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SURGICAL

CASES AND ESSAYS

BY

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CONTENTS.

PART I.

Paper read at the International Medical Congress of 1881 on the Treatment of Fractured Femur by Thomas' Splints - 1 ,, 8

Discussion on the use of Compression in Synovitis of the Knee - 9 ,, 17

Two Cases of Excision of the Tongue and Jaw, for Cancer - - 18 ,, 25

Case of Simple Fracture of Patella in which bony union occurred - 25 ,, 26

Abstract of Address on the materials of Blood Poisoning. Is Malignant disease Parasitic? - - - - - - 27 ,, 30

Case of Suture of Patella to its Tendon, by Antiseptic Incision of Knee-Joint - - - - - - - - - - 31 ,, 34

Ligature of Subclavian Artery - - - - - - - - 34 ,, 36

On Umbilical Herniotomy - - - - - - - - - 36 ,, 39

Case of Large Calculus with Natural Perforation for Urine, removed by Recto-Urethral Lithotomy - - - - - - 40 ,, 43

PART II.

Radical Operation for Hernia by John Wood's Pin-method. Case of Compound Fracture of Jaw; Wire Suture by Thomas' method. From Liverpool and Manchester Reports, 1876 1 ,, 4

Paper read in the Surgical section of the International Medical Congress, London, 6th August, 1881.

ON THE TREATMENT OF FRACTURED FEMUR,

BY

RUSHTON PARKER, LIVERPOOL.

Among the many uses to which the splints of Mr. Hugh Owen Thomas, of Liverpool, may be put in the mechanical treatment of injuries and diseases of the lower limb, none is more conspicuous in fitness, frequency, and effect than their employment for cases of fracture, especially of the femur. A glance at the models or diagrams will show this, and will besides, I hope, throw upon my words a light in which they could hardly otherwise be seen, as, to many here addressed, the objects and methods may be unfamiliar. Having been deeply impressed with the excellence and practical value of the appliances in question ever since they were first shown to me; having during six years occupied myself with their constant use and exposition to others; and having been the means of attracting professional attention to their existence and to the important labours of their author, who has spared no pains in transferring to me the details of his knowledge and methods, I may venture, without apology, to make this brief contribution.

For fractures of the shaft and condyles, Thomas's knee-splint is advised (*a* to *e*), and for fractures of the neck, the hip-splint of the same author (*f*).

In fractures of the condyles the knee-splint is applied in its most simple style and in a way exactly similar to that adopted for uncomplicated inflammation of the knee-joint (1). The oval padded ring of iron rod encircles the root of the limb, lying in the fold of the groin in front, and similarly behind, being in close contact with the skin covering the ischium. Two strips of bandage, laid one along each side of the leg, and fixed there firmly, but not tightly, by plenty of adhesive plaster, are tied to the lower end of the splint, so that the leg is pulled straight and the splint kept constantly against the perineum by what has the appearance of slight extension and counter-pressure. The limb itself lies between the parallel bars of the splint, suspended evenly and steadily, in a sheet of calico or a towel pinned to the bars at each side, and reaching from a little above the ankle to a little below the hip (1, 3) A wide bandage round the middle of the leg, and another round the middle of the thigh, keep the limb perfectly still and straight, the whole thing constituting an exceedingly comfortable and a really artistic adjustment, in a perfectly natural attitude.

The patient rapidly loses any pain and tenderness that may have existed, can sit up in bed, make use of the bed-pan, and otherwise move unassisted, without interfering with the treatment and good progress of the case. There is, in all surgery, no more perfect means of securing, with great facility, the linear immobility of the lower limb, and of giving at the same time a great range of liberty to the patient. The knee is left uncovered (1), with little or no readjustment, requiring chiefly to be let alone till union of bone, disappearance of all swelling of the soft parts, and complete slackness of the joint, have ensued. Passive movement is, under this system, never employed by either the author of the apparatus or by myself, being replaced by a patient confidence in its strict avoidance, a few additional weeks of which easily purchases immunity from that stiffness of which passive movement in not unfrequently, although unintentionally, the cause.

For immediate use the "bed-splint" (*a*, *b*,) is preferable to the "walking-splint," though the latter is, perhaps better known (*d*, and 5).

The former is made with a symmetrical oval ring, and can be employed on either side of the body. The lower end of the bed-splint has hitherto been made simply square (*a*), and may conveniently rest upon a block or a book laid in the bed. But a recent improvement consists in an oblong rectangular frame, by which the splint and the limb are raised a few inches off the bed (*b*, *c*, 2, 3).

In the walking-splint (*d*) the ovoid ring is unsymmetrical, being shaped according to the section of the thigh, more prominently curved behind, around the hamstrings, than in front, where it is flatter. It must, therefore, be made "right" and "left." The lower end, moreover, is furnished with a circular, oval, or ovoid patten, to touch the ground, while the limb is slung in a sheet of leather for more permanent fitness and durability.

Again, while referring briefly to modifications in form, I may add that instead of two bars merely (*a*, *b*, *c*), the knee-splint is now often fitted with three, the additional bar reaching from the back of the upper ring to a point about half-way down the calf, where it is attached by a semi-circular piece of rod behind the other two welded to all three (*c*, *d*). This third bar existed in an early development of the splint, but was cast aside as not essential to rigidity as at first supposed. But it has now been found to be invaluable in preventing the back of the knee from coming in contact with the bed in the recumbent attitude, and from striking the chair when the patient sits in using the walking-splint. It is thus a great, and sometimes a necessary addition, protecting the joint against even slight, though painful, or at least detrimental, movements. Incidentally, the third bar diminishes the pressure of bandages without necessarily impairing their efficiency (5).

In fractures of the shaft of the femur the knee-splint is of great value. The side-straps are applied as before said, and tied to the lower end of the splint (1, 2, 3) permitting adjustment of the limb at its full length, by extension and counter pressure on the ischium, as in the case of the "long-splint" and "perineal band" of Liston. The leg from the knee downwards is supported, slung between the bars on a towel or sheet of calico, which may be conveniently used double, folded over one bar and

pinned to the other (3). It is well to place a soft pad behind and in front of, or even all round the leg, as a protection to the skin in contact with the tibia and fibula, before applying the wide bandage. The thigh is separately supported by a hollow firm splint of padded sheet metal (zinc or iron), or wood, as in Gooch's material, or even thickly folded paper, closely fitting the limb, reaching from the ring at the buttock to a little way below the knee (2). Contact should be secured behind the knee-joint by interposing, if required, a small mass of extra padding slipped in to relieve the soft parts behind the knee from the irksome strain of supporting the bones. This splint behind the thigh is now slung to the side bars by strips of bandage two or three in number, suitably adjusted and knotted. Other short hollow splints, of the material that may be chosen, or that comes most handy, are now placed so as completely to encircle the thigh, and strips of bandage tied moderately tightly around them and the included thigh, inside and outside the iron bars according to fitness (2).

The extension straps are tightened up from day to day, if slack, so that the full length of the limb is, if possible, secured within a week or so, especially in children, whose bones so quickly unite. When the length is secured, all that is required is a vigilant maintenance of immobility and correct line, by tightening the encircling bandages as they become slack during the wasting of the limb, and by such other adjustments as common sense demands. In case the skin of the perineum becomes tender, apply grease, and so prevent or allay excoriation.

By this mode of treatment shortening may be more often prevented than is generally imagined, and in a good proportion of cases can easily be averted. I have left a case now in hospital where a fracture of the tibia, fibula, and femur in the same limb, managed chiefly by the house-surgeons of the Liverpool Royal Infirmary, in one of the splints here named, has resulted in a perfect union without deformity in the leg, and an almost inappreciable shortening of the thigh; though here the difficulties were really great, in spite of which the patient has had less than the average discomfort attending either one of these fractures; to say

nothing of other injuries, namely—fractured clavicle, sprained wrist, and scalp wound, stripping the bone.

It is obvious that shortening must often occur in fracture of the shaft of the femur, but by this method of treatment the frequency and the extent of the deformity are, to say the least, less difficult of control than by any other.

The liberty of the patient in bed, while securing the full efficiency of the treatment, is also obviously greatly increased. In osteotomies and other compound fractures the same means are employed, with the addition of Lister's arrangements and dressings.

During convalescence, after union, the walking knee-splint (*d*, 5), in which the weight of the body is transferred to the perineum, as the limb hangs harmlessly between the bars, and the sound limb is provided with an elevated boot or patten, should be used until union has become inflexibly hard. In adults the period varies, but is one that may be counted by months—roughly speaking, from six to twelve after the receipt of the injury, in favourable cases. It is well to let the patient know this at first, for the sake of his or her arrangements; and in order to do so with confidence, it is well for surgeons to provide for the supervision of the case during some such length of time, as it is to be feared that they not seldom erroneously substitute the six to twelve weeks properly claimed in books for the mere process of union, in computation of the average duration of the more lengthy process of a finished cure.

In children the precautions taken need not be so stringent, as their bodies are lighter, and their bones, although soft, less liable to bending at the seat of union, in comparison; though the possibility of secondary deformity must be borne in mind and guarded against. The calliper walking splint may be substituted for the longer knee-splint as soon as the limb is fit to bear the whole or most of the weight of the body, while still requiring to be maintained in the straight position. The elevated patten is thus dispensed with, but even then, if required, part of the weight may be taken off the confined limb by making the splint

just long enough to press on the perineum in the attitude of full linear extension (*e*, 6).

Fractures of the neck, or immediately below the great trochanter, are best treated in Thomas's hip-splint (*f*), applied exactly as in hip-joint disease (1, 2). In fracture of the neck without impaction, as there is not seldom an absence of shortening at first, it is well to apply the splint as early as possible after the receipt of the injury ; in fact, when opportunity occurs, before the patient is moved at all. Otherwise, during transport shortening to even a great extent may any moment be caused.

In impacted fracture the shortening is accepted, but the use of this splint is found to be most gratifying, not only by removing and diminishing pain, but by greatly extending the patient's liberty.

The unassisted use of the bed-pan and other considerable voluntary changes of situation and attitude can be painlessly effected in bed, with the aid of the hands and the other leg, and the enforced recumbency thus made less wearisome. The bed should be soft for the use of both kinds of splints ; in that for the hip the patient lying chiefly upon the back, which should be uniformly supported by the bed, into which, when sufficiently soft, the splint is depressed, and prevented from bearing more than a trifling share of the recumbent weight of the body.

In the event of recent shortening in unimpacted fracture of the neck, in a vigorous patient at or under the middle age, extension straps should be well fixed to the thigh, and tied to the lower end of the splint, which then should have no shoulder bands, and which, by its observed tendency to slip downwards towards the feet, will be found to act as a sufficient drag in maintaining the length of the limb. But if that do not prove enough, the inner horn of the thigh crescent may be thickly but firmly covered with extra padding, and comfortably employed in counter-pressure on the ischium (*g*, 1). When locomotion is resumed, on the cessation of all tenderness and the occurrence of union, the injured limb is kept off the ground, and all flexion and other possible strain avoided at the now pliable neck, by the use of crutches under the arms, a wooden clog, or iron patten, under the boot of the sound leg,

and by a continuance of the splint behind the broken limb (4). The only postures permitted are the vertical and the horizontal.

In compound fracture, incision of joint or of abscess, or in case of any other wound or open inflammation, a Listerian dressing can be applied to the locality just as well with this splint as without it, the splint of course being outside the dressing.

In the event of non-union, in fracture near the head, from whatever cause occurring, the walking knee-splint, (5) or a long calliper, (6) may be employed with advantage, as a valuable aid to progression, and a useful substitute for crutches.

a. Ordinary Bed Knee Splint, for either side.

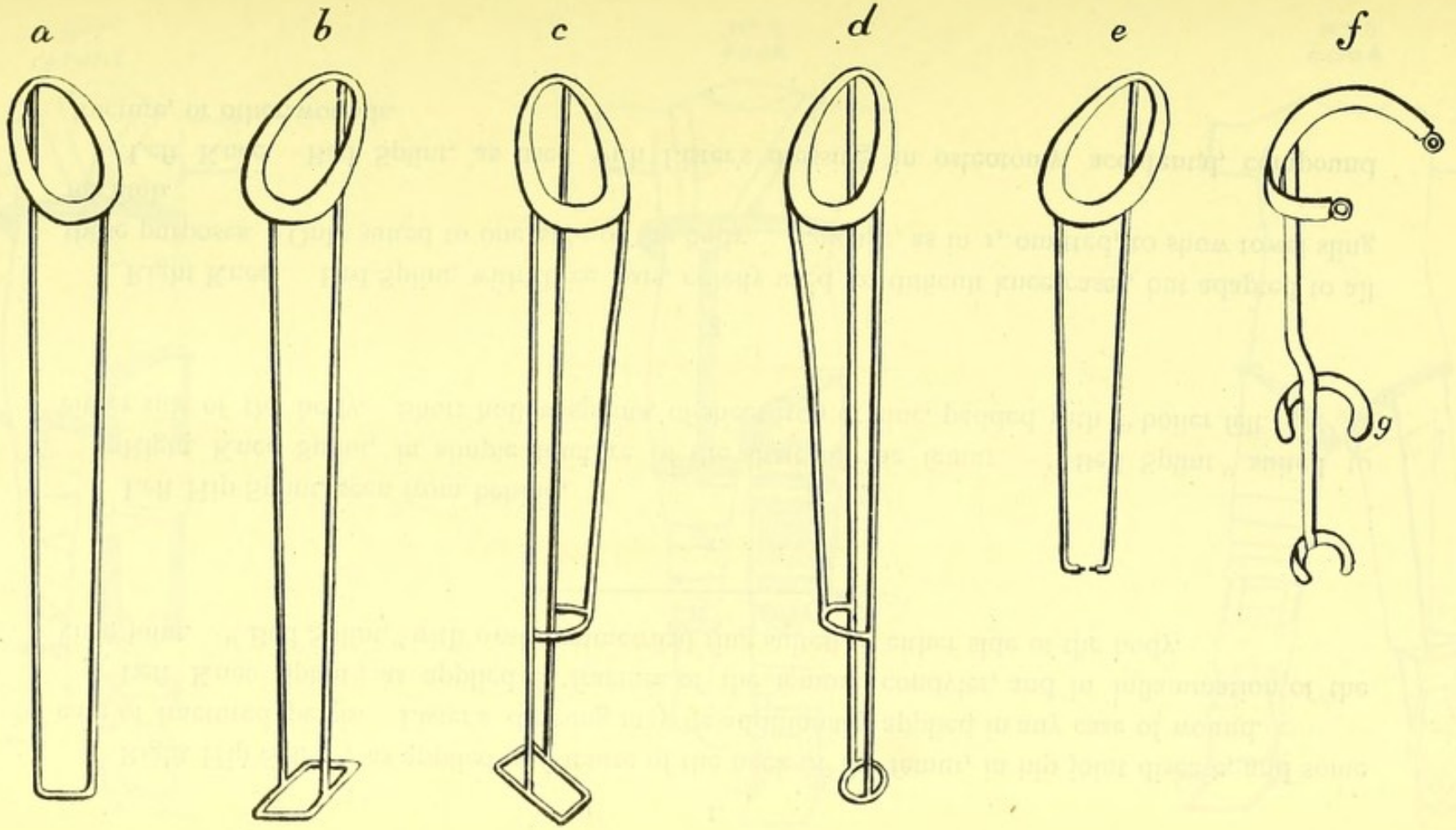
b. Ditto. with new end to raise it off the bed.

c. Bed Splint, with three bars for right side.

d. Walking Knee Splint, for left side. Three bars and terminal patten.

e. Calliper Walking Splint, to clip in boot heel.

f. Hip Splint, for right side.


a
b
c
d
e
f
g

1.

Right Hip Splint ; as applied in fracture of the neck of the femur, in hip joint disease, and some case of fractured pelvis. Lister's dressing may be additionally applied in any case of wound.

Left Knee Splint ; as applied in fracture of the femoral condyles, and in inflammation of the knee joint. "Bed Splint," with oval symmetrical ring suited to either side of the body.

2.

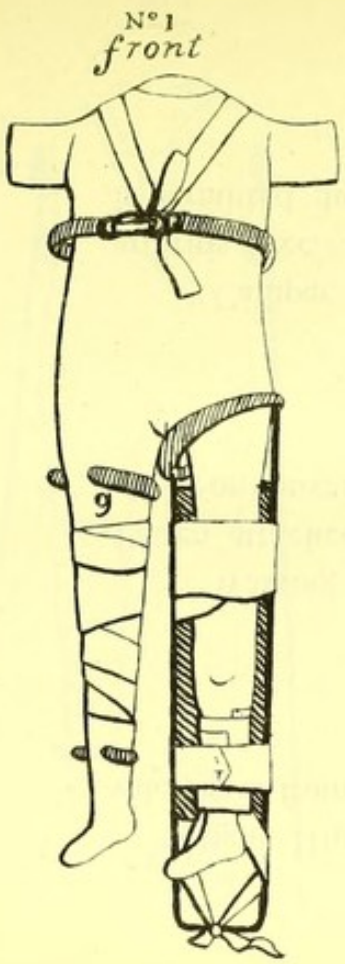
Left Hip Splint, seen from behind,

Right Knee Splint, in simple fracture of the shaft of the femur. "Bed Splint" suited to either side of the body. Short hollow splints, of sheet iron or zinc, padded with "boiler felt."

3.

Right Knee. Bed Splint, with three bars, chiefly used for difficult knee cases, but adapted to all these purposes. Only suited to one side of the body. Bandage, as in 1, omitted, to show towel sling for limb.

Left Knee. Bed Splint, as used with Lister's dressing, in osteotomy, accidental, compound fracture, or other wounds.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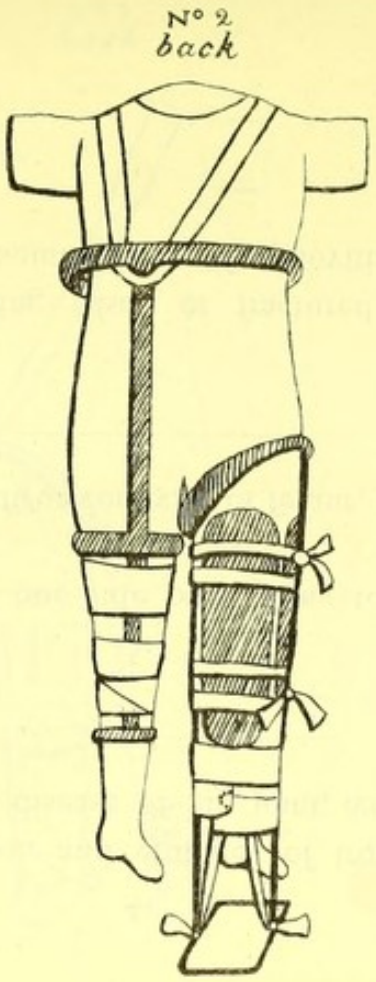
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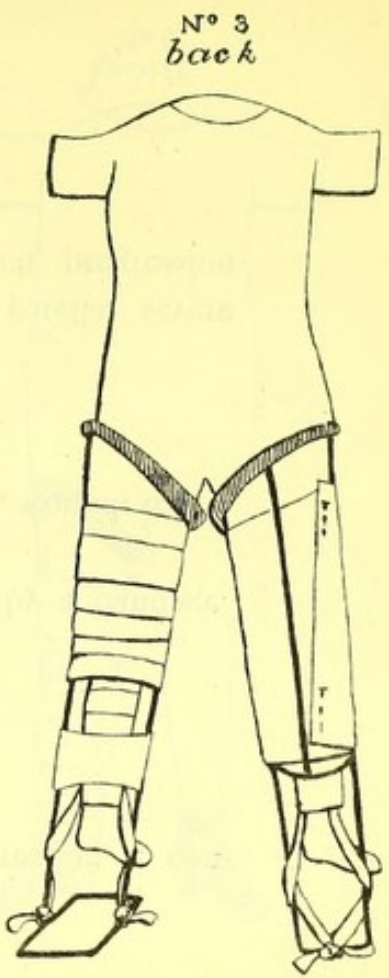
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4.

Right Hip Splint, patten to left foot, and crutches of iron gas-pipe; for progression, in convalescence from fracture of neck of femur, disease of hip joint, &c.

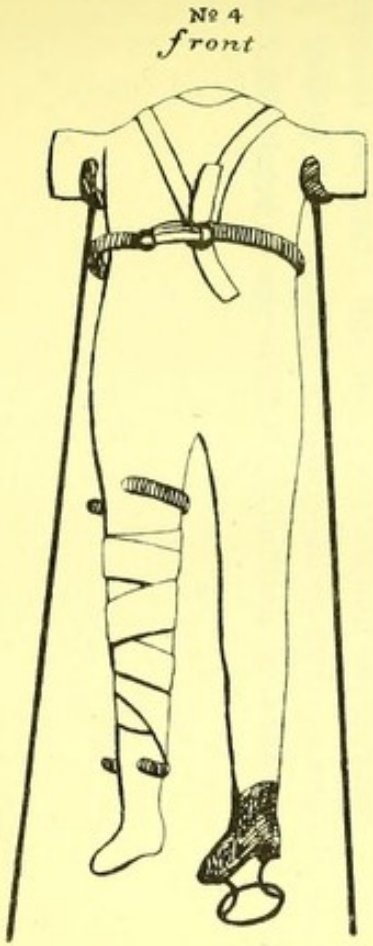
5.

"Walking Knee Splint," adapted for one side only, slung to opposite shoulder by a bandage. Patten attached to opposite foot..

For convalescence from fractured shaft or condyles of femur, disease of knee joint, wound, &c.

6.

"Calliper Knee Splint"; for finishing cases of fractured femur, fractured patella, severe arthritis, &c. For immediate use in some cases of synovitis of knee, in which progression is permitted during treatment.



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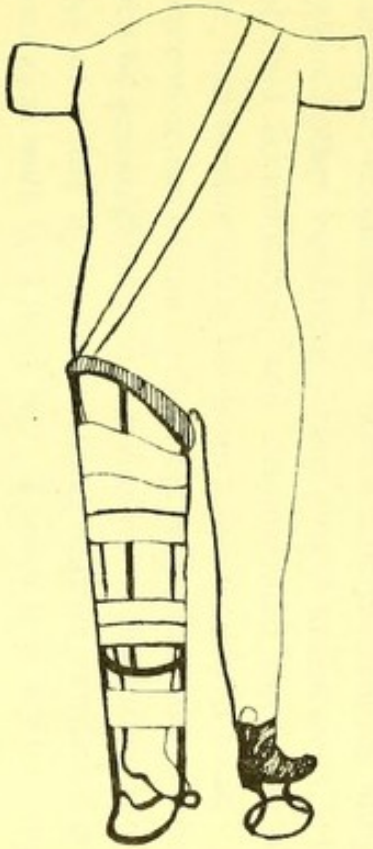

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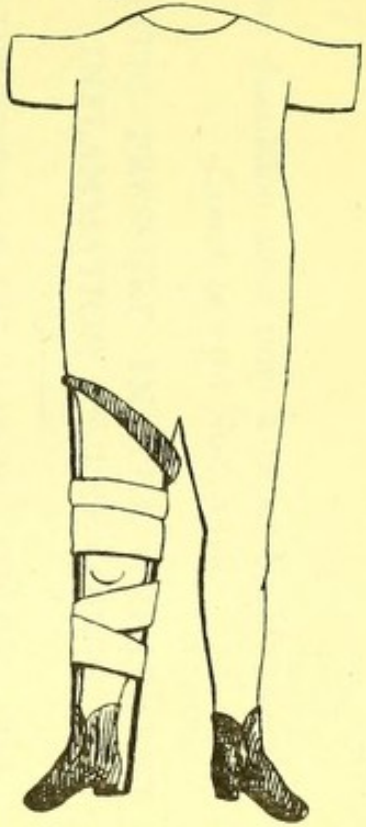

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The following discussion arose from a paper by Mr. Keetley, in the *Lancet* of 23rd Nov., 1878.

ON ELASTIC PRESSURE IN THE TREATMENT OF INFLAMMATION OF THE JOINTS.

TO THE EDITOR OF THE "LANCET," 7TH DEC., 1878.

Sir,—The remarks of Mr. C. B. Keetley, in your last issue, in advocacy of the above practice, are characterised by a *naïveté* and truthfulness of manner which assures me that my adverse criticism of the matter will be as well received by him as it is meant by me. When Mr. Lister referred in your columns ("On some Recent Improvements in Antiseptic Surgery") a few years ago to the treatment of effusions into the bursa patellæ by puncture, evacuation, and continuous drainage, under his antiseptic conditions, he showed how the removal altogether of tension alone (other conditions being almost unchanged) led to a cessation of fluid accumulation, and demonstrated most conclusively the converse, that tension alone keeps up inflammation in a sac.

My own conviction of the truth of his proposition dates from the day on which he promulgated it in the *Lancet*. I have since had many opportunities of acting upon, and of being further convinced of, this elementary surgical truth (as I think it). I teach it in my lectures, and endeavour to act up to it in my practice.

Without going into much detail as to its application in other ways, I hold that it applies no less to the case of fluid confined in a joint, and have even proved its verity when mere serum has accumulated under a scab, for a faint pink blush may be perceived in the skin at the edge of a scab as soon as fluid tension beneath that scab has become established, only to disappear on the elevation of the scab and the liberation of the fluid; this, too, even without suppuration.

I believe that pressure is misapplied to hydrops articuli, and that its use is calculated to aggravate the condition it is intended to relieve.

In the majority of instances the fluid will disappear when the joint is fixed straight and still, in acute cases. In many chronic cases this is also true; but if, in addition, the fluid be drawn off with an aspirator, in either acute or chronic cases, its disappearance may be assured. Perhaps not always by a single aspiration, but always after some. I am not now referring to cases where the joint has a lining of lymph in addition, though even here it does not always fail. It is on this principle also that Mr. Lister has practised (as others have also practised) the incision, evacuation, and drainage of simple serous synovitis.

There is uncertainty enough in what we are often pleased to call the principles of surgery to enable many to argue for or against any and every theory under the sun, and to dispose of each with a stroke of the pen; so that the view I here contend for may be less easy to prove on paper than to demonstrate in practice. However, having regard as much as possible to the realities of the case as distinguished from mere language, I believe that those surgeons will have most success with articular effusions who avoid compression. I have never yet regretted having avoided it, and can quote many instances in my favour. That cases may get well after compression is undeniable, but these occurrences are, I think, in *spite* of it. This fact alone renders the proof more difficult in writing than in personal acquaintance with its operation.—I am, Sir, yours, &c.,

RUSHTON PARKER.

Liverpool, November 26th, 1878.

TO THE EDITOR OF THE "LANCET," 1ST MARCH, 1879.

Sir,—Mr. Rushton Parker, in your journal of Dec. 7th last, attacks not merely my own particular plan of hydraulo-elastic pressure, but pressure in general, as a treatment for joint affections. He writes: "I believe that pressure is misapplied to hydrops articuli, and that its use is calculated to aggravate the condition it is intended to relieve." He adds: "That cases may get well after compression is undeniable; but these occurrences are, I think, *in spite* of it. This fact alone renders

the proof more difficult in writing than in personal acquaintance with its operation." It would be valuable to have a detailed description of that "personal acquaintaince with" the "operation" of pressure which Mr. Parker considers strong enough to justify him in condemning the belief in the virtue of pressure which is entertained by almost every British surgeon who uses Scott's dressing for chronic joint cases, or Baynton's dressing for indolent ulcers—that is to say, by almost every surgeon in the country.

There is only one *argument* in Mr. Parker's letter, and that is based on the success attending continuous antiseptic drainage. I read some time time ago in Braithwaite's Retrospect what was probably an abstract of the paper in the *Lancet* referred to. I then accepted the doctrines of that paper as fully as Mr. Parker does; but it appeared to me to justify conclusions as to the operation of pressure the very opposite to those drawn by him. Does he think that the relief of internal tension and the removal of external compression are the same thing? If so, he is guilty of the physico-physiological fallacy which lies at the bottom of almost all theoretical opposition to compression—a fallacy which I have striven to combat in a paper which will shortly be published in the forthcoming volume of St. Bartholomew's Hospital Reports, to which I would beg to direct his attention; and, so far from perfect rest and the straight position being the real curative agents, and doing their work in spite of the hydraulo-elastic pressure, I have some reason to believe that they rather retard the perfect restoration of a joint to its healthy functions. Certain it is that I have now a case of chronic synovitis with great effusion which has recovered rapidly without any kind of splint, and in spite of the patient's getting about every day and walking backwards and forwards to the hospital as an out-patient. Surely my bag and bandage policy deserves some credit here.

Finally, I beg to thank Mr. Parker for the friendly tone of his comments, and to apologise to you, Sir, for occupying so much space.

Yours, &c.,

CHAS. B. KEETLEY, F.R.C.S.

Manchester-street, W., Jan. 1879.

LANCET, 26th APRIL, 1879.

ON ELASTIC PRESSURE IN THE TREATMENT OF INFLAMMATION OF THE JOINTS.

BY

RUSHTON PARKER, M.B., B.S., F.R.C.S.,

Assistant-Surgeon and Lecturer on Surgery at the Liverpool Royal Infirmary and School of Medicine.

—o—

My reply of Dec. 7th, 1878, to Mr. Keetley's paper of Nov. 23rd, on the above subject, written with a studious brevity, was rather an assertion of my own conclusions and personal impressions than an attempt at the more lengthy process of their detailed justification. This attempt, however, I feel now compelled to make, and I have the less hesitation in doing so as I see in his paper a disposition to perpetuate views which are of a somewhat representative character, which really affect the whole subject of inflammation, and, consequently, its surgical treatment, but which I regard as no less misleading in practice than erroneous in principle. Mr. Keetley is kind enough to reciprocate the feeling of personal goodwill, which I hope there may be no occasion to disturb. A want of clearness in my last sentence, quoted in his answer of March 1st, 1879, has led him to misinterpret its meaning; but as the sentence is quite unimportant I will dismiss it, and go on to the main points.

Whether Mr. Keetley estimates correctly or not the prevalence of a faith in, or of the use of, Scott's dressing, I cannot really say, but I am less concerned with "the belief . . . . . entertained . . . . . by

almost every surgeon in the country" than with a desire to learn and to prove what are the realities of our art, as contrasted with the incoherent language and shallow inconsistencies by which it is too often defaced. I entertain no "theoretical" opposition to pressure, in the sense in which, if I rightly understand Mr. Keetley, it would be more correctly termed "hypothetical." I prefer to recognise as theory that explanation alone which is ascertained to be true. Theoretical considerations are, in this sense, the verbal expression and interpretation of facts, and difficult if at all to be kept out of an argument. Any reliance, however, on purely "hypothetical" grounds I agree with Mr. Keetley in deprecating, and am anxious to avoid. *Bonâ fide* compression I oppose, for practical reasons, derived from practical experience, tempered, I hope, with reflection, and not unmindful of the opinion of others, when veraciously given and free from obvious fallacy.

The view epitomised in my letter is based upon clinical knowledge, which has taught me that the repeated pressure inseparable from flexion in the use of a knee-joint, the subject of hydrarthrosis, is a frequent, and often the only, obstacle to speedy recovery. I availed myself of Mr. Lister's exposition of the perpetuation of patellar bursitis under tension, and the relief of it by antiseptic evacuation and drainage, as a collateral argument against the perpetuation or increase of this fluid tension in a joint. It must be admitted that concentric compression from without increases the fluid tension within a sac containing fluid. Whether or not the absorption of that fluid be thereby promoted is another matter. If the indiscriminate use of such compression were followed, either invariably or even generally, by the disappearance of the fluid, a much stronger argument in its favour would be established on this ground alone, quite apart from any other explanation, such as the arrest of flexion, and the consequent removal of a form of repeated pressure and friction. Even admitting, for the sake of argument, such an invariable sequence, in the hands of one surgeon, or of more, we have to explain the recoveries without it in the hands of others.

Synovitis of the knee often gets well after the application of poultices, fomentations, iodine painting, various solutions on rags,

without any mechanical appliance, and even when totally untended and unprotected from use. Who is to tell beforehand what case is capable of spontaneous recovery? What we want to know is the treatment under which no case shall get worse, or for mere want of which any case may fail to get well, and the unalterable laws governing the use of treatment which may admit of variations in detail while attaining its invariable purpose.

I will now proceed to the further consideration of synovitis of the knee, patellar bursitis, and also boil, abscess, or other inflammation, cutaneous or subcutaneous, in the same anatomical neighbourhood, having found that similar treatment is, in principle and often in detail, appropriate to all, and that each condition in its own way gives evidence of the part played by rest in the process of inflammatory resolution. Any one of these affections can be treated, as a rule, without laying the patient up, and is, if painful, immediately relieved as soon as the knee is fixed in the straight position by a back splint, or by abundance of plasters enveloping the joint and continued a moderate distance above and below, or by a combination of both. A continuance of this treatment, not tightly applied, but so as to prevent or greatly to limit flexion, is not only comfortably borne by patients going about, but is generally followed by complete resolution. I cannot attribute its good effect to any compression of the plaster; witness cases where the actual joint was uncovered from first to last, a practice which I invariably adopted formerly. In each case there is an inflammatory condition which with each flexion of the knee-joint is either compressed (as in the case of synovitis, bursitis, or abscess), or pulled upon (as in boil, wound, &c). The mere cessation of this movement not only allows the patient to get about painlessly within certain limits, but, by ceasing to aggravate, permits the resolution of, the inflammation. The abscess may, of course, require incision or aspiration, and the same is true of the serous fluids; in fact, much time is often saved in synovitis, and always in bursitis, by aspirating at once *after fixing the joint;* while in some cases it is indispensable. But I am quite prepared to admit that some of my cases could possibly have got well without my

interference; so with anybody else, Mr. Keetley included, as, for example, most probably in the case referred to at the end of his letter on March 1st. The obvious existence of such cases is one source of the prevailing fallacies which attribute recovery to some one or more useless, but harmless, devices, that hopelessly fail in cases of more importance, such as the obstinately chronic or painfully acute. The essentials of treatment I have learnt from the important cases, which respond with great precision to its proper employment. The same means, though less imperative, are always advantageous, even in minor instances. These minor instances, however, are those which sometimes emerge little or none the worse, or, at any rate, eventually get well, after the application of other modes of treatment which I most unhesitatingly condemn from abundant knowledge of their ruinous effects upon severe cases, and the undoubted delay thay make in the recovery of the mild. Such are blistering, firing, so-called passive motion, and, equally, the too early recommendation of voluntary motion, each of which is an importation of fresh injury into parts which one would think deserved a gentler handling, by reason of their already known infirmity. Into this injurious category the hydraulic compression of Mr. Keetley must often enter, can, in fact, only accidentally fail to enter, by the very thoroughness with which it effects compression, and so inflicts upon the joint an injury which it may, indeed, fortuitously survive, but to which it should in reason never be subjected. The very pain produced is faithfully recorded by that gentleman, in the only two cases which he reports, and is such as I should deem evidence rather of injury, however temporary, than of relief. As he truly supposes, such pain would not have occurred under a sufficiently slack application of his bag and bandage, for which he will, I trust, forgive me for recommending a "bag and baggage" policy.

To return to the treatment I am defending. We have here a relief of inflammatory tension, obtained in two different ways: first, by the arrest of movement and of the repeated slight compression, friction, or tension which that act inflicts; secondly, by the withdrawal of the fluid when it exists. Either may succeed alone, but either may singly prove

insufficient; whereas both combined are certain. For example, a woman applied to me with a small effusion in both patellar bursæ. Each was aspirated three or four times at suitable intervals of a few days, the joints being unconfined. Re-accumulation, however, occurred as often. Then one bursa was aspirated, and the joint restrained with plaster, the other limb being used as before, and remaining *in statu quo.* No further accumulation resulted, the single aspiration sufficed, and the joint was set at liberty after a week or two. The same was then repeated with the other knee, with the same result. I have subcutaneously ruptured the swollen bursa patellæ, and applied a back splint; also punctured, drained, and dressed in Mr. Lister's fashion, other bursal cases, and applied a back splint with the same perfect effect, and treated synovitis of the knee with back splint or plasters, or both, aspirating once or oftener, or not at all, in all cases allowing the patient to walk, without a single failure or mishap, often enough to be quite certain of what I am saying.

It may be true enough that joints plastered in Scott's fashion succeed in getting well, or even derive actual benefit from the plan. The *hoc* is there, and I will admit the *post*, but I draw the line at *propter*. The apparatus is a splint, imperfect at the best, but which may suffice, particularly if, as it must often have been, not too tightly applied. While intended to compress, it really rests, by immobilising, the joint, and so does good in a proportion inverse to the attainment of its immediate object, in consequence of its accidental attainment of another. In mild and unimportant cases be it remembered, for in advanced general arthritis, it may be disastrous or, at best, futile.

The strapping of ulcerated legs is undoubtedly of value, whether in the mode practised by Baynton, or in its extended modification, and possible improvement, by John Scott. Is it because of compression, either of the ulcer or of the leg in general, when œdematous or congested? If so, an indolent and already ill-nourished sore is rendered still further anæmic, and an apparent contradiction afforded of the well-kown fact that healing proceeds more rapidly where the blood and other juices are increased, as in paraplegic bedsores, and other cases of accident or

experiment illustrating vaso-motor paralysis. But the ulcer improves nevertheless, even in legs not œdematous or congested by varicose veins. Is it not rather by the support and fixation of the surrounding healthy skin, and the consequent immunity of the ulcer from incessant stretching and sliding, that the benefit results? So with carbuncle, so with boil, so with sprains. The pressure applied with plasters inflicts a momentary, perhaps a more permanent, pang or even injury, but the seat of disease and the surrounding healthy skin are stiffened, and move only *en masse*, thus neutralising the constant pain due to the slightest local movements. I do not therefore join in the indiscriminate welcome which some accord to Martin's elastic bandage, which is a sensational revival, in a deteriorated form, of a known and well-approved device that has never yet died out, and consequently not stood in need of re-discovery.

So much for the mechanical item; now for the local applications. Any and every form of joint disease can be got well (if got well at all) without them, as I have abundantly satisfied myself, and can assure others. They are of two kinds: the positively injurious and the harmless, The former have been already alluded to, and include every form of effective irritation. The latter are a host, from which I would by no means exclude the pharmaceutical ingredients of Scott's dressing, their filthy character notwithstanding. One cannot legitimately attach any more therapeutic importance to the use of mercuralised, iodised, or improvised applications, *of a non-irritating character*, to inflamed knees, than to any supposed local action of the sticky material in the various plasters, or even of the paper, wood, or iron in the splint. But allowances must, of course, be made for a certain amount of credulity, even among ourselves, to the perfectly free exercise of which I prefer to extend the utmost indulgence, particularly in the use of materials which are, at the worst, but harmless incantations, and which are often not without their psychological uses as *placebos*.

(Reprinted from the Medical Times and Gazette of 1st Dec., 1877.)

EXCISION OF HALF THE TONGUE, PART OF EACH JAW, SUBMAXILLARY GLANDS, AND SIDE OF PHARYNX, FOR EPITHELIOMA, WITH SUCCESSFUL RESULT.

James Gunn, aged sixty-one, a dock porter, under the middle height, and with a healthy history, family and personal, applied at the Stanley Hospital, Liverpool, early in May 1876, on account of an excavated ulcerated swelling affecting the left side of the tongue rather to the under side, for a length of about an inch and a half, and extending continuously to the molar gums of the lower and upper jaws adjacent, and involving a small piece of the inner side of the intervening cheek. The glands under the angle of the jaw felt enlarged and hardened; the centre of the main sore was excavated to a depth of about half an inch, and its edges were hard, elevated, and tender. The patient had had it for two years, to the best of his knowledge, and, althongh a very wiry man, was now much debilitated by pain, and inability to eat with sufficient ease. The growth was judged at the time, and has been subsequently proved, to be epithelioma, and the circumstances were considered to justify an operation, if complete extirpation were feasible. Accordingly, this having, after a little consideration, been proposed to him, he readily consented, and gave absolute *carte blanche* as regards extent.

On May 19, under ether followed by chloroform, the left cheek was incised from the angle of the mouth to the sub-maxillary region. The facial and lingual arteries and veins were sought and tied; the lower jaw was sawn through at the canine tooth, and immediately above the angle; the upper jaw was clipped with forceps at the posterior and lower corner; the tongue was drawn out, and transfixed with a sharp-pointed curved bistoury from the middle line at the hyoid bone to the base of the epiglottis, and then slit to the tip; part of the soft palate and side of the pharynx were then separated with the rest. A

vessel or two remained to be tied, catgut ligatures being used in every instance, and the wound was closed with a pin and sutures. The operation is easily told, but it took nearly two hours to do, the patient being with the utmost difficulty influenced at all by the anæsthetic, and much time being lost in sponging out the pharynx, and giving him breathing opportunity; however, he bore it with great courage, and made a good recovery; but a large piece of skin sloughed from the cheek, and left a pharyngeal fistula, no doubt because, in the operation, about two inches of the facial artery had been sacrificed in removing the submaxillary salivary and lymphatic glands. The latter were found scarcely enlarged, while the former was very indurated.

After five months, the hole in the neck being about the size of a hazel-nut, and having assumed its ultimate shape by cicatrisation, was closed by a plastic operation on October 20. But the tip of the flap, which was taken from the neck below, and slid up along its long axis, did not hold, and the fistula became as bad as ever. Six months later (Arpil 6, 1877) another attempt was made, but this likewise failed.

He manages very well by keeping a lump of cotton wool on the hole, and tying a band over it round his head and chin.

He was seen early in November, 1877, eighteen months after the operation, strong and well, continuing his work as a dock porter, which he resumed four months after the original operation, and only discontinued again in order to submit to the plastic attempts.

Examination of the Specimen.—The extent of the disease was found to be even rather more wide than was expected, and the duct of the submaxillary salivary gland passed immediately under the base of the ulcerated growth.

The microscopical details are somewhat unusual. The extent to which the epithelial masses can be seen penetrating between the bundles of fibrous tissue, and the total absence of small round-cell infiltration, where the epithelial elements are most abundant, give the tissue an aspect which is astonishingly like alveolar sarcoma. Yet everywhere the large characteristic cells of the buccal epithelium—arranged in globes at the centre of each cylinder, yet nowhere forming the horny globes so

usually present in cutaneous and buccal epithelioma,—and the unmistakable even front presented by the "lines" of the rete Malpighii, make the true nature of the disease plain enough. The round-cell infiltration is, in the adjacent muscular tissue, quite in the usual small-celled style ; and where the epithelial ingrowth is more scattered, it is perfectly visible and somewhat larger-celled. The bundles of the fibrous tissue are split up, and the individual fibres widely and often almost singly separated, and singularly invaded by the epithelial columns at the surface where all trace of papillæ or other sign of mucous membrane is wanting. The indurated salivary gland shows an abundant round-cell infiltration between the gland-tubes and acini, constituting an interstitial adenitis. The sections of slightly enlarged lymphatic gland did not show any secondary infective growth.

Condition.—Though he has lost such a considerable part of the lower jaw, this defect is, as usual, hardly perceptible. The remaining half of the tongue is pulled over to the left, and its outer side serves as a front and tip. It is mobile to a useful extent. The pterygoid plate shows on the left side, tightly covered with cicatricial mucous membrane ; and close to it, firmly attached by cheek and cicatrix, is the sawn end of the body of the lower jaw; while between the two is the pharyngeal fistula, about the size of a small hazel-nut. There is not much room in his mouth, it is true, for the fingers of a surgeon ; but there is room enough for his own food and its efficient mastication. He has had continuous good health and strength, which latter, however, is tested to the utmost by his poverty and the rough nature of his work.

June, 1882.—He has been continually under observation ever since, on account of hairs growing into the mouth and pharynx through the cicatrix in the cheek, and on the margins of the fistula, which he has plucked out from time to time. He did not continue hard work for long, but obtained employment as a night watchman on ships in dock. Up to the early part of this year he continued well. There has gradually appeared, however, a hard rounded lobulated swelling under the right sterno-mastoid, involving the floor of the anterior triangle and its component tissues. The mass is evidently a malignant growth,

the anterior lobe of which has already commenced to soften. Whether it be a primary growth in the fascia, associated with the site of a branchial cleft, or it be a secondary infection of lymph glands, it is equally unusual and peculiar, as in the latter event the side of the neck opposite to that originally affected is the seat of disease. There is no trace of disease in the mouth or pharynx, or in any part of the left side of the neck, originally operated upon.*

EXCISION OF HALF THE TONGUE, HALF THE SOFT PALATE, SIDE OF PHARYNX, SUBMAXILLARY GLANDS, AND PART OF LOWER JAW, FOR EPITHELIOMA—RECURRENCE.

Wm. O., aged fifty-four, a full-bodied, strong-looking man, over the middle height, giving a family history and personal antecedents of a perfectly healthy character, came under notice May 26, 1877. He had, until lately, had a good digestion and lived freely, eating heartily and drinking plenty of alcohol, but not getting intoxicated. His face was spotty, having bright red pimples on the forehead and cheeks; the tongue was furred, and the breath very foul. On the left soft palate was a sloughy and excavated mass, covered with granulations at the edges, which were prominent, extending from the left of the uvula to the pillars of the fauces. Under the angle of the jaw was a globular induration the size of a small walnut. The dorsum of the tongue was unaffected, and some difficulty was experienced in ascertaining the whole extent of the disease, on account of stiff closure of the jaws. But a later examination showed that the under side of the tongue and the molar gum of the lower jaw were included in the affection, which was evidently epithelioma. He was recommended to give up the use of alcohol, and to take his food (liquids only could be used) at regular meal-times exclusively; also to take a tumbler of water containing a little Epsom salts each morning on rising.

By June 6 the tongue was clean and moist, the fetor of breath

* See remarks at end of next case.

was all but gone, the face was less spotty and flushed, and the complexion clearer. The epithelioma was perfectly clean, and its granulations slightly less prominent, while the submaxillary swelling was less turgid, but harder and smaller. The only inconvenience he felt was difficulty and pain in swallowing, and constant pain about the left ear. The case was not considered a favourable one for operation; and all that was hoped for was a mitigation of the inconveniences of the disease by a judicious system of diet and, if necessary, other palliative measures After careful consideration, in fact, the operation was declined by Mr. Parker; but the patient begged, as a favour, that anything that was possible might be undertaken, saying that his prospects could not be worse than if he were left alone. So on June 8, under ether followed by chloroform, the left cheek was incised from the corner of the mouth to the back of the hyoid bone, in front of the facial artery; the lingual artery and vein were tied under the hyoglossus muscle, with the aid of an aneurism needle and catgut; the lower jaw was sawn through about the first molar tooth, and clipped across with forceps above the angle, after stripping the masseter and internal pterygoid muscles; the tongue was then drawn out and slit from base to apex, by medium puncture from below to the upper surface at the epiglottis, with a sharp-pointed curved bistoury; then with a probe-pointed bistoury the soft palate was cut vertically to the right of the uvula, and separated from the posterior edge of the hard palate. The whole specimen, consisting of half the tongue, palate, submaxillary glands, etc., was then grasped, and swept off at its pedicle, close to the great vessels of the neck. Sponges were in readiness to instantly control the bleeding which was expected from this final measure. The facial artery was found cut about an inch from the carotid, and tied. A pin and a number of wire sutures were put in to close the wound.

It was hoped that the operation might have been more quickly performed, but the time occupied was at least an hour and a half. The anæsthetic was admirably managed, and the operation unfelt by the patient,' except for a few minutes at the finish. For a few days he had a good deal of smarting, but he made a good and rapid recovery, as far

as minor matters are concerned. Food was almost withheld for the first few days, a little warm water containing boiled sago being given. A month after the operation there was a glandular enlargement under the sterno-mastoid, and in the pharynx a rosy crop of granulations, quite soft, but which looked ominous.

On July 13 the lump was exposed, and in doing so at least half the thickness of the sterno-mastoid was broken through. On almost completely isolating the growth, it was found to enclose the carotid artery, the jugular vein, and pneumogastric nerve. It was not considered proper to sacrifice the last structure, although the vesseis might have been readily extirpated with the epitheliomatous mass of glands, so the latter were burst, and scooped out with the finger-nails and other instruments, and the wound left to heal. A day or two before this second operation his diet was changed with obvious benefit. He had had beef-tea and milk given him by the attendants, and it was noticed that his tongue was persistently furred white; moreover, he spat pints of saliva in the day. He was now ordered three meals daily, to consist of any one, or even two, of the following articles:—Bread, pea-flour, sago, and oatmeal, prepared with hot water or tea; milk was interdicted. In a day or two the tongue cleaned, and salivation ceased. The wound of the first operation healed at once, and was firm in ten days, exept a minute hole where the tip of the jaw necrosed, and which closed after the separation of the minute exfoliation. The second wound became the seat of slough, deep down about the fasciæ and vessels. Much fetor was set up by decomposition here, but was completely corrected by filling the wound with magnesia powder. The sloughs then separated amid antiseptic suppuration, which gradually subsided. After all decomposition had ceased, he had a severe attack of erysipelas of the neck and head. His bed had been in a draught, so he was put in another, and the only treatment adopted was the administration of a little morphia, and the limitation of his diet to bread and sago, while the erysipelatous skin was coated with thick boiled starch. Within five days he was desquamating, and walking about as if nothing had happened. But the patch in the pharynx was increasing, and the deep parts of the neck, although

the wound was closing, were enlarging again.

He was discharged on August 15 exceedingly well in health, perfectly satisfied with his daily diet of a little bread-and-butter and tea, and pea-flour mixed with boiling water and butter. There was no emaciation, and he was perfectly free from hunger. Since that time recurrence advanced still farther beyond the reach of operative remedy, and he was admitted into Mill Road Hospital, where he died in September or October, 1877.

Remarks.—It is plain that no operation less extensive than the one performed would have been of any use in either case. When the gum is affected, the whole width of the mandibular arch need not always be severed; but when the tongue and reflected mucous membrane are also concerned, the greater sacrifice of bone is of little or no account to the patient (in view of the issues at stake), while it immensely facilitates an operation which is at best not one of the easiest, by permitting the free exposure of the parts involved, and leaving a perfectly accessible wound. The fact that each lingual artery is confined to its own side of the tongue allows the vertical median division of that organ to be bloodlessly effected, while the preliminary ligature of the vessel renders the removal of the corresponding half of the tongue equally bloodless. The submaxillary salivary gland (with or without the sublingual) is better removed, in order to effect a clean sweep; while the lymphatic glands and the whole track of lymph-vessels leading to them from the diseased part were specially included (themselves healthy or diseased) among the tissues whose removal was most thoroughly desired and anxiously attempted. The perfect success of the first case, and the strictly limited area to which recurrence was at first confined in the second, suggest the probability that, in spite of all precautions, the operation in the latter instance may have fallen a little short, in extent, of what ought to have been done. If that could really be proved to be true, no better justification of the precedure could be found. The singularly spare diet (as it would seem) which sufficed, in the same case, to fully satisfy and to maintain in good condition a big, strong man, is regarded as a feature of much clinical importance, not only as having afforded an

easy means of nourishing an individual who could not masticate at all, and only with difficulty swallow, but as being one out of many instances where the condition of a "sore place" can be improved and kept apparently within bounds by the dietetic amelioration of the "constitutional state."

From the British Medical Journal, December 17th, 1881.

SIMPLE FRACTURE OF PATELLA, UNITED BY BONE.

William H., aged 23, a bargeman on a canal, was kicked on the right knee; fell, and, on rising, fell again heavily. He was admitted some hours later, on July 16th, 1879, having a transverse fracture of the patella, with about three-quarters of an inch separation between the fragments, and œdema of the neighbouring subcutaneous structures, but no articular effusion. The limb was fixed horizontally in a Thomas's knee-splint, being suspended between the bars on a posterior hollow splint of sheet-iron, padded with boiler-felt. A ring of three-quarters of an inch rope, about six inches in diameter, thickly wound with cotton wrung nearly dry out of water, was placed, closely-fitting round the patella, on the front and sides of the joint, and pressed backwards with strips of bandage in such a way as to hold the fragments closely together. To prevent their tilting, some more cotton was then stuffed in front, so as to fill the ring, and confined with a bandage, firmly and comfortably without being tight.

This treatment was continued for a month, with occasional adjustments, the patient sitting or lying in bed as he pleased, and having experienced distinct relief at the first application. On August 14th. Thomas's calliper knee-splint was put on, and the patient allowed to get up and walk about; in fact, he was made an out-patient at once, and returned to Cheshire, being advised to wear the splint six months

or more, and, under those conditions, to do some of his work. He visited the hospital on November 17th. Union was good and close, but not bony—a result not thought of then. He had discontinued the splint shortly before, and was at work on his barge; but, though not following out his injunction to persevere with the splint, which he found irksome, he wore a bandage, and took some pains to avoid more than a slight bending of the joint. He did not come again till March 15th, 1881, when bony union of a very firm kind was obvious to anyone, and complete mobility and perfect strength of the joint. He is a very powerful and healthy man, of middle height, and thick-set.

The above method of putting up a recently fractured patella is simple, accurate, and very satisfactory when no effusion is present. In the latter event, any forcible attempt to approximate the fragments is better omitted until the effusion is gone, or has been withdrawn by aspiration. The effusion may in some cases have coagulated, in which case aspiration fails. Under any circumstances, effusion generally disappears rapidly, and the fragments fall together so satisfactorily that forcible approximation is hardly necessary. The great item should be the avoidance of flexion in the after-treatment until the union has long been inextensible—if possible, for six or twelve months; after which, fibrous union is practically as good as that by bone; while the occurrence of bony union itself is probably even facilitated.

[Reprinted for the Author from the BRITISH MEDICAL JOURNAL, June 17th, 1882.]

ABSTRACT OF AN ADDRESS

ON THE

MATERIALS OF BLOOD-POISONING:

IS MALIGNANT DISEASE PARASITIC?*

Delivered at a Meeting of the Lancashire and Cheshire Branch at Blackpool,

BY RUSHTON PARKER, B.S., F.R.C.S.,
Professor of Surgery in Liverpool.

I HAVE to show you micrococci from acute abscess, gonorrhœa, and pyæmia, and bacilli from a wound in a case of septicæmia. They are prepared by Koch's method of aniline-staining, and rendered distinct under microscopes bearing high powers, illuminated, in two instances, by Abbé's condenser; and are additionally represented in the diagrams which hang before you.

The germ-theory of disease is so far a reality, that spirillum is the demonstrated organic cause of relapsing fever, bacillus anthracis that of splenic fever; while the local and constitutional changes in septicæmia, pyæmia, and acute suppuration, are equally proved to be due to the presence, propagation, and influence of bacilli and micrococci of various sizes and differing degrees of irritative or toxic virulence.

In reviewing the germ-theory of infective disease in general, and of traumatic infection in particular, it may be convenient to allude to two distinctive types severally represented by septicæmia and pyæmia. Many of the infective diseases having been proved, most of them are provisionally supposed, to be due to organisms imported in some way from without. The organisms present in decomposing animal fluids are both numerous and various, yet they are, fortunately, "pathogenic" only in an extremely small minority. Some of them are always present in decomposing, and under certain conditions in suppurating, wounds; while, even in health, the cutaneous and mucous surfaces may be peopled with organisms of several distinct kinds. Under the type represented by septicæmia may be classed anthrax (and possibly also measles, typhus, and their associates), where the blood is simply polluted with an organism or with its products. Septicæmia proper seems to be of two kinds: (1) septic intoxication or toxæmia due to sepsin evolved by the septic bacteria (themselves confined to a putrid part of the patient or victim); and (2) septic infection or toxæmia in which the septic bacteria themselves enter the blood. In the septicæmia of mice, bacilli are the form of organisms concerned, and found in the blood, or in the infected wound, or in both. But they are often not to be found in casual specimens of the blood, owing to their more numerous accumulation in the capillary vessels rather than in the main blood-stream.

* This Report was kindly prepared by Dr. Barr, from the extempore address; and has been revised, with slight verbal alterations and additions, by the author.

In pyæmia, as investigated in rabbits, the organisms concerned are micrococci. There have been changes of opinion as to the appropriateness of the word pyæmia, as a descriptive term, especially in the old sense implying a suppuration of the blood, seeing that the introduction of pus into the blood had chiefly a negative value in the attempted experimental production of pyæmia. But, since Mr. Lister showed, in his observation of the breaking down of the infected blood-clot in a donkey's vein, that a genuine suppuration of the blood can indeed take place, the rational value of this necessary traditional expression is once more established. Pyæmia is characterised by a clotting of the blood, and the distributed infection of an organic ferment. The micrococci crowd together, increase the adhesiveness of the corpuscles, and promote the clotting of the blood, even in capillary vessels. The thrombi, whether large or small, are foci for the further development of the micrococci; and hence all the secondary phenomena, which, like the primary, may be suppurative or not.

In septicæmia, the bacilli kill by poisoning the blood, without giving rise to secondary inflammations or primary local manifestations; whereas in pyæmia, the micrococci cause clotting of the blood, and set up embolic pneumonia, nephritic infarcts, and perhaps also suppuration of the joints. The micrococci do not seem to be in themselves always so extremely poisonous; but, by giving rise to suppurative or other organic changes, indirectly lead to death by perversion of visceral functions.

What is the immediate cause of death in perforation of the bowel? The general answer is, "Collapse", which is indeed true enough when collapse actually takes place. But how are we to explain the cases where neither collapse nor death occurs? Perforation or rupture of intestine, with diffusion of contents throughout the peritoneum, is followed by peritoneal absorption, and the collapse is septicæmic; but a similar occurrence into the tissues, and not into the peritoneum (or only gradually and slowly into that serous sac), is a sure cause of acute (because putrid) abscess, but is often followed by recovery. A similar explanation attends the fatality of intestinal gangrene—as a complication, for instance, of strangulated hernia. It is a modern canon of surgical pathology that, in gangrene of any superficial part, putrefaction will occur unless circumstances specially prevent it. Dry gangrene may spontaneously fail to putrefy, except at the moist line of demarcation; but moist gangrene will infallibly putrefy, unless the timely disinfection of the superficial surface be artificially undertaken. But, if this be successfully done, the disease may be arrested, its spread prevented, and its disappearance accomplished, without loss of substance.

In the case of the intestine, no such prevention can be practised, so putrefaction inevitably attends the establishment of gangrene, demanding the prompt and free excision of this (as of any equally advanced) gangrenous organ.

A case of hernia, three days strangulated, recently came under my care at the Liverpool Royal Infirmary. At the necessary herniotomy, I removed twelve inches of bowel, with some omentum, and the patient for a time did perfectly well, in fact nearly recovered, but eventually died collapsed. After the *post mortem* examination, it was found that fresh patches of gangrene had appeared in other parts of the intestine, and thus the temporary relief and the ultimate death were both explained. Cases have been already reported in which this operation has been perfectly successful.

Although bacilli are the characteristic organic poison in the septicæmia of mice, and micrococci in the pyæmia of rabbits, it is to be noted

that Koch found rabbits liable to a true septicæmia produced by micrococci differing in shape, size, and distribution from those producing pyæmia in the same animal.

Tubercle is an infective disease, now known to be due to an organism which gives rise to the characteristic manifestations. These are both anatomically and physiologically allied to pyæmia. Opinions have, in the past, been apparently divergent as to the supposed real nature of tubercle; for instance, one school of able observers held that it was a purely inflammatory process, while another equally able, and its allies, have always regarded it as a specific disease due to an infective virus. No doubt the histological phenomena of tubercle are consistently explained as inflammatory, and so are those of pyæmia. But what causes the inflammatory changes? The very specific virus once thought to be an explanation antagonistic to the former, but now woven inseparably into it in the form of the tubercular bacillus so admirably discovered by Dr. Robert Koch.

Syphilis again presents many features analogous to those of pyæmia, and some have even alleged that they have seen a special syphilitic germ. But though this is not yet sufficiently proved, it is probable that such a germ exists. As for gonorrhœal rheumatism, its clinical features have long been interpreted as those of an aseptic pyæmia, which, fortunately for the patients, lacks the anatomical proofs that might be afforded if it terminated fatally; while ulcerative embolic endocarditis is a true aseptic pyæmia on the best anatomical evidence.

There is another infective disease which I venture to compare with pyæmia, and that is malignant disease, more especially its so-called carcinomatous varieties. Like tubercle, the inflammatory character of which is admitted on all hands, so far as the histological changes are concerned, the cutaneous, mucous, and glandular cancers have very close affinities to inflammation. The primary growths are essentially a plastic catarrh; and the round-celled infiltration, by which they are additionally indurated, shares, with the similar indurations of undisputed inflammation, a histological identity. Simple inflammations, however, are resolvable, their infiltrated products disappearing on the subsidence of the irritant cause, be it chemical or mechanical; whereas the cancerous induration is unresolvable, be it a malignant stomatitis, glossitis, enteritis, or dermatitis, as in epitheliomas, or be it a malignant adenitis, as in mammary or other glandular cancers. Round-celled sarcoma, again, is a true infiltration of the plainest possible kind, whether it constitute a malignant cellulitis, periostitis, or ostitis, or even an interstitial orchitis or any other adenitis; and differs only from undisputed inflammation of regions and organs in its "unresolvability". But the very unresolvability of carcinomatous tumours, whether primary indurations, lymphatic infections, or disseminated visceral growths, has a distinct parallel in the similar unresolvability of pyæmic, tubercular, and neglected syphilitic phenomena.

The cachexia of acute cancer, and of acute sarcoma, when now and then it kills as a poison, without prominent local symptoms, is not unlike that of pyæmia, of tuberculosis, and even of syphilis; the lymphatic glandular infection, and all its attendant and consequent phenomena, is conspicuously similar to various forms of infective inflammation; while the malignant thrombi that form in veins, in cases of carcinoma and sarcoma alike, with the still more frequent embolic disseminations of these truly infective appearances, have a resemblance to the thrombosis and embolism of pyæmia too obvious to need defence.

More than six years ago, I was led to the assumption that malignant disease had inflammation for its anatomical type, by the histological examination and comparison of inflammation, tubercle, and cancer; and I have taught it, during the greater part of that period, as an idea justified on anatomical grounds, though not entitled to acceptance as a truth. As a mere hypothesis, I venture to suggest it here, with the intimation that many things will surprise me more than the discovery of a parasitic germ originating malignant growths.

The bacillus of tubercle, though discovered, separately cultivated, and successfully inoculated by Koch, is still most difficult to find, and then chiefly in the freshest growths. The microphytes of disease, how terrible soever be their vigour, or the initial reality of their presence, are sometimes exhausted, and even effaced, in the transformations of tissue which they themselves educe—exhausted, as noticed in tubercle by Koch; effaced, as observed by Lister in the ass's jugular. The parallel, once established, recurs even in prevention, in treatment, and in cure. Against pyæmia, the only certain safeguard lies in preventing the primary infection; in tubercle, we already extirpate the earliest manifestations when we can get at them; while, in cancer, timely excision does sometimes amount to effectual eradication. The purpose is, in all, to avoid the dreaded physiological "infection".

From the British Medical Journal, December 17th, 1881.

UNUNITED WIDE SEPARATION BETWEEN PATELLA AND ITS TENDON: INCISION AND SUTURE ANTISEPTICALLY: CURE.

John R., aged 12, a healthly schoolboy, applied, in December 1879, on account of an injury to his right knee, received a fortnight or three weeks previously. He had not been laid up, nor had he had any restraining apparatus. When erect, this limb fell straight, and could be used for progression; but he could not stand upon that leg alone, nor in any way employ the extensor muscles of the knee, so that the least force from behind knocked him off this leg. In flexion, the whole patella was drawn up, or rather remained constantly, at and above the trochlear surface of the femur, so that a gap of three inches could be instantly made; in the erect posture it fell a little, and could be drawn completely down. There was no pain, swelling, tenderness, or other abnormal sign about the knee. The operation of incision and suture was done on January 6th, 1880, under ether, and with all the precautions of Mr. Lister's carbolic acid method. A transverse incision was made, and the joint entered in its femoro-patellar division, above the mucous ligament; the patella was bored along its length obliquely from below, upwards and forwards, with a cabinet-maker's small twisted gimlet, which was made to issue through the skin, and then withdrawn along with a piece of copper bell-wire (about three-sixty-fourths of an inch thick), held in the twisted groove of the gimlet. Two wires were thus employed, in two different parallel tracks; and the same process was repeated through the skin and ligamentum patellæ. By this means the patella and its ligament were drawn together, and the wires acutely bent once on the skin at each aperture above and below; serving, in addition, as relaxation-stitches for the wound, the edges of which were then capable of being closely sewn with carbolised waxed threads, without tension on the latter. No twist in the wires was needed, nor any

disturbance of the wound contemplated or experienced in their withdrawal. The drains were of rubber tubing and horsehair, and Thomas's knee-splint was put on in addition to the gauze dressing.

On the following day the temperature was 103°, the pulse quick and the knee painful and exquisitely tender. When exposed under the spray, the skin all over the outer half of the joint and the lower outer half of the thigh was swollen, and marked by a circumscribed bright red inflammatory blush. The inner side was not puffed, and was free from tenderness. Ether was at once given, and the wound examined at leisure, as defective drainage was suspected. A suture or two being removed, and the drains in the outer corner being examined and nothing found, a pair of dressing forceps were passed into the joint, with the effect of letting out a couple of drachms or less of bloody serum from behind a clot. The drains were doubled, and the sutures not reintroduced. The temperature fell two or three degrees in as many hours, the tenderness gradually diminished, all pain disappeared, and the boy remained well until healing was accomplished. Several days elapsed between the changes of dressing, which were effected on the second, seventh, fourteenth, and the twenty-fifth days respectively; the wires were straightened and easily withdrawn on one of these occasions; the drains were gradually removed, and at the end of a fortnight the few punctures and spots in the incision, still unhealed, were superficial granulating sores. Nothing but blood and serum issued from the incision at any time; a flake of puriform lymph collected at each wire orifice, where slight ulceration of the skin ensued under the acute flexion of the wire; and, after the first fortnight, the boy got up each day, wearing a calliper splint and his Listerian dressing. Thomas's calliper knee-splint reaches from the groin and perinæum to the heel, where it clips a short piece of gas-pipe lying in a slot in the boot.

At the end of about three weeks total healing had resulted, and the patient was walking about and playing with other boys; the patella keeping its place in contact with the upper end of the tendon, and, from the impossibility of flexion, not being in the slightest degree induced to leave this position. He went home at the end of five weeks

and visited the hospital as an out-patient during the next few months, wearing the splint night and day; being, moreover, enjoined to continue doing so for about a year, and being particularly urged not to permit the knee-joint to be flexed to the slightest degree for any purpose during the same period. He was lost sight of for the latter half of the year 1880, but was seen in January 1881, still wearing the splint and knocking about the fruit market and town generally, perfectly comfortably and healthy. He could not be persuaded to come to the hospital to show his knee, but he was told that he had probably worn the splint long enough. However, he did not remove it till the beginning of June 1881, and on June 25th he came to show himself. After three weeks disuse of the splint the knee could be bent to a right angle, and extended fully by the proper muscles in any attitude. Though the patella was firmly attached to its ligament or tendon, it is situated about an inch or more higher up than the opposite one.

It will be perceived that no "passive motion" was employed here. On his discharge from hospital, examination of the knee revealed what is often called "stiffness," but what was in reality a want of suppleness or flexibility in that part of the capsule involved in the cicatrix—a perfectly natural and, of course, inevitable result of the simple unexaggerated inflammation by which the primary union was effected. The perfectly straight position was maintained until long after the cicatrix had ceased to be vulnerable under muscular pulling and articular motion—with the effect of restoring the suppleness of the tissues. The boy was so afraid of bending the knee, which at first pained him at the slightest attempt, that there was no difficulty in getting him to comply with the directions given him: in fact, when all need of the splint had ceased to exist he still wore it for his own comfort and protection. The much dreaded permanent stiffness, which is so much talked about, did not supervene; but, on the contrary, the slight temporary œdema and juiciness of the cicatrix gave place to toughness and consolidation; and the slight defect in suppleness, naturally resulting from long disuse, is being safely removed under the gradual, painless, and consequently

harmless, resumption of articular movements. After sixteen months' confinement in the perfectly straight position, the joint can be easily bent to a right angle, though it had been liberated only three weeks, and may confidently be expected to bend very much more, possibly completely, in a month or two to come.

From the British Medical Journal, March 5th, 1881.

LIGATURE OF LEFT SUBCLAVIAN ARTERY FOR ANEURYSM.

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Michael McMahon, aged 36, a dock-labourer, applied in the last week of April 1880 on account of a small swelling below the left clavicle. Only five days previously, on awaking, he felt "something contrary with his shoulder"; and, on putting his hand there, he discovered the lump, which had not pained him either then or since. About eighteen months previously, he had felt rheumatic pains, as he called them, in the situation of the lump; but they disappeared in about a week. His work for the last three years had been among cargoes of corn, of which he had to carry heavy sacks; and, although one arm, commonly the left, was elevated to grip the top of the sack in this severe labour, there was nothing which drew attention to special strain in his case upon the affected blood vessel, unless it were that from disease it was the less fitted to withstand extra pressure.

He admitted having had a chancre ten years before, with enlarged inguinal glands and falling of the hair, but no rash or sore-throat. Before that time, also, he drank heavily, but said that he had since been sober and free from disease. Under the clavicle was a distensile pulsating swelling, of the size of a small hen's egg, soft, compressible, ceasing to pulsate, but not collapsing, on pressing the subclavian artery, and revealing a *bruit* on auscultation over it. The corresponding radial pulse was feebler than the right, and somewhat delayed.

On April 27th, under ether, the left subclavian artery was tied above the clavicle with a medium-sized ligature of carbolised catgut; the wound in the integuments being made with a knife, and those in the fasciæ with a pointed but blunt steel instrument, aided by dissecting forceps. In this way, after reaching the first fascia, both it and the succeeding layers were easily divided; while the external jugular and other veins were as easily left unwounded and pulled aside. The aperture in each fascia in turn was held open, as soon as made, with two pairs of artery-forceps, by Mr. Bickersteth, who kindly acted as principal assistant. The aneurysm-needle was passed unarmed; then threaded and withdrawn to give place to the ligature. In this way, bleeding was avoided, and accordingly sponging was not required. No incidental obstacles were encountered, and none were created; so the operation was shorn of all difficulty. Lister's arrangements were adopted in the steam-spray and carbolised gauze; the drain being a wisp of horsehair. The dressings were changed on the third, fourth, and tenth days; on the last occasion, boracic lint was used, as a superficial strip of granulations alone remained to be healed. The drain of horsehair had escaped before the third dressing, when it was found convenient to substitute a short piece of tubing. This, having escaped before the fourth dressing, six days later, and, being then obviously no longer of any use, was no longer employed.

Pulsation ceased in the aneurysm at the operation, and never returned. In the corresponding radial artery, no pulse could be detected till after ten days, and then only feebly; and thus it has continued ever since. The limb did not become cold or painful, and no wrappings of any kind were used. The discharge was slight throughout, consisting of bloody serum, followed later by serum; no pus or lymph.

The temperature rose to 102° on the evening of the third day, having been 101° on the second, and 99° on that of the operation. It had previously been normal, and subsequently reached 100° on ten successive evenings. But the patient was never ill, or in any way inconvenienced, beyond a feeling of numbness in the limb. After five weeks, he was sent to a convalescent hospital outside the town, and

returned in a few days somewhat ill, having exposed himself to a chill, and having a great arterial throbbing, especially in the lower limbs, the vessels of which seemed of immense size and painfully distended. Tincture of opium was given in frequent small doses for a day or two; and he was kept to bed, and fed lightly. He soon recovered, and went again to the convalescent hospital. Throughout the summer he took care of himself, and got a few light jobs to do. In October, he was working hard again as a dock-porter, and reported himself occasionally. All this time the aneurysm remained soft, and but little reduced in size, being still visible. In December, he reported himself better than ever, and working regularly without discomfort. The swelling had now very nearly gone, though it could be felt as a small knob, seven months after the ligature.

Two years after operation he applied on account of iritis, which soon passed off. In other respects he was well, including his arterial system and the site of the aneurism, which continued as at last note. The pulsation in the left radial artery was still hardly perceptible.

From the Lancet, July 8th, 1882.

ON THE METHOD OF OPERATING IN STRANGULATED UMBILICAL HERNIA.

The communication of Mr. T. F. Chavasse in the *Lancet* of May 27th, 1882, is deserving of criticism on several grounds, among which are, the importance of the emergency, the principles concerned in its appreciation, and the question, above all, of practice. The gravity of a condition that, without artificial relief, is almost necessarily fatal, and which formerly seldom proved otherwise, in spite of that relief, cannot possibly be over-estimated; and the traditional importance of the emergency may have not been diminished by the comparative infrequency of its occurrence; may rather, as I think, have been enhanced, seeing that a possible reduction in the mortality may have failed to

attract a deserved attention, through sheer poverty of the associated statistics. The amenities of experience (or of what, in default, has to do duty for it) sometimes uttered in the terms "he will never get better," or "such cases always die," are frequently more authoritative than trustworthy; and I confess that I have on that account now and then withheld the complete respect accorded by some to this familiar but despondent wail. In short, the frequent former fatality that attended herniotomy, as performed for umbilical strangulation, has never caused me to view it as the inevitable, or even as the most likely, prospective issue of such cases. But, after all, this statement of my impression must, like that of Mr. Chavasse, or of anyone else, be held subordinate to the great realities, in the light of which the mere impression may be criticised, and eventually justified or rejected.

The former death-rate of umbilical herniotomy, though absolutely high, has been in certain groups of statistics, especially in the hospitals of towns, almost if not quite equalled by that of inguinal and femoral. But an improvement has taken place all round, for reasons that will be differently explained under varying or imperfect impressions. It is certain, however, that of late years an immense immunity from death, in quarters where escape was previously more rare, has been enjoyed after the more common herniotomies; while there are records of conspicuous, if not numerous, successes even in umbilical cases. Much of this success is attributed, and fairly attributable, to the direct protective influence of the antiseptic system and the simplification and multiplication of its cures. But an indirect result of this success has been the removal of unwonted reluctance and delay; in fact, men operate earlier, and for some purposes oftener, than they did before, while operations are freely undertaken that were formerly avoided altogether. The causes of failure, and the means to ensure recovery, in cases of strangulated hernia are not all, however, summed up in the methods employed at the wound or hernial sac, since we have often to reckon with widespread disturbance of intestinal function, to administer opium and proscribe diet, for want of which precautions the most

perfect herniotomy, or the most successful taxis without operation, may alike be rendered useless.

I had occasion to cut an umbilical hernia for the relief of strangulation in the summer of 1879. The symptoms were quickly relieved, and the patient made a simple recovery. A complication subsequently arose in the formation of a fæcal fistula, which did not heal spontaneously, but which I effectually closed at a second herniotomy in the summer of 1880. The case is recorded in the *Medical Times and Gazette* for Feb. 18th, 1882, where details are given. A radical cure of the hernial protrusion did not occur (though I attempted it at the second operation), owing to the wideness of the neck, the thickness of its margin, and the inability of my sutures to obliterate the aperture. But the method that proved unsuited to mine succeeded in a case of much larger umbilical hernia, but with a smaller neck, previously operated on by my colleague, Mr. Banks, for the purpose of radical cure alone, and at which I assisted him, in the same summer.* Eventually I was enabled to radically cure, by effectually ligaturing the sac alone as deeply as possible, an irreducible omental umbilical hernia,—a method I venture to recommend to all for simplicity and safety.†

I can see nothing in umbilical hernia, strangulated or not, to which the known principles of surgery, that apply to other herniæ, do not equally apply; still less do I see why such a hernia should be, under any circumstances, denied complete reduction, or the supreme advantage of a radical cure. Neither can I imagine that the three patients in these four cases were placed in special jeopardy by manipulation, under suitable precautions, of the umbilical sac or of its contents; or that their simple and speedy recovery can be viewed in the light of a narrow escape.

It is true that in only one instance was strangulation present, and even then of so mild and recent a character as to contrast favourably with similar cases more advanced. But the very fact that the woman was not left till she became moribund, or rather was promptly rescued

* See the Liverpool Medico-Chirurgical Journal for Jan. 1882.

† See Medical Times and Gazette, May 27th, 1882.

before signs of actual danger were evinced, is one of the proofs so often and so truly adduced that we must not mistake for consequences of the operation symptoms that never occur when herniotomy is properly and promptly performed. Perhaps one cause of the desperate state into which intestinal irreducibility may drift, in umbilical cases, is the comparative wideness of the neck, facilitating descent, but not strangulation, which is consequently rather prohibited, and, what is worse, is from its more gradual onset apt to be insufficiently noticed by the patient, who fails to connect with the tumour, not differing, perhaps, from its usual daily state, the uneasiness, eructation, and other early symptoms, so much more appreciable to some non-medical intelligences than to others, and so instantly attractive of medical notice. It is truly bad enough for the patient if medical attention be delayed until the unequivocal strangulation has reached an advanced stage of constitutional and even local disturbance. Just the same, however, occurs in old inguinal herniæ, from many of which an umbilical differs only and simply in the single item of locality. Even at this juncture the successful advantage of operation is conspicuous enough, but it may go very hard with the patient if his surgeon has to think twice about cutting him, through a a perfectly unfounded and superstitious dread of killing, by the means alone capable of keeping him alive. I cannot therefore entertain or further discuss the notion of the special vulnerability of the sac of a strangulated umbilical hernia as distinguished from that of the adjacent peritoneum ; the onus of proof rather rests upon those who have invented the idea, which, I venture to think, is not based upon any intelligible principle of anatomy, physiology, or clinical experience. The method of operation related by Mr. Chavasse is at best, and under the easiest circumstances, a roundabout way of attaining what should be a straightforward, intelligent, and even simple end ; in gangrenous cases it is the surest way to spill fæces into the peritoneal cavity, while in all it is an obstacle to radical cure, without which no herniotomy can now be said to be artistically complete, and to solely attain which many herniotomies are very properly undertaken.

From the Britsh Medical Journal, January 19th, 1878.

CASE OF LARGE CALCULUS, WITH NATURAL PERFORATION FOR THE URINE: REMOVED BY RECTO-URETHRAL LITHOTOMY, AFTER EXTRACTION OF A PENILE URETHRAL CALCULUS.*

The patient was a man aged 54, a native of the Edinburgh district, who came under notice and submitted to operation in the first week of July, 1877. Five years previously, he had suffered from difficulty of micturition and other urinary inconvenience, in consequence of which he had entered the Liverpool Royal Infirmary, where an operation was proposed and was on the point of being performed, but was frustrated on account of the fear and sudden departure of the patient. Since that time, he had had repetitions of the old trouble, but not to a severe extent until shortly before the date of the present observations, when he consulted his private medical attendant, Mr. T. W. Evans of Liverpool, who found a stone in his urethra, and brought him to me at the Stanley Hospital.

The penis was thickened, and very much hardened about its middle, and so tender that little examination could be endured. The urethra terminated anteriorly at the margin of the retracted prepuce, where it was wide enough to admit the point of a finger, being, in fact, now but a wide sinus. That part of the urethra which should traverse the glans penis had ceased to exist, owing to sloughing chancres which he had had many years ago in India. There was, moreover, a fistulous perforation of the urethral floor about an inch behind the preputial orifice, of the width of a crow-quill.

Under ether, on July 6th, the penis was explored with forceps, and eventually a triangular stone was removed, less than three-fourths of an inch long, more than half an inch wide, and a quarter of an inch thick. The surfaces were irregular; one concave and the other convex. This

* Read in the Surgical Section at the Meeting of the British Medical Association in Manchester, August 1877.

stone lay in a space lined with granulations; a wide sinus, bounded by a portion of the urethra and corpus spongiosum.

On passing a sound towards the bladder, it stopped in the prostatic region, and struck a stone or stones. By the finger in the rectum, it was felt that the foreign material was close above the mucous membrane of the roof of the bowel. The prostate felt hard, slightly enlarged, and of the usual shape. The patient was then turned on his side, and the stone cut down upon with a small knife in the middle line of the roof of the rectum; the hole was enlarged forwards and backwards with a blunt-pointed bistoury, after which a calculus with several projecting lobes could be distinctly explored with the finger, but not easily dislodged. However, at last, with the aid of a scoop, the stone was removed.

The patient had a severe rigor shortly after the operation; but, in other respects, he has been very well. The wound was left to take its course. In two or three days, he had a stool. He has complete control over his fæces, and urine when in small quantity; the latter escapes partly by the penis and in part *per anum.*

The treatment adopted was the administration of morphia subcutaneously for the first few days regularly, and afterwards when required. The diet was at first warm sago and water; afterwards bread and other farinaceous stuffs. Throughout, milk has been avoided.

The left testicle, which had years ago been swollen during his attack of syphilis, and which had dwindled down to small dimensions, became the seat of acute inflammation, which at its height was perceptibly relieved by the operation of a single leech. The complication was probably set up a fortnight after the original operation, in an exploration of the penis under ether, undertaken on account of persistent pain and tenderness in the organ, on the supposition that possibly some stone still lay unremoved. It was found, however, that the original operation had in this respect been complete. The case is still in progress, and the recto-prostatic aperture still remains; but I have thought that, in view of the extraordinary size, shape, and general circumstances of

the stone concerned, its relation, at even this early period and in this imperfect form, would not be altogether inappropriate to the present occasion.

I have not been able to find any record of a prostatic stone, perforated in this manner and pervading the prostatic substance so completely as this has apparently done. The calculus has the shape of the prostate itself, with the addition of a promontory or spur at one end. Including the spur, the total length is 1⅞ inches; without it, 1½ inches. The greatest width is a little over 1½ inches—strictly speaking, 1 9/16 inches. The remaining diameter is 1¼ inches. The canal runs parallel to the side which I take for the upper, at a distance below it of three-eighths of an inch, having a length of about half an inch, and opening forwards into a shallow groove on the surface in question, and extending along the promontory before referred to. Its horizontal diameter is an eighth of an inch, but the vertical less, so that a no larger catheter than a No. 2 of the English scale will pass.

The stone weighs 1⅜ ounces, is of a pale yellow colour outside, and paler within. One or two chipped surfaces show a laminated texture.

From the British Medical Journal, July 22nd, 1882.

At the Manchester meeting of the British Medical Association in 1877, I shewed the calculus, referred to in the Journal on January 19, 1878, to Mr. Cadge, who expressed his conviction that it was not, as I had supposed, of prostatic origin at all, and that its situation in the prostatic urethra was due merely to the arrest of its passage. Mr. Cadge's opinion proved to be perfectly correct, and the calculus turned out to be urethral. This I had the opportunity of ascertaining in consequence of the death of the patient in December 1878, after an operation intended for the relief of recto-vesical and urethral damage.

At the *post-mortem* the prostate was found entirely unaffected, but of the smallest size known to the adult state, whereas the spot that had been occupied by the extraordinary calculus was that part of the perineum traversed by the membraneous urethra, of which merely portions

remained, in what was really a spheroidal sinus. A section of the stone has been made and its composition determined by Dr. Campbell Brown, professor of chemistry in University College, Liverpool, who has kindly reported thus:—Chiefly phosphate, much ammonia, very little lime, a little magnesia, organic matter, only a trace of urates, possibly a little oxalate.

The small stone extracted from the penile urethra has a white phosphatic nucleus, excentrically attached to additional material, but with its own concentric layers. It has probably a composition not differing from that of the other.

TWO CASES OF OPERATIVE SURGERY.

By RUSHTON PARKER, M.B., B.S., F.R.C.S.,
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Case 1.—*Operation for the Radical Cure of Hernia in a Child, by Mr. John Wood's Pin method; partial success.*

A boy, æt. 6, was brought to the Stanley Hospital in April, 1874, suffering from an inguinal hernia occupying the right scrotum. The tumour was about the size of a goose's egg, and went back easily when the boy lay down; the inguinal canal was wide enough to transmit a walnut, and its two apertures were dragged so nearly parallel to the axis of the body as to have erased any obliquity which the direction of the hernia may have possessed. The protrusion had existed since birth and was presumed to occupy a congenital sac. In addition to this defect the right forearm was unrepresented except by a conical stump projecting an inch or so below the elbow, the result, it is imagined, of intra-uterine mutilation. Only a single bone could be felt in this stump, which, however, most satisfactorily served his purpose as an instrument of self-defence and of aggression in his little encounters with his fellows.

On the 24th of April, 1874, under the influence of an anæsthetic, Mr. Wood's operation, with a view to a radical cure, was performed with the smaller rectangular pins devised by that gentleman, and in strict accordance with the directions so clearly given in his work on the subject. A pad of lint and spica bandage were then applied. In three days the testicle on the side of the hernia was swollen to about twice its former size. There was no pain, but slight tenderness at the part.

After five days the pins were removed, their track being by that time a freely suppurating sinus, and the scrotum very œdematous. A thick band of inflammatory consolidation could now be felt in the inguinal canal, and slight abdominal tenderness in the neighbourhood.

On the eighth day the abdominal tenderness was gone and the scrotum diminished in size.

On the twelfth day a ring-shaped pad was used.

On the twenty-second day all suppuration had ceased, the thickening in the canal was nearly gone, and when he stood up there was no hernia. The pad and spica were, of course, continued, and a truss was ordered for him.

On the fortieth day the pad was loose, and the hernia was once more in the scrotum. The young fellow had, in spite of some vigilance, got up and run about in the hospital.

Two days later a truss was put on, and this answered perfectly in preventing a further descent.

On the sixty-fourth day he was discharged, the truss having, since its application, successfully prevented the protrusion of any abdominal contents.

Four months later, or six months after operation, he called at the hospital, and his mother declared that the rupture had never reappeared. The inguinal apertures could scarcely be detected on examination. The continuance of the truss was advised for a year or two.

In this case the hernia was so large, and the inguinal apertures were so wide at the time of the patient's first visit, that the application of a truss was not regarded as likely to prove of any avail. The operation so far answered its purpose that it easily permitted an ordinary truss to keep the abdominal viscera within their proper cavity. Whether, if the hernia had not been permitted to reappear, the sac could have been absolutely obliterated, it is not easy to say; as the firm adhesion of the walls of a protruded peritoneal pouch has hitherto been difficult, because uncertain, of achievement; but the result, even if it shall never be a radical cure, is so far a satisfactory remedy that the comfort of the patient is secured, the utility of a truss is at any rate made practicable, and an ultimate cure by that means made possible.

Case 2.—*Fracture of the Jaws; Wire Suture.*

A boy, æt. 12, was brought to the Stanley Hospital on September 4th, 1875, having, half an hour previously, fallen a depth of about six feet into a neighbouring sandstone quarry, some of the loose stones of which had crushed and injured his face. The left cheek was raw from general abrasion, and the lower lip split and ragged all over the red margin. The left upper jaw was obviously depressed, its front teeth and their alveolar margin driven in, and a perceptible difference of level between the hard palate of this and the right side.

The lower jaw was fractured at the first left bicuspid tooth, the break passing obliquely downwards and backwards, the inner margins of the fragments being exposed, rendering the fracture compound. The displacement here was considerable. There was, in addition, free bleeding from the right ear.

In about an hour later the lower jaw was drilled and wired. He was now much blanched, and his pulse very feeble and quick; the bleeding continued from the ear, but he was quite conscious and not in pain. Intense ecchymosis of the eyelids had now come on, greatly increasing the disfigurement. The bicuspid tooth at the seat of fracture was first withdrawn, as a precaution to ensure union. I then held the jaw with the left hand, and the handle of an Archimedean drill with the right, while the house-surgeon worked the drill. Two drill-holes were made, one in front of, and the other behind, the fracture, both being directed below the level of the inferior dental canal, so as to avoid wounding the nerve.

The front drilling was performed simply through the jaw after turning down the lower lip; but that of the posterior fragment, being behind the corner of the mouth,

was performed by piercing the cheek from the outside, drilling the bone there, and passing the wire through bone and cheek; the wire was then picked up from inside the cheek by incising the mucous membrane under which it lay, the hole in the cheek being then done with and left to heal.

Each end of the wire was then twisted into a coil by means of the key devised by Mr. Hugh Owen Thomas, of Liverpool, which is simply a steel rod with a slit at the end, the coil in each case lying on the outside of the bone, but inside the lip and cheek. In returning the wire from the inside through the drill hole, a straight hollow needle was used; this being easily introduced from the outside, and taking the tip of the wire which is then withdrawn with the needle. When the wire was twisted up the apposition of the fragments was perfect, and the only subsequent reatment adopted was frequent washing and wiping of the mouth and injured parts.

No dressing or bandages of any description were used, and the depression of the upper jaw was disregarded. The bleeding from the ear ceased the same evening, and the boy never had any particular discomfort, and slept well each night afterwards.

On the following day the key was introduced into one of the coils of wire to tighten it up, and about a quarter of a turn given; after which the wire was not again interfered with until withdrawn.

He was kept in bed about a week, and fed on liquid diet for about a fortnight, by which time distinct union had taken place, as exhibited by an almost absence of tenderness on straining the fragments.

He lost three upper incisor teeth and the left canine, and their alveoli necrosed, during his convalescence. The left lower second milk molar was shed during this period, and the permanent bicuspid appeared in its place.

The wire was cut and withdrawn twenty-six days after being put in, consolidation being firm, and some periosteal callus having formed.

An abscess formed in the cheek at the seat of fracture, and left a sinus leading to bone; this, however, was healed completely in ten weeks.

His appearance more than three months after the accident is somewhat peculiar, as the injury to the upper jaw has imparted a curious vacant expression to his face, the lips, too, being a little apart. This is mainly due to the absence of his front teeth and their alveoli, the place of which has granulated up and cicatrised; the deformity due to the depressed maxilla alone being now but slight; when complete contraction of the cicatrix has taken place he will be able to have a plate and some artificial teeth, which will probably restore his natural expression. The lower jaw is in every respect satisfactory, strong, and without any deformity.

I must regard this treatment as the most simple and effectual yet devised; a great merit being that by its means the tolerably old method of drilling and wiring is rendered both effectual and workmanlike; while the superiority lies in the plan of twisting each end of the wire, separately, into a coil which can be tightened at will by the mere introduction of the key, and without disturbing the fragments, the wire, or the patient.

The operation was performed with the instruments described in

Mr. Thomas's pamphlet, from which my information on the subject has been derived, and where full explanation and illustration can be found.

The wire which I used was of annealed silver, $\frac{1}{32}$ inch thick; but in reality copper bell-wire of the same size would do admirably, and I should use it in future cases.

The two following conditions should be borne in mind:

1. The method is only required in compound fractures.

2. Any tooth at the seat of fracture should be at once removed, for want of which it has been ascertained that union has been interfered with.