Contributions to practical surgery, pathological, therapeutic, and operative. Pt. I / by James George Beaney.

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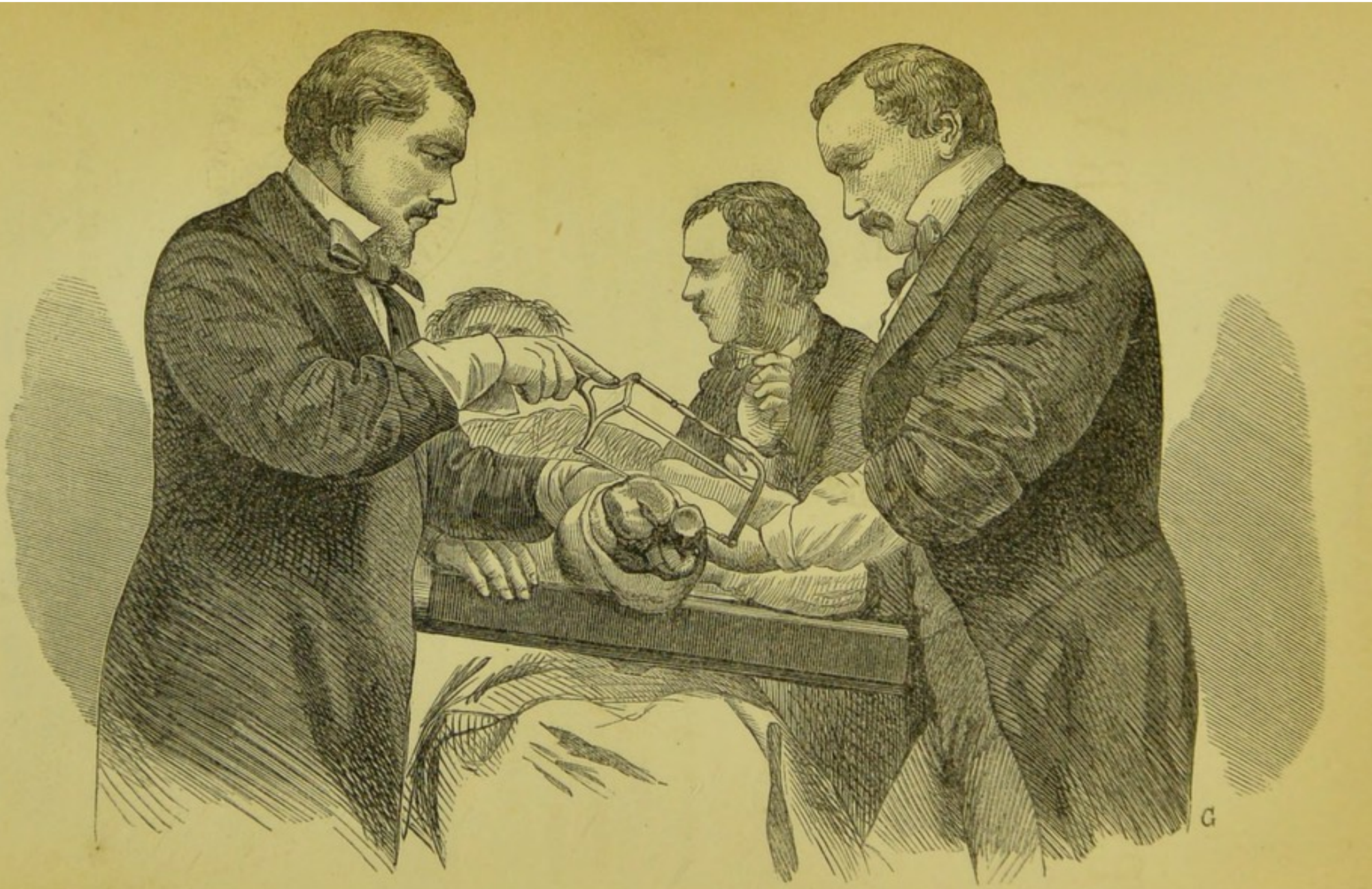

NEW MODE OF EXCISION OF THE KNEE JOINT.

Surgery 10

CONTRIBUTIONS

TO

PRACTICAL SURGERY,

PATHOLOGICAL, THERAPEUTIC, AND OPERATIVE.

BY

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PART I.

MELBOURNE:

WILSON AND MACKINNON, 78, COLLINS STREET EAST.

1861.

PRACTICAL SURGERY.

"The science of medicine wants facts, numerous facts, comparable facts, well observed, carefully arranged, and accurately classified; her language must be the language of figures, her test, the calculus of probabilities, her example the most perfect and exact amongst the sciences of observation and experiment."—*Lancet.*

INTRODUCTORY OBSERVATIONS.

At no period of our history has medicine occupied so distinguished a position amongst the learned professions, as it does at the present time. The number of systematic treatises, serials, brochures, essays, and contributions, which are constantly emanating from the Press, upon all subjects connected with the healing art, bear the stamp of acute observation, profound thought, and a vigorous experimental inquiry.

The high standard of education insisted on by the various examining Boards throughout the kingdom, requires that candidates for professional honours should have received the education of gentlemen, in classical, mathematical, and general learning. Such a course of mental training must needs exercise an influence of the most wholesome and salutary kind upon the future conduct of the medical practitioner. Possessing the materials necessary to observation and research, he is not held captive by the opinions of other men, neither is he an adherent to traditional theories, nor to the practice of the unsound physiology of an era happily passed away.

With a mind well disciplined to the process of synthetical and analytical inquiry, he discovers that hasty generalizations must necessarily give place to the slower but surer method

of inductive reasoning; and with a constant searching after truth, wherever he can find her, boldly endeavours to lift the veil of nature for himself, by a rational and experimental inquiry, conducted in a liberal and philosophical spirit, unfettered by the doctrine of ancient systems, and the dictum of authority. He carefully and diligently observes all the phenomena of life, and with a willing obedience bows to the laws by which such is governed. Such is the spirit that characterized the minds of Bacon and of Sydenham, and led to the brilliant discoveries of John Hunter.

The present furnishes a new era in the history of the healing art. The gigantic edifice, erected from ancient systems, false generalizations, and empirical practice, is now fast tottering to the ground, and upon the ruins of which will soon rise in stupendous magnificence, a colossal temple of rational medicine, second to none amongst the exact sciences, and in its holier character—that of assuaging the pangs of suffering humanity, of prolonging life, and averting the "tendency to death," not to be surpassed.

It is highly gratifying to find that the public are beginning to rightly appreciate the scientific and honourable character of the ground we occupy, and I trust the day is not distant, when that hydra-headed monster, quackery, will receive its final and fatal blow; when such empirical gentry as Homœopaths, Hydropaths, Kinesipaths, Mesmerists, Hygeists, Silent Friends, Chronothermalists, and Nervo Arterial Essentialists, will soon be swept away.

In the true spirit of that, upon which I have briefly touched, I beg to commend to my professional brethren this first part of an intended series of "Contributions to Practical Sur-

gery." The first of the chapters being on a new method of performing the operation of excision of the knee-joint, which I trust may be suggestive for our future guidance in the performance and after-treatment of this important conservative operation. The second will show that progressive dilatation, aided by proper therapeutic measures and manual dexterity, will be all-sufficient to cure most of the cases of stricture that fall to our lot to treat, including many of traumatic origin.

122, Collins-street East,
May, 1861.

CHAPTER I.

ON A NEW METHOD OF PERFORMING THE OPERATION OF EXCISION OF THE KNEE JOINT.

Excision of the knee joint, pertinent remarks on, by Mr. Skey—Object of the present disquisition, propriety or impropriety of performing the operation, settlement of the "vexed question," logically and statistically—Mortality of the operation, less than that of amputation—Mr. Price's analysis—Reported cases of Mr. Humphrey—Cases by Dr. Mackenzie—Immense superiority of excision over amputation—Surgical history as important as political history—Resection of the knee joint—Brilliant results produced—Operation fell into desuetude—Revived by Fergusson—Fashion opposed to scientific advancement—Hypophosphite of lime, chlorodyne, podophylline—"Stage" of purgation—Discredit brought upon the operation by indiscriminate performance of the same—What are the pathological conditions favorable to resection? answered—Operation not advisable when suppuration is going on—Free incision should be made into joints—Cases unsuitable to the operation described—Operation should be performed early—No objection to operation in struma—Mr. Solly's cases—Mr. Tapp has operated in strumous cases successfully—Importance of constitutional treatment—Mr. Solly's views thereon—Subjects necessary for our consideration—Operation—After treatment—Preparation of the patient—Trifling circumstances frequently prevent successful issue—Three modes of operating proposed—New one suggested—Results of operations and experiments—Old method of operating common cause of failure—Desirability of a more mathematical method—During operation the limb should be supported unmoved by a reliable assistant—Both bones removed by one application of the saw—Cut surfaces found in accurate apposition—Cannot injure popliteal vessels except by design—Wedge-shaped portion of bone removed—A cause of failure in the old operation, large interval between cut surfaces a cause of profuse suppuration—Mr. Jones's observations—Cases, civil and military—Constitutional treatment—Spaniard cured in eight weeks—Advantages of the new operation—Erichsen's obvervations on suppuration—The operation illustrated—After treatment—Splint recommended, preference for Butcher's or Mackenzie's—Importance of well padding the same—Practice of changing splints too soon reprehensible—Mr. Skey's observations—Dangers to be apprehended—Prostration, traumatic fever, secondary hæmorrhage, erysipelas, pyæmia, constitutional irritation, periostitis—Development of dormant disease—Necessity of stimulating treatment—Mr. Jones's observations thereon, recommended by Mr. Skey—Fresh air, importance of, after all capital operations—Conclusion.

It has been observed by Mr. Skey,* of St. Bartholomew's Hospital, that "If resection of the knee joint could be

* Operative Surgery, 2nd Edit. p. 441.

divested of its dangers, it would stand forth as one of the most brilliant discoveries of modern surgery. This brilliancy, however, pales not a little on consideration of the large mortality that has marked the progress of this conservative operation; an operation admirable in the boldness of its design, and not less so in its consequences,—and nothing but a more general success is required to justify the high commendation bestowed upon it, and the remarkable notoriety it has hitherto acquired throughout the surgical world." The object of the present disquisition, therefore, is to illustrate as practically as possible, some of the difficulties which surround this important operation, and to offer suggestions by which these may be surmounted. The propriety or impropriety of excision of the knee joint no longer admits of any doubt whatever, and these "vexed questions" which have so long agitated the minds of the surgical profession, can now be fairly settled upon logical and statistical grounds. That resection of the knee joint can (in properly selected cases) be performed with as reasonable an amount of success, as the like operation on other joints, we have sufficient evidence before us to show, and from the additional fact of the mortality from excision of the knee joint being considerably less than that from amputation of the thigh, we may reasonably infer that the former operation may be most advantageously employed in cases where the system is deemed sufficiently strong to sustain the shock of the latter.

To Mr. Price, of London, we are much indebted for the particulars of his analysis of 160 cases of resection of this joint, which have been performed in Great Britain since the year 1850, and of these 32 proved fatal, or in the proportion of 1 to 5. Mr. Humphrey,* of Cambridge, has recently reported 13 cases of resection of this joint, of which one only proved fatal; Mr. Jones, of Jersey, has reported 14 cases, 13 of which recovered and 1 died. Dr. Mackenzie of Edinburgh, operated on 5 cases in the year 1854, and 1 died. I saw him perform these operations, and consider the fatal

* Medico-Chirurgical Transactions, 1858.

case not suited to the operation, the whole of the shaft of the femur being infiltrated with scrofulous matter. Therefore, when the mortality from amputation of the thigh (one case in three) is contrasted with the satisfactory results of excision of the knee joint, the immense superiority of the latter operation is made strikingly apparent,—with this important addition that we preserve a pillar of support, and a valuable agent of locomotion.

From what has been said it will at once be seen that the history of the origin, revival, or discontinuance of an important operation, holds quite as prominent a position in Surgery, as History does in political economy; in both cases we refer to history as a safe guide for future conduct.

Above all other operations, the history of resection of the knee joint cannot be too often repeated; at first producing brilliant results, then allowed to lapse into desuetude and oblivion. On its revival it met with violent opposition, and not until numbers of patients, who had had the operation performed on them, were going about the ordinary duties of life with a useful leg, could the operation be admitted as justifiable by the majority of surgeons. Now, however, the stream is running too far in an opposite direction, and knees that would recover under the care of skilful surgeons, by rest, sometimes by opening them freely,* and by appropriate constitutional measures, are eagerly caught by others anxious for the *eclât* of a successful case of resection.† Unfortunately the onward progress of science is retarded in many cases by the prevailing epidemic *fashion*, which seems to linger amongst the surgical as well as the medical ranks of the healing art. Thus, hypophosphite of lime, since its introduction into the *materia medica*, has been prescribed

* Mr. Adams, of the London Hospital, says, "you may be quite certain of this, that where suppuration has taken place, it is absolutely necessary that you should open the joint freely, as there is no chance whatever of the pus being absorbed."—*Lancet*, August 13, 1859. p. 155.

† Mr. Skey says, Operative Surgery, 2nd Edit. 1858, p. 1, "The knife should be essentially conservative in its operation, not to be employed as a shield to ignorance, or the stepping stone to notoriety, but solely as the compulsory alternative of an evil of greater magnitude."

most indiscriminately in almost every disease in the medical nosology. Chlorodyne has been extensively employed in the "Naval and Military Hospitals," and from being highly recommended by a "Deputy Inspector General," is as a matter of course, prescribed by the "Faculty," as the most speedy "pain killer" that has been discovered in modern times, and as a medicine eclipsing all others for assuaging the pangs of suffering mortals, that has ever been administered during the history of therapeutics. Again, if a patient looking yellow, and suffering from constipation with debility, applies to a physician for advice, these symptoms will be considered conclusive by many that the cause of all the mischief is in the liver, (especially if the patient has just returned from the East or West Indies,) the offending organ is then immediately assailed by a volley of podophylline pills, and should the sufferer survive this "stage" of active purgation, the character of the stools and the number of "chambers" exposed in triumphant array, herald the speedy approach of the patient's convalescence, and the "new remedy" is vaunted as one superseding all others in the category of eliminative medicines.

In like manner, since excision of the knee joint was revived by Professor Fergusson, of King's College, London, in 1850, it has been performed most indiscriminately in a great number of cases not at all suited for the operation, and by which considerable discredit has been brought upon the same.* It may be asked what are the pathological conditions favourable to resection?

This question may be very properly met. If when the disease is of a chronic character, and the joint disorganised or rapidly approaching that condition, incapable of sustaining the weight of the body, and when all our previous treatment has proved abortive, then I maintain we must seek for permanent relief, by removing the diseased structures.

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* It is proper to add, that in many cases collated by Mr. Price, the operation was performed as a *dernier resort*, on account of extensive and protracted disease of the articulation, attended with a worn out state of the system.—Gross' System of Surgery, volume ii. p. 1096.

I am of opinion that the operation of excision, should not be performed whilst active suppuration is going on, although Mr. Solly, of St. Thomas' Hospital, does not seem to consider that such a condition militates against the success of the undertaking.* I think, however, that when pus has formed in a joint, the sooner it is evacuated the better, and that freely, as practised by Adams, Skey, Lloyd, Day, and other eminent surgeons, and I myself have witnessed many cases in which healthy anchylosis followed the removal of the pent up fluid from the joint. If this stage be neglected, the cartilages run into extensive ulceration; pus becomes diffused and spreads up the thigh, the periosteum inflames, and the bone softens or is necrosed; the patient is now in a sinking condition. This then is a case quite unsuited for the operation, and one in which it would in all probability prove fatal, but we should be vigilant in order that the above portrait should not be realised—when the operation of excision is in prospective, the process of destruction should be arrested whilst the sufferer has yet sufficient vital force left to sustain him through his great affliction. There are other circumstances which would cause me to consider well the propriety of operating; these are—*a.* consumption developed before the disease of the knee appeared and becoming dormant on its appearance; *b.* rectal fistula, attended by symptoms of disease of the liver or colon; *c.* dysentery of long standing, particularly if the patient had been a drunkard.

Patients suffering from displacement as the result of disease, generally make excellent recoveries from this operation; this may be explained from the fact of these persons being in tolerably good health at the time of the operation.

I see no objection to excision being performed in strumous disease of the joint, in support of which we have the testimony of Mr. Price, of London,† who observes, "If the white swelling has begun with disease of the synovial membrane, or so called ulceration of cartilage, the diseased joint surfaces

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* *Lancet*, April 2, 1859, p. 335.

† Contributions to the Surgery of Diseased Joints, p. 263 to 269.

may be cut off, and the case will do well, or if there be scrofulous exudation into the bone structure, and if it be in one or more *circumscribed* masses, bounded by a layer of lymph and healthy bone, these masses when laid bare by the section of the bone may be gouged out, as a dentist would do with a carious tooth, and if sound bone is left the case will do well." Mr. Solly, of St. Thomas' Hospital, London, has reported several cases of excision in strumous disease, and the result was most satisfactory; these cases require very careful constitutional treatment before and after the operation. In a strumous girl, where scrofulous deposit had destroyed the head and neck of the femur, and had extended even below the trochanters, I operated successfully.* Mr. Tapp, Surgeon to the Dorset County Hospital, operated on a strumous girl, and she perfectly recovered in thirteen weeks; in this case there was ulceration of the cartilages, and the synovial membrane throughout was totally changed in structure, having been converted into a firm fleshy mass."

Mr. Solly places great reliance in careful constitutional treatment before the operation, and very properly allows patients a generous diet, with cod liver oil, and in some cases small doses of iodide of iron in conjunction.

Having descanted on the merits of the operation, I shall pass successively in review the subjects necessary for our consideration, and which I trust may contribute something for our guidance in bringing to a successful issue, one of the most brilliant operations in Conservative Surgery.

These are,

A. The operation.
B. The after treatment.
C. The preparation of the patient.

It has been said, it matters little what method of operating is employed, provided the after treatment is judiciously carried out, but those surgeons who are of this opinion, state

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* Original contributions to the Practice of Conservative Surgery, by the Author—1859, p. 8.

that trifling circumstances frequently prevent a successful issue, such as a want of accurate apposition of the ends of the bones, or the movement of them afterwards. The interposition of some of the structures surrounding the joint is a frequent cause of failure, from exciting profuse suppuration, and acting as a mechanical cause in preventing union of the ends of the bones. Of course this can only occur when the ends of the bones are not in contact.

Obviously what is wanted in this operation is,

1. To open the joint with as little disturbance of the parts as possible.
2. To remove the *whole* of the diseased bone, and leave two *accurately fitting surfaces.*
3. To close the wound, and place the limb in the most favourable position for anchylosis.

For this purpose three modes of operating have been proposed and carried out, by the surgeons recommending them. The old H incision (Moreau) has this disadvantage, that it has eight angles, four of which rarely if ever unite by the first intention, and although it admits of the ready performance of the operation, yet this little advantage during the few minutes of the operation is dearly bought, by the protracted discharge which ensues, from the sloughing edges of the flaps, and which cannot but have a prejudicial effect upon the uniting ends of the bones. By the semilunar incision (Mackenzie) only two angles are made, and these are in *the more* favourable position to unite by the first intention. This incision gives quite sufficient room to remove any amount of bone that may be diseased, and it is gradually superseding the former H incision, being preferred by the majority of surgeons favourable to the advancement of conservative surgery. Mr. Jones, of Jersey, has recommended the opening of the joint from the side, and the retention of the ligamentum patella,* as a valuable means of resisting the action of the flexor muscles, the integrity of the quadri-

* My own experience is not in favour of leaving this ligament, as it often causes great irritation from being implicated in the disease, and if loose it is apt to get between the bones and interfere with their union.

ceps and rectus muscles being preserved, cannot be otherwise than a powerful and natural means of effecting the object; but on the *other hand*, we must not be too timid in dividing these structures if occasion requires, knowing as we do that they will unite and be almost as powerful as they were before division, the only loss being during the anchylosis, and if the splint be properly used, this will be of no great consequence.

In operating frequently on the dead subject, the difficulty of obtaining accurate apposition of the ends of the bones, and placing the limb in a straight and desirable position has often been felt, the slightest variation of the angle of section producing a very crooked limb. To obviate this difficulty, and obtain the *certainty* of apposition of the ends of the bones, with perfect straightness of the limb, a number of dissections and experiments were performed, and as the result of 29 operations on the subject performed by Dr. Hudson and myself, we arrived at the following conclusions.

1st. That the ordinary method of sawing off the bones, is a frequent cause of failure of the operation.

2nd. That if a method were introduced, by which the above evil could be obviated, the per centage of cures would greatly increase.

It will be seen that by the new mode of operating I am about to propose, all these difficulties are at once surmounted, and the ease with which the operation can be performed is another feature in its favour.

The operation is performed by first making the ordinary semilunar incision across the joint, from one condyle to the other, and below the patella, carrying the incision half an inch higher on the outer than the inner aspect of the leg.

This flap is then to be dissected upwards, carrying the patella with it, the ligaments of the joint if not destroyed by disease are now in view. The lateral and crucial ligaments should be divided, and the popliteal fascia separated from the femur and tibia to the extent of bone required to be removed. The leg must now be flexed upon the thigh, the heel to be brought close to the root of the penis (if a male)

and resting on the pubis, the tibia must be kept in close contact with the femur, it may be well to bandage the limb in this position, unless some reliable assistant be present to retain it *unmoved* during the operation. It will now be found, that the femur projects about an inch and a quarter beyond the tibia, both bones lying almost parallel to each other: the saw is to be applied to the inner condyle of the femur at the usual place, that is, about an inch and a half above the articulating surface, and by keeping it at right angles to the *shaft* of the femur, and sawing *both bones at once:* from within outwards, with an inch and a half of the femur, there will be one quarter of an inch of the tibia removed, by *one application of the saw,* the limb may now be unbandaged and brought into a straight line, and the bones will be found to be in *accurate* proximity, and the case will be one of the most favourable for cure as far as the operation is concerned. Perhaps some will think this two bold a proceeding, to apply the saw without looking to the popliteal vessels, but if the limb is properly flexed and retained in the position as above indicated, it is impossible to injure the artery except by actual design. There will be none of the *straining* and tight bandaging required, which one sometimes sees to bring the ends of the bones in contact. By the old operation, the bones were only brought into contact at their posterior edges, a wedge-shaped space being left, varying from a quarter to half an inch in width. It has been our lot to witness the same result in many cases performed on the living subject, and I believe this to be the great cause of failure in the old operation, and in support of this opinion we have the testimony of Mr. Skey,* of St. Bartholemew's Hospital, who justly observes "the great after difficulty arises from local disturbance, causing profuse secretion from the joint, and it is not an unreasonable supposition that the presence of an interval between the ends of the bones must lead to the encouragement of such actions within the joint, as, to say the least, to protract recovery." Mr. Jones of

* Operative Surgery, 2nd Edit. p. 425.

Jersey, is very painstaking in bringing the bones into close apposition, and his cases have been remarkably successful. Dr. Mackenzie, of Edinburgh, also indoctrinated this very necessary and important expedient.

Corporal O'R —— of the 48th Regiment, received a gun shot wound in the joint, at the battle of Inkermann, the ball lodging in the femur, close to the inner condyle. Pus had formed within the joint which had escaped from an opening on the inner side, and below the patella. He was received into Her Majesty's Hospital, along with a batch of wounded at Gibraltar, by Dr. Stewart, Surgeon of 72nd Regiment, but this gentleman being with his regiment ordered up to the front, he came under my care as one of the Surgeons to Her Majesty's Forces. As the destructive process was rapidly going on, and the patient's health sufficiently good to justify operative measures being taken, I excised the joint in the usual way. He bore the operation remarkably well, there was no prostration, and little or no consecutive fever, but in three weeks he died from exhaustion and constitutional irritation. In this case there was a space measuring half an inch between the ends of the bones, and the suppuration was most profuse. In August 1855, I was requested to perform the operation by a native physician in Spain, on a young Spaniard residing at St. Rooke, a village near Gibraltar; it was a decided case of strumous disease of the knee, with several sinuses running into the joint in different directions. After preparing him with nutriment, cod liver oil, iodide of iron, &c., I performed the operation, and endeavoured to bring the bones into close and even contact, to accomplish which, I had to remove three slices from each bone. The limb was carefully put up and not disturbed in any way until consolidation had taken place. He was going about in eight weeks and made a most excellent recovery.

Since these cases came under my observation, I have been constantly endeavouring to discover some method, whereby we could always secure the proper adjustment of the bones after the operation, and I think, as I have just shown, that I have accomplished it.

It will therefore be seen that the advantages to be derived from the operation here recommended are the following,

1st. The operation being rapidly performed, there is little loss of blood.

2nd. The bones being in *close apposition,* there is every possibility of speedy union.

3rd. When speedy union takes place the patient is spared the long and tedious process of suppuration which is the cause of death in the majority of cases.*

The operation being completed and the necessary apparatus applied, the stage of the reparative process next engages our special attention. The limb should be carefully *put up* in a splint prepared for the purpose before the operation is commenced, and for the proper execution of which several kinds of splints have been recommended by different surgeons; it will be needless to describe them seriatim, suffice it is to say, that as each new splint is successively introduced to our notice, we generally find it to be a compound innovation, combining in one instrument, the many excellences pertaining to the whole of its predecessors.

For my part, I think there can be no better appliances to fix the limb in an immoveable position than the wooden back and side splint, of Mr. Butcher, and the back splint, and sand bags as used by the late R. J. Mackenzie, in the Edinburgh Infirmary.

Too much care cannot be exercised in the first instance, in padding and fitting the back splint. We should be certain that there is no pressure on the heel, or on either malleolus; the utmost care should be bestowed in this important respect, as the apparatus ought not to be re-

* Professor Erichsen, of University College, London (The Science and Art of Surgery, 1853 pp. 33, 34,) says, "Hectic does not come on unless there is a discharge of pus from the system. It is essentially a fever of debility, conjoined with irritation, emaciation, and general loss of power invariably accompanying it, the debility rapidly increasing, the patient wastes and at last dies from sheer exhaustion, the conjoined result of fever, mal-nutrition and wasting discharges.

moved until consolidation has taken place, and as the side splints as well as the sand bags are moveable, no difficulty will be met with in dressing the wound. All the pads should be nicely prepared and secured from soiling by the application of oil silk, oil satin, or gutta percha sheeting.

No movement must be permitted in the limb for several weeks, the practice of changing splints at too early a period cannot be too strongly deprecated. On this point Mr. Skey observes: "the act of simply and injudiciously attempting to change the splints before the bones were united has frequently led to three terrible consequences, namely, irritation, amputation, death." The same gentleman* thinks the putting up of the limb may be greatly facilitated by division of the hamstring muscles, but I consider that it would be more prudent in the adult to take off sufficient bone to admit of the bones being brought together without any strain whatever.

The next stage of the after treatment, consists in our using the utmost vigilance in preventing the development of, and being ready to combat should they arise, the dangers which may—and frequently do—tread upon the heels of some of the most brilliantly performed operations, and which are thus tabulated:

(A.) Prostration.
(B.) Traumatic fever.
(C.) Secondary hæmorrhage.
(D.) Erysipelas.
(E.) Pyæmia.
(F.) Constitutional irritation.
(G.) Acute periostitis.
(H.) Development of dormant disease.

It is now a recognised fact, that hospital patients are much less tolerant of the knife, than patients outside its walls or those who live in the country. It is, therefore, essential in hospital practice, that a patient who has undergone the operation of excision, should have a small ward to himself, and that too at the top of the house where he can get

* Operative Surgery, p. 447.

plenty of fresh air. Having been placed in a quiet room, some brandy and water should be administered, and that too with a generous hand. A patient of mine living at Brunswick, upon whom I performed the operation of excision of the hip joint, would most certainly have sunk had it not been for *fresh air* and large quantities of *nutrient* and *stimulating* fluids; and Mr. Jones of Jersey, remarks, "I attribute the large amount of success that has attended my cases, partly to climate and partly to stimulating treatment."

We must not lose sight of the fact that there exists a tendency to prostration or collapse of the nervous system, in a greater or less degree, in all operations of any magnitude; the feeble pulse, and respiration, blanched countenance, cold extremities, imperfect vision, oscitation, sighing, jactitation, excessive thirst and sometimes vomiting, are symptoms clearly demonstrating an exhausted condition of the vital powers. To the practical and observant surgeon, such a pathological condition is strikingly suggestive of the most rational and appropriate treatment; obviously what is required to be done, and promptly, is to stimulate the heart and brain, and by these means endeavour to bring about healthy reaction; brandy and water should be freely administered, hot bottles placed along the spine, to the soles of the feet and under the axilla, strong beef tea should be administered by the mouth, and if the power of deglutition fail, it should be given by the rectum, in the form of enemata, to which brandy and the yolks of eggs should be added. When the system has rallied sufficiently to justify the surgeon in withdrawing the stimuli, and sickness or vomiting is distressing and persistent, they may be allayed by the use of iced water, iced soda water or lemonade, and by the application of synapisms over the region of the stomach.

From the above remarks, it will be seen that two very essential and important conditions of the system are to be speedily brought about after large operations, namely, perfect tranquillity of the nervous system, and an additional supply of the circulating fluid; quietude of the nervous system is to be obtained by sedatives, of which perhaps

morphia is the best. It should be administered as soon as the patient is carried to his bed, and the mind should be comforted and sleep encouraged by every possible means.

Traumatic, Secondary, Surgical or Consecutive Fever, we may look for more or less. It is usually ushered in within eight or ten hours after operations. The pathological condition is that of a deteriorated condition of the blood, and its consequent reaction on the nervous system. It is characterised by a quick and irritable pulse, flushed face, dryness of the skin, thirst and restlessness. Sometimes these symptoms are persistent, at other times they are of transient duration; this febrile condition is frequently very deceptive, sometimes assuming symptoms of quite an alarming nature, though yielding to treatment of the mildest and simplest description, or subsiding spontaneously. The treatment is obviously to admit as much fresh air as practicable into the sick chamber, and to act speedily on the two great excretory organs of the animal economy, namely, the bowels and skin, two grains of calomel combined with one grain of morphia, should be administered at bed time, with a mixture containing the tartrate of soda with spirits of nitric ether, and tinct. of hyoscyamus every three hours. Should any vomiting be present, small quantities of iced soda water or lemonade, to which a drop dose of Scheele's hydrocyanic acid is added, should be given every hour, or Sir James Murray's fluid magnesia with citric acid may be administered. On the subsidence of the vomiting, a mixture containing the chlorate of potash may be prescribed with advantage. I need not here dilate upon the advantages to be derived from good and efficient nursing, the vital importance of which is patent to the minds of every operating surgeon, the tender and unremitting attention of a faithful nurse has been the means of saving many a valuable life.

Secondary hæmorrhage is an occurrence always dreaded by the operating surgeon, anxious to bring his case to a speedy and successful issue. Its occurrence not only tends greatly to alarm both patient and friends, but it is most obstructive to the process of adhesive inflammation.

On these grounds therefore it is to be strongly guarded against.

The bleeding may be arterial or venous, slight or profuse, and generally supervenes upon the imperfect deligation of the vessels before the patient is removed from the operating table. Such an occurrence should be most studiously prevented, so far as we possibly can, as this accident when severe, would of course necessitate the re-opening of the wound, and thereby materially retard the healing process. Too much care cannot be devoted to the proper deligation of all the arterial branches likely to prove troublesome, and also by exposing the flaps a short time to the air, before the necessary sutures are applied.

Erysipelas is said to occur in persons of intemperate habits and broken down constitutions, but it will also shew itself in others whose general health and habits are not considered favourable to its development.

It generally makes its appearance in three or four days after operations and may be at the site of the wound, or in the structures around it.

No local applications appear to me to be so efficient as those lotions containing acetate of lead. The next step is to act upon the liver and bowels, by small doses of blue pill and compound rhubarb pill. The mixture composed of the chlorate and nitrate of potash and spirit of nitric ether, with hyoscyamus appears to me to act like a charm in these cases.

Phlebitis and pyæmia frequently follow the operations on bones, the patulous condition of the veins in bones readily allowing the passage of diseased fluid within them. Pyæmia may prove rapidly fatal, or the patient may linger some time and gradually sink from the formation of abscesses or other visceral diseases.

The diagnosis is readily established, both by the physical and rational signs and the prognosis as to its ultimate issue of the most unfavourable kind. The disease is essentially of an asthenic character, and fearful are the consequences to be apprehended when the system is thus assailed.

In the treatment of this formidable disease, it appears

that brandy, ammonia and bark, wine, nourishing broths, beef-tea and nutrient enemata are strongly indicated.

Mr. Skey observes (Operative Surgery 2nd edition, p. 727), "In stimulants will be found in my opinion the only protection against local congestion, erysipelas or pyæmia, which are but manifestations in different degrees of loss of vital power."

"In an aggregate of 150 operations, I have within the time specified performed about 80 large ones in surgery without one example of phlebitis or pyæmia. No moderate quantity of undiluted spirituous liquors will produce evidence of excitement, and still less of intoxication, from which may be inferred *a capacity* for stimulants, and if a capacity, assuredly *a want.*"

"For several years past, I have noted the efficacy of stimulants, given under the conditions above described; in 1855 a succession of operations in St. Bartholomew's Hospital, for cancer of the breast, were succeeded by prostration and erythema around the wound, sometimes extensive. I need hardly say, that such condition of the integuments indicates a total suspension of the healing process. The next case that presented itself, I treated with stimulants. I gave her an ounce of brandy, a little diluted, every four hours, and continued it at intervals of increasing length, for the next forty-eight hours; she had neither prostration, consecutive fever, nor erythema around the wound, and her recovery was rapid. I conceive the principle to be sound, its success is especially marked in cases where loss of blood has been considerable, or in those in which the nervous system gives symptoms of unsteadiness." The treatment is even more distinctly indicated where the subject of the operation has been largely addicted to spirituous or fermented liquors; in such cases the patient should observe the recumbent position for some time, and the limb should be elevated. This period should be observed as a probationary one, and mental annoyance of every kind should not be permitted to obtrude themselves. The surgeon should endeavour to assuage, and mitigate by explanations, of the most conciliatory kind, all

the forebodings which usually possess the mind of the patient, who has constantly presented to his mind all the horrors of the much dreaded operation, it is his duty to furnish consolation to the weakhearted, and give encouragement to the timorous.

Operations should never if possible be performed during very hot weather; cold is not objectionable as the temperature may be raised.

Constitutional irritation, hectic, or suppurative fever, is a continued fever of a remittent character, and may assail the life of the patient long after all apparent danger is over. It is paroxysmal in its character, and its existence is nearly always indicative of serious organic lesion. Its invasion is often sudden and violent, at other times more gradual and stealthy. In the former case there are severe rigors, in the latter merely a sense of chilliness. Like every other fever, it passes through a stage of incubation, which may be brief or protracted; a sense of slight indisposition being the feelings by which it is ushered in, the appetite becoming impaired, the sleep disturbed, the tongue dry and coated, with more or less thirst; later, the pulse becomes quick and weak, and there is profuse perspiration, which, in the majority of the cases alternates with obstinate diarrhœa. The fever may be of the inflammatory, irritative, or typhoid type. The febrile exacerbation is sometimes matutinal, but more frequently vesperal, but always presenting a distinct periodical character. The pyrexical rigors are sometimes severe and protracted, the patient shivering for hours; at other times the chill is very slight, and is felt principally along the spine, and about the shoulders. The emaciation also is rapid and progressive, and the sufferer finally sinks from sheer exhaustion.

The variety of conditions influencing suppurative fever defies anything like a prognosis being given; but in that which we witness after excision of the knee joint, if there has been much serious inroad made upon the constitution, and much advanced local disorganization, we are not warranted in holding out any hope of the patient's ultimate recovery.

In the operations of approximating both bones in the manner recommended, there is little or no risk of constitutional disturbance by profuse suppuration; and, therefore, if excision of the knee joint be carefully and accurately performed, I think we may banish hectic from the category of disorders which so frequently follow the operation, and which are so disastrous in their consequences. It is in the prevention of suppuration that I conceive the superiority of the operation to consist.

Dr. Gross* writes, "in traumatic affections, hectic fever often sets in at an early period after the accident, perhaps there may have been grave shock, and profuse hæmorrhage, and the two are soon followed by profuse suppuration, which thus still further undermines and exhausts the vital powers, or it may be that more or less pus has been carried into the circulation, and the whole of the system has been poisened by the unfortunate admixture, every blood cell, and every fibre and atom of solid matter feeling its baneful influence. The brief struggle which ensues, may be characterised by the inflammatory type; but this is evanescent, hectic soon taking its place, and thence on, steadily maintaining the ascendency, no intercurrent circumstances ever changing its real character, although they may temporarily disguise it, or for a time, keep it in abeyance."

The treatment of this disease consists in,

(1.) Removing the local disease.

(2.) Supporting the strength of the patient.

(3.) Relieving urgent symptoms.

The first of the above indications, in my opinion, cannot be entertained if the disease is the sequel of excision, and amputation would in all probability speedily cut off the patient, and the statistics under similar circumstances support this opinion. I shall not enter into the treatment of this disorder, as that will be found sufficiently considered in most systematic works on surgery. My object being merely to illustrate the dangers arising from profuse suppuration, espe-

* System of Surgery, p. 190.

cially after excision, and the simple means to be used, by which such dangers may be averted.

Our attention should also be directed to the preparation of the patient to be operated on. No operation except those of emergency should be performed without duly preparing the patient for the coming event; its importance has long been fully recognised by some of the best operators of the past; but, strange to say, it does not receive the attention it merits, at the hands of many of the present race of surgeons.

The probable loss of blood consequent on an operation should invariably be taken into account, as much loss of the circulating fluid will give rise to the supervention of erysipelas and pyæmia, and thereby retard the recovery. The older surgeons considered that loss of blood did good, by rendering the system less liable to inflammatory action, but modern experience has demonstrated clearly, the untenable nature of such opinions. With regard to aperients I believe their moderate use to be highly beneficial, as correcting disordered secretions of the liver and bowels, and a brisk purgative is invariably called for when it is desirable to prevent any action of the bowels for several days after such operations as lithotomy, recto-vesical, recto-vaginal, or anal fistula. Great judgement should be used in the regulation of the patient's diet, much of the success of an operation may be traceable to the attention which has been given to this important subject. In some cases we may grant a liberal dietary scale, in others we must curtail it. The mental condition of the patient also requires the most tender and careful supervision.* If the operation is likely to be of a

* Mr. Skey Operative Surgery (pp. 723, 724.) remarks, "It may be asked by an unobserving surgeon whence the cause of death so unexpected? The answer is a fatal shock to the man's nervous system. We may now recollect that he had eaten little food for many days or weeks, or that he had not recovered from an attack of sickness or diarrhœa, or that his fear of death had greatly preponderated over his hope of recovery. This fatal anticipation will occasionally take possession of the mind, especially in women." We frequently see, ourselves, in the natives of New Zealand, Africa, Indian Archipelago, India, and Turkey, that after operations they take an idea

serious nature, the most perfect quietude should be observed, for days and in some cases for weeks. In the extraction of foreign bodies from joints, and in the operations for the cure of hernia and varicose veins, too much caution cannot be used.

The age of the patient should never interfere with an operation, provided there be immunity from structural organic lesion of the internal organs. Infants have been operated on, for imperforate urethra and anus, and also for stone. Persons of advanced age are often surprisingly tolerant of surgical operations, and frequently make excellent and rapid recoveries.

During the pregnant state major operations are never to be undertaken, except to save life; those of a minor character have, in some cases, cost the patients their lives.

Lastly, in considering the propriety or impropriety of performing an operation, we should not forget to investigate the previous *habits* of our patients, as they materially influence the ultimate issue of an operation; thus in persons accustomed to habits of intoxication, who have undergone a severe operation, we frequently find that the wound will not take on any reparative action, days may pass without any progress whatever, restlessness and loss of appetite supervene, finally erysipelatous inflammation commences in the wound, and in a brief period, life is forfeited.

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into their minds that they "will die." When they do, death invariably ensues, and no encouragement or hope of ultimate cure can remove the impression. It is a subject upon which I have often reflected. Here are people who, under the influence of drugs or excitement, will mutilate themselves so severely that an Englishman, if subjected to similar treatment, would probably die; yet, under an operation which the latter would consider "as nothing," they often sink.

CHAPTER II.

STRICTURE OF THE URETHRA; ITS NATURE AND TREATMENT; AND ON A NEW STRICTURE DILATOR.

Stricture of the urethra—Kind of knowledge essential in the treatment of—Importance of the subject—Anatomical relations of the urethra indispensable—Measurements of the same—Male urethra divided into four portions from before backwards—"Sinus of the bulb"—Sub-division of urethra into three regions, by Mr. Henry Thompson—Practical utility of the same—Physiological conditions of urethral canal—Kolliker's researches—Observations of Mr. Hancock—Approximative measurements of the urethra—Mr. Thompson's analysis as to seat of stricture—Observations of Sir E. Home, Ricord, Amusat, Civiale, Philips, Vidal, Leroy D'Etiolles, Ducamp, and others—Researches of Thompson and Rokitansky—Exemption of the prostatic portion from stricture admitted by most surgeons, denied by Ricord, and Leroy D'Etiolles—Definition of stricture by Thompson, Sir C. Bell, Sir A. Cooper, Professor Syme, John Hunter—Stricture necessarily divided into permanent and transitory—Permanent stricture the result of inflammation—Various forms which organic strictures assume—Causes of stricture numerous, such as gonorrhœa, employment of instruments in the treatment of diseases of the urethra, unskilful use of catheter to relieve retention of urine, abuse of "Porte Caustique," traumatic injury, violent equitation, masturbation, abnormal conditions of the urine, improper use of urethral injections—Urethral chancre supposed gonorrhœa a cause of stricture—Denied by John Hunter—Forcible introduction of catheter highly reprehensible—Lallemand's "Porte Caustique"—Empirical abuse of the same—Unskilful application of a cause of urethral abscess—Laceration of the urethra, how produced—Cavalry soldiers obnoxious to stricture—Masturbation may cause urethritis—Pathological sequence of the same—Morbid urine a cause of stricture—Opinion of Mr. Liston and Sir B. Brodie—Chancre may occur within the urethra—"Bridle stricture"—Pathological sequence of permanent stricture—Skill of surgeon required to overcome obstruction—Objects of treatment, to restore the canal and keep it patent—Chemical and microsopical examination of urine, importance of—Therapeutic aid in the treatment of stricture essential—Value of chloroform, and belladonna—Operative periods—Stricture may present variations in character—Diversity in number met with in same urethra—Symptoms of stricture not pathognomic of the same—Exploratory examination essential before forming diagnosis—Post mortem appearance of permanent stricture—Importance of arriving at a correct diagnosis—Nature of instrument employed, should be highly polished—Oil, glycerine, instruments should be warmed—Dashing style to be avoided—"Tour de maitre,"—Erect position of patient best—"Stricture chair"—Holt's dilator—Graduated sounds—Permeability and impermeability of stricture—Syme's belief, Mr. Liston's assertion—Cure of stricture effected by absorption of plastic deposit—

Different kinds of treatment, by dilatation, compression, cauterization, urethrotomy, perineal section—Different kind of bougies recommended—Holt's dilators—Idea borrowed from Perreve of Paris—The "tubular system"—Superiority of concentric dilatation—Dangers to be apprehended in dilating urethra too rapidly—Opinions of Wade and Thompson—Dr. Grosse's "Porte Caustique," its superiority—Therapeutic action of "potassa fusa"—Danger of internal incision—Perineal section advised in obliterated urethra—The "temper of the urethra," Sir B. Brodie on—Mr. Adams prefers catheter—Importance of constant practice in passing instrument—Necessity of being familiar with the structures—Only to be acquired by long and diligent practice—Dilatation superior to cutting when aided by dexterity, and therapeutic treatment—New Dilator—Advantages which it offers.

No subject connected with the chirurgical art more engrosses the minds of eminent surgeons at the present time than stricture of the urethral canal. The amount of constriction varies from a slight narrowing to an almost complete occlusion of the channel, and for the successful treatment of which, a comprehensive knowledge is essential, as regards the causes, situation, and precise nature of the obstruction. It is very essential that we should make ourselves acquainted with the correct anatomical measurements of the urethra, the average length of which on the cadaver is eight and a half inches; but Mr. Briggs, of the Lock Hospital, London, computes it at from seven and a half, to seven and three quarter inches, on the living body. It is important that these measurements should be borne in mind when treating cases of urethral stricture.

Proceeding from before backwards, this extent is divisible into

(1.) The meatus or orifice.
(2.) The spongy portion, six inches in length.
(3.) The membranous portion, three quarters of an inch.
(4.) The prostatic, one inch and a quarter.

The meatus urinarius is the smallest and narrowest part of the canal, the spongy portion or second division is moveable, and its anterior half can assume any direction; but, as it approaches the pubis, the relations of the surrounding parts render it more fixed, and at the same time it curves under the pubic arch. At the distance of one inch from the orifice, is the "fossa navicularis Morgagni;" this is an enlargement or

dilatation, and is seated in the glans penis. At the posterior extremity of the spongy portion another enlargement occurs, which is recognised by anatomists as the "sinus of the bulb." The most contracted part of the urethra is, with the exception of the orifice, the membranous portion. In the erect position of the body, its direction is upwards, with a slight curve, a continuation of the curve by which the posterior part of the spongy portion passes under the arch of the pubis, and which further increases in the prostatic, until at last, the course of the canal is almost vertical.

Mr. Henry Thompson, of London, in his prize essay on stricture of the urethra, has subdivided these anatomical divisions into three regions, an arrangement of great practical utility.

The first occupies a space of one and three quarter inches, beginning one inch anterior to the junction of the spongy and membranous portions, and continuing backwards through the whole of the latter.

The second region is from two and a half to three inches in length, and extends from the first, to within two and a half inches of the meatus, thus occupying the centre of the spongy portion; and the third is included between this and the meatus.

It is in these regions that strictures are localised, the result of analyses being that 67 per cent occur in thefirst, 16 in the second, and 17 in the third.

The physiological condition of the urethra requires to be noticed, the vascular condition of which occasions great variations in its length, even in the same individual, erection increasing, flaccidity diminishing it. It has been demonstrated by Kölliker, that the urethra is surrounded by muscular fibres in its entire length, a double layer investing it at the membranous portion, and again at the meatus, whilst Mr. Hancock, of Charing Cross Hospital, London, has shown that the prostate and spongy portions, are included between planes of muscular fibres.

Approximative measurements have only been made by anatomists with regard to the width of the male urethra,

and these have been stated at three, four, and five lines, as deduced from observations on the diameter of calculi that have been passed. However, it is certain, that in the normal condition of the urethra, when quiescent, the walls of the canal are in close apposition.

In support of Mr. Thompson's conclusions, as derived from his statistical analysis of 320 cases of stricture, we have the corroborative testimony of many eminent surgeons of the day. John Hunter asserted its greatest frequency "about the bulbous portions;" Sir Benjamin Brodie, "anterior part of membraneous portion behind the bulb, and behind the triangular ligament;" Sir Everard Home, "just behind the bulb;" and "at the junction of the bulb with the membranous portions," by Ricord, Phillips, Leroy D'Etiolles, Vidal, Ducamp, Amussat, Civiale, and others.

The most frequent seat of stricture is in the first division of Mr. Thompson, and its causes are thus attributed. First, that here the anterior layer of the deep perineal fascia comes into close relations with the urethra, and this connexion is presumed to have an influence favourable to contraction.

Secondly, that this is the site of those violent spasmodic contractions of the voluntary muscles, which so strongly oppose the passage of the instruments.

Thirdly, that from the admirable researches of Mr. Thompson and Prof. Rokitansky, they have been thus enabled to demonstrate most lucidly that this is one of the two spots usually affected by gonorrhœal inflammation, the "fossa navicularis," being the other.

The non-existance of stricture in the prostatic portion of the urethral canal, is now universally admitted by most surgeons of repute, although M. Ricord, and Leroy D'Etiolles, maintain an opposite opinion.

How then shall we define stricture? Mr. Thompson considers it "an abnormal contraction of some portion of the urethral canal;" Sir Charles Bell, "as having lost the power of dilating;" Professor Syme, "a narrowing of the canal at one or more points," and divides them into five classes, namely, imaginary, slight, confirmed, irritable, and contract-

ile; others again into spasmodic, congestive or inflammatory, and organic; Sir A. Cooper into permanent, spasmodic, and inflammatory; John Hunter into permanent, spasmodic, and mixed; but I conceive the most effective, and by far the most practical, is into

1. Permanent, depending on narrowing of the urethral canal.
2. Transitory, arising from spasm of Wilson and Guthrie's muscles. There are other causes, which may produce stricture lasting from a few hours to several days, and which cannot be said to belong to the first category. These are—tumefaction of the prostate, from abscess or inflammation of its substance, or of the membrane lining its canal, or enlargement of the posterior part of the lower portion of its lobe.

Permanent or organic stricture is invariably the result of inflammation, and that too of a chronic form, with subsequent effusion of plastic lymph into the lining membrane of the urethra and subjacent cellular tissue, where a portion of the infiltrated material remains, ultimately becoming organized.

At one time it was considered that urethral stricture was mainly owing to a shrinking of the canal, accompanied by a gristly degeneration of the tissues surrounding the same; but from the valuable researches of Mr. Hancock, Jabez Hogg, and Professor Rokitansky, it appears that lymph may be effused on the free surface of the mucous membrane, and be converted into imperfect fibrous tissue, thus partially blocking up the canal.

It will also appear that organic stricture may assume various forms. Thus it may be recent or old, soft or indurated, simple or complicated, partial or complete, permeable or impermeable, dilatable or undilatable.

The causes which induce the pathological condition of the urethra to which the term stricture has been applied, are both numerous and varied, but the following I consider may

be tabulated as being the most rational and practical kind. They are,

1. Gonorrhœa.
2. Employment of instruments in the treatment of diseases of the urethra, and for relieving retention of urine.
3. Unskilful application of "Porte Caustique."
4. Traumatic injury.
5. Violent equitation.
6. Abnormal condition of urine.
7. Improper use of urethral injections.
8. Urethral chancre.
9. Inflammation of the spongy portion of the urethra.
10. Wounds destroying the erectile tissue of one side of the penis.
11. The use of mechanical appliances to prevent masturbation, or with the idea of preventing night emissions.
12. The operation of opening the urethra and dividing the stricture is very apt to be followed by a worse stricture than existed at first.

It has long been conclusively considered by the medical profession, that gonorrhœa is one of the causes to which urethral stricture may be attributed, and in testimony of which we have the authority of Sir Charles Bell, Sir A. Cooper, Sir Benjamin Brodie, together with Messrs. Lawrence, Liston, Ducamp, Chelius, and other eminent men, although it may be observed that John Hunter dissented from this opinion. Rash and unsurgical catheterism in the treatment of spasmodic or transient stricture, as also the improper and unnecessary introduction of the bougie by the patient himself, are common agents in the production of stricture.

A patient who may happen to be suffering from retention of the urine, applies to a medical man for relief, who from a desire to relieve his patient as quickly as possible, applies

undue force to the catheter employed, and much mischief is thereby inflicted upon the mucous membrane of the urethra. The management of the catheter in these cases requires great tact and delicacy, and the subsequent history of cases treated by any other mode than such, has furnished results of so disastrous a character, that I am convinced that the forcible introduction of a catheter to relieve retention of urine, or of a large sound to dilate a narrow stricture, is to say the least a highly reprehensible proceeding. The operator should never forget that it is "arte non vi," which will enable him to perform successfully an operation projected for the relief of a confiding and suffering fellow being.

Since M. Lallemand introduced to the profession his "Porte Caustique," the use of which in the treatment of spermatorrhœa is too well known to require any comment, it has been applied by those who do not rightly appreciate its use, nor understand its "modus operandi." It has been resorted to by empirics, for the treatment of diseases that never existed, except in the minds of hypochondriacal subjects, before whom the instrument has been pompously paraded with charlatanic impudicity as the "proper remedy" for the effectual treatment of his case, and the quack expresses his astonishment that the application of an instrument so potent has been so long withheld!! I have known the unskilful application of the "Porte Caustique" induce such violent inflammatory action of the urethra, that most alarming abscesses have resulted, and have been followed by permanent stricture.

Traumatic injury, such as violent blows on the perinæum is a common cause of stricture, and is frequently met with amongst soldiers, sailors, bricklayers, stockmen, and others. A sailor may fall from the rigging, and alight astride on a spar; a bricklayer from a building; a horseman thrown on to the pommel of the saddle; or a man may receive a kick from an iron shod boot. In two or three cases which have fallen under my care, the sufferers attributed the strictures to kicks they had received when young. The most prominent symptom after the occurrence of such an accident, is the

discharge of blood from the urethra, and in many cases retention of urine; but laceration of the urethra has occurred without any blow having been received on the perinæum. In such cases the individual has fallen from a height and alighted on his feet, which at the time were widely separated. Violent equitation, as hunting, leaping, breaking in restive horses, &c., is a common cause of stricture. Cavalry soldiers suffer much from this disease; they are trained to the military seat by riding bare-backed from one to two hours daily. I have known this give rise to smart attacks of urethritis and to aggravate pre-existing chronic discharge, both of which have been ultimately followed by stricture. Masturbation may induce a chronic discharge from the urethra, and by its persistence lay the foundation of stricture. The possibility of such an occurrence is denied by Ricord; although Sir Everard Home, and M. Lallemand state that they have seen and treated cases of this kind.*

The injurious effects of a morbid condition of the urine, on the urethral mucous membrane, were observed long since by eminent surgeons, amongst whom may be mentioned, Sir Benjamin Brodie† and the late Mr. Liston‡. Thus a morbid alkaline, or an unduly acid condition of the urine, may excite irritation, inflammation, and finally stricture. Sir B. Brodie considers that excessive alkalinity of the urine is more likely to induce morbid action than when it is acid, whilst Mr. Liston says "that the continuance or frequent occurrence of morbidly acid urine frequntly lays the foundation of stricture." It may therefore be presumed that both these states may favour the occurrence of stricture. This is the result of my own experience.

The East and West Indies have been considered as especially favourable to its occurrence. As this cause is doubtless due to the heat of the climate, I may add that my own experience fully justifies me in arriving at the same conclu-

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* I have been called upon to treat cases of this kind in patients who had never had sexual congress.

† Medical Times and Gazette, June 22nd, 1844.

‡ Operative Surgery, 4th Edition, p. 467

sion, from the difficulty I have often experienced in arresting urethral discharges in South America, the Mediterranean, and in Australia; and although stricture is a very prevalent affection in the last named country, I consider that it is materially aided in its development by the abuse of alcoholic liquors in which its residents are wont to indulge.

Much mischief has been done to the urethra by the untimely and injudicious use of urethral injections, in the treatment of gonorrhœa. The practice of using strong solutions of the nitrate of silver, and of bichloride of mercury for the treatment of urethral discharges, is in my opinion, a most painful, and frequently a very dangerous proceeding, and one betraying a most lamentable degree of ignorance on the part of the practitioner advising them.

Injections when intended to act as curative agents, should *never cause pain*, a little smarting along the canal is the only sensation that should be desired by the surgeon anxious for the future welfare of his patient.

Chancres may form *within*, as well as without the canal, and be productive of a purulent discharge, which is frequently presumed to be gonorrhœa, and treated as such. The true nature of the discharge never being suspected until it is followed by secondary syphilitic symptoms, often of an obstinate and protracted character.

Loss of substance, caused by an internal chancre, may occur in the mucous membrane as well as the skin; therefore, by an analagous reparative process, which takes place after burns and ulcers, we may have a deposit of strongly contractile tissue in the mucous membrane of the urethra, which may cause a narrowing of the canal.

The amount of constriction varies from a slight narrowing to almost complete occlusion, a portion of the circumference of the urethra only may be involved, or it may occupy the whole, annular, or be stretched across like a frænum, and thus produce the "bridle stricture" of Sir Charles Bell. It also varies in extent, pervading more or less of the canal, throughout its length.

The sequence of permanent stricture is hypertrophy of

the bladder, from increased muscular contractions to overcome the resistance offered by the stricture; dilatation of the ureters speedily follow, from accumulation of urine in them, owing to the natural reservoir, the bladder, being surcharged. Subsequently the pelves and callices of the kidneys become distended, and by pressing on the secreting substance its speedy atrophy is accomplished. But we have more mischief in perspective. The constant and intense straining dilates the urethra behind the obstruction; repeated micturition and the constant irritation of morbid urine excite chronic inflammation of the mucous membrane of the urethra, and its invariable result—ulceration. This ulceration may be superficial or deep; if deep, infiltration of urine with the submucous tissues follows, which extends until an opening takes place externally, and fistula is established; or the urethra gives way and the urine escapes with the subcutaneous cellular tissue of the scrotum and lower part of the abdomen, causing mischief of the worst kind.

Strictures may present great variations in their character and extent, there is also much diversity in the number to be met with in the same urethra. Instances are recorded where there were,

Two. (Professor Syme, Beaney.)
Three. (Boyer, Thompson, Beaney.)
Four. (Gross, Thompson, Ducamp and Rokitansky.)
Five. (Ducamp, Mott.)
Six. (John Hunter.)
Seven. (M. Lallemand.)
Eight. (Colot.)
Nine. (Leroy D'Etiolles.)

The symptoms, though sufficiently obvious to point to the precise nature of the diseases which induce them, are nevertheless not to be considered as strictly pathognomic, until an exploratory examination has been made by means of instruments.

The patient usually feels a great inclination to pass water frequently, which is slow and difficult to accomplish; there is also a diminution in the size of the stream of urine, which

may be spiral shaped, forked or dribbling, and preceded, accompanied, or followed by a sense of heat and scalding, together with muco-purulent discharge from the urethra. The urine will often be loaded with mucus of a fœtid character, particularly when the mucous membrane of the bladder becomes inflamed. There is also great languor, and the spirits are depressed. Should death take place during this stage, the post mortem examination will invariably furnish the following pathological changes.—The urethra behind the stricture will be found greatly dilated, the prostate gland and its ducts in a state of suppuration, and frequently containing small circumscribed abscesses, the bladder generally dilated, often contracted, thickened and sacculated, and its mucous membrane inflamed or ulcerated, the ureters are dilated and the kidneys almost invariably disorganised.

We now arrive at the general diagnosis of stricture: a correct and conclusive one being most imperative, as regards the *existence* of an obstruction, its seat, extent, and amount of contraction. The urethra should be explored by means of instruments made of silver or plated steel, which should be *highly polished.* It matters little whether it be a sound or catheter, but of the two instruments I usually prefer the former, my favourite size for exploratory purposes being a No. 8. Some surgeons recommend that an instrument commensurate with the *size of the stream of urine* should be commenced with; but I am far from considering the constant adherence to such a rule as sound and practical surgery. If we commence with a very small instrument, it may probably hitch in a lacuna or enter *a false passage,* but in using a No. 8, these will be avoided; and should it be found too large it may be withdrawn, and a smaller one substituted, to be followed in its turn by diminished sizes, until one of the proper calibre is attained. The instrument should be warmed and oiled, as advised and practised by Mr. Henry Thompson, others recommend glycerine as being miscible with the urine, and thus being more speedily removed from the urethra than the former.

In the use of instruments all attempts at a "dashing

style," or "tour de maitre" is strongly to be deprecated. The urethra being lined by a very delicate mucous membrane, *experience* only can impart the tact which regulates the amount of force oftentimes requisite to overcome the obstruction, no force whatever should be exercised, until the point of the sound is *fairly engaged* in the stricture, and, when *once* it has penetrated, the cure can be most readily and satisfactorily accomplished.

The desired objects to be arrived at by treatment are,

(A.). The restoration of the channel, to its original capacity.

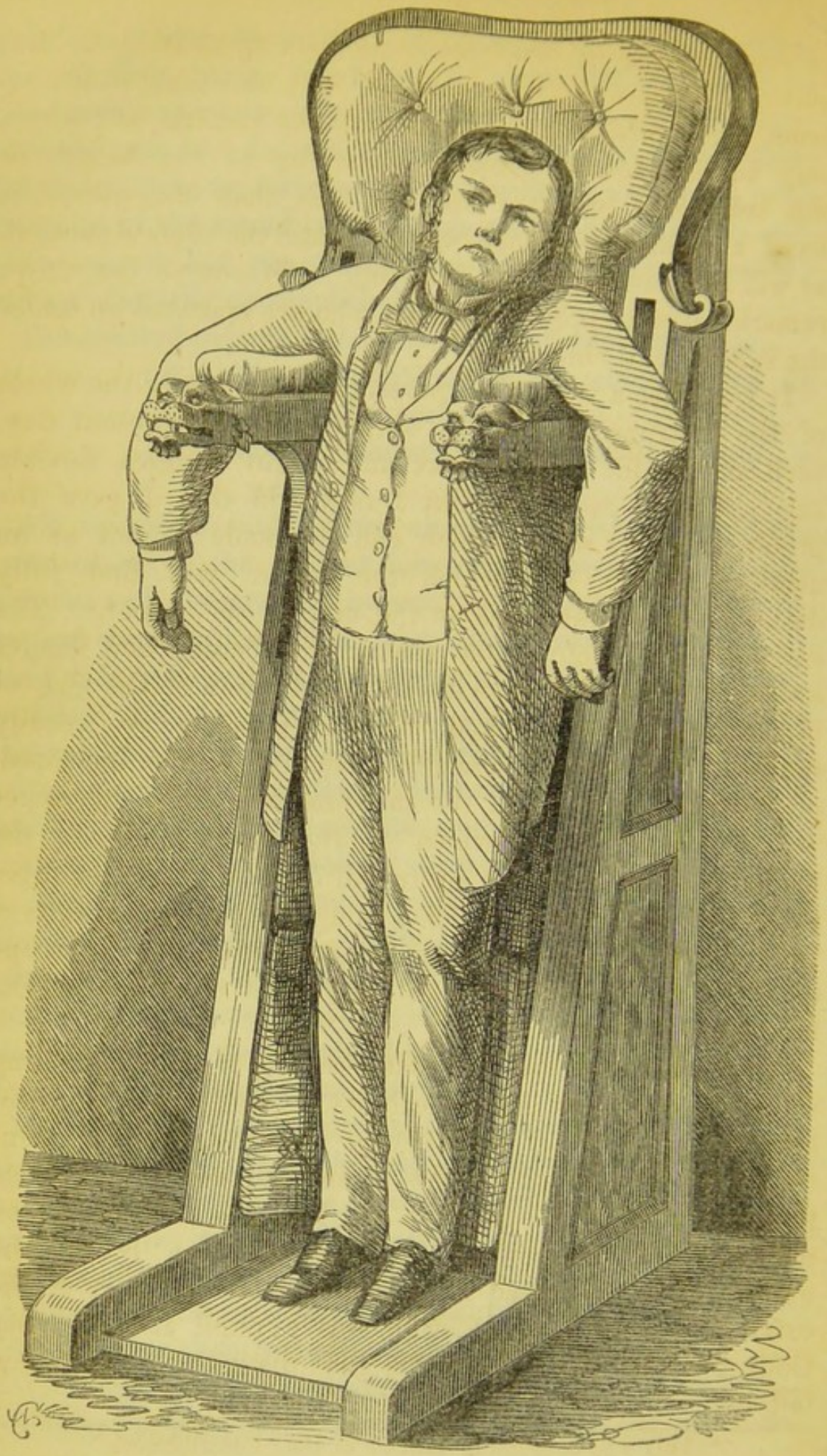
(B.) Having accomplished this, to keep it patent.

All operative interference should be withheld until the constitution of the patient has been improved by proper dietetic and therapeutic means. A chemical and microscopical examination of the urine should *never be omitted,* as these aids will point to the proper medical means necessary to allay extreme irritability of the urinary organs, and determine the existence or not of disease of the kidneys.

Sometimes the anæsthetic influence of chloroform will facilitate the introduction of the sound, particularly through irritable and highly sensitive strictures, and in belladonna or atropine will be found a remedy of the highest value, in allaying the smarting which is so distressing after the instrument has been withdrawn. These remedies are therefore important adjuvants in the hands of the operator, who, by the judicious application of which, may, very often, dispense with more serious operations.

Having *passed* the stricture, the dilatation must be proceeded with very gradually, and the instruments augmented in size, until the passage is considered to be of its normal calibre. Once in three days, and then reduced to once in six, should be the operative periods. It should also never be forgotten that an instrument should not be used, of larger circumference than the *urethral orifice.*

With regard to the position of the patient operated on, I certainly am of opinion that the *erect* one is the best; but



STRICTURE CHAIR.

in consequence of the great tendency to fainting in this posture, I use a "stricture chair" with moveable or sliding arms, upon which the patient supports himself, and which may be elevated or lowered, according to the height of the individual operated on. In this chair the patient is fixed, with his toes turned outwards, and the heels separated, as will be seen from the drawing. Of course the above remarks do not apply to patients who are operated on under the influence of chloroform.

It would be a work of supererogation to notice the whole of the instruments used by surgeons of the present day, such as metallic sounds, wax and catgut bougies, flexible and inflexible catheters, but I may add that I give the preference to a *sound* which can be made to act as an urethral dilator, and which the reader will find fully described and illustrated at the end of the paper.* The surgeon must not forget that the difficulty and danger increases in proportion with the diminution of the size of the instrument employed. False passages are readily entered, and even made, and the difficulty thereby increased, of keeping the point of the instrument against the upper wall of the urethra, which is the *direct* guide to the bladder. I have known an unskilful or bold operator drive the end of the catheter or steel bougie through the walls of the canal into the surrounding parts, and from the escape of urine into this false canal, the most disastrous results follow.

Much misunderstanding has resulted of late respecting the permeability or impermeability of stricture. Professor Syme believed that if urine can be extruded, an instrument can be passed; with this view, as entertained by the learned professor, I entirely concur. The late Mr. Robert Liston maintained that inability to enter the bladder through the urethral canal indicated incompetency on the part of the surgeon, but Dr. Reeves, who was a pupil at University College Hospital, has known that distinguished surgeon fail.

* This will be found in Part II. of the "Contributions."

The effective treatment of stricture does not simply depend on mechanical dilatation, but rather upon the absorption of the plastic exudation which constitutes the "materies morbi," and for the successful accomplishment of which various means have been employed by different men, and and which may be thus arranged.

(1.) Dilatation.
(2.) Compression.
(3.) Cauterization.
(4.) Urethrotomy by internal incision.
(5.) Urethrotomy by external incision.

Numerous instruments have from time to time been recommended for the purpose of dilating strictures, such as bougies of divers materials, and catheters of various kinds. These may be straight or curved, flexible or inflexible, hollow or solid, their vesical extremity being fusiform, conical, or cylindrical, according to the fancy or requirements of the operator; but the greatest innovation of late years will be found in the urethral "dilators." The first of these very ingenious instruments was devised and brought into use by M. Perreve, of Paris ; this was subsequently improved upon by Mr. Barnard Holt, of the Westminster Hospital, and these led to the introduction of another set, by Mr. Wakely, of the Royal Free Hospital, London. The treatment of stricture by the later-named instrument is designated the "tubular system." The plan is equally applicable to the treatment of strictures of the œsophagus, rectum, and cervix uteri.

The advantages of the tubular treatment, writes Mr. Wakely, are "greater *safety*, *certainty* and *permanence* of cure"; but, in my own practice, I give the preference to Holt's instrument, in consequence of the dilatation by this method being *concentric*. The stricture can be dilated slowly, or rapidly, according to the size of the perforated rod used.

This treatment is highly commended by many eminent surgeons, amongst whom may be enumerated, Solly, Coulson, Ferguson, Lizars, Guthrie, Keate, Crampton and others.

The dilator of Mr. Holt, and the *solid* silver graduated sound, are the instruments I rely upon, in an extensive practice amongst these cases, but of late I have used a much simpler dilator than Mr. Holt's.

The practice of rapidly dilating or "slitting up" strictures of the urethra, as practiced recently by Mr Hillman, of the Westminster Hospital,* is, I consider, by no means a rational and justifiable proceeding, as the tendency to a relapse will be greatly increased, should the patient escape the formation of urinary abscess, which might cost him his life. On this point Mr. Thompson pertinently remarks, "unquestionably it is in our power to dilate the urethra as rapidly as we please in a *day or two,* if the patient chooses; but if we intend the treatment to be safe and sure, and desire the case to be substantial and enduring, we certainly should not perform any rash operation upon him."†

In further allusion to this subject, Mr. Wade, Surgeon to the Westminster General Dispensary, truly observes, "My own experience has convinced me that the great error, with regard to dilatation, has been an attempt to do too much at a time, by which the disease has been *aggravated* instead of relieved. The urethra is in fact too frequently treated as if it were an inert lifeless tube, and not a living structure, possessing more or less exquisite sensitiveness."

Compression of the stricture has been attempted, when it has been so hard and tight, that it could not be penetrated by the ordinary method. It consists in pressing the instrument against the anterior part of the stricture and by these means promoting absorption. This method was introduced to the profession by Dupuytren, of Paris, and is known by the term "vital dilatation." It met with the approval of and was subsequently adopted by Guthrie of London, and Velpeau of Paris. The hydrostatic process of Dr. James Arnott has been also used for bringing about the like results.

The treatment by cauterization is a most dangerous pro-

* British Medical Journal, Nov 19th, 1859, p. 933

† Prize Essay on Stricture of the Urethra, p. 175.

‡ Medical Times and Gazette, June 18 and 25th, 1859, pp. 635 and 650.

ceeding in the hands of the inexperienced, but discriminately employed, it may be used as a therapeutic *adjuvant* of the most valuable kind; therefore, when using the "potassa fusa," it must not be forgotten that it is to be employed as a therapeutic agent *only*, during a long and tedious process of dilatation in strictures such as,

1. Those of a gristly kind.
2. Strictures that have a marked tendency to bleed on the introduction of instruments.
3. Those of a morbidly sensitive character.

For the successful application of this method of treatment, the "Porte Caustique" of M. Lallemand is preferred by the majority of practitioners, but I certainly give the preference to that recommended by Dr. Grosse of the United States. I consider Grosse's "Porte Caustique" superior to that of Lallemand. In the structure of the former, a weak point is discoverable rendering it liable to break off in the urethra, but this danger is entirely obviated in Grosse's instrument. An admirable instrument of this kind has recently been invented by Mr. Wade, a description of which will be found in the *Medical Times* and *Gazette* for April, 1859.

When the caustic potash is skilfully applied to those strictures which evince a disposition to bleed, it will generally remove this tendency. Gristly strictures require the strength to be increased, but it is in the morbidly irritable kind, and which give rise to so much acute suffering on the introduction of the sound, that the beneficial effects of potassa fusa are witnessed.

This practice having had for its advocates such men as Hunter, Home, Ducamp, Phillips, Lallemand, Segelas, and more recently Wade has been added to the list of votaries, it is not to be wondered at, that its indiscriminate employment has been considerably in the ascendant of its more careful and rational application.

The operation of internal incision for the relief and cure of stricture cannot in my opinion be too vehemently denounced. I consider it most reprehensible on the part of

any surgeon who would subject his patient to such a mode of treatment. It is gratifying to find, however, that it is gradually falling into desuetude. I may also observe *en passant*, that one of the strongest advocates for this operation was M. Civiale, of Paris, who has in a most praiseworthy manner, tabulated the dangers incurred by its adoption in his work De l'Uretrotome, viz.

(A.) Hæmorrhage.
(B.) Pain.
(C.) Irritative fever.
(D.) Ecchymosis.
(E.) Local inflammation with or without discharge.
(F.) Infiltration of urine.
(G.) False passages.
(H.) Formation of abscess.
(I.) Death.

The instruments for performing this operation have been numerous, but the urethrotome of Mr. Stafford, or some modification thereof, is the kind generally preferred. The foregoing array of results so disastrous should make us pause and consider, whether safer measures could not be devised, and in the present advanced condition of the surgical art, such are undoubtedly placed within our reach.

Lastly, we arrive at the fifth division of our subject, namely, urethrotomy by external incision, or the "perinæal section," so designated by Professor Syme; a practice, the good of which is placed beyond doubt, when resorted to in the intractible forms of stricture, the result of traumatic injury, and not amenable to treatment by the process of dilatation. Should we resort to this procedure, we cannot do better than follow the method practised by Professor Syme, namely, by making an incision in a line corresponding to the raphé of the perinæum, on a grooved director, and by these means relieve the stricture.

This operation, projected and performed by the learned

professor, has been so fully and freely ventilated of late years, that it would be superfluous to dwell upon the details, or the various improvements suggested as regards his staff, by Haynes Walton, Mr. Marshall, the late Dr. Richard Mackenzie, and lastly by the professor himself.

Sir Benjamin Brodie has lately observed, "that the temper of the urethra varies as much as the temper of the mind," hence the modifications which have been suggested of late, with the view of relieving contractions of its canal.

Mr. Adams, of the London Hospital, believes that the majority of cases may be relieved without any other interference than that of the catheter, and Mr. Syme views no case as *impermeable*, but that with time, patience, and care, an instrument may always be passed.

In the treatment of these cases, however, much depends on the individual dexterity of the operating surgeon, and the "unwritten experience" which practice alone engenders.

The mode of passing instruments along the urethral canal and into the bladder, cannot be practised too often. An instrument that would be dangerous in the hands of the young and inexperienced practitioner, possesses a magical power, when wielded by one, who has rendered himself *familiar* with the delicate structures, and has thereby acquired the power of exquisite tactile sensibility, by long and diligent practice. An eminent surgeon,* in descanting on urethral stricture, entirely falls in with the views above enunciated, and observes, "It may be taken for granted that the treatment (dilatation) will be most successful in the hands of those who use all possible gentleness and caution in the introduction of the instrument; lightness of hand, delicacy of touch, as well as great patience and forbearance are indispensable qualities in the surgeon, to enable him to do justice to this, the simplest of all methods of treatment."

From what has been said in the preceding pages concerning the rational method of treating permanent stricture of

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* Mr. Wade, in *Medical Times* and *Gazette*.

the urethra, and which I intend to illustrate by cases occurring in my own practice, I think that the majority of medical men will arrive at the same conclusions as myself, namely, that skilful mechanical dilatation, patiently perservered in, aided by manual dexterity and therapeutic treatment, will be all sufficient to bring to a successful issue most of the cases of stricture which may fall to our lot to treat.

I feel so confident that this practice is fast gaining ground with the majority of surgeons, that the day evidently is not far distant, when in the treatment of these disorders, all cutting operations* will be virtually abandoned, for, to say the least, they cannot be divested of danger.

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* Not including obliterated urethra.

ILLUSTRATIVE CASES.

CASE I.

Stricture of the Urethra of Ten Years' Standing, Double Stricture, Incontinence of Urine, Cured by Dilatation.

History.—Mr. ————, æt. 30, residing at South Yarra, states that he has been in the colony about eight years. About ten years since, when residing in London, he suffered from a smart attack of gonorrhœa, and for which he was under medical treatment. The ordinary copaiba mixtures were prescribed, in conjunction with strong urethral injections, the latter causing considerable smarting, followed by pain which lasted some time. Notwithstanding this treatment the discharge continued for a long time, characterized at times by an amelioration, but frequently by an aggravation of the symptoms. Subsequently he observed that his stream of urine was much smaller than usual, and twisted in shape. These symptoms being persistent, to which was added great irritability of bladder, medical aid was sought, medicines were administered, and instruments were used. He did not, however, get on so fast as he could wish, and he consulted Mr. Cock, of "Guy's." This gentleman furnished him with elastic catheters, in order that he might use them himself, and prescribed alkalies and sedatives in combination. Under this treatment he considerably improved, and in a short time left for Australia. He says he has not been able for some time to pass an instrument into the bladder.

Present Symptoms.—May, 1860.—There is a thin muco-purulent discharge from the urethra, and a constant desire to pass water, the act of doing which is attended by a greal deal of straining, and bearing-down pain. The stream is small and forked at the commencement, but towards the termination of the act of micturition passes *guttatim*. There is great tenderness in both groins, and considerable pain in the perinæum, and after urinating complains of pain of a severe character; the urine is strongly alkaline, and

loaded with mucus, and, after standing some time, gives off a pungent ammoniacal odour. On endeavouring to pass the sound, it meets with an obstruction about three inches from the urethral orifice. The examination was commenced with a No. 8. silver sound with a curved point, gradually substituting a smaller one until a No. 2 was found to have entered, and become fairly *engaged* in the stricture. The contractions upon the instrument were powerful and painful. After allowing the instrument to remain for about eight minutes it was withdrawn, a warm bath was recommended, and the following prescribed :—

℞ Acid Nitric dilut. ʒi. Spt. Æth. Nit. ʒvi. Tinct. Hyoscy. ʒij. Syr. Tolu. ℥i. Infus Buchu. ℥viij. Two table-spoonsful to be taken three times a day, in water.

℞ Pulv. Ipecac. gr. iij. Morphiæ Hydroch. gr. i. Pil. Scillæ Co. gr. ix. Divid. in pil. iij. Sumat i. o. nocte.

Treatment and Progress of the Case.—June 2.—Introduced a No. 3 into the stricture, and kept it there ten minutes. On its withdrawal, I injected half a fluid ounce of the following :—

℞ Atropiæ Puræ gr. iii. Glycerinæ Opt. ʒiv. Aquæ distillat. ʒviij. M. Ordered hip-bath every night.

June 6.—There is a good deal of straining during micturition ; discharge increased ; cannot hold his water properly ; ordered him to wear an urinal.

June 7.—A No. 3 was again used, and *entered* the stricture, kept it in eight minutes. To continue atropine injection, and warm baths every night.

June 11.—Spasmodic pain at neck of the bladder not so bad ; he sleeps better ; wearing urinal. I now tried a No. 2 again, which passed easily into the stricture as far as I had penetrated with No. 3, and by keeping it steadily maintained against it for several minutes, it suddenly slipped through. This instrument was then withdrawn, and a No. 3 again substituted, which I suceeded in passing ; but unfortunately a second stricture was discoverable at the sub pubic curvature, through which I could not penetrate. Ordered the atropine injection to be continued.

June 15.—Feels easier ; not so much straining, but the dysuria is very troublesome ; discharge very copious ; urine acid. Ordered Ol. Copaibæ ʒi. Ol. Cubebæ ʒj. Liq. Potassæ ʒij. Spt. Æth. Nit. ʒiv. Tinct. Hyos. ʒiij. Syr. Simplici ℥ij. Vin. Colchici

℥ij. Aquæ Menth. Sat. ʒviij. M. fiat mist. et capiat cochl. magna, ter quotidie ex aquæ, and introduced Holt's guide, being equal to a No. 3 sound with a beautiful point, passed it gently into the stricture, and held it there twelve minutes. Continue remedies.

June 18.—Same used again, and held there some time.

June 22.—Is in great pain ; used the same guide again, and after some delay, succeeded in getting it fairly into the bladder.

June 23.—Same kept in ten minutes.

June 28.—Same kept in twelve minutes.

July 2.—Improving rapidly ; left off urinal ; less discharge. To continue baths, mixture, injection, and pills, and this time I passed a No. 4 sound.

July 5.—Can hold his water well ; stream larger and slightly twisted ; passed again No. 4.

July 10.—Passed a No. 5 well warmed and moistened with glycerine.

July 15.—Passed same with very slight uneasiness ; held it in ten minutes.

July 20.—Very much improved in health ; can hold his water a long time. Holt's dilator was used this time, with the No. 1 tube ; caused him no pain.

July 24.—Passed a No. 6 sound easily ; less discharge.

July 28.—Passed the same ; let it remain some time.

August 1.—Passed a No. 7, which was a little tight, but the urethra is less sensitive, it therefore caused no uneasiness. Continue the injection. Ordered :—

℞ Pil. Hydrarg. gr. vi. Extract Hyos. gr. vi. Extract Colo. Co. gr. x. M. fiat pil. vi. Sumat ij. o. n. h. s.

August 4.—Passed the same, and retained it.

August 8.—Passed a No. 8 comfortably.

August 12.—Passed the same.

August 18.—Holt's dilator was used with tubes to bring it up to the respective sizes of 10, 11, and 12, which were used regularly until the 3rd of October, when he was cured, with instructions to have a large-sized instrument passed once a month for six months.

Reflections.—This case is a good example of chronic gonorrhœa, giving rise to the formation of stricture of the urethra. There is no doubt but that the irritating injections used in the treatment aggravated the mischief, and by causing effusion of plastic material, permanent stricture was established.

The baneful influence of stricture on the functions of the bladder was here strikingly illustrated. The rapid cessation of all the morbid phenomena after *passing* the stricture, and thus removing the exciting cause, is most suggestive of treatment. Dilatation, carefully and judiciously performed, was in this case entirely successful; but dilatation, as I have before alluded to, must be *slow*. Patience and forbearance will accomplish all that we desire; and the success which will crown our efforts will amply repay us. It is worthy of remark, that during the whole of this tedious process of urethral dilatation, *not a drop of blood escaped from the passage*. An interval, ranging from three to six days, according to circumstances, should always be allowed when performing the operation of progressive dilatation.

CASE II.

Obstinate and Irritable Stricture, Caused by Injections, Cured by Dilatation and Constitutional Treatment.

History.—Mr. P————, æt. 35 years, residing at Sandhurst, a store-keeper, of temperate habits, came under treatment in October, 1858. States that about four years since he suffered from a smart attack of gonorrhœa, and which he thought he "was never going to get rid of." Whilst under treatment, he says he took a large quantity of corrosive sublimate dissolved in gin, and used injections of the nitrate of silver, under the influence of which the discharge gave way considerably, but it has *never* entirely left him. For some time has noticed his stream of urine getting much smaller, and for the treatment of which has been advised to use bougies of divers sizes, but without deriving any benefit therefrom. Latterly he has suffered from retention of urine, accompanied by pain of a very distressing character. He has used hip-baths frequently, which have relieved him.

Present Symptoms.—There is a constant inclination to pass water, which he accomplishes in a broken stream, about the size of a No. 1 catheter. The act of micturition causes great spasmodic pain about the neck of the bladder, and in the perinæum, to which is added a great desire to go to stool. On exploring the precise situation of the stricture, I find it in the same locality as the one before narrated. I now tried to pass a No. 2 sound, and succeeded in

getting it into the stricture, but the jerking pain, caused by the presence of the instrument was so distressing that I withdrew it, and immediately injected into the urethra a mixture of atropine, and glycerine previously warmed. This afforded him so much relief, that I tried again, and this time it caused little or no pain, which encouraged me to persist in maintaining the instrument there; and after fifteen minutes' perseverance, it passed into the bladder, and I retained it there for ten minutes longer, and then withdrew it. Very little pain followed the operation, I ordered him

℞ Potassæ Bicarbon. 3i. Tinct. Scill. 3i. Spt. Juniperi Co. 3iv. Tinct. Hyoscyam 3i. Syr. Simplicis 3i. Vin. Colchici 3i. Aq. Anethi ad 3viij. M. fiat mist. capiat cochl. ij. ampl. ter quotidie.

Treatment and Progress of the Case.—October 26, being two days after the first operation, I introduced the same instrument comfortably; he can hold his water better, and he has no desire to evacuate the bowels after urinating. Ordered to continue mixture, and use the tepid hip-bath every night at bed time.

October 29.—The stream is larger, and there is a good discharge. I now introduced Holt's dilator without the rods, and kept it in the bladder ten minutes. Ordered :—

℞ Atropiæ gr. ij. Glycerinæ Opt. 3vi. Aq. Rosæ 3viij. M. fiat injectio, to be used night and morning after making water, and to continue medicine and baths.

The treatment by dilatation was cautiously and patiently persevered in until January 5, 1859, when he was quite cured, and I could pass a No. 12 sound or catheter with the greatest facility.

CASE III.

Stricture Caused by Improper Use of "Porte Caustique," Cured by Dilatation.

History.—J. H——, æt. 24, residing at East Melbourne. About two years since, just after returning from New Zealand, he was annoyed by frequent *nocturnal* emissions, on account of which he applied to a medical man, who recommended the application of the "Porte Caustique." The application was often repeated, which was invariably followed by bloody urine, and purulent discharge. Finding himself getting worse, instead of better, he discontinued

the local and constitutional treatment which had been prescribed for him, and ever since he has suffered more or less from urethral discharge, associated with a desire to pass water more frequently, which is accomplished by means of a smaller stream than he ever witnessed before.

Present Symptoms.—February 28, 1861.—There is great straining during micturition, the stream is fine and forked, there is a discharge from the urethra also. The urine is strongly alkaline, and loaded with mucus; bowels costive, appetite bad, sleep disturbed by a frequent desire to urinate. I placed him in the "Stricture Chair," and commenced with a No. 8 sound, which I withdrew, introducing successively others of smaller calibre, until I finally succeeded in passing a No. 2 into the bladder. I kept it there for eight minutes. Ordered:—

℞ Acid. Nit. Dil. ʒij. Spt. Æth. Nit. ʒvj. Syr. Aurantii ℥i. Sol. Morphiæ Mur. ʒi. Inf. Buchu. ad ℥viij. M. fiat mist. capiat cochl. ij. magna, tertia quaque hora ex aquæ. A tepid bath every night.

March 3.—Re-introduced No. 2 easily; ordered the remedies to be continued.

March 6.—Introduced No. 3, which was followed by pain. Ordered:—

℞ Atropiæ gr. iij. Glycerinæ Opt. ʒiv. Aquæ Rosæ ℥viij. Omne nocte hora somni utend.

March 10.—Holt's dilator was introduced without causing any pain.

March 14.—Same instrument used, through which a No. 1 tube was passed, and retained ten minutes. Very little uneasiness was caused by this operation.

March 18.—Great desire to pass water, attended with considerable heat and scalding; urine acid, but clear. Ordered

℞ Potassæ Bicarbon ʒii. Spt. Æth. Nit. ʒiv. Tinct. Hyoscy. ʒi. Syr. Aurantii ℥i. Inf. Buchu ℥viij. Two table-spoonsful to be taken every three hours.

March 22.—Much better; can pass water freely; introduced No. 5 sound without causing any pain. Ordered to continue the medicine.

From this time graduated instruments have been used, until a No. 10 can now be passed comfortably. He is still under treatment (April 22).

CASE IV.

Traumatic Stricture of the Urethra, Cured by Dilatation and Appropriate Therapeutic Treatment.

History.—G. M————, æt. 30, a farrier by occupation, his habits those of a "bon vivant," came under care on the 8th of August, 1858. He states that four years before he was riding a restive horse, which, plunging and curvetting, threw him on the pommel of the saddle, and ruptured his urethra, for which he was attended by a surgeon. Soon after, he experienced great difficulty in passing his water. There was pain in the perinæum, accompanied by a gleety discharge from the urethra. As these symptoms became much worse, he left for England, and placed himself under the care of Mr. Teale, of Leeds, Surgeon to the Leeds General Infirmary. This gentleman treated him for several months, and succeeded in passing catgut bougies and elastic catheters, until a No. 4 was attained, but not beyond. Satisfied with this, he returned to Melbourne, but during the voyage had an attack of complete retention of urine, to relieve which, the medical officer pertaining to the ship, attempted the introduction of a catheter. This, however, he was unable to accomplish, but the desired effect was procured by means of a hot hip-bath, and an opiate. No further treatment was had recourse to until he reached Melbourne, when he consulted me.

Present Symptoms.—He complains of great pain in the perinæum, and about the anus. There is incontinence of urine, the latter excretion continuously escaping *guttatim ;* he exhales a very offensive odour, of which he is painfully aware. On examining the urethra, a stricture is discoverable at the sub pubic curvature (that is at the junction between the spongy and membraneous portions), through which I was unable to penetrate ; his urine is unduly acid, and loaded with mucus and the urate of ammonia. Having eight or nine times carefully endeavoured to pass No. 1 catheter, but ineffectually, I placed him under the influence of chloroform on the 12th of August, and fairly introduced this instrument. Ordered a warm bath at bed time.

August 14.—No. 1 was passed again without anæsthesia ; and on the following day the urine flowed, but in a very fine stream. The urethra, however, was excessively painful, and I ordered him

℞ Extract Belladon. ʒi. Glycerinæ ʒiv. Aquæ Rosæ ℥viij. M. fiat injectio. To be used warm three times daily.

August 16.—No. 1 was again passed, and on this occasion easily and with very slight pain. Ordered him to continue the injection.

August 18.—No. 2 was passed, and retained seven minutes. The pain excited was very great, but instantly relieved by the belladonna injection.

August 20.—Re-introduced No. 2, and with little pain ; urine still dribbling, with a muco-purulent discharge. He was ordered

℞ Ol. Copaibæ ʒij. Vin. Colchici ʒij. Spt. Æther Nit. Juniperi Co. *aa* ʒiv. Sol. Morphiæ Mur. ʒij. Liq. Potassæ ʒiij. Syr. Simplicis ℥ij. Decoct. Uvæ Ursi *ad* ℥viij. One table-spoonful of this mixture to be taken three times a day in water, and to continue the injection.

August 22.—The stream is larger, and the discharge lessened, is able to retain his urine. A No. 3 was successfully introduced.

August 25.—Same instrument introduced.

August 28.—The same.

September 1.—No. 4 was introduced easily.

September 3.—Same size passed.

September 6.—The same.

September 9.—No. 5 introduced without pain.

September 12.—Passed the same.

September 15.—Passed the same.

September 18.—Introduced a No. 6 sound.

September 22.—Same instrument passed.

September 28.—Passed the same instrument.

This process was persevered in until Dec. 18, when he was cured, but advised to have an instrument passed occasionally.

Reflections.—This was a most unyielding, tight, and obstinate stricture, the result of urethral laceration. The symptoms were observed a few weeks after the accident, and progressed from bad to worse. I am sure this case would have been considered incurable by many practitioners, except by the perinæal section ; it is therefore highly gratifying to find such an obstinate case yield to treatment of the most harmless description, although the result of traumatic injury.