Strictures? I rather incline to the opinion that the continuation of the gleet was due to the "cicatricial knot" which followed the operation and complicated the case; and its gradual absorption (usual in such cases) removed the remaining source of irritation, and the gleet ceased. In Mr. Hill's own fifteen cases one-third were promptly cured. In the remaining ten *recontraction* took place: this, it appears to me, is a good and sufficient reason why the gleet should persist; and I feel confident that the results of *thorough re-division* of these Strictures would go far to establish the truth of my views.

In closing his lecture, Mr. Hill objects to any examination of the urethra for Stricture until the gonorrhœa and gleet shall have lasted for six months. It is a well-known fact (see Thompson "On Stricture," English edition, p. 115) that Strictures are often present from other causes than a gonorrhœa; that a gouty or rheumatic diathesis, etc., may cause them, and that even a first gonorrhœa is often aggravated and prolonged by them. Is it then wise to ignore for a long period a well-recognized cause of trouble when the alternative is a prolonged and possibly a useless, if not harmful, course of urethral injections and nauseous medicines? However much we may deprecate unnecessary instrumentation, we cannot lose sight of the fact that *unnecessary injections and unnecessary medication* are quite as much to be deprecated. A careful, judicious, and thorough urethral examination immediately after the acute stage of a gonorrhœa has passed, I have never found to result in more than a temporary discomfort, and less than often follows the use of a single injection.

I do not claim perfection for any method or means of mine, but I offer my instruments and my experience to the profession, abroad and at home, with the sincere hope that they may be tested in the fair and generous spirit shown by my friend Mr. Hill, and that ultimately we may arrive at the solution of the most vexed of all surgical problems—viz., the best way of curing Strictures and gleet.

CHAPTER XI.

DISCUSSION CONTINUED.

THE next public discussion of my position on urethral questions appeared in May, 1877, in the Maryland Medical Journal, by Dr. Thomas R. Brown, Professor of Clinical and Operative Surgery, and of Diseases of the Genito-Urinary Organs, in the College of Physicians and Surgeons, Baltimore. This critique is considered worthy of citation because of the practical efforts which Professor Brown has made to solve the questions most in dispute, and especially on account of original observations of the fœtal urethra, and that of the newly born (page 243,); important as bearing upon the significance of the dilatation usually found in the anterior part of the adult urethra heretofore described by anatomists as a normal condition, and called the *fossa navicularis*, but which I have claimed to be the result of mechanical dilatation behind a contracted meatus urinarius.

Again at page 242, he raises a point or two in regard to estimates of size of urethra from circumference of penis, which may have a general interest, while on the same page he confirms them in citing a case with a penis $4\frac{3}{4}$ inches in circumference, associated with a urethra 47 mm. circumference, perhaps the largest on record. Again, ibid., his experience as to most frequent locality of Strictures; in 100, 75 per cent. anterior to $4\frac{1}{2}$ inches, confirms the claim made page 97, as against previous authority. Again the emphatic endorsement of my claim as to the importance which may attach to Strictures but slightly invading the urethral lumen, page 192. Professor Brown's opinions have an especial value from the fact that his position heretofore, has been in a measure antagonistic to my own.

Citation.

DURING the past three years the attention of Genito-Urinary surgeons has been especially invited to the study of urethral Strictures, their pathology and treatment. The fresh interest in this subject is, in great part, due to the new departure of Professor Otis, as to what constitutes a Stricture. Heretofore, the French surgeons have taught that an urethra through which a twenty-one of their scale could be passed, is free from Stricture. According to the English school, if an eight or nine of their scale can be passed into the bladder, no Stricture can be said to exist, while the American standard of 31½ millimetres was quite universally accepted as correct. In opposition to these current views, it is claimed, as the outcome of many experiments, that there is no such thing as a "standard urethra" which applies to every man any more than a standard hand or foot, but that they vary in size in different individuals, according to the physique. So the urethra varies with the size of the flaccid penis. It is moreover claimed that this variation is definite and according to a rule; beginning with a penis three inches in circumference, its urethra would measure 30 millimetres, and for every ¼ inch increase in the circumference of the penis, there would be an urethral increase of two millimetres. These results have been verified by Otis in nearly all of 500 examinations. The establishment of this proportionate relationship, if sustained, would be a valuable addition to both anatomy and surgery, and for the purpose of testing its correctness many investigations have been made—notably, by Drs. Henry B. Sands, Weir, Mastin and myself in this country, Teevan, Watson, Berkeley Hill, Cooper and Coulson in Great Britain—with a result that is anything but satisfactory.

The second proposition and perhaps most important in a practical point of view, is that which relates to results of treatment. It is insisted upon, and if true the argument is a sound one, that operations performed in accordance with the rules laid down, followed by the proper after-treatment,

yield perfect results and complete cures, cures so complete that the previous seat of Stricture cannot be detected by a properly sized olive sound, and so complete that the danger of re-contractions no longer applies,* enabling the patient to dispense with the dependence upon the introduction of the sound for the purpose of keeping his urethra open.

The fourth point is, that by far the most Strictures, in fact nearly all, are found in the spongy urethra. This contrasts with Sir Henry Thompson's position, who locates sixty-one per cent. in the membranous, or bulbo-membranous part, and is doubtless to be explained by the fact that the anatomical basis of the former's collection of cases and that for the latter, are distinct and dissimilar. The coarser procedure of the one ignored, as having no existence, what the more refined method of the other esteems important and demands treatment. Hence it is that we hear so much of late about Strictures of large calibre; not only because they are morbid conditions of themselves, but chiefly because they are apt, if let alone, to go from bad to worse, and sooner or later impair seriously the efficiency of the organ. It will be observed that this advance seems to take no account of the by no means dis-established assumption, that slight constrictions not only may be present, but may become harmless in the course of time, undergo absorption, or by a process of infection, (strictly rendered) take on the structure and function of the tissues in which they are seated.

These are the salient points of this new method, and the importance of keeping our premises constantly in view must explain this reference to what, after a fashion, is already before the profession. And whilst we must admit that the author has conducted his investigations with commendable fairness and zeal, we must also regret that his challenge of criticism has not been accepted. We have had any amount of *à priori* reasoning presented against his formidable

* See reference to report of Prof. Alfred Post, Drs. Miner, Woodruff, upon an examination of patient operated upon for five (5) Strictures "with complete absence of a trace of Stricture." N. Y. Med. Journal, April, 1878.

array * or on the other hand such complacent acceptance of the claims, both alike damaging to the cause of truth, that we would pronounce not so much "not proven" but "not tried." The trial has made little progress, the case is still open with all the presumptions necessarily favorable to Dr. Otis's side Let us briefly consider some of the results of the trial as far as it has progressed.

As to the question of the normal urethral calibre, Sir Henry Thompson, who has all along been the great champion for small sounds, has recently admitted that † "he had long seen the practical necessity of a higher estimate of the normal urethral calibre than that generally assumed." With this sentiment Mr. Berkeley Hill, of the University College Hospital, London, agrees, and for the sake of illustration I quote the following of his:

"I did Syme's perineal section in a case of traumatic Stricture lying in my wards, and who had been several weeks in Guy's and St. Bartholomew's Hospitals, and under private treatment before he came to me, without any instruments having reached his bladder, I measured the circumference of his flaccid penis, and found it 3¼ inches. I turned to my audience and said: 'now according to Dr. Otis's observations, this urethra should easily admit 32 F.' I took up 32 F. sound, (at the size a general murmur ran round); I placed it in the meatus and it slid down to the bulb quite by its own weight. Then it was stopped of course by the Stricture. I then proceeded to divide the Stricture upon a Syme's grooved and shouldered staff in the perineum; the thick part of the staff was No. 26. I held it up to the audience along with the usual one of No. 16, to show the difference. After division I took the 32 F. sound again and slipped it readily into the bladder." In connection with another case he states, "I divided a contracted meatus this afternoon in a private

* See Sands "On the Causes of Gleet and Calibre of the Male Urethra," New York Medical Journal, March, 1876. R. F. Weir, New York Medical Journal, April, 1876. Boston Medical Journal, November, 1876.

† British Medical Journal, Feb. 26, 1876.

patient, (his own doctor being in attendance); after which No. 39 F. passed readily down into the bladder, as I had announced that it would when I measured the canal with the urethra-metre. I then made the practitioner pass the 39 himself, in order that he might be sure that there was no hocus-pocus in the matter." Testimony of this character must carry weight, especially when it is considered that the cases cited evidently constitute parts of a series. It is scarcely necessary to argue farther, this need for a higher estimate of the normal urethral calibre. So far as my own examination of nearly one hundred cases extends, while not prepared to affirm that the *exact proportionate* relationship between penis and urethra exists, I am convinced that the capacity of the urethra is much greater than has been supposed and that the size of the urethra bears some ratio to the penis. It is important to state here that all of my measurements were made with the urethra-metre, a most invaluable instrument. The amount of benefit, however, derived from its use depends upon the skill and delicacy acquired by long education in its manipulation. And under no circumstances must the "limit of easy distension" apply to the patient, except to a minor degree. That "feeling of fulness" referred to the patient, "sense of distension" must be regarded as too varying to make it the "*sine qua non*" of a grave surgical operation. As stated above, my examinations do not justify me in conceding the relative size of penis and urethra, so far as the measurements of the latter were made with the urethra-metre. This may spring from a want of proper tact in handling it.

In certain examinations it was quite evident that the same penis in a state of flaccidity may vary in its dimensions, when exposed under different temperatures, also that there were variations in different parts of the same organ—the point near the peno-scrotal angle measuring less than immediately behind or at the corona glandis; in fact does not the nature of the tissue of which the penis is made up suggest such conclusions? Under such circumstances as these what part must

be selected as standard?* With the statements of Prof. Sands, and Dr. R. F. Weir, that contractions occur in different parts of the normal urethra and are not prima facie evidence of disease, as indicated by a series of eight carefully prepared wax casts, my investigations do not agree. In all instances where obstructions to the easy movement of the urethra-metre were met with, there was abundant reason for suspecting disease. The converse is equally true that where the urethra was found to be normal, the withdrawal of the instrument was accomplished without resistance. These and the post-mortem experiments serve to convince me that constrictions do not belong to normal urethræ, and where they do exist they must constitute the rare exceptions. It is a curious fact, which seems to have gone unnoticed, that in both of the collections of casts referred to the principal narrowings were in the anterior half of the urethra, a possible effect of the injection not continuing in the same state of liquefaction throughout, or again, if this supposition be not correct, might not these few cases when placed beside Prof. Otis's 500 cases, be classed with urethræ in a state of disease. This is especially probable when we recall the fourth proposition as to the most frequent site of Stricture, a position which I fully indorse. Out of nearly 100 Strictures divided by myself, including many that are usually designated as impermea-

* The estimate of the size of the urethra from its proportionate relation to the size of the penis, is but approximate and intended only to serve as a guide where the urethra-metre is not available. Examined by the rule laid down p. 89, experience has shown that the estimate will never exceed the normal calibre, though it often falls short of it several millimetres circumference. The flaccid penis is subject to variation from heat, cold, etc., but practically it will be found that the relative conditions will always be the same *when the patient presents to the surgeon*. Measurements should always be made at about midway of the body of the penis.

In a recent edition of the standard work of Prof. S. W. Gross of Philadelphia, on the genito-urinary organs, edited by his son Prof. L. D. Gross, he says (in a note following his illustration and description of my urethra-metre, page 472) in regard "to the proportionate relation between the penis and the urethra," "From a number of measurements made upon private and hospital cases, the Editor is enabled to add confirmatory evidence of the correctness of Dr. Otis's estimates." —F. N. O.

ble, at least 75 *per cent.* were found within the anterior 4½ inches. I am therefore led to infer that those deeper constrictions are nearly always the consequence of extension of disease from in front. With reference to the controversy as to the existence of the boat-shaped dilatation—the fossa navicularis—I have been forced by my post-mortem, rather than by the urethra-metric inquiries, to consider it to be the rule for this, or at least some form of dilatation to be found. In my examinations, not exceeding a dozen, to be sure, made according to the directions of Malgaigne and Thompson, it was always present. I feel however almost convinced that it is acquired and not congenital, and dependent upon the constant and increased tension to which this part is subjected in the resistance to the exit of urine offered by a contracted meatus. For the purpose of determining this point, I have examined a number of fœtal and infants' urethræ, some of them in the presence of my colleague Prof. Bevan, and up to this time I have met not *a single one* in which this dilatation occurred. In all of these examinations the meatus was invariably found to be narrower than the rest of the canal. As an evidence of how utterly unreliable our hitherto arbitrary mode of excluding Strictures really is, I would cite from among a number, the case of Wm. ——, in attendance upon my clinic, as an out-patient, at the College of Physicians and Surgeons. The size of his penis was 4¾ inches, and upon introducing the urethra-metre, and expanding it to what I believed the proper size, the indicator marked 47 millimetres. Without any more than the usual discomfort, and but very inconsiderable pain, it was withdrawn easily along the entire urethra, it only becoming necessary to diminish the bulb at the meatus, and at that point to 35 millimetres. Now in this case, how very unreasonable it would have been to have allowed the introduction of a No. 8 or 9 of the English, 21 of the French and 31½ of the American scale to effectually dispose of the question as to whether there was Stricture in that man's penis or not, when not one-half of its normal calibre had been ascertained. And even taking his meatus as the

guide, its indication would have fallen short to the extent of 12 millimetres. I am therefore compelled to agree with Prof. Sands, that "in practice we find in the size of the meatus a rough test for the calibre of the urethra," a test indeed so very rough and unreliable as to preclude our making any use of it in an operation which has for its object a complete division of the Stricture.

From what has been said, I am forced, with the qualifications stated, to agree with the principles contained in this postulate, and to decide that the old methods of examinations abound in faults. Under its teachings very decided disease must have been overlooked, and an easy explanation of the intractability of that bugbear gleet, now recognized as the offspring of Stricture, obtained. In passing I may state here that this dependence of gleet upon Stricture has been greatly misunderstood, because when the Stricture has been effectually divided, the urethral discharge did not cease. Many have considered this to disprove the connection, but this is obviously unjust, for the reason that the Stricture was not the gleet *per se*, but the cause of it, and in a way easily to be explained. The obstruction favors the accumulation within the urethra of residual urine bound to undergo decomposition. This urine, acting as an irritant, constantly applied, especially to the sinuses of Morgagni, induces a chronic catarrh, which requires after the division of the Stricture, treatment of the most persistent, discouraging character. As it is true that all acute diseases tend towards recovery, it is equally true that all chronic diseases tend, with as much emphasis, in an opposite direction. This, we all must admit, holds true of gleet. I am not prepared here to explain those cases of gleet, wherein the discharge had continued over such a period that analogy would warrant an assumption of Stricture, and which are said to have disappeared entirely upon expectant treatment. I can only say that I have met with no such cases during these investigations, and feel inclined to question the completeness of the alleged recoveries. On the other hand, I have met with a number while presenting a

somewhat similar history, they have, in addition, complained of a peculiar susceptibility to contract "fresh cases" of what they called gonorrhœa or simple urethritis, contracted whether after legitimate or illegitimate sexual indulgence; after "taking cold," or after slight excesses in eating or drinking. By way of illustration, I extract from my "Case Record" a brief synopsis of two cases:

Case 1. Mr. —— Jr., contracted four years ago a case of gonorrhœa, which after the usual treatment and a long time "got well." Has noticed since that time that scalding with urination and a discharge would follow sexual intercourse. This discharge, which the patient states, is like that in his previous attacks, when seen by me, was not the frank, purulent discharge of gonorrhœa, but was decidedly more serious, though the usual symptoms of irritation were present. I observed that during urination the stream was too small, somewhat twisted and followed by dribbling. An attempt to pass 32 F. was made but failed, this being the size indicated. Before the canal could be traversed, it became necessary to use the smallest olive in my possession, which is marked 13 F; the contractions being so considerable as to prevent the use of the urethra-metre, until after a Thompson's divulsor had been introduced and dilated. Three distinct Strictures were made out—one 3 inches, the second 2½ inches, and the third 1½ inch from the meatus, all of which were completely divided. Now this man considered his penis well, except as to these recurring attacks of gonorrhœa.

Case 2 presents almost identically the same history, except as to the number of Strictures, there being but one, and as to the suspected cause of his urethral attacks—"cold." The Stricture, located in this instance 2⅛ inches from the meatus, was alike perceptible to myself and to his physician, Dr. Saltzer, of Baltimore. In both cases, the usual after-treatment of the tri-weekly introduction of the proper sized sound was followed out strictly and with good results.

Another point, in this connection, is the alleged insignificance or harmlessness of Strictures of large calibre. Before

accepting this there is need for more extended observation. I fully endorse the claim of the pathologist that this simple cicatricial tissue is liable to increased hyperplasia and liable to become not only a more and more serious condition in itself, but also liable, even in its early stages, to produce consequences that may prove dangerous and even disastrous. If space permitted, I should like to give the details of two cases in point; the first that of a man dying in the Hospital of the College of Physicians and Surgeons from toxæmia consequent upon extravasation of urine through a hole in the urethra 1½ inch long, beginning just behind a Stricture through which a No. 12 Van Buren's conical sound could easily be passed. The second case occurred in the practice of Mr. Walter Coulson, of the Lock Hospital, London, and is reported in the *Lancet* of August 28, 1875, pages 332.333; in which perineal fistules refused to heal after the usual section, until some Strictures of large calibre, anterior to the fistulous openings, were freely divided. After this the patient entirely recovered. The anterior Strictures were large enough to admit a No. 10 E., and still they offered sufficient resistance to the flow of urine to keep the false passages from healing. I do not mean in either of these cases to dissent from the now generally accepted opinion, that perfectly normal urine is innocuous even when injected under the tissues, but, more than probable, in both of these the urine was not normal.

These are some of the notes which I have wished to make about that which I hope and believe will become a valuable addition to our fund of surgical knowledge. At some future time I propose to extend these comments, especially with reference to the results of the operation, not sufficient time having as yet elapsed to make me willing to venture an opinion. I feel justified in stating, even now, that I have made re-examinations where the Strictures have been completely divided, nine months after the operations, without finding re-contractions.

In reply to a letter asking for information, Prof. Brown writes, under date of April 5th, 1878, as follows: Upon the

whole a careful study has made me a convert, in the main, to the principles of your procedure, and I never think of considering any of my operations complete, until the indicated sound as well as bougie-à-boule has passed 'sans resistance.' I have, moreover, very certainly, by inviting sceptics to many of my operations, served to dismantle the old *doxies*, and, by doing the Otis operation, have been instrumental, in a measure, in dis-establishing the false views which have so long obtained. *I have divided over* 300 *Strictures without a single death.* * * * Every day convinces me more and more of the great importance of free division of the Stricture, with a view of preserving the normal calibre of the urethra. With regard to your claim of the relative size of the urethra and penis, on the careful observation of an immense number of cases it has never happened to me to find, for example, a penis of three inches with a urethra measuring less than 30 mm., but I have found a large number where the urethra measured more."