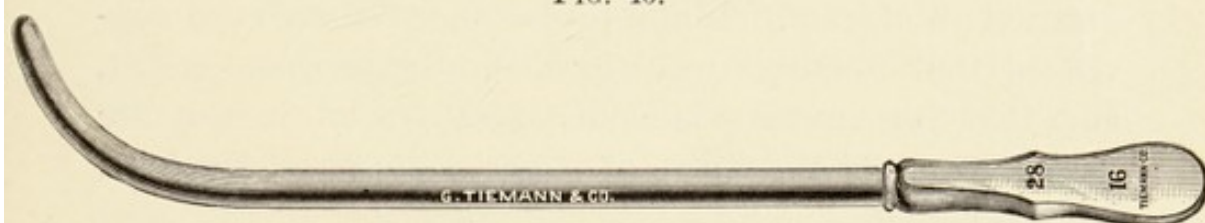
parts resist the gradual increase in the size of the instrument, it will be necessary to suspend the treatment temporarily, and perhaps permanently. In many of these cases local medication to the anterior and posterior urethra will put the parts in such a condition that gradual dilatation may again be resumed.

It will be generally found, when dilatation is commenced, in the form of stricture under consideration, with very small olivary bougies, that at first the sizes may be increased quite regularly, and no trouble, or perhaps very little, is experienced by the surgeon until he gets up as high as 20 or 22 F. Then he will generally find that the dilating process goes on much more slowly, and that it may be necessary to introduce sounds of one size several times before larger ones can be used.

The prompt and usually perceptible effect of the early small bougies has much bearing on the future of the case. Patients watch the progress made step by step, and as they see that they are gaining in urethral calibre, and that they have lost their unpleasant symptoms (urethral or vesical), they become sanguine of an eventual cure, and present themselves regularly for treatment. It is most essential in these cases that the patient should have implicit confidence in the surgeon, and that he should keep his moral courage up in the ordeal through which he is going. Though these patients are neither hurt nor inconvenienced, the irksomeness of having at stated intervals to go to the surgeon is very trying to some. Others, and indeed the majority, appreciating the infirmities and sufferings which strictures almost inevitably lead to, resolve to keep on till they are cured. The main, and indeed the only, valid objections to gradual dilatation are that it is a slow process and

occupies a quite long stretch of time. But it must always be remembered that if it is followed up until the urethra is restored to a calibre of 30 F., in the majority of cases it will only be necessary to have sounds introduced once or twice a year thereafter; whereas it can be said, without fear of contradiction, that when a man's urethra has once been cut he has (if he would keep the channel open) to pass instruments at

FIG. 46.



Conical steel sound.

short intervals all his life. All these considerations should be presented by the surgeon to his patient as the treatment goes on. Men often get careless and even indifferent at the time when they may be said to be about half-cured. In these circumstances the surgeon should use all his influence against faltering and backsliding.

FIG. 47.



Benequé's sound.

When in the course of this treatment the urethra will admit an olivary bougie No. 20 F., it is well to resort to the curved steel sounds (see Fig. 46), and with them finish the cure. In many cases when the coarctation is

extensive and involves the whole length of the bulbous urethra, the Benequé sound will produce particularly good results. (See Fig. 47.) Its double curve seems to exert a beneficial pressure not obtainable by the use of the ordinary curved sound.

The trend of thought as regards the treatment of urethral stricture of late years has been so unswervingly toward cutting operations that many surgeons are wholly unaware of the beneficent and lasting effects of gradual dilatation. I am to-day more than ever convinced that cutting operations should be a last resort, and that intemperate incisions and over-stretching are very frequently the cause of never-ending suffering and inconveniences.

It is impossible to state exactly the period of time necessary for gradual dilatation, since it varies in each case and much depends on the regularity and sedulousness of the patient. In some cases the normal urethral lumen may be restored in three months, and in others in six, nine, and twelve months. As a general rule, a six-months' treatment will be followed by better results than a shorter course.

There is one point which deserves especial emphasis, and it is this: To produce lasting and permanent results by gradual dilatation the urethral canal must be brought up to the calibre of 30 or perhaps 32 F., and when this is attained the dilating process must be continued for some time, until these large sounds pass easily and without any grasping.

Continuous dilatation is very rarely resorted to at the present time. In some cases where a filiform has after a long struggle been passed through the stricture, it may be retained there for some hours, or perhaps for a day, in order to render certain the passage of a larger instrument.

In the majority of cases the process of cure by gradual dilatation is uneventful, but in a small minority certain complications may arise and give more or less trouble. These complications are: 1, fever and chills; 2, urethritis and urethro-cystitis; 3, a tendency to hemorrhage; 4, temporary retention; 5, rheumatism; and 6, pyæmic abscesses. It is well to state in advance that since the beginning of the era of asepsis and antisepsis in surgery these complications occur much less frequently than formerly and they are much less severe.

The occurrence of chills and fever shows that there is a low grade of suppuration in the deep urethra, but it need not cause the permanent discontinuance of dilatation. Such cases should be treated on the lines laid down for chronic anterior and posterior urethritis and urethro-cystitis.

When the sound causes inflammatory reaction its use should be discontinued until appropriate treatment removes the tendency thereto, as it will do in most cases. Exceptionally, however, it happens that the resulting inflammation is so great and so constant that it is necessary to wholly abandon this form of treatment. In many such cases judicious topical urethral medication after a time brings about such a change that the sound may be used again. In some severe and exceptional cases the expediency of external urethrotomy will suggest itself to the mind of the surgeon.

In like manner, the tendency to slight oozing of blood after dilatation can generally be checked by the instillation of a few drops of a solution of nitrate of silver (1:250).

When in the course of gradual dilatation retention of urine occurs once or at intervals it is perfectly certain that one or two causes are at work; these are swelling

of the mucous membrane in and near the stricture and temporary spasm of the compressor urethræ muscle. In such cases there is need of topical urethral medication, and the intervals between the passage of the bougies or sounds should be materially lengthened. When carefully managed this complication can be overcome.

The occurrence of rheumatism and of pyæmic abscesses indicates very clearly that, besides the stricture-process, a decided suppuration of the urethra also exists, which can be cured by the means described in the section on the treatment of chronic anterior and posterior urethritis.

It will be seen, therefore, that in the successful employment of gradual dilatation the surgeon must be thoroughly conversant with all forms of urethral inflammation.

The scope of this volume will not admit of the consideration of the treatment of strictures by internal and external urethrotomy, for full information concerning which the reader may consult my work entitled *The Pathology and Treatment of Venereal Diseases*, Philadelphia, 1895.

CHAPTER XVII.

CHRONIC AFFECTIONS OF THE PROSTATE.

By far the most frequent cause of sexual weakness and impotence is chronic inflammation of the prostate gland. This morbid condition is produced by various causes, the most frequent probably being acute and chronic gonorrhœa, the next in order being masturbation and sexual excesses, while in a less number of cases traumatism, such as damage to the posterior urethra by sounds, lithotrites, dilators, endoscopes, and very caustic injections are the starting-points of the trouble.

It is necessary to clearly understand the far-reaching effects which acute and chronic gonorrhœa often exerts upon the prostate, since such knowledge renders clear the etiology of many cases which might otherwise seem very obscure.

GONORRHŒAL CONGESTION OF THE PROSTATE.

The most common form of inflammation of the prostate in the course of gonorrhœa is congestion of more or less severity. This condition occurs with, and is dependent upon, acute posterior urethritis. In the latter condition the submucous connective tissue is the seat of an acute phlegmasia, and as a result the substance of the prostate becomes hyperæmic. With this further extension of the gonorrhœal process the patient has still other symptoms besides those of posterior urethritis. He complains of a sensation of dull weight and pressure in

the perineum deep in the pelvis, and an uneasy sense of fulness in the rectum or anus. In severe cases rectal tenesmus may add to the patient's discomfort. The vesical tenesmus may be increased, and often in defecation the patient experiences severe pain in the prostate when the fecal mass passes under it. When there is much swelling the stools are small and ribbon-shaped. Rectal examination reveals a swollen organ, broader than normal from side to side, and bulging considerably into the rectum. The finger-tip reveals the fact that the part is hot and decidedly painful, and on its withdrawal vesical and rectal tenesmus frequently ensues. In many cases pollutions are a distressing symptom. The swollen state of the prostate generally causes dysuria, or even such a condition of retention that it is necessary to remove the urine with a catheter.

In the great majority of cases this congestion is temporary. It may last a few days or two or three weeks; usually, however, resolution takes place in about ten days. With the decline of the posterior urethritis the swelling and tenderness usually subside. In some cases the involution of this congested condition of the prostate occurs suddenly and unexpectedly a few days after its onset.

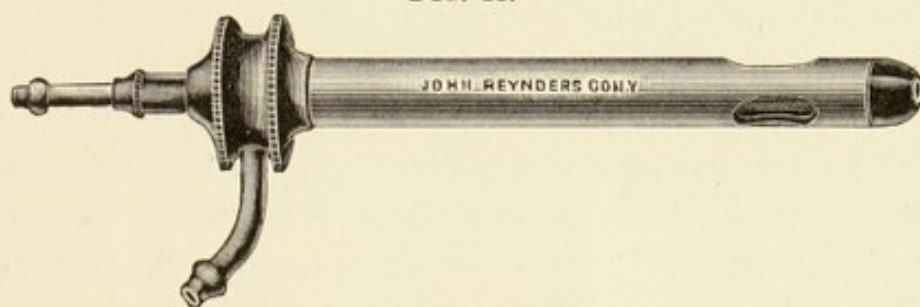
Congestion of the prostate may be due to violence from sounds, catheters, lithotripsy instruments, to the irritation of a stone in the bladder or of a fragment of stone, or of small stones impacted in its mucous membrane, and to stricture. It is not very probable, as claimed by some, that injections used by patients in the anterior urethra cause congestion of the prostate.

Long-continued masturbation is also a frequent cause of chronic congestion of the prostate.

TREATMENT. In the acute stage of congestion of the prostate rest in bed and antiphlogistic treatment are required.

When the congestion becomes chronic the condition may be discovered by the finger-tip in the rectum, which finds the organ swollen and tense. At this time gentle massage may do much good, but it may cause distress, and then it should be stopped. Warm, hot, or cold irrigations of the rectum may be given once or twice a day by means of Dr. R. C. Kemp's prostatic cooler (Fig. 48), and are often of much benefit. This

FIG. 48.



Kemp's double current prostatic and rectal cooler.

useful instrument is made of both hard and soft rubber, so the surgeon may have his choice. In chronic congestion of the prostate mercurial, ichthyol, or iodide of potassium suppositories may be used (*vide infra*). In all cases the condition of the urethra should be ascertained, and if diseased it should be treated.

CHRONIC INFLAMMATION OF THE VERUMONTANUM AND PROSTATIC URETHRA.

This form of chronic prostatitis is not very uncommon, and is found, as a rule, in young men from about eighteen to twenty-five years of age. The underlying causes are either prolonged masturbation or, rather less fre-

quently, chronic posterior urethritis, or both may be factors. Patients thus afflicted may enjoy tolerably good health or they may be anæmic or even neurasthenic. (See section on Chronic Posterior Urethritis, with which this condition is sometimes combined.)

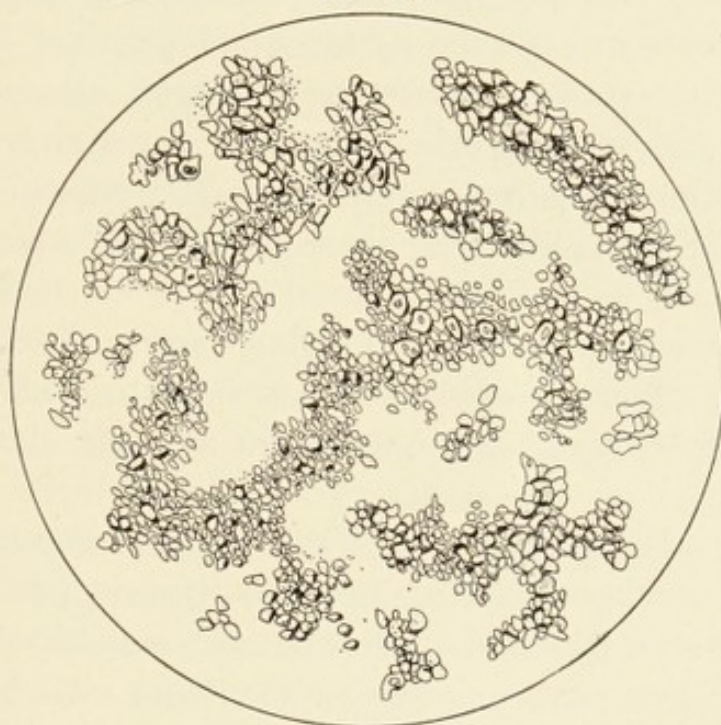
The first symptoms pointing to this prostatic disorder are referable to the sexual system. In those patients who indulge in coitus it is first noticed that they suffer from premature ejaculations. Erections may be firm and desire may be great, but the sexual act is aborted. Then, as time goes on, the erections become less vigorous and the ejaculations are weak and dribbling. Unless relieved such patients become impotent. Besides these symptoms nocturnal pollutions may trouble the patient, who may also observe the escape of mucus from the urethra after urination or defecation. In some cases a sense of weakness and depression follows the supposed loss of semen. All these symptoms may be observed in those whose trouble originated in masturbation.

When the emission or ejaculate is examined under the microscope it is found to consist of mucin and granular phosphates as a rule (see Fig. 49), but in some quite chronic cases puny and dead spermatozoa may be seen in the fluid, together with cuboidal cells, pus, and perhaps oxalate of lime.

When the urine is examined, if posterior urethritis exists, the first few ounces will contain gonorrhœal threads (see p. 211 and Fig. 36), the second specimen will be clear, and in some instances the third specimen will have a decidedly milky appearance, due to the mucus and granular phosphates which have been expressed by the contraction of the prostate. If, however, after the second cylinder has been filled with clear urine and some of the residuum is still left in the bladder, mas-

sage of the prostate will cause a more or less copious flow (one-half to two or three drachms) of a mucus which may be thin and milky or as thick as condensed milk. This secretion may escape from the meatus or it may be voided with the urine. In any event, in this form of prostatitis (and the same is seen in other forms) the dominating component parts will be found to be mucus and granular phosphates. (See Fig. 49.) And it may be

FIG. 49.



Granular phosphates.

here stated that this combination is the one which, with more or less admixture of other crystals and of tissue-elements, will be found throughout the course of the various forms of prostatitis yet to be considered. Sometimes mucus escapes which is not mixed with phosphates, but this is not of frequent occurrence. It is most important, therefore, that the surgeon should become thoroughly familiar with this muco-phosphatic secretion and with the urine

which is so commonly voided by these patients. The urine is usually of low specific gravity (1004 to 1010), of moderately neutral, alkaline, or not very acid reaction. Its color is of a pale-straw tint, and it is usually voided in considerable quantities. Much familiarity with these cases will enable the surgeon (if he were so disposed) to make a diagnosis simply from inspection and microscopic examination of the urine. As has already been said, the dominating feature of the abnormal discharge is the combination of mucus and granular phosphates.

These patients sooner or later complain of frequent urination; in some it occurs at night, in others in the daytime, and in still others both by day and by night. Some patients complain of pain in the passage of the urine as if it scalded, or as if a hot iron were in the canal, and it is not uncommon for these patients to experience a dull pain in the glans penis at the end of urination. Some patients have a sensation as if their urine escaped, but examination of the penis shows that it is dry.

Endoscopic examination of these cases should not, as a rule, be made, since they are usually very painful, and the conditions which they reveal can be determined by other and less severe means. The facts already in our possession, derived from the endoscopic study of the prostatic urethra in these cases, show very clearly that the whole canal is very red and swollen, and this is observed particularly in the verumontanum and the adjacent surfaces.

Examination of these cases with the *bougie à boule* shows the same state of affairs. As the bulb enters the prostatic urethra the already apprehensive patient may experience a severe and even stabbing pain, which causes him to cry out, particularly as it glides over the

verumontanum. In many instances, on the withdrawal of the instrument a little blood will be seen on the bulb or at the meatus.

In some cases, when the steel sound is introduced there may be some impediment at the bulb, due to spasm of the compressor urethræ muscle. This, however, is soon and painlessly overcome, and then the tip of the instrument passes into the prostatic urethra, where it may cause at first as much pain as the bulb does. In some cases a powerful spasm of the prostate may be induced, by which the sound is thrown out of the urethra, or an orgasm may occur, and the same result may be produced. As a rule, the great sensitiveness of the deep urethra disappears under careful treatment, and the introduction of the sound then comes to be a source of comfort.

Now, when these cases are further examined by means of the finger in the rectum much important information may be obtained. Careful palpation of the prostate with the finger-tip experiences no enlargement or perceptible change; indeed, no pain may be produced unless deep pressure be made. If, however, the sound is left in the urethra, and then pressure by the finger-tip in the rectum is made, the patient may experience pain, and even cry out in agony.

Now, by this study of the symptomatology, by the consideration of the antecedents and age of the patient, and by the results of instrumental and urinary examination, we are warranted in drawing the conclusion which has been largely fortified by post-mortem examinations, that such patients are suffering from exudative catarrhal inflammation of the mucous membrane of the prostatic urethra, and that the verumontanum, with its numerous contained mucous tubules and copious nerve

and blood supply, is the focus of that process. This condition, which is now generally vaguely alluded to as spermatorrhœa, to my mind is a distinct morbid entity, and it may exist, I am positive, without any extension or involvement of the environing prostatic substance or of the sexual parts beyond. Finger's studies of post-mortem subjects have clearly proved this condition, which can readily be demonstrated in life if the surgeon has sufficient experience and skill.

This affection, as it becomes very chronic, may lead to catarrhal inflammation of the gland-tubules.

PROGNOSIS. As a rule, these cases are quite promptly benefited by treatment, provided they will conform to the requirements of sexual hygiene. Sexual and alcoholic excesses prove great drawbacks to a cure and materially interfere with the treatment.

In anæmic and neurasthenic subjects this form of prostatitis is sometimes very chronic, and the continuance of local inflammation leads to the intensification of the general low condition. In many cases, however, brilliant results follow a carefully adapted method of treatment.

TREATMENT. The treatment in the man is that advised for posterior urethritis. The health and *morale* of the patient should be improved as much as possible by all hygienic influences. In anæmic and neurasthenic cases iron, quinine, and strychnine are very beneficial, and they may be combined with coca extract, as in the following formula :

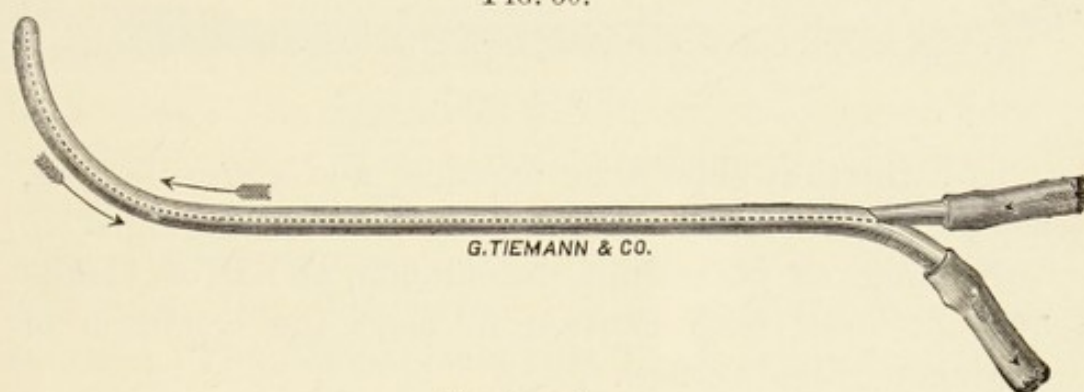
R.—Ferri et quin. cit.	. . . . .	℥iij.
Fl. ext. cocæ	. . . . .	℥ij.
Tr. nucis vom.	. . . . .	gtt. c.c.
Tr. gentianæ co.	. . . . .	℥ss.
Aq.	. . . . .	℥ss.—M.

S.—One teaspoonful in a wineglass of water an hour after each meal.

This combination will be found useful in most cases of sexual disorder in which anæmia or neurasthenia coexists.

But in all these cases the existence of the focal inflammation deleteriously reacts on the sexual centre and the general nervous system, and it is of prime importance to cure that. To this end the careful introduction of a goodly sized (20 to 30 French scale) steel sound (chilled in ice-water) two or three times a week, and its retention in the urethra for three or four minutes, will be very beneficial; or, should the surgeon prefer, he

FIG. 50.



Psychrophor.

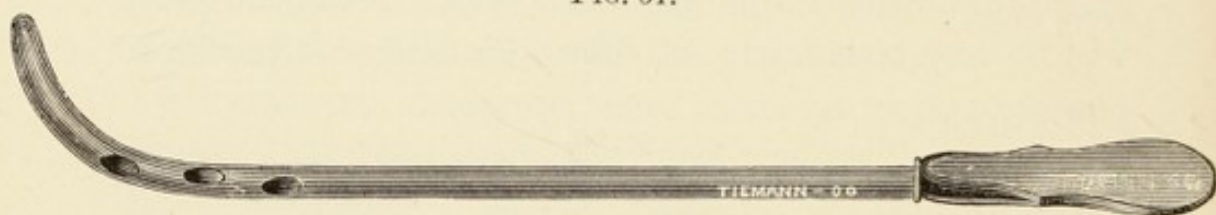
may use the now-nearly-out-of-date psychrophor.¹ (See Fig. 50.)

Instillations and irrigations of nitrate of silver, permanganate of potassium, or of alum and sulphate of zinc, may be used in most cases with much benefit.

¹ "A double-current catheter without eyes, the two canals communicating near the point of the instrument. It is introduced into the urethra until its point has passed the pars prostatica, and it is then attached by rubber tubing to a reservoir containing water of the desired temperature. On turning the stopcock, the water flows into one canal and out through the other. In this way the caput gallinaginis and the entire mucous membrane are exposed to the mechanical action of pressure and the sedative action of cold."

Good results often follow the use of the cupped sound of a calibre of 24 to 30 French scale, which may be introduced once or twice a week. (See Fig. 51.) Into the little depressions on the curved part of the sound small portions of an ointment composed of nitrate of silver and vaseline or simple cerate (5ss-5j to 5j) may be placed, which, when the instrument is in the urethra, will melt and soak into the morbid tissues.

FIG. 51.



Cupped sound.

Constipation should be avoided, and coffee, liquors, asparagus, and spiced dishes should not be indulged in.

Bromide of potassium, belladonna, and hyoscyamus may be used with caution to meet the condition of erethism when it arises.

Prostatic massage is not indicated in these cases.

CHRONIC CATARRHAL INFLAMMATION OF THE PROSTATE.

This condition is not very uncommon, and in order to fully understand it it is necessary to be familiar with the general and minute anatomy of the prostate. (See p. 25.)

In some cases gonorrhœa and in others masturbation is the primary cause. The essential lesions are, first, a round-cell infiltration and hyperæmia in the connective tissue around the gland-tubules; and, second, simple catarrh of the lining membrane of the gland-tubules.

This periglandular inflammation is usually continuous with that of the mucous membrane of the prostatic urethra, but in some cases this latter condition may not coexist, or it may be only an insignificant feature.

Histological investigations have shown that in some cases of inflammation of the prostatic urethra only the ducts of the glands have been involved, consequently the parenchyma of the prostate escaped. It has also been shown that one or more groups of gland-tubules may be attacked in an irregularly scattered manner, either on one side or both, and that symmetrical involvement may not occur in one or in both halves of the prostate. The inflammatory process may invade in an irregular manner several groups of glands on one or both sides of the organ, and there may be scattered here and there groups which remain unaffected. This peculiarity of the prostatic inflammation is due to the anatomical arrangement of the tubules, which, in passing into the depths of the organ, remain separate from one another. Thus it happens that the inflammatory process, when attacking a tubule or a group of tubules, runs down them to their blind ends, and thus limits itself and shows no tendency to invade the peripheral parts. In some cases the whole mass of gland-tubules may be attacked. This knowledge will explain to us why in some cases the whole gland is swollen, why in others its surface feels nodulated and lumpy, and in still others presents the sensation as if many good-sized shot were deeply imbedded in the capsule of the prostate. In the first case the glands of the whole organ are quite uniformly attacked; in the second groups of glands are swollen and cause nodulations and lumps on its external surface; and in the third case individual glands scattered irregularly over the organ are the seat of the

inflammation which by its limited swelling gives the finger the sensation as if shot were seated in the tissues.

Such are the anatomo-pathological facts and the resulting conditions which are revealed to the surgeon in examining cases of chronic catarrh of the prostate.

The pathological conditions here mentioned may lead to various secondary morbid states, which will be brought out later on.

Chronic prostatitis is observed in the period between puberty and middle age, but mostly between twenty and forty-five years. It occurs in all classes, in the poor and in the rich. Though the morbid conditions in the prostate are nearly the same in all cases, the symptoms presented vary very considerably in different cases. This marked variation in the symptoms allows the classification into certain forms of the disease, the description of which will lead to recognition.

Temperament, habits, and age have much to do with the diversity of the symptoms ; but in the chronic course of the disease certain secondary conditions are developed and certain complications may be induced which also give rise to marked symptoms. Thus in many cases the symptom-complex is very striking.

Some patients suffering from chronic prostatitis experience little trouble, and they give themselves scarcely any concern about the matter. Other patients may be troubled more or less in mind, but their health is not seriously affected, while still others become weak and nervous, and even truly neurasthenic. In some cases prostatitis causes no symptoms, or if present they are unrecognized until some failure of the health occurs from dyspepsia, mental worry, grip, or acute adynamic diseases. After catching cold, standing for a long time in the cold, or sitting on cold stones, the symptoms of

chronic prostatitis have first shown themselves. There is clear evidence at hand that chronic prostatitis has lasted many years (five to fifteen) without having caused appreciable symptoms, and its existence was unsuspected by the patient.

Chronic prostatitis runs a long and irregular course, with short or long periods of exacerbation and of remission, in which the symptoms are insignificant, mild, and bearable.

My experience and study have convinced me that the most correct and satisfactory division of chronic prostatitis is, first, that form which is observed in patients between the twentieth and thirtieth years, or thereabouts, and, second, a more advanced form, which is seen mostly in patients beyond the thirtieth year. This division is not at all arbitrary, but is based upon certain quite uniform type-forms.

Catarrhal Prostatitis in Young Subjects.

The symptoms which cause patients of this class to seek relief at the hands of the surgeon may be arranged, for clearness of description, into three categories: first, those of patients who complain of uneasiness in the prostate and perineum and rectum; second, those of patients who, after defecation, urination, and severe muscular exertion, notice a mucous discharge from the penis; and, third, those of patients who complain of some form of sexual weakness.

In some of these cases there is coexistent inflammation of the verumontanum. (See previous section.)

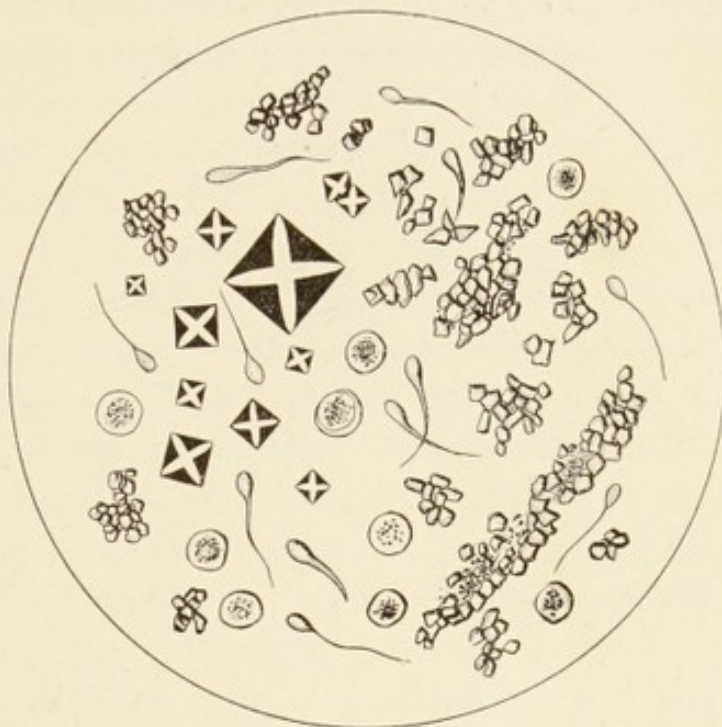
Patients who complain of uneasiness and pain in the prostate are mostly those who have masturbated immoderately, or whose trouble began in specific posterior

urethritis. Very often the symptom is so slight that it causes no annoyance or impairment of health. In some cases the worry and fret lead to anæmia, and in severe cases neurasthenia may be induced. The pain or uneasiness may be continuous or spasmodic, or it may only be felt after defecation, urination, and severe bodily exertion.

Examination of the prostate by means of the fingertip in the rectum shows various conditions, as follows: the whole organ may be a little or much swollen in all directions, or but one-half of it (and usually it is the left one) may be the seat of the congestive infiltration. Moderate or severe pain may be produced by pressure, or such may be the extreme sensitiveness of the gland that the patient will not allow it to be touched. Then, again, one lump or many of them may be felt, in most cases, I think, limited to one lobe, and in a smaller number found irregularly scattered in both lobes. These lumps are more or less painful. And, lastly, there may be found scattered over the whole prostate half-pea-sized or large-shot-sized prominences, of which there may be two or three or even a goodly number seated on one or both lobes. The discovery of these morbid foci clearly warrants the diagnosis of chronic prostatitis. (In some cases the existence of tuberculosis may be suspected.) In any of the foregoing conditions massage of the prostate will cause certain abnormal mucoid secretions to escape from the meatus or to appear in the urine. These secretions are as follows: 1, that of chronic posterior urethritis (see Fig. 36); 2, a clear, viscid mucus; 3, mucus and cylindrical prostatic epithelium (see Fig. 17); 4, mucus (thin or thick and viscid) and granular phosphates (this is the secretion most commonly found); 5, mucus, granular phosphates,

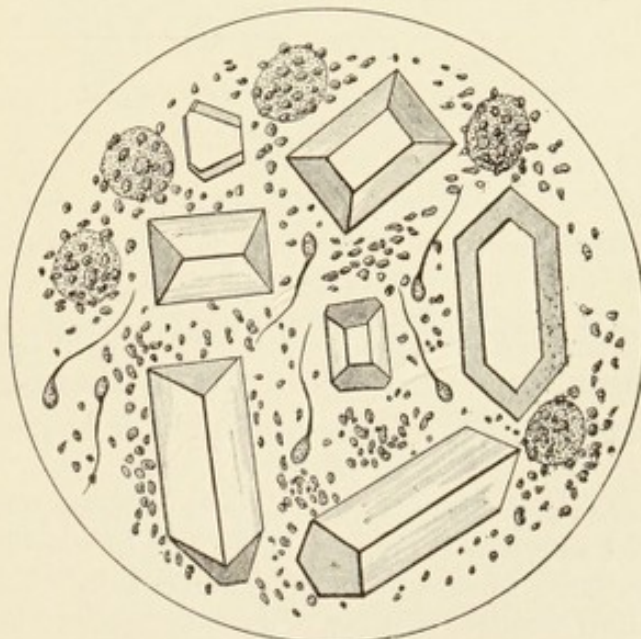
and cylindrical epithelium (these are usually found in very recent cases) ; 6, mucus, granular phosphates, dead

FIG. 52.



Granular phosphates, oxalate of lime, spermatozoa, and pus-cells.

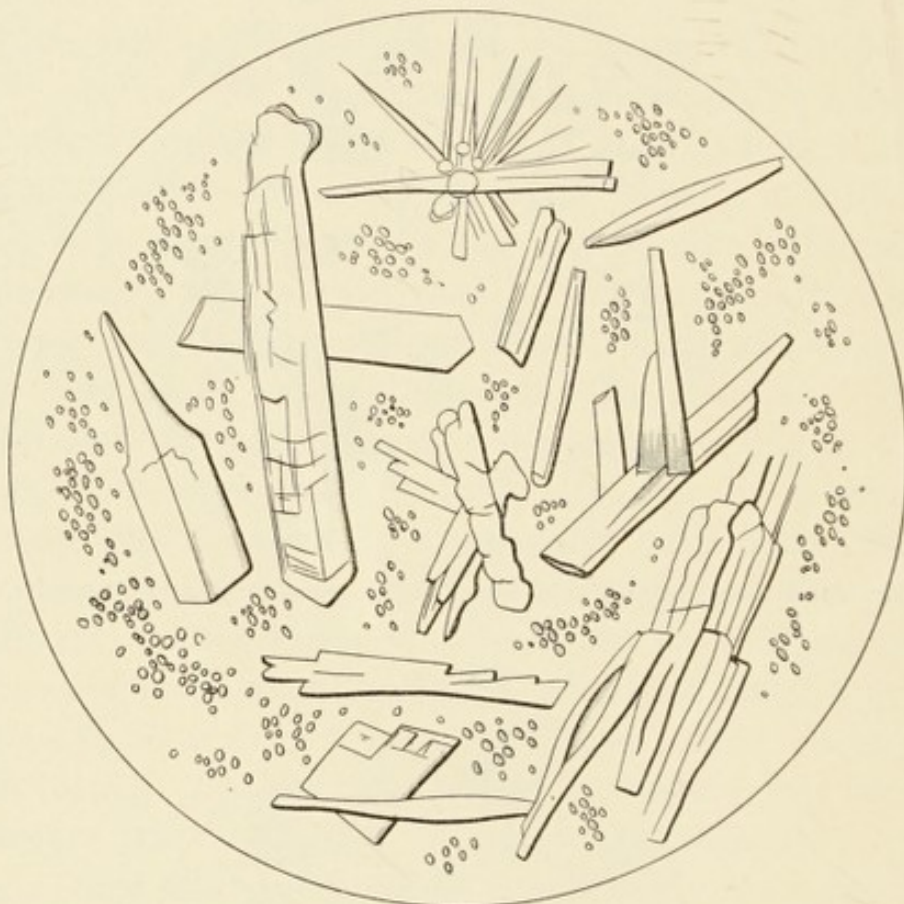
FIG. 53.



Triple phosphates, granular phosphates, and spermatozoa.

and puny spermatozoa, and oxalate of lime (see Fig. 52); and, 7, mucus, granular phosphates with either triple phosphates (see Fig. 53) or crystalline phosphate of lime (see Fig. 54). In any of these secretions there may be at some time spermatozoa and pus present.

FIG. 54.



Crystals of phosphate of lime and granular phosphates.

The essential secretion of all chronic catarrhal prostatic inflammation is mucus in which there is a greater or less admixture of granular phosphates.¹ (See Fig. 49.)

¹ In many cases the quantity of these salts in the urine, the ejaculate, or in the expressed secretion is not very large; but in some it is surprising to see the very large amount of these granular salts which have been voided in the third specimen of urine, or have been pressed out by prostatic massage. In one instance, after urination into two cylinders, in neither of

This secretion in excess attests the activity of the cylindrical epithelial cells lining the tubules, whose function in health is to secrete a thin milky fluid, together with the granular phosphates, which constitute the true prostatic fluid which plays such an important *rôle* in the production of pure, fertile semen. (See p. 179.) In disease this normal process becomes exaggerated, and as a result we see when examining cases of catarrhal prostatitis the clear viscid mucus, the milky secretion, and that which looks as it escapes from the meatus like a wormy mass of condensed milk. When the prostatic inflammation becomes still more chronic we find the other admixtures which have just been enumerated. It may here be mentioned and emphasized that in most cases of chronic catarrhal prostatitis in young subjects the ejaculation in masturbation is composed mostly of the above-mentioned abnormal prostatic secretion, with or without the other salts or spermatozoa. Further, it is well to bear in mind that the so-called nocturnal pollu-

which any granular phosphates were present, the balance of clear urine was drawn off by means of a small soft-rubber catheter, and four ounces of sterile water were thrown into the bladder. Then, the prostate having been well massaged, the patient expelled the injected water, together with the expressed mucus. After settling, this liquid showed a thick layer of granular phosphates, and when the whole were thrown upon a filter, and the salts were dried and collected, it was found that they weighed one hundred and fifteen grains. These facts, which can be verified by anyone who will carefully examine his cases, very clearly show that very many cases which are now classed under the title phosphaturia, and in which it is supposed that some disturbance of the nervous system causes the excess of phosphates, are really instances of chronic catarrhal prostatitis. These observations also very clearly show that those authors who consider many sexual disorders to be sensory and motor neuroses, due to some undefined nervous condition in which phosphates are found in excess in the urine, have confounded cause with effect. The truth is, the diseased prostate produces the phosphatic excess, and, acting on a central focus of irritation, it, in all probability, reacts locally on the cord, and through it upon the whole nervous system.

tions in these cases, the defecation and urination ejaculate, and the secretion which escapes from the urethra after hard work, are all wholly or nearly composed of mucus and granular phosphates. In some cases, owing to causes to be mentioned a little later, some spermatozoa may be found in the ejaculate. With this statement of facts held well in mind (which I have verified in clinical observations and by microscopic studies scores of times), the vague conception of that old-time bugbear of medicine—namely, spermatorrhœa—really becomes an enlightened subject.

In some of these cases there is increased frequency of urination during the day, and perhaps during the night, and there may be more or less uneasiness or pain at the end of the act. In some cases at the end of urination there is marked tenesmus, which may radiate to the pelvis, rectum, and anus, and cause much distress of mind and suffering. These patients, besides uttering their complaints as to prostatic pain and soreness, often become much worried and nervous about their pollutions, which they think will render them permanently weak. Many of them sooner or later present evidences of declining sexual power.

Unless cured by proper treatment these patients continue in an unsatisfactory state for months and years. Some may appear ruddy and healthy, even though they suffer somewhat, and worry; others become decidedly nervous and anæmic, while not a few really become neurasthenic.

In proportion as the mental and physical reaction is severe, so is the case unpromising as to ultimate relief. In general, with the improvement in the urethral and prostatic trouble which proper treatment brings about, the mental and physical condition improves.

Many young men suffering from chronic catarrhal prostatitis make no complaint of symptoms which point to the prostate as the source of their trouble, but lay much stress upon their so-called loss of semen after defecation and urination and bodily exercise, and by nocturnal pollutions. In these patients, as a rule, we find by rectal examination all the tangible conditions of the prostate already mentioned, and microscopic examination of their urine, of their ejaculates, or of the expressed secretion of the prostate will reveal the appearances detailed in the preceding pages. This class of patients usually become very nervous and excited, and from anæmia rapidly pass into a neurasthenic condition, and complain of an infinitude of morbid symptoms. They become sexually weak, while at the same time they are abnormally sexually excited, and the result is sometimes very depressing and discouraging. In many instances great harm results to these patients by their persistence in masturbation, futile attempts at coitus, and dalliance with women. The result in many cases is physical and mental exhaustion.

A certain number of patients suffering from this form of prostatic disorder seek relief for their sexual weakness, which is the dominating symptom in their minds. In some cases erections are normal, but coitus after prolonged effort does not result in ejaculation. In other cases the act is performed in a weakly and unsatisfactory manner, and ejaculation is not attended with much, if any, sensation, and it collapses in feeble dribbling. Then, again, some patients complain of moderate erections and premature ejaculations, while in some erections no longer occur. In many of the cases thus summarized there is escape of morbid mucus either in

nightly pollutions or after urination or defecation. Many of these patients are weak or anæmic, the majority of them are mentally much worried, and some of them are decidedly neurasthenic. Unless relieved by proper treatment, these patients go from bad to worse. The essential point to be remembered in all of them is the necessity of the cure of the focus of the trouble in the prostate.

As catarrhal prostatitis becomes chronic in some cases the morbid process creeps up the ejaculatory ducts and involves the mucous membrane and that of the ampullæ and of the seminal vesicles. The direct result of this extension is a more or less severe catarrhal condition of these parts. But the most striking effect produced is a condition of flabbiness of the outlet ducts of the ampullæ and of the seminal vesicles and the development of more or less patulousness in the not very strong muscular fibres of the ejaculatory ducts. The process which really takes place in all these parts which normally safeguard the retention of the semen and prevent its escape, is one of weakness and of incompetence, which allows the secretion to escape under various mechanical conditions (abdominal pressure, defecation, particularly with firm fecal bolus, and urination). When, therefore, chronic prostatitis is present with this, as we may term it, seminal incontinence, the abnormal ejaculate is composed of prostatic mucus and some of the secretion of the ampullæ and seminal vesicles. As a rule, the amount of this fluid lost at any time by these patients is very small. The loss of this secretion *per se* is not the cause of the deterioration of the health of the patient, as is so generally believed. The real morbid factors are the local lesions and the resulting mental unbalance and general depression of the economy.

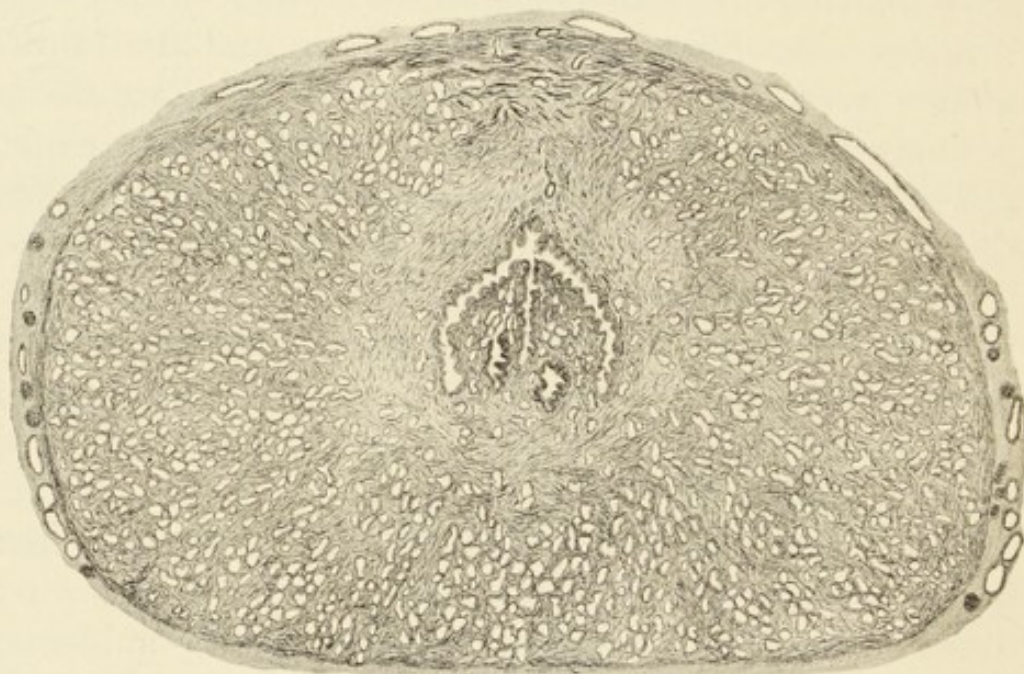
Catarrhal Prostatitis in Older Subjects.

There is no uniformity in the clinical history of the cases of chronic prostatitis in patients beyond the thirtieth year. In some cases the symptoms are few and not well marked; in others they are more pronounced, while in a few so striking is the symptom-complex that prostatic inflammation at once suggests itself to the mind of the surgeon. In these older patients we do not have to listen to so much persistence in the recital of their troubles concerning sexual discharges and the multifarious symptoms of sexual neurasthenia as we do in younger subjects. Older patients may become anæmic, and even more or less neurasthenic, but they rarely reach the deplorable condition so often seen in young subjects. The older patients, as a rule, have started in sexual life with their organs in a healthy condition, and disease has set in later. In the younger subjects the integrity of their sexual organs was much impaired and damaged before and at puberty.

Examination of the prostate by means of the finger in the rectum of these older patients gives somewhat different results from those found in young subjects. The whole prostate may be symmetrically enlarged to as much as double its normal size; only one-half of it may be more or less enlarged, or we may only find one or more well-defined large or small lumps, which, in exceptional cases, may have a soft structure. But in these cases, as a rule, there is evidence of firm structure, even approaching true hardness, and the finger-tip gives the surgeon the impression that marked cell-proliferation must have occurred in the organ. This clinical fact is clearly explained by the results of histological studies, which have shown that with the chronicity of the in-

flammatory process new connective tissue has been developed around the tubules to such an extent as to produce a semi-sclerotic condition of the gland. For a long time this new cell-growth causes the decided increase in the size of the gland which has been mentioned, but later on a cirrhotic condition sets in, by which the size of the gland is materially decreased, even to the point of atrophy. (See Fig. 55.)

FIG. 55.



Showing prostate of a man in which senile changes are beginning to develop. This section was made through the posterior portion of the prostate. Here the ducts run forward, and they therefore appear in cross-section in the drawing. The lobulation apparent in the prostate of the young subject (see Fig. 4) is no longer distinct, owing to the development of fibrous and muscular tissue. Voluntary muscle-fibres are prominently developed on the superior surface of the organ. In the verumontanum the left ejaculatory duct is seen opening centrally into the prostatic sinus. The right ejaculatory duct shows as yet no communication with the prostatic sinus, but opens at a point further forward. (Drawn from the Erdinger projection apparatus.)

It is sometimes observed that when one lobe of the prostate is attacked there is pain in the corresponding

side of the rectum. This condition is also found in some cases of unilateral seminal vesiculitis. In still other cases we find an enlarged, somewhat eburnated organ, which is the seat of firm, half-pea-sized nodulations.

With the continuance of the chronic catarrhal process the lumen of the tubes in many cases becomes more or less plugged up by phosphatic concretions, by desiccated masses of old, cast-off epithelial cells, and by amyloid bodies. Some of these abnormal products may be sometimes observed in younger patients.

Catarrhal prostatitis in older subjects not infrequently gives rise to very poorly marked symptoms. Some patients complain of uneasiness, as they term it, at the neck of the bladder, and others speak of more or less deep pelvic pain, which they think is in some manner connected with the rectum. In some cases the pain is felt on standing up, in others after muscular exertion, bicycle exercise, and horseback-riding, while in still others it is felt when in certain positions on sitting down, particularly on the edge of a chair. In some cases the uneasiness is also felt in the perineum and anus, and in other cases on one side of the body corresponding to the side of the prostate involved. In some cases pain in one hip-joint is complained of. In many of these cases there is frequency of urination, and in some there is pain in the glans penis at the end of the act. Most patients thus affected have some form of sexual weakness, which is either mild or pronounced, and some have abnormal mucoid discharges.

The uneasiness and pain in the prostate may be more or less continuous, or mildly paroxysmal, or it may be rendered worse when the bladder is much distended and when constipation or diarrhoea is present, in which instances there may be decided tenesmus.

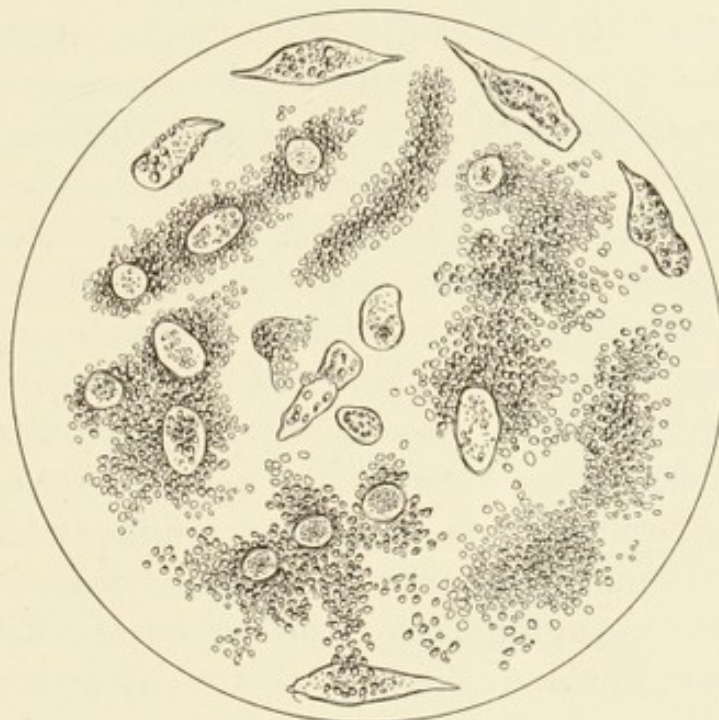
Some of these patients speak of a vague feeling of numbness deep in the pelvis and in the prostate, and this feeling may also exist in the perineum. In these cases there may not be much disturbance of the health, though some patients become anæmic and worried.

In marked contrast with the foregoing mild order of cases are those in which the symptoms are numerous, severe, and complex. In these cases there is more or less ill health, and in some neurasthenia. Such patients first complain of vague and sometimes fugitive pains in the back, loins, and pelvis. Inquiry then will usually bring out the statement that there is increased frequency of urination, and perhaps pain in the prostate and the glans at the end of the act, and that their sexual capacity is rather weak. Sometimes it will be found that one lobe of the prostate has been involved, and that the pain in the glans penis is referred by the patient to the corresponding side of the prostate gland. There may be present either sexual apathy or erethism. These patients sometimes notice the escape of morbid mucus, which may be thin and milky, or clear and very viscid (like liquid glue), or it may look like condensed milk or very thick glue. (See Fig. 56.) When in these conditions the ampullations and the seminal vesicles are also involved, some of their secretion may escape and become mixed with the prostatic mucus, in which event the secretion is usually of a yellowish-brown color. It will generally be found, in these older patients, that when the secretion comes from the prostate it is white or slightly turbid, like liquid glue, or grumous, but that when it comes from the ampullations it is of a yellowish-brown or, exceptionally, of a dark-brown tint. The diagnostic indications which are observed by inspection of the color of the morbid mucus from the deep seminal

parts can readily be verified by microscopic examination.

The urine of these patients is usually of rather low specific gravity (1008 to 1013), of pale color, of feeble acidity, or perhaps it may be quite constantly alkaline. It is, as a rule, rather opaque and sometimes of decidedly

FIG. 56



Secretion of chronic prostatitis, showing granular phosphates, degenerated cylindrical epithelial cells, and pus.

milky hue, and upon its surface very frequently an iridescent pellicle forms. The phosphatic salts, being in great excess, sometimes appear like a sheen of little whitish glistening particles. On standing in the cylinder or urine-glass the sediment first collects throughout the specimen in little cloudy tufts, somewhat resembling water which is slowly freezing. Then, in a short time, the sediment sinks to the bottom of the glass and forms a tolerably thick mass, which has a flocculent, grayish-

white appearance, very different from that presented by pus.

In some of these cases of chronic prostatitis in older subjects (and it is sometimes seen in younger patients) a peculiar form of emission or ejaculate is observed which needs description. Such patients more or less frequently see, after urination or defecation or hard work, a thick ropy, whitish mass escape from the urethra which looks like plaster-of-Paris mixed with water. In some cases the escape of this stuff is unattended with any unpleasant symptom, but in others there is a sensation of sickness at the stomach and great weakness during and for a time after its passage. In some cases there is a scalding sensation in the whole course of the urethra, beginning at the prostate, and such may be the patient's suffering that he becomes pallid, is thrown into a cold sweat, and he may be on the point of fainting. This discharge may occur at short or quite long intervals, and the fear of its occurrence creates in the minds of some patients great apprehension and fear.

Microscopic examination of these abnormal discharges shows that they are composed of mucus and granular phosphates, together with (in some instances) triple phosphates and crystalline phosphate of lime. (See Figs. 52, 53, and 54.) There may also be other components, such as pus-cells, prostatic epithelium (see Fig. 56), and some spermatozoa. Many of these patients think that they are suffering from a particularly severe form of spermatorrhœa, and they may become much depressed in mind and even mildly neurasthetic.

In some cases of chronic prostatitis in older subjects there is at one time hyperæsthesia of the prostatic urethra, in which event there may be much sexual erethism, some frequency of urination, and more or less pain in the

whole act. Ejaculation may be somewhat premature, but it is usually attended with unpleasant, even painful, sensations, which may soon cease or which may last for hours or for a day or two. In some of these cases of erethism the penis is often in a semi-erect condition, and prostatic mucus flows from the urethra at times.

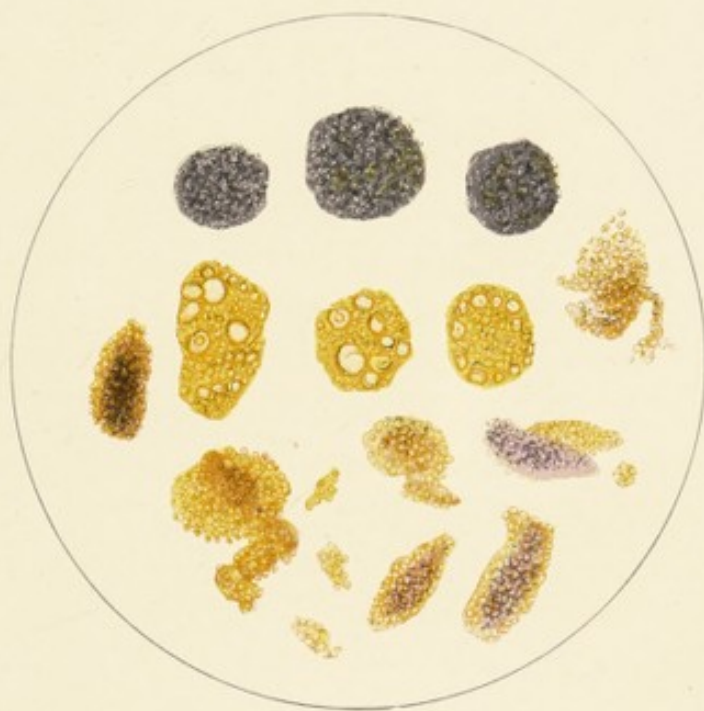
The course of this hypersensitiveness of the prostate and prostatic urethra, when uninfluenced by treatment, is much prolonged, and it may be uneventful or be attended by marked exacerbations. As time elapses the erethism gradually ceases and in some cases it is followed by very decided anæsthesia in the parts, which may extend throughout the course of the urethra, and in a mild form involve the bladder. There may also be partial insensitiveness of the testes, scrotum, perineum, and upper portions of the thighs. In some rather rare cases of prostatitis with involvement of the ampullæ and of the seminal vesicles I have seen this queer association of these numb sensations. In this condition there may be interference with the function of urination and with coitus. Such patients state that sometimes they are not aware of the fact that the bladder is full, and when they attempt its evacuation, though the stream may be full in size, it is feeble and more or less halting. Then, again, erections may be normal, but ejaculation is feeble, and the sexual act may suddenly collapse.

By massage of the prostate thus affected we cause the escape of several forms of mucus which present somewhat different features from one another. This expressed secretion may consist of mucus or mucus and glandular phosphates, perhaps combined with triple phosphates and phosphate of lime, or it may contain degenerated prostatic epithelium, pus, spermatozoa, phosphatic con-

cretions, amyloid bodies, and cylindrical casts of the prostatic tube-glands.

In these older cases it is very common to see (as we sometimes do in the secretion of younger subjects) the granular phosphates arranged in the shape of regular cylinders, which are straight or more or less curved. (See Figs. 49 and 56.) These cylinders are formed in the tubules by the functional overactivity of the prostatic epithelial cells. Phosphate of lime is formed in excess at the same time that a thick, gluey mucus is proliferated. These two component parts, remaining for a time in the tubules, become amalgamated, and the muco-phosphatic cylinders are the result. These granular phosphates also give rise in the prostate to certain little oval or round bodies, to which the term prostatic concretions should, I think, be applied. They are small masses, composed of the same structures as the cylinders—namely, mucus and granular phosphates. They are variously colored; some are yellow (and may be mistaken for urates, but chemical analysis will prove their true nature), or they may be moderately red or of a deep purple tint. (See Plate III.) These little bodies remain in an indolent manner in the tubules (and undoubtedly cause pain and uneasiness), and they may excite more or less hemorrhage, in which event they become colored to a greater or less extent. These phosphatic concretions may become the nuclei of calculi. In some specimens of urine and of expressed prostatic secretion we find very firm threads, which are of a yellowish, a brown, or purple color, which on examination are found to consist of granular phosphates, mucus, and altered blood-cells. These threads are undoubtedly the initial forms of the little colored phosphatic concretions.

PLATE III.



Concretions of Chronic Prostatitis.

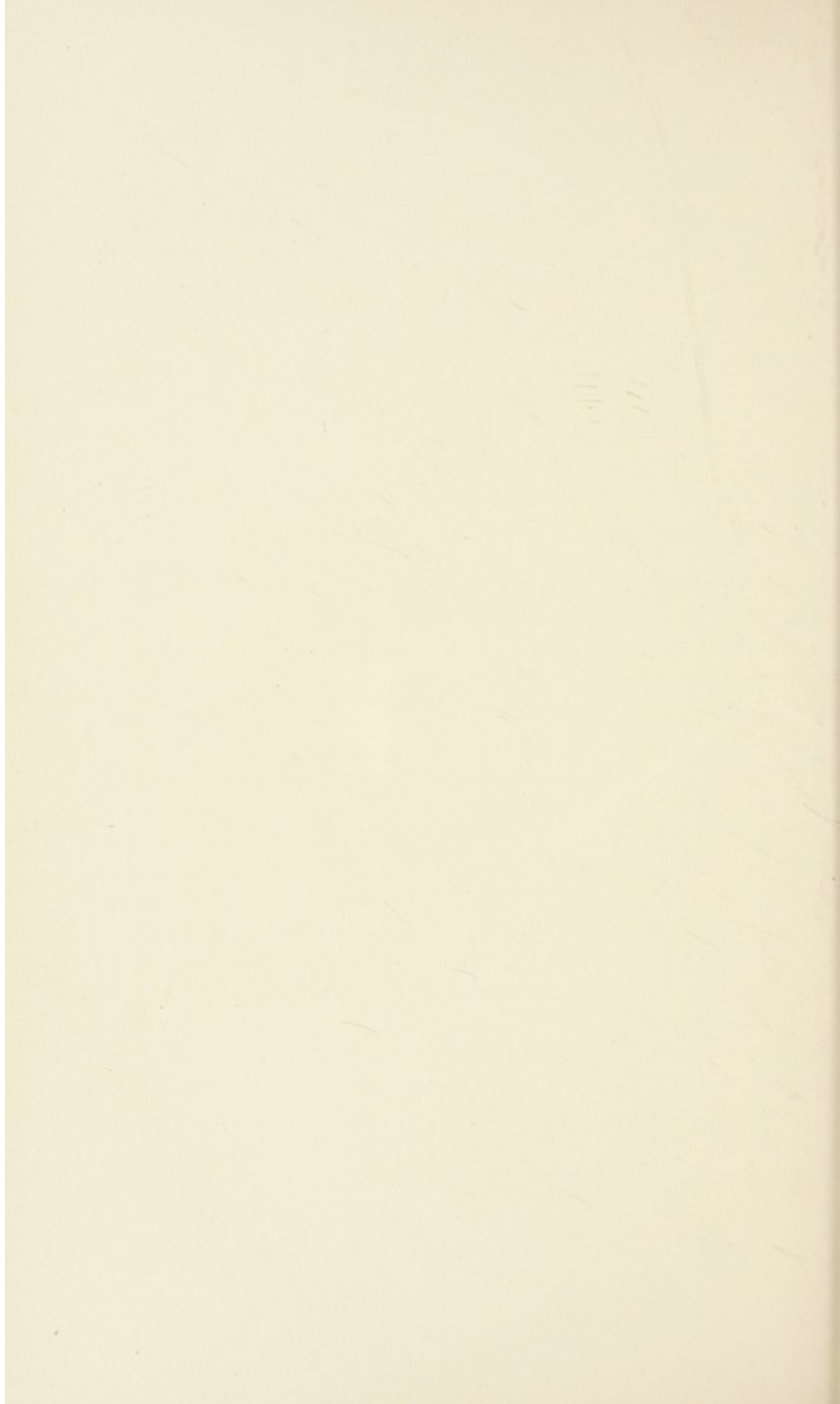


PLATE IV.



Amyloid Bodies in the Prostatic Tubules Shown on Transverse Section.

In some exceptional cases, particularly of old men, we find well marked hyaline cylinders.

These hyaline cylinders, which look like large hyaline renal casts, are undoubtedly due to the inflammatory exudation which takes place in the depth of the gland-tubules. They are sometimes quite long, wavy, of irregular contour, and in some cases somewhat bulbous on one end. They are not of constant occurrence, and are usually found in cases in which the painful symptoms are well marked.

Amyloid bodies are not, as stated in the books, of frequent occurrence. They are seldom seen in the prostatic secretion of younger subjects, and are rather exceptionally found in that of older patients. We cannot to-day state definitely what are their component parts, but they are in all probability composed of mucus, desiccated albuminous matter, intermingled with phosphatic salts. These bodies present distinct and symmetrical striations, which are very clearly shown in Plate IV., which also shows the structure and arrangement of the tubular prostatic glands.

Small prostatic concretions resembling mustard seeds may be found in the ducts of many tube-glands, and they may cause any of the foregoing painful symptoms. These little round, brownish, shot-like masses are largely composed of mucus and lime salts.

Phosphatic calculi may exist in the ducts or in the tube-glands themselves, and produce painful symptoms. These calculi are composed of lime salts, sometimes in combination with oxalate of lime. They are oat-shaped or bean-shaped, though sometimes they are round. There may be one calculus, or there may be as many as a dozen, or several dozens, in one prostate.

There can be no doubt that these various concretions

just described act as foreign bodies which, by plugging up, destroy the function of the tubules, and by their presence give rise to the uneasy sensations and pains complained of by these patients under varying conditions (sitting down, horseback and bicycle exercises, golf, urination, defecation, and copulation).

Chronic prostatitis in older subjects, as in younger ones, may be complicated with chronic bulbous or posterior urethritis, and it is not infrequently coexistent with chronic inflammation of the ampullæ and of the seminal vesicles. When these sacs at the base of the bladder are involved there may be the same seminal incontinence which is observed in young men. When this seminal vesicular condition exists we may find in the urine, in the expressed secretions, and in that which escapes after urination and defecation or severe exercise, the tissue-elements depicted in Figs. 56 and 57.

PROSTATORRHŒA.

In some rare cases of chronic prostatitis the discharge is so copious that the term prostaticorrhœa has been applied to them. In these cases, when they are well marked, there seems to be a continual production of mucus by the prostatic tubular glands; therefore, the most constant symptom is the escape from the meatus of a clear mucous fluid or of a mucus mixed with pus and perhaps a little blood. This mucous fluid may be scant in quantity, only a few drops appearing at the meatus in a day. It may also be more copious, and keep the end of the penis in a moist condition continuously, and in very pronounced cases the escape is so excessive that patients complain of a constant and annoying "dripping," which may wet and stain a large

part of their shirt-flap or of the handkerchief which they instinctively make use of under these circumstances. The escape of this discharge in large quantities occurs frequently during the act of defecation, particularly when the fecal bolus is hard and firm. In some cases the escape of the mucus causes a peculiar tickling feeling in the prostate and urethra, while in others it produces pleasurable voluptuous and lascivious sensations. Some patients claim that they can feel the escape of the fluid from the prostate into the urethra. In rather rare cases the escape of mucus, particularly after defecation, is attended with a sickening sensation of great faintness, which may last for several minutes. Many of these cases have been treated for spermatorrhœa.

Although we have no pathological knowledge on the subject, it seems fair to assume that in prostatorrhœa there is such an atonic condition of the compressor urethræ muscle that it cannot prevent the escape of the fluid into the anterior urethra. The next most constant symptom is increased frequency in urination, which may be very excessive or only about twice as often as the normal desire. There may be decided uneasiness at the end of the act, and there may be a slight pain or decided scalding sensation, which passes from the prostate to the end of the penis. In many cases the stream is small and weak—a condition which seems to point to an atonic state of the detrusors. A sense of dulness and weight is often felt in the prostate and in the rectum, and pain and uneasy sensations are experienced in the perineum, thighs, and lumbo-sacral regions.

Some patients suffer from chronic prostatorrhœa without becoming much disturbed in mind by it. But there are others to whom this affection is little less than a calamity. They become exceedingly nervous about

their trouble, even to the extent of being melancholy. They lose flesh, strength, and appetite; they become irritable and incapable of mental and physical exertion. In fact, in some cases the whole *morale* of the man seems lost.

In many cases of prostatorrhœa there is more or less disturbance in the sexual function. In some subjects it is morbidly exaggerated; in others there is much desire, much erethism, many erections, but very little is accomplished, owing to the precipitate ejaculations. In still other subjects there is little if any desire, even as a result of much excitement, and the penis and scrotum seem shrunken, cold, and lethargic.

Rectal examination of cases of prostatorrhœa reveals an enlarged organ, usually jutting more or less backward on the gut, and being decidedly broader than normal. Very often only one lobe or a portion of one may be involved. Sometimes it feels soft, and again it may seem decidedly indurated. There is commonly more or less tenderness, even severe pain, on pressure by the finger-tips. Urethral examination, even with a small and not stiff instrument, often causes a great outcry from pain when the tip passes through the prostatic urethra.

DIAGNOSIS. When the foregoing descriptions of clinical cases are borne in mind the suspicion of chronic prostatitis will force itself upon the surgeon's mind. Then rectal palpation will reveal the extent and severity of the local condition. At the same time the condition of the urine must be examined, and it, with any expressed mucus, must be carefully studied by means of the microscope. If these requirements are fulfilled, a very satisfactory estimate of the case can always be made.

It may be well here to inform the beginner in the study of chronic prostatic disease that all the pictures of microscopic appearances already enumerated will not be found, as a rule, in one microscopic field. In the preparation of the specimens for these drawings I have carefully selected typical appearances offered by many microscopic fields, and have grouped them into one figure, which contains all the type-forms and some rather unusual ones. In every instance the endeavor has been made to delineate nature truthfully and exactly.

Chronic prostatitis may be caused by tuberculosis, and by the exercise of care and skill a correct diagnosis can soon be positively made. The examination of the urine in these cases for the bacillus tuberculosis will in many true cases be unattended with the detection of the micro-organism. It is absolutely necessary in these cases to examine preferably the expressed or the escaped prostatic secretion after proper staining. Great care should be taken that the penis, and particularly the glans, be rendered absolutely sterile, since upon these parts the smegma-bacillus lives and hibernates, and the detection of this inert microbe might lead the unwary examiner to mistake it for that deadly bacillus which causes tuberculosis.

But, in addition to the condition of the prostate, the surgeon must make himself familiar with that of the urethra, chiefly its bulbous and prostatic portions, and also of the state of the seminal vesicles and of the ampullations. In forming an estimate of a case it is well to bear in mind that in young individuals a more or less recent gonorrhœa may have existed, and that it is very common to find the damage quite sharply limited to the deep urethra and prostate, and perhaps largely to that gland. It is exceptional to

find seminal vesicular involvement in young subjects. In older individuals the prostate and the seminal vesicles and ampullations may be the seat of chronic inflammation, and this complicated condition can be clearly made out by rectal exploration, and by microscopic study of the expressed secretions or of the urinary sediment.

PROGNOSIS. In very many uncomplicated cases of catarrhal prostatitis most satisfactory results follow the adoption of proper treatment. In every case, if the patient persists in sexual or alcoholic excesses or in any way transgresses against the rules of sexual hygiene, his ultimate cure will be greatly retarded.

In young men suffering from the effects of masturbation and chronic posterior urethritis the prognosis is, as a rule, good, provided the patient is not very anæmic or neurasthenic. In those cases in which the *morale* of the patient is much below par the progress toward cure is slow and often unsatisfactory and halting. The occurrence of cystitis by extension, particularly in chronic masturbators, is of serious import, for such cases are very refractory to the most careful forms of treatment.

In very many older men an excellent prognosis may be given if they can control their sexual tendencies by moderation and will not overindulge in alcohol. The co-existence of chronic posterior urethritis, of seminal vesiculitis, or of chronic inflammation of the ampullæ is a rather serious drawback which may tax the skill and patience of the surgeon. Very many of these cases, however, are much benefited, and even unpromising ones can be cured.

TREATMENT. The first essentials in the treatment of chronic prostatitis are a regular, quiet life, abstinence from alcoholics, and the avoidance of all kinds of sexual

excess or excitement. A bland nutritious diet should be taken, and spices, coffee, cocoa, highly seasoned dishes, and asparagus should be avoided. The rectum should be thoroughly emptied every day at least once, and if the natural evacuation does not occur a mild aperient must be taken. These patients must avoid taking cold, and they should not take part in violent sports, nor should they indulge in bicycle exercise.

Moderate and rather infrequent sexual intercourse may be practised, provided no ill effects are found to follow it.

When chronic bulbous or posterior urethritis is present active treatment must be instituted for the relief of these conditions, which materially aggravate the case and render it more rebellious. In like manner strictures of the urethra should receive proper attention and treatment. (See pp. 223 *et seq.*) Instillations of nitrate of silver, irrigations with watery solutions of the same salt (1 to 500, 1000, to 2000), of permanganate of potassium (1 to 4000 to 10,000), or of sulphate of zinc and alum (1 each to 500 to 1000), may be given every few days.

In many cases the careful introduction of a steel sound cooled in ice-water, every four to seven days, is most grateful and beneficial. The psychrophor may be used instead of the sound if the surgeon so desires.

Direct treatment to the prostate by the surgeon may be made by means of the finger-tip in the patient's rectum. Preparatory to beginning the treatment of massage of the prostate the surgeon should acquaint himself with the size of the organ and ascertain what part is affected, or whether the totality of the gland is involved. Then the relative softness, bogginess, and hardness should be learned. When the conditions of the organ are ascertained full details thereof should be

noted down for future reference and comparison. The main object is to reduce the size of the swollen organ, and by massage we press out pathological products (*vide supra*), stimulate the tissues, and cause the absorption of more or less of the inflammatory exudation, by means, probably, of the increased circulation in the vessels and lymphatics. In addition to these changes, we undoubtedly give tone and resiliency to the flabby bloodvessels and also stimulation to the relaxed muscular fibres. A certain healthy stimulus seems to be communicated to the nerves of the prostate by judiciously administered massage. The technique of the operation is very simple. The patient stands with his feet slightly separated and bends the body forward at a right-angle. Then the surgeon, having liberally greased his forefinger with vaselin, gently inserts it until he reaches the prostate. Then, by means of extended lateral and up-and-down gentle but firm pressure, he thoroughly kneads the organ. Patients act and feel very differently while this operation is taking place. Some cry out with pain, particularly at the first *séance*, others suffer a little and make no complaint, while others are entirely passive and perhaps say that the sensation is a little unpleasant. In some patients partial or full erections are produced, and in almost all of them there is inability to urinate for several minutes after the operation. The secretions which are expressed have already been described.

In most cases prostatic massage produces much benefit and comfort, but in some it is necessary to proceed very guardedly, lest irritation be set up. No absolute rule can be laid down as to the frequency of repetition of this treatment. In general, one massage in five or seven days, or even ten, will be found sufficient to pro-

duce good results. When there is concomitant chronic urethritis of the bulb, posterior urethritis, or involvement of the verumontanum, the patient may be more or less sensitive to this procedure, and it behooves the surgeon to proceed slowly and carefully. The indications for the continuance and the frequency of the massage are the comfort and benefit the patient says he experiences, and also the moral effect, which in many cases transforms a gloomy and foreboding patient into a cheerful and hopeful one. As a rule, when no ill effects are produced, as attested by the feeling of general and local comfort experienced by the patient, when there is no abnormal desire to urinate, and when pus in unusual quantity does not appear in the urine, the surgeon may be certain that he is on the right track, and can continue. He can also gain much information by ascertaining from his records how much involution in the prostate he has produced, and by repeated microscopical examinations in auspicious cases he can convince himself that the pus, effete epithelial cells, granular phosphates, perhaps tube-casts, prostatic concretions, and amyloid bodies are growing less numerous as the patient improves in every particular. During the massage treatment rectal irrigations with very warm water, administered by means of Kemp's instrument (see Fig. 48), are often of signal benefit in causing the involution of the swollen organ and the absorption of diseased products. In some cases, also, cold water thus administered seems to be very beneficial.

In order to obtain the beneficial effects of heat in the rectum it may be necessary to use water of the temperature of 100° to 120° F. The increase in heat can be accomplished gradually until the higher temperature of 130° F. is reached. When hot water is thus used,

many patients from the very first experience great relief and gladly consent to the elevation of the temperature of the irrigations. It is probable that these hot rectal applications prove beneficial by their stimulant action upon the nerves, the bloodvessels, and lymphatics.

The use of cold water by rectal irrigations should be carefully watched, and it should be discontinued at once if discomfort to the patient is produced. The temperature of cold irrigations should range from 50° F. to that of ice-water.

Many patients state that their sexual function is much improved by the use of the very hot rectal irrigations.

I know of no morbid condition in which such reliable data can be obtained by physical and microscopical examinations of the patient and of his urine as are presented by cases of chronic prostatitis.

Many cases of chronic prostatitis are much benefited by tonic mixtures which contain goodly doses of nitro-muriatic acid combined with strychnine and quinine. The neurasthenia and weakness which very often occur in the course of chronic prostatitis should be carefully treated. Such patients should receive kindly encouragement, and their general well-being should be sedulously cared for.

In addition to systematic local treatment, much benefit may follow the internal administration of full doses of fluid extract of ergot and strychnine. The muriate tincture of iron combined with strychnine is sometimes very efficient, particularly in debilitated subjects.

It is also well to mention mercurial, ichthyol, and iodide of potassium suppositories, which should be introduced into the rectum every night. The inert basis of these suppositories is a mixture of cocoa-butter and white wax. In each suppository may be incorporated

twenty grains of strong mercurial ointment, fifteen to twenty drops of ichthyol, and thirty grains of the iodide of potassium.

In all cases the surgeon should be on the watch for urethral, vesical, and seminal vesicle complications.

HYPERTROPHY OF THE PROSTATE.

The scope of this treatise precludes the full consideration of the subject of hypertrophy of the prostate, therefore the genital and sexual symptoms induced by this morbid condition will receive most attention.

In all probability many cases of hypertrophy of the prostate take their origin in the chronic catarrhal processes already described. In general, it may be said that this morbid state begins to develop or to reveal itself by symptoms after the fiftieth year, though it may begin at an earlier date.

Succinctly stated, hypertrophy of the prostate consists largely in enormous overgrowths of the gland-tissue of the organ, together with increase in the muscular fibres and connective tissue of the stroma. This overgrowth in most cases occurs in the path of least resistance, which is toward the bladder, but it also takes place laterally and backward, when it bulges more or less into the rectum. With the lengthening of the lobes the urethra becomes elongated, and with the growth of these parts the lumen of the canal is impinged upon, and it is rendered smaller, inextensible, and very frequently tortuous. In some cases the so-called third lobe becomes enlarged into a round or pear-shaped body, which acts as a ball-valve at the vesical orifice. In some instances a true bar across the lower part of the vesical neck is formed. With the increase of this overgrowth

at the neck of the bladder, which then is no longer dilat-able, more or less difficulty in expelling the urine is experienced, until in the end in many cases expulsion becomes impossible. Some patients state that their first knowledge of the trouble was revealed to them by their want of power to start the urinary stream.

In many cases the development of enlarged prostate is very slow and insidious, and unattended with marked symptoms, while in others its onset is quite rapid. The most constant symptom is frequency of urination, particularly at night. In stricture of the urethra this symptom is mostly observed during the day, while in old prostatic cases it is complained of at night. After a time the patient becomes conscious that the outlet or the neck of the bladder is contracted, and that the expulsion of the urine causes him much greater effort than it did formerly. The stream of urine is then small, feeble, often falls perpendicularly on his shoes, is sometimes suddenly arrested, and ends in unsatisfactory dribbling.

With the progressive development of this overgrowth the impediment to urination increases and the bladder may become overdistended, and then chronic incontinence with all its painful symptoms and unpleasant features is observed. Synchronously with the overgrowth of the prostate certain hypertrophic changes take place in the bladder by which its walls are much thickened and its inner surface is rendered rugose and much trabeculated. As the case grows worse the irritation of the neck of the bladder becomes more and more painful, and a burning, scalding sensation is felt in the whole urethra, together with, in many cases, severe pain in the glans penis. After urination some prostatic mucus may drip from the meatus. Many

patients suffering from hypertrophy of the prostate give evidence of sexual erethism. Erections more or less perfect quite constantly occur, and nocturnal emissions are not infrequent. In some rare cases these men become in a measure sexually perverted, and, not being satisfied by coitus, they indulge actively or passively in many unnatural practices. As a rule, however, this period of eroticism sooner or later passes away and the man lapses into a condition of sexual apathy and permanent impotence. In other cases, happily the more numerous, as the hypertrophy of the prostate develops and its incident sufferings increase, sexual desire slowly or quickly dies out.

Besides the sexual symptoms some patients complain of pain in the penis, particularly in the glans, in the testes and scrotum, and in the perineum. Many patients complain of uneasy sensations and dull pains in the sacral, hypogastric, and lumbar regions, which they wrongly attribute to rheumatism and lumbago. Pain near the rectum or anus or in the perineum, when in certain positions, or when the body is roughly jolted, or on sitting down, is not at all infrequent.

With the progress of the case, when unrelieved, the health sooner or later fails. In many cases cystitis becomes a most distressing symptom, and this bladder infection creeps up the ureters and involves the kidneys, and then death ends the scene. The cystitis causes urinary poisoning, and the damage to the kidney prevents the elimination of the effete products of metabolism, so that the patient is really doubly poisoned.

As his diseased conditions grow worse he loses his appetite and he becomes thin and sallow. He suffers from a peculiar dry tongue, and his breath has a urinous odor. Then chills and fever set in, and death ensues.

TREATMENT. Care should be taken as to the mode of life of the patient. He should eat and drink moderately, should not overexercise, and should avoid taking cold. It is important that his bowels should move freely every day. Spirituous liquors should not be taken.

In the first stages of hypertrophied prostate in some cases much benefit results from the very careful and painless passage of sounds and bougies, which seem for a time at least to keep the lumen of the urethra patulous. Rectal injections of hot or cold water may be beneficial. In many cases warm irrigations of the bladder and urethra with boric acid and hot water (two drachms to sixteen ounces) are very grateful and soothing, and the same may be said of very mild warm solutions of nitrate of silver (1 to 5000 to 20,000), or of permanganate of potassium (1 to 8000 to 10,000). In some cases irrigations of flaxseed tea, with perhaps the addition of a little laudanum, give much relief and comfort. Alkalies or acids, as the case demands, may be given internally to render the urine bland. These patients should be told not to try to hold their urine when the desire for expulsion comes on. Massage of the prostate may sometimes be very beneficial. As a rule, these patients have to resort quite early to the catheter, the use of which may make them comfortable for many years.

In very bad cases prostatotomy, urethral or perineal, may be resorted to, and in some cases much benefit may result from prostatectomy. Castration and ablation of a segment of the vasa deferentia have not proved to be the boons which they were expected to be. In many cases permanent perineal and suprapubic drainage may of necessity be resorted to.

CHAPTER XVIII.

INFLAMMATION OF THE SEMINAL VESICLES.

IN some cases seminal vesiculitis is the cause of sexual weakness, impotence, and of neurasthenia. This affection is really not so frequent as it has been claimed to be, yet it is found in a goodly number of cases. It is due to chronic gonorrhœa, masturbation, and sexual excesses.

Seminal vesiculitis may be acute or chronic. The acute form has many points of analogy with epididymitis. Both affections are almost always secondary to gonorrhœa, occurring in the third or fourth week, or to hyperæmia of the posterior urethra, due to masturbation and venereal excesses or to inflammation of this region resulting from traumatism, catheterization, endoscopy, and strong injections. In both there are inflammation of the mucous membrane and hyperplasia of the connective tissue. In epididymitis the testicle does not swell, and in seminal vesiculitis the prostate is not usually affected. In both cases suppuration, in the sense of abscess-formation, is the exception and resolution the rule.

SYMPTOMS. The symptoms of the acute form of seminal vesiculitis are quite similar to those of posterior urethritis and to those given as diagnostic of the severe varieties of prostatitis. The patient first experiences pain, either of a dull or throbbing character, or a sensation of weight, which he refers to the deep portion of the pelvis just within the anus or at the neck of the bladder or in the perineum. There is markedly increased fre-

quency of urination with tenesmus, sometimes mild, again quite decided, and in some cases very severe. As the bladder fills the painful symptoms increase in severity, and there may be pain at the end and sometimes at the root of the penis. There may be fever, chills, and malaise. All these symptoms may be present in posterior urethritis, so that the crucial test in diagnosis is palpation of the prostate and seminal vesicles by means of the finger in the rectum. If the case is one of acute posterior urethritis the prostate may be tender, even painful, on pressure, and perhaps swollen. If seminal vesiculitis is present and explored for early, one or both vesicles will be found to be much enlarged in all directions in the shape of a distended leech, hot, brawny, and exquisitely tender. In a few days the swelling may still further increase, and then moderate fluctuation may be felt. In some of these cases the patient presents a pitiable spectacle. He suffers from pain in the perineum, rectum, bladder, and at the top of the sacrum. He has frequent desire to urinate, and the act is attended with much pain, or, again, in some cases, there is very distressing dysuria. Defecation is very painful, and perhaps complicated with rectal tenesmus, and may be attended with vesical spasms; sleep is heavy and unrefreshing, and often during the night painful erections and pollutions, perhaps bloody, may add to the patient's sufferings. The urine may contain pus and epithelial cells, but these tissue-elements may be absent for hours or for days, during which the urine is clear; and in this feature acute seminal vesiculitis differs from acute posterior urethritis, in which the discharge of pus or blood is constantly seen. At the onset, and early in the course, of seminal vesiculitis the gonorrhœal discharge may disappear entirely, and in this it

resembles epididymitis. But in a short time the discharge reappears, and it may be more or less bloody. In seminal vesiculitis the blood is mixed with the pus or the latter is streaked with it, whereas in posterior urethritis the blood follows the act of urination, or there may be a worm-like thread of coagulated blood with the first jet of the urine.

The inflammatory stage of seminal vesiculitis usually pursues a course similar to that of epididymitis, and at the end of a week or ten days the symptoms become ameliorated, and resolution gradually sets in. In all probability, in many cases the parts sooner or later become normal again. In some cases after resolution of the vesicular inflammation the urethral discharge reappears, while in others the urethra is left in a healthy condition. In this acute stage of inflammation the morbid process resembles that of gonorrhœa in the redness and swelling of the mucous membrane and in the sub-mucous cell-increase. When, however, the phlegmasia becomes intense a true suppurative process or abscess forms, in which event the local and general symptoms are more pronounced and the suffering of the patient greater. Rectal exploration then reveals a large boggy, painful swelling at the base of the bladder, beyond and to the outer edge of the prostate. This swelling is very large when both vesicles are involved.

Dr. Gouley's remarks on this subject are very pertinent. He says: "If the swelling is in the form of a single, hard, oblong tumor extending from the base of the prostate upward, backward, and outward, the presumption is that the phlegmasic process has not extended beyond the proper capsule of one vesicle. If, however, there is a diffuse, doughy swelling extending beyond the median line, it is likely that both vesicles

are involved, that perforation of their walls has taken place, and that the ambient connective tissue is infiltrated."

While the ejaculatory duct of the seminal vesicle remains patulous the contained pus may escape, or perhaps may be milked, by means of the finger-tip, into the urethra, in which event full resolution without ulterior bad results may occur. If, however, the duct becomes occluded by the swelling of its mucous membrane or by being plugged up by sympexia or masses of mucus dislodged from the diverticula of the vesicle, the abscess may attain a very large size, and the pus may perforate its wall and burst into the ischio-rectal fossa or around the rectum into the bladder, the rectum, and the peritoneum, sometimes causing death, and generally leading to the formation of fistulous tracts which are very difficult to cure.

It is stated that the abscess never ruptures into both bladder and rectum. In any of these very painful events examination of the parts is necessary, and from it the line of operative procedure will be arrived at. The intimate relations of the vas deferens, the ejaculatory duct, and the seminal vesicle are such that the last structures and the testicles may be involved at the same time. It is probable that in some cases seminal vesiculitis and epididymitis coexist, but that the violence of the symptoms of the testicular trouble masks those of the vesicular affection. It is also very probable that the intra-pelvic pain which so frequently accompanies acute epididymitis, and which we have been taught is due to a complicating phlegmasia of the pelvic part of the vas deferens, is sometimes really symptomatic of involvement of the seminal vesicle. The statement that this affection is a common accompaniment of gonorrhœal epididymitis needs confirmation.

It can be readily understood, after a consideration of the foregoing facts, why acute seminal vesiculitis has often been wrongly diagnosticated as posterior urethritis and acute prostatitis, and by many, under the influence of old ideas, as inflammation of the vesical neck and floor of the bladder.

CHRONIC SEMINAL VESICULITIS.

This form of seminal vesiculitis may result from the non-occurrence of resolution in the acute affection, and in this event the clinical history is tolerably clear and striking. But in the majority of cases of chronic seminal vesiculitis it begins as a low-grade inflammatory process in persons, particularly of neurotic or neurasthenic types, who may suffer from chronic subacute posterior urethritis or chronic prostatitis, and in confirmed masturbators and in those given to excessive venery and alcoholics. The difficulty in the study of the chronic form of seminal vesiculitis is that in many cases the symptoms are so few and so vague, and point so indefinitely, if at all, to trouble in these vesicles, that oftentimes their origin is not suspected by the surgeon. Then, again, cases are seen in which the symptoms are very clearly and strongly marked, yet they may be with seemingly good reason attributed to trouble in the posterior urethra and in the prostate.

Cases of seminal vesiculitis which follow quite directly a recent or more or less remote attack of gonorrhœa very often present such a group of symptoms that the surgeon is led to suspect their origin in inflammation of the seminal vesicles, particularly if no trouble is found in the posterior urethra. Such patients, who are usually young men and not over thirty years of age, state that

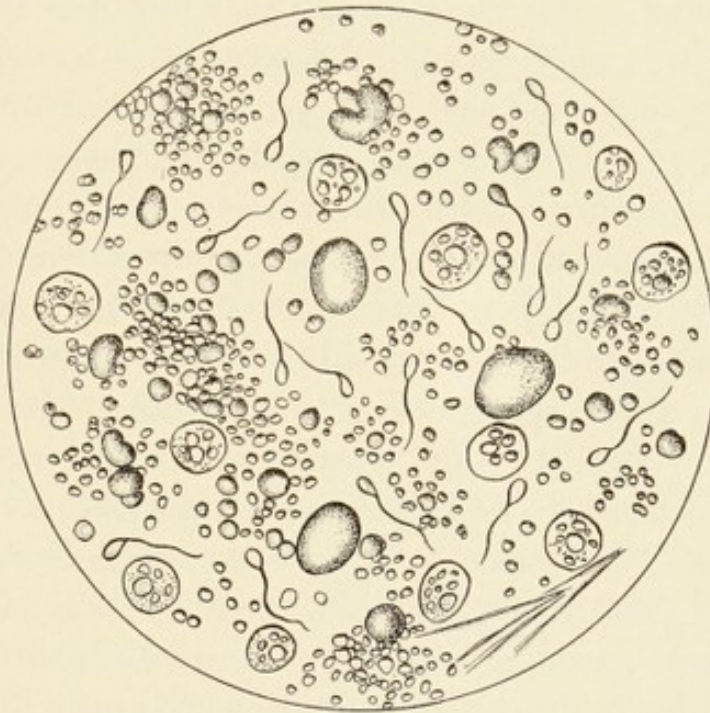
since an attack of gonorrhœa or a relapse they have not felt well as regards their sexual organs. Some complain that they are sexually weak, that they have little desire, or that they have premature and perhaps painful ejaculations, which in some cases are mixed with blood. Others, again, are subject to a constant slight or profuse discharge, which is of a mucous or muco-purulent character. Again, this form of discharge may be intermittent. There may be, however, a decided chronic seminal vesiculitis without any discharge which is perceptible. Not infrequently patients having a history of one or more attacks of gonorrhœa state that they suffer with a mild or moderately severe, even burning, pain or itching, or a sense of weight in the course of the urethra, in the perineum, bladder, anus, and rectum. In addition to this they often give a history of sexual erethism with or without gratification in coitus, and sometimes of increased desire, while little relief, and even aggravation of the symptoms, may follow the sexual act. All of these symptoms may be present in cases of chronic prostatitis.

Gouley lays stress on the occurrence of painful spasmodic contracture of the anal sphincter both in acute and chronic seminal vesiculitis. He very rightly calls attention to spermatic colic due in all probability to the temporary lodgement of sympexia and mucous masses or plugs in the duct of the vesicle.

Chronic seminal vesiculitis in younger men consists in a submucous round-cell infiltration beneath the mucous membrane, which gives rise to hyperæmia and purulent catarrh. If care be taken to cleanse the urethra of the discharge from posterior urethritis and from any form of prostatitis (if these morbid conditions coexist), a grayish or brownish mucus can be expressed in some cases from the vesicle by the finger-tip in the rectum.

This secretion may be very copious or decidedly moderate in quantity. It is very viscous, and in the earlier days of the inflammation it may be tinged with blood or pus more or less abundantly. When this secretion is examined by means of the microscope it will be found to contain vesicular mucus in large and small globules, granular and perhaps crystalline phosphates, pus-cells (perhaps red corpuscles), and spermatozoa, which in most cases are lifeless. These features are well shown in Fig. 57, the secretion having been gotten by massage

FIG. 57.



Secretion of chronic seminal vesiculitis.

from a patient and examined by myself. These appearances are quite constantly found in the secretion of cases of young men in whom, though the affection is chronic, it has not yet reached its full development. In these cases, which, by their clinical history and their secretion, seem to constitute a distinct class, the cell-infiltration and consequent thickening of the walls and structural damage

of the vesicles are not yet very great, and the prognosis generally is better than in more advanced cases.

More Advanced Form of Seminal Vesiculitis.

In the cases of pronounced masturbators, in old gonorrhœics, in those given to excessive indulgence, particularly with the addition of alcoholic excesses, chronic seminal vesiculitis may sometimes be found in a more severe form. These cases are often those of anæmic, neurotic, and neurasthenic subjects who respond very indifferently to treatment. Such patients, who are usually beyond thirty years of age, in whom the affection is very chronic, may complain of some pain or disturbance in the urethra, bladder, anus, or rectum, and they may present a discharge; then, again, all these symptoms may be wanting. Most of them, however, give a history of disturbance in the sexual function similar to those just detailed. These disturbances are mainly of two forms: first, those of lowered power, and, second, those of erethism of the sexual organs. In the first order of cases we find absence or incompleteness of erections, pollutions from slight causes, without enlargement of the penis. In these cases there is often a haunting desire for erection, with no response. Very often these patients suffer from a constant dribbling of a dirty-gray or brownish mucus, which may during the day be so copious as to saturate one or two pocket handkerchiefs. Then, again, some of these patients have no such discharge, but an emission of a thin, gray, watery, and sometimes brownish and even curdy fluid occurs daily or more frequently.

In these advanced cases, particularly in subjects who are approaching middle life, the structural changes in the vesicles are much more pronounced than they are in

the earlier class of cases. The submucous infiltration will then be found to have thickened the walls of these sacs very much, and in some cases there will be found a very decided increase in the density and quantity of the perivesicular connective tissue, whereas, in the earlier class of cases, the vesicles to the touch feel like a distended leech, and are yet compressible. In the most advanced cases these structures are firm, perhaps very resistant, and they convey to the mind, by means of the finger-tip, the impression that a well-defined, compact, perhaps indurated, mass has taken the place of a tolerably soft sac. The conglomerate morbid process then consists of epithelial hypertrophy, submucous round-cell infiltration, general increase in the connective-tissue stroma, and much hypertrophy of the perivesicular fibrous tissues. In these cases, as time goes on, contraction takes place in the newly formed morbid tissues, and the calibre of the chambers of the vesicles becomes much contracted. In this event the muscular contractile function of these sacs is more or less impaired or is wholly lost.

When a post-mortem specimen of the seminal vesicles in the less advanced form of the morbid process is examined, it is often found that the calibre of the vesicles and of their chambers has not been materially decreased, and that, although the walls are thicker than normal, they are yet compressible and tolerably extensible. In the older cases above mentioned the rigidity of the parts contrasts strongly with the condition just now described.

The normal secretion of the seminal vesicles is of a dull gray color, perhaps slightly tinged with light brown. In disease this secretion becomes more and more brown. In the less advanced class of cases it is of a yellowish-

brown color, and in the advanced cases it is of a very pronounced dirty, sometimes rusty, brown color. In the diseased condition, as age advances, the secretion becomes much more viscid than it is normally.

The dark color of the secretion in very chronic seminal vesiculitis is due mainly to phosphatic concretions held together by mucus and more or less stained with blood-pigment. Then we also find large round or oval masses of the dried mucus peculiar to the vesicles, which seem to have become stained by blood and to have become condensed into spheres. Further than this will be found large, flat, irregular plates of epithelial cells grouped together in a chaotic mass and deeply tinged with yellow pigment derived from the blood. These are the main constituents of the secretion of very chronic seminal vesiculitis, and their presence is very constant, as I have often observed. In addition, we find more or less granular phosphates, very often of a yellowish color, red blood-cells, pus-cells in varying quantity, and spermatozoa, which are, as a rule, dead.

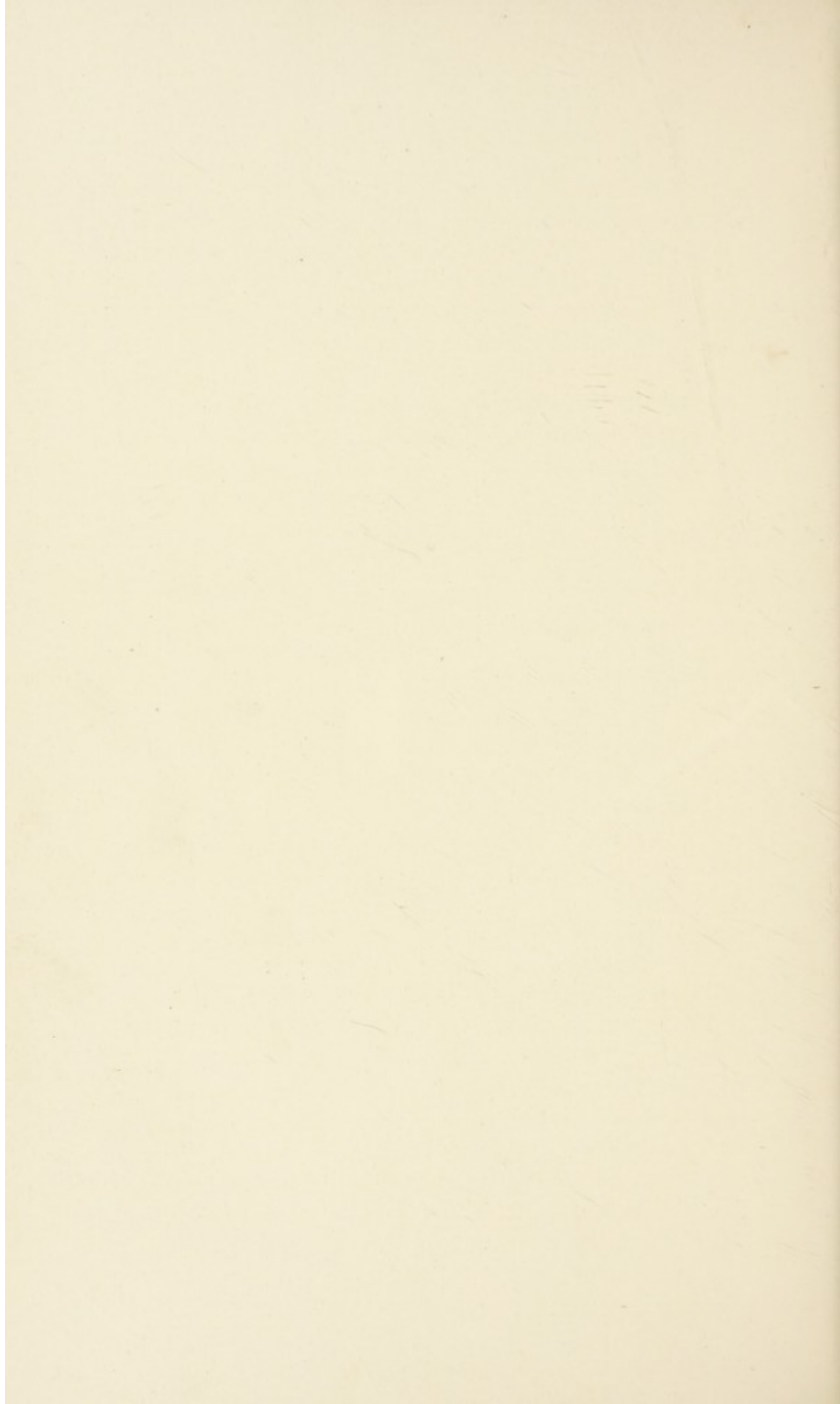
In Plate V. the secretion of very chronic seminal vesiculitis is well shown. The secretion used in the preparation of the plate was drawn by me from the seminal vesicles of a man, aged forty-two, who died of alcoholism, and who in life suffered from chronic seminal vesiculitis.

I have found in post-mortem specimens that the secretion of the seminal vesicles in health and in disease is exactly like that of the deferential ampullations, except that perhaps spermatozoa may be rather more numerous in the latter secretion. Now, as these parts are so closely coapted, and as their function and structure are precisely similar, it is very probable that the ampullations are also involved in some cases of seminal vesiculitis,

PLATE V.



Secretion of Very Chronic Seminal Vesiculitis. Containing Phosphatic Concretions, Granular Phosphates, Sympexia, Pus Cells, Mucoid Globules and Spermatozoa.



and it may happen that the disease may be limited to the ampullations. In the living subject I can well conceive that it would be sometimes very difficult to diagnosticate, by means of the finger-tip in the rectum, between chronic seminal vesiculitis and chronic inflammation of the ampullations. I have before me, as I write, the seminal vesicles of a man which are the seat of advanced chronic inflammation, and their structural condition and their secretion are precisely similar to those of the ampullations which lie in close contact at the inner side of the vesicles. If such a case were examined in life, in the light of our present ideas, the diagnosis of chronic seminal vesiculitis would be unhesitatingly made. It is probable, therefore, that in cases of chronic, and perhaps acute, seminal vesiculitis the ampullæ may also be involved by the same morbid change.

Such is the erotic condition of some patients suffering from chronic seminal vesiculitis, that the sight of a pretty woman, of her breast or her ankle, throws them into a high state of nervousness and sexual erethism. I have known several instances in which one woman only exerted this morbid influence upon the man. Accidental slight contact, the glance of the eye, the sound of the voice, and the grasp of the hand served to so excite and exalt them sexually that an orgasm, with or without partial erection, would result. This erotic condition is also not infrequently observed in men suffering from chronic catarrhal prostatitis.

These cases, as we may term them very chronic, run a somewhat peculiar course. In some the symptoms and conditions continue in a more or less subdued manner, and though they disturb the patients considerably, the latter arrive at a state of mind by which they bear their troubles more or less philosophically. In this class of cases the

affection runs on from year to year in a monotonous way. Such patients are neither healthy nor very sick. But cases are sometimes seen in which the chronic, uneventful course of the affection is varied by the development of more or less severe exacerbations. In this event the health becomes deteriorated, the patients lose their appetite and weight, and present the appearance of very weak and sick men. Concurrently with this condition the nervous system becomes much disturbed and the patients present the symptoms of neurasthenia. A nervous apprehension and anxiety are very frequent concomitants. Such an exacerbation may last months or years, and may lead to permanent invalidism.

In old men suffering from hypertrophy of the prostate a low grade of seminal vesiculitis is a not uncommon accompaniment. In many of these cases the vesicular complication passes unnoticed, for the reason that it may give rise to no symptoms at all, or, if present, they are not pronounced in character. Then, again, they may be masked by the disturbances produced by the prostatic affection.

Tuberculosis of the seminal vesicles will only be touched lightly upon here. The onset of the affection is attended with moderate and not well-defined symptoms, which are frequently referred to the posterior urethra and the prostate. When the affection begins, as it rarely does, primarily in the vesicles, the symptoms may be for some time so mild and vague that they are not understood. Beginning in the prostate, as so commonly occurs, tuberculosis either goes backward to the vesicles or downward to the testicles. With the involvement of the posterior urethra the symptoms are increased frequency of micturition, pain with the act, occasional hemorrhages, and a purulent discharge. With the ex-

tension backward to the seminal vesicles these symptoms become more pronounced. The rectal touch then shows that the prostate is swollen and hard, has well-defined borders and an irregular nodulated surface, on which there may be spots which feel soft. At the distal end of the prostate the seminal vesicles also are swollen. In the early stages of the process that portion only which merges into the prostate is thickened, hard, and perhaps nodular. With the further extension of the disease the whole organ becomes enlarged, hard, uneven, and nodulated. This period of density and nodulation of the vesicles may be only transitory, and there is left a voluminous, smooth, and perhaps doughy tumor. Richet compares the sensation conveyed to the finger-tip to that of sebaceous cysts or to a pocket injected with tallow. This sensation is due to the softening of the tuberculous matter. Guelliot emphasizes the point that induration and nodulation are not, as we have been taught, absolutely constant in tuberculosis of the seminal vesicles. Out of fifty cases examined by him he observed these signs only eight times.

In addition to the symptoms already given of tuberculosis of the seminal vesicles (and it must be remembered that this affection is generally a concomitant of *erethism*). In some cases the genital excitation amounts even to torment. Erections are strong and constant, desire for coitus is continuous and imperative, and pollutions are frequent. This excitation is the outcome of the hyperæmic condition of the infective process. As degenerative changes take place in the tissues the condition changes, the desire slowly abates, and finally the sexual function is wholly lost. This form of genital tuberculosis is usually concomitant with involvement of

other vital parts, which in the end leads to death. Cases are on record, however, which go to show that tuberculosis of the seminal vesicles may undergo degenerative changes—caseation and absorption, followed by atrophy and fibroid degeneration.

DIAGNOSIS. The diagnosis of seminal vesiculitis, in whatever form it may exist, is to be arrived at mainly through palpation of the parts by the finger inserted into the rectum. It has already been shown how little light the subjective symptoms throw upon the nature of the trouble. It is not, as a rule, as easy as it is claimed to be by some to make out clearly the outlines and dimensions of the seminal vesicles. In the examination some authors state that the patient should bend the body forward as far as he can, his feet being about a foot apart. It is always well that the bladder should be full, for in that condition the vesicles are more readily detected. Then the finger (which of necessity should be a long one) is introduced to the prostate, and, having defined its outline, the vesicles are sought for above and to the outside of this body.

This examination can also be made with the patient on his back in the lithotomy position, in which event the bladder, being full, tends to sag down in the pelvis. It is easy to conceive that in some patients in the bending-forward-and-standing position the bladder may tilt forward toward the abdominal wall, and then the vesicles will be more inaccessible.

At the prostate the two vesicles approach to within a finger's breadth of one another, and on the inner side of each one is the vas deferens, which at this part becomes much enlarged and ampullated. I myself think that very often the ampullation of the vas deferens, which may be increased in size by the gonorrhœal or chronic

hyperæmic process, is mistaken for enlargement of the seminal vesicles. It certainly is next to impossible to say from rectal examination in life that the vas deferens is not swollen and the vesicle is. These parts are in such intimate juxtaposition that it is nearly impossible to distinguish between the two. It is important, also, to have a good knowledge of the structure and physical characters of the vesicles in their normal state. To this end study on healthy men is necessary. The seminal vesicles in health have a firm, somewhat resistant structure, which, while not presenting a brawny feel to the touch, gives the sensation of having tolerably thick walls. Therefore the surgeon must not enter upon the examination with the idea that he is to feel two oblong, rather soft, and readily compressible little bladders.

If diseased, the seminal vesicles will, in the acute stage, feel much swollen in all directions, tender, perhaps hot, and may present a doughy sensation, like that of the over-filled leech. In the stage of abscess the swelling will be great, the pain intense, and the symptoms severe and pointing to intrapelvic trouble.

In the chronic forms a quite firm tumor may be felt. If both vesicles are involved, the base of the bladder beyond the prostate is the seat of the tumor, which is usually of goodly size, often very large. Abdominal pressure, exerted deep down and toward the pelvis, may often afford much aid in these examinations. Some authors lay stress upon the presence of a sound in the bladder, pushing its base downward toward the rectum, as being of great help to the finger in the rectum. Perhaps in some cases this procedure may be admissible or practicable, but it should never be resorted to without due thought concerning the nature of the case and the state of the deep urethra and prostate. In all

acute cases the introduction of the sound as an accessory aid to diagnosis is strictly interdicted. In chronic cases the surgeon must always remember that the posterior urethra may be the seat of a low grade of inflammation, and that the prostate may also be at least hyperæmic. This same caution applies very strongly to the cases of old men who are suffering from enlargement of the prostate and also from a chronic inflammatory condition of the seminal vesicles—a complication, as we have seen, which is sometimes met with.

Examination and manipulation of the seminal vesicles by means of the finger-tip cause a flow of pus, with perhaps blood, into the urethra when the inflammation is recent and active. In the subacute cases the discharge is muco-purulent and mucoid.

PATHOLOGY. In the acute gonorrhœal stage it is probable that the lesion of the mucous membrane is similar to that of gonorrhœa of the urethra. This is a field worthy of careful study. As yet the observations have been macroscopical rather than microscopical. In the main, the morbid process consists of swelling of the mucous membrane and small-cell thickening in the sub-mucous connective tissue. The vesicles then may be much dilated, or, again, they may, by contraction of the newly formed tissue, become much shrivelled. Within the vesicles a brownish mucus, muco-pus, spermatozoa alive or dead, sympexia, and calcareous concretions may be found. Gouley states that of sixty dissections of the seminal vesicles made in cases of prostatic enlargement, in three-fourths of them the vesicles were shrivelled and hard.

PROGNOSIS. In the acute form of this trouble resolution usually takes place. In the chronic forms amelioration and cure may be obtained. In some cases,

however, the morbid process goes on to the formation of large tumors which require operative measures. Tubercular infiltration of the seminal vesicles may perhaps undergo resolution or lead to cicatrization or caseation, but in most cases it is continuous with or concomitant to a similar affection of other organs, and in the end death results. In malignant new-growths a lethal outcome is inevitable.

TREATMENT. When recognized in the acute stage seminal vesiculitis is to be treated on the general principles which govern the management of all phlegmasiæ of the genital and urinary organs. Hughes, of Dublin, recommends the application of three or four leeches to the anterior wall of the rectum (previously cleansed and disinfected) near the vesicles. This procedure will always be found to be difficult and disagreeable, so that the best plan is to apply a large number of leeches upon the perineum and the margin of the anus. Injections of cold water may be used, and the rectum may be packed with ice if the procedure is pleasant to the patient, or hot irrigations may be administered by means of Kemp's prostatic cooler. (See Fig. 48.) These applications may be used once or twice a day, or even more frequently. Opium in suppositories, diluents, and saline cathartics may be administered as necessity requires.

Should an abscess form, it may be reached by means of a long incision, as suggested by Mr. Lloyd, in the perineum just anterior (about three-quarters of an inch) to the anus, great care being taken that the membranous urethra, the prostate, and the rectum are not cut. In this operation much aid will be given by means of the finger in the rectum. The incision may be made in the median line laterally, or, if both vesicles are the seat of acute suppuration, it may be crescentic. Then the dis-

section between the base of the bladder and the rectum must be cautiously made. The resulting cavity should be treated on general surgical principles. When the abscess is not large, but is well defined, Gouley recommends that the "parts should be brought to view by means of a Sims speculum in the rectum, and a slightly curved aspirating-needle, not less than two millimetres in calibre, should be thrust into the abscess and the cavity quickly emptied, and then well irrigated with a warm sublimate solution (1:5000). A single aspiration may suffice, but in case the cavity refills the aspiration and irrigation should be repeated."

In more acute and extensive abscesses Gouley recommends free incision through the rectal wall, followed by careful antiseptic packing. If these operative procedures through the rectal wall are adopted, it is important to remember that the after-treatment must be conscientiously carried out, bearing in mind the great danger of sepsis and the possibility of the formation of fistulæ.

In the treatment of chronic seminal vesiculitis, in which we may find distended, pouchy, or brawny vesicles, it is well to institute the procedure known as stripping or milking the vesicles. This procedure is accomplished by the finger-tip gently but firmly pressing or kneading as much of the organ as is within reach from above downward, so as to express the contents through the ejaculatory duct into the prostatic urethra. The patient should bend his body at a right angle to his lower extremities, and in this position the surgeon introduces the finger, all the while making counter-pressure on the abdomen, the bladder being, if possible, well filled. Should there be resistance of the perineal muscles, the surgeon should rest his foot on a chair, then, with the knee well braced against the elbow, such firm and continuous

pressure may be exerted as will enable the finger to reach the vesicle, the resistance of the muscles having been overcome. As has already been said, it is no easy matter in many cases to reach the vesicles and clearly define their size and shape, even when every favoring condition is present. Then, again, at the best, only the lower half of the vesicle is really accessible to the stripping process. Further than this, it must be clearly remembered, as has already been pointed out, that the seminal vesicles are made up of blind-ended tubes or diverticula, and that they have not the structure and arrangement of racemose glands, firm pressure on which will cause the contents to exude into the excretory duct. An inspection of Fig. 6 will clearly show that it is a physical impossibility to cause the contents of the third tube—or, as we call it, the handle of the jack-knife—to exude into the urethra, for the reason that it is a blind sac or pouch, its non-patulous part ending downward near the prostate. This portion of the vesicle is fully as large as the other two-thirds are, and the contents of this large part cannot in any way be extruded into the urethra. For anatomical reasons it will be clearly seen that the utmost that can be accomplished in stripping or milking a vesicle is to act upon about one-quarter of its whole structure. In theory, stripping the vesicles seems to be a rational treatment, in that it seeks to rid these organs of retained chronic inflammatory matter and to restore the tone in muscular and mucous tissues which have become relaxed and flabby. Undoubtedly in some cases benefit does result from the procedure.

The treatment of the cases of chronic seminal vesiculitis in which there are neurasthenia, debility, and often great mental depression, belongs largely to the domain

of general medicine. Such cases require good hygiene, and, if possible, an entire change of scene, rest, and pleasant surroundings. Tonics, combined with nuxvomica and ergot, produce much benefit. Iron, quinine, and coca are also indispensable in some cases. The urethra, bladder, prostate, and seminal vesicles should be very carefully examined by instruments and by inspection of the urine and expressed secretions. If there is, as so frequently happens, a coexistent posterior urethritis or prostatitis, these morbid conditions should be properly treated.

CHAPTER XIX.

MASTURBATION AND SEXUAL EXCESSES.

CERTAIN morbid conditions of the genital tract and disturbances of the sexual function have their origin in excessive and long-continued masturbation and sexual excesses; consequently it is necessary to discuss these unpleasant subjects in these pages. Much exaggeration has been indulged in, and an unnecessary amount of sentiment has been bestowed by lay and medical writers, and notably by quacks, on the habit of self-abuse; therefore it will only be treated of here in a purely scientific manner.

It is a great mistake to claim that among the majority of boys excessive indulgence in masturbation is very common, since the truth is that such is the exception rather than the rule. There are boys whose nervous system is not stable, and those who are precocious in their mental processes, who like to seclude themselves very much from the games and sports of their comrades, and who, having indulged in self-abuse, keep up the bad habit until it produces harmful results. But, as a rule, boys like to be up and doing, and each feels that he likes to stand as high in all pursuits of early life as his fellows. This generous rivalry tends to elevate the moral nature of the boy. Thus it is that a healthy moral status exists which tends to keep boys in the right path. If, perchance, a boy has indulged unnaturally, he, as a rule, sees the error of his ways, and he leaves off his bad habit, or indulges in it quite infre-

quently. Undoubtedly, in many cases the exaggerated accounts of the ills which follow masturbation have a decidedly deterrent effect. While in the main the foregoing survey of this subject holds good for the better classes of our community, it must be confessed that among the poor and squalid, who are closely herded together, the moral tone is low and the habit is more widespread.

Masturbation has been observed in quite young children. In some cases there seems to be some nervous defect, of which sexual precocity is a prominent symptom. Then, again, phimosis, retained smegma, uncleanness, dermatitis of all forms about the genitals, and thread-worms in the rectum cause erections, and thus the child contracts the bad habit. Stone in the bladder may also be the cause of sexual excitement in the infant. Then, again, it is not uncommon for nurses and caretakers to fondle and titillate the penis of the child in order to keep him quiet, and thus the bad habit is engrafted upon him.

Epileptics, hydrocephalic infants, and those suffering from many forms of nervous disease, are said to be prone to commit masturbation. In older subjects, the victims of cerebral and spinal affections, masturbation is frequently a distressing symptom.

As a rule, these subjects are seen to constantly handle their genitals and to produce erections, and they commit the self-abuse by peculiar movements of the thighs, by rubbing up against firm objects, or by rolling on their stomachs on the floor.

Infantile onanists soon become sickly, flabby, peevish, and irritable. Their gastro-intestinal functions become much impaired, and as a result their nutrition is much lowered.

Young boys are either taught this bad habit by older boys, or they acquire it by exploratory inquisitiveness. They, as a result of excessive indulgence, lose their manliness, moral courage, and frankness of expression. They become secretive, and seek seclusion rather than exercise and sports in the open air with their companions. In these cases the mind becomes centred on the genital organs, and the effect is to debase the moral standard. Some of these boys after a time become depressed in mind by the knowledge that they are victims of the indulgence in a secret habit. In perhaps the majority of instances, when the environments are favorable and the surrounding influences are in the right direction, the bad habit is discontinued and the whole *morale* of the boy undergoes a total change.

It is very probable that the emissions which occur from masturbation have little if any lowering effect upon the general health of the subject.¹ In very early years

¹ On this subject the words of my late friend, Dr. E. R. Palmer, are very expressive and just (A Contribution to the Physiology of Sexual Impotence, New York Medical Journal, July 2, 1892). Speaking of the impotence in the young who have practised masturbation, Dr. Palmer says:

"What, then, is this impotence of youth, for which we are so often consulted? Wherein lies the fault? Wherein is to be found the remedy? The fault rests largely in the common misconception with which the emission of semen is viewed by nearly every one, the medical profession included. The youth is taught that semen is a marvellous product, a thousandfold more precious than even blood itself; that a definite, an inflexible limit is placed by nature on man's capacity to produce it; that he is charged, so to speak, at birth with a limited amount of the precious fluid; and so, therefore, by the most natural logic of the case, he is led to believe that in the prodigality of his early solitary indulgences he has largely, if not wholly, expended his stock of this priceless fluid, until matrimony, with happy home and healthy family, is barred to him forever; so that, like the despairing soul at the gateway of Perdition, he lifts his eyes but to read above the doorway of his future: 'All hope they leave behind who enter here.' That such should not only be a popular doctrine, but should secure at any

the ejaculate is simply prostatic and urethral follicular mucus, and its loss *per se* is not serious. Later on true semen may be emitted, but in most cases the amount lost at each indulgence is very small indeed, and most commonly it is simply the secretion of the seminal vesicles and of the ampullæ.

In exceptional cases the bad habit is persisted in, and then more or less serious mischief is produced. Probably 2 per cent. of all cases seen at venereal clinics are those of young men who suffer from the results of masturbation. The first and most obvious bad result of masturbation is lowering of the moral standard, as we have already seen.

It is well to remember that in masturbators the normal sexual desire is absent and the orgasm is produced by artificial friction and by brain-effort, which results from libidinous thoughts. The natural stimulants to sexual desire are also absent, and the act is therefore forced and unnatural.

It must also be borne in mind that this act is committed by boys when the sexual apparatus is in a state of growth and development and when the sexual centre has not yet been thoroughly developed by time and

rate the tacit indorsement of our profession, is, to my mind, not only an egregious error, but a blunder unwarranted either by analogy or by fact.

"We see its teachings shown, not alone in the melancholy youth, but in the adult of middle life also, who not only exercises his will power to economize his stock, but bemoans the involuntary nocturnal pollution that results, as another precious charge futilely expended from his rapidly ebbing magazine of pleasure. It is like the dread of the Bogie man that, taught to the child in the nursery, leads him to fear the dark in later years, a false tradition that the sooner we get rid of the better. What an anomaly it would be in the eternal fitness of things if there should be a special law in nature thus confining that phase of life by which life itself is perpetuated! A curse, rather, and its conception in human philosophy is as irrational as it is untrue."

healthy processes. The growing prostate and the developing seminal vesicles and ampullæ are thus acted upon by abnormal stimulation and by actual nervous shocks. This naturally explains why excessive and prolonged masturbation in the young is more disastrous in its effects than it is in older subjects whose sexual sphere has attained full development without damage during youth.

The actual physical damage which results from masturbation occurs, therefore, in the sexual tract. The first morbid effect is hyperæmia of the bulbous urethra, which is soon transformed into true catarrhal inflammation. This morbid state creeps backward and involves first the mucous membrane of the prostatic urethra, the verumontanum, and the sinus pocularis, and may attack the prostatic tubules in part or in totality. Then, in bad cases the morbid process extends through the ejaculatory ducts and attacks the ampullæ and the seminal vesicles. Thus there is produced a low grade of catarrhal inflammation, which extends from the bulb backward to the seminal vesicles and tends to lower the tonus and resiliency of these parts.

In many cases there is more or less just complaint of relaxation and numbness or oversensitiveness of the scrotum and of a sense of softness of the testicles. Darkness of the skin of the penis, thickening of the mucous membrane of the prepuce, and density of the corpora cavernosa are found in many chronic masturbators.

Then, again, the unnatural orgasms act as damaging shocks upon the nervous system, which then becomes deranged in its totality, and as a result the whole economy is more or less thrown into an abnormal state. With the development of the lowered nervous condition, and as a result of the irritation transmitted backward

from the prostatic urethra, verumontanum, and prostate, the integrity of the sexual centre is disturbed, and it is thrown into a condition of excitation and of decided irritability and incompetence. All these sexual and mental disturbances result in a vast array of morbid symptoms, physical and psychical.

SYMPTOMS. In the first place, the function of urination is more or less impaired. Frequent micturition is very commonly complained of, and in many patients there is more or less mild incontinence or dribbling of urine after the act. In very bad cases, such is the hyperæmia of the mucous membrane of the bulbous and prostatic urethra that the passage of urine causes a severe scalding sensation (sometimes compared to the insertion of a hot iron in the canal), and toward the end of the act a more or less copious flow of blood. In some cases at the end of the act there is decided pain in the prostate, resulting from its physiological contraction. Examination of the affected portions of the urethra by means of the endoscope shows a thickened and inflamed condition of the mucous membrane, very often with marked swelling of the verumontanum and of the orifices of the sinus pocularis and of the ejaculatory ducts. In these cases the passage of goodly sized *bougies à boule* (24 to 30 French) causes great pain in the deep urethra, and very often a flow of blood.

When the finger is introduced into the rectum and the prostate is carefully explored, it is usually found that this organ is in part or in whole swollen and sensitive, and that pressure upon it causes the escape of mucus from the urethra. (See pp. 244 *et seq.*) If the examination is pushed further, it may be discovered that the ampullæ and seminal vesicles are tender and distended.

As a result of these lesions of the sexual organs and of the nervous disturbances there is usually more or less impairment of the sexual function. Such patients, when attempting coitus, find that they are sexually weak, although they may have normal desire. Their erections are either absent or incomplete, or, if normal, they last but a very short time. As a result, the power of intromission is more or less lost, and, when present, the performance of coitus ends in premature ejaculation. In some of these cases vigorous erections occur at times when the patient is not near a woman, but they fail utterly when in close proximity.

Such cases form a large contingent of the class designated under the title symptomatic impotence. (See p. 91.)

These patients are further tormented with nocturnal emissions, with or without erotic dreams, also with daytime pollutions, which may follow defecation or urination, or be caused by muscular efforts or by the simple presence of a woman.

The ill health which is developed in consequence of excessive masturbation may be expressed by the terms anæmia and neurasthenia. Neurasthenic masturbators never cease complaining of all forms of morbid symptoms. The following list taken down *verbatim* as it was rattled off by the patient may serve as a good specimen of these wails. He said he suffered from insomnia, pain in the head (occipital and frontal), in the eyes, back, down legs and feet, and in the body; felt nervous when he walked or worked; was more tired in the morning than at night, and felt mentally depressed; had frightened dreams at night; his memory was failing; had ringing of bells in his ears, and palpitation of the heart on the least exertion, and often suffered from

shortness of breath; fever flashes at night, and then he feels hot and feverish; has cold, clammy hands and feet; gets very dizzy if any one looks at him in both eyes, and has no appetite, and is troubled with constipation. He wound up by claiming that he had very sensitive and also numb spots and blotches over the whole body. Many cases are much less severe and the patients only complain of a few symptoms.

In more severe (and we may say desperate) cases the symptoms are more accentuated, the psychical condition is much worse, and marked hypochondriasis may develop. In some of these cases the mental condition of the patient is rendered infinitely worse by the persistency of the pollutions and the unceasing loss of erections and power of intromission.

In some cases in which masturbation has been moderately indulged in, and in which no permanent harm has been done to the patient, the recollection of the early transgression may cause want of confidence and timidity in attempting coitus. In such a case, though there may be one or two preliminary failures, the patient should not be discouraged, as success will come by repetition, especially if warm encouragement is given by the surgeon.

In later life the recollection of early indulgence in masturbation very often comes to a man's mind, and is wrongly considered the cause of sexual weakness, which is usually due to conditions which developed long afterward.

TREATMENT. Infants addicted to masturbation should be treated on a mechanical basis—that is, such measures and appliances should be adopted as will prevent the child from touching his genitals.

In young boys the indications are to break up the

habit as soon as possible. To this end much careful watching is necessary, and reprimand and good counsel should be judiciously used. It is always well, when this habit is suspected, not to allow the patient to sleep with another boy. In such cases the boy should not be kept closely at his studies, but should be encouraged to interest himself in sports and games and outdoor pastimes. It is not well to terrify these boys, since good, wholesome advice and kindly treatment, persuasion, and sympathy will do more toward breaking up the bad habit than fear and punishment will. In some bad cases, however, it may be necessary to apply every night an adjustable apparatus made out of tin or wire, like short drawers, which will cover over the genitals and buttocks and can be locked, so that the patient's hands cannot reach his penis. By this procedure much benefit may be produced.

In the cases of masturbators suffering from nervous, cerebral, and spinal diseases the central condition should receive most attention. Such cases, however, are very rarely benefited by any form of treatment.

Boys at and beyond puberty usually are afflicted, as we have seen, with diseases of the sexual apparatus, and these should receive especial attention in the way of careful and continuous local treatment.

The indications for general methodical treatment in boys and men are, as far as possible, to restore the health and to improve the moral tone of the patient. Such drugs as have a decided tonic action should be given, such as iron, quinine, strychnine, phosphorous preparations, arsenic, and perhaps the animal-extracts by injection. Bromide of potassium is sometimes beneficial when there is great erethism and to prevent pollutions. Belladonna, conium, gelsemium, cannabis indica,

piscidia erythrina, antipyrin, and hyoscyamus may also be used in these conditions. Sea and mountain air, cold baths, healthy outdoor sports should be advised, together with faradization and massage.

Such patients should eat good, wholesome food without much spicing; they should eat sparingly at night; should sleep on a hard mattress, with light covering, and in a cool, well-ventilated room. They should retire when they are tired and sleepy, and get up as soon as they awake in the morning.

SEXUAL EXCESSES.

To sexual excesses much more harm to the economy is attributed than the facts of the case really warrant. In many cases sexual excesses are committed by persons who previously had suffered from the effects of masturbation, and then the consequences may be severe.

Young men, particularly those newly married, are sometimes guilty of overindulgence in coitus, and as a result they may become debilitated or perhaps neurasthenic. But in these cases the passion is spasmodic, and it generally ceases with the loss of strength. Then, as a rule, moderation in sexual matters is observed, and the condition of the health receives proper attention, and in the end no permanent harm may be done to the system or the genital tract. The same remarks apply to overindulgence in young unmarried men.

It is well to remember that sexual capacity varies greatly in different individuals, and that what would be excess in one person may be considered by another to be about the average of normal indulgence.

As some men grow older they may indulge to excess sexually as well as with alcoholics, and as a result ill

health is induced. In these cases a general reform is usually followed by the restoration of health, if the patient is not also suffering from the physical effects of early masturbation. When, with the maturity of the man, the sexual apparatus and the nervous system are perfectly healthy, he, as a rule, can undergo, without permanent damage, severe and prolonged sexual and alcoholic indulgence, provided these excesses do not extend over too long a period. In these cases nature often shows remarkable powers of recuperation, and unless she is too severely overwrought she can, in time and by means of care on the part of the patient, efface the effects of overindulgence. The truth of this statement will be obvious to those who have seen many such cases, in which it seems remarkable that a man can retain his health and virility in spite of prolonged and excessive sexual and alcoholic indulgences.

In those cases in which men thus put a strain upon nature year after year, as time goes on sexual weakness may develop, and beyond the fortieth or fiftieth year they may become partially or wholly impotent. But in these cases there are often other factors in the decay besides those just mentioned. Such men may lead irregular lives, they may also tax their nervous system by engrossing projects and schemes which involve worry, doubt, and fear, so that in also every particular their course of life is unhygienic. It is natural, therefore, that in the resulting physical and mental unsoundness the sexual function should be more or less impaired.

Sexual excesses by means of bestial practices, especially *coitus ab ore*, in many instances lead to ill health, and in some cases to general paresis. But in these cases, as a rule, too much prominence, I think, is attributed to the sexual errors, and other damaging factors are

not fully considered. As a rule, men who thus over-indulge err in almost every direction of life. They are irregular in eating, drinking, and in going to bed, sit up late in stuffy rooms, playing cards and drinking, and they do nothing whatever in the way of hygienic reparation. It can readily be seen that under such conditions sexual excesses will ultimately lead to the man's downfall. But there is still another powerful factor at work in many of these cases—namely, chronic syphilis (in many cases there may be antecedent arterial or connective-tissue degeneration in the brain and cord)—the influence of which should be thoroughly borne in mind. According to my observation, the nervous and general breakdown of men which is commonly attributed to sexual excesses, and particularly to immoderate *coitus ab ore*, has as powerful contributory factors: first, a general unhygienic mode of life; second, alcoholic over-indulgence; and, third, chronic syphilis. It can readily be seen that excessive sexual strain in such individuals will inevitably lead to mental, and perhaps physical, decay.

TREATMENT. The first indication is to bring about a cessation of the excesses, and then to establish a condition of normal sexual hygiene. Whenever any part of the sexual tract is damaged it should receive careful topical treatment. Little can be done to cure men suffering from nervous decay from the causes just mentioned.

CHAPTER XX.

SPERMATORRHŒA.

IN the light of our present knowledge of the morbid conditions of the prostate, deferential ampullations, and seminal vesicles and chronic urethral inflammation, the subject termed spermatorrhœa can be lucidly elaborated in a few pages, whereas in the past, when the scope and exact nature of this symptom were not clearly known, many pages and even volumes were required to tell what we really did not know. In the past spermatorrhœa has been the bugbear alike to the layman and the surgeon, while to-day the term itself is a misnomer as applied to most cases, and when used in any connection it is unprecise and unscientific.

As has already been shown in the chapters on Chronic Prostatitis and on Masturbation, the abnormal discharges observed in cases belonging to these categories are, as a rule, not of seminal fluid, but of a morbid prostatic mucus with, perhaps, a few zoösperms. Patients who have masturbated excessively in youth, and who have damaged their prostates, ejaculatory ducts, and the seminal vesicles, fall into a condition of ill health, in which hypochondriasis and neurasthenia are prominent symptoms. The physical and moral tone of these individuals is very much lowered; their thoughts are centred on the genital organs during the day, and they dream of erotic subjects at night. In this mild state of moral degradation the whole economy seems to go wrong, and such patients complain without ceasing of

an infinitude of morbid symptoms. They talk and reason, as a rule, in a prolix and incoherent manner, and are, day by day, thrown into a condition of panic by the escape of a small amount of prostatic mucus, which they speak of as seminal fluid, the loss of which they regard as so serious and so devitalizing to their health. Now, these cases may be summed up in the following way: First, young men who, as a result of masturbation and perhaps gonorrhœa, notice after urination, defecation, or hard labor, and in their sleep, the escape of a fluid which comes from the prostate. Second, cases in the same condition, plus a little discharge, due to relaxation from chronic inflammation of the ejaculatory ducts, the ampullations, and the seminal vesicles. Third, older men, in whom gonorrhœa and sexual excesses have reacted on all the seminal parts, and who, spontaneously or in urination, or at stool, or in excesses, notice a quite copious secretion, which consists, in some cases, of prostatic mucus (see p. 254), and also of the secretions of the seminal vesicles and of the ampullations. In these three categories may be included all the cases to which the term spermatorrhœa may in any way be applied. As we shall see a little further on, more or less perfected seminal fluid may escape in some individuals, but the underlying conditions are not those of disease.

The so-called pollutions and emissions of chronic masturbators are, as a rule, grossly exaggerated as to their copiousness and frequency of occurrence. These patients come to the surgeon with a sorry story of the great extent of their seminal losses. The truth is that in most cases the morbid mucus which escapes during the day or night is very small in quantity. Sometimes it consists of only a few drops, and rarely, if ever, amounts to half a teaspoonful. The tendency to mor-

bidly exaggerate these so-called seminal losses is so prevalent that the truth can hardly be obtained by the surgeon. I have for several years investigated this subject under varying conditions of difficulty, and I have reached the conclusion already stated.

To my mind, the terms defecation- and urination-spermatorrhœa are unscientific and unnecessary, and they do harm by reason of their ominous significance. The real facts are that certain mechanical conditions (the chief of which is abdominal pressure) cause a little morbid mucus to escape from a damaged prostate, or in consequence of a relaxed condition of the seminal parts above.

In like manner, I think that that ill-sounding term pollutions is a sort of a pathological scarecrow. These, for the time, unbalanced boys and men have in their prostates and deep seminal parts a focus of irritation which may during sleep disturb the sexual centre, already in a condition of erethism, and this disturbance reacts in its turn badly on the unstable nervous system. The erotic dreams that are so much written and talked about are merely the results of a damaged sexual sphere and a general nervous depression. What is needed in the management of these cases is the recognition of the morbid condition of the sexual organs, and when a correct diagnosis of the case has been made there is no necessity for refinement and elaboration in the details of unpleasant symptoms the importance of which is always unduly magnified. Most of these cases are much troubled about their loss of manhood (and quacks foster this idea), and they are really made worse by the perusal of the ordinary treatises on spermatorrhœa, with their unsavory symptom-complex. My experience has taught me that a great step is gained if by scientific

methods we can demonstrate to these worried individuals that they are deceiving themselves as to the quantity of morbid mucus lost, and that spermatozoa are not commonly found in it, and, if found, only in small quantities.

With our more precise knowledge as to the nature of these cases, and our more practical methods of treating them, we shall, no doubt, as time goes on, see less chronicity of their course, and very much less of the resulting mental depression and lowered health.

Many continent men notice at times, owing to abdominal pressure or severe exercise or straining, the escape of a mucoid fluid from the meatus. In many instances this secretion is simply prostatic mucus, and in others it comes from the ampullations and seminal vesicles. This condition is a very simple one, being only the partial removal of a plethora. When it occurs frequently it may, in nervous individuals, cause anxiety and dread, but it speedily ceases with the adoption of a rational sexual hygiene.

A large amount of loose statement and exaggeration has been made regarding nocturnal pollutions and their supposedly disastrous effects. The pollutions of young or older masturbators are, as we have seen, the complex outcome of sexual damage, and spinal cord and general cerebral depression and weakness. Now, it is obvious that in healthy men these conditions do not exist, therefore the occurrence of an occasional emission is not followed by harmful results. According to my experience, most men who have these emissions seek and obtain the remedy in coitus. Some men, of a timid and nervous temperament, however, who have moral scruples, will not indulge in sexual intercourse, and, in somewhat exceptional cases, their genital centre becomes irritated

and the general health lowered. These cases, however, are not very numerous, and by proper advice can be benefited and cured.

It is impossible to say what number and what frequency of emissions may occur without damage to the individual, since some men are sexually vigorous and others are the reverse. I have known many men to have several emissions a week for a long time, and yet their health was not at all affected; whereas in others I have seen one such discharge in a week, or ten days, or less, followed by mental depression and physical debility. When a man is mentally and physically strong and vigorous, and is up and about in a lively way, a few and perhaps many nightly ejaculations will do him no harm. But a weakly, neuropathic man with a worrying tendency, who shuns society and does not indulge in healthy exercise, may become much reduced. In these particular cases, however, the mind, by dwelling on the seminal loss and the portent of possible impotence, is the chief factor of ill health. In all cases it is important to establish a wholesome state of sexual hygiene.

IMAGINARY SPERMATORRHŒA.

Many young men who have indulged even moderately in masturbation imagine in subsequent years that, as a result of their former habit, they are then suffering from spermatorrhœa. This idea is mendaciously set forth in the pamphlets of, and in personal interviews with, advertising quacks, and it causes in many patients much worry and anxiety. Some of these patients have no symptoms except those they conjure up in their minds, while in others some slight deviation from a normal condition is magnified into a serious evil.

In most men in periods of sexual excitement a perfectly clear, viscid mucus escapes in small or large quantity from the meatus. It is the secretion of Cowper's glands and of the urethral follicles; therefore, is perfectly normal in every respect. After dalliance with women men notice this secretion, and some become much alarmed, as they think they are losing semen. In young and strong courting men (when the engagement is rather long and the mutual affection between lover and *fiancée* is very intense) sexual excitement in the male is often so great and this Cowper's gland secretion occurs so constantly and so copiously that much disquietude of mind is felt by them. Some men even become hypochondriacal and neurasthenic. The trouble in these cases is that the excitement cannot be allayed by coitus. It cannot be too clearly understood that this condition is a perfectly harmless one, and that it will cease at once when marital relations are established. This condition is called *urethrorrhœa ex libidine*. In some cases this secretion escapes during erections at night.

Some patients, having recovered from gonorrhœa, may see for a time a little harmless, clear mucus within the meatus, and others who have not had gonorrhœa may see the same. They run to the surgeon, milk out with more or less firm squeezing a little secretion, and then look the picture of woe, and claim that they are losing their manhood. In other cases the declining and scanty gonorrhœal secretion which escapes from the urethra, or the few threads which yet may be seen in the urine, are looked upon by many as loss of semen, and they are more or less unhappy. During the condition of involution which occurs after the subsidence of con-

gestion of the prostate a little harmless prostatic mucus may escape from the urethra, particularly after defecation, and this may by some be looked upon as a sign of evil omen.

Nervous and worried patients bring to the surgeon specimens of urine which they erroneously think contain spermatozoa.

Some overworked and neurotic young men who may not have a full, liberal diet, and who eat a preponderance of vegetables, not infrequently bring to the surgeon specimens of slightly acid urine of low specific gravity, which has a peculiar opaque color bordering on a milky tint. The constant passage of this phosphatic urine, and perhaps the thought that in boyhood he had masturbated, result in convincing the patient that he is losing seminal fluid. Others become likewise worried about the presence of urates in their urine. Quacks find these individuals pliant and oft-returning victims. In these cases it is important for the surgeon to remember that a condition of lowered health may exist, and that in some instances these patients are somewhat neurasthenic. The most convincing evidence for such individuals is the addition in their presence of a little acetic acid to the urine, which, if it contains much earthy phosphates, is rapidly rendered clear, and if it also contains carbonates, there is an additional marked effervescence. This little chemical test, together with wholesome advice and tonic treatment, will soon put these patients in a better state of mind, and then under favorable circumstances the health may be restored.

Horseback-riding, cycling, and severe jolting may sometimes cause the escape of a little prostatic mucus

or of the secretion of the seminal vesicles. In some cases the fluid seems to come from Cowper's glands. As a rule, these little discharges cause no worry to healthy and vigorous men; but nervous, worrying, and neurasthenic individuals may be very much troubled in mind.

CHAPTER XXI.

VARICOCELE.

VARICOCELE is that varicose condition of the spermatic veins by which a localized or generalized swelling of the scrotum is produced.

As a rule, when the tumor is small it is a simple, painless affection; but when the swelling is large it may cause sensations of dragging weight which extend to the parts beyond, and are more severe in hot weather and after bodily exertion. In some cases there is a dull, aching, intermittent pain; in others the pain is sharp and crampy.

To the eye and to digital examination varicocoele reveals itself (1) as an elongated, diffuse swelling, which extends from the external abdominal ring down to the testicle, and is larger higher up than lower down; (2) as a diffuse tumor surrounding the testicle, particularly its upper part, and extending half-way up to the external abdominal ring, and (3) as a goodly sized tumor just below the ring and extending half-way down to the testis.

When a varicocoele is palpated a sensation is conveyed to the fingers like that of a mass of earthworms, and this simile is sometimes rendered all the more striking by the contraction of the cremaster muscle. Very often the scrotum is lax and dependent, and in its walls tortuous, flaccid veins can be distinctly seen. (See Fig. 58.) Under the influence of cold the scrotum and its varicocoele contract materially, while heat and excitation tend to produce laxity and elongation of the parts.

Varicocele is mostly observed on the left side of the scrotum; exceptionally it is found on both sides.

The causes of varicocele are: the entrance of the left spermatic at right-angles into the corresponding renal vein, pressure on the spermatic vein by rectal and intestinal distention, and by tumors in the groin and within the abdomen. Incompetence of the cremaster muscle may act as a contributory cause.

FIG. 58.



Varicocele and varicose enlargement of the veins of scrotal walls.

Although in former years it was claimed that varicocele was the direct cause of atrophy of the testis, this view to-day has few supporters. The truth of the

matter is that, as a result of varicocele, there is usually at the time of testicular increase in the years preceding puberty an arrest of development. As a result, we find small, soft, and sometimes quite insensitive testes, which are ill fitted to produce spermatozoa. It is very probable that, owing to the disturbance in the circulation of the organ by the backward pressure of the blood, its spermatogenic function is interfered with and perhaps held in abeyance. The organ is not necessarily sterile; with the removal of the varicocele by operation the nutrition of the testis will become re-established, the organ will grow in size and firmness, and its function will soon be restored. I have seen this result so often, and there are so many well-attested reported cases in proof of the statement here ventured, that I make it without hesitation or reserve. In all probability, in those cases in which atrophy of the testis has been found associated with varicocele of the same side, the mischief has been produced by some antecedent cause, such as hereditary syphilis, gonorrhœa (which is found even in infants and young children), tuberculosis, or traumatisms. In many reported cases of atrophy of the testis there is evidence of want of thorough clinical investigation, and the impression left on one's mind is that the surgeon jumped to the conclusion that the varicocele was the morbid factor. Some authorities, however, are willing to admit that very exceptionally atrophy of the testis may result from uncomplicated varicocele.

In most cases varicocele causes its bearer very little, if any, mental disturbance. This is the case usually in subjects who are mentally and physically in good condition, and who are not addicted to masturbation. In weakly, lascivious, and neurotic subjects this condition

of the spermatic veins causes a state of mind which is to be described presently. I have several times observed that when in excellent health subjects having varicocele gave themselves no concern regarding the affection, and that in a state of debility and worry from business or other troubles their minds became fixed on the scrotal tumor, and they gave way to apprehension and anxiety.

There is no evidence at hand to prove the contention that varicocele is a result of masturbation. The occurrence of the venous anomaly in the persons of confirmed masturbators is no proof that the deformity was produced by this bad habit. When boys or men have been addicted to masturbation the development and detection of varicocele sometimes cause in their minds much disquietude, and even worry, and they often very wrongfully associate the two as effect and cause. Indeed, the reverse of what is generally believed is true. The irritation of the varicocele and the condition of disturbed nutrition in the testis lead to much sexual irritation and increased desire, and as a result of these the patient may fall into the bad habits of masturbation and other depraved practices. This erethism of the sexual parts occurs at a very bad time for the patient—namely, when he is in the process of evolution from the condition of the child to the maturity of puberty, at which time his sexual apparatus is vigorously growing and when his inclinations to coitus are beginning to be felt very keenly. As the habit of masturbation increases an irritative hyperæmia develops in the prostate, ejaculatory ducts, and perhaps as far back as the seminal vesicles and deferential ampullations. This syndrome of morbid conditions then further includes pollutions and abnormal seminal discharges. Thus, beginning in local testicular irritation, the whole sexual apparatus may be thrown

into a seriously morbid state by reason of the masturbation and the disturbed mental condition which ensues. Many of these patients become much worried and depressed, while others become very melancholic, and some even show evidences of mild monomania.

In young men who are engaged to be married, and who pass much time in the society of their *fiancées*, sexual erethism may be so severe and protracted that the mind or the health of the individual may be somewhat disturbed. These young men come to the surgeon complaining of a sense of weight, fulness, or even of pain in the spermatic veins. If there is a moderate or pronounced varicocele present, the patient may give himself up so much to worry and anxiety that his life becomes a burden. These patients are prone to think that impotence is impending, and that they will be unable to consummate matrimony. If in this unhappy state of mind nightly emissions occur, or if, when in the presence of their *fiancées*, a glycerin-like mucus (*urethrorrhœa ex libidine*) escapes from the meatus, their cup of woe becomes filled to the brim. Yet in these cases the mental condition is really their only source of danger, since the physical condition can be relieved. Plain, sensible, kindly advice and a little treatment usually bring these patients out of their sorrowful position. In some instances the moral effect of removal by operation of the varicocele is most gratifying.

The simple existence of a very small varicocele in some patients causes much depression and dejection, and in some well-marked neurasthenia, such as we see in subjects who imagine that they have some deep-seated sexual disorder or some undefined or undefinable rectal trouble.

Then, again, the presence of varicocele so operates on

the minds of some patients that they imagine they are impotent, and this state leads to no end of worry and dejection. In this frame of mind they may try to indulge in sexual intercourse, and they usually fail signally. As a result, such patients become almost unalterably convinced that they are impotent, and their distress of mind and general unhealthy, cachectic, and woe-begone appearance really make them pitiable objects. This state of mind is very often further increased by the base misrepresentations of quacks. Patients in this deplorable state require very careful management. They should, first of all, be assured that the impotence is only temporary, and that it is largely due to their unbalanced state of mind. Then proper attention should be given to their general health, to their sexual hygiene, and also to their local disturbances.

TREATMENT. For the less developed class of cases cold-water affusions, used night and morning, and a nicely fitting suspensory bandage worn during the day, will give the patient comfort and contentment.

When radical measures are necessary the open operation, with ligation and ablation of the venous mass, is by all means to be commended, since it always produces beneficial results. In some cases subcutaneous ligation may be practised. In all cases of varicocele the condition of the patient's mind must be taken into consideration. In such cases good, kindly, reassuring advice, with the regulation, as far as possible, of sexual hygiene and coitus, will bring back health and gladness to the sufferer.

The radical cure of varicocele can be effected by a number of surgical procedures, many of which are complicated and attended with difficult after-treatment, and need not be mentioned.

The two operations now mostly employed are Howse's operation for excision, and its modification by Bennett. Subcutaneous ligation of the veins is often useful in the milder form of cases. The results of the open operation are conspicuously and uniformly good. The parts are so clearly exposed, the ligatures can be applied with such precision, and there is so much simplicity about the operation that it cannot be commended too highly.

It is necessary to remember that the veins to be excised are those of the pampiniform plexus, which are surrounded by a well-defined connective-tissue sheath. These spermatic veins lie well in front, while the vas deferens with its artery and veins are further backward and inward in the scrotum. If the testis is carefully pulled downward, the vas is put on the stretch, and it can easily be felt, it being hard and firm like a whipcord. The vas and the deferential artery and veins should be carefully avoided. Only by gross carelessness will they be included in the ligation of the veins. In that event there may be sloughing of the testicle from want of blood-supply.

EXCISION OF THE SPERMATIC VEINS. The patient is properly prepared for the operation and placed under the influence of ether. The hairs of the abdomen and genitals must be thoroughly shaved off, and the parts—the scrotum especially—well washed with soap and water, then with alcohol and ether, and then with bichloride solution (1 : 2000). An assistant holds the testicle firmly and draws it horizontally downward between the thighs. The parts are then tense, the veins can be distinctly felt, and under them the vas is very perceptible. An incision is then made for an inch and a half in the longitudinal direction and over the prominence of the veins. The edges of the wound are then separated by retractors,

and the coverings of the cord are carefully dissected until the sheath of the veins comes into view. It presents a shining, whitish-gray color, through which the purple veins are seen. This sheath of the pampiniform plexus, which must not be cut into, is then isolated with the knife, aided by the fingers, and then the ligatures, of good, strong catgut, are to be applied by means of an eyed probe or aneurism-needle about an inch and a half apart, in which case a longer incision is necessary. The lower ligature is tied first, and then the upper one. The vessels are then cut with scissors about a quarter of an inch from the ligatures. The wound-cavity is then copiously irrigated, and put on the stretch, so as to bring the two edges of the scrotum in coaptation. This can be done with the fingers or by means of two blunt hooks, one at each end of the wound. Five or six, or perhaps more, catgut sutures are now applied, thus firmly fixing the parts. A small opening in the dependent part of the wound is left for drainage. Usually no drainage-tube is necessary. The continuous suture may also be used.

Bennett's modification of the foregoing operation is the one I now most commonly employ, since its results are so uniformly satisfactory. I can do no better than quote Mr. Bennett's words. He says: "The precise extent of the varicocele which it is desirable to resect in any given case is best determined by placing the patient in the standing position and roughly estimating with the eye—or, better, by measuring with a tape—the degree of elongation of the cord; for instance, should the testis be three inches lower than normal, then certainly not less than three inches of veins should be included between the two ligatures, as it will be desirable to excise at least two inches and a half." Bennett dissects

down to the sheath of the fascia, which he also says should not be opened; then he passes his two ligatures, ties, and leaves them quite long. Then he cuts out the segment of the veins included between the ligatures. "The cut-ends of the stumps left by the division of the varicocele are then brought together and retained in permanent apposition by knotting the ends of the upper ligature to those of the lower, thus at once raising the testis to about its natural level. The ligatured ends are cut off quite short."

Then, after the operation, the wound is dusted with iodoform and bandaged with absorbent cotton and gauze. The first dressing may remain on for several days. Perfect healing usually occurs as early as seven and as late as ten or twelve days; very rarely is it delayed longer. At first a callous mass will be felt at the point of juncture of the ends of the veins. This will gradually be absorbed, and in the end a little firm nodule will be felt. It is well to cause the patient to wear a suspensory bandage for a short time after any of the radical operations for varicocele.

SUBCUTANEOUS LIGATURE. It is needless to describe the operations by the use of wire, which sloughs out and leaves the veins occluded, since to-day they are practically obsolete. This method is looked upon by most surgeons as unsatisfactory, particularly by reason of the want of certainty as to just what is ligated, and of the chance that some veins may escape, in which event recrudescence would in all probability occur. On this subject I think that Bennett's contention is forcible. He says: "Speaking generally of the subcutaneous plan, it seems to me that in the present condition of surgery there is a singular anomaly in performing under cover of the skin—that is to say, out of sight,

and therefore necessarily wanting in exactness and certainty—an operation which by the open method may be carried out with absolute precision, with what I believe to be no unavoidable risk, and with greater certainty in result.”

SUBCUTANEOUS LIGATION OF VARICOCELE.

The scrotum, being shaved, is rendered surgically clean in the usual manner, the patient standing with legs apart before the surgeon and beside an operating-table, on which he is placed as soon as he begins to feel faint. The dilated veins are now thoroughly separated

FIG. 59.



Varicocele needle.

from the vas deferens by the thumb and forefinger of the left hand, the veins occupying the outer and the vas the inner half of the tense scrotum, which is transfixed from before backward between the veins and vas with Reverdin's needle threaded with a stout, twisted silk ligature about twelve inches in length. As the eye of the needle emerges from the posterior scrotal wall it is unthreaded and allowed to hang down, the empty needle being pulled back until its point is just within the anterior puncture, when it is passed beneath the dartos, around the outer side of the veins, and made to emerge from the posterior puncture, when it is re-threaded with the ligature there, which it carries back and out of the anterior puncture. The dilated veins are thus surrounded by the silk, which is then firmly tied, the ends

cut short, and the knot allowed to sink into the tissues through the opening made by the needle. One, two, or even three, of these ligatures may be employed, according to the size and extent of the varicocele.

The usual dressings are applied, and the patient should be kept in bed for several days.

CHAPTER XXII.

SEXUAL WORRY AND HYPOCHONDRIASIS AND SEXUAL NEURASTHENIA.

SEXUAL WORRY.

MANY individuals become worried about the condition and the function of their genital apparatus, or of some part of it, while others become possessed of a groundless, morbid fear of some abnormal state or disease of these parts which does not really exist. In the majority of cases men or boys of average or marked intelligence, not knowing exactly what is normal, complain of simple, harmless conditions or of appearances which they think may lead to something more or less dangerous to the function of the parts. As a rule, cases of this category are simply instances of sexual worry, which may be more or less acute and prolonged, but rarely present a formidable condition. On the other hand, some individuals become really sexually hypochondriacal, and fall into a morbid state of the mind.

In the category of sexual worry there is an infinitude of complaints. A man consults the surgeon because one testis hangs lower than the other, and he fears ill consequences may result. Another convinces himself that his penis is too small, or that his testes are ill developed, and that he may not be able to indulge in coitus. Such slight affections as simple red spots (perhaps microbial invasion) on the glans and scrotum sometimes send a man post-haste to the surgeon, thinking that

something very bad has happened. The normal redness of the meatus is not uncommonly the cause of much mental uneasiness. Then, again, the smegma, natural to the prepuce, may be regarded as an evidence of disease for which a man may anxiously seek treatment. One of the most persistent victims of sexual worry that I have ever seen was a robust young man in whose coronal sulcus a few little crypts, not as large as the head of a pin, caused by the invagination of the mucous membrane, were to be seen. Notwithstanding that the man was told impressively several times that his penis was in perfect condition, his worry caused him to come back a number of times a year for several years, in order to obtain fresh reassurance that he was all right.

It sometimes happens that the coronal collar or expansion of the glans penis possesses a deeper hue than normal, even a deep red color, and that sometimes the part appears minutely papillated. I have several times had this condition shown to me by men in an anxious state of mind, and in some a deep-rooted fear of ulterior cancerous development was entertained.

A phimotic condition of the prepuce, moderate or well developed, is a not uncommon cause of worry, and mild or severe balanoposthitis has, in my experience, several times been the cause of much anguish of mind.

Some men become worried because they find their scrotum studded with many little, harmless, unchangeable milia (those little white papillations which are so common), and it was difficult in some instances to comfort them. One man who had several small wens seated in the scrotal tissues was firmly convinced that his spermatogenic function was entirely out of order, and that these tumors were evidences of a vicarious activity which might lead to sterility. Notwithstanding the

absurdity of this assumption, it required several interviews to convince the man that he had nothing but little harmless tumors.

Some men come to the surgeon complaining that their meatus is unnatural; in some, from their standpoint, its lips are too flaring and the orifice is too patulous; in others the lips are naturally in close coaptation, and that must be wrong. I have seen many instances in which sensible men have worried over these absolutely normal conditions.

Eczema and psoriasis of the penis very often induce a worried condition of mind, and much apprehension has been entertained by many regarding signs of eczema marginatum of the thighs, crural fold, and scrotum. Simple perspiration at the peno-scrotal angle and in the crural fold has caused many men to think that their sexual apparatus was entirely out of gear.

Minute spots or patches of pigmentation about the genitals cause in the minds of some individuals much uneasiness, and the discovery of small superficial nævi of recent growth has sent the bearer to the surgeon in a condition of panic.

Strange to say, the equanimity of patients suffering from hydrocele, even when the tumor is large, is very rarely, indeed even moderately disturbed; whereas varicocele may cause such worry that a hypochondriacal or neurasthenic condition may result. (See Chapter XXI.)

Strange as it may seem, many men, particularly young and healthy ones, become thoroughly convinced that they are suffering or have suffered from gonorrhœa, although they have never presented any symptoms of that infection. These men are usually old masturbators or sensitive men who are continent for long periods. They express by diligent efforts a little

clear mucus from the meatus, and offer that as undoubted evidence of the correctness of their statements. These patients very often assert that they experience vague, dull pains in the region of the pubis and in the course of the pendulous urethra. Pain at the end of the penis is also frequently complained of by them, and it causes them much worry. Such patients are prone to fall into the hands of quacks, who usually put them through a fearful ordeal in the way of cutting operations, sounds, and injections. I have seen several cases in which these patients had been under the care of regular but ignorant practitioners, who had proposed meatotomy and other wholly unnecessary and, to them, harmful procedures. If these patients are submitted to a careful urethral examination as well as a thorough examination of their urine, taken at different periods of the day, especially early in the morning, and they are found to be free from gonorrhœa, it is usually easy in one or two interviews to convince them that they are only the victims of sexual worry. In such cases moderate coitus regularly indulged in is very beneficial, and, as a result, these men soon cease to complain of pains in the genitals.

Then, again, more or less pronounced worry may occur in cases of obstinate chronic urethritis. Such patients continually squeeze the glans penis from behind forward, to see whether they can produce a drop of secretion. They are on the lookout, bright and early, for the morning drop, and they freely provide themselves with glass vessels, into which they frequently urinate and then critically examine for urethral threads. In some cases this worry is so prolonged that a mild neurasthenic condition is produced.

Then, again, patients will come to the surgeon bring-

ing specimens of urine laden with phosphates and carbonates or urates, and claim that their sexual and urinary apparatuses are seriously out of order. If by a strange coincidence there is present any of the foregoing harmless structural conditions, if there is more or less imaginary pain felt in the testes, scrotum, penis, or inguinal or hypogastric region, the patient may fully convince himself that his health is in a very critical condition. Many of these cases fall very readily into the hands of quacks, by whose ignorance and rapacity they are often greatly injured and cruelly despoiled.

In all the foregoing cases the worry of mind results from some harmless condition or from some affection which is readily curable. The root of the trouble is that patients have gotten their minds fixed upon their genital organs, and for a time more or less constantly this thought dominates their existence. In many instances no effect on the health is produced; in others the mental and physical vigor are somewhat impaired; while in still others dyspepsia, mild sleeplessness, and moderate cachexia may supervene. As a rule, however, all these cases can be relieved, ameliorated, or cured by sensible, kindly advice and encouragement, or by well-directed treatment, local or systemic.

SEXUAL HYPOCHONDRIASIS.

In my experience true hypochondriasis, originating in some imaginary sexual disorder, is very rare. Perhaps the specialist in nervous diseases may see more of these cases than the genito-urinary surgeon does. In the cases I have seen the mental disturbance hinged on the early and vigorous practice of masturbation, on the memory of sexual excesses, or on the fixed thought

that an antecedent gonorrhœa had never been cured. In some cases there was an abidingly haunting religious fear that in sexual indulgence and excesses an unpardonable sin had been committed. In somewhat rare cases in continent men nocturnal emissions have led to a markedly hypochondriacal state of mind. In these hypochondriacal cases morbid fears are not uncommonly a marked symptom. These patients are always in a state of excitement and worry about their digestive organs, in which they claim vague radiating pain or a dull heaviness is present; about catching cold, and the weak, distressed, and painful state of their lungs, and about the atony and cold sensations, or tingling and pricking feelings, which are experienced in their genital organs. They imagine they are going to suffer or are suffering from softening of the brain, paresis, locomotor ataxia, or any disease which they hear of. In their recital of their imaginary ailments they are tediously prolix, and frequently enter into details which are really disgusting. They are most exacting, sometimes exasperating, in their requirements of the surgeon, and at each interview insist that a thorough physical examination be made of nearly every organ of the body, as well as of the secretions. They are often hypersensitive, and imagine that they are the objects of ridicule on the part of friends and others. They can apply their minds to no useful purpose, and they are incapable of well-directed physical effort.

SEXUAL NEURASTHENIA.

The term sexual neurasthenia is to-day widely employed in an indiscriminate manner as designating a large and heterogeneous class of cases in which there

is more or less ill health, together with some trouble, mild or severe, of the sexual apparatus. Too much latitude has been given to the use of this term, and very frequently the inquiry into the etiology of the cases designated as neurasthenic has been too superficial and of a routine character. There can be no doubt that certain sexual irregularities, excesses, and morbid states so weaken the nervous system that a serious condition of ill health is produced; but, on the other hand, this identical morbid state may be induced by other causes, which in their turn more or less directly lead to sexual debility.

Though the existence of neurasthenia as a definite morbid entity has been denied by some authorities, there can be no doubt that there exist many cases in which the symptoms of impairment of the nutrition of the nerve-centres and of their lowered function are sufficiently definite and common as to warrant the retention of this term in our nosology. While, therefore, neurasthenia cannot be called an absolutely well-defined disease, like diphtheria or tuberculosis, it may be considered a well-marked morbid condition, having a wealth of symptoms which are tolerably constant, and most of which are present in the majority of cases. The fact of the matter is, that when one has become fully acquainted with this weakly and irritable condition of the whole nervous system, blended with anæmia and chlorosis, its recognition is usually very easy.

The main causes of neurasthenia are severe mental and bodily strain, anxiety, worry, excitement, uncertainty of mind, and mental emotion of a depressing character. Certain morbid conditions, such as typhoid fever, malaria, syphilis, and influenza, may leave in their wake a state of the nervous system which this name properly

expresses. In this condition the drain on the nervous system required by the vital processes is so great that there is not at any time a reserve supply of nerve-force to call upon; hence it can readily be understood that sexual debility, inability, or apathy may soon develop. In this event, however, it is not correct to class such a case as one of sexual neurasthenia. The sexual debility is the result of the ill health, and not its cause. On the other hand, sexual excesses, unnatural prolongation of coitus, buccal coitus, conjugal onanism, or withdrawal, masturbation (particularly in men at or near middle life, also in younger subjects), and long-continued sexual erethism with unsatisfied desire, not infrequently induce a condition of ill health in which the classical symptoms of neurasthenia are present. Such cases, therefore, reasonably come under the category of sexual neurasthenia.

An important question in the etiology of neurasthenia now presents itself for consideration. We quite commonly see young or middle-aged men who have chronic anterior and posterior gonorrhœa, chronic prostatitis from masturbation or gonorrhœa, or chronic inflammation of the seminal vesicles and deferential ampullations, and even from imaginary or real rectal disease, who fall into such a condition of ill health with mental unrest and debility which no other term than neurasthenia will concisely express. In these cases the condition of the sexual apparatus seems to be the dominating influence in the long morbid chain, and the condition is strikingly one of marked sexual disorder. The question then presents itself: Are these cases primarily due to irritation which is reflected from the morbid area back to the genital centre, and from there to the spinal cord and brain, in which it sets up a condition of malnutrition? or are worry and morbid fears induced by the genital

trouble the cause of the mental and physical decay? These questions can only be partially answered by ingenious theories which may at will be elaborated in support of either contention. Seeing that we have no pathological facts and observations to guide us, the more rational course, to my mind, is to wait until, little by little, definite and scientific knowledge is acquired upon this very obscure subject.¹ One practical point, however, here suggests itself—namely, that in most of these cases relief of the local trouble is promptly followed by improvement of the mental and physical health of the patient. Such cases are typical instances of sexual neurasthenia.

SYMPTOMS. The onset of sexual neurasthenia is usually slow and insidious. The most common symptom is a dull, heavy feeling in the head (frontal or occipital), sometimes with a sense of constriction, which is worse in the morning. Such a patient, after a troubled night, awakes, unrefreshed, in very much the state of a man who had indulged to excess in alcohol the night before. Then the appetite becomes capricious, and it may be nearly lost. The digestive functions become labored and slow, and constipation is apt to result. At this time a marked change in the *morale* of the man can be noted. He is indisposed to perform his work, and has to force himself to keep up to his duties. His mind is

¹ The result of researches of Hodge (*Journal of Morphology*, 1892, vol. vi. p. 95) are very interesting as tending to throw some light on the pathology of neurasthenia. This observer found that prolonged electrical stimulation and fatigue produced in the brain-centres of certain animals and birds marked degenerative changes in the nuclei, cell-protoplasm, and cell-wall when present. These changes disappeared slowly under rest and quiet, and after a lapse of time the normal structure of the parts was re-established. Perhaps in neurasthenia the molecular nerve-changes are the underlying pathological causes.

less acute, his memory less accurate and may become very defective, and his disposition becomes altered. He angers easily, and any slight cause irritates and worries him. Troubles of any kind which in the normal state would be soon thrown off, are brooded over, and severe mental depression may follow. Then sleep becomes much more disturbed and unpleasant, and perhaps erotic dreams keep the patient in a restless state during the night. In the day the discomfort of the patient is very great, by reason of the weakness, the mental unrest, and the torpidity of the gastro-intestinal processes. In a short time the facies of the sufferer becomes much altered. A pallor with a dull, worried expression is often very noticeable, together with some or much emaciation of the face. In some cases these patients soon come to look like sickly or weakly old men. General loss of weight soon becomes noticeable, and adds another source of worry to the patient's mind. The foregoing description applies to very bad cases, and must not be considered as absolutely typical. Thus we see cases in which men seem to be a little anæmic or run down; others as if they were somewhat overworked, or too much confined indoors, or who do not have sufficient sleep. In none of the cases can the patient, from his appearance, be said to be really sick. Then, again, we see men who appear well-nourished, and who have a fairly good color in their faces, who surprise us by their wealth of neurasthenic symptoms. As a rule, however, the man carries in his face the stigmata of a nervous system the nutrition of which is very considerably impaired.

The tale of woe which sexual neurasthenics pour into the surgeon's ears or those of anyone else who will listen to them is almost endless and of infinite detail and

variety. They complain of vertigo, of dull pains in the head, spine, back, and legs, and insist that they have painful areas all over the body, especially over the trunk. They are graphic in their descriptions as to how hot and cold flashes dash and radiate all over the body, and as to the acuteness of certain pricking or itching sensations, or of a feeling as if water were flowing over their limbs. They also complain of cold feet and hands, which, when felt, present a disagreeable, clammy sensation. They perspire on slight exertion, suffer from local hyperidroses, and sometimes from a profuse general sweating which exhausts them greatly. In the recital of their cardiac and lung troubles they are very diffuse and insistent. They sometimes have a dull, heavy precordial sensation with a sense of suffocation, and sometimes of pain, reminding one of angina pectoris. Palpitations of the heart, with a frequent, thin, wiry, and irregular pulse, can very often be found by the surgeon. These patients sometimes claim that they suffer severely in their lungs. They somewhat uncommonly are attacked by such a sense of suffocation that asthma is simulated (*asthma sexuelle*). I have seen several cases in which there was much emaciation, and in which the patients so pertinaciously insisted that they had severe pains in the lungs and cough, together with night-sweats, that a suspicion of tuberculosis was for a time entertained.

In considering the foregoing rich but sad symptomatology in which the peace of mind and the health of the patient are so seriously disturbed, it can be readily seen that the victim is incapable of applying himself to any work, bodily or mental, and that all the enjoyments of life are lost to him. He becomes irritable and excitable, and is anything but an agreeable companion. To the

surgeon he is often a sore trial, and in his importunities for relief he taxes his patience and endurance to the utmost. In some bad cases I have observed an abiding spirit of marked ingratitude, notwithstanding the sufferers had received much kindly and patient attention, together with proper advice and treatment. Their ailments and sufferings and demands for relief are always poured forth into the surgeon's ears, and no attention is paid to his good offices previously extended.

The attempt has been made in the foregoing description to depict the severer class of cases of sexual neurasthenia. It must be remembered, however, that this disordered condition of the nervous system varies in different individuals. In some it is mild, and only a few of the clinical symptoms are present; in others the condition is more severe and the symptom-complex greater, while in the very severe cases the whole economy seems to be deranged.

The local or sexual symptoms are numerous, and have their origin in some part of the sexual tract. In some cases, when ill health brings back memories of early masturbation, and the patient begins to brood over the imaginary ill consequences or the sinfulness of the act, sexual symptoms seem to spring up as if by magic. Neuralgia of the testis or a heavy, distended condition of these glands is complained of. Darting or dull, heavy pains in the scrotum, groins, and urethra are said to be frequent and severe. The penis, testicles, and bladder seem to have lost their life, and desire for coitus is more or less absent. These patients complain that their genitals are cold or clammy or wet, and that they are certain that these organs are growing small or are withering up. Prostatic and bladder pains are also complained of. Coitus not being indulged in, emis-

sions, mostly nocturnal, with or without erections, occur, and become the source of great worry. Any escape of mucus from the urethra is looked upon as a dangerous omen, and convinces the patient that he is becoming devitalized. In the cases where there is tangible lesion of the sexual tract there may be a chronic urethral discharge, especially in the morning. There may be increased frequency in urination, and exceptionally post-mictional hæmaturia, pain in the glans penis at the end of the act, pain or burning sensations in the urethra and perineum, and deep in the pelvis from involvement of the ampullations of the vasa deferentia and seminal vesicles, or the pain may be referred to the rectum itself. (For further information on these subjects the reader is referred to the chapters on masturbation, on chronic posterior urethritis, chronic affections of the prostate, and inflammation of the seminal vesicles and of the deferential ampullations.)

DIAGNOSIS. In sexual neurasthenia the disorder in the sexual apparatus so dominates the patient's mind that if the surgeon is sufficiently familiar with the trouble he can readily make a diagnosis. In all cases it is very important to make one's mind perfectly clear as to whether the general morbid state had its origin in some imaginary or real sexual disorder, or whether in neurasthenia the man's mind became disordered as to the condition of his sexual apparatus and its function. When the sexual tract is the seat of morbid change a thorough, painstaking investigation should be instituted, in order to determine the location of the trouble, as well as its nature, extent, and severity. Upon the accuracy and fulness of this investigation the intelligent treatment of the case and its outcome largely depend.

I have seen several cases of sexual neurasthenia in

which the symptom-complex seemed to point to the existence of the opium- or cocaine-habit or to secret chronic alcoholism.

PROGNOSIS. In sexual neurasthenia, as a rule, a good prognosis may be given, since the disease, though chronic, does not lead to death. Such is the markedly beneficial effect produced on the mind by the relief of symptoms and the cure of morbid sexual conditions that the patient's health in general becomes appreciably better at once. In some neuropathic and hypochondriacal cases, and in some patients with an inherited unstable nervous system, sexual neurasthenia may be very persistent and a long period of time—months or years—may elapse before a cure is brought about. Such cases, however, are not very common, and recovery in most instances occurs in a few months or in less than a year. The return to vigorous health may be slow.

TREATMENT. In sexual neurasthenia, as we have seen, the *morale* of the patient is most improved when he experiences amelioration of his local symptoms. With this fact in mind, the surgeon should enter upon a mild and conservative course of treatment directed to the part of the urethral canal which is affected. It is important that heroic measures or new fads should not be used in these cases, and that exacerbation of the underlying chronic inflammation of the parts should not be induced. The patient watches the progress of the case with such tireless scrutiny, and is so easily depressed if matters do not run smoothly, that we cannot be too careful in the use of topical applications (see pp. 214 and 266) or of instruments. Very often these patients are importunate, and try to bully the surgeon into a change of treatment or to the adoption of more

stimulating applications. The course to pursue in such an event is to placate as far as possible, but not to resort to measures of doubtful value or those which may do even moderate harm.

The general management of a case requires much care and circumspection. The condition, disposition, and surroundings of the patient must be fully studied. Then a careful and grateful system of hygiene should be established. The patient should be kept quiet and at rest, and all cares and anxieties and obligations should, as much as possible, be kept from him. The condition of the stomach and bowels should receive much attention, and, if necessary, medication, to aid digestion and prevent constipation, should be sparingly administered. Pepsin, peptenzyme, bismuth, nux vomica, rhubarb and soda, pancrobilin pills, and mild aperients should be kept in mind and used as the occasion seems to demand. The food should be simple, bland, and nutritious, and should never be taken in too large quantities. Milk in abundance, if assimilated, is excellent, as also are rare red meats in moderation, with stale bread, rice, and hominy. Tea, coffee, and cocoa are, as a rule, harmful, and are liable to disagree with the patient or to make him more nervous.

The condition of the lungs and of the heart should be carefully watched and treated symptomatically. In all cases, however, drugs should be used sparingly, and their action should, as a rule, be regarded as secondary to the general system of management of the case. It is well to bear in mind strychnine, arsenic, iron, quinine, coca, preparations of phosphorus, the hypophosphites; but never to use them in a careless and routine manner. Alcoholic liquors in general are not beneficial, but a mild claret or Burgundy, or some pale ale or beer, may at

times, chiefly at meals, be of benefit if taken in limited quantity. The use of tobacco should be reduced to a minimum, and cigarette-smoking should be firmly interdicted.

In some cases the bromides, cautiously administered, have a very sedative effect. Much care should be exercised if a preparation of opium is used, lest addiction to the drug should be induced. Antipyrin, phenacetin, trional, and all heart-depressants should only be employed at certain urgent times.

It is well to keep these patients at rest and to aim at tranquillity of life. Sexual neurasthenics brood over their trouble so much, if left alone, that it is well that one or two compatible and companionable people should be with them. Bathing is of much benefit, particularly at the sea-shore, but care should be exercised that the temperature of the water be not too low. Then, again, fresh-water baths should not, as a rule, be too hot. Sponging the body and mild rubbing down with a rough towel are very beneficial. The faradic current (the slowly interrupted form) may produce good effects if administered in short daily *séances*. Massage carefully administered for short periods once or twice a day usually leads to sedation and, later on, invigoration. Change of scene and of air is of the highest importance in these cases. Sea-voyages, short or protracted, restful quiet in the mountains or in some pleasant country place, and camping out, offer sources of much relief, and often lead to marvellous improvement.

CHAPTER XXIII.

COITUS RESERVATUS VEL INTERRUPTUS; WITHDRAWAL, OR CONJUGAL ONANISM.

A NOT infrequent cause of ill-health and of well-marked neurasthenia, particularly in the male in youth and in middle age, but also in the female, is that unnatural method of coitus which among us is called conjugal onanism, or withdrawal, and by Germans, *coitus reservatus vel interruptus*. This harmful practice is mostly followed by well-to-do, refined, and educated people, and there is medical evidence at hand to prove that it is a rather widely spread custom, both in the married and the unmarried.

The main object of this mode of coitus is to prevent conception, and beyond that there are many underlying reasons and purposes. In some cases it is done without the woman's consent, and she, in her simplicity, thinks the method is proper. Between some men and women the arrangement for this procedure is deliberately made, while in some cases the man wishes it, and in others it is followed at the woman's instigation. The underlying motives are various: the wife or husband may not desire children; the wife may fear that pregnancy will spoil her beauty or ruin her good figure, or she may wish to avoid conception in order that she may not be removed from society's pleasures and obligations or from the various functions into which many women enter with much zeal and enthusiasm, such as church and parochial duties, charitable objects, literary and scientific clubs,

bicycle practice, etc. Then, again, painful and dangerous parturition, puerperal fever, puerperal eclampsia, post-partum dementia, and the ill-health of the wife are the reasons why pregnancy is often feared and unnaturally avoided; and, further, in illegitimate coitus the fear of conception causes the adoption of this procedure, which also may be followed for economical reasons. In many cases the absence of the fear of conception leads to too frequent coitus.

Most persons have no knowledge whatever of the harmfulness of this procedure.

It would be rash to say that this bad habit is invariably detrimental to the health of the man or the woman, since there is abundant evidence to prove that many men and women practise withdrawal for long periods without any perceptible discomfort or resulting deterioration of the health. Indeed, there is the widest variation in the effects of the habit. In some men it induces ill-health very promptly in a few months, or a year or more, while in others the practice may extend over several or many years before its baneful effects begin to show themselves.

The resulting harmful effects of withdrawal may be summed up under the head of neurasthenia, which varies very much in severity and duration in different cases. A perusal of three of my cases will give a good general idea of the harmful results of this practice.

CASE I. A man, aged twenty-nine, of excellent physical and nervous condition and with no previous damage to his sexual system, had practised coitus reservatus with his wife for three years. He then began to lose flesh, and became pallid, suffered from mild dyspepsia and constipation, and was restless, irritable, and despondent for trifling reasons. In this way he remained for nearly a

year, the various symptoms gradually becoming more pronounced. A sea voyage, a sojourn in Switzerland, and general tonic treatment, together with baths and electricity, produced scarcely any benefit. In my examination of this man I learned his sexual history. Under a general invigorating regimen, with the use of tonics and with sexual rest, this man became perfectly well in about two months.

Several years after he again fell into his bad habit, and experienced a mild relapse of his former symptoms. This time he was cured by sexual rest and outdoor life in the mountains. After both sicknesses there was decided sexual impotence, which in each instance gradually ceased and left the man in a perfectly virile condition.

CASE II. A man, aged forty-two, had in general enjoyed good health and was not in the least neuro-pathic. He had suffered at puberty from pollutions induced by masturbation, and when thirty-two years years old had suffered from chronic posterior urethritis. When thirty-six years old he married a strongly built, passionate young woman, and had with her practised withdrawal for six years. About five years after the commencement of this unnatural coitus he began to observe that his health was breaking down. He had been under the care of a number of physicians for about a year when he came to me. He then was thin, pallid, and sallow, and had an anxious facies. He complained of a multitude of ailments with incessant volubility. He slept badly, had bad dreams (sometimes erotic), awoke in the morning with a dull, heavy head, pain over eyes, and much vertigo. As the day wore on these symptoms became less marked. He was generally depressed in mind, and sometimes decidedly melan-

cholic. His memory was very defective, and so great was the physical and mental inertia that he could not attend to business or fix his mind for any length of time on a subject. There were general well-marked torpor of the stomach and intestines; frequent urination, with pain in the prostate at the end of the act; deep-seated pelvic pain, tenderness in the perineum, and a burning sensation at the anus were the symptoms referable to his sexual apparatus. His erections were weak, his ejaculations were feeble, and after difficult defecation a mass of mucus and pus escaped from the urethra. Examination showed that the posterior urethra was chronically inflamed and exquisitely tender, and that his prostate was much swollen in all tangible directions, and very sensitive to slight pressure, after which manipulation a worm-like plug of glairy gray mucus escaped from the meatus.

As a result of well-regulated sexual hygiene and local treatment to the prostate and posterior urethra, this man's health improved surprisingly, and he became in a few months perfectly well in all respects. In this case tonics and sea bathing acted as valuable adjuvants to the treatment of what at the start seemed a very unpromising case.

CASE III. A man, aged thirty-two, of fairly good physical structure, but whose nervous system was never vigorous, had suffered in early years from pollutions following long-continued masturbation, which he began when twelve years old. He recovered from the morbid condition, and remained in good general and sexual health for several years. When thirty years old he indulged frequently in coitus reservatus with an amorous mistress. In about a year he noticed that his health was impaired, and he sought relief in taking all kinds of

tonics, with no perceptible effect. When he came to me he presented a sorry appearance. He was pale, emaciated, and haggard, and his symptoms were legion. Utter weakness, loss of sleep, mental depression, lack of memory, gastro-intestinal inertia, palpitations, and profuse sweating at slight cause were the principal symptoms. He complained bitterly of great and paroxysmal oppression to his breath, with a dry cough and vague pains in his lungs. He was very nervous and the subject of an abiding unrest. He had pains in his head, all down the spine from the occiput to the sacrum, had a sense of constriction around the abdomen, painful spots over the thorax, and there was decided paræsthesia of the legs and forearms. On several occasions he had had attacks of severe cardialgia, which caused him much anxiety. He had imagined that he was suffering from pulmonary tuberculosis, or from incipient locomotor ataxia or paresis, and had consulted men experienced in lung-troubles, who found those organs healthy, and neurologists, who said that he was neurasthenic. Carefully directed treatment had failed to give him any relief. The recital of this exuberant symptom-complex convinced me that the man was suffering from the effects of coitus reservatus. This suspicion was confirmed by the patient, after much fencing and hesitation, on my examination. Discontinuance of the bad habit, and the establishment of proper sexual relations, together with change of air and tonics, did much to improve this man at once. His convalescence, however, was slow and sometimes halting, but to-day he is free from his symptoms and may be called a well man. Further transgressions, even for a limited time, would probably throw him back into his former condition.

These cases give a quite clear idea of the average

run of mild and severe forms of this morbid state which are not of very frequent occurrence.

At the risk of some slight repetition of what has already been said in the chapter on sexual neurasthenia, owing to the great importance of clearly understanding the effects of this bad habit, the category of its resulting morbid symptoms will be further dilated upon.

As a rule, the onset of this trouble is slow and insidious without any dominating symptom or symptoms pointing to the origin of the trouble. In the main, the early symptoms most commonly observed are weakness, more or less loss of flesh, and pallor, nervousness, irritability, unrest, dyspepsia, and constipation, together with a dull, heavy sensation in the head likened by many patients to the feelings experienced after alcoholic indulgence. These bad symptoms are worse in the morning, and in a measure wear off as the day progresses. In general the nervous debility and ill-humor increase, insomnia becomes persistent, and the patient becomes irritable at the slightest cause, despondent, morose, melancholy, and even monomaniacal. There are often observed failure of memory and such an apathetic condition of mind that the slightest exertion is shrunk from. In most cases there is lack of sexual vigor, and there may be even decided impotence. The performance of the sexual act is followed by much weakness and nervousness, together with a sleepy tendency instead of the normal vigor and alertness of mind.

In some cases nocturnal erections, erotic dreams, and pollutions are observed, particularly in those whose sexual apparatus has been damaged by excessive coitus, masturbation, or gonorrhœa.

The wearing-out of the nervous system which obtains in these cases shows itself in a large number of morbid

phenomena. In addition to the many head-symptoms already mentioned, in various cases we find evidence of faulty innervation in the cardialgia, palpitations, and rapid and small pulse, which are so frequent; in the shortness of breath and sense of suffocation (the so-called *asthma sexuelle*), which are such prominent but not common features; in the spinal pain, general or local (spinal irritation); in the painful spots and joints; in the numbness and the various *paræsthesiæ*; in the sense of constriction, resembling girdle-pain; in the excessive sweating, local or general, on very slight exertion; in the nervous contraction of the larynx and *œsophagus*, and in the general gastro-intestinal inertia. The symptoms referable to the sexual sphere may be slightly marked or obtrusively prominent; in mild cases, in which there had been no previous sexual disorder there may be simply an uneasy sensation in the penis—a feeling of moisture—together, perhaps, with relaxation of the scrotum. Neuralgia of the testes is not uncommon, and the pain may be dull, heavy or aching, or lancinating, or there may only be present a sense of distress and fulness in these glands.

In one of Peyer's¹ cases the pain in the testis was so severe that when it came on the man had to go to bed, or lie down on the spot on which he stood when he was attacked. There is also pain, deep and determinate, in the pelvis, in the groins, and in the lumbar and sacral regions, which is more or less constant. In some cases aching and burning pains are experienced in the perineum and anus. There also may be increased frequency in urination, with pain in the act, especially at its end,

¹ *Der Unvollständige Beischlaf, etc.*, Stuttgart, 1890.

and in the glans penis. In some cases mild hæmaturia has been observed.

In some cases there is a more or less constant state of erethism of the genitals, which has the effect of producing a desire for frequent coitus.

In nearly all cases erections are less firm and enduring than in the normal state, ejaculations are less vigorous, the seminal fluid generally escaping in a feeble stream or by drops.

The morbid effects of this unnatural mode of coitus produce in some women (but not in the majority) a condition of ill-health in which general debility, anæmia, and neurasthenia are the chief features. As a rule, women are not so profoundly affected as men are.

In young women of poor fibre and of neuropathic tendency withdrawal in coitus and precipitate ejaculation on the part of their male consorts sometimes give rise to distressing heart-symptoms. The evil effect of the incompleted sexual act may show itself simply in severe palpitation, which begins at once after the act and ends in a few minutes or several hours afterward. As the case grows worse the irritability of the heart becomes more distressing and is continually present. Then these women become depressed and irritable and very emotional. They suffer from headache, indigestion, constipation, weakness, and vertigo, and very frequently they have fainting-spells. Though the pulse is weak, soft, and accelerated, and not infrequently intermittent and arrhythmic, auscultation will reveal no structural lesion either in the heart or the vessels. All these morbid phenomena quickly disappear when the bad habit is avoided and normal intercourse is indulged in. Tonics and good general hygiene are valuable adjuvants in the manage-

ment of these cases. On this subject Kisch, of Prague, has recently published an interesting essay.¹

A general consideration of what takes place in coitus reservatus is now necessary in order that we may better understand the physical and psychical damage wrought by this habit. The excitation of both man and woman is in a great measure under restraint. What should be absolutely spontaneous and untrammelled in the way of desire and sensation becomes abnormal by reason of the mental process by which the act is interfered with at its most critical stage. On this point the words of Eulenberg² are really graphic. He says: "The natural energetic sexual act experiences from the beginning an essentially artificial change. The attention directed toward the postponement and prevention of the natural intravaginal ejaculation introduces an altogether heterogeneous arbitrary element in the process, which necessarily retards and harms the proper working of the automatic reflex mechanism. The slower and less energetic friction, the weaker sexual feeling, and the less complete and sudden dissolution of the sexual tension prevent the occurrence of such complete reaction as results from the natural ejaculation, by which, on account of the necessary energetic muscular action, a sudden emptying of the engorged bloodvessels of the genital apparatus results. The centripetal stimulus is set at naught, and through the disappearance of the central innervation the entire genital apparatus becomes suddenly and completely relaxed." In any case this act is

¹ Herzbeschwerden der Frauen verursacht durch den Cohabitation-act. München. med. Wochenschr., 1897, vol. xlv. p. 617.

² Ueber Coitus Reservatus als Ursache sexualer Neurasthenie bei Männern. Internat. Centralbl. für die Physiol. und Path. der Harn- und Sexual-Organen, 1893, vol. iv. pp. 3 et seq.

most unsatisfactory both to the man and the woman, neither of whom experiences the complacency of mind and the gratification which usually follow the proper performance of the sexual function.

It naturally follows from what has already been said that, in addition to the general condition of ill-health induced, coitus reservatus leads to more or less damage of the sexual apparatus. When a man has not previously suffered from chronic gonorrhœa or from the effects of masturbation, this bad habit produces a low grade of inflammation in the bulb of the urethra, in the posterior urethra, and in the prostatic follicles, and it may extend further and involve the ejaculatory ducts, the deferential ampullations, and the seminal vesicles. In any case an irritable, flabby, and atonic condition is induced which is unfavorable to the proper performance of coitus. When any of the above-mentioned parts has previously been the seat of chronic gonorrhœal inflammation, with its submucous infiltration and mucous membrane catarrhal condition, an intensification of the process is naturally induced. We have then, besides a damaged mind and body, a local and often deep-seated morbid state of the sexual apparatus.

In forming an estimate of these cases it is necessary to take into consideration the general bodily and mental condition of the patient, the condition of the genital apparatus, and the habits, obligations, and surroundings of the patient. Further, we must ascertain how long the habit has existed, and how frequently the sexual act has been performed. It is most important of all to determine the mental calibre of the patient, whether he is of a neuropathic tendency, either acquired or hereditary.

There can be no doubt, as maintained by Peyer, that

the results of coitus interruptus are variable, and that very many practise it without experiencing bad results. Some particularly strong men (mentally and physically) can with impunity indulge in normal coitus once or more daily for many years; others reach their limit with one or two indulgences a week, and still others cannot attain that degree of frequency without suffering from bodily or mental fatigue. In some cases of coitus interruptus a strong, well-balanced nervous system is largely responsible for the immunity which so many men enjoy. In many cases worry, mental excitement, and various dyscrasiæ are factors in the general breakdown of health. Ignorance of the baneful effects of this habit on the part of some patients, and feelings of modesty or shame in others, are the two principal causes of the difficulty of diagnosis of coitus reservatus. When, however, the attention of the profession is prominently directed to this habit and its symptom-complex is generally understood, inquiries directed to its existence will be adopted, and the truth will in all probability be revealed. Much difficulty is sometimes experienced in getting a true history from a patient, and the surgeon must exercise prudence and tact, and he must call to his aid all his acumen. Parenthetically, I may remark that several patients have bitterly resented the mock, religious, and sentimental interrogatories and admonitions to which they had been subjected by some surgeons. Several patients have remarked to me that they have gone for medical and surgical aid, and not for platitudinous moralizing.

There is one point which should always be borne in mind—namely, that most of these patients suffer from some or many symptoms referable to the sexual apparatus, and that inquiry directed to these parts may

reveal the existence of this bad habit. Therefore it is necessary to examine the morning urine for the presence of various tissue-elements, to carefully explore the urethra, especially its prostatic portion, and by digital examination in the rectum to ascertain the condition of the prostate, and, if possible, that of the deferential ampullations and of the seminal vesicles.

TREATMENT. In the mild form of ill-health, simple discontinuance of the habit may produce a prompt and encouraging effect, and general hygiene and tonics may also be of very much benefit.

In all cases, when necessary, proper and efficient treatment should be directed to the underlying urethral or seminal lesion, wherever it may be.

Relaxation from business cares, rest, and change of air are of much value. Tonics, nutritious diet, carefully regulated, not excessive, muscular exercise (gymnastics, bicycle, golf, walking, etc.) should also be ordered as the indications of the case may point. Electricity in some cases produces good results.

Whatever method of treatment is employed, it must be remembered that no benefit will result until the sexual life of the patient has been brought back to its normal condition and until the integrity of his sexual apparatus has been restored.

CHAPTER XXIV.

PRIAPISM AND SEXUAL ERETHISM.

PRIAPISM.

WHILE in the normal state erections last only a short time, in certain morbid conditions they are, on the contrary, of prolonged duration, and constitute a condition to which the term priapism is applied.

In cases of true priapism the erections are painful, persistent, and irreducible, and are unaccompanied by sexual desire. Much latitude has been accorded to the term priapism, since under it have been classed several orders of cases which really are only instances of slightly prolonged and moderately painful erection, due to an obvious cause. Conforming to usage, however, we may divide this affection into the following classes :

1. Priapism observed in infants and children, induced by reflex action in cases of long, tight, adherent prepuce, of stone in the bladder or prostatic urethra, and of worms in the rectum.

2. Priapism in adult subjects, symptomatic of stone in the bladder, stone in the prostatic urethra, stricture, cystitis, and observed during retention. In these cases the uneasy or painful sensation is felt in the glans penis, while the body of the organ usually is only moderately congested and sometimes curved downward or laterally. This condition disappears upon removal of the cause.

3. Priapism symptomatic of gonorrhœa, with perhaps

involvement of the corpus spongiosum and downward curvature. This condition is painful and transitory, and may occur several times during the night. In cases of downward curvature of the penis, due to inflammatory engorgement of the corpus spongiosum and spasm of the musculature of the urethra, the term *chor-dee* is applied.

4. Priapism due to ingestion of cantharides, which is a form that is seldom or never seen now, since this drug is so rarely used in medicine.

5. Essential priapism.

It is unnecessary here to consider the first four forms of so-called priapism, as it is merely an intercurrent symptom, usually of short duration, of well-known morbid or structural conditions, and, as a rule, is relieved by operation or medical treatment.

An attentive study of all reported cases, amplified by a considerable personal experience, has convinced me that we may divide essential priapism into four varieties:

1. Priapism caused by injury to the spinal cord (either high up or low down), and by blows or violence inflicted upon the perineum;

2. Priapism which is a symptom of cerebral or descending spinal-cord disease;

3. Priapism which occurs after alcoholic and sexual excesses; and

4. Priapism which comes on a person in ill health, in whom it is difficult to obtain data as to local injury and causation, and in which cases there is now a tendency to look upon leukæmia as the etiological factor.

Priapism after Spinal Injury.

In this form of priapism the traumatism has been found as high up as the cervical and as low down as

the lumbar and sacral regions. When the injury is in the cervical region it is probable that irritation of the nerves which pass down the cord to the sexual centre is the cause of the trouble, and that the priapism is due to excitation communicated to the erigentes. When the damage is inflicted low down it is probable that the sexual centre is so irritated that it is thrown into a state of chronic excitation which shows itself in the engorgement of the penis. In these cases, as a rule, there is not great distention of the organ, nor are the attendant symptoms of a marked character. Such patients usually complain little of the condition of the penis, and they have no sexual desire.

The course of these cases depends upon the extent and severity of the injury ; in some the integrity of the parts is restored and the priapism ceases, in others death occurs sooner or later.

Hunt¹ thinks that in the cases of traumatism of the spinal column and cord in which priapism is a symptom there has been injury to the sympathetic ganglia and nerves. He reports a case in which this lesion was found after death.

Priapism in Cerebral and Descending Spinal Disease.

The recorded cases of this variety of priapism are very few, and in most neurological writings this symptom is not much dwelt upon. In a case reported by Legros Clark² the patient, aged thirty, had suffered with hemicrania, during the violence of which he had several attacks of priapism. He also had pain in the lower part of the back, and in time became delirious, was attacked by epilepsy, became dull and stupid, and

¹ Medical News, Feb. 25, 1882.

² St. Thomas' Hospital Reports, 1887, N. S., vol. xvi. pp. 19 et seq.

died in coma. After death the liver and spleen were found to be enlarged, and there was congestion of the base of the brain. It is unfortunate that a minute microscopic examination of the brain and cord were not made in this case.

In Harwood's case¹ the man was twenty-eight years old, and was free from any disease. Following exposure to cold he had priapism and pains in his back, which gradually extended down his legs. He then complained of pain in the perineum and of a sensation as if he had a belt around his body. He died of cerebral symptoms, the priapism having lasted one hundred and sixteen days.

In this class belongs a peculiarly interesting case reported by Dukeman.² It was that of a man, aged thirty-five years, a fakir, who from early life had been a pronounced sexual pervert. He was anæmic, seemed to be laboring under severe mental depression, and practised hypnotism, in which art he was tolerably successful. No traces of spinal lesion could be found. For several years in the attacks, varying in duration between two and five months, this man suffered from priapism. He died of tuberculosis.

I have had two cases of spinal syphilis in which there were inco-ordination of the movement of the legs, girdle pain, and hyperæsthesia of the integument of the abdomen and back, in which mild priapism was a symptom, and which were cured by antisyphilitic treatment.

In the cases of locomotor ataxia and of sclerosis of the posterior columns of the cord in which priapism is observed, the symptom usually lasts during the early or middle stages, and ceases in the later periods.

¹ *Internat. Journ. of Surgery*, 1889, vol. ii. p. 7.

² *Pacific Medical Journal*, 1889, vol. xxxii. pp. 480 et seq.

Starr¹ reported the case of an ill-developed male, aged twenty-one years, who had lateral curvature of the spine and meningo-myelitis, who suffered from mild priapism for seven years.

Priapism due to Sexual and Alcoholic Excess.

The greater number of cases of priapism may be denominated alcoholico-erotic cases, since the trouble usually has its origin in a drunken sexual debauch. As a rule, the greater number of those who suffer from this form are young and vigorous men, although medical annals show that men in middle and advanced life furnish a moderate contingent.

The mode of onset in cases of erotic priapism differs. In some cases there is for a time increased frequency of erections, which are premonitory and last a few or many minutes; in others, after sexual intercourse, the rigidity of the penis remains and becomes persistent; while in still others the patient, on awakening from his debauch, finds that he is suffering from priapism. In most cases when the opportunity exists, these patients endeavor to relieve themselves by coitus, and they always fail. In exceptional cases orgasm and emission, without pleasurable sensations, occur; but, as a rule, there is no sexual desire, and ejaculation is not produced. In fact, it is stated that in several cases the suffering of the patient was materially increased.

During attacks of priapism the state of the penis has been found to present several variations in different cases. In its most severe form the organ becomes much enlarged, tense, and comparable to cartilage in

¹ New York Medical Journal, June 15, 1887, p. 75.

rigidity, and the seat of severe pain. The glans may be double in size, much distended, and glistening, as if it would burst. The corpora cavernosa are very dense and unyielding to pressure in their whole length, including their crura. The corpus spongiosum is likewise hard and swollen, and its bulbous expansion is in a similar condition.

In some cases the perineal muscles can be felt as dense fibrous bands, and the dorsal vein of the penis seems much distended and feels like a whipcord.

In many of these cases attentive examination reveals very painful spots or perhaps nodules in the corpora cavernosa, particularly toward their root or in the crura. Then, again, digital pressure on the bulb and over the perineal muscles may cause an agony of pain. Spasm of the cremaster muscles may be present, and the testes then are drawn forcibly up to the internal ring. This symptom may be wanting. In some cases there is pain in the lower part of the back and along the course of the spermatic cords. Redness and swelling of the prepuce may be observed as complications. As a rule, the integument of the penis retains its normal color.

In this pronounced condition the sufferings of the patient are very severe, and many authors apply the term atrocious to the pain which is seated in the virile organ. The patients fear the least touch of their linen or of the bedclothes, and jarring of the bed or heavy steps in the room cause them agonizing suffering. They draw up their legs upon the abdomen in order to protect the penis from the slightest touch. This organ may lie rigid against the abdomen, or it may be more or less erect and at a right angle with the body in the horizontal position. Very soon these patients become much worried and apprehensive, and their faces give

evidence of anxiety and suffering. In these cases urination may be accomplished either with little difficulty, or the act may be painful, slow, and halting, with a small, sputtering stream, or the patient may have to assume the knee-elbow position in order to expel the urine from the bladder.

The atrociously painful symptoms are usually spasmodic in character, but the attacks may be very frequent and much prolonged, in which event insomnia, nervous exhaustion, and general prostration supervene. In this way the man suffers from day to day, sometimes experiencing very little amelioration of his condition for days or weeks. In many cases, however, there are intervals of comparative freedom from suffering, in which the hyperæsthesia and turgidity of the organ are somewhat diminished and the patient may have some much-needed sleep.

The duration of severe priapism may be from two or three to six consecutive weeks, and even longer. In a hospital case observed by Birkett¹ it lasted five months.

There is usually no fever, particularly in young, robust men, but in older subjects having leukæmia or visceral lesions pyrexia may be observed.

In contrast to the foregoing very severe forms of priapism we observe cases in which the organ is less tense and distended, and in which the mental and physical suffering is not very severe. In somewhat exceptional cases the patients suffer but little pain, and the discomfort experienced in the turgidity of the organ is the chief symptom.

It is not the rule to find priapism involving the corpora cavernosa and corpus spongiosum at the same

¹ Lancet, 1867, vol. i. p. 207.

time. Some cases have been observed in which the glans and the whole corpus spongiosum have been lax and extensible; others in which the turgescence of one cavernous body was very severe while its mate was more supple, and others, again, in which the rigidity was unequally felt in the length of the corpora cavernosa.

While, as a rule, the invasion of this trouble is prompt, even sudden, and severe, its involution is always slow and often halting, and attended with disheartening relapses. The first sign of improvement is the diminished rigidity of the organ, which soon becomes less painful, and thus the case progresses until the normal state is reached. In that happy event the patient cannot be said to be entirely out of danger, for the reason that recurrences may follow at short or long intervals, particularly if the patient is guilty of sexual or alcoholic indulgence or excess, is subjected to wet or cold, or is constrained to undergo severe bodily exertion.

From the records of the various published cases, the inference seems to be warranted that in about one-half of the cases the patient is left impotent. It would be unwise, however, to state this as a rule or law, since the publication of cases usually follows quite promptly upon their occurrence. It may be that permanent impotence is induced, or the condition may be of temporary duration. In young and vigorous men it is to be presumed that their virility will later on be re-established.

ETIOLOGY. While the etiology of this form of priapism cannot be clearly stated, certain suggestions may be made as to its causation. In some cases there is strong evidence that damage has been done to the corpora cavernosa, particularly near their roots. This is shown in the tender spots and the hard nodules left after involution of the affection. Then, again, in some

cases there is a probability of blood extravasation into the areolæ of the cavernous tissue. Whether or not in these alcoholico-erotic cases there has been irritation of the sexual centre and of the nervi erigentes, or whether there has been injury to the sympathetic nerve, we cannot say.

A number of cases have been reported in which it was clear that priapism was caused by injury of the penis and perineum, notably that of Johnson Smith.¹

In all probability traumatism, though unrecognized, is the essential cause in all cases.

Priapism of Leukæmic Origin. (?)

There is a class of cases of priapism in young men, but particularly in men of middle and advanced life, in which, during and after a more or less prolonged period of ill health, this symptom appears.

The clinical history of this form is similar to that already portrayed, but in general there is an absence of any data as to excesses of any kind. In this form we find cases with the pronounced agonizing group of symptoms and cases in which lesser degrees of priapism and suffering have been experienced. In these cases there is a history either of neurasthenia, mental worry and depression, or of malarial fever and leukæmia, sciatica, hemicrania, and numbness and cramps in the muscles.

Owing to the fact that leukæmic blood-changes and enlargement of the liver and spleen have been observed in most of these cases, some authors unhesitatingly accept leukæmia as the cause of the priapism, although

¹ *Lancet*, June 7, 1873, p. 804.

Peabody,¹ who leans to this view, makes the guarded statement that "it may be regarded as an occasional symptom of leucocythæmia" (leukæmia). While I am not prepared to deny that priapism may be etiologically related to leukæmia, I am free to confess that on the evidence thus far submitted this relation is in no manner made clear, and the suspicion forces itself upon one's mind that perhaps the occurrence was a coincidence. The trouble with the reported cases is that the antecedent history of the patient has not been thoroughly gone into.

The facts have not been established that there has been no alcoholic or sexual indulgence, or in some cases that injury to the penis has not occurred. Having the leukæmic explanation in mind, this thought seems to have guided the various authors in their estimate and treatment of the case, and they have failed to pursue channels of investigation which might reveal some local injury to the sexual tract. Therefore, while I am not disposed to deny that this morbid blood condition may participate in the development of this chronic turgescence of the penis, I hold to the opinion that this etiology should not be fully accepted, but that inquiry in all cases should be pushed into the sexual antecedents of the patient with a view of finding out whether there had been sexual excess or whether any part of the sexual sphere had been damaged. I can hardly understand why in some exceptional cases the genital centre and

¹ New York Med. Journ., 1880, vol. xxxi. pp. 463 et seq., and *ibid.*, 1881, vol. xxxii. pp. 272 et seq. See also Klemme, Schmidt's Jahrbucher, vol. cxxxi. pp. 173 et seq.; Edes, Boston Med. and Surg. Journ., July 27, 1871; Longuet, Progrès Médical, 1875, vol. ii. pp. 447 et seq.; Matthias, Allg. med. Cent.-Ztg., 1876, vol. xlv. pp. 1185 et seq.; Neidhart, *ibid.*, 1876, vol. xlv. pp. 681 et seq.; Salzer, Berlin. klin. Wochenschr., 1879, vol. xvi. pp. 152 et seq., and Wetherell, Med. Record, 1880, vol. xviii. p. 192.

the *nervi erigentes* have been thrown into a condition of severe and chronic excitation simply from general blood changes, without there being some lesion of the parts under the control of or near to these nervous organs.

In general, the facts concerning the troubles can be readily elicited from boys and young men, but middle-aged and old men are for various reasons less communicative as to their sexual habits and life.

PROGNOSIS. Few definite statements can be made as to the prognosis of priapism of any form. In those cases in which injury to the corpora cavernosa or thrombosis can be made out, incisions may greatly expedite the cure. The existence of spinal disease necessitates a guarded prognosis. In very much run-down neurasthenic subjects, in sexual perverts, and in those suffering from leukæmia the chances are that the priapism will be very persistent, and when it disappears that it will be very liable to undergo relapse.

TREATMENT. In surveying the results of treatment of the cases of priapism already published, one is forced to the opinion that nothing like a routine method can be laid down. Remedies which have produced more or less good in one man's hands have failed in those of another. This much, however, can be stated with emphasis: Chloroform narcosis has failed in every case in which it has been used; ice usually does more harm than good; electricity has no value, and may even be harmful; and leeches, to the number of sixteen and forty, have failed to produce any amelioration in the condition of the penis, and have been injurious in their depletory effects.

My own preference, after a review of this whole subject, is to resort early to moderate and tentative incisions into the most turgid part, or into parts the

seat of continuous pain, or into nodular masses, in all probability the result of traumatism. Under antiseptic procedures there is no longer any fear of fever, profuse suppuration, or pyæmia, which were observed in cases treated before the new era in surgery. With a clean, incised wound we need not have the scarring, nodulation, or loss of the tissues of the cavernous bodies, which almost always occurred in former years.

Vorster¹ reports a case in which, after priapism had resisted various methods of treatment for thirty-two days, a cure followed four days after incision.

In Booth's² case, after six weeks of vain effort in relieving the patient, five-gramme doses of the iodide of potassium four times a day gave immediate relief and caused the disappearance of the priapism in two weeks. In Matthias's case a similar good result followed the use of this remedy, and in W. H. Taylor's³ case cure was produced by the combination of a mercurial salt with iodide of potassium. My own opinion is that it is always good practice in priapism to use either the potassium salt alone or in combination with mercury when a history of antecedent or present syphilis is elicited.

Bromide of potassium, chloral, belladonna, and morphine may be of benefit, especially during paroxysms; lupuline, camphor, and cannabis indica have been used with indifferent results, and the same may be said of ergot and strychnine.

Of local applications, the following may be found to be beneficial: hot baths, hot and cold spinal douches, sponging with very hot water, spinal cauterization,

¹ Deut. Ztschr. für Chir., 1887-88, vol. xxvii. pp. 173 et seq.

² Lancet, 1887, vol. i. p. 978.

³ Maryland Medical Journal, 1883-84, vol. iv. p. 854.

anodyne poultices (belladonna, stramonium, opium, hyoscyamus, and camphor), and perhaps ice-bags, but the latter must be guardedly used.

Any ephemeral or systemic disorder should receive appropriate medication.

SEXUAL ERETHISM.

The intensity of sexual desires and passion varies markedly in different individuals. In some it is very moderate, in others it is more pronounced, while in a few it is very strong and enduring. In cold and moderate climates, as a rule, the sexual appetite is not excessively fervent, whereas in hot countries it is a constant and dominating force. As a rule, among Americans the sexual appetite is fairly well developed, and in the majority of cases it is held well under control. In some exceptional instances we find young men who are in a constant condition of sexual erethism, to such an extent that it impairs their usefulness in life. Thus, we occasionally meet with cases of young men who, when they associate with young women in business affairs and in social life, become so sexually excited that their condition is betrayed, or who from fear retire from such association. Some young men employed in shoe stores have been known to lose their heads when fitting shoes on ladies' feet; and in other pursuits and businesses the association of the sexes is often interfered with by the abnormal sexual erethism of the male. This rather abnormal state is not at all common in the female.

Guelliot¹ reports a very interesting case of sexual erethism. It was that of a highly nervous man of

¹ *Op. cit.*, p. 214.

twenty-three years of age. From his fifteenth year such was the excitability of his genitals that the least touch on the glans penis produced ejaculation. At the age of twenty-three this man had coitus eleven times in one afternoon without fatigue with a woman suffering from nymphomania. It is stated that from that time on this man could undergo seven ejaculations a day.

In many of the colored race such are their brutal licentiousness and the exaltation of their sexual appetite that negroes are constantly conniving at the commission of rape.

I once saw a gentleman who suffered from persistent sexual erethism for years until he voided an oxalate of lime calculus from his prostatic urethra.

We also see instances in which men beyond fifty or fifty-five years of age become the victims of an annoying sexual desire, and, strange to say, many of them are able to indulge in coitus with all the vigor and reserve force of a man of thirty. In all probability, the irritative structural and degenerative changes which are taking place in the prostate are at the root of this senile sexual erethism.

There is a class of cases of inordinate sexual desire in the male, to which attention was first directed by Beard,¹ which deserves special mention. In the majority of these cases the subjects of this trouble are educated, intellectual, moral, and religious men, of exceeding sensitiveness of nature, most of whom shrink in horror at the contemplation of their condition. I have had a number of such cases under my care from time to time, but none of them gave such a graphic account of their condition as that presented by one of Beard's patients,

¹ Sexual Neurasthenia, pp. 273 et seq.

which I will transcribe. Beard says: "A clergyman, aged forty years, came to my office, and, after long delay and marked hesitancy and confusion of manner, related substantially the following history: 'I am,' he said, 'in a most lamentable, even desperate, condition. I fear that my memory is deserting me, and that I bid fair to become both a mental and physical wreck.' He appeared healthy, and his mind, when directed from his trouble, was as vigorous as ever. He had been married but five years, and by mutual agreement, based on their ideas of personal purity and religion, and perhaps also on an almost complete lack of sexuality on the part of his wife, he had to a considerable degree suppressed sexual inclinations that were naturally very strong. He did not, however, become unbearably annoyed through these efforts of repression until some two years ago, when priapism would occur and continue for hours, diverting his mind from study and irresistibly directing his thoughts in such licentious channels that he became at times overwhelmed with anguish and despair. Intercourse brought only partial and temporary relief, and sometimes he would lie awake for hours after a repetition of this natural effort for relief, with erections that would not subside. He was in constant fear that he would commit some act of folly when alone with certain of his female parishioners, and for this reason resorted to methods and excuses to avoid meeting them alone that he thought might seem to them strange and inexplicable. This worried him greatly also." This patient had been operated upon without result for redundant prepuce. He had mild hemorrhoids and varicocele. He was treated by good hygiene with bromides and bitter tonics, and assurances of recovery were held out to him.

As a result of treatment he says: "I have a good, healthy imagination, almost free from voluptuous images. Again, instead of the unsatisfied burning desire for sexual intercourse which came again and again during the day and night, the desire is now very moderate and at times not perceptible. Instead of repeated erections when alone, all seems comfortable and quiet. Only one of the symptoms I spoke of still remains, and that is the insane desire to take hold of women (who perhaps tempt me), to caress and fondle them, and play with them. The presence of certain women excites my passions, but by no means in the same manner as before. Please remember that I never took liberties with women in former years, and that I have not yielded to this desire, no matter how strongly tempted, yet I find it remains. My wife is a very chaste woman, and she regards my desire to fondle, look at, and admire her form as signs of manly weakness. She thinks yielding to these things only hurts me and excites my passions. The desire to look at and fondle women is much stronger than the longing to have intercourse with them. If this terrible longing is due to some disorder of my system, I want the physician's help; if it comes from a wicked heart, I'll fight it till the day of my death. You perhaps can help me to decide." In this case Beard says that good advice and the sedative effects of the bromides produced a cure. My own experience in these cases has taught me that in general there is some deep-seated trouble in the sexual tract, which has been caused by early and chronic masturbation (perhaps by chronic gonorrhœa) and by the congestion of the sexual parts which results from prolonged indulgence in libidinous thoughts and from dalliance with women without coitus. Those cases in which structural damage has been pro-

duced should be treated on the general lines laid down for the management of chronic urethritis, prostatitis, and seminal vesiculitis. (*Vide supra.*) Bromides and sedatives may produce temporary relief, but they can hardly be expected to cause a cure.

CHAPTER XXV.

SEXUAL PERVERSION.

IN the whole field of medicine there is no more melancholy chapter to peruse than that which treats of those degenerates who are victims of sexual perversion. This subject has of late been exploited *ad nauseam*, and by reason of their prurient details certain psychological volumes on this morbid state have done much harm. I shall here only give a general outline of the various divisions of this subject.

Sadism is the association of sexual lust with cruelty and violence of varying degrees (biting, scratching, infliction of pain, infliction of injury and wounds, and even death). The sadistic act is inflicted either during or after coitus, or with the view of stimulating the declining sexual power. Lust-murder, or anthropophagy, is the severest form of sadism, and its perpetrator may not only kill his victim, but also eat a part of her. In some individuals the sadistic crime is the equivalent of coitus. In this revolting category are included the cases in which coitus is indulged in with corpses (which might also be more or less mutilated), and those of men who can only have sexual intercourse when the live woman is laid out as a corpse with all funereal accessories.

The mildest form of sadism is that in which a man has an orgasm when he surreptitiously cuts the hair of young girls which he keeps as a sexual fetich. Under this division may be included the cases of individuals

who have orgasms when they whip boys on the naked nates, or when they see cruelty inflicted on animals.

Sadism is very infrequently observed in women.

In all probability vitriol-throwers are sadists.

Masochism may be defined as the desire for abuse and humiliation as a means of sexual satisfaction. In cases of this form of perversion the individual seeks every opportunity to be beaten or injured by a woman. Such patients become sexually excited by any blow, or by direct injury, by flagellation, and by being trodden upon by women who have their shoes on.

Fetichism is the association of lust with the idea of certain portions of the female person, or with certain articles of feminine attire, without which the performance of coitus is impossible. The inanimate sexual fetiches are handkerchiefs, shoes, stockings, gloves, beads, letters, locks of hair, articles of female underwear, and flowers belonging to some woman whom the pervert loves or has sexual passion for.

The parts of the female body which have been selected as fetiches by these perverts are the eyes, the hand, and the foot. In their thoughts interest is concentrated on these parts, and not upon the *genitalia*. In some cases the fetich may be a cross-eyed woman or one with the amputated stump of one leg. Cases have been reported in which men were impotent unless the woman presented these abnormalities or defects.

Hair-despoilers may be examples of the sadists and fetichists combined, since in the act of cutting they have a sexual orgasm, and the stolen tresses afterward act as stimulants to sexual lust.

A mild form of fetichism is found in those individuals who are only sexually excited by a brunette and those to whom only a blonde is congenial. In this same cate-

gory may be included the cases of men who, in order to become sexually excited, must see women dressed in a peculiar manner or have upon them some particular article which has taken the fancy (furs, velvet, silks, and feathers).

Homo-sexuality is that form of perversion in which the sexual feeling for the opposite sex is diminished or absent, and in which sexual desire is centred on one of the same sex. Thus men become enamoured of certain men, and women of certain favored ones of their own sex.

Urnings are certain homo-sexual individuals who have in their sexual life the same feelings as those experienced by normal subjects in hetero-sexual love.

Krafft Ebing says of these cases: "The urning loves and deifies the male object of his affection just as a man idealizes the woman he loves. He is capable of the greatest sacrifices for him, and experiences the pangs of the unfortunate often unrequited love; suffers from the unfaithfulness of the beloved object, and is subject to jealousy," etc. "The attention of the male-loving man is given only to male dancers, actors, athletes, statues," etc.

Effemination and viraginity are forms of the perversion known as urnings. In the male the subject likes to masquerade as a female. He seeks to make of himself by sweetness, sympathy, taste for æsthetics, etc., a fit mate for his homo-sexual lover. He endeavors to present a feminine appearance in gait, attitude, dress, and mode of speech.

The female urning in early life tries in every way to act as a boy, and avoiding girlish games and tastes, she adopts those of boys. Later on she becomes mannish, and even amazonian in her manner.

These homo-sexual perverts practise all kinds of sexual debaucheries.

Sodomy is a form of sexual perversion which is said to be very frequent in most large cities.

Many individuals who are persistently addicted to masturbation are really mild sexual perverts.

CHAPTER XXVI.

STERILITY IN THE FEMALE.

MUCH marital and domestic unhappiness is often caused by the non-occurrence of impregnation of the wife and the resultant absence of children in the family. As a rule, in the early years of matrimony the want of children on the part of the two consorts is not noticed, or, at least, is not keenly felt; but as years go by and no offspring appears, anxiety, discontent, unhappiness, and even misery are experienced, and mutual recrimination may be indulged in.

In former years sterility was incontinently laid to the part of the wife, but careful observations of late years have quite clearly proved that only in five cases out of six is she the consort at fault. This fact, that the husband may be the sterile partner in one-sixth of all instances, therefore, puts him on trial as well as the wife. Therefore, before a married woman shall be suspected of being incapable of bearing children the husband and his semen must be carefully examined (*vide supra*) and pronounced virile.

Sterility is very common in the human race, and is the outcome or expression of many and varied morbid conditions. The sexual apparatus of woman is very complicated, and anatomical study has shown that even in health its mechanism is not thoroughly adequate for the harmonious functional activity between the Fallopian tubes and the ovaries. This point is often well illus-

trated by cases in which the ovum does not fall into the tube, but into the peritoneal cavity.

It is stated on good authority that conception is most likely to occur a few days after the cessation of the menses, and that it is not liable to occur just before their appearance; therefore, in seemingly healthy women who do not become impregnated, it is well to ascertain the facts as to the time of coitus.

It is said in a general way that high conditions of civilization and luxurious and indolent modes of life tend to cause sterility, but before we accept this unqualified and unsubstantiated statement it is well to ascertain whether, for obvious reasons, these married people do not shrink from the cares incident to parturition and childhood, and whether they do not take measures to prevent pregnancy.

The absence of sexual desire and feeling in some women has been urged by some authors as the cause of sterility; but this contention is met with direct evidence which proves that many women have borne children who never experienced sexual desire and to whom an orgasm was an unknown sensation.

Though no direct pathological reason can be assigned for it, it seems to be established beyond doubt that prolonged intermarriage of blood relatives tends in the end to produce at least a relative sterility, but it certainly does give rise to rather inferior grades of human offspring.

Sufficient evidence has been offered to prove that obesity, by reason of its accumulation of fat in and around the internal sexual apparatus of the woman, and its interference with its functional activity, is really an important factor in the establishment of sterility in

women. On this subject a very interesting paper has recently been published by Dr. J. V. Gaff.¹

In anæmia, chlorosis, the adynamic conditions following grave diseases, and neurasthenia, temporary sterility may occur, which is due, in all probability, to the lowered functional activity of the ovaries.

Syphilis in women causes frequent abortions, and in some of these cases sterility occurs; but we are not yet in the necessary scientific position to account for these pathological results.

The sterility so commonly observed in prostitutes is, as a rule, due to chronic inflammation of the uterus, of the tubes, and of the ovaries. In this connection it is well to remember that gonorrhœa is a potent and frequent factor in the production of uterine and pelvic inflammation. Parturition is frequently the starting-point of these diseased conditions, which are not infrequently caused by careless and meddlesome surgeons.

In the case of the absence of the ovaries, of the Fallopian tubes, or of the uterus, sterility is always found.

Chronic oöphoritis is a frequent cause of the suppression or destruction of the ovule, while in perioöphoritis the theca of the ovary becomes so thickened that injurious pressure is exerted on the secreting portion of the organ. In either event sterility is produced.

The mechanical adjustment of the ovary to the fimbriated extremity of the Fallopian tubes may be impaired or destroyed by fibrous bands left by peritonitis, and in this event the ovule cannot escape into the uterus, nor can spermatozoa find their way to the ovule, consequently fecundation is impossible.

Ovarian cysts may so destroy or distort the tissue of the ovary that it can no longer produce ovules.

¹ Journal of the American Medical Association, Jan. 23, 1897.

Salpingitis is a very frequent cause of sterility. In the catarrhal variety, with its hyperæmic mucous membrane and the continual escape of muco-pus into the uterus, the mechanical conditions are such that the irruption of spermatozoa into the uterus and tubes is rendered impossible; therefore impregnation cannot occur. In hydro- and pyosalpingitis an insurmountable barrier to the upward migration of spermatozoa is formed by the collection of water and pus, and, as in these cases the ovaries are usually diseased, it follows that a woman thus afflicted is irremediably sterile. Chronic interstitial salpingitis results in atrophy and stenosis of the tubes, which are then no longer permeable. Atresia of the uterus, congenital or acquired, renders impregnation impossible.

Atresia of the cervix uteri, caused by overcureting, caustics, syphilitic and chancreoid ulcers, and syphilitic cell-infiltration, offers a barrier which spermatozoa cannot overcome. In like manner, the plug of dense tenacious mucus which forms in inflammation of the uterine neck may act as a net which entangles the spermatozoa. In catarrhal endometritis and endocervicitis the mucous membrane is so altered that the necessary conditions for the fecundation of the ovum are absent. In these conditions the profuse downward flow of pus both kills and washes away spermatozoa, and thus prevents conception. Fissures of the uterine neck frequently react so seriously on the condition of the uterus that it is rendered unfit for the function of conception. Hypertrophy of the cervix uteri, in which stenosis of the cervical canal is a frequent concomitant, is a very common cause of sterility. Malignant and simple tumors of the uterus act as efficient barriers to conception.

In superinvolution, inversion, and prolapse of the uterus

such abnormal conditions of structure and position exist that impregnation is rendered impossible.

In ante flexion and retro flexion of the uterus such distortion of the lumen of the organ is produced that a barrier to the upward invasion of the spermatozoa is formed.

Anteversion and retroversion of the uterus so throw the organ out of position that a purely mechanical impediment is offered to the efforts of spermatozoa to reach the interior of the organ.

Ruptured perineum causes so much disturbance in the sexual parts of women that impregnation is prevented.

Absence, atresia, prolapse, and cicatricial stenosis of the vagina prevent intromission of the penis, and it follows that impregnation cannot be effected. In purulent vaginitis the zoösperms may be killed by the secretion or carried out of the paths of fecundation by it.

In small and imperforate hymen such a barrier may exist that impregnation is prevented.

It is only intended in this chapter to give a general outline of the causes and conditions which produce sterility in women, which may form a basis for study and observation. To give the full treatment of the various morbid conditions already mentioned would require a very large volume; therefore, for further details it is better for the reader to be referred to the various authoritative text-books on gynecology.

Various structural conditions of the vulva and vagina which more or less interfere with the performance of coitus will be considered in the following chapters. These vulvar lesions, as a rule, are not well understood, and concerning most of them much difference of opinion among authors exists.

CHAPTER XXVII.

NEW GROWTHS AND HYPERTROPHIES OF THE VULVA.

It is noticeable that in the various text-books on diseases of women little if any information on broad ground is given concerning hypertrophic lesions and simple new growths of the vulva. In a number of scattered essays these important subjects have been considered, but no definite and systematic description of them has been given. A fair presentment of the discordant views held to-day regarding simple (and by that I mean all processes not included under the head of malignant degeneration) hypertrophic and ulcerative vulvar lesions is as follows :

1. That they are identical with lupus or the *esthiomène* of Huguier and French authors generally. 2. That they are the result of essential and specific syphilitic processes. 3. That they are the result of some indeterminate ulcerative process. 4. That certain cases may be the result of tuberculous infection.

It may be further added that certain of those who do not accept the lupus theory look upon these affections as being peculiar and even extraordinary, and while some even regard them as mysterious and specific, they only indulge in generalities in speaking of them.

This being the condition of the uncertainty of opinion and of the inadequacy of systematic description, I availed myself, during a period of many years' service at Charity Hospital, of the opportunity to study these lesions on many thousand cases of women with sexual and genital

disorders. As a result of these observations, supplemented by microscopical study, I have reached the following conclusions :

1. That a large and perhaps the greater number of chronic deforming vulvar affections are due to simple hyperplasia of the tissues induced by irritating causes, inflammation, and traumatisms.
2. That chronic chancre is a cause in a certain proportion of cases.
3. That many cases are due to essential and specific syphilitic infiltrations.
4. That other cases are caused by the hard œdema which often complicates and surrounds the initial sclerosis and perhaps gummatous infiltration.
5. That many cases are due to simple hyperplasia in old syphilitic subjects who suffer from chronic ulcerations of the vulva long after all specific lesions have departed.
6. That some cases also in old syphilitics are due to simple hyperplasia without the existence of any concomitant ulcerative or infiltrative process, and seem to be caused by conditions which usually in healthy persons only result in vulvar inflammation.

In the foregoing categories the acting, contributory, and remote causes are briefly outlined.

The systematic division of these new growths and hypertrophies is very essential in order that a clear and comprehensive knowledge of them may be gained. My studies have convinced me that this subject can most lucidly be treated of by the recital of the facts presented by the smaller orders of lesions, which form an excellent groundwork for a clear knowledge of the larger ones. Clinical observation shows that these lesions are divisible in the following categories :

1. Small hyperplasiæ, caruncles, and papillary growths.
2. Large hyperplasiæ and hypertrophies.
3. Hyperplasia resulting from acute and chronic chancroids.
4. The

various forms of hypertrophy induced by the indurating œdema of syphilis. 5. Hyperplasia resulting from chronic ulcers, the so-called chancroids, in intermediary and old syphilis. 6. Hyperplasia in old syphilitics, presenting no specific character, and occurring soon or long after the period of gummy infiltration, in some cases being coexistent with specific lesions elsewhere.

The foregoing affections have neither in their clinical history nor their pathology any resemblances to lupus, nor do they partake in any manner of the nature of lesions produced by tubercular infection.

In the last periods of many cases in which ulceration and destruction are very great, evidences of pulmonary phthisis may be seen, but my observation convinces me that the tuberculous infection does not occur through the genitals, but in the lungs of women worn and spent with disease. Many authors, particularly French, have laid stress on the point that these vulvar lesions are the outcome of scrofula.

In the following chapters these vulvar affections will be succinctly described.

In many of these cases the walls of the vagina are also involved to a greater or less extent and depth.

CHAPTER XXVIII.

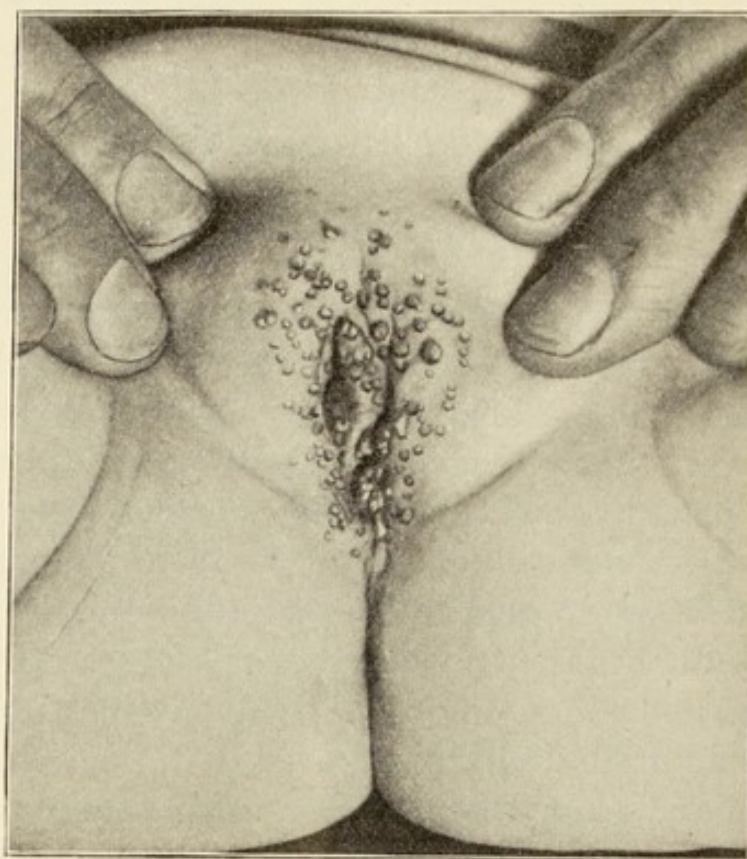
VEGETATIONS OF THE VULVA.

IN general vegetations of the vulva may be classed among the smaller growths, though they may become very large. These smaller orders of tumors are, first, papillary growths or vegetations, commonly called warts, and, second, hyperplasiæ of the various prominences, folds, and anfractuositities found within the more or less complete ellipse formed by the labia minora.

Vegetations of the vulva may occur singly or in various numbers, and are prone to develop in the vulvar sulcus, chiefly around the urethral and vaginal orifices, in children, and more frequently in adults, at or beyond puberty. They are commonly seen on all portions of the vulvo-anal region, and show no tendency whatever to localization to the vulvar ellipse. They are of a pinkish or deep-red color, spear-shaped, digitate, sessile, pedunculated, cauliflower-like, or they may resemble strawberries of various sizes. They are essentially papillary hypertrophies, and show a tendency to exuberant growth. The latter feature and their tendency to irregular and scattered development are points of diagnostic value in separating them from hyperplastic lesions considered further on.

These vegetations begin as very minute red spots of erosion, which soon become elevated, and, if many are present, the mucous membrane at first presents a velvety appearance. In a short time these little masses become true warts with more or less papillated external struc-

FIG. 60.



Small vegetations in a young female child.

FIG. 61.



Exuberant vegetations of adult female genitals.

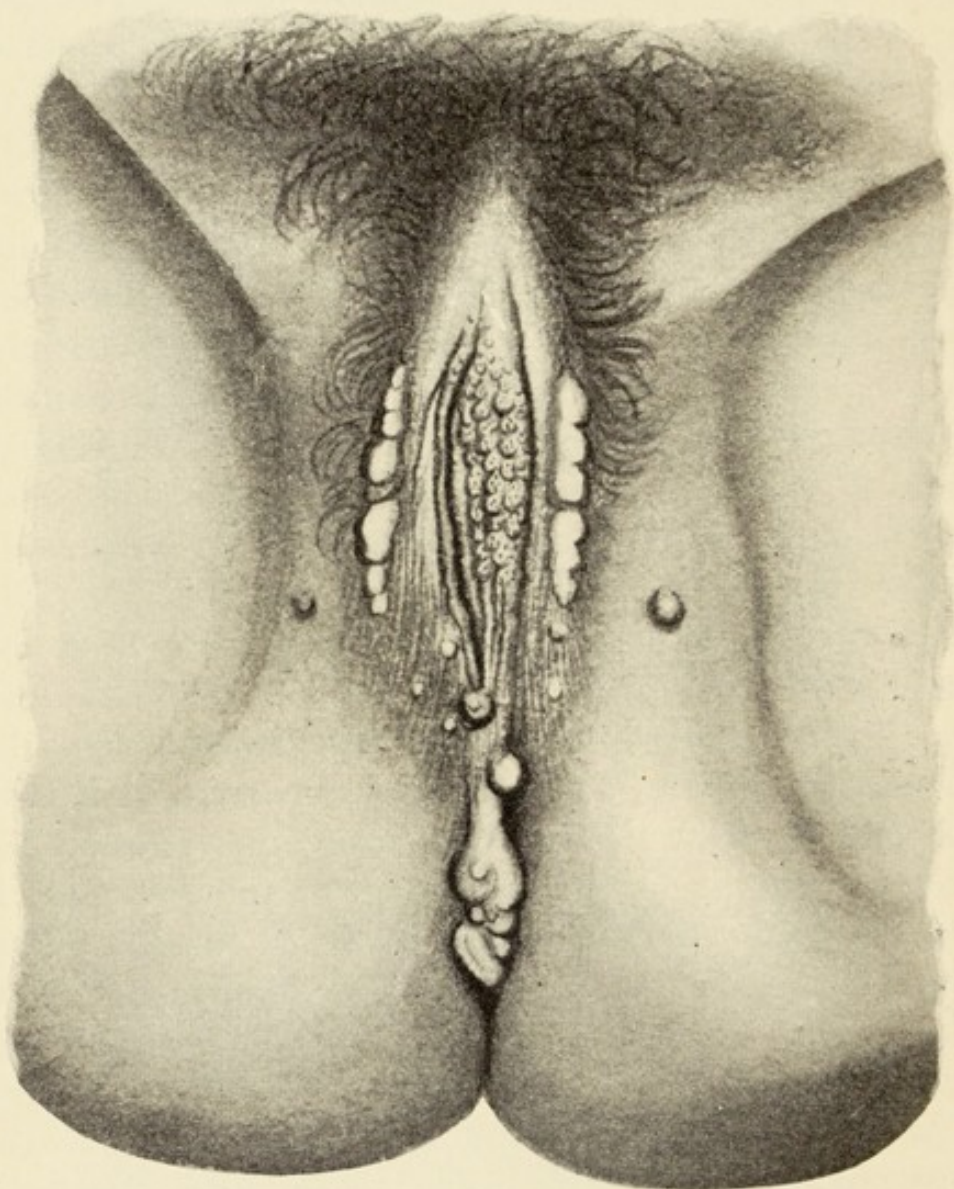
ture. Their appearance in early development is well shown in Fig. 60. They rapidly grow larger, and coincidently very many new ones appear, until (if treatment or preventive means are not adopted) the whole vulva and the surrounding regions may be literally covered. The appearance of exuberant vegetations on the female genitalia are portrayed in Fig. 61.

Vulvar Hypertrophy Consequent upon Vegetations.

There is a form of hypertrophy of the vulvo-anal region of women which I believe has not heretofore been mentioned by authors. The initial stage of this form consists in the development of simple vegetations on any part of the external genitals. Owing to neglect, want of care and cleanliness, and of surgical intervention, these growths become enlarged, as they also usually increase in numbers. As they grow in height and breadth, particularly those on the outer portions of the labia majora (where they are subject to continuous friction), they lose their warty appearance and come to look like nodules, processes, or tabs of skin. They are, as it were, polished off, losing entirely their granular, strawberry-like look, and taking on the appearance of integument. In Fig. 62 this form of hypertrophy, in its initial and advanced stages, is well shown. The figure was taken from life, from a young pregnant woman, who had suffered for a long time from leucorrhœa, the irritation of which led to the development of the new growths. In the depth of the vulva three rows of typical vegetations may be seen, and on the outer edge of each of the labia majora a string of fleshy masses, which had been vegetations but which had undergone the polishing-off process, may be seen. Over the perineum are a number of conical tumors of like origin, and hanging over the anus

are a large gourd-shaped mass and several smaller ones, which had resulted from the transformation of several clusters of very exuberant warts. Unless ablated, these

FIG. 62.



Showing simple vegetations in process of change into fleshy tabs and hypertrophic masses.

tumors inevitably lead to great hypertrophy and disfigurement of the parts. They, acting as low-grade inflammatory foci, induce hyperæmia and hyperplasia

in the vulva, and in the end lead to its great distortion. I have many times seen this general hypertrophy of the external genitals by warts, and I recall an instance in which these growths, being very large, were ablated, and in their stumps hyperplasia took place, which led to great deformity. The practical teaching of these cases is not only that these new growths should be thoroughly removed, but that great care should be taken that their sites shall not become the foci of hyperplastic new formations.

Hyperplastic Growths of the Vulva.

Simple new growths of the vulva have been variously called polypi of the urethra and of the vagina, hypertrophied caruncles—berry-like tumors—villous growths, warty excrescences, and papillary polypoid angioma. Though there is much uncertainty in the minds of medical men as to their real pathology, and though the most varied views are entertained as to their essential nature, the matter is a very simple one. In my studies of the larger orders of hypertrophies I included a consideration of the pathology and clinical history of these smaller ones. As a result I found that, clinically, the larger growths were but exaggerations of the smaller ones, and I also learned, through pathological and microscopical studies, that the morbid process observed in small lesions can be traced in progressive and undeviating development through all sizes of these simple hypertrophies until the enormously large ones are reached. I thus strongly state these facts for the reason that I have seen the affection begin in an insignificant manner on or within the labia minora, and in the course of years eventuate in the development of enormous vulvar hypertrophy. Further than this, I have been able to confirm

the clinical facts which I have observed by what I deem satisfactory and convincing microscopical studies of the small, intermediate, and large lesions which I excised.

The small growths of the vulva, which may properly be called hypertrophied caruncles and simple hyperplastic tumors, are found either singly or in numbers of from two to a dozen or more. They are sometimes very small, of the size of a large shot, or as large as a pea or a strawberry, or even larger. They may present a decided firmness of structure, or they may be soft and vascular, and between these two extremes there are many gradations. They may be of a pale-pink color, of a bright scarlet-red tint, of a deep-red, or of a purplish hue. When they are very firm, the hyperplasia is composed of all the cell elements of the mucous membrane and fibrous tissue, and the new growth of vessels is not excessive; but in the softer variety there is a greater amount of new-vessel development, consequently they are more vascular, of deeper color, and softer in structure. These facts will fully explain the varying clinical features of density and color. I may, in passing, remark that these lesions may give rise to no uneasiness whatever, but may also be the cause of great suffering, paroxysmal or continued.

Urethral Caruncles.

On the lips of the meatus urinarius and within the urethra, more frequently on its posterior wall, one or more small or large warts are sometimes seen, and they are then called urethral caruncles. It is not uncommon for these lesions, even when very small, to become extremely sensitive, and even the seat of great pain, particularly in urination. This pain may radiate to the parts around, and even down the legs. Not uncommonly

bleeding may occur from a caruncle, and during micturition there may be severe spasm of the vesical sphincter. Cases have been observed in which one little urethral caruncle has produced such pain, distress, and anxiety that patients have fallen into severe ill health and have suffered intolerable agony. Warts seated near and around the introitus vaginae are also in some cases the seat of pain and they may prevent coitus.

When vegetations are few in number they may remain isolated, and as they grow they attain the size of strawberries, and they may resemble them in appearance or become of a dark-purple color. In these instances they are sometimes regarded as cancerous, and in times past they have been diagnosticated as lupus-growths. In young women these lesions are, as a rule, simple in nature. As age advances one must be more guarded in prognosis, since in old persons simple warts have a tendency to cancerous degeneration, and epithelioma of the vulva very often begins in a lesion which resembles a simple wart. As a broad general rule, warty lesions of the vulva before the fortieth or fiftieth year are of simple nature; after these periods their structure is often doubtful, and the surgeon should strongly suspect epithelioma, and at once have a microscopical diagnosis established.

It must not be assumed that all small growths increase in size and eventuate into larger ones. Many remain for years without any increase in size, others become larger and troublesome, and are excised, and perhaps but few reach large proportions. Social position, personal cleanliness, and many other considerations tend to determine the life history of these growths. It should always be remembered that, as age increases, these benign growths are very liable to become malig-

nant in character. This is particularly the case with the more vascular ones. Consequently the surgeon should always recommend their ablation in women about and beyond forty years of age.

TREATMENT. The indications for the treatment of vegetations are their complete removal and the prevention of their return. In every instance the immediate and surrounding parts should be thoroughly washed or irrigated with solutions of carbolic acid (1:100) or of the bichloride of mercury (1:2000); then the surfaces and interstices of the warts should be thoroughly painted with an 8 per cent. solution of muriate of cocaine. In very nervous women in whom the lesions cover a large or delicate surface, mild chloroform- or ether-narcosis may be required. This condition being induced, the necessary treatment can be more thoroughly and easily instituted.

It may be stated as an axiom that surgical procedures for the removal of vegetations are much more rapid and effectual than caustics are. The latter, however, are useful under certain circumstances. When the vegetations are small they are readily removed by the dermal curette or Volkmann's spoon, the scraping being carried well to the level of the tissues, which, however, must not be wounded. A solution of persulphate or perchloride of iron should be carefully touched to the bleeding points, and the parts, when dry, quite firmly covered either with iodoform- or absorbent-gauze—never with watery solutions. Such is the tendency to recurrence of these growths that the cure cannot be considered complete until the surfaces are smooth. In cases of recurrence, before the little growths have reached much salience, chloroacetic acid, lactic acid, acid nitrate of mercury, nitric acid, the various solutions of iron just spoken of

and strong tincture of iodine may be employed. Bichloride of mercury (thirty grains to the ounce of collodion) or salicylic acid (one drachm to the ounce of collodion) is sometimes a very effectual solution for small warts and those for which curetting is contraindicated.

Sessile or pedunculated warts of an area of an inch or more may be readily removed by strangulation with a silk ligature. In some cases this object may be accomplished by the elastic ligature, using the ordinary small India-rubber bands, fixed firmly around the base of the warts; still, in all cases in which it is practicable scraping is the best treatment.

Warts of larger area than an inch are best treated by the galvano-cautery loop, and these cases are the only ones in which this method of removal is really indicated. Their ablation must be slowly and carefully effected with the least loss of blood. Their further treatment is similar to that of the small growths. Rigid antisepsis is required in every case.

The utmost care must be observed in removing vegetations about the meatus, and when possible scraping or tying should be employed. The parts should be viewed in a clear light, and a urethral speculum should be used in order that no new growth may escape. When curetting is impracticable salicylic or bichloride collodion or tincture of iodine may be used very carefully. The idea is simply to remove the new growth and avoid damaging the parts and causing stricture of the urethra. As a rule, acids are contraindicated in this region.

In cases where operative procedures are not admissible, whether owing to the size or situation of the warts, it is well to apply freely to them, after preliminary fomentations with very hot water, followed by wash-

ing with bichloride or carbolic solutions, equal parts of calomel and salicylic acid.

There is a popular fallacy that warts in pregnant women should not be removed for fear of producing abortion. This view was the outcome of the old and now, happily, nearly obsolete treatment by vigorous and intemperate cauterization, which produced great vulvar and vaginal inflammation, and sometimes rigidity, even stenosis of the genital tract. No such results are produced when the growths are removed by curetting or other surgical means supplemented by rigorous antiseptis. Since vegetations may act as impediments to parturition by reason of their own size and position and of the œdematous hyperplasia which they cause, they should always be promptly and thoroughly removed.

After removal the surgeon should explain to the patient the conditions under which warts grow and luxuriate, with a view to prevent their recurrence.

In persons beyond forty years of age persistent recurrence of an originally simple wart should always awaken suspicion of malignancy, and prompt and radical extirpation should be practised.

CHAPTER XXIX.

LARGE HYPERTROPHIES OF THE VULVA.

THE larger orders of vulvar hypertrophies, like the smaller ones, may be found in early puberty, up to middle life, and are less common in persons beyond fifty years of age.

These hyperplasiæ are, as a rule, the direct result of some irritation or of traumatism. Vulvar inflammation, whether simple or the outcome of antecedent chancroids, vaginitis, herpes progenitalis, leucorrhœa, gonorrhœa, uncleanliness, masturbation, tears in coitus and parturition, scratches, cuts, bruises, eczema, and all forms of traumatisms have been found to be exciting causes.

It is impossible to give a systematic and comprehensive description of these hypertrophies, since they all differ from one another. This is due to the fact of the very great variation in the conformation of the vulva in women. In some the labia majora are large, in others very small and exceptionally absent. The labia minora are seen in an infinite number of sizes, shapes, and general configurations. Some are long and thin, some short and thick, some smooth on their free edge, others irregular and perhaps festooned and frilled. Then the structure of the vestibule, the condition of the introitus vaginæ, and the shape of the fourchette are found to vary so greatly that nothing like uniformity occurs. It can be readily seen, therefore, that a good-sized essay could be written on all the varying appearances offered

by these vulvar growths, and then the limit would not be reached.

In some cases there is simple enlargement of the natural parts, but in the majority there is more or less deformity, and even distortion. Very little of diagnostic importance is offered by a study of the various shapes and sizes of these growths. A clear idea of the appearance and history of them can best be given by the pictures and details of three cases. The first case (see Plate VI.) shows the localization of the affection in one nympha, and its history is as follows :

A woman, aged twenty-eight years, free from syphilis, had severe attacks of herpes progenerialis involving the right labium minus. About six months later she had a profuse purulent vaginal discharge for a time, and then noticed that the right labium minus was sore and slightly inflamed. In a short time the inflamed part became noticeably enlarged and of a deep pinkish-red color, until it reached the proportions shown in Plate VI. It is seen to be a flat tumor, semicircular in shape, quite deeply indented on its free margin, and limited sharply to the right labium. Its color was of a whitish-pink when the patient was long in the recumbent position, and of a pronounced pinkish hue when she walked very much. She was very clear as to the fact that in its early days the tumor was of a rosy-red color, softer and thicker than now, and that as it had grown older it had become decidedly contracted and much firmer in consistence. At the base of the enlarged nymphæ corresponding to the introitus vaginae were two small superficial ulcers of simple character. The perineal rhapshe was somewhat thickened and ended in a thickened and flabby pouch-like mass of skin, which hung over the unaffected anus as she lay on her back.

PLATE VI



Hypertrophy of the Right Nympha and Perineum.

The inguinal ganglia were unaffected. Beyond a sensation of heat and pruritus, which occurred in short paroxysms, the patient experienced no discomfort.

It will be noted that the labial hyperplasia began in this woman at the age of twenty-eight, and reached the size depicted in Plate VI. in about two years.

It is important here to call attention to the flabby, pouch-like tumor at the anal orifice, since growths like it are so common in all cases of vulvar hypertrophy, whatever may be their origin. These protrusions are not, strictly speaking, piles, for the reason that they are not of necessity connected with the anus, certainly in their early stages. They seem to begin as hyperplasiæ of the skin of the perineum, and as they grow to settle themselves on the anterior margin of the anus. In the uncomplicated condition they do not impinge upon the anal orifice, but as they grow larger and broader they involve that outlet more or less, at first on its integumental part, and later, in very chronic cases, the rectal mucous membrane may become affected by the hyperplasia.

The second case shows still further vulvar involvement:

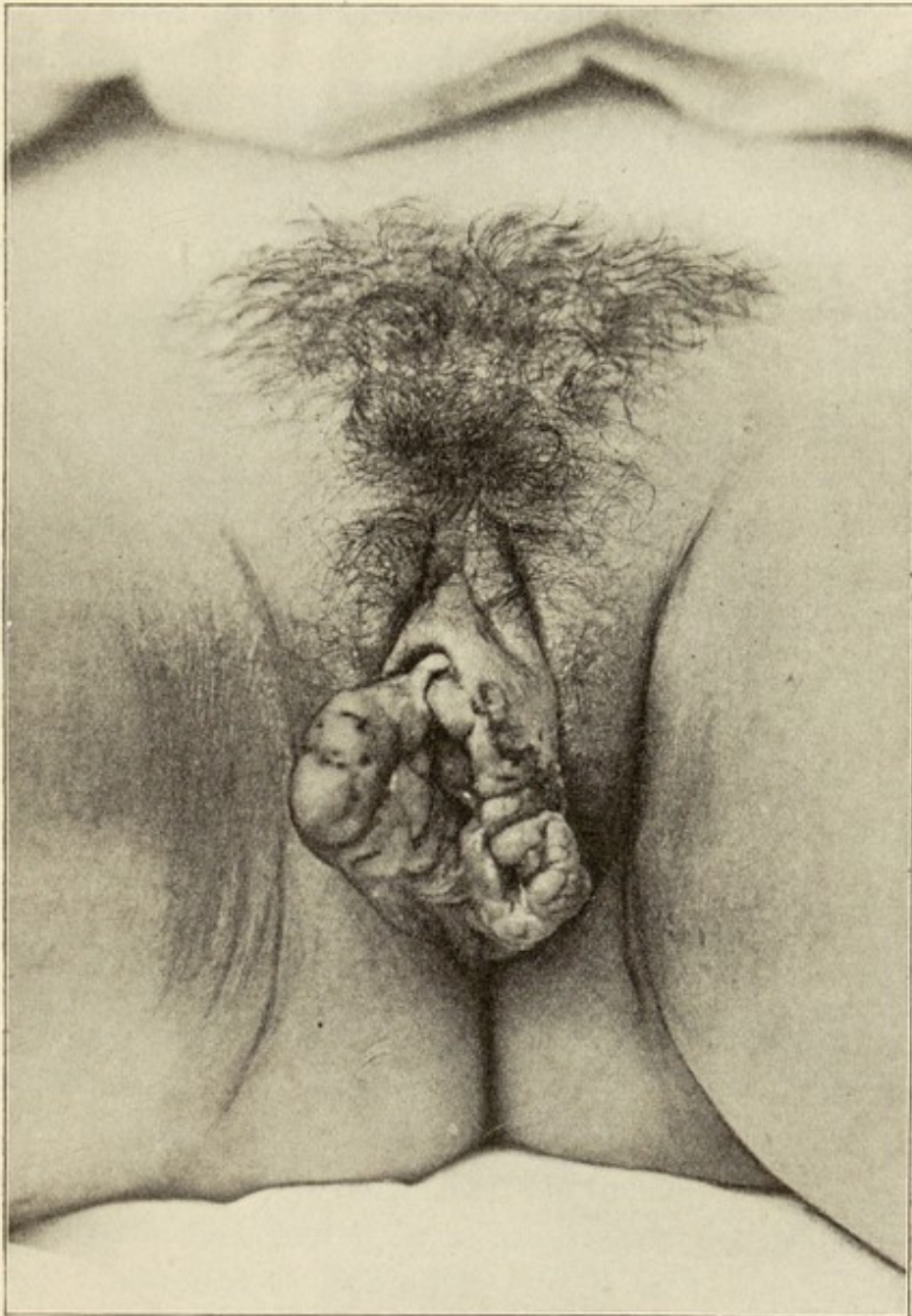
A woman, aged twenty-five years, American, single, had cohabited with men from her sixteenth year, but was free from syphilis. She had had numerous attacks of mild vulvar and vaginal inflammation, due to sexual irritation, but gave no history of gonorrhœa. About a year before the date of operation she noticed that the *carunculæ myrtiformes* were rather red and tender, and that some of them soon increased to the size of small peas, being firm and somewhat shotty to the touch. Then she noticed that her external genitals were growing larger and protruded, whereas in former years the

nymphæ had habitually been closed in by the labia majora. In the early period of development of these vulvar growths they were of a bright-red color, and from their inner surfaces bloody serum exuded at times. On one occasion a mild hemorrhage took place, which lasted several hours. At this time also the thickness of the labia was much greater than it was when the swellings became as large as shown in the figure. She experienced very little occasional heat and pruritus in the parts, and only applied for relief when they became rather obstructive to copulation. When first seen, the nymphæ and clitoris were much hypertrophied. The left tumor was fully five inches long, and by traumatism became gangrenous in its distal half, which soon fell off. The parts presented the appearance and color of integument, were firm, even leathery and resistant, not at all sensitive, perhaps rather callous, and they had an irregular lobulated and nodulated contour. They are well shown in Fig. 63. On several occasions mild and ephemeral ulcerations had existed in the deep vulva, but they caused no uneasiness. Two weeks after removal of the hypertrophied parts the woman stated that she was as well as ever, and left the hospital. In this case the irritation from the myrtiform caruncles extended to the lesser labia, and this led to their hypertrophy. In the early stage of the affection the parts were softer, more succulent, and redder; as it grew old they became condensed and gradually lost their color, until they came to closely resemble ordinary integument. The general health was wholly unaffected. There was no involvement of the inguinal ganglia.

In this case, as a result of simple local inflammations, the myrtiform caruncles became inflamed, and then hyperplastic, and from these foci the new growth extended

and involved the labia minora, including the prepuce of the clitoris, and that organ itself, in hypertrophy. The low form of inflammatory, red, œdematous infiltration

FIG. 63.



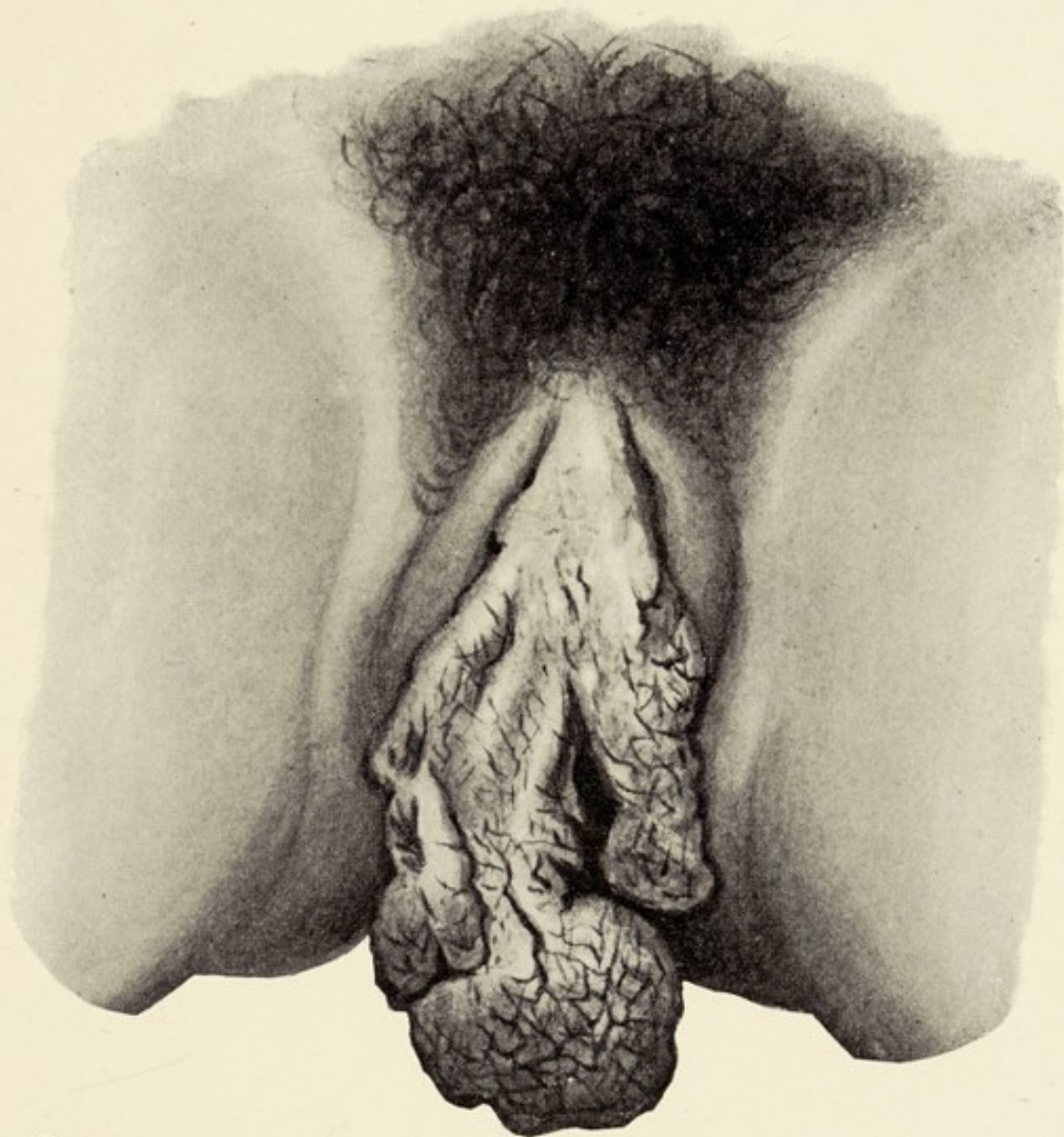
Showing hypertrophy of both nymphæ and of the sheath of the clitoris.

of the vulva which was observed early in the woman's medical history will be fully discussed later on. In this and the preceding case the limitation of the morbid process to the vulva and nymphæ is clearly marked. In them, also, the tendency of the affection to push outward and downward is well shown. Later on, however, the deeper parts very often become invaded. This case, therefore, may be accepted as a typical one, showing the involvement of each and all of the parts of the vulva. Though the introitus vaginae was at the date of the operation thickened and less supple than normal, this condition was undoubtedly due to symptomatic irritation, since in a few weeks after the operation the natural condition of the parts was restored.

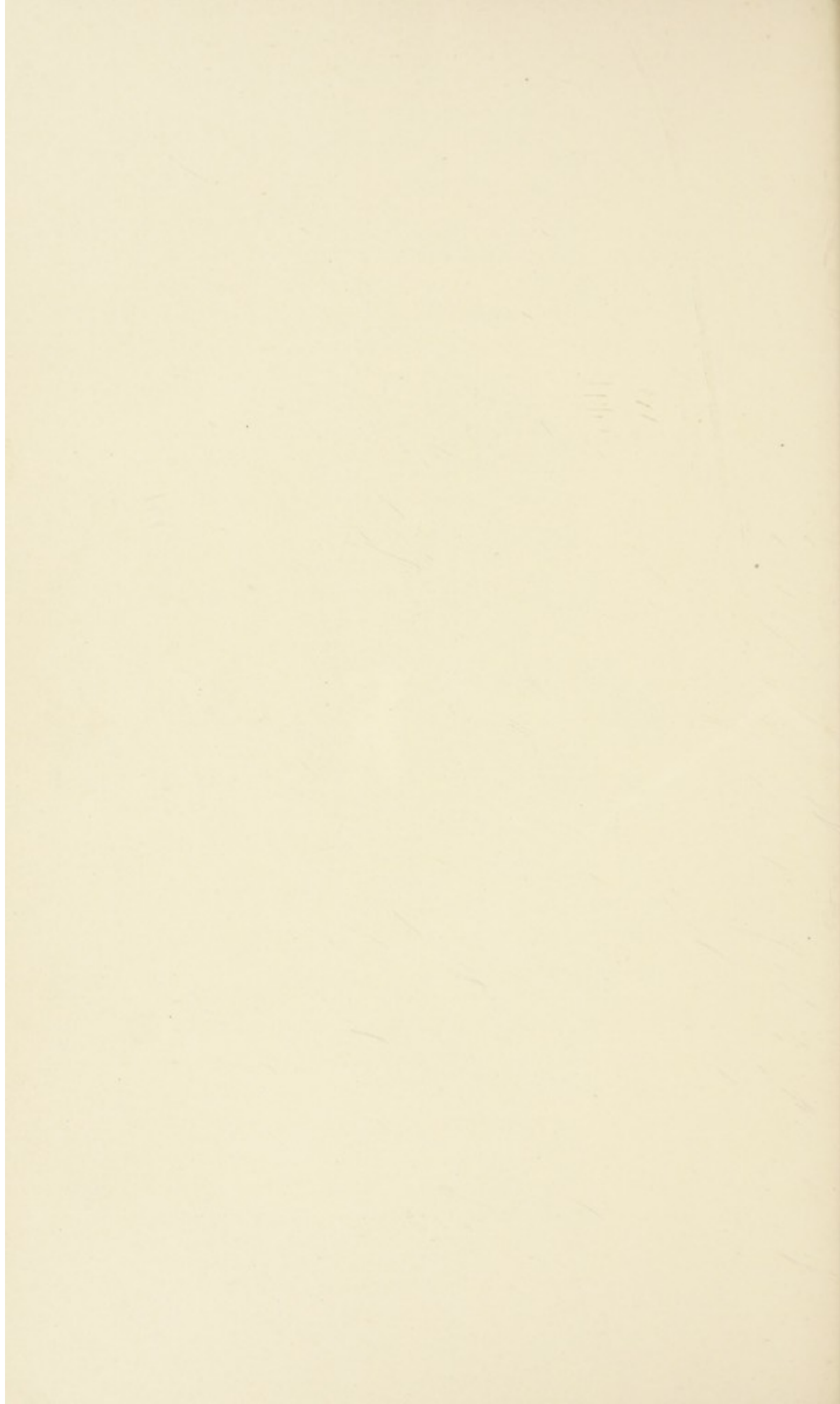
In Plate VII. we observe the acme of the hyperplastic process of vulvar distortion, which centred itself in the præputium clitoridis and a part of a nymphæ.

A woman, aged twenty-six, Irish, married, had not suffered from any vulvar or vaginal affection. Six months before the operation she had fallen upon a fence and wounded the mons veneris and upper part of the vulva. These regions were the seat of ecchymosis and pain for about two weeks. Shortly after the patient noticed a protrusion from the upper part of the vulva, but, as it was unaccompanied by pain or inconvenience, she paid no attention to it. It, however, grew quite rapidly, until in about eighteen months the growth measured four inches, and, besides being very inconvenient from its bulk and situation, it caused uneasiness by its weight. The patient noticed that when she was on her feet very much the tumor was larger and of a deeper color than it was if she remained recumbent. There was no affection of the inguinal ganglia. The mass is well shown in Plate VII. It was rather more than four

PLATE VII



Enormous Hypertrophy of the Clitoris, with part of the Left Nympha.



inches long and about two inches at its widest part. It involved the prepuce of the clitoris and a portion of the upper part of the left nympha. It was hard and firm in consistence, of a pinkish-white color, and its surface was studded with lobulations and intersected with large and small furrows. It was ablated, and the woman left the hospital cured.

A special point of interest in this case is the rapidity of development of this enormous growth. Assuming that the patient's story was correct (and great care was taken to get at the truth), the large mass was developed in about eighteen months. This I may say is very exceptional, for in several other cases I have noted that the time occupied in the growth of hypertrophy of the clitoris has been two or more years. In the present instance the trouble began in trauma, but I have seen a number of cases in which hypertrophy of the prepuce of the clitoris was due to masturbation. I have now under observation a woman of twenty-two who, since her twelfth year, has produced almost daily one or two orgasms by digital irritation of the clitoris, and yet the hypertrophied mass is not larger than the first joint of one's thumb.

In this affection it is very probable that the hyperplastic process begins in the prepuce, and that later on the body of the clitoris is involved.

These hypertrophic growths of the vulva have been wrongly called elephantiasis, notably by Hildebrandt, and more recently (1885) by Zweifel. Neither in their clinical history nor in their pathological anatomy do they in any way resemble true elephantiasic growths, which are due to lymphatic inflammation with connective-tissue increase. They are elephantine only in size.

There are a number of conditions relating to the early stages of these vulvar hyperplasiæ which demand consideration. In many subjects, particularly young, cleanly, and healthy ones, these hypertrophic growths run their course to full development without any perceptible signs of inflammation. The growths in these subjects are, while increasing, of a pink or pinkish-red hue, and, as they grow larger and push from between the labia majora, they become blanched, and finally may look like integument.

In another class of cases, particularly in unhealthy, uncleanly women, in those subject to any vaginal discharge, and in women about and after the menopause, we see synchronously with their growth a decided increase in their inflammatory and œdematous features. In these cases there is always more or less concomitant vulvar hyperæmia. The hyperplastic parts (when their mucous membrane is yet intact) are either of a deep-red or of a dull-violet-red color. They have not the firmness of structure, perceptible to the touch, of the less hyperæmic growths, but are rather softer and, we may say, more succulent—a condition, in all probability, due to a correlated œdematous exudation.

In this soft and succulent stage of the hypertrophies there is, besides the lesser degree of sharp limitation and of localization, a decided tendency to ulceration, particularly in the fissures, sinuosities, and anfractuosities which are found in them. In all uncomplicated cases of these simple forms of hyperplasia it will be evident to a careful examination that the ulcerative process is always secondary to the hypertrophy. It is usually plain to the observer that the power of resistance of the morbid tissues to irritation is greatly impaired, and that when pressure exists, as from close coaptation of the

parts, or when any irritation is exerted, there will be found ulceration. These ulcers, however, do not present any pathognomonic features, and it is amusing to peruse the descriptions of these lesions by those who lean to the view that they are due to lupus. The writers see distinctly that the ulcers have not a lupoid look, and they go over point after point trying to reconcile in their minds the evident discrepancies.

We find as concomitant features of these vulvar hypertrophies simple excoriations, smooth ulcerations, with or without slight or pronounced granulating tendency, indolent conditions, and sometimes sluggish ulcers covered with necrotic detritus. They are almost always, however, in uncomplicated cases, what we may term simple ulcers, having the most varied shapes—linear, penniform, irregular, and stellate—and differ very markedly from those we shall study in the two following chapters.

But, simple as they are, they exert a very bad effect upon the course of the new growths. They tend to increase the morbid process itself, and they themselves very often grow and cause incalculable mischief. Thus they may burrow and cause fistulous tracts into the labia and urethra, work their way forward and cause vesico-vaginal fistula, pass backward into the ischio-rectal space, and even into the rectum, forming a channel between it and the vulva or vagina. Then, again, they frequently lead to necrosis of small and even large hypertrophic growths by eating them away at their bases.

These ulcerations often cause mild and even severe hemorrhage, which is usually readily controlled when they are superficial, but which may be very intractable when they are deeply seated.

It not uncommonly happens, when both sides of the vulva, as is very common, are the seat of hypertrophy in the succulent stage, that excoriation of the coapted surfaces occurs, and from them there is an oozing of bloody serum or blood. It is this condition, undoubtedly, which the older writers observed in what they called oozing tumor, and which later on has been labelled hemorrhagic lupus.

In favorable cases the succulent stage of these growths gradually subsides and the parts slowly pass into the condition of condensation, until in the end a dense, leathery state may be reached.

In bad cases—and they are generally in old women—however, the trouble extends, and destruction of the vulva and its canals is more or less complete. In this event the patient gradually wastes away from marasmus, dies of phthisis, or of chronic diarrhœa or dysentery. For many years, however, the general health may remain unchanged, and only when the destruction is great, and the natural outlets of the body more or less destroyed, do signs of breaking up begin to show themselves.

When ulceration attacks these hypertrophies there is very often more or less enlargement of the inguinal ganglia.

I have been particularly struck with the fact that I have never seen cancerous degeneration of any of these hyperplastic growths, even when they have become very old and when very much irritated. The little red vascular tumors of the caruncles and vulvar fringes may from irritation become epitheliomatous in women toward and beyond forty years of age, but when they have reached the stage of condensation they, like their larger congeners, may become much inflamed and ulcerated,

may be the seat of abscesses, and may slough off, but they show no tendency to become epitheliomatous. This is probably due to the fact that, with the thickening of the skin, it becomes impervious to the invasion of exuberant epithelial tissue from without.

In some cases I have seen much ephemeral hyperæmia and an erysipelatous condition of the growths and parts around them, particularly in those who had become infected with gonorrhœa, who had vaginal discharges and were uncleanly, and also in women who had returned to the hospital after a protracted debauch.

In their succulent stage these hyperplasiæ might possibly be mistaken for epithelioma, but the mistake should not last long. Epithelioma is usually more localized, of a much greater density even to stoniness, is productive of a large warty or papillomatous and ulcerated surface, and is very soon accompanied by enlargement of the inguinal lymphatic ganglia. The ulcerations of epithelioma are upon the surface of the neoplasm, while those of simple hyperplasia are mostly found in the interstices and fissures and at the bases of the simple hypertrophies. Epithelioma of the vulva gives rise to pain of a lancinating character, while the subjective symptoms of the simple growths are not severe and consist mostly of heat and pruritis. In any case, the diagnosis can be made at once by a microscopic examination of the morbid tissue.

PATHOLOGY. The morbid process producing these hyperplasiæ is a form of inflammation with the production of new connective tissue, while congestion and exudative products are almost if not entirely absent, and is termed *chronic productive* or *chronic cellular inflammation*. Productive inflammation in mucous membranes and transitional cutaneous mucous membranes produces

a new growth of connective tissue in the stroma, occurring diffusely or in the form of nodular polypoid outgrowths. A characteristic feature of this form of inflammation is its slow development and its tendency to persist for a long time. These general characteristics of productive inflammation agree very well with the clinical history and physical properties of the vulvar growths already described.

The foregoing description applies only to the anatomy of simple hyperplasiæ, which have thus been traced through all periods of their development and course. But it must be remembered distinctly that hyperplasia in old syphilitic subjects presents precisely the same pathological appearances as in non-syphilitics. My aim has been to clear away all the darkness that has obscured these vulvar lesions, by showing that the majority of them are in no way specific or lupous in their nature, but that they are simple hyperplasiæ which, owing to their situation, have undergone various changes. I have not attempted to portray the pathological anatomy of any of the syphilitic new growths, since that has been done by many, and it is not essential here.

(For further microscopical details as to this morbid process, see my essay "On Chronic Inflammation, Infiltration, and Ulceration of the External Genitals of Women," *New York Medical Journal*, January 4, 1890.)

TREATMENT. Thorough removal with the knife or with the galvano-cautery of these growths is always necessary, the incision being made with the view of preserving the conformation of the parts as much as possible. After operation, irrigation of the vagina and care as to the cleanliness of the vulva are very necessary.

CHAPTER XXX.

INFILTRATION AND DISTORTION OF THE VULVA FROM CHRONIC CHANCROIDS.

HYPERTROPHIES of the labia majora and also of the labia minora, and of the deeper tissues, as the result of chronic chancroids, are far from uncommon in hospitals for women suffering from venereal diseases. Any one who has had large experience in the treatment of these ulcers in women will at once call to mind cases where, after the healing of the ulcer or ulcers, a persistent and rebellious thickening of the parts has remained. Time, care, and appropriate treatment will, in most cases, cause the disappearance of this residual thickening. But when patients are careless or refractory to treatment, uncleanly, and given to drink, the hypertrophy, if it has attained a moderate degree and extent, will almost inevitably increase. Then, again, we constantly find it perpetuated by gonorrhœal and leucorrhœal discharges. The foregoing remarks apply to conditions secondary to what we may call acute chancroids—that is, lesions which have come and have disappeared within one, two, or four months, for this form of ulcer is very persistent in women.

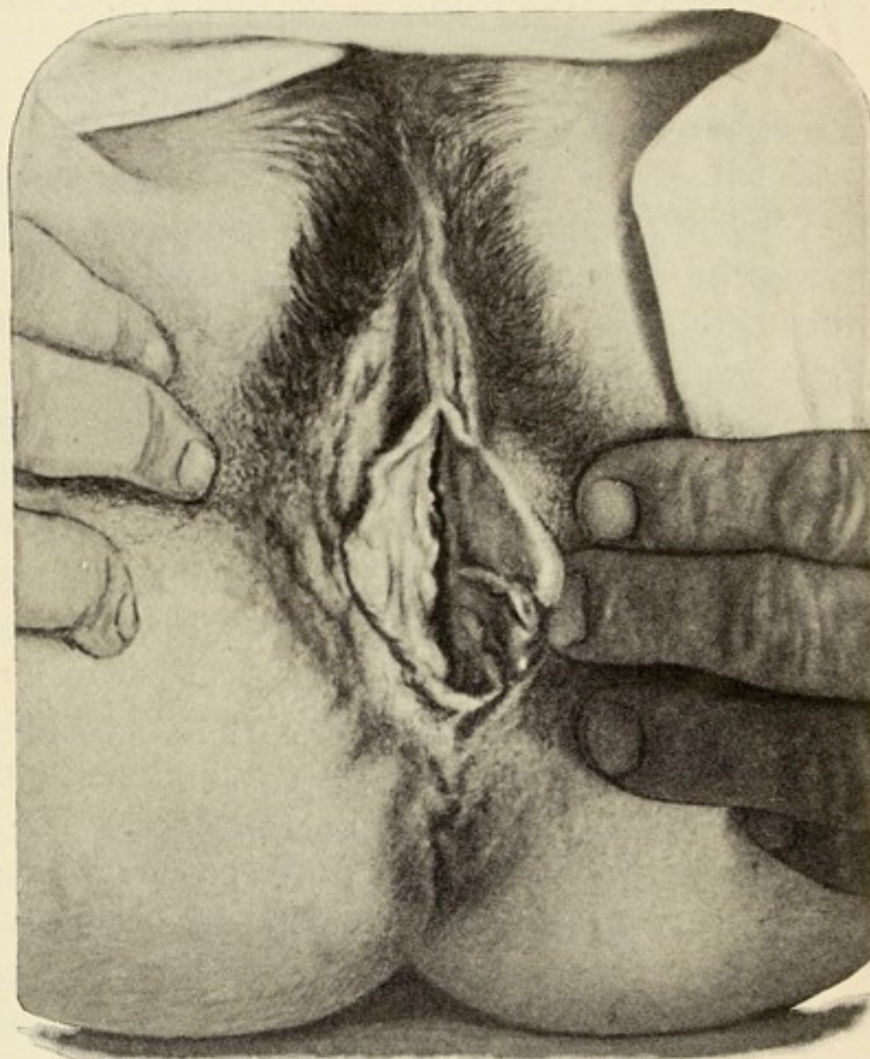
In like manner hypertrophy of the vaginal introitus, vulvar and juxta-anal region is far from infrequent as a direct result of chronic chancroids.

The history of a case will throw light on the course of this form of trouble:

A domestic, aged forty-eight years, who never had

syphilis, had a small chancroid just above the fourchette on the left labium minus, which had lasted nearly a year, when she entered the hospital. It then was an elevated ulceration (*ulcus elevatum*) on the inner side of

FIG. 64.



Showing chronic chancroid of the left nympha, with hypertrophy of the deeper parts.

the left nympha about the size of a silver quarter. It showed no tendency to extend, but remained in an indolent condition, became hyperplastic and elevated. The corresponding nympha was very much thickened, hard,

and elastic, and the hyperplasia continued from it into the vagina for about an inch. The appearances are well shown in Fig. 64, which was made from a photograph taken fifteen months after the chancroidal infection. It will be seen that the hyperplasia is well limited to the affected nympha. Though this woman received the utmost care from my internes and nurses, the ulcer healed very slowly, and it required a full year's treatment (for, contrary to the custom of these patients, this woman remained continuously in the hospital) to produce perfect resolution in the nympha and to restore the elasticity of the introitus vaginæ.

The foregoing case was an especially auspicious one, as the woman was kept under treatment until she was cured. These women are usually very bad patients, and will only submit to treatment for short periods of time.

The painlessness of the genitals in this condition is very surprising, and, although the ostium vaginæ is often hard and rather unyielding, these women may continue to have promiscuous coitus. After the acute stage the hyperæmia settles down into an indolent condition, which may thus remain indefinitely, or it may be succeeded by an exacerbation of inflammation and ulceration due to drunkenness, debauchery, and general uncleanness. Internal medication is powerless in these cases, and topical applications, which are slow to heal the parts in the early stage of the career of these women, in the latter periods have little and often no effect. As the trouble becomes chronic, the whole vulva, more or less of the vagina, the anus, the rectum, the vesico-vaginal septum, and vagino-rectal space becomes inflamed and hyperplastic, and, as a result, ulcerated.

In general, chronic chancroids on the clitoris and external portions of the genitals heal readily, while those

of the ostium vaginæ, of the inner surfaces of the labia minora, and of the fourchette are often very difficult to cure, and they show a tendency to become chronic, and to induce hyperplasia and hypertrophy of the parts. In the chronic stage, in proportion as the ulcers are deep and inaccessible, and as they involve the natural outlets, they are menaces to life by the disastrous conditions which they lead to.

Large or small fleshy masses, the result of an extension of the inflammatory process, may occur on the perineum or at the margin of the anus. Fleshy tumors and excrescences may also result from chancroids hidden in the puckered folds of the anus.

Chronic chancroids with great vulvar hypertrophy are usually found in women beyond thirty and forty years of age. Such women, so long as they are in any way attractive to the male sex, remain in the hospital just long enough to become "patched up," as we may say. In the early years of their trouble their general health does not suffer, and it is to the uninitiated a matter of surprise to see women with distorted, disfigured, and ulcerated vulvæ complain so little, if at all, and seem so well. As time goes on, however, things change. Ulcerations may perforate the urethra, the bladder, the vagina, and the rectum, and they may burrow and form large cavities which may open by fistulous tracts about the buttocks or thighs. Hemorrhages of greater or less severity may take place and erysipelatous inflammation, beginning about the genital parts, may spread beyond and be accompanied by severe systemic reaction. Then, as years go by, signs of decay show themselves. The patients begin to cough and emaciate, and a rapid phthisis may end their misery. They may become attacked by affections of the kidneys and liver which

prove fatal. Then, again, we constantly see these women fall into a condition of marasmus, over which treatment has no influence whatever. And, again, we see life gradually sapped by rebellious chronic diarrhœa or dysentery. I have seen several of these women carried off by well-marked pyæmic infection.

In a general way, I should say that women suffering from these severe forms of chronic chancroids and vulvar deformity, with all their dangerous concomitants, live from eight to fifteen years; an average of ten years, I think, is quite constantly observed.

Some patients are more prone to inflammation and irritation than others, and they may become the subjects of vulvar hyperplasia. I have not been led to look upon a dyscrasia as an underlying cause of any moment in any non-syphilitic cases. In my experience the vulvar troubles begin when the women are well, and ill-health overtakes them when the hypertrophies have led to ulceration, fistulæ, deep abscess, fissures, and to strictures of the urethra and rectum, and stenosis of the vagina.

It is important to remember that, though we use the term chronic chancroid, very many of the so-called ulcers do not present the typical and classical appearance of these lesions when of recent origin. Indeed, the term as applied to ulcers about the vulva is one of great elasticity, since almost any good-sized intractable ulcer is thus denominated. These ulcers present wide variations, since they may appear like ulcerated excoriations, they may present resemblance to the classic chancroids, and they may be covered with a greenish-brown or grayish-black film, or even with a layer of tenacious necrotic tissue. Their edges very frequently present nothing pathognomonic, and their secretion of pus and pus com-

bined with molecular detritus, and even blood, will be offensive to the nose in proportion as patients are uncleanly and untreated. Some authors have laid much stress on the odor of the secretions in these cases of vulvar hypertrophy, but my experience teaches me that it conveys nothing of diagnostic import, but that all morbid secretions are exceedingly disgusting in unclean persons.

In many instances the origin of these ulcers in a contaminating coitus is readily ascertained, while in others they seem to develop *de novo*. The truth of the matter is that in all cases of vulvar hypertrophy, particularly in the succulent stage, ulceration is liable to occur as a result of irritation or traumatism of all kinds, and that they are undoubtedly caused by micro-organisms, which find a nutrient nidus in chronically inflamed tissues.

In some cases we find hypertrophy precede ulceration, and in others that chronic ulceration leads to hypertrophy. As a general rule, however, hyperplasia is by far the more active and the ulcerative the less prominent process. It is remarkable to observe the great chronicity and indolence of these vulvar ulcers. They, as a rule, increase very slowly, and may remain many months, and sometimes one or two years, without any perceptible change. In these cases, however, the hyperplasia goes on more or less actively. The reason for the slow and indolent growth of these lesions lies in the fact that the condensation of the hyperplastic tissue offers, chiefly by its narrowing of the bloodvessels, a dense and unyielding soil for the destructive process.

The inguinal ganglia in these cases are usually somewhat enlarged and sometimes much swollen. In some cases no change is noted in them, consequently they are not of much aid in diagnosis.

TREATMENT. When seen tolerably early chronic chancroids with vulvar hyperplasia should be treated systematically by means of frequent and copious injections of some antiseptic solution. Watery solutions of powdered borax (℥iij to ℥xxxij) with one drachm of carbolic acid should be used three times a day. The next essential is to keep the morbid surfaces separated as much as possible and in a dry condition. To this end tampons of absorbent-gauze dusted with iodoform, boric acid, or aristol should be carefully applied and frequently renewed.

When the surfaces of the ulcers are sluggish, fluid carbolic acid may be carefully and sparingly applied, and then the tampon may be inserted. When the surface is very necrotic or fungoid it may be necessary to curette the parts or to apply pure nitric acid very carefully.

Whenever fleshy masses protrude so much that they cause discomfort, they should be removed with the knife. Should infection of the cut surfaces occur, the continuance of the regular treatment will soon abort this threatened complication.

CHAPTER XXXI.

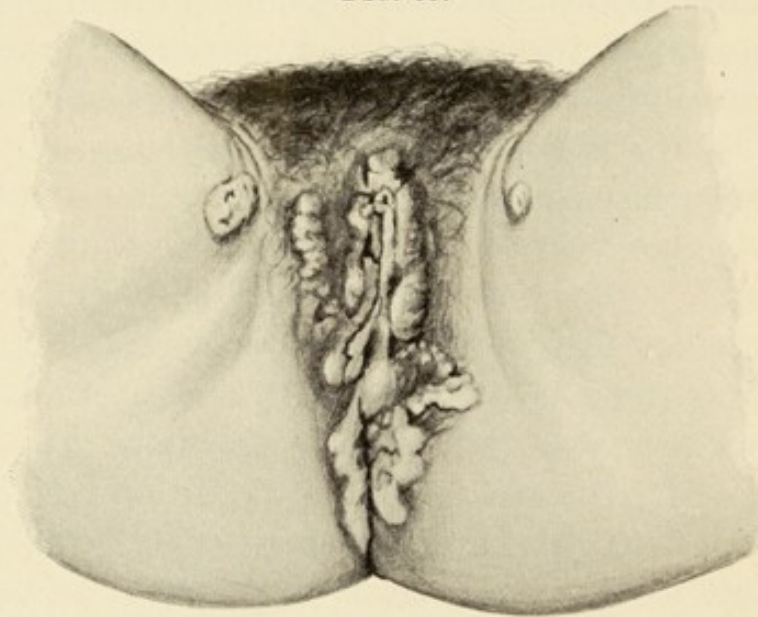
HYPERTROPHIES OF THE VULVA DUE TO SYPHILIS.

THE vulva and anal region are not infrequently the seat of syphilitic lesions in the secondary and tertiary periods of the disease.

Condylomata.

In the secondary period it is not uncommon to find, particularly in uncleanly women, pinkish or red, broad,

FIG. 65.



Showing condylomata of vulva and anus.

flat, fleshy disks of thickened tissue, which may become remarkably salient, as shown in Fig. 65, and sometimes may present a warty surface.

Condylomata in the female may give rise to a viscid

malodorous discharge, which, escaping down the thighs, causes much irritation.

These lesions begin as one or two red eroded spots, in which hyperplasia soon develops, and then the condylomata increase in size and in height, until large fleshy masses may be produced. These run an indolent course and may cause much distortion of the vulva and perineum. They usually yield quite promptly to treatment. In some neglected cases they lead to vulvar and vaginal deformity.

**Vulvar Deformities in the Early and Late Stages of Syphilis
due to Indurating Œdema.**

In some exceptional cases the initial sclerosis occupies a whole labium and much enlarges it. In a decided number of instances we find that accompanying the initial lesion, either around it or in its vicinity, a hard œdema of one labium or both labia occurs. This œdema, which has been called sclerotic or indurating, is very peculiar and is the sole appanage of syphilis. It usually begins in an indolent aphlegmasic manner, without pain, and perhaps with no heat and pruritus, and becomes fully formed in from one to three weeks. Then, again, in some cases its onset is quite brusque and rapid, and in a few days a labium may be greatly enlarged. When such a labium is examined it may be found to be of double, even quadruple, its normal size. Its tegumentary covering may be normal in color or a little redder than usual, while its mucous membrane is of a dull red. In some cases the corresponding labium minus may be affected, and its pinkish-red color is then somewhat increased. There is no evidence of inflammatory engorgement, nor of soft œdematous swelling. The parts are not unusually hot, not tender on pressure or otherwise

as a rule, but they are of an extreme hardness, sometimes presenting a dense elasticity, like one's ear, and again a stony feel, like cartilage or sclerodermatous tissue. The impress of the finger always meets resistance. It may be that the whole labium or the labia (if

FIG. 66.



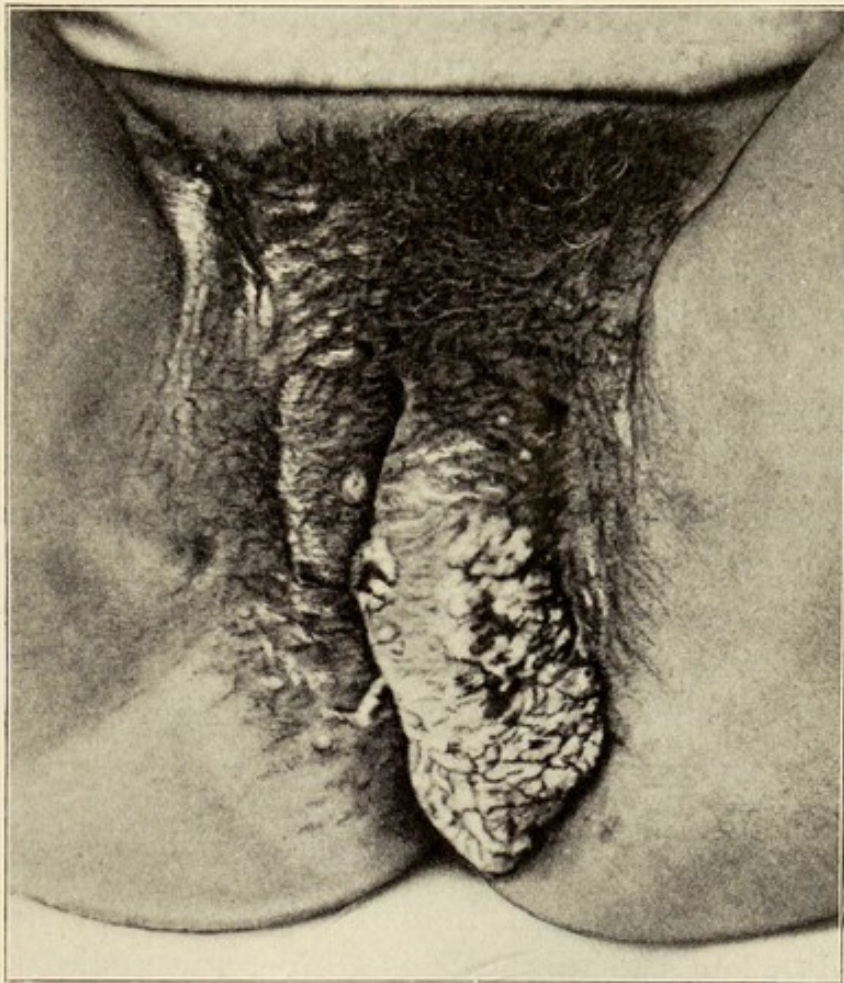
Showing indurating œdema of both labia minora in late syphilis.

both are involved) may be thus uniformly sclerotic, or, as often happens, there may seem to be a central kernel of great density surrounded by an atmosphere of elastic firmness. In uncleanly women, during preg-

nancy, and as a result of traumatism, this indurating œdema may extend beyond the labial limits. Well-marked secondary symptoms are usually constant concomitants.

The appearances of indurating œdema of both labia minora in late syphilis are well portrayed in Fig. 66.

FIG. 67.



Showing indurating œdema of both labia majora, with warty and papillomatous growths.

Though indurating œdema is more commonly seen in the primary and early secondary stages of syphilis, it may occur later in the disease—namely, in the first,

second, and even third years. In these cases of late development, however, there is commonly a marked persistence and activity of the diathesis. While the indurating œdema of the primary and secondary stages of the disease usually accompanies or follows the active lesions, that of the later periods may be unaccompanied by any previous or present syphiloma. Though late œdema may be thus complicated by various syphilitic processes, it very often is developed by vaginal or vulvar irritation, and also by traumatism.

In some cases very much enlargement and distortion of the labia majora are produced by indurating œdema, and rather exceptionally the surface of the new growth becomes warty and papillomatous. When this warty condition is found on these densely hard and indolent tumors the diagnosis of epithelial cancer may be made. In Fig. 67 a typical mass of indurating œdema is shown on which many warty growths had developed. Several physicians who saw this case at first thought it was one of cancer.

Indurating œdema runs a long, sluggish course, and yields very slowly to treatment, which should be both local and general. In some cases ablation of the parts becomes necessary.

Chronic Chancroids in Old Syphilitics.

We frequently find in early syphilis and in later periods when the diathesis is active, and again when it is waning, ulcers which appear *de novo*, and from tradition we call them "chancroids." It is to-day a generally accepted fact that chancroidal ulcers are caused by many forms of active pus, and that syphilis is a frequent cause of the secretion which gives rise to these ulcers. There undoubtedly exists in syphilitics a vulnerability of the

tissues, showing itself in their tendency to ulceration and hyperplasia. About the female genitals this tendency is shown in the development of chancroids upon parts irritated by uterine, vaginal, and vulvar secretions, and especially upon any lesion of continuity, such as an excoriation, a tear, a fissure, or upon the seat of vesicles. In their early stages these ulcers may resemble the classical chancroid, but as they grow older they lose more or less of their typical appearance.

These ulcers usually have sloping edges and fairly smooth bases, which are covered with a greenish-gray or brownish-red film of pus, under which is a slightly papillated surface. They look indolent, and their history proves that in general they are aphlegmasic, persistent, and chronic. They occur on all parts of the female genitalia, and may remain without any perceptible extension for a long time, but yet they frequently cause great harm. As long as they remain they give rise to a very low grade of secondary inflammatory engorgement which leads to hyperplasia, which may extend up the vagina or into the vulva, thickening the vaginal and often the rectal walls, attacking the labia minora by preference and causing their great hypertrophy, and also sometimes inducing similar change in the labia majora. All of the clinical features of the vulvar hypertrophies which result from chronic chancroids may be produced by these chancroids of syphilitic origin; therefore, having already described them, repetition is unnecessary. It, however, may be added with advantage that where the syphilitic diathesis is active, and often even when it is waning, specific evidences of the disease may be seen elsewhere upon the body. The hypertrophies produced by these syphilitic ulcers are similar to those of simple chancroids, except that we sometimes

see a greater tendency to destructive ulceration, and in some cases to phagedena. Though the clinical features of chancroidal and of this form of syphilitic sequelæ are hardly sharply enough drawn to warrant separate descriptions of their respective hyperplasia, the underlying facts must be stated, and this necessitates the division I have made. Hypertrophy of the vulva, therefore, depending on simple hyperplasia from chronic ulceration in syphilitic patients, is far from uncommon.

Distortion of the Vulva in Old Syphilitics.

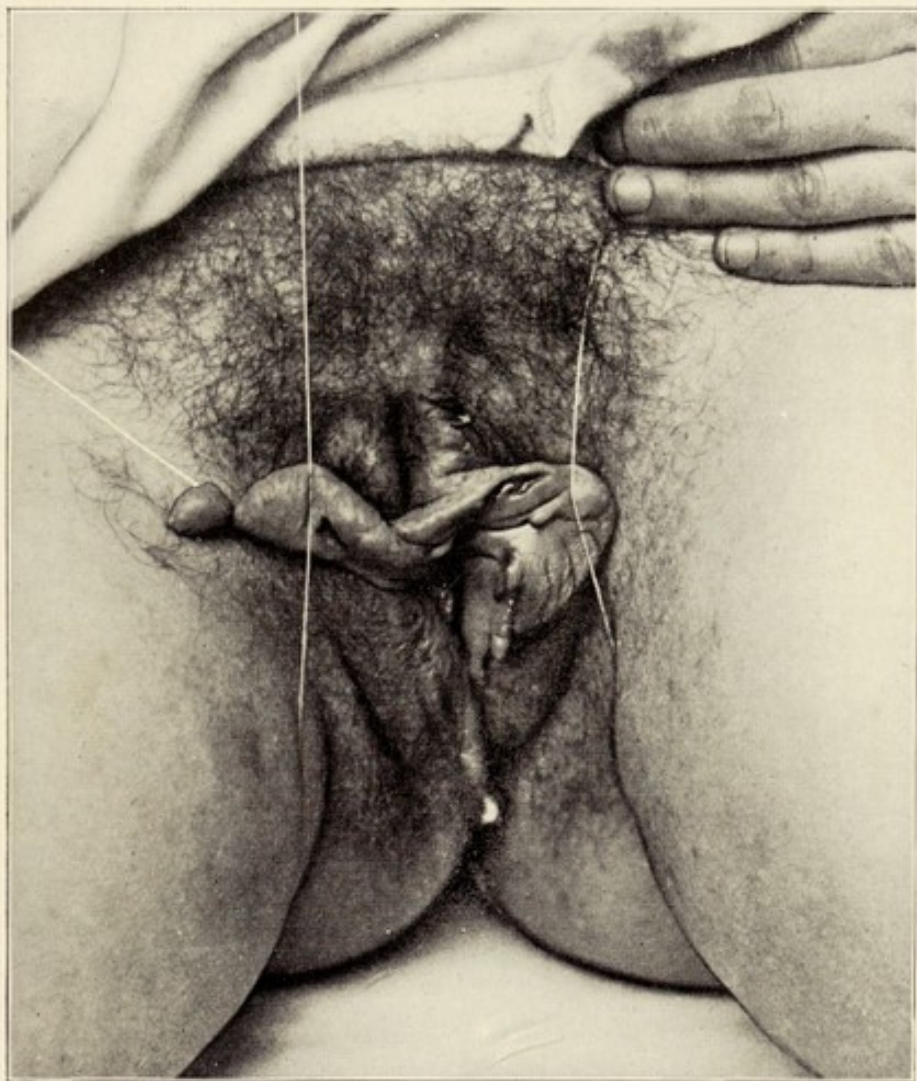
There is a condition of the tissues in older syphilitics, and usually in persons of the lower classes, which has not, according to my reading, been described by any author, but which, I am convinced from years of study, is not extremely uncommon about the genitals of women, particularly as seen in large venereal services.

This condition consists in a simple hyperplasia of the tissues of the genitalia, which results in more or less deformity. While early in the disease we so commonly see the tendency to ulceration, later in the diathesis it seems to engraft on these tissues a tendency to a very low grade of inflammatory process by which organs and parts are much thickened and distorted. This hyperplasia in syphilitics is microscopically the same as that of non-syphilitics, and cannot in any sense be considered as an essential evidence of disease.

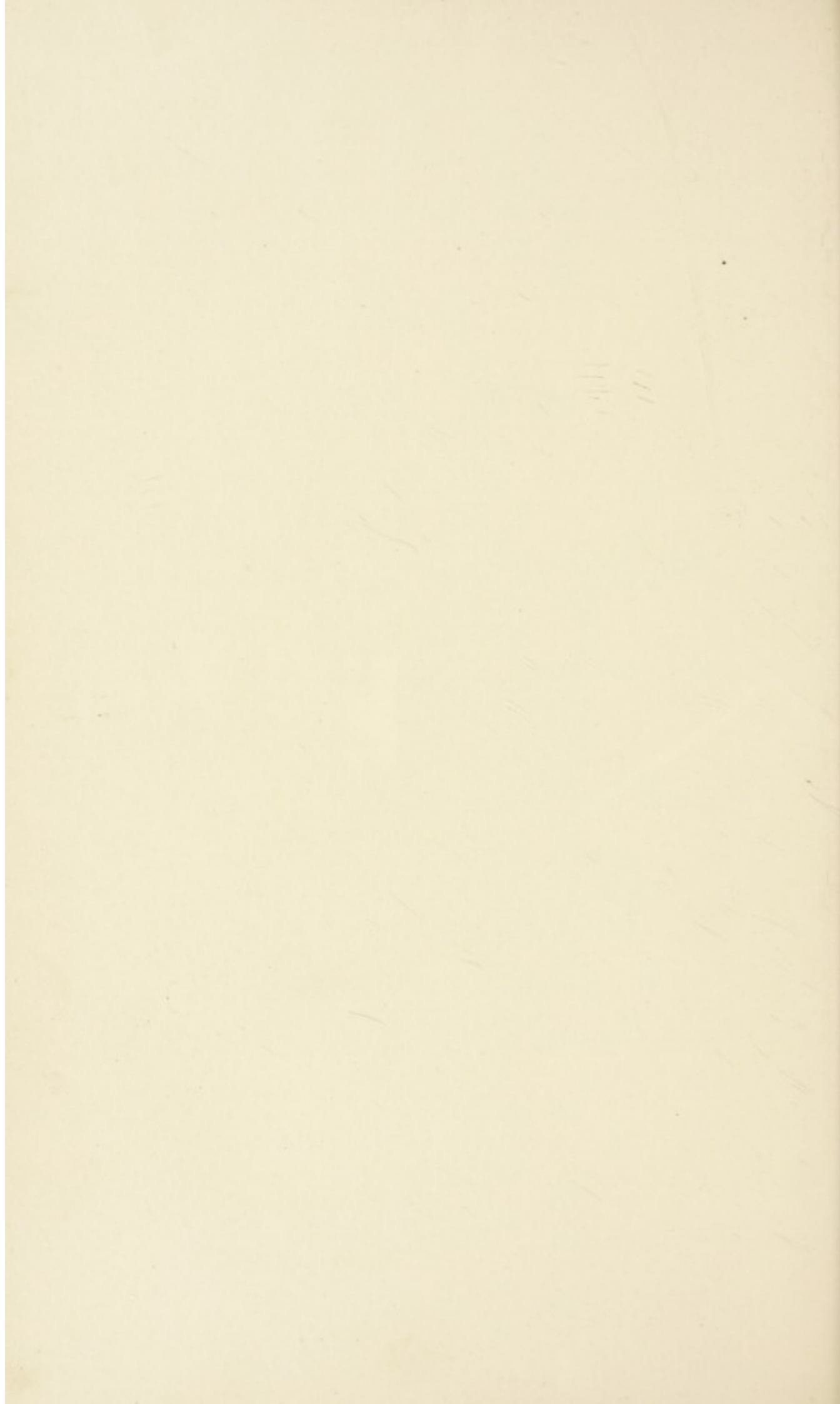
No systematic description can be given of these vulvar distortions, since no two cases are alike. In all cases the natural shape and relations of the parts are more or less enlarged and disfigured.

On Plate VIII. is well shown the condition of the external genitalia in a twenty-eight-year-old woman who had had syphilis six years before this vulvar distortion had

PLATE VIII



Hyperplasia of External Genitals in an Old Syphilitic.



developed. At this time the following conditions were noted by me: The left labium minus was very greatly increased in length and thickness, the clitoris and its prepuce were much hypertrophied, and the right labium minus (which was originally much shorter than its fellow) formed a long, fleshy process, which hung down nearly two inches between the thighs. The appearances are well shown in the Plate, the hypertrophied growths being brought into prominence by means of threads. The mucous membrane of these parts was somewhat thickened and similar to integument. The whole mass was of a deep violet or purple-red color. At the base of these tumors were three shallow ulcers which might be taken for chancroids. Eversion of the hyperplastic nymphæ showed a thickened, violaceous condition of the whole vulva, with a decided narrowing of the vaginal orifice by reason of the thickening of the tissues, which extended into the vagina three inches. The orifice of the urethra was obscured by a cluster of hypertrophied caruncles. The labia majora were also enlarged and swollen, and the very short perineum ended in a tab-like mass of integument, seated just on the anterior border of the anus, but not encroaching upon it. From the stenosed vaginal orifice a copious persistent discharge escaped. The hypertrophied nymphæ presented a firm resistance to pressure, and the tissues of the vulva, though rather more dense than normal, were, as we may term it, in a succulent condition from the hyperæmia. The ulcerations were rather superficial, of brownish-red color, smeared with pus, smooth of surface, without well-defined outlines, and their margins devoid of any appearance of being undermined. There was little or no pain in the outer growths, though the vulva was rather tender, and sometimes, when irritated,

the seat of a stinging, smarting, and itching pain. The sufferings of the patient, however, did not seem to be at all proportionate to the severity and extent of the morbid process. She had at times been treated energetically with antisyphilitic remedies with no effect whatever. I ablated the external tumors, greatly to the relief of the patient. Later on, hot antiseptic injections and appropriate topical treatment cured the ulcers and lessened the vulvar hyperplasia. The woman left the hospital much improved.

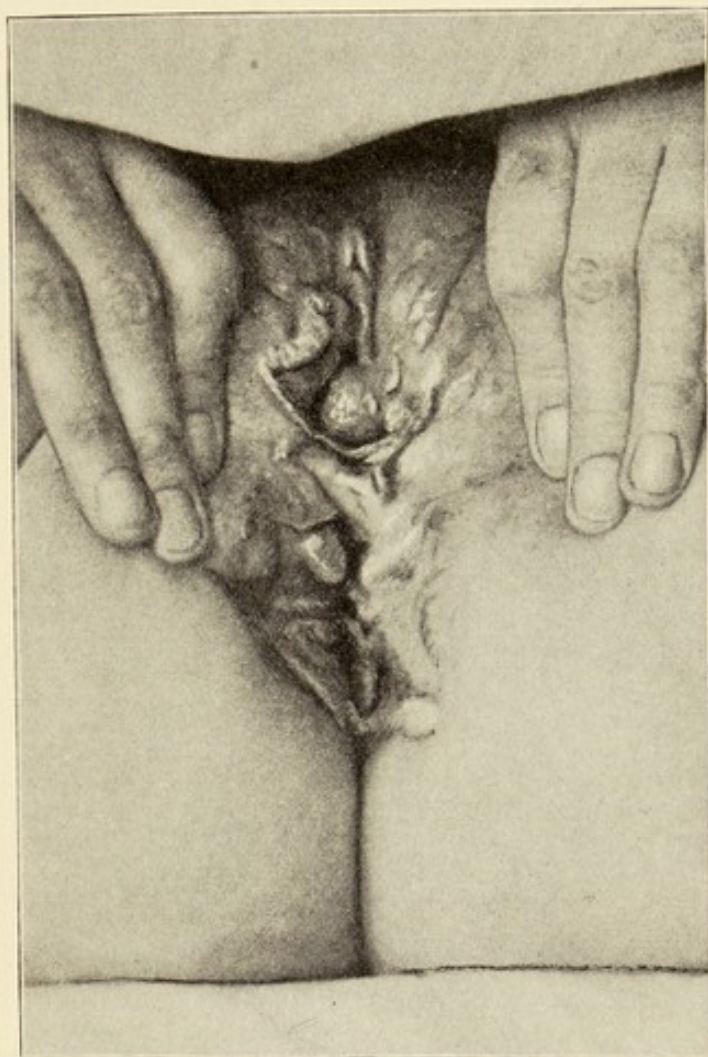
It is interesting to note that during the three or more years in which the vulvar hyperplasia was going on in this woman she suffered very little from the local affection. The progress of its development was slow, aphlegmasic, and unattended with any constitutional reaction. Microscopical examination of the removed masses showed that their structure was identical with that of hyperplasia occurring in non-syphilitic women.

Distortion of the Vulva, with Destructive Ulceration.

When the genitals are the seat of hyperplasia in non-syphilitic women ulceration may occur, but it is commonly limited in extent and not very destructive in tendency, though from the nature of the parts such damage may be done in these cases as will lead to invalidism and death. In chronic chancroid the ulcerative tendency is sometimes well marked and even quite destructive. In syphilitic subjects with these hyperplasiæ the acme of disintegration is often observed. In them, as a rule, the ulcerations are more active and extensive than in non-syphilitics. Not only do we find severe ulceration in syphilitic subjects, but also phagedæna, which may cause terrible destruction of the affected parts.

In Fig. 68 are shown the external genitalia of a woman, thirty-two years old, who became syphilitic when twenty-two. Seven years after infection, not having suffered from any manifestation, nor having presented any evi-

FIG. 68.

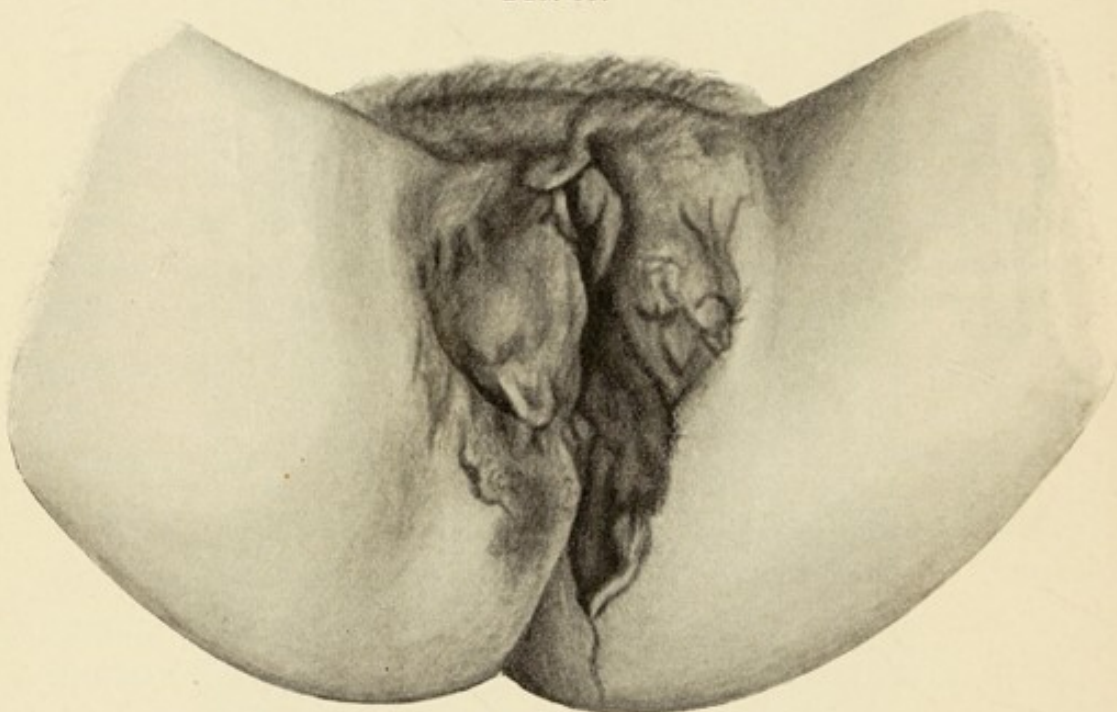


Showing hyperplasia of vulva and perineum and destructive ulceration in an old syphilitic.

dence of the disease for three years, she, after an attack of vaginitis, observed that her vulva became gradually swollen. This hypertrophy went on for three years, when it presented the appearances shown in Fig. 68.

At this time she became much debilitated and took stimulants and opiates. While she was in this state ulceration began in the vulvar ellipse and destroyed considerable of the hyperplastic tissue. Having built her up with tonics and generous diet, and nearly cured the ulcers, I removed the hypertrophied masses and obtained a very favorable result from cicatrization. Microscopic examination of the new growths showed simple hyperplasia.

FIG. 69.



Showing great destruction of hypertrophied vulva and perineum of an old syphilitic.

In rare cases phagedena may attack these vulvar tumors, particularly when the patient is getting on in years, is unhealthy, and uncleanly. The course and results of phagedena in an old syphilitic in whom vulvar hyperplasia was present are well shown in Fig. 69 and by the following details of the case: A woman, aged forty-seven, had had for years great hyperplasia of the

vulva following syphilis contracted ten years before. When she was in a dissipated and woe-begone condition, ulceration began about the fourchette. This lasted several weeks, and then the parts began to melt away from phagedena, with the result depicted in Fig. 69. Under treatment, healing was induced, cicatrization took place, and a fairly good condition of the parts was left, incontinence of the feces being the most distressing symptom.

The ultimate outcome of hyperplasiæ of the vulva in old syphilitics is about the same as that already sketched of the declining days of patients suffering from chronic intractable chancroids of that region.

The chronicity and inveterate course of these vulvar hyperplasiæ are undoubtedly due to the structural peculiarities of the vulva, to its excessive vascular and nervous supply, to the conditions to which it is so constantly subjected, and to its dependent position compressed between the thighs. Except in the mouth (and that very rarely), we do not see such persistent and deforming low-grade inflammation and hyperplasia.

In the past these chronic deforming lesions of the vulva, whether due to chancroids or in old syphilitics, were fancifully called by the following terms: *lupus hypertrophicus et tuberosus*, *lupus serpiginosus*, and *lupus prominens*, *esthiomène hypertrophique œdémateux et végétant*, *perforating lupus*, and *esthiomène perforant de l'anús et de la vulve*.

TREATMENT. Condylomata lata of the vulva and perineum should be treated both locally and systemically. The first essentials of treatment are absolute cleanliness of the genital tract and a condition of dryness of the parts. Alkaline and antiseptic irrigations should be used freely and frequently. When the parts are dried

they should be well dusted over with a powder composed of calomel and oxide of zinc, of equal parts. Then care should be exercised in keeping surfaces which tend to coapt as much apart as possible by means of absorbent-gauze.

When condylomata lata have become warty on their surface it may be necessary to apply very carefully and sparingly fluid carbolic acid, or even nitric acid in rebellious cases. When involution of the lesions is well under way a powder of oxide of zinc and boric acid (equal parts) may be used.

Systemic treatment may be administered in the form of mercury by the mouth or by inunction or injection, or by the use of the mixed treatment.

Indurating œdema of the vulva and the perineum is usually very persistent, even when active treatment is instituted. Cleanliness and dryness of the parts are absolutely necessary. Mercurial ointment, strong or mild, may be applied and kept on these growths, and thus, with the internal use of mercurials, perhaps in combination with the iodide of potassium, we may cause resolution after a time. When indurating œdema attacks protruding parts or those which can be removed without destroying the conformation of the vulva, therapeutics having failed, it is well to resort to the knife, treating the case with all antiseptic requirements.

Chronic hyperplasiæ of the vulva, vagina, and perineum are always absolutely uninfluenced by local or general mercurial treatment. The best results follow the ablation of all prominent masses. Then healing may be induced, and though a more or less stenosed vaginal orifice and vulva may be left, the patient is at least more comfortable and not in so much danger of ulceration, abscesses, fistulæ, and septic complications.

CHAPTER XXXII.

TUBERCULOUS ULCERS OF THE VULVA.

THE fact is now so well established that tuberculosis not very infrequently attacks the skin that the probability of the development of the tuberculous ulcers upon the outer genitalia of the female can no longer be called in question.

It may be stated as a broad fact that tuberculosis of the female genitalia grows progressively more uncommon in occurrence as it descends from the ovaries, the tubes, and the uterus into the vagina and vulva. Tuberculosis of the vagina by extension of the process from above is hardly to be called very rare. Involvement of the vagina alone is far from common, and when it does occur in some cases the vulva may be more or less involved.

I have seen three cases in which ulcers began just beyond the external genital regions, and in their extension involved the vulva, and of which the clinical diagnosis was tuberculosis of the skin and mucous membrane. These ulcers had finely and coarsely granular, papillomatous, and even fungating surfaces, and were encircled by hard, somewhat everted, deep-red, and even bluish-red, margins, with irregular and somewhat festooned outlines, and they secreted an abundance of pus. They began as round or oval, deep, violaceous red tubercles, which soon broke down into ulceration. In former years we classed these lesions under the head of *scrofulide tuberculeuse ulcéreuse*, proposed by Hardy and Bazin. Two

of my cases occurred before we knew of the existence of the *Bacillus tuberculosis*, while from the third and more recent case I was unable to excise a portion of the morbid tissue for examination. The patient, however, had pulmonary phthisis.

Primary tuberculosis of the vulva, however, is rare, and the most satisfactory case of it on record is that of Deschamps.¹ Zweigbaum's case² has been spoken of as being rare and peculiar. It is rare in the sense that tuberculosis of the female genitalia is rare. The details of it show that the morbid process began in the uterus and extended downward to the vulva. Chiari's case³ seems to have been one of tuberculous infection of the vulva, with involvement of the vagina.

If it is worth while to preserve the term lupus of the vulva, it may be applied to cases of ulcers caused by the tubercular bacillus.

TREATMENT. These tubercular ulcers should be curetted and dressed with balsam-of-Peru ointment. They heal very slowly and are prone to relapse.

The general tuberculous condition of the patient should be carefully treated, and if possible he should have an appropriate change of climate.

¹ "Étude sur quelques ulcérations rares et non-vénériennes de la vulve et du vagin." Archives de Tocologie, January, February, and March, 1885.

² "Ein Fall von tuberculöser Ulceration der Vulva, Vagina, and der Portio Vaginalis." Berlin. klin. Wochenschrift, May 28, 1888.

³ "Ueber den Befund ausgedehnter tuberculöser Ulceration in der Vulva und Vagina." Vierteljahr. für Derm. und Syph., 1886, vol. xviii. pp. 341 et seq.

CHAPTER XXXIII.

A PECULIAR NEW GROWTH OF THE VULVA.

THERE is a form of new growth of the vulva, which was first described by me¹ several years ago, which presents many peculiar and interesting features. I have had three cases of this trouble, but I shall in this chapter only describe two, since they contain all the essential facts. The first case was that of a woman who was perfectly healthy until her thirty-fifth year. From the time of puberty she performed the duties of a domestic, and had intercourse, more or less frequently, with different men. In July, 1876, she was treated in Charity Hospital for a suppurating bubo of the left groin, which, being incised, left a characteristic cicatrix. The patient had no knowledge of an ulcer upon the external genitals. Early in the year 1877 she again entered the hospital, suffering from a large chancroid in the sulcus between the left labia majora and minora. This ulcer was markedly persistent in its course, but was finally healed. At this time she remained in the hospital eight months. Neither at that time nor in later or recent years could I discover any history or evidences of syphilis, nor did the patient present any syphilitic lesions during a period of over twelve years. It may be stated, therefore, as beyond doubt that she was free from that disease.

On her discharge from the hospital in August, 1877, the patient was in excellent health; she had no vaginal discharge, and a redness of the left side of the vulva was

¹ American Journal of the Medical Sciences, Feb., 1890, and Jan., 1894.

the only sign of her previous trouble. At this date she was rather more than thirty-six years of age.

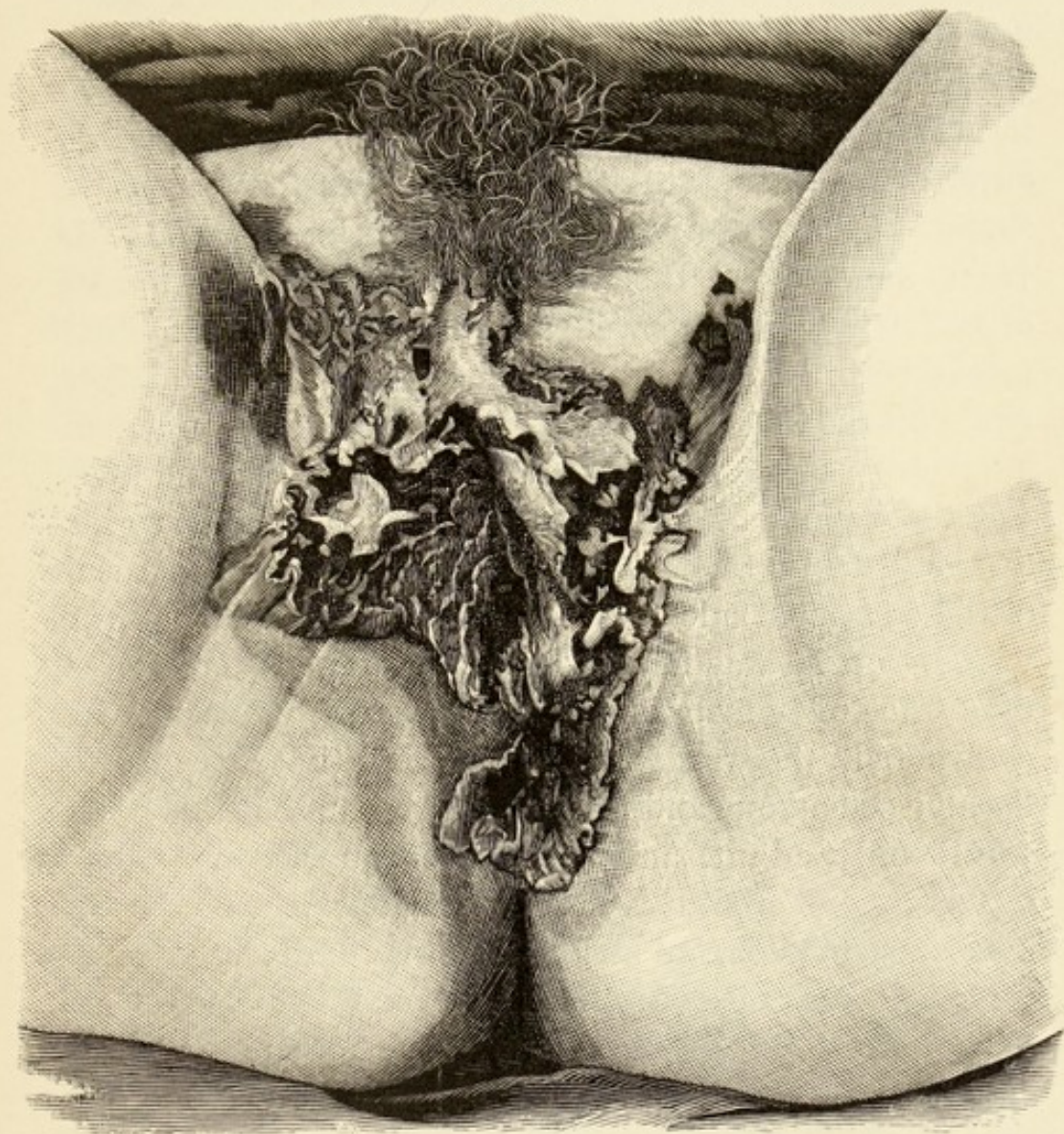
During the autumn of 1877 the patient suffered from excoriations of the vulva about the seat of the already mentioned chancroid. This part was noticed to be red and tender, and to be the seat of slight oozing of blood, particularly after hard work, fatigue, and the menstrual epoch. In consequence of this irritated and somewhat painful condition of the vulva the patient never afterward had sexual intercourse.

During the succeeding nine years she worked as a domestic. She was fairly clean in her habits as a rule, but during periodical drunken debauches she was careless as to the condition of her genitals, and in consequence thereof she had numerous attacks of varying severity of acute and subacute vulvitis. During all these years it seems clear from her story (which was elicited at various times with careful minuteness) that she suffered from an inflamed and excoriated condition of the left side of the vulva, which was subject to exacerbations and periods of quiescence, as a result of this long-continued condition of irritation an anomalous form of new growth developed.

The appearances of this peculiar new growth are well shown in Fig. 70, which was made about two and a half years after the date of its beginning. It will be seen that the normal appearances of the vulva are wholly lost. There are no traces of the labia, large or small. The clitoris is represented by a central mass of cicatricial tissue, and the introitus vaginæ looks like a ragged slit. The perineum is also invaded with processes of the new growth jutting backward. Extending from the vulva the disease is seen to invade the pubes and the right groin, and to extend downward over the skin of the fork

of the thighs. In no place is there evidence of tumor-like formation, as the new growth is everywhere developed *en surface*; in other words, it is flat in structure. The

FIG. 70.



Showing the new growth in period of full development.

surface of this neoplasm is of a maroon or chocolate color, with considerable glossiness. At times this morbid surface was perfectly dry, and at other times it gave issue to a thin, scanty, reddish serum.

The parts present a firm but decidedly elastic feeling, as if the new growth possessed a fair amount of density. To the eye and to the finger-tip it is evident that the vulvar and extra-genital portion of the new growth is uneven and thrown into slight irregular folds, a condition due undoubtedly to the natural conformation of the parts. Radiating from the clitoris region is a quite well formed sheet of cicatricial tissue, and scattered on the outer and upper parts of the new growth are irregular shaped islets of the same. Upon the lower part of the vulva and toward the perineum the mode of extension of the new growth is well shown. On the right side it juts outward by an abrupt semicircular elevated margin, while on the left side the morbid tissue ends in a similarly sharp festooned outline. In the upper and older parts of the morbid area the sharpness of the margination is lost in cicatricial tissue, and elsewhere as a result of the treatment adopted. At the time the drawing from which Fig. 70 was made the morbid process stopped at the orifice of the vagina, which, however, was somewhat contracted. Toward the end of life the new growth became so copious and firm in this region that this orifice would only admit, and then with considerable pain, a soft bougie of about No. 26, French scale. There was never any evidence of stricture of the urethra. Besides the foregoing appearances, there was evidence in life of a marked condensation and contraction in all of the affected parts, which increased very slowly and imperceptibly. The salience of the vulva was, in the end, wholly lost, and examination of the new growth *en masse* showed that it was quite firmly adherent to the deeper parts. When the patient was on her back the genitalia had a peculiar, flat appearance, and, as she

stood up, it was evident that the labia majora no longer protruded between the thighs.

This new growth began as a thickened, slightly elevated patch, of deep-red color, upon the left small and large labium. From this region it extended by peripheral increase toward the vaginal orifice, over the clitoris and upward and downward on the right side, while on the left it jutted down to near the anal orifice. The increase in area took place slowly, and as the new morbid tissue was formed, the older portions remained without any visible change, ulcerative or reparative. A slight amount of heat, pain, and pruritis were felt at irregular periods. The local symptoms, however, were for a long time so mild in character that the patient made little complaint. She could sit, walk, move, and lie down with little discomfort. Later on this was all changed.

This form of new growth, it seems, is not peculiar to mucous membranes alone. By its peripheral increase it involves the skin, and by it its progress on this tissue may be accurately studied. We find on the integument the same flat form of new growth seen on the mucous membranes. The surface is smooth, even, and glossy, and the color a decided maroon. The elevation of the patches is from one to three lines, and they end by a well-defined, curved or festooned border, which, rounding off sharply, is lost in the sound skin.

The elasticity of the infiltration remained for indefinite periods, and was slowly and gradually replaced by a marked condition of condensation, particularly in the central vulvar region. The result was that the conformation of the genitals was more and more destroyed.

As the new growth infiltrates the tissues it is noticed that, when condensation takes place, the morbid areas become more or less attached to the bony or aponeurotic

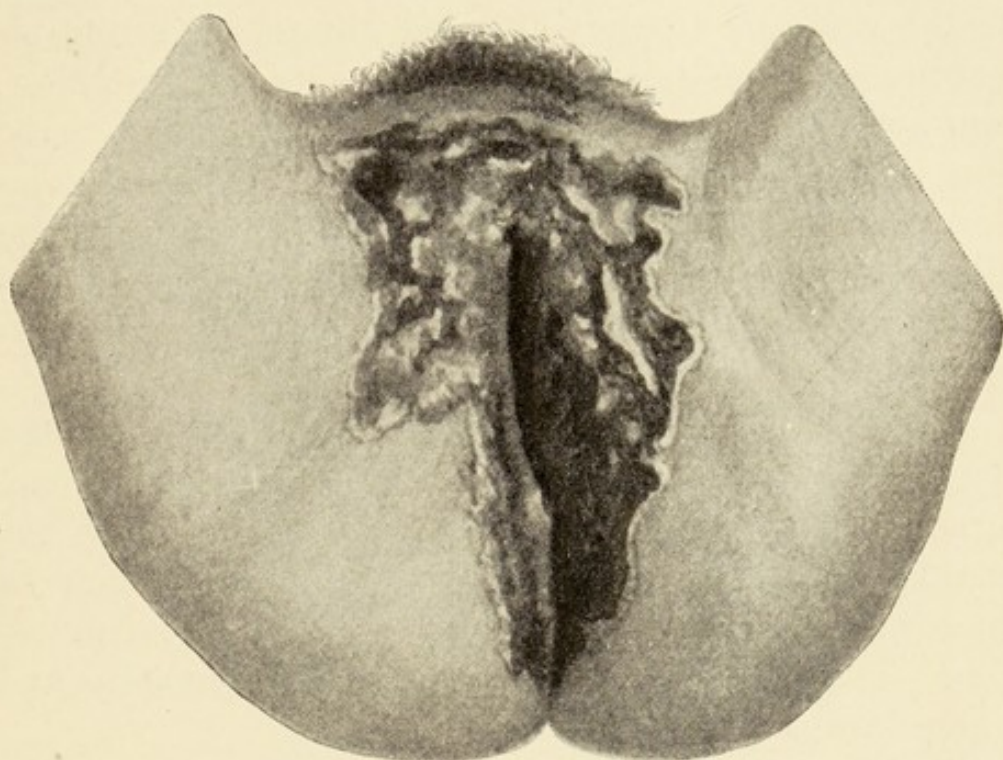
parts beneath until, in the end, they may feel as if soldered to them. Along the vulvar sulcus, where the disease originally began, the tissues presented to the finger-tip an almost brawny sensation, whereas, at the periphery of the new growth, well-marked but still decidedly firm elasticity was noted.

On the mons veneris and the thighs evidences of healing were very often noted. This process usually began in spots of pearly cicatrization, which increased under favorable circumstances, until sometimes large healed areas were produced. But the cicatricial tissue always showed a great lack of vitality and endurance. So long as great care was observed, and the parts were kept scrupulously clean and dry, the healed surfaces might remain intact. But any inattention (from indifference of the nurse, during the menstrual epoch, or a drunken debauch) was inevitably followed by retrogression. It was surprising to see how rapidly the cicatricial tissue melted away. A part which was pretty well healed one day might a day or two later present the most typical morbid appearance. It was always evident that in healing, though the superficies of the morbid tissue became cicatrized, the deeper parts remained unaltered. Thus the disease oscillated between a cicatrized condition and the reverse month after month, in spite of the most careful treatment.

The tendency to healing, however, was only observed in the juxtagenital parts just mentioned. At no time could we produce reparative changes on and within the vulva proper. There the secretions and the close coaptation of the parts wholly prevented cicatrization, even though the greatest care was paid to place interposing absorbent dressings. As time went on, the condensation of the vulvar and vaginal tissues was so great that

the vulva was converted into a raw slit of tough tissue, the lips of which were drawn more and more tightly together, and the vaginal orifice almost completely stenosed. This state is well shown in Fig. 71, which

FIG. 71.



Showing the condition of the genitals three months before death.

was taken about three months before death. It is interesting to study this picture in connection with Fig. 70. It will be seen that in rather more than two years the disease has extended somewhat in an outward and backward direction. It is evident, however, that the luxuriance of the infiltration shows itself by involving the tissues in their whole thickness and depth, rather than by peripheral extension. The new growth showed a tendency to remain localized to the vulvar and juxtavulvar regions.

During its whole course this new growth showed no

tendency to luxuriate upon the surface. There was never any evidence of tumor-like formation, since the infiltration never reached a greater height than three lines. There is never any evidence whatever of ulceration, and though the morbid growth may, in more or less degree, become less salient, the decrease in its height was due to the slow and almost imperceptible melting away of its superficies and to its inherent, slow, contractile tendency. Further than this, it was observed that in the recesses of the vulva where the lesion was thrown into anfractuositities there was not the slightest ulceration between its clefts and folds. It never presented any appearance resembling papillomatous outgrowths.

Though this inflammatory and infiltrative process lasted many years, it did not seem to involve the contiguous lymphatic system. In both of my cases the ganglia were slightly larger than normal, but in none of them was there at any time any evidence of inflammation. There was an entire absence of erythematous and erysipelatous complications.

The disease shows no tendency whatever to malignant degeneration, and of itself seems to have no direct influence upon the general economy.

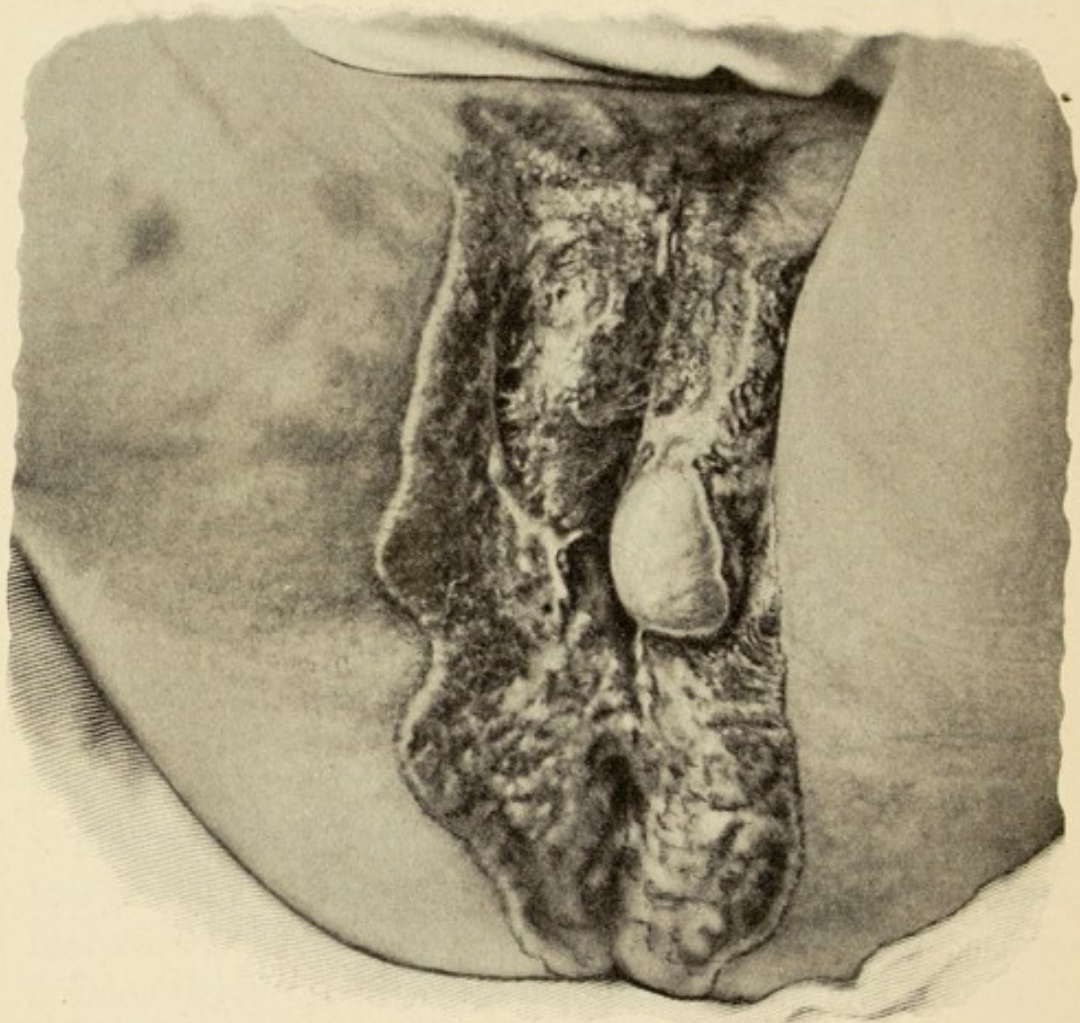
As I have already stated, the local symptoms were for a long time mild in character, and the patient made little complaint. Gradually, however, as the disease progressed without any abatement, the soreness in the parts was replaced by pain, particularly on the slightest movement. Walking became almost impossible, the erect position of the body could only be maintained with the greatest difficulty and discomfort, and as sitting became painful and almost impossible, the patient was forced to take to her bed. Even in the

recumbent position all movements caused uneasiness and pain. The swollen, contracted, and excoriated condition of the vulvar sulcus impeded urination; the stenosis of the vaginal orifice prevented the use of cleansing and soothing injections and impeded menstruation, while the rigidity and irritated condition of the parts prevented the application of absorbent tampons. In this hopeless, bedridden condition the patient was a pitiable object. Her sufferings, pain, and worryment of mind led to utter demoralization, marasmus, and death.

A second case observed by me was in appearance and histologically the same as the one already detailed. It was that of a widow, aged twenty-five years, of remarkably healthy parentage, was well developed and tolerably strong, and measles in early infancy was the only sickness she could remember. When twenty-two years old she was married to a sailor, who seemed to her to be a perfectly healthy man. In the second year of her marriage (fully four months after the accidental death of her husband) she noticed a small pimple in the right inguinal fold at about the centre. This pimple gave her no pain and discharged no pus. In three months it had increased and formed a circular patch one and a half inches in diameter, with an exulcerated surface, and raised about an eighth of an inch above the normal plane of the skin. This new growth steadily increased in size, running down on the outside of the right labium majus, and involving it and the corresponding nympha, then gradually it extended downward and backward, encircling and involving the anus well in toward the sphincter. From this region it ran up the outer side of the left labium majus, attacking and destroying, or causing to melt away, part of it and then the whole of

the corresponding nympha and ending at the left inguinal fold. The appearance of the parts is very clearly shown in Fig. 72. The new growth was sharply margined by an elevated border nearly a quarter of an inch in height, beyond which the skin was somewhat

FIG. 72.



Showing the new growth of second case in its active stage.

pigmented, but seemingly healthy. The surface of the new growth was purplish-red in its oldest parts and at the periphery, and of a dull pinkish-red in its centre. The vulva was a raw oozing slit, but it would admit with little uneasiness the first joint of the index finger.

The anus was wholly involved, its tissues much condensed, and it was raw, sore, and painful on defecation. The surface of this new growth was similar in its nature and character, but was rather more uneven and more mammillated than the previous case. It gave issue to a scanty serous and sero-sanguinolent discharge. In its early months this new growth was the seat of ephemeral, throbbing pain, but in general, though it caused some discomfort and uneasiness on urination and defecation, it could not be said to be painful.

Early in her hospital days we gave this woman a thorough and vigorous antisyphilitic course of treatment as a tentative measure. She bore the medication very well, but her vulvar lesion remained unaffected. We tried all sorts of local applications—antiseptic, astringent, and stimulating—without much success. We observed signs of improvement, and then came relapse. In this way about ten months slipped by, when, as a last resort, mercurial ointment was applied to the surface, and healing slowly but surely began. In two or three months the parts were fully cicatrized, but the introitus vaginae was very much lessened in diameter, and the anus was rather rigid and less distensible than normal.

The most thorough examination and searching inquiries were made to ascertain whether the case was of syphilitic nature, but in the end I became convinced that the woman never had had syphilis.

MICROSCOPICAL EXAMINATION AND PATHOLOGY. Portions of the new growth, in its full thickness, excised by me from both cases, were examined by Dr. Ira Van Gieson, by whom the drawings (see Figs. 73 and 74) were made. The tissue was composed of three layers: (1) a superficial layer corresponding to the

cutis, which is irregularly thickened by a considerable ingrowth of the Malpighian layer; (2) beneath this, replacing the corium and a portion of the subcutaneous tissue, is a layer of tissue apparently identical with

FIG. 73.



Showing a topographical view of the lesion.

a. Epidermis irregularly thickened by ingrowths of the interpapillary portions of the rete Malpighii.

b. Layer of granulation tissue.

c. Lymph-spaces of the deeper subcutaneous tissue filled with granulation tissue.

granulation tissue, except that in places it contains large numbers of free red blood-cells; and (3) a third layer corresponding to the deeper subcutaneous tissue, whose lymph-spaces are filled and distended with small round and small polyhedral cells. (Fig. 74.)

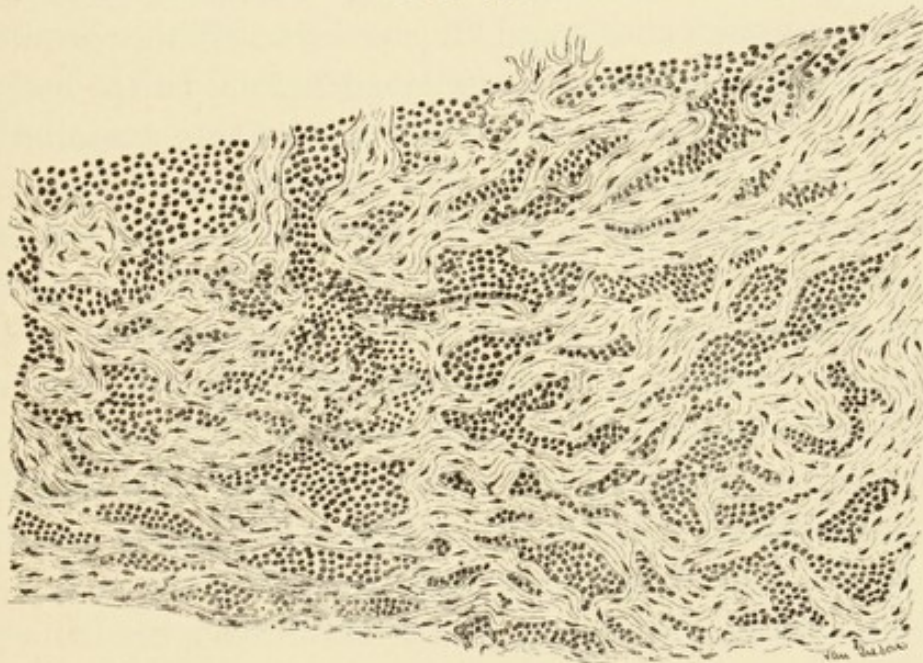
Where the nodule became continuous with the sur-

rounding skin, the cutaneous lymph-spaces were also filled with small round and polyhedral cells.

There were no bacteria of any kind in any of the numerous sections.

The results of this examination, therefore, seem to warrant the opinion that this chronic and incurable lesion consisted of simple local inflammatory tissue, which extended quite extensively into the subcutaneous lymph-spaces.

FIG. 74.



Showing the distention of the deeper subcutaneous lymph-spaces with the granulation tissue.

When we consider the disastrous results produced by this growth, it seems almost incredible that it should belong among the recognized simple and benign new formations. Though possessing no malignancy, it led in the region affected in one case to as much suffering and to as deadly results as true malignant new growths are known to produce. The conformation of

and the conditions inherent to and acting upon the external female genitals are undoubtedly the underlying causes of the chronicity of the inflammation.

Our knowledge of the behavior of inflammatory tissues in general may be used in the present instance in explaining the varied conditions which are observed in the new growths. In its soft elastic stage it consisted of the elements already mentioned. Later on, where the conditions would admit of it, healing occurred by the production of fibrous tissue out of the abundant infiltrating granulation cells. Upon the juxta-pudendal regions—mons veneris and thighs—this change resulted in true but ephemeral cicatricial tissue. In the vulvar circle, fibrous tissue was formed out of this granulation tissue, and it produced in the new growth the density and contractility which were observed to appear as the process grew old. But here surface-healing did not occur. How far the color of the new growth was due to the red blood-cells which escaped from the new and thin capillaries, we are unable to say.

It seems strange that such an active inflammatory process should increase so slowly and show such a slight tendency to grow outward.

ETIOLOGY. The exclusion of syphilis as the cause of this new growth is warranted not only by the absence of any history of that disease, but by the anatomical structure of its tissues. Tuberculosis is, also, etiologically out of the question, by reason of the clinical and microscopical facts adduced. Though prolonged search was made for bacteria, none were found. For these reasons, therefore, we are warranted in concluding that the lesion was not a local expression of a general infective process, nor a result of a local infection.

My studies convince me that the local inflammatory

condition engrafted upon the vulva by the chancroidal ulceration led to the occurrence of chronic vulvitis, and that this affection was the starting-point of the inflammatory new growth of the first case. Any one who has seen a considerable number of cases of chancroids in women will recall instances in which the resulting inflammatory thickening of the tissues was even more difficult to cure than the original ulcers. Though I look upon the antecedent chancroid in the first case as the pathological forerunner of the new growth, in the second, I could not discover any special or specific cause whatever. The chancroidal ulceration induced a tendency to inflammation which remained long after it had lost its virulent nature and had healed. A virulent, ulcerative, and inflammatory process existed and was cured, but left in its wake a predisposition to simple local inflammation, which the nature of the parts and the uncleanly and disorderly habits of the patient tended to perpetuate. The resulting inflammation was in no degree complicated with an ulcerative tendency. In the second case the new growth began as a pimple in the groin, which was probably subjected to irritation.

DIAGNOSIS. The clinical features of this new growth are peculiar and distinctive. I know of no affection which resembles it in course or appearances. At the first glance chronic serpiginous chancroid may suggest itself to the mind. It was different in all its features from syphilitic lesions of the skin and mucous membranes, and, though to superficial examination the idea of lupus might suggest itself, a little reflection would convince the observer that neither in development, course, clinical features, nor microscopic anatomy was it like that disease. It has no appearances in common with epithelioma. So well marked and peculiar are the char-

acteristics of this new growth that any one familiar with its description will readily recognize it.

PROGNOSIS. The outlook in this disease is far from satisfactory. It is possible that if seen in the early stage of its course it might be arrested and cured, but when it has attacked the deeper portions of the vulva little hope can be entertained.

TREATMENT. In the first case the new growth had attained such proportions when seen that palliative or destructive methods of treatment were out of the question. Various agents were used to induce healing, the most efficient of which were iodoform and bismuth and iodoform combinations. When perfect cleanliness was obtainable these drugs, applied on absorbent gauze and supported by gentle but firm pressure of a bandage, usually did good. Unfortunately, this treatment could not be efficiently used in the vulvar sulcus, so that little progress was made there at any time. Though cicatrization was very often induced upon the juxta-pudendal portion of the growth, it never lasted for a long period. In short, though of simple and benign nature, this new growth is as rebellious to treatment as are the most malignant forms. It, however, may be said with some satisfaction that it does not give rise to the secondary metastatic growths which are such frequent complications of the latter.

Systematic local and general antisiphilitic treatment was once carefully followed as a tentative measure, for some months, but no improvement whatever was produced. In this first case the applications of mercurial ointment increased the irritability of the parts and the suffering of the patient.

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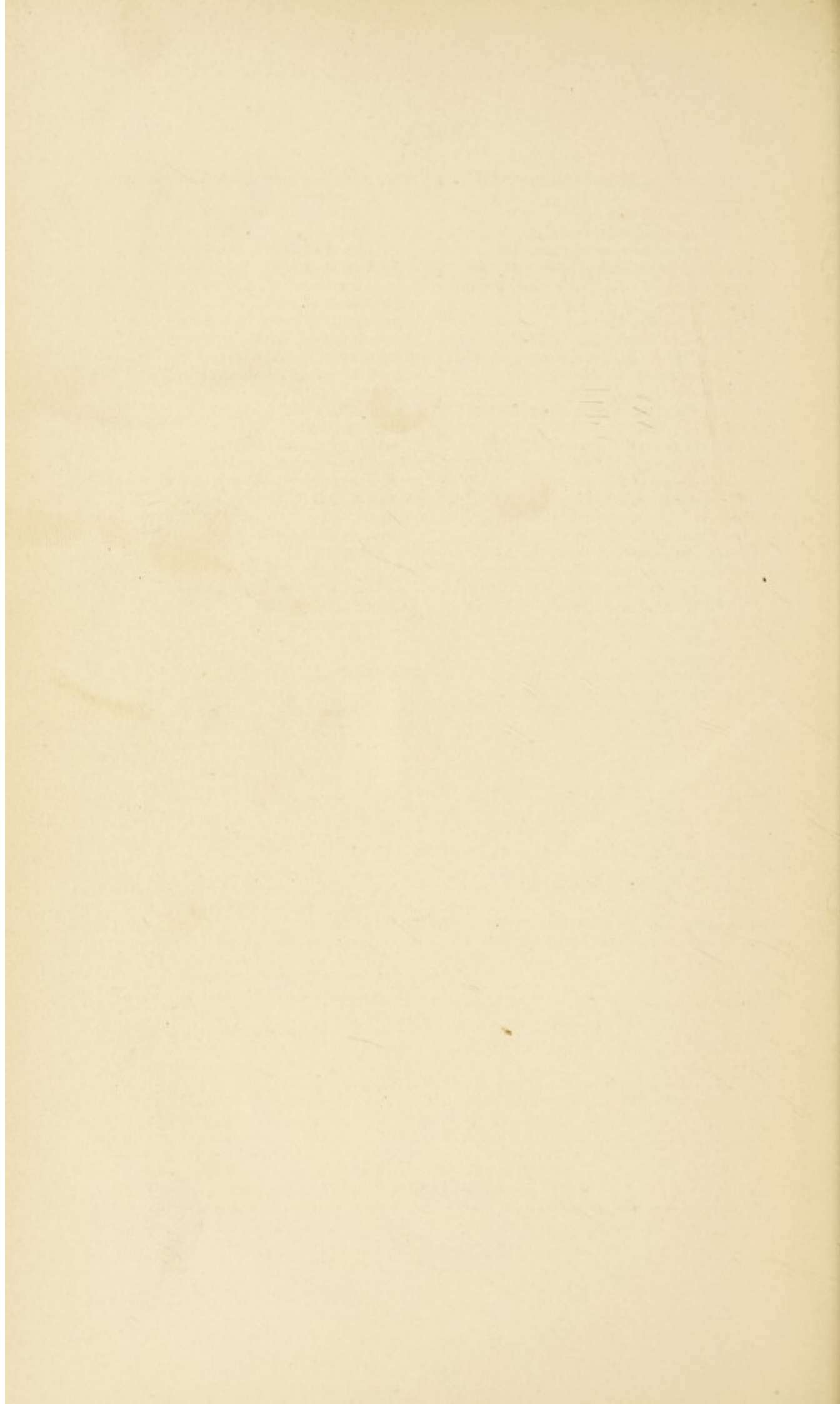
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