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SURGICAL REPRINTS.

(FIRST SERIES.)

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Honorary Surgeon Liverpool Stanley Hospital, &c., &c.

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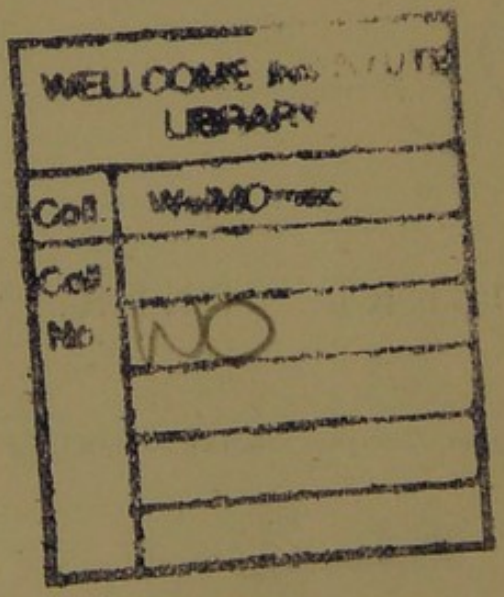
[1888 ?]



CONTENTS.

An Analysis of One Hundred and Five Cases of Colles's Fracture, with a few Remarks on Treatment. By ROBERT JONES, M.R.C.S., &c., Assistant-Surgeon, Stanley Hospital, Liverpool.

COLLES'S fracture is so common an accident in the experience of most of us, and is so often the source of anxiety to both surgeon and patient, that I need offer no excuse for bringing the subject forward to-night. To do it anything approaching justice, however, requires a much longer time than we can afford, so I shall confine myself to a hurried analysis of a hundred and five cases, many of them patients at the Stanley Hospital, and offer a few remarks upon points which may be of interest.

It is generally admitted that Colles's, with the exception of that of the middle of the clavicle, is the fracture most frequently met with. During the period covered by the cases about to be described I have treated—

17	fractures	of the	humerus,
4	„	„	olecranon,
13	„	„	ulna,
29	„	„	radius and ulna,
13	„	„	radius over two inches above wrist,
2	„	„	carpal bones,
61	„	„	clavicle,
2	„	„	scapula.

In my own experience, therefore, the proportion greatly favours Colles's over that of fractured clavicle. My statistics in this matter, however, are scarcely reliable without one qualification, namely, that injury to clavicle is so often accompanied by other serious complications which prevent many patients from appearing at a hospital out-patient department.

It is a somewhat extraordinary fact that this accident should occur much more frequently in woman than in man—more especially in later life. In my tables are figured—69 females,

36 males. I have never met with the accident in patients under eleven years, although I know such cases are by no means phenomenal.

7	occurred	between	the	ages	of	11	and 17,	of whom 3 were males.
17	„	„	„	17	„	20	„ 8	„
25	„	„	„	30	„	40	„ 13	„
26	„	„	„	40	„	50	„ 9	„
23	„	„	„	50	„	60	„ 3	„
7	„	„	„	60	„	70,	all females.	

It is interesting to note the way in which the accident occurs, for this in great measure is answerable for the amount of deformity, and the position which the fragments take. In sixteen cases, for reasons alcoholic, I could obtain no reliable history. Seventy-two told me that they fell on the hand. Out of this number four asserted that their arms were not extended, and that the fall was broken not by the palm, but by the palmar aspect of the fingers. This is a point which strongly bears out Gordon's theory of the "cross-breaking strain," which I shall allude to later. In four instances the fall was on the fist, with wrist extended. One of the four had two shillings in her hand, which she tightly grasped as she fell, and did not lose in the falling. Another suffered from contraction of three fingers, and instinctively closed the fourth before reaching the ground. One vigorous old dame of sixty-nine fractured the right radius in the act of beating her grandson, and when she found her arm powerless she struck out with the left, missed her aim, fell, and perpetrated a second Colles. An acrobat, performing on parallel bars, disabled his arm by hyperextension of the wrist in the act of throwing himself off the apparatus. A machine was accountable for two cases, and a somersault for a third.

I shall not take up your time by detailing the symptoms of Colles's fracture. The injury is far easier appreciated in the flesh, than even in the best definition. There are a few points, however, in connection with the deformity which I should like to allude to. In the first place, with regard to its degree. Most of us must have noticed that this is a very variable quantity,

and can be increased with greater facility than it can be decreased. I can recollect instances of fracture of the lower end of the radius very difficult to diagnose by reason of almost perfect apposition. In that barbarous custom, however, known as "the search for crepitus" (of which I am often guilty), displacement has readily been induced and the injury transformed to an almost typical Colles. In the case of the old woman just referred to, there existed the greatest disparity in the degree of deformity in both arms. Where the injury was due to the fall the symptoms were much more aggravated than in that due to infantile correction. These, and other facts to be adduced, lead me to believe that, however much may be claimed for the action of muscles, the discredit of deformity is mainly due to the direction of fracture and its casual force. The lower end of the ulna is very plainly seen beneath the skin, and is a symptom of interest. It is due to the backward displacement of the articular end of the lower fragment and abduction of the hand. This symptom was absent in the only case of dislocation of the carpus backwards I have ever seen. The ulna is often forced through the skin in so-called "compound Colles's fractures;" generally speaking there is no communication between the radius and the wound. In five of my cases I found beyond doubt fracture of the styloid process of the ulna. I suspected it in several others. Dissection has proved this symptom to be far from uncommon. In a very interesting paper by Mr Clement Lucas,[1] kindly pointed out to me by Mr Paul, attention is drawn to the fact that out of three cases he dissected, in two this complication was manifest, and of thirty-two cases he examined at Queen's College Museum, Belfast, he discovered sixteen instances of separation of this process. Dr Cameron, in the *Glasgow Medical Journal*, for March 1878, draws attention to similar facts. I met with a patient some month's since, who had a movable ulnar styloid and a Colles of many years standing. The triangular fibro-cartilage binding the radius and ulna together is also often found ruptured.

The discussion in regard to impaction is a very animated one.

[1] *Guy's Hospital Reports*, 1884.

Irish surgeons, notably Smith and Gordon, oppose the majority of English and French surgeons who affirm its common occurrence. Voillemier goes so far as to rank it amongst what he calls "fractures by penetration," and he describes four methods in which this occurs. (1) Impaction of both walls of the upper into the lower fragment. (2) That in which comminution of the lower fragment is added. (3) Where the posterior edge of the upper finds its way into the lower. (4) Reciprocal impaction, where each fragment is impacted into the other. Callendar[1] refers to thirty-six specimens in the London museums, which he thinks prove the existence of impaction of the proximal into the distal end of the bone. Professor Smith, in very forcible argument, denies the utility of examining old bones with a view to a correct conclusion, as in non-impacted fractures the production of a compensatory ring of callus closely simulates impaction. Dissections in recent cases, however, leave little doubt that impaction occurs, although I am very sceptical as to the condition being a common one. In the only case I ever dissected the ends were free, and many others have noticed a similar condition. The mere difficulty in reducing the fracture is certainly not proof of impaction, any more than ease in reduction proves the contrary. Mr Couper's case, to be alluded to in a moment, bears me out in this statement.

What influence has muscular action upon the maintenance of deformity? Colles states—"If the surgeon lock his hand in that of the patient, and make extension even with moderate force, he restores the limb to its natural form, but the distortion of the limb instantly returns on the extension being removed."

Gray says—"On extension being discontinued the parts immediately assume their deformed appearance."

Mr Clement Lucas adds—"Admitting that impaction does take place in a certain number of cases, it must not be lost sight of that muscular action is alone sufficient to maintain and reproduce the deformity." Other authors are equally distinct. Mr Lucas gives publicity in this connection to a very interesting case. A patient was admitted into hospital under Mr Jonathan

[1] *St Bartholomew's Hospital Reports*, vol. i.

Hutchinson. She was seventy years old, and suffered from brain injuries, which paralysed her right arm and leg. A fracture of the wrist of the palsied arm was examined by Mr Hutchinson. He states that there was some swelling at the wrist, but none of the usual deformity so characteristic of Colles's. He could crepitate behind at a spot continuous with the middle line of the interosseous space. At first he doubted the existence of fracture, and then thought the radius split longitudinally. The patient died three days after admission, and Mr Couper made the *post-mortem* examination. Rigor mortis had set in, and typical symptoms of Colles's fracture were seen. Mr Couper tried to reduce it in every conceivable way but utterly failed. All attempts to produce crepitation were useless. He first severed the tendons of the supinator longus, then the flexor carpi radialis, then the tendons of the extensors carpi radialis longior et brevior, but it was only when the extensors of the fingers were severed that reduction could be effected by gentle traction. Mr Couper remarks—"This case appears to show that the deformity of Colles's fracture may be entirely due to muscular action, and that the absence of crepitus and irreducibility of displacement may be due to the same cause, and do not necessarily imply impaction." With a similar inquiry in view, I fractured the arms of three patients newly dead, after the method of Gordon. In the first case I placed the fractured ends of the right radius in good apposition and allowed the left to lie in the typical deformity. Although rigor mortis set in firmly no distortion occurred in the right wrist, while the left became but little altered although difficult to reduce. Reduction, however, did not require nearly the amount of force which was employed by Mr Couper. I tried the experiment a second time with results scarcely different. In a third case rigor mortis was insufficient to justify me in drawing any conclusions. It would appear then, as far as can be based on these experiments, that muscular action is not sufficient, without external assistance, to produce the deformity. This is borne out by my previous remarks upon the occurrence of fracture of the lower end of the radius without displacement. In dealing with treatment I shall further

strengthen this point. Mr Couper does not state the position in which the patient lay in the *post-mortem* room, nor whether instructions had been given for the careful handling of the body. This may possibly account for the starting of the deformity prior to its muscular fixation. We know the rough and ready treatment which a corpse receives at the hands of hospital porters, and nothing would be easier than to shake the hand and fractured end of the radius into a distorted posture.

A great deal has been written in regard to the mechanism of this fracture, and I believe that in the main Professor Gordon of Belfast has offered the most correct explanation. He states that hyperextension of the wrist "puts the anterior carpal ligaments and flexor tendons violently on the stretch, wrenching off by the cross-breaking strain the lower end of the radius, tilting it backwards, with alteration of the aspect of its carpal surface." This I have no doubt is the true etiology in the majority of cases, and is proved by the ease with which one can artificially produce the fracture on the dead body by fixing the radius and extending the wrist. I have always inquired of patients whether they fell on the palm or fingers, with the result which I have already stated. It is obvious that a fall on the fingers could only act in the way which Gordon explains. But that direct transmission of force to the lower end of the bone is accountable for many of the accidents I am fully persuaded; people so often state that they fall almost upon the articulating surface of the radius, where the "cross-breaking strain" would scarcely have opportunity to act. And if we look at the anatomy of the lower end of the radius we find its posterior surface on a lower level than its anterior—a fact admirably suited to the receipt of the propulsive force of the carpus. It is not sufficient to object to this, because the fracture does not radiate from the point struck. The bone would obviously give way at its weakest part, namely, where it is composed of cancellous tissue, in fact that part which is the seat of Colles's fracture.

Our museums tell us that the breach of continuity ranges from one-eighth of an inch to 1¼ inches above the radio-carpal joint, and that it may be in any direction. From the depths of

my heart I envy the diagnostic skill of those authorities who learnedly tell us that they can detect the position of the line of fracture in the living subject to within a quarter of an inch. I have given over the attempt long since in despair.

Mr Lucas finds fault with the authors of nearly all our text-books for speaking of a prominence of the styloid process of the ulna (which is so often broken), instead of a prominence of the lower end of the ulna. It is more correct, I think, to speak of the abduction of the hand, as the ulna is a fixed point. Some authors go so far as to allude to the "luxation" of the ulna. This is of course an error.

The degree of mobility is very trivial in this form of accident. In eighty-five of my cases there was no movement of supination or pronation. In seven there was this motion to a limited extent. All the seven cases were recent, and in not one was the deformity extreme. In some cases, on the contrary, where the deformity was equally slight, the hand admitted of no movement. In testing this, it is important to fix the elbow, as there is in most cases apparent supination and pronation due to action at the shoulder-joint. In five I found very free movement of the fingers, in ten no movement whatever. The rest fluctuated between these extremes. In unreduced cases of at least a week's standing movement is generally present to a varying extent.

Pain is a prominent symptom, although I do not think it greater than in other fractures of the upper extremity. Twenty-three complained of most pain over the inner side of the wrist. This is referred to by Mr Lucas, who, in dissecting an old case, discovered the dorsal branch of the ulnar nerve stretched, and angularly displaced, by the abducted hand. This may of course sometimes account for it, but I very much doubt that it generally does. We know that after falls on the palm, where a Colles has not resulted, pain is felt over the internal lateral ligament, and whenever the joint is sprained pressure on this spot is accompanied by much suffering. The same is true in fractures of the lower end of the radius without displacement. Twenty-nine complained of most pain over the seat of fracture in front; only

nine over the seat of fracture behind. In twenty-three cases pain was very general, and in the rest I could obtain no information.

Crepitus is very often absent, but not nearly to the extent so generally supposed. In sixty-one cases I experienced the sensation very distinctly, in other instances less so. I am satisfied that the usual inefficient reduction of the bony deformity is answerable for its frequent absence. Many state that impaction is the cause; but, even granting its existence, no surgeon with an eye to future results would leave the fragments disengaged Others, again, state the fibres of the pronator quadratus insinuate themselves between the fractured ends, while all admit that under anæsthesia crepitation is often evident.

In two of my cases there was synovitis of the wrist, which somewhat complicated treatment but terminated happily. In another case there was double fracture of the radius, the upper fracture being about the middle. This made little or no difference in the facility of reduction.

Before adding a few words on treatment, I had better state that—

69 cases came to me before the 3rd day.
24 „ „ between the 3rd and 5th day.
5 „ „ „ 5th and 8th day.
3 „ „ „ 14th and 21st day.
1 case came on the 25th day.
1 „ „ 33rd day.

In regard to reduction, Mr Callendar[1] says:—"We may, I believe, safely conclude that it is very often impossible to reduce the impaction of the proximal portion of the shaft, and that a certain amount of deformity is necessarily permanent."

Mr Flowers, in the article on fractures, contributed to the last edition of Holmes' *System of Surgery*, speaking of old persons, states that "the result is often most unsatisfactory even after the greatest care has been used during treatment. It is frequently months before the hand is free from pain and regains its proper motions, and too often an unsightly, crooked, and permanently

[1] *St Bartholomew's Hospital Reports*, vol. i. p. 288.

stiff wrist remains, to the great inconvenience of the patient and annoyance of the surgeon."

Colles, who used straight back and front splints, is equally dismal in his prognosis.

These evils fortunately are avoidable with ordinary care. As a routine practice, I think it best to seize the lower fragment of the radius, use the knee as a fulcrum, draw the lower from the neighbourhood of the upper fragment, and forcibly pronate, keeping the upper part of the radius fixed. Do not let the pull be upon the wrist-joint exclusively, as, apart from the extra pain it gives rise to, the control over the offending fragment is lessened. The great point is to ignore the patient's cries, and to make an unrelenting effort to propel the lower fragment, not merely in a line with, but in front of, the upper. The endeavour will of course not succeed, but by attempting a little too much just enough will be done. If the hand is now unloosed and even shaken a bit, only in very exceptional instances will the deformity recur. I have over and over again demonstrated this to friends, and nothing surprises me more than when the little experiment fails. This bears out some of my earlier observations regarding the unaided power of muscular contraction. On the rare occasions when deformity does reappear, the great obliquity of certain fractures, or extensive comminution, will sufficiently explain the symptom. I have often extended the arm, as many books tell us is sufficient, with the effect of partially obliterating the distortion, only to return on release. In such cases the deformity is lessened merely by stretching the soft tissues, very little, if any, movement of the radius having been effected thereby. The recurrence so much spoken of is the effect therefore of incomplete reduction. On this point I am pleased to find I am supported by Mr Mitchell Banks[1] and Dr Packard.[2] Surgeons generally do not apply nearly sufficient "elbow grease" to the operation, and hence its frequent failure In some cases very much force is required, and the successful policy is to tug, twist, and turn until all is well. I have given the

[1] *Clinical Notes*, by W. Mitchell Banks, F.R.C.S. (Stephen Miller, Glasgow.)
[2] *Encyclopædia of Surgery*, vol. iv. p. 173.

mode of reduction I think best as a routine plan; several cases, however, will have to be judged on their merits, and treated with a due regard to the mechanism of their displacements.

I have never used chloroform in a recent case, and I never remember being more than one minute (generally 10 or 15 seconds) over the most obstinate of recent cases. After the first week, however, real hard work is sometimes necessary, and an anæsthetic may be required. In one fracture, which had obtained for sixteen days, and in another of eighteen days, chloroform was given. An assistant fixed the anterior surface of the arm on the operating table, the wrist and lower fragment of the radius overhanging, and all the force I was capable of was expended upon pronating the lower fragment. In each case the result was successful. Here I would state that no fears of breaking the arm should intimidate the surgeon. In the vast majority of instances he is safe. He has only to remember the difficulties which at times visit him as he vainly endeavours to fracture a puny, rickety limb. The instrument I show you now, invented by Mr Thomas for the cure of club foot, I have often found useful in obstinate cases.[1]

A sailor presented himself at the out-patient department of the Stanley Hospital with an old Colles of thirty-three days' standing, which I tried to reduce, assisted by Dr E. R. Williams, but the labour was chiefly unproductive. Although direct force failed in its immediate results, carefully adjusted pads well attended to succeeded, and a very useful arm resulted. This method, which in a recent publication has been described as the physiological method of reducing deformity[2] is I think conveniently suited to old cases of this special fracture. There is more in this form of treatment than is generally believed. Seven or eight days, assisted by discreetly applied counterforce, will do wonders in the case of a fracture which has passed the pathological limit of its flexibility. In this injury, however, we are carefully warned not to put much pressure, by reason of exceptional

[1] The foot-clamp can be obtained from Mr Critchley, Upper Pitt Street.

[2] *The Principles of the Treatment of Diseased Joints*, by H. O. Thomas. (H. K. Lewis.)

liability to gangrene. So far I have adopted the pads and avoided the gangrene, and in the future will be guided by the past.

In conclusion, it may be asked, "What splint is best?" Provided reduction has been complete, and the patient is under observation, it does not matter in the least. A Colles's fracture thoroughly reduced is as easy of treatment as any other, and special splints are either indications of doubt on the part of the surgeon or are used as extra precautions against the carelessness of patients. This latter reason is often an urgent one, and I can offer no better splint than the flexible sheet-iron splint, now often used in Liverpool. Gordon's splint, the application of which Dr Alexander so clearly demonstrated the other evening, is very good. His admission, however, that it is so often erroneously applied is an argument against it. I have seen more evil results following in the wake of the pistol splint than that of any other. In twenty of my cases, after being certain as to complete reduction, I used straight concavo-convex anterior and posterior splints with very desirable results. But I again strongly insist on the fact that the splint is utterly secondary to complete reduction, which, when once effected and secured, will go more than half way towards success. Many surgeons advise us not to continue the anterior splint beyond the wrist, in order to avoid stiffness. This, I am quite certain is an error. Sufficient security is required to ensure complete rest of the joint, movement in which interferes with the radius. Much of the thickening from excessive callus which our museum specimens exhibit, may without exaggeration be attributed to the short anterior splint. The same argument applies against removing splints in the third week "to exercise the parts." I have very rarely indeed had any difficulty in regard to stiff joints and fingers, although I have always very rigidly confined the wrist. My experience is in favour of five weeks' incarceration, when the joint will be more movable than in the third or fourth week. When the splints are removed, above all things leave the hand alone, and let the patient do his own exercising. By that means passive motion will be employed in the manner best

calculated to early return of action. I have often been interested in noticing the good motion which often results in old cases, where stiffness obtained for years. The fact that the carpus follows the articular surface of the radius wherever it goes will partially account for this Mr Clement Lucas, however, in a case he dissected, found that the movements of the wrist-joint were largely supplemented by abnormal mobility of the mid-carpal joint. Colles tells us—"One consolation only remains, that the limb will at some future period again enjoy freedom in all its motions, and will be completely exempt from pain." "Some future period" is a very vague phrase, and many of us, when confronted with a querulous old lady, have thought it a long time coming, and have often sighed for it in vain.

NOTES ON POTT'S FRACTURE, WITH A FEW REMARKS ON THE TREATMENT OF OLD CASES.

By Robert Jones, *Honorary Surgeon to the Stanley Hospital, Liverpool.*

Alluding to the fracture associated with his name Percival Pott, a hundred years ago, wrote :—" The inferior fractured end of the fibula falls inwards towards the tibia, that extremity of the bone which forms the outer ankle is turned somewhat outwards and upwards, and the tibia having lost its proper support, and not being of itself capable of steadily preserving its true perpendicular bearing, is forced off from the astragalus inwards, by which means the weak bursal or common ligament of the joint is violently stretched if not torn, and the strong ones which fasten the tibia to the astragalus and os calcis are always lacerated, thus producing at the same time a perfect fracture and a partial dislocation, to which is sometimes added a wound in the integuments made by the bone at the inner ankle; by this means, and indeed as a necessary consequence, all the tendons which pass behind or under, or are attached to the extremities of the tibia or fibula or os calcis, have their natural direction and disposition so altered, that instead of performing their appointed actions they all contribute to the distortion of the foot, and that by turning it outwards and upwards."

Since this description was published no great advance has been made either in the anatomy or treatment of this lesion. Indeed, its limitations are so well defined that there is scarcely room for even an ingenious speculation. The clinical signs are, briefly, a depression over the site of injury, eversion of the foot, a prominent inner malleolus, and a swelling round the ankle-joint. The fracture takes place usually about two inches above the malleolus, the deltoid ligament being often ruptured, and the astragalus separated from the tibia. Before entering upon an analysis of cases it will be better to discuss a little more in detail the various factors which together constitute this injury.

(*a*) *Dislocation of Foot outwards.*—This is generally supposed to be an essential and absolutely diagnostic symptom. It is however not quite so. A slight outward displacement may occur on separation of the tibia from the fibula, without fracture of the fibula, and outward displacement of the astragalus. I have seen at least two such cases where the fibula was undeniably intact, and yet the simulation to Pott's fracture quite marked. In one case a gentleman in jumping a ditch alighted on a stone upon the opposite side, and was with difficulty able to walk home, a distance of three-quarters of a mile. The foot was slightly everted, the inner malleolus prominent, and the ankle-joint swollen. On further examination I found the fibula unbroken, and the distance between the malleoli obviously increased. The ankle-joint was firmly fixed. On attempting to reduce the deformity, which was accomplished with difficulty, crepitus was experienced. The fall on the foot had by means of the astragalus wrenched off that portion of the tibia immediately on the inner side of the tibio-fibular articulation, the force, trivial though it appeared, being sufficient to tear the interosseous ligament, to wedge the astragalus, to slightly separate the bones, and to keep the foot fixed in an everted position. In the second case the eversion was very slight, and there was no crepitus nor fracture of the fibula, the injury being also caused by a fall upon the sole.

The amount of dislocation of course varies, and I have seen it so marked in the outward direction, that with the tibia perpendicular the inner malleolus would all but touch the ground. This outward displacement is sometimes accompanied by a backward luxation (although I can find no published record of it), which is evidenced by a shortened foot, a lengthened heel, and extended ankle. The correctness of the diagnosis is readily verified during reduction of the deformity.

(*b*) *Fracture above External Malleolus.*—This varies to the extent of 3 or 4 inches. The precise spot is often obscured by rigidity due to swelling. The patient himself is often under these circumstances a valuable diagnostician. Often guided by pain he places his finger on the exact point. An even better test is

to press upon the upper third of the fibula, maintaining the pressure as we travel downwards; the pain is generally referred to the fractured ends. The direction of fracture can generally only be guessed at—and that badly. Roughly we may decide that transverse fractures give rise to easier ascertained crepitation, and that fractures from within, taking a direction downwards and outwards, are accompanied by least deformity. I may add that I have on several occasions diagnosed fracture of the fibula on Pott's site without any dislocation. A little later I shall give one or two such cases.

(*c*) *Prominent Inner Malleolus.*—This is always present, but is not essentially diagnostic. It occurs in certain fractures of the lower end of the tibia. It may be diagnosed from similar deformity, due to fractures of both bones above the ankle, by its lesser mobility and crepitation; in sprains of the ankle, where laceration of the deltoid ligament has taken place, a tense swelling is often found sufficiently deceptive to lead the inexperienced into errors of diagnosis.

(*d*) *Separation of Astragalus from Tibia.*—The distance of course varies, and can be fairly estimated by the degree of deformity. The majority of indirect fractures are doubtlessly caused by the pressure which the astragalus is made to exercise on the lower end of the fibula.

(*e*) *Crepitation.*—Absence of this is not sufficient to prove immunity from fracture. In over twenty-five cases out of seventy-five it was absent during the manipulations which, having regard to the patient's comfort, I thought it justifiable to make. Eversion of the foot usually gave rise to no crepitus. Inversion frequently produced it, but the movement best calculated to elicit it consisted in combined flexion and inversion. It is always easy to diagnose the crepitus of fractured fibula from that, in consequence of a chipped inner malleolus.

(*f*) *Fracture of Inner Malleolus.*—Complicated twenty-nine cases out of seventy-five. The diagnosis was generally simple. Where this fracture complicates the danger to the skin is increased. Crepitus can rarely be felt until reduction is partially complete.

Of seventy-five cases I find on reference that fifty-seven were males and eighteen women. The age varied greatly—

3	occurred	between	the	ages	5	and	10 of whom 2 were males.
10	„	„	10	„	20	„	7 „
25	„	„	20	„	30	„	21 „
21	„	„	30	„	40	„	18 „
9	„	„	40	„	50	„	4 „
4	„	„	50	„	60	„	2 „
2	„	„	60	„	70	„	2 „

1 was 74 years old, a male.

About 30 per cent. of the cases sought surgical aid on the day of the accident, about 35 per cent. on the second day, about 15 per cent. on the third day, and the remainder later. In fifty-four out of seventy-five cases the fracture was of the right fibula.

In regard to the question of the cause of deformity it appears to me that there has been a great deal too much written. I have no belief in any muscular action theory. It occurs and is intensified by the continuation of the force which was employed upon the fracture. A foot is fractured by inversion, and generally the deformity is inversion, and so with eversion. Patients generally do not realise the enormity of the accident, and continue for a few strides onward until a trivial deformity becomes typical. Two cases will illustrate this. A gentleman vaulting from his bath fell upon the inside of his left ankle, and "feeling something give," he looked at his foot. There was no deformity to be observed. The pain not being acute he walked as far as the towel rail, donned his dressing-coat, and found his way to the bedroom. The deformity by this time had, to his amazement, become typical. Another instance will be afforded by a case I saw, in consultation with a medical friend, who told me that he had been called to the patient, who had fallen on his ankle, the point of obscurity being the presence or not of a fracture. On entering the patient's room my friend was astonished to find a well-marked case of Pott's fracture with an exceptionally pronounced eversion. The transformation was explained by the patient, who confessed to having doubts con-

cerning the suspected fracture, attempted to walk, experienced great pain, and in trying to relieve the foot from pressure clumsily augmented it, with the result I have described. Generally speaking those fractures due to direct force are less prone to luxation, for reasons which must be obvious. Furthermore, those fractures of the fibula, where the patients have attempted to walk, are generally more pronounced than in the cases of those who have resigned without an effort. In speaking of too early removal of restraint I will further emphasise this point.

There is no difference in the principle of treatment of Pott's fracture from that of any other. There are two objects to be attained—(*a*) the reduction of deformity, (*b*) the maintenance of reduction.

(*a*) *The Reduction of Deformity.*—This is accomplished the more readily in proportion to the absence of delay. Water dressings and Fabian policies should be rigidly discarded, as even twenty-four hours may make a material difference in the easy success of manipulations. My advice to house-surgeons and others is to seize the earliest chance of replacing the astragaloid luxation. A patient brought straight from his fall, with no matter how terrible an eversion, presents no approach to difficulty. It is hard to give any rule of procedure which alike will remedy the defect of symmetry in all cases. Generally speaking, after flexing the knee it is best to firmly grasp the foot, the dorsum in the right hand and the heel in the left, and to steadily pull for a few seconds. Next move the foot a few times from side to side and powerfully invert. Should this fail, start again, repeating the former movements, and on each occasion a gain in the right direction is recorded. This may be even again repeated. If, notwithstanding, deformity yet remains, increase it by still further everting the foot,[1] and then repeat the primary manipulations. Should it still be unsatisfactory a gradual replacement must be attempted by means of pads. But the effort at reduction should be long continued, and very rarely indeed given up as futile. Once reduc-

[1] Mr Thomas has drawn attention to this in the reduction of luxations, *vide Contributions of Surgery*, part vi.

tion be complete there is no tendency to recurrence of deformity, and therefore no real occasion to employ those splints which are devised to counteract special displacement. Lest, however, a little deformity remain, it is well to put on a couple of side splints and a posterior splint, the side splints being armed with pads suitably arranged to minimise deformity. The splints I have been accustomed to use are made of malleable sheet iron, and the practitioner can with his foot press the ends of both side splints, so that they approximate on the sole, forming a support which maintains the ankle at right angles. When the splints are adjusted the patient must be directed to flex the knee and lie on the outer side of the leg. Just a few words respecting the position of the ankle. It is of the utmost importance that the ankle be kept at right angles, and that the bed-clothes be prevented from pressing upon the toes and extending the joint. After results, very serious by reason of their tediousness, are due to neglect of this precaution, and hardly a month passes but a case presents itself at our out-patient department, walking upon his toe with a contracted tendo Achillis, which might have been well months previously were it not due to the overlooking of this apparently trivial detail. Patients should be kept in splints for fully five weeks, and even then the foot should only be very tenderly dealt with. Mr H. O. Thomas is accustomed to crook the heel of the boot, the slope being from without inwards, the lowest point being on the inner side, as soon as the time for walking commences, and this precaution will be found of much service. The more moderate the exercise during the initial period of walking, the better the ultimate result. The patient should be kept under observation for at least three months. Personally I very rarely treat a Pott's fracture, which appears at the out-patient department as an indoor-patient. With proper precautions, complete reduction, and firm splinting I have hitherto experienced no evils by this practice. Rest should of necessity be prescribed during the intervals between visits.

Before concluding this rough sketch I desire to offer a few suggestions regarding the treatment of what we may term return cases of Pott's fracture. I mean those patients who, long after

active treatment is over, complain of pain, deformity, or inability to walk. First among these troubles we may place :—

1. *Persistent Pain over the Ankle-Joint.*—This is generally due to injury which the articular surface has suffered at the time of accident. It must have been sufficiently severe to have outlasted the period of rest which the fracture necessitated. The pain is generally most marked over the deltoid ligament, and though lessened does not disappear at night time. It is accompanied by fulness over the joint, which may or may not include the rest of the foot. It is needless to say that passive motions in such cases are sad blunders, and result in increased pain and decreased movement. Rest is the remedy.

2. *Swelling of Foot increased on movement.*—This may be due to chronic synovitis, but generally results from circulatory disturbances, arising sometimes from the results of tight bandaging, but oftener from inefficient reduction, with subsequent outpourings of callus. The errors in circulation are best attended to by bidding the patient to elevate his leg when in bed, to keep his knee slightly flexed, to apply hot applications, and to adopt surface friction from knee to foot twice every day. A little exercise is good, but immediately on return let the patient fall on his back, and elevate the foot.

3. *Pain over Site of Fracture.*—As a rule this is due to the unsoundness of the bond of union, and is frequently the result of permitting too early perambulation. It may or may not be accompanied by deformity. If it is I shall describe the mode of procedure in the following section. If deformity be absent, the ankle should be still further kept quiet—should be supported by plaister—and later on the heel of the boot crooked as suggested by Mr Thomas. If despite these precautions walking is irksome, an iron stem should be fitted to the outside of the leg, and into the heel of the boot, and the leg well bandaged to it night and morning.

4. *Contracted Tendo Achillis.*—This is a common accident of neglected precaution in the treatment of Pott's fracture. There is no excuse for it. It should be an axiom that the foot be kept at right angles. Simple as the treatment of such cases

may appear, in actual practice real difficulty is encountered. Suppose for instance the case is one where the joint has become stiff from articular mischief. Division of the tendon here will avail but little, and we shall be forced to adopt those measures applicable to the reduction of anchylosis. In other instances, also, where there is no arthritis, much force has to be expended upon the foot in addition to tenotomy before the result is respectable. It is, therefore, clearly wiser to avoid the necessity. The after treatment consists in knocking the heel off patient's boot, and in directing him to amply exercise the stiff articulation.

5. *Deformity.*—This may be due either to inefficient primary reduction or to return of displacement from pressure upon the foot during unsoundness of the fibular bond of union. A case will illustrate this latter condition:—J. F., a sailor, came to the Stanley Hospital Out-patient Department, having been treated at a neighbouring charity for Pott's fracture. He had been an indoor-patient for a fortnight, and had then been in plaster of Paris, which was removed fourteen days later. Three weeks from that date I first saw him, when he complained of swelling in the foot, pain over the site of fracture, and just a trace of deformity. I gave him instructions what to do, and bade him call to see me after a week's interval. In two months he called again with an ugly deformity, increased pain, and helplessness of foot. He had been obliged to sail for Bordeaux, to put pressure upon his foot, and to neglect all remedial measures. This led me to the conclusion that, if deformity can be brought about by yielding of the fracture during the unsoundness of the callus, that such unsoundness may be called to aid in the reduction of inefficiently reduced fractures; subsequent opportunities and experiences confirmed this. I have, in all, treated seven cases of what one may term old Pott's fractures, with results satisfactory beyond expectation. At some future date I shall take an opportunity of publishing in detail, with accompanying diagrams, the results I have attained. Meanwhile, I will be content to give very briefly the following instances:—

Early in 1885, M. L. applied to me at the Stanley Hospital

on behalf of a marked deformity of her ankle. Eighteen months previously she was an inmate of one of our hospitals for Pott's fracture, and having undergone the usual treatment, was dismissed a little early. She complained of severe pain, more especially towards evening, and seemed anxious that something should be done to what she called her crooked limb. The pain, although shared by the foot generally, was much more acute over the site of the old fracture, and pressure denoted great tenderness. She was admitted as an in-patient, and agreed to forcible reduction. Ether was administered by Dr E. R. Williams, and assisted by my colleague Mr Sheldon I commenced the manipulations. The patient's foot was brought over the edge of the operating table and laid on the outer side, the table supporting the fibula up to the point of fracture. Our combined strengths was then exercised upon the foot in efforts at eversion, and this was supplemented by the use of a powerful wrench introduced by Mr Thomas[1] for the cure without osteotomy of obstinate club foot. A marked improvement resulted after a few minutes' effort, and the patient was sent to bed, the limb being firmly bandaged in splints and padded so as to continue the good effects of the forced reduction. The result was such that one could barely distinguish a difference in the shape of her ankles. During reduction there was no actual fracture of fibula. Although the bone at every stage appeared hard and unyielding, it succumbed slowly to the amount of weight applied.

The second case bore a similar history of treatment. He was a sailor, aged 54 years. The fibula had been three months fractured when I first saw him. I reduced it in the presence of Dr H. Chapman and my colleague Dr Whitford. After the forcible reduction I treated the case as an out-patient, and the end fully justified my course. And so with the other cases. The after-treatment of these cases is always tedious, and for a lengthened period, say five or six months, patients should only be permitted to walk on condition of their employing the stem support and the crooked boot. By

[1] See *Provincial Medical Journal*, October 1886.

these means the weight of the body favours inversion, and so tends to lessen the deformity. Many might be interested in an easy method of estimating the degree of deformity. Pass a malleable strip of metal from halfway up the leg along the fibula, under the heel, along inner malleolus, and up tibia. Take the metal off the foot and place it on paper whereon a tracing may be made. In this way improvement can be readily chronicled, when failure has attended the attempts by photography.

ON THE SO-CALLED "ABUSE OF REST." By Robert Jones, *Assistant-Surgeon, Stanley Hospital.*

[Reprinted from the *Liverpool Medico-Chirurgical Journal*, January 1886.]

Ask medical practitioners what is their opinion of rest in the treatment of surgical affections, and the majority will most likely tell you: "Rest in moderation is good, but, like most other blessings, it has to be cautiously prescribed, lest the evil it inflicts should outweigh its good effects. It has, in fact, its definition and its limitations." Like a photographic plate, which may be sacrificed either to over or under exposure, a hapless limb, it would seem, may be either moved too soon or endure the baneful effects of a too prolonged rest. On one side we read of Mr So-and-So, who suffered amputation for "restlessness'" sake, and Mrs Some-one-else with anchylosis for life, due to fixation for a year. Under the terrors of such alternatives, is the uncertain attitude of a medical mind to be wondered at? The annals of current surgical literature rise before him in the shape of hideous stumps and useless appendages, until his heart yearns for some surgical hour-glass which will solve the problem —how long the "kill or cure" treatment called "rest" shall be employed. Hence the passive motions which find their justification in a fiction, and the weak logic which, confounding the "propter" with the "post hoc," condemns a sound surgeon for neglect, because, forsooth, he welcomes an anchylosis in preference to an excision.

Although the multitude cry out "danger," so far no satisfactory explanation has been vouchsafed as to why a healthy joint should become permanently stiff from mere disuse. This may be due, however, to the fact that even human ingenuity has its limits. In any case, before supplying the "why and wherefore," it is well to prove the validity of the assumption.

The term "rest" is difficult of definition, as its degrees of comparison are various in themselves and in each practitioner's conception. A man suffering from chronic inflammation of the knee will be told to use it as little as he can; another similarly

affected, to lie quiet in bed; a third is fixed in excellent appliances,—and each attendant will speak glowingly to the other of the advantages of "rest" in such cases. One man is advised rest counterbalanced by twice its amount of movement; the second in equal parts; the third to the extent of avoiding all kinds of motion. Again, some affirm that a weight and pulley is an indispensable rest-producing adjunct, while others[1] as confidently condemn it. We find Mr Keetley[2] pinning his faith to a special form of elastic compression, and Mr Rushton Parker[3] asserting its utter futility. Even now there are some who revel in the mysteries of a Scott's dressing, and others who think a pair of sand bags a complete antidote to movement.

To all this may be answered—"Clearly, rest is the basis of all these methods you have chronicled, and you have no right to grumble at the means, provided the end is attained." Rest being then, surgically speaking, a quantitative term, it behoves its disciples to specify the amount they employ, otherwise the gravest ambiguity must needs prevail; and a surgeon is not entitled to say that "rest" has failed until the best means at his disposal for securing it have been sufficiently tested. But, it will be argued, everything depends upon that word "sufficiently," which varies in definition in direct proportion to the surgeon's experience and observation. Chronic disease of the hip may be treated by rest, under the most favourable conditions, for twelve months, and not recover, when the surgeon may recommend excision, on the ground that rest has failed after a "sufficient" trial. Another, more sanguine, perseveres longer, and succeeds. Time, therefore, is an element to be calculated, even when the rest procured is of the most efficient kind; and it would be as ill-advised to remove a splint from an inflamed joint because of slow progress as to remove the restraint from a fracture in the second week because of non-union. In either case a sufficient time would not have elapsed. The process

[1] *Diseases of Hip, Knee, and Ankle*, by H. O. Thomas.

[2] *Lancet*, March 1, 1879.

[3] *Lancet*, April 26, 1879.

Nature adopts is always one of allegiance to rest. The callus thrown round a broken bone—the thrombus to protect an inflamed vein—pain to disable inclination—anchylosis even, to fix a joint in danger from tremor—these are but a few of Nature's modes of protecting diseased structures.

Theoretically, it is impossible to conceive of anchylosis occurring in a joint not previously the seat of disease, from mere disuse. Inflammatory action is a *sine qua non* for its occurrence. In a given case, the more severe the inflammation the greater the danger of anchylosis. That rest can *per se* give rise to this necessary antecedent of anchylosis, surgeons will scarcely be prepared to assert. The wide hold upon medical men which the belief has secured must be held as evidence that there is some plausible foundation for the error. In a recent work[1] the sources of this fallacy have been examined. The author affirms that when a man falls and breaks his leg, the anchylosis which sometimes, though very rarely, occurs in a neighbouring joint is due to direct injury simultaneously received either directly or by the influence of concussion. For instance, a fall on the feet may produce synovitis of the knee, due to concussion of the joint surfaces. Clearly this, and not the rest adopted, must be held accountable for any subsequent defect of movement which the joint evinces. Two cases which have recently come under my notice will better explain what I mean.

In January, last year, a man presented himself as an out-patient at the Stanley Hospital. He was suffering from fibrous anchylosis of his left knee. The angle was about 80°. On examining his thigh I found an old united fracture just below the small trochanter. Two years previously he fell from a height on board ship, and was under the treatment of his captain for four months prior to landing. The splints were not continued as low as the knee, as the diagnosis was "a broken hip-joint." While the patient lay in bed the knee became swollen and painful, but this being ascribed to too tight bandaging,

[1] *The Principles of the Treatment of Fractures and Dislocations*, by H. O. Thomas.

nothing further was remarked. On getting about, the patient found his knee still painful and contracted, and the deformity continued to increase. The hip which had been confined in splints retained an excellent range of movement, whilst the unguarded knee had become quite useless.

In July 1884 a boy came under care suffering from an angular knee. Eight months before, in company with other boys, he was "dropping" from the top of a rock, and falling, turned his ankle. He was carried home and conveyed to a neighbouring cottage hospital, where splints were applied to his foot, and kept there for seven weeks. The knee, which had been painful meanwhile, got worse when he began to walk, all movement having ceased in it when I saw him. On examining the ankle I found the remains of a Pott's fracture combined with perfect motion at the joint.

The moral of these two cases is obvious, and may be considered in connection with some passages in an address delivered by the lecturer on surgery at the Sheffield School.[1] He says:— "A movable joint previously the seat of disease is a rarity in my wards, a common one in Hilton's experience. I get anchylosis, not in the diseased joint where I want it, but in the next joint where I do not." . . . "We keep limbs too long in splints, and we apply them to too many joints." Had a splint been applied to both hip and knee in my first case, doubtless rest would have been blamed for the anchylosis; whereas by such procedure this untoward complication might probably have been avoided. Indeed it may be considered an axiom that where a fracture occurs in the vicinity of a joint its fixation should *include* rather than *exclude* the articulation. Many an arthritis would be thus checked in its commencement, and orthopædic surgery be deprived of many of its "illustrative" cases. In the second patient doubtless the inflamed knee dated from the fall, but as the fracture was much the more urgent and evident evil, it was treated to the neglect of the joint. The main point, however, for the present argument is, that the joint in confinement moved on release, whilst that disregarded remained crippled.

[1] *The Medical Press*, April 8, 1885.

Rest has never yet caused anchylosis, but on the contrary has always lessened the tendency to it; and when we hear of authorities gravely asserting the benefits of passive motions, we may well cease wondering at the slow progress which the study of articular disease has made. It is undignified to tear in tatters the reputation of a splint when the joint it rescued from amputation rests at anchylosis. Such blame is about as logical and well merited as that which the ungrateful friends of a deceased patient sometimes heap upon the astonished attendant. Occasionally bony, or what has recently been termed "true," anchylosis may result, with but few clinical symptoms and with apparently no effusion. This will readily explain the failure on the part of many practitioners to observe early arthritic morbid changes, while their attention is elsewhere absorbed.

I have notes of nearly thirty cases of genu valgum totally imprisoned in the calliper splint for terms of from twelve to twenty-four months (the lengthened period being merely protective), and so far not one has ended in anchylosis. Twelve knees suffering from fracture of the patella have been immovable for nine months, and yet no anchylosis, despite the direct injury which the articulation must have received. In twenty-one cases of knee-joint disease, subjected to over eighteen months uninterrupted rest, in only nine cases has anchylosis resulted. In five of the nine cases the joints were opened, and in three aspiration was frequently practised. Of twelve elbows strictly at rest for over three months, eleven returned to motion, abscess having complicated three. In Colles's fracture I always keep the wrist-joint imprisoned, for reasons I have on another occasion explained, and I have not met with one case of anchylosis in over two hundred articulations so treated. My results in Pott's fracture do not in any way change my opinions, and observations on the hip and ankle all convey a similar lesson. But it is useless to multiply evidence, for "enough is as good as a feast." That many surgeons confound temporary stiffness with fibrous anchylosis is beyond question, the clinical difference between

them being that the one improves by exercise and the other requires skilled treatment.

Speaking of synovitis with effusion, an author before quoted[1] states:—"I have no hesitation whatever in saying that to wear a splint all day and all night, never to be able to change the position of the limb, is the very reverse of physiological rest. An adult does not move his limb when it causes him pain to do so; there is no danger in the case of an adult of dislocation; and there is really, unless he is an idiot, no necessity for a splint." Without wishing to be discourteous, I cannot help asserting that this advice is seriously prejudicial to a patient's welfare, and readily accounts for the author's unfortunate results. We may apply weights to any extent, constrict with india-rubber, or freeze with ice, all of which he recommends, but the moment we desert the principle of rest, it is well for the patient if we desert him also. It is not the voluntary movement on his part which we fear, but the unavoidable tremor, the starts during sleep, and the unguarded jerks of sympathising friends. Better infinitely the so-called "reverse of physiological rest" than a recourse to practice alike at variance with clinical observation and reason. When the author condemns hard heavy wooden splints, and the ill effects of strangulating a limb by encircling bandages and plasters, I fully agree with him. Splints should be so constructed as to secure efficient rest without the aid of tight bandages. Happily, surgical mechanism has already attained this end.

When we read graphic descriptions of limbs stiffened beyond hope, sacrificed on the altar of rest, we may well afford to turn the current of inquiry to channels more productive of scientific truth. We read in Eastern fable how the evil genius Chaldac at length succumbed to the faith of a stripling. An inflamed joint knows no greater foe than a surgeon whose faith in rest is governed by neither "but" nor "if." He controls just so long as he is steadfast to the principle, and feels firmly convinced that the only "abuse of rest" is to speak slightingly of its benefits.

[1] *Medical Press*, April 8.

STANLEY HOSPITAL, LIVERPOOL.

ANKYLOSIS, HYPERTROPHY, AND EXTREME LATERAL CURVATURE OF THE CERVICAL AND UPPER DORSAL VERTEBRÆ FOLLOWING ACUTE RHEUMATISM, SUCCESSFULLY TREATED BY MECHANICAL MEANS.

(Under the care of ROBERT JONES, Honorary Surgeon.)

[Reprinted from *British Medical Journal*, Feb. 5th, 1887.]

H. F.,* aged 11, while on a visit to friends at Manchester, fell into a pond and omitted to change his clothing for some hours. In two days he was attacked by acute rheumatism, and suffered in almost every joint. In the sixth week it was noticed that his neck became somewhat contracted and rotated towards the left side, whilst its slightest movement, manipulative or voluntary, gave him much pain. When the fever abated, the neck still remained awry, and the patient was sent home to Ripon. The neck, however, continued to get worse, and in seven months his doctor took him to a large northern infirmary, where he remained an in-patient for some weeks. He was discharged without any attempt being made at reducing the deformity. For the following two years and a half he underwent no treatment.

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* Exhibited at Liverpool Medical Institute.

On October 8th, 1885, he was sent to me from Ripon in a condition of very unusual deformity (Figs. 1 and 2). The

FIG. 1.

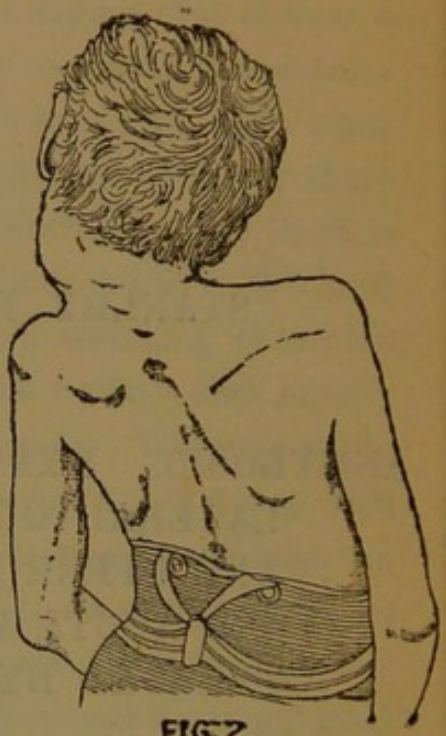

FIG. 2.

angle of the right jaw rested on the sterno-clavicular notch, the face looking almost parallel to the left shoulder. On first inspection, it suggested the appearance of extreme wry-neck. The muscles at the front of the neck were, on the contrary, atrophied from desuetude. It was impossible to obtain even a remote sensation of yielding on trying to elevate the side of the face. The right pupil was widely dilated, and the eye was examined by my colleague, Dr. Karl Grossman, who pronounced the fundus healthy, and the dilatation due to pressure on the sympathetic. For mechanical reasons the little patient's articulation was indistinct, and his respiration sometimes very hurried. On examining him from behind, the bodies of the cervical vertebræ were observed to be enormously hypertrophied, especially to the left side, resembling in appearance a large enchondroma. The tumour was painful on pressure. The vertebræ were ankylosed as low as the fifth dorsal.

The patient was admitted into the Stanley Hospital, and the treatment consisted in a carefully-adjusted process of

graduated leverage. The first stage was occupied by insinuating paper wedges between the jaw and sternum, the wedges increasing in thickness so soon as the slightest yielding became perceptible. By the end of the first fortnight the neck had moved sufficiently to enable us to place around his neck a paper stock. His dyspnœa completely left him, his pupil became normal, and his articulation much improved. The nurse was now instructed to exercise the boy's neck as frequently as she could without giving rise to any pain. Towards the end of the third week the patient could raise or depress his chin to the extent of nearly two inches. This rapidly improved, and by the middle of November there was ample room to place a Thomas's leather collar around his neck. the rotatory deformity remained, however, in abeyance, and the face still looked towards the left shoulder. To remedy this defect, I devised an iron framework to surround the head and allow of suitable oblique traction upon the deformity (Fig. 3). The cervical collar was retained whilst the framework remained, so that rotation could not be gained at the expense of flexion. The edges of the framework were roughly serrated by a few blows with a hammer, so that bandages could not slip. The iron was held *in situ* by means of a plaster waistcoat. This waistcoat fulfilled a double function. The patient carried his spine badly, and we placed him in what Mr. Bernard Roth would call a "key note" position, that is, the position of least obvious deformity, and the waistcoat partially maintained it. The nurse frequently assisted the apparatus by gradual twisting exercises. After wearing the instrument a fortnight, the boy was much improved, and on December 24th he was discharged from hospital, wearing the collar, having

FIG. 3.

been an inmate for a little over two months. At the time of his discharge he had very complete voluntary power over extension and flexion, and could bring his chin opposite the sterno-clavicular notch, and rotate it upwards of four inches to the left.

On his return to Ripon he was taken ill, and failed to continue his exercises, so that, on his re-admission into the Stanley Hospital, On April 9th, his radius of rotation was much diminished. Under proper treatment, however, he soon improved, and, on his discharge presented the appearance delineated in Fig. 4. This case seemed to be very hopeless at first; but, after consultation with my colleagues, Messrs. Sheldon and Smith, it was decided that a mode of treatment should be adopted which would in no way jeopardize the patient's safety; the leverage used was consequently of a very harmless kind. The patient's impaired articulation and respiration, apart altogether from the hideous and painful characters of the deformity, proved the urgent necessity for remedial action. The principle which underlies the treatment of deformities of this type consists in maintaining any advantage gained; hence the value of stocks and wedges. Manipulative exercises without this precaution are simply useless. As soon as the position of the neck is improved ever so slightly, wedge it in that position, so that it cannot gravitate into the old deformity. I have mentioned that the upper dorsal vertebræ were ankylosed. They were also slightly incurvated, the right shoulder being about three inches higher than the left. When the patient was told to stoop, none of the spinous processes of the ankylosed vertebræ projected, a symptom I have on other occassions witnessed and pointed out. I have to thank Dr. Owen for the interest

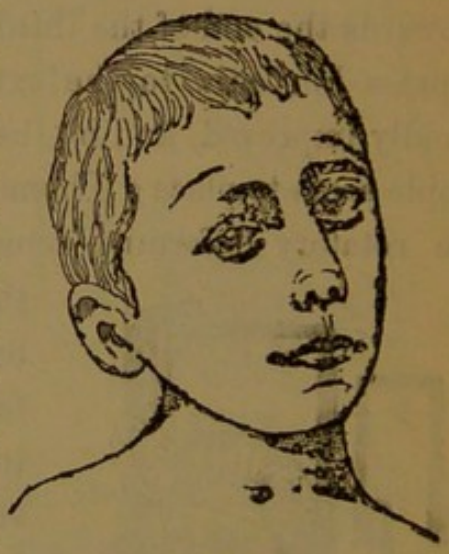

FIG. 4.

he took in this case, and for the excellent photographs from which the diagrams are taken.

COMPLETE AMPUTATION OF MALE GENITALS FOR RECURRENT EPITHELIOMA.

By Robert Jones, *Honorary Surgeon, Stanley Hospital, Liverpool.*

[Reprinted from *Lancet*, Nov. 6th, 1886.]

S. K——,* of good family history, aged twenty-nine years, came to me in April, 1885, suffering from a hardened condition of the end of his penis. There was a small superficial ulcer, which gave rise to very little pain and discharged a small quantity of thin pus. He denied emphatically ever having placed himself in the way of syphilis, and stated that the hardness of the penis had more or less obtained for three months, the ulcer for a fortnight or three weeks. The glands of the groin were enlarged and hardened, and erections of the penis, which were very frequent, were also very painful. Being in some doubt in regard to malignancy, I placed the patient under a mercurial course, and watched the progress of the ulcer. For upwards of three weeks it underwent no perceptible change; its edges were not ragged; there was but little pain; no tendency to bleed or excavate. The edges were barely raised above the surface, the base even, and no eversion of the borders. In fact, it presented no marked features of epithelioma. The induration, however, rapidly increased, until half the penis was of a characteristic leaden consistence. The diagnosis, which was no longer doubtful, was shared by Mr. Rushton Parker and Mr. H. O. Thomas, and the penis amputated early in May, just in front of the pubes. The patient was at his work in a fortnight, the enlarged inguinal glands having meanwhile subsided. For over seven

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* Shewn at the Liverpool Medical Institute.

months the patient was completely rid of the disease, but at the end of the year he complained of soreness at the end of the stump. He came to me in January, when I found the disease had returned at the site of amputation, which was occupied by a tumour, painful on pressure, and freely discharging pus through the urethra. The inguinal glands had again become enlarged, and difficulty was experienced in micturition. The scrotum in the neighbourhood of the urethra had become ulcerated, and the left spermatic cord was much enlarged and indurated about an inch from the inguinal canal. An operation being imperative, the patient was admitted into the Stanley Hospital towards the end of January, where, owing to the kindness of my colleague Mr. Sheldon, I was enabled to treat him.

On Feb. 4th, having made an incision through the length of the raphé of the scrotum, I came down upon the corpus spongiosum, and slowly dissected it from the adherent corpora cavernosa. The cavernous bodies were next followed to their origin, and with a blunt scalpel the crura were separated from the pubic arch. The corpus spongiosum was then divided, the posterior part being left of sufficient length to easily reach the perineal skin wound, the anterior part being included with the cancerous mass.† The left testicle was now removed, the involved cord being dissected high up and secured in the inguinal canal. The right testicle was then excised, together with most part of the scrotum, excepting a flap, into which I made a slit for the reception of the urethra and brought down like an apron over the perineum. The edges of this flap were stitched to surrounding structures, and the urethra made secure to the central opening. The wound was kept as fresh as possible, the patient placed upon light dietary, and an indiarubber catheter maintained in position.

† In dissecting I made a small puncture in the tense corpus spongiosum, and experienced great difficulty in controlling the hæmorrhage, which only ceased by leaving a Spencer Wells forceps upon the gap for about twenty-four hours.

The temperature rose to 102° upon the second day, but was reduced, and the patient recovered, without any symptom of interest in three weeks. In seven weeks he was able to work.

Several cases have been lately reported where the crura have been dissected from the rami after the manner first described by Mr. Pearce Gould. But I have only met with the reports of two cases where the dissection was as complete as that which I now report. One was a case described by Professor Annandale, some years ago, where, if my memory does not fail me, he removed the penis and testes, but did not clear the pubic arch. The other is reported by Mr. Wheelhouse of Leeds, and, if I understand his description, the organ was severed anteriorly to a ligature or switch placed around it in front of the triangular ligament, and he further advised that, should any of the remaining portion of the crura look suspicious, it had better be clipped away. In any case I think it would be well to remove the whole of the crura at once, on the same principle that it is wise to remove the whole and not merely a section of the breast for scirrhus; it adds but little to the complexity or danger of the operation, and may be the means of preventing a recurrence. The case I have reported is also interesting inasmuch as the patient was only twenty-nine years old, and had never been the subject of phimosis. His inguinal glands at the time of operation were extremely hard, and I was sorely tempted to remove them. Indeed in a few days after operation they felt so thoroughly malignant that I appointed a day for their excision. In a few days, however, the hardening quite disappeared. This accords with the observation of other surgeons. In my own practice I have had to deal with only four cases of epithelioma of the penis, in three of which I performed the ordinary flap amputation. In one case a recurrence occured in the glands twelve months after operation. In the remaining three cases the stump was the seat of attack. In that where the glands became affected they were normal in every way at the time of the amputation, whereas in the other three instances they were

enlarged at the time of the operation, but subsequently became healthy. Six months have now elapsed since the operation, and there is no sign of return. The patient is at work; has, of course, full bladder control, and suffers no manner of inconvenience except from a superabundance of skin, which is apt to become damp and irritable, but only to a very slight extent. The general conclusions I have arrived at with regard to future cases are: (*a*) when the diagnosis of epithelioma is beyond question, and the patient of a suitable age, the amputation should include the crura; (*b*) that the testes should, in the majority of cases, be removed; (*c*) that a scrotal flap should be saved as a covering for the perineum; (*d*) that there should be no hurry about excising enlarged inguinal glands; (*e*) the higher up the artificial penis can be brought, the more convenient to the patient, and the sooner it will unite to the surrounding tissues, as the discharges gravitate towards the most dependent parts.

Liverpool.

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A PROTEST AGAINST THE ROUTINE EXCISION OF JOINTS.

By Robert Jones, *Honorary Surgeon to the Liverpool Stanley Hospital.*

Mr. President and Gentlemen,

To deal in any sense exhaustively with such a subject as the treatment of the diseases of the joints in the short time at our disposal is of course impossible. And yet to criticise excision without offering some better alternative, would be to afford members no grounds for exchange of opinion. Indeed the best arguments against the operative school consist in noting the principles, the observance of which render excision unnecessary and the neglect of which are, in point of fact, ample apology for the strong effort made on behalf of operation. I will, therefore, roughly and rapidly sketch those points which I deem it essential to remember in the successful treatment of articular disease. And here, at starting, I would frankly admit that my connection with Mr. H. O. Thomas may have given me a bias in favour of rest as against operation, a bias made more intense by the frequency with which unsuccessful excisions have been forced upon my attention. Still, a bias is not apart from the influences of evolution, and current medical literature is in some measure an antidote to any conservative experiences one may cling to in relation to articular disease.

What, then, are the principles which should govern us in the treatment of these lesions. I group the joints because the laws which obtain in the successful management of a diseased phalangeal joint are identical with those applicable to the hip, and a surgeon prepared to apply diverse methods has not yet grasped the secret of success. The first and all important essential is "rest," and all that is in conflict with this in treatment retards recovery. Later I shall have occassion to deal with some of the factors by which surgeons often unconsciously violate this cardinal doctrine. At present I shall content myself by saying that enough rest is wanted to make more useless.

It is of importance to detect disease early and to apply at the outset those methods of restraint which, whatever course the mischief runs, are sufficient. Most surgeons experienced in joint diseases know that often cases with the mildest primary symptoms run the severest course, and this fact should urge us to do our best *at once*. The first duty, therefore, of a surgeon called upon to treat an inflamed joint, is to secure for it mechanical and physiological rest. This, in the case of the joints of the lower extremity and wrist, is best attained by the suitable application of splints. In their application we must remember that we have to deal with diseased structures undergoing pathological changes, and no splint should be employed calculated to hamper those changes which are curative. Circular compression of the joint is of these obstacles perhaps the most pernicious, and it is in addition one that is perhaps the most popular. The ideal splint is that which, while securing unnobility admits of no compression, and that splint is practically the best which most nearly attains this end. Mr. Thomas aims at this in his knee splint, where the bars are so placed as to admit, on the application of bandage, of a triangular space the whole length of the limb between it and the bars. In the case of the posterior hip splint, an equally successful effort is made by reason of length of leverage. Having chosen any splint which best fulfils these indications, let us apply it say to the knee, and note progress. The joint has perhaps been recently injured, and synovial secretion is plentiful. Should this give rise to no special symptoms, it is best to leave it alone—the yearning for compression notwithstanding. If sensitive, hot and burning to patient, an ice bag will relieve—if not too long continued and its weight be not appreciated, no harm follows its application. Should the effusion diminish or disappear in a few days, so much the better; if not, then the question of aspiration arises. And here it may be asked, "why aspirate if the local or general symptoms give no special indications?" To this I reply, that there are no reliable tests whereby the transformation of serum into pus can be affirmed; and anchylosis may occur even after intra-articular effusion has been absorbed. It is therefore best to aspirate if

after 8 or 10 days, no diminution in a moderate spontaneous collection occurs. If effusion takes place suddenly, following a blow or sprain, and hæmorrhage be suspected, immediate removal is indicated, and this should be repeated as often as fluctuation becomes apparent. If effusion, no matter what its character, be accompanied by acute pain or fever, aspiration should be at once insisted on. Simple mechanical distension which prevents physiological rest is often the direct cause of this pain. The operation is always a harmless one provided two points are remembered. The first and most important being the fixation of the limb before, during, and after the puncture of the needle. The second is the choice of a needle, care being taken that the bore is not too fine. Neglect of this precaution involves much harmful prodding when the surgeon finds his labour has been unproductive. Provided things go well, despite frequently recurring secretions, aspiration should be from time to time continued, and it is by no means uncommon for patients to undergo for months a weekly operation. If, however, the pus be thick or cheesy, or if constitutional symptoms arise, attention will be turned to the propriety of incision. This may be done by the employment of Listerism or not. Personally, I do not recommend the adoption of Lister's method unless the patient is under constant observation; for an abscess may run a very protracted course, and retention would be encouraged by any dressings, save the simplest. It is much more important to see that the incision occupies the most dependent spot of the abscess cavity, and to exercise unrelaxing effort at efficient drainage. This should be done without the introduction of tubes. If observation demonstrates one fact more clearly than another, it is the pernicious effects of drainage tubes. They are a perpetual source of irritation, and their removal is invariably of benefit. Nor will the fact that obscess cavities often exist in out of way corners, answer my objections for their existence much less their position is rarely made out until the joint is removed. Consequently drainage tubes generally do nothing but lie near them. Even did they reach the requisite sites, their benefit would be more than doubtful by reason of the attendant risks. The more

effective way is found in frequently repeated pressures exerted towards the joint from above and below it, which should rarely give pain. Mr. Thomas stitches the skin wound to the abscess wall, and this seems to answer well, for generally speaking, obstruction to discharge, is near its outlet. If the abscess should increase by ramification, incision should follow and check it. And now comes month on month of anxious waiting and constant supervision, attended often by but little change in the patient's condition. It is here that patience and hope are of value, because the vast majority will get well if the waiting is but sufficiently long. Some, but happily a very small minority, succumb, and others recover maimed as far as motion is concerned, while many get well with joints which are of full service. When the pain and fever goes, let the smaller patients don a walking splint and patten, and the country air will act as a charm upon their weakened constitution. We have very many such with discharging sinuses, and intelligent nurses or parents who do not need to visit us for months at a time. Now and again something may occur to pulse or temperature to create alarm, but renewed care and rest generally prevails. Nor should kidney trouble discourage, for annyloid disease may be, and often is, present in a case which finally progresses to recovery. There is, of course, a time in each patient's case when his worst has come, and generally from that time onwards, his recovery becomes attained. The great point to remember is that under appropriate treatment this worst class of case is a rarity, but may easily be manufactured by neglect on the part of the patient, or error of treatment on the part of the surgeon. The observation of the benefits of long continued rest warrants my assertion, and if further proof be needed, it is afforded by those doleful statistics which crowd the two last monographs written on behalf of excision.

The joint should be imprisoned long after the appearance of disease has gone and after all subjective symptoms have disappeared, for the sensations experienced by a patient recovering from articular disease cannot be very reliable under the masking influence of a splint. The test comes on removal of restraint, and a very critical time it is unless the surgeon has grasped the

knowledge whereby such a test becomes infallible. No surgical text books give any allusion beyond vague generalities to the means of knowing the right moment to discard treatment. There is no more danger of relapse in cured joint disease, than there is of disease in a healthy articulation. But if a joint be pronounced fit for use when the remnants of inflammation have not gone, it is easy to understand the very frequent references to relapse which meet us everywhere. What, then, is this test of recovery? The most practical demonstration of it has been rendered by Mr. Thomas, and is in reality founded on the means of detecting early disease. The law may be thus laid down. A joint is cured of disease where the range of movement does not diminish by use. It is easy to understand that this is founded on the fact that the first sign of disease is impaired motion. The practical estimation of these varying degrees of movement is of course to be understood, and may be roughly illustrated in the cases of the elbow and hip. We will suppose an inflamed elbow slung to the chin, where it has remained for many weeks. The surgeon believing it to be sound, slackens the bandage when the weight of the arm takes in the slack either at once or shortly, the angle at the elbow becoming less acute. If at the end of a week or a fortnight, or less, the wrist will not voluntarily return to the chin, the elbow is yet unsound. And so in the hips, supposing all restraint removed, and the patient undergoing a probationary term, returns in a month to find the lordosis is increased, as tested by appropriate means on a plane surface, the proof of remaining disease is beyond doubt. I need hardly say that without some fixed principles in regard to recovery, a surgeon's qualifications for grappling with arthritis must be incomplete. It is as necessary to know when a joint is recovered as it is to know when it is diseased. Without such knowledge, patients are in constant danger of so-called relapse, and surgeons wonder whether such frail members are worth any conservative effort made on their behalf.

Success in the management of joint disease in the young is not always repeated in the case of older patients. Despite the utmost care, such cases sometimes display a strong retrogressive

tendency. The joint, as a rule, seems to be doing excellently, and in spite of this, the general health continues to fail. The temperature rises and with it the pulse, the movements are tremulous and the tongue dry or white and coated. Delirium is sometimes present of a muttering type and the patient, usually uncomplaining, can be roused to conversation. Rigors are not infrequent, and diarrhœa rarely present. Unless amputation be performed, death will most probably ensue. Excision at this stage would be out of the question, for the patient should be at at once freed from his incubus. The condition is by no means common, and to excise early would be to sacrifice a number of curable joints on the bare chance of averting an amputation.

And here we may discuss very briefly the question of rest. To take any monograph and to compare the statistics of successes in those cases treated by excision with those treated by "rest," would be very puerile. The term differs in meaning almost every time it is employed, and unless there be some common agreement regarding it, not much good will come from comparisons between it and rival methods. We require to know its duration as well as quality, and that in connection with the disease and its severity. For instance, a man sprains his ankle sufficiently severely to require a month's repose. A surgeon would be unwise to remove restraint at the end of the first week on the ground that "rest" had been tried and had failed. And yet this is the common proceedure in joint cases where two, three or more months' "rest" is prescribed with almost mathematical precision, and if the goal is not attained, a change comes over the surgeon's principles. A skilful mariner, who has faith in his nautical science, finding he does not reach port at the time he thought, would never dream of sailing in an opposite direction. What is required in both cases is, sufficient belief in the means employed and patience to await the end. The quantitative estimation of rest therefore is essential to its clear definition.

Nor is it enough to pop a patient into a splint without the most careful adjustment takes place. Very few people indeed understand how to properly apply a posterior hip splint; more

especially in Liverpool, where one would imagine that opportunities for knowing how are greatest. Still the best splint is a trivial detail when compared with the theories which govern its best use. Indeed when a surgeon pins his faith to any special appliance, he is prone to place a mechanical reliance on its virtues which may render him negligent to the real welfare of his patient. While it controls it should be under control. A splint is no more automatic in its action than is a violin ; and the handle of a broom in the hands of a surgeon who understands the principles upon which recovery is based is of far greater power than the most efficient appliance in the hands of him who is ignorant of them. This explains the success of some who, notwithstanding awkward splints, attain results denied to a majority who fail to make even the posterior support succeed in serious cases. One great cause of failure is the fear which often seizes the surgeon lest limbs should become anchylosed from long confinement. In contemplating the future he forgets his present belief that rest diminishes inflammatory action, and that motion intensifies the disease upon the extent of which anchylosis is so often dependent. Nor are these fears allayed when cases are shewn stiff and deformed where the only rest has been that modicum prescribed by unassisted nature. They therefore resort to the lately fashionable "passive motions." This form of practice after undignified struggle is happily expiring, and not too early, for it has already done incalculable harm. Cases can be shown where despite diminishing range of movement, on discarding these manipulations and prescribing long continued rest, joint functions have been recovered. Even shampooers and bonesetters prefer to operate on healthy joints whereby their unsystematic wrigglings may at rare intervals release a bond. Whenever the joint is not sound, ample evidence can be produced to prove the damage they do and the motion they limit. The point is to test the patient before he has deserted his doctor and the truth of what I say will be evident. Such is the psychological problem that patients who visit these vampirès, despite the contrary, often assert improvement, and it requires an actual experiment to convince them of their error.

Passive motions will not admit of serious defence, and their practise is utterly alien to every principle of rest.

Another factor which most who think they fully prescribe rest resort to is extension. And this they do in the full belief that the joint participates in the full benefits of repose. Is it possible that stretching an inflamed capsule will conduce to its recovery? The assertion that muscular turbulence is quelled by it is no sufficient argument in its favour; for confinement from movement will very soon take all the power of involuntary spasm from muscular tissue. The chief clinical argument against the school of extensionists is that their success is only assured in the simplest cases, and that so large a percentage of the more serious cases are relegated to excision or amputation. Reference need only be made to standard works on the subject, and abundant evidence will be found to corroborate my statement, which is only tantamount to saying that failure to succeed condemns the methods employed. Nor are these results to be wondered at when we learn from Taylor, of New York, himself an apostle of extension, that the stretching sometimes destroys healthy articulations during the treatment of diseased ones. If this may occasionally be the case in regard to a healthy joint, what general effect can we expect it to have on a joint already soddened by disease.? Some defend it on the theory of the removal of intra articular pressure; a theory when applied to the hip where its benefits are mainly ascribed, can in the early stages only induce pressure upon the lower and inner aspect of the acetabulum and the corresponding portion of the femur. In the late stages it can only viciously pull upon the soft structures helping to form the joint. It may be laid down as an axiom that muscular control is easier and safer attained by fixation than by any degree of extension. This must be evident to any who have experience in fractures of the lower extremities, more especially if they are sufficiently heretical to put pressure upon a riding fragment. That pain is sometimes eased when weights are applied, and more especially heavy weights, is open to many interpretations besides that usually given, and whether a tense capsule becomes ruptured or traction is sufficiently severe to produce

paresis of the parts involved, both of which conditions are probable, we may feel certain that serious harm is being inflicted. Patients who have complained bitterly of extension are often instantly relieved on its removal, and the pain of which many complain when a splint is first applied is due to rectification of deformity, which it is a duty to secure, and which once attained is generally an indication of freedom from pain.

It is not my object this evening to affirm that excision should never be performed but rather to protest against its routine employment. Nor will the constantly met with phrase "suitable case for excision" be accepted until the term "suitable" (which involves the fallacy of *petitio principii*) be defined. Each surgeon, doubtless, thinks each case he excises "suitable" despite very different conditions. Mr. Wright of Manchester, who has written the latest work * on this subject, says:—"As soon then as there is any evidence of external abscess, excision should certainly be performed, and still better results would, I believe, be obtained by operating even before the pus has escaped from the articulation." It is against advice such as this that some effort should be made as it relegates to mutilation and deformity so large a proportion of curable joint cases. Without dwelling upon the difficulties involved in the diagnosis of pus in some of the early stages of the disease, I would submit that the vast majority of cases so operated upon, would have recovered with better limbs and with less risk under more conservative conditions. The little baby, for instance, which you have examined this evening, whose hip joint, though emptied of pus, has now so complete a radius of movement, would, had Mr. Wright's rule been adhered to, have been destined to limp for life. The early operator has no sort of advantage over him who relies on rest. The one exhibits a percentage of useful substitutes for joint movements with some operative fatality. In the case of the hip and elbow, movement is often aimed at and sometimes struck, often with much more

* Hip Disease in Childhood with special reference to its Treatment by Excision. By G. A. Wright, B.A., M.B. Oxon., F.R.C.S. Eng. London: Longmans, Green & Co., 1887.

effect than bargained for. In the case of the knee, an anchylosis is his best result. To him, on the contrary, whose patience can stand the test, better ends are in view. He cures a number whose joints become totally free from defect. Some only partially hampered in movement, and his worst cases need not take second place when compared with the operator's best. The one may shew a perfect joint, the other, do what he will, cannot. Excision, however, if it be performed, should be undertaken early if the mere record of consistent operative success be aimed at. But the early operator while he can claim a better operative record, has, by thrusting his operation so often between disease and its cure, done less to merit our surgical confidence than the surgeon who operates late and unsuccessfully. Early operation involves the destruction in the large majority of cases of the potentialities of recovery, and if this be as true as I believe it to be, no stronger adverse criticism can be offered. Mr. Howard Marsh, who is in advance of most of his contempories upon this point, draws attention to the fact that few are willing in private practice to undergo an operation which care and early treatment so generally negative. Mr. Mitchell Banks has sounded a similar note. And this is, I think, now getting more and more recognised. Even Mr. Wright who strongly supports early excision, says:—"In private practise cases are usually seen in the early second stage, and it is possible to ensure that the Thomas's splint shall be kept on and no strain thrown upon the joint hence recovery without operation is the rule." If therefore, by the admission of those, who do not practise rest in its fullest sense, cases in private can advantageously evade excision, it should be our aim to ensure for hospital patients a similar immunity. Excision at any stage is a confession of failure and surgical triumph is to be found not in the obliteration but in the restoration of a joint.

Some argue that patients can ill afford the time necessary to prolonged rest, and when a case is shewn to them with restored joint function having during disease presented much more than the bare indications for excision, they say, "Yes, but see how long it takes." They are thus forced, by evidence, to admit the superiority of result to any who can afford to wait, and excision

becomes thus reduced to a mere expedient of hurry. So long as a surgeon feels in such instances the almost unwilling creature of circumstances, there is a better time coming for even our hospital cases. Certainly with a hospital committee nagging it is not easy to do justice to joints, and fathers of families are often forced to sacrifice the utility of their limbs to the exigencies of their conditions. The same arguments prevail in the case of the one legged artisan hobbling on a wooden stump and denied by hard times the carefully constructed but expensive movable artificial limb. If this were understood, much of the enthusiasm of the wholesale excisionist would be damped when he realised that by the operation he was supplying to a patient who could not afford a better, a second rate commodity. In the case of children, however, where excision is most often performed, much of this *time* argument must disappear. But is so much time saved unless excision be performed early? The Clinical Society's Sub-Committee on hip disease reported that the average period occupied by rest at the Alexandra Hospital was two and a half years; and in Mr. Croft's cases of excision the recovery occupied a year and three quarters. In short, despite the fact that principles of rest were obeyed at this institution, which I have shewn to be deficient, the gain of time in favour of excision was only nine months. Against this presumed gain, you have to add the mortality of actual operation and the want of success so often inseparable from excision. Under the more rigid adoption of correct principles we have every reason to claim a shortened period for the disease. And should not the market value of a patient recovered with a good joint be more than compensation for extra time employed? which, for the sake of argument, may be admitted. The real truth is that excision, even in such cases, becomes popular only because the surgeon has not sufficient confidence in any other method, and thus the patient becomes deprived of hope.

I so frequently see the uninviting aspect of excision cases gone wrong with their shortened limbs, and flail elbows, and at best stiff knees, that their memories will cling to me, more especially when I read the tables of so-called cures written by

specialists and find phrases such as these: "two sinuses: can walk very fairly," again, "recovered; one sinus: not much discharge." Such experiences are not encouraging even in the light of those successful cases we hear more about and oftener see in public.

Some surgeons, however, excise because they fear the pathological conditions which the joint may evince. Rupture of capsule, ulceration of cartilage, synovial thickening seem to offer to them no likelihood of cure. I would with all modesty wish to reassure them. Huge joints become small, grating joints may become mobile, and cases which I have exhibited before you teach us not to shrink before extensive abscess with ramifying sinuses. Every serious case now recovered at one time possessed joint surfaces fit to adorn the ghastly shelves of our museums. It is the same in all disease. Nature's recuperative powers are not appreciated, and both physician and surgeon are constantly remined by unexpected results of the ease with which she may transform a pathological condition. We need but roughly glance back to note those surgical ailments which time and discovery have rescued from the category of incurable. That joints *do* recover with movement from extremely advanced disease is beyond question, all we have to do is, so to work out our principles that possibilities may become probabilities.

The fear of diathesis is, however, more general, and we all feel now and again anxious when a puny, sickly patient prepares to do battle with his diseased joint. At one time the term Struma was applied to all these cases, and of late this seems to be supplanted by the Tubercular theory. The terror of this latter term seems to have affected most medical minds, and many seem to think it useless to apply mechanical aid to the local manifestation of a constitutional state. Let it be understood, that whatever term be used the condition is curable, and this is vastly more important to all concerned than speculations regarding its morbid anatomy. Reference to the discussion on Tubercular Peritonitis, held at the Clinical Society on October 28th, 1887, will throw some light on this subject. It was proved by the experience of several surgeons, including Sir Spencer Wells,

that simply draining the peritoneal cavity, or cleansing it by means of a germicide, was sufficient in several cases to completely cure those affected. There was no question in the minds of the operators as to the nature of the peritoneal deposits as they were clearly viewed on abdominal section. This should encourage those of us affrighted by terms. But this question surely needs no debate, for most of us will be able to call to mind old cases of strumous or tubercular disease where a patient has come for the rectification of deformity, with a knee anchylosed, traces of old rib sinuses, an elbow bent, and glandular cicatrices. Such cases have weathered the storm and successfully, as far as some points are concerned, unassisted by art, and the conviction should be forced upon us that if so many get well under conditions of so marked neglect, how many more should be rescued by an intelligent and persevering use of means. I have one such case at present in the Stanley Hospital where I have performed osteotomy for an old sound but anchylosed and deformed hip. Her neck, ribs and knee bear witness to her diathesis, and, in spite of all, with little more than nature's help she had recovered. The case I exhibited here six weeks ago is also proof of its curability, and so are some of the patients you examined to-night. Indeed, those surgeons who excise, as I know some do, when there is barely any naked eye pathological condition, do it because of the diathesis; although most will now unite in rejecting the theory that the joint may become a focus of infective disease.

I would not class incision into the hip for removal of necrosis as an excision, although for some puzzling reasons some authors do. On ordinary surgical grounds a piece of dead bone which is of course irrecoverable can have no good mission in a joint. If only to secure free drainage and a hastened recovery, such an operation is absolutely necessary. We should remove any loose piece of bone which can be diagnosed in the joint.

Whether we determine to excise or endeavour to save joints, we do not always succeed in keeping our patients alive. While both schools have their rates of mortalities, it is at present impossible to make a comparative estimate. The mere placing results in parallel columns without regard to the special peculi-

arities of each case can serve no useful purpose. Nor can we condemn the prolonged treatment by rest until several fallacies in its general application are exploded. Amyloid disease, tubercle, and septicæmia are amongst the forces against which we have to contend, and not always successfully. That extensive and long continued albuminuria can be overcome without operative assistance some of my cases have proved to-night. Were it not monotonous, I could have largely increased the number, but sufficient have been exhibited to demonstrate the truth of my remark at a previous meeting that long continued confinement of the knee accompanied by suppuration was not necessarily productive of a stiff joint. Had such a condition been required by any of these patients, passive motions sufficiently assiduously conducted would have probably produced it, and extension would have added its weight in favour of destruction.

In conclusion, I would add that our efforts should be directed to assisting the curative efforts of nature and to removing all obstacles which frustrate that end. In the advance which is sure to be made in the treatment of diseased articulations we may feel convinced that better things are in store for us than excision. Surgeons cannot always remain content with stiff, short knees. Excision has nearly fulfilled its mission in saving from destruction limbs which, without a full knowledge of the benefits of rest, would have been lost. In future, surgeons will realise that it is more important to reclaim those tissues encroached upon by disease than to advocate their sacrifice.

Mr. Robert Jones and Mr. H. O. Thomas shewed amongst other cases the following in illustration of the paper :—

Case 1. J. Q., æt 6; suppurative arthritis of knee. Three years in splint. Strumous diathesis. Two years previously opened knee-joint on inner side. Discharging sinus for six months. Rest uninterrupted. Partial movement which is steadily increasing.

Case 2. Suppurative arthritis of knee. H. W., æt 16. Duration of disease two years. Suppuration of joint. Aspirated seventeen times. Joint finally opened. Albuminuria for four months. Shortening quarter of an inch. Good range of motion.

Case 3. Suppurative arthritis of hip; amyloid disease. C. B., æt 12. Duration of disease nine years. In splint for eight years without interruption. Aspiration thirty-five times. Six sinuses into joint. Half an inch shortening. Very good motion in joint.

Case 4. Suppurative arthritis of knee. Two sinuses into knee. Total duration of disease nine months. Deformed and anchylosed during disease. Good motion now.

Case 5. Suppurative arthritis of ankle. Twelve months in splint. Two sinuses. Prolonged pyrexia. Free motion in joint.

Case 6. Suppurative arthritis of hip with fifteen sinuses leading into joint. Kidneys diseased for two years. Hyperpyrexia for three years at short intervals. In splint for ten years. Patient twenty-five years' old. Can now walk six miles without being very tired. No deformity. Shortening three quarters of an inch.

Case 7. Suppurative disease of ankle. C. B., æt 8. Two sinuses. In splint six years. Movable ankle.

Case 8. Suppurative arthritis of elbow. Two sinuses. Patient under treatment for eighteen months, during which time liver was enlarged and albuminuria. Recovery with free motion.

Case 9. Suppurative arhritits of hip with lordosis and tilted pelvis. Eighteen months under treatment. Two incisions made. Correction of deformity. Shortening scarcely half an inch, although apparent shortening when first seen was three inches.

Case 10. Arthritis of hip. Splint taken off at meeting for first time after four years uninterrupted confinement to show that long continued rest did not result in anchylosis. Motion free.

Case 11. Suppurative arthritis of hip. Three abscesses into joint. Lardaceous disease and dropsy for twelve months. Complete recovery with three quarters of an inch shortening.

Case 12. Suppurative arthritis of knee. Knee splint five months. Very slight motion which is increasing.

Case 13. Suppurative hip disease in a baby cured after eighteen months' treatment, where only one aspiration proved necessary. Motion perfect.

Case 14. F. A., aged 15. Suppurative arthritis of wrist. Six sinuses which discharged for fifteen months. Free motion.

Case 15. R. W., æt 17. Suppurative arthritis of hip. Six sinuses. Duration of disease six years. Four years in splint. Albuminuria sixteen months. Three quarters of an inch shortening. Movement increasing.

Case 16. Suppuration of knee-joint. G. F., æt 14. Strumous disease of joint for six years. Four years in splint. Five sinuses into joint. Old disease of elbow and wrist. Cicatrices of excised lymphatics of neck. Albuminuria for five months. Tubercular family history. Free motion in joint.

Case 17. Abscess of elbow and shoulder. A. F., æt 14. Five years under treatment. Three sinuses into shoulder, four into elbow. Free movement in both.

Case 18. Hip disease of seven years' standing in youth of seventeen. Two sinuses into joint. Five years in splint. Moderate motion which is increasing. No deformity.

Case 19. Abscess of ankle and knee of four years in boy of nine. Tubercular family history. Enlarged glands in neck. Treated by complete rest. Three sinuses into knee, one into ankle. Recovered with fair movement in knee and complete range in ankle.

Case 20. Suppuration in hip-joint. Disease of seven months' duration in boy of ten. Good recovery with motion.

Mr. Robert Jones shewed several other cases of a similar kind in proof of his assertion at a previous meeting, that under the proper application of prolonged rest joints recovered their functions in spite of extensive suppuration.

FRACTURE OF THE LOWER JAW; NECROSIS; WIRED.

By Robert Jones, M.R.C.S.Eng., *Senior Assistant-Surgeon, Stanley Hospital.*

[Reprinted from the *Lancet*, 1882.]

I am indebted to the courtesy of Mr. Sheldon, for the privilege of treating this case.

George S——, aged five years, was admitted into the hospital on July 20th, 1881, suffering from a fracture of the lower jaw. The fracture, a compound one, was situated between the right canine and bicuspid teeth. Treatment at first consisted in adapting the fractured ends by means of wire attached to the teeth. This, however, proved futile, owing to the wire, which was too thin, breaking. A four-tailed bandage was then tried, but the lad, being of a restless disposition, continually succeeded in displacing the fractured ends, until a large piece of bone, three-quarters of an inch wide and an inch in length, constituting one of the fractured ends, necrosed. It was now impossible to keep the jaw in good position by ordinary methods, so a fresh operation was decided on.

On August 19th, the lad was anæsthetised and Thomas's operation of wiring performed. This consists in first extracting any loose teeth situated at the seat of fracture, and then drilling the jaw on both sides of the fracture, introducing silver wire from the outer side into one of the newly drilled openings, and out through the other. The fractured ends are then drawn together and two simple coils, so arranged as to admit of easy tightening, left between the cheek and gums. Three weeks elasped and still there was no attempt at union, and in a few days an abscess pointed beneath the chin, which required an incision. On Oct. 26th, he was made an out-patient; the abscess healed, but, withal, no union. On Nov. 12th, the coils were undone, without extracting the wire, for the purpose of separating the fractured ends and rasping their edges. This accomplished, the coils were once more tightened so as to place the fractured ends in apposition. In three weeks more union was complete and the wire removed.

During the whole of this treatment the little patient was permitted to talk and walk when and where he wished.

While in hospital his diet was limited to liquids and his relatives, when the child was made an out-patient, were urged to continue the same precautions. After the last operation, however, his mother confessed to his having done justice to the family meals from the third day after wiring to the date of recovery. During the uniting process it is necessary to tighten the slackening wire about once a week—a very easily porformed task, and one in no way painful to the patient. In this case the only deformity is the unavoidable one of a protruding upper jaw, due to the loss of bone from the inferior maxilla.

By the ordinary methods it was quite impossible to keep the jaw in line after necrosis caused so large a gap. Even were other conditions more favourable, the restless nature of the child was an active reason for continual displacement. The fact that in three days after the last wiring he was able to masticate potatoes and even bread, bears ample testimony to the effectual mode in which by this method the fractured ends can be guarded against movement. The operation itself is comparatively a painless one—an anæsthetic being rarely required—and generally speaking no difficulty is experienced in its accomplishment. It ensures better adaptation, and a less easily disturbed one than other methods, besides affording the patient very much more liberty, and securing him against the hideous display of drapery, inseparable from most other appliances. To those desirous of immediately attending their usual avocations this is distinctly a consideration.

UNUNITED FRACTURES OF HUMERUS, RADIUS, AND ULNA, SUCCESSFULLY TREATED; REMARKS.

By Robert Jones, M.R.C.S.Eng., *Senior Assistant-Surgeon, Stanley Hospital.*

[Reprinted from the *Lancet*, Oct. 28th, 1882.]

Case 1. *Ununited Fracture of the right Radius.*—J. K—, aged forty, a sailor, fractured his right radius on the way to New Zealand. The captain of the vessel undertook its treat-

ment for the first two months, which consisted in the application of the usual side splints. The patient on landing procured a surgeon, who proclaimed non-union, and persisted in the use of splints for a further period of six weeks. No success, however, accompanied this and, in J. K—'s own words, "For four months once a week the doctor took hold of my arm and elbow and shook it for five minutes." The patient subsequently returned to England; and in August, twelve months after his mishap, he was admitted as an out-patient at the Stanley Hospital. The radius was ununited at the junction of the middle with the upper third. Around the fractured ends some thickening was perceptible. He complained of pain at night, more especially when the previous day had witnessed much use of the arm. He was quite unable to do heavy lifting, and any attempt at closing the hand firmly produced "shooting pains" around the elbow. Further more a dependent position of the arm invariably gave rise to an unbearable feeling of fulness at the seat of fracture.

Case 2. *Ununited Fracture of the Ulna.*—R. S—, a sailor, aged fifty, became in October last an out-patient at the hospital. On examining him an ununited fracture was found at the middle of the ulna. The ends were freely movable and thickened, and the skin over the seat of fracture much hypertrophied. The subjective symptoms were, pain at night, loss of power in limb, and voilent neuralgic pains during damp weather. He gave the following history: Twelve months previously he broke his arm in a pugilistic encounter on the plains of the Argentine Republic. It was plastered next day by a practitioner, who advised the removal of the dressing in about a fortnight. This injunction the patient obeyed while at sea, but necessarily with unpleasant results. On his arrival at a foreign port, a doctor applied more plasters and advised more rest. For five weeks this treatment was adopted with no improvement save in the matter of pain. Three months later the patient arrived in England, where he immediately sought advice from a medical gentleman, who pro-

posed cutting down upon the fractured ends and excising them. This procedure he would not submit to.

Case 3. *Ununited Fracture of the Surgical Neck of the Humerus.*—J. R.—, fifty-six, was admitted an out-patient for fracture of the surgical neck of the humerus. He had met with the mishap the day before, and on his admission the contusion and swelling were so formidable as to render the application of splints quite out of the question; nor were these appearances sufficiently modified to admit of the use of supports until the ninth day, when the arm was immovably fixed. With the exception of the usual weekly trimming, this fixity was undisturbed for seven weeks, at which time there was absolutely no union. Three weeks more of anxious waiting and withal no change.

Remarks by Mr. Jones.—In the treatment of these cases I followed the method introduced to the profession by Mr. H. O. Thomas—that known as "percussion." Of this there are two varieties. The one consists in severely percussing the limb over the seat of fracture at long intervals; the other in its daily but gentle performance. Whichever plan be adopted elastic bands should also be tied above and below the fracture to induce local congestion and thereby facilitate the reparative process. More especially is this necessary at night time, when the circulatory system is less active than during the day. The hammering is performed with an instrument covered by an indiarubber cap, so as not to lacerate the soft structures. In its absence, however, anything almost will suffice. In Case 1, the bone being somewhat deep seated, I adopted the method of severe hammering, which I performed once a week. The patient tolerated it very well, and complained but little of the pain, although the indiarubber tubes tied round his arm at night made him very restless. I applied no splints, but merely permitted the carriage of his arm slung in hammock-like fashion. This lasted five weeks. After each beating a good deat of swelling and even some contusion marked the occasion. At the end of the fifth week,

having noticed a decided thickening of the ends of the bone, I applied splints for four weeks, removing them in time to find union complete. Case 2 is more interesting because more rare. In treating the patient I dispensed with the elastic tubes, and the bone being superficial it was, of course, better to try the gentle mode of percussion than that adopted in Case 1. Accordingly I hammered twice a week and kept the splints firmly applied. In a little over four weeks union was firmly established. In both these cases the treatment gave the patients hardly—if indeed any—more inconvenience than they had already endured. Case 3 differs from the others in being a less confirmed non-union. The patient was ten weeks in splints after a primary delay of nine days; and it is impossible to say but that another month's continuance would have produced union. I thought it best, however, not to trust to this alternative, and using my fist for a hammer, I worked away twice a week for nearly two months, with completely satisfactory results. I may mention that the elastic tubes may be applied immediately after the gentle method, but it is best after the severe mode to wait until the local irritation commences to subside, and thereby prolong it. Should the contusion be very marked, it would, of course, be unwise to apply them at all. As a matter of detail, I may add that the tubing should not always be tied to the same spot, or else ulceration may result. Generally speaking its application at night time is quite sufficient, and affords the arm very acceptable respite during the day.

FRACTURE OF HUMERUS, WITH DISLOCATION AT RIGHT SHOULDER AND ELBOW.

By Robert Jones, M.R.C.S.Eng., *Senior Assistant-Surgeon, Stanley Hospital.*

[Reprinted from the *Lancet*, 1883.]

R. P——, whilst plastering a lofty ceiling, fell, and in falling grasped at an open door. He came next day to the

Stanley Hospital, suffering from dislocations of the right shoulder and elbow, with fracture through the middle of the right humerus. The head of the humerus was felt beneath the clavicle. The radius and ulna were dislocated backwards, and the fracture was oblique. Splints were temporarily adjusted in order to permit of the necessary manipulations for reducing the luxations. This was easily completed without the administration of ether, the splints were readjusted, the arm placed in a sling, and the man requested to attend as an out-patient. In six weeks from the date of injury, consolidation had taken place, and movement both at elbow and shoulder was free and painless.

In treating the case it was thought wise to fix the elbow so as to restrain all movement, as signs of effusion appeared on the third day. This, however, was rapidly absorbed. The reductions were easily accomplished by gentle manipulations. The patient had at previous times dislocated both hips, and on three occasions the left shoulder.

ANCHYLOSIS OF HIP; REDUCTION FACILITATED BY FRACTURING THE FEMUR; REMARKS.

By Robert Jones, M.R.C.S.Eng., *Senior Assistant-Surgeon, Stanley Hospital.*

[Reprinted from the *Lancet*, July, 1883.]

Thomas F———, aged twelve, was presented as an out-patient on September 25th, 1882. In October, 1875, he slipped and fell on his hip. He walked home without discomfort and rested for two hours upon a couch. On trying to get up he experienced great pain, and was obliged to continue resting. By the evening the pain had disappeared and did not return for several months. Meanwhile, within a few weeks, the father perceived a limp. In six months this defect had increased, and the boy was taken to a surgeon, who applied a Thomas's posterior splint. This was worn for two years and a half, during the latter part of which the joint was

aspirated five times, and finally the abscess laid open. All this time the case progressed very favourably. At length the patient's eyes troubling him, and the parents dreading a "weakening" effect from the splint, removed it, and took the boy to an eye hospital. Fearing the resentment of the practitioner whom they had ignored, they visited at long intervals three other hospitals. At the first the patient was advised to wait until he became twelve years old; at the second a splint was applied, which chafed and had to be removed; at the third the mother was told that neglect had gone on too long to expect much good in the future. In despair the parents placed a patten under the diseased limb, which much increased the deformity.

The boy was admitted as an in-patient of the Stanley Hospital on October 5th, when it was found that the hip was very firmly anchylosed at an unusually acute angle (Fig. 1). The diseased limb was so much adducted as to prevent the free movement of the opposite leg. The patient in consequence perambulated in a series of semi-circles. The sinus had healed and lordosis was marked. It was very difficult to come to a positive conclusion as to whether the condition was that of synostosis or not, and the diagnosis was not assisted by anæsthesia. The general opinion inclined towards bony anchylosis. Movement at the knee was limited, but not to the extent figured in the diagram (Fig. 1).

The patient was placed in bed, and a Thomas's posterior splint was so adapted as to form a basis for traction on the deformity. In two days the knee was straight, but during the first fortnight no change occurred at the hip.

On October 19th, chloroform was administed, and forcible movements were adopted, which produced just a little motion. Patient was replaced in the splint. In four weeks the flexion at hip was completely remedied, but the adduction was the same as before. On the 25th, chloroform was again given, and an effort made at rotating the twisted femur. Immediately on attempting it, however, the bone broke just below the tro-

chanter major. The deformity was then reduced, extension applied to leg, the fracture set at the most useful angle, and the lad kept in bed for eight weeks longer. At Christmas

Fig 1.

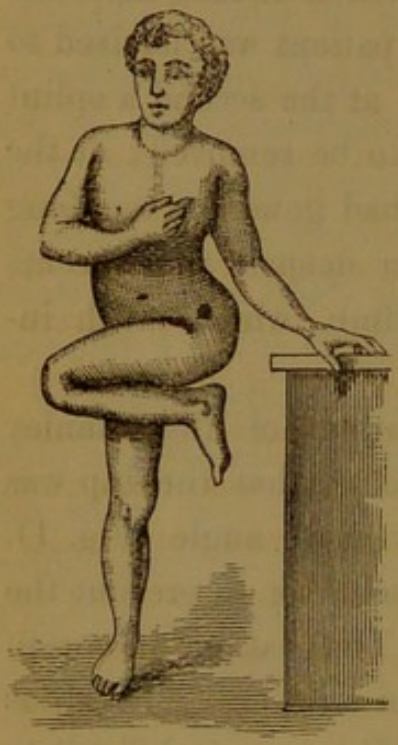

Fig 2.

the lordosis was materially better, and, shortly after, the thigh being strong, he was sent out in the hip splint, with instructions to buy crutches, and to fix a patten upon his sound leg in order to relieve the defective one from any pressure (Fig. 2). Patient attended regularly as an out-patient, much of the apparent shortening of the limb disappearing.

Feb. 19th.—Lumbar incurvation still lessening. Adduction quite remedied. Actual shortening of limb from pathological changes an inch and a quarter. The patten was now taken off the sound limb, and the crutches substituted by a stick, but splint retained. Since February the youth has gradually improved, and moves about with ease. He does not complain of pain; the sinus has not reopened, and the lordosis is less.

Remarks by Mr. Jones.—The previous history of this case

would suggest osseous union, otherwise means should have been adopted calculated to at least lessen the deformity. Indeed, before I had made a careful examination I had thought the condition a suitable one for subcutaneous osteotomy. The case is interesting in evidence of how much can be done by very simple means in cases of extreme malpositions. The treatment gave rise neither to pain nor constitutional disturbance. This, however, was unusual; for during the period when the parts are stretched into new position pain is rarely wholly absent. So soon as it was discovered that the least yielding occurred, the complete reduction of deformity was to be expected. Whether this could have happened without fracture of the femur is an open question. I believe it could. The weight of the limb afforded excellent antero-posterior extension, but when flexion was remedied the leverage requisite for the cure of adduction was not equally at command. The femur in a hip case of long standing is very easily broken, as, in common with other structures, the bone atrophies. This was so here, where, the patient being lean, the affected femur was felt to be scarcely more than half the thickness of its opposite, which, it must be remembered, was for mechanical reasons prevented from doing its work. The fracture doubtless was a valuable ally in perfecting and shortening treatment, and I see no reason to dread it in the future. The precaution is to guard against its occurring low down, and if splints be adjusted to support that portion of the bone we wish to remain inviolate, we may be sure it will yield where there is least resistance. Division of muscles or fasciæ in this case would have complicated matters without doing good. The precise pathological nature of the limitation to the action of the joint I do not know. Should the deformity yield to gradual extension, synostosis may be excluded. The great point is so to conduct the treatment of joint disease that we shall not meet with deformity, and that anchylosis, when it occurs, shall place the patient at the least possible disadvantage.

I am again indebted to the courtesy of my senior colleague, Mr. Sheldon, for the privilege of treating this case.

TREATMENT OF FRACTURES OF THE PATELLA.

By Robert Jones, M.R.C.S.Eng., *Senior Assistant-Surgeon, Stanley Hospital, Liverpool.*

[Reprinted from the *British Medical Journal*, November 24th, 1883.]

Some articles have of late been published by Mr. H. O. Thomas, upon "Fractures of the Patella and their Treatment;" and there has lately appeared in the *Journal* a case treated by Mr. Henry Parson, which illustrates a much older method of procedure. Mr. Thomas's method involves complete fixation of the knee until the bond of union between the fractured portions of the patella is sound, and consequently unyielding. Mr. Parson's splint permits "slight movement of the knee while walking;" a very grave defect, and one that calls for a little attention. The essentials of Mr. Thomas's apparatus consist of two parallel iron rods, terminating at one end in the heel of the patient's boot, and at the other in a nicely fitting perineal ring surrounding the uppermost portion of the thigh. A blacksmith can make it in a day, with a saddler to help, and their combined labour would scarcely realise ten shillings. A roll of soaked cotton-wool above, and one below, the patella, and a strip of plaister to bring pressure, together with a bandage, complete the plan by which the broken bone can be admirably controlled. With the splint on, the patient has no power of flexion at the knee, but full freedom of the hip. Mr. Parson, in describing his splint, adduces five arguments on its behalf. They embody the propositions that long confinement to bed is avoided; that the fragments are kept in good position; that security (?) against ankylosis is provided by permitting, during treatment, slight movement of the joint; and that there is maintenance of "activity in the parts to complete union."

If movement be permitted to the knee-joint during treat-

ment, it must of necessity be at the expense of immobility at the seat of fracture, the extent of harm being commensurate with the range of motion. In the particular case reported, movement was not attempted until the fifth week; but this I take to be accidental, as Mr. Parson lays down the rule that "as soon as the primary inflammation has subsided . . . the patient can begin to move about." The term "primary inflammation" is vague; but, if it mean the synovitis, with or without effusion, often present, a few days will generally suffice to overcome it. Should the patient, however, not commence to walk until imperfect union has occurred, Mr. Parson urges that movement of the fractured ends will produce "sufficient activity in the parts to complete the union." This is contrary to usage, and, I venture to say, to experience. We have only to inquire into the causes of non-union of other bones to find that consolidation is often absent where motion has been summoned too early. Fracture of the patella demands rest no less than other fractures; and, as Mr. Thomas has pointed out, one of the pregnant causes of defective cure in this very injury is flexion of the knee before the uniting medium is quite sound. This is proved by every day experience. How often we find cases discharged from hospital after two, three, and four months' sojourn, where patellar union seems all but perfect; and yet a very few weeks' use of the limb, with or without knee-cap, is sufficient to make both surgeon and patella gape! Previous treatment cannot be blamed for it; but the surgeon may be justly censured for permitting movement where its evil result is manifest. In Mr. Parson's case, the result does not wholly defend the means, for we have abundant proof of the good recovery of many patients from similar injuries, left to the tender mercies of even sea-captains. Isolated cases of good results will occur, whatever the treatment. The danger lies in the confusion of the *propter* with the *post hoc*. Mr. Parson adds:—"Slight movement of the knee in walking about prevents a stiff joint." This I emphatically deny, and

the proof is contained in two propositions :—1. Inflammation is an essential precursor of ankylosis ; 2. Inflammation is increased in a knee when moved. In a given case, the worse the inflammation, the greater the danger of ankylosis.

The advantages claimed for Thomas's method are freedom from confinement and efficiency of cure. With the splint on the patient is free to follow his outdoor habits in a couple of days after his accident, and that without the slightest risk. The apparatus forms a convenient perineal crutch, which withholds all flexion at the knee. A few days ago, at the Stanley Hospital, I removed a Thomas's splint from a corpulent old dame, who had worn it five months. Movement at the knee was very fair ; it will soon be nearly well. The fragments, which were two inches apart, are now in perfect apposition ; but the method I adopted saved me from all apprehension from the first. Lately I removed two splints which, for two years, had been correcting genu valgum, during the whole of which time no movement was permitted to the knee-joints. Movement is now nearly perfect. This is but one of several instances. I have seen upwards of twenty cases of fractured patellæ treated by Thomas's method, and never yet a stiff joint resulting. To ensure permanency of cure, it is often necessary to wear the splint six months ; and patients rarely complain of discomfort.

A NEW SPLINT FOR THE TREATMENT OF COMPOUND INJURIES AT OR ABOUT THE ELBOW JOINT.

By Robert Jones, M.R.C.S.Eng., *Honorary Assistant-Surgeon, Stanley Hospital, Liverpool.*

[Reprinted from the *Lancet*, March 20th, 1885.]

I have found the annexed figured splints very useful amongst the out-patients of the Stanley Hospital. One form (Figs. 1 and 2) is composed of two very flexible sheet-iron splints covered with felt, and connected by means of a firm

iron rod, so twisted as to extend beyond the elbow, leaving ample freedom for easy change of dressings, without interfering with the immobility of the joint. This is of great advantage where perfect rest and free drainage are requisite. For comfort's sake the forearm support is extended beyond the wrist—a detail which should on no account be neglected. The connecting bar must be sufficiently strong to admit of no movement at the elbow. Where the wound is unusually large and extends up the arm, I use a modified splint (Figs. 3 and 4), the flexible sheet-iron support being substituted by small wings, which are quite easily bent and can be moulded to the arm without any trouble. The splint is made at any

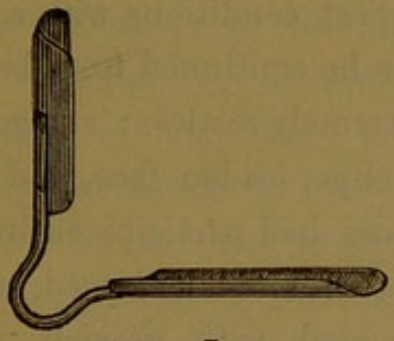

FIG 1

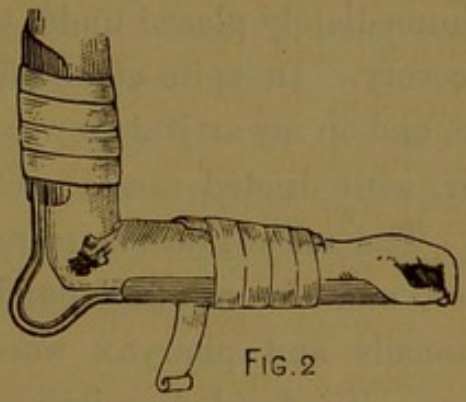

FIG.2

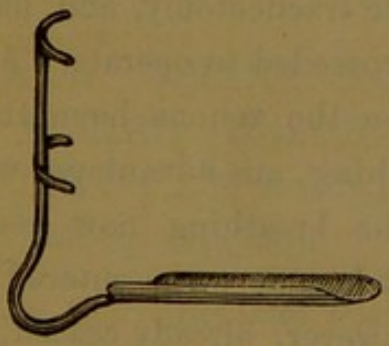

FIG.3

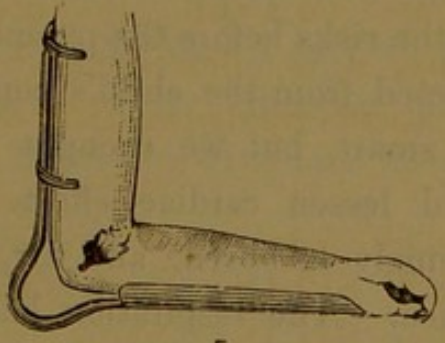

FIG.4

angle which the surgeon, regardful of the possibility of ankylosis, may suggest. This will vary according to the patient's vocation. Generally speaking, a right angle gives the most useful result.

The splints may be procured at a moderate cost from Messrs. Krohne and Sesemann, London; and from Mr. J. Critchley, Upper Pitt Street, Liverpool.

DIPHTHERIA—TRACHEOTOMY—PROLONGED ARTIFICIAL RESPIRATION—DEATH.

By Robert Jones, M.R.C.S.Eng., *Senior Assistant-Surgeon, Stanley Hospital.*

[Reprinted from *Medical Press and Circular.*]

On Saturday, August 22nd, I was sent for by Dr. Herbert Butcher, of Birkenhead, to consult with him over a case of diphtheria. The patient, æt. 6, had felt depressed for a week or more, and complained on August 21st of rigors, sore throat, and of frequent vomiting. He was placed in bed and poulticed by his parents. When Dr. Butcher visited him the same day he exhibited all the symptoms of diphtheria, and was immediately placed under the best conditions with a view to recovery. In spite of all efforts he continued from bad to worse, and on my arrival he was extremely restless: struggling for air, with dilated nostrils, blue lips, leaden face, and dull eyes. The nasal mucous membrane had participated in the disease, and the cervical glands were much enlarged, while the tonsils and pharynx were coated with greyish white patches. We decided on immediate tracheotomy, and, having laid the risks before the parents, proceeded to operate. As we expected from the child's condition the venous hæmorrhage was smart, but we thought anything an advantage which would lessen cardiac effort. The breathing now became extremely laboured, and Dr. Butcher at once entered the trachea. The respiration had, however, already ceased, and thinking the tube blocked he placed his mouth to it and succeeded in clearing it. Artificial aids were then adopted but still no breathing ensued, the child was pulseless. Windows were opened, fans worked, and during the whole time artificial respiration was kept up. At the end of half an hour there was apparently no result, but in another ten minutes the lips moved and we worked with hopeful energy. The legs and hands next moved, and in a little over an hour the patient breathed assisted by sharp applications of a wet cloth

to the abdomen. He was placed in a bed carefully covered with a canopy, and for fourteen hours the breathing was easy, but the pulse very rapid. Then restlessness, obstructed breathing, and death ensued in two hours.

The case is recorded in order to still further impress the advantages of unrelenting attempts to reinstate natural respiration. The child was practically dead before the trachea was opened, and at the end of half an hour after the operation the child could not breathe. A still further effort resulted in the prolongation of life for sixteen hours, and transformed what to parents would appear an operating table catastrophe, into a partially successful issue. We have had two or three samples lately of medical heroism, similar to that displayed by Dr. Butcher in this case, but courage should certainly be tempered by discretion. I very much question the morality of more than risking one's life for the sake of a highly problematical recovery. It is a species of professional suicide which seems to seize upon the most courageous in our ranks, and should, I think, be discouraged.

A NEW SPLINT FOR PLANTAR VARUS AND ALLIED DEFORMITIES.

By Robert Jones, L.R.C.P., M.R.C.S.Eng., *Honorary-Assistant Surgeon, Stanley Hospital.*

[Reprinted from *British Medical Journal.*]

I venture to bring before the notice of surgeons a cheap and useful splint for application to the foot after division of the plantar fascia. It is a modification of a splint with which Mr. Thomas sometimes treats disease of the ankle. It is made of iron, the foot-stem being curved with the concavity pointing towards the sole. To this stem is attached a crossbar with holes at each end, through which the bandage is introduced in order to forcibly pull the foot straight. A large pad of cotton-wool is placed on the prominent dorsum, its position

being often changed so as to avoid the risks with which continuous pressure threatens the tissues over thinly clad bones.

FIG. I.

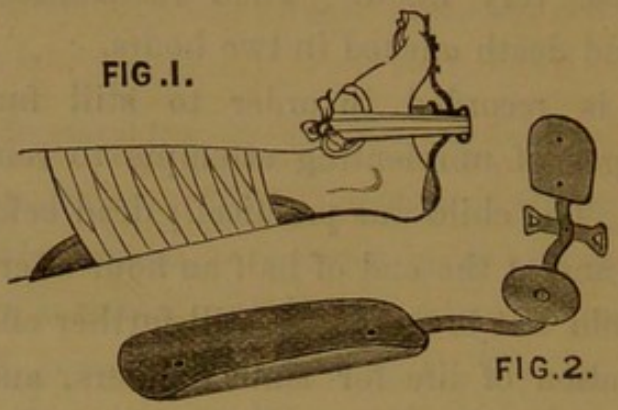

FIG. 2.

The advantages offered by the splint are its simplicity, ease of application, and efficiency. The portion of the sole operated upon is always in view, and if any bands of fascia become tight as the foot becomes stretched, they can be divided, the splint remaining *in situ*. It can be procured from Messrs. Krohne and Sesemann, of London, and Mr. Critchley, of Liverpool.

LIVERPOOL MEDICAL INSTITUTE.

LIVERPOOL MEDICAL INSTITUTE, January 19th, 1888, Dr. WILLIAM CARTER (President) in the chair. **Discussion on the Routine Excision of Joints.**—Mr. ROBERT JONES introducing the subject said that it was necessary to protest against a recent revival of excision in early joint disease, and agreed that the resort to early operative measures was proof that the correct principles of treatment were not understood. He stated that it was of immense importance to detect early disease, and to treat in such a manner that if it became serious no change of principle would be of use. There should be no difference in the theory of treatment in the case of a knuckle to that in the case of the hip. Suitable mechanical appliances should be fixed, so as to secure the utmost rest without compressing the diseased areas. Mr. Thomas's appliances best secured these ends. Mr. Robert Jones took as a sample the case of a knee which was supposed to be inflamed. Having secured it in a splint, he considered the effusion. If sensitive, he recommended an ice bag so slung as to give rise to no appreciable weight. He aspirated if, in a spontaneous collection, no diminution occurred in ten days. In the case of hæmorrhage, he advocated early aspiration to be repeated when necessary. If effusion, no matter what its character should give rise to, acute pain, or fever, aspirations should be insisted on. Two points were to be regarded in aspiration. (1) Not to operate until the knee was fixed in splint. (2) Not to use too fine a bored needle, lest prodding should be encouraged when the surgeon failed to get pus. It was not uncommon for him to aspirate once a week in certain cases for lengthened periods. If pus were thick or cheesy, or if constitutional symptoms arose, incision should be discussed. Personally he did not employ Listerism, as the lengthened time abscess took to heal only convinced him of the value of the simplest dressings. He thought drainage of more importance, and to see to the opening being in the most dependent spot. He strongly condemned transfixing the joint with drainage tubes. Incision should at once follow and check the ramification of abscess cavity. It was often necessary to wait long and patiently for improvement, and not to be deterred by retrogressive tendencies on the part of the joint. The vast majority got well if waiting were sufficiently long. Some recovered maimed, and a large proportion of even the worst cases finally attained movable joints. With the disappearance of pain and fever, let them don a walking splint so constructed as to allow progression and disallow articular motion. Country air worked wonders on their constitutions. He had many such patients with discharging sinuses living in country places who did not need to be seen for months at a time. The joint should be imprisoned long after the appearance of disease has gone. The knowledge whereby a joint can be affirmed recovered was very necessary, and was only in very vague terms referred to in text books, and that not correctly. It were as necessary to detect recovery as to detect disease, and the want of this knowledge accounted for the frequent relapses. Mr. Thomas' theory of the test of recovery was the most reliable, and was founded on the means of detecting early disease. The law might be roughly laid down that a joint was cured of disease when the range of movement did not diminish by use. Mr. Jones then dealt at length on the details of this method, and its practical applications. He further alluded to those cases which sometimes ran an erratic course, mainly in patients over sixteen. He urged that they were rare, and that the joints seemed too well to account for the symptoms on any but septicæmic grounds, and gave reasons for deprecating their excision. One great cause of

the frequent resort to excision was founded on the want of a practical acquaintance with the principles of rest. The term differed in meaning almost every time used ; its quality should be stated. Its quantitative estimation was also necessary to its definition. Another cause of failure was due to inattention to the mechanical details of splintage. In Liverpool and elsewhere very few really understood the proper application of the posterior hip splint, so that its full benefits were rarely attained. A splint was no more automatic than a violin. Another fallacy was the fear of anchylosis from long confinement. Mr. Jones removed a hip splint before the meeting, from a boy who had been confined four years in it, and who, up to that moment, had not had his splint removed. Motion in the hip was, in spite of this, quite good. "Passsive motions" he also condemned it as utterly alien to the principles of rest. The extension of joints was even worse. The main clinical argument against the school was the frequency with which they advocated operation. Extension had been proved to induce disease in the strong and resisting tissues of healthy joints; how, therefore, could articulation soddened by disease be benefited. An inflamed capsule could not be improved by stretching. In the case of the hip in the early stages, extension could only induce pressure upon the lower and inner aspect of acetabulum, and adjoining surface of femur. Muscular control was easier and safer attained by extension. The speaker accounted for the relief of pain which at times attended excision ; he considered the advice tendered by Mr. Wright, of Manchester, to excise as soon as abscess was detected, as extremely retrogressive. If followed, it would relegate to mutilation and deformity, a large number of curable cases. The little baby, for instance, exhibited that evening with perfect motion at the hip, would be destined, had his advice been followed, to limp for life. So would fifteen or sixteen of the other cases. The operator could claim no advantage over him who relied on rest in its full sense. The former did not cure but obliterated joints, whereas, the latter cured a number which became totally free from defect, others were partially defective, and his worse cases compared favourably with the operator's best. Howard Marsh and Mitchell Banks had pointed out the infrequency of operation among the well-to-do, and Mr. Jones argued that endeavour should be made to place on equal footing hospital patients. When cases were shown to advocates of excision which had recovered in spite of the worst disease, they argued still in favour of operation, because of time saved. They could not deny superiority of result to those who could afford to wait, but resorted to operation as an expedient of hurry. The same argument would relegate a one-legged artisan to a wooden stump, instead of an expensive artifical limb, and did not argue against treatment by rest, but against his good fortune. In the case of children there could be no excuse for this argument. Mr. Jones then argued at length to prove that the time saved was very trivial unless almost healthy joints were excised, although the treatment of those who practised rest was deficient in many elements which he, Mr. Jones, thought essential to the correct appreciation of the term. He added that the improved market value of a man properly cured would outweigh the defect of length of time. To this should also be added the direct mortality from operation and the frequent flail sequelæ. Some surgeons excised because of the pathological conditions they diagnosed. They seem unaware that recoveries could take place where rupture of capule, abscess of joint, synovial thickenings and ulceration of cartilage, had taken place. The cases shown that evening with numerous sinuses and movable joints should reassure them. The fear of diathesis, more especially the tubercular, alarmed others. Either the term was much too frequently applied, or the disease was curable. He referred to the discussion on tubercular peritonitis held at the Clinical Society on October 28th. He maintained that all surgeons of experience would be able to refer to old cases of strumous or tubercular disease where patients had recovered unassisted by art. and had appeared at hospital for the rectification of deformities. Some of the cured cases exhibited that evening

betrayed typical strumous characters. He would not include under the term excision those cases of incision into hip for the removal of necrosed bone, or loose bone; such operations on surgical grounds were urgent. After summing up in favour of saving joints in preference to excising them, Mr. Jones urged that it was more important to reclaim those tissues encroached upon by disease than to advocate their sacrifice.

Mr. ROBERT JONES and Mr. THOMAS showed, amongst other cases, the following in illustration of the paper:

Case 1.—J. Q., æt. six; suppurative arthritis of knee, three years in splint. Two years ago abscess of knee opened on inner side. Rest uninterrupted; movement of joint increasing.

Case 2.—Suppurative arthritis of Knee. H. W., æt. sixteen. Duration of disease two years. Suppuration of joint. Aspirated seventeen times. Joint also opened. Shortening quarter of an inch. Good range of motion.

Case 3.—Suppurative arthritis—amyloid disease. C. B., æt. twelve. Duration of disease nine years. In splint for eight years without interruption. Aspiration thirty or forty times. Six sinuses into joint. Half-inch shortening. Very good motion in joint.

Case 4.—Suppurative arthritis of knee. Two sinuses into knee. Total duration of disease nine months. Deformed and anchylosed during disease. Good motion now.

Case 5.—Suppurative arthritis of ankle. Twelve months in splint. Two sinuses. Prolonged pyrexia. Free motion in joint.

Case 6.—Suppurative arthritis of hip joint with fifteen sinuses leading into hip-joint. Kidney diseased for two years. In splint for ten years. Patient twenty-five years old. Can now walk long distances. No deformity. Shortening three-quarters of an inch.

Case 7.—Suppurative disease of ankle. C. B., æt. eight. Two sinuses. In splint six years. Movable ankle.

Case 8.—Suppurative arthritis of elbow. Two sinuses. Patient under treatment for eighteen months, during which time albuminuria was present and liver enlarged. Recovery with free motion.

Case 9.—Suppurative arthritis of hip with lordosis and tilted pelvis. Eighteen months under treatment. Two incisions made. Correction of deformity. Shortening scarcely half an inch, although the apparent shortening when first seen was three inches. Free motion in joint.

Case 10.—Arthritis of hip. Splint taken off at meeting for first time after four years to show that long-continued rest did not result in anchylosis. Motion free.

Case 11.—Suppurative arthritis of hip. Three abscesses into joint. Lardaceous disease and dropsy for twelve months. Complete recovery, with three-quarters of an inch shortening.

Case 12.—Suppurative arthritis of knee. Knee splint five months. VERY SLIGHT movement, which is increasing.

Case 13.—Suppurative hip disease in a baby cured after eighteen months treatment, where only one aspiration proved necessary. Motion free.

Mr. JONES showed several other cases of a similar kind in proof of his assertion at a previous discussion, that under the proper application of prolonged rest joints recovered their functions in spite of extensive suppuration.

Dr. ALEXANDER said he deprecated routine treatment of any kind, and he certainly deprecated the routine treatment of joints. The advocates of rest, however, sometimes went too far, and cases were lost through their unwillingness to operate. He disagreed with the early "excisionists," and thought excision should only be performed when dead bone required to be removed. The great majority of diseased joints could, however, be cured by rest, especially rest commenced early and long continued. In spite of rest a number of cases drafted into hospital for operation, and often when admitted the disease would only admit of amputation. By earlier operation the limb might have been saved. He did not think aspiration was always necessary in hæmathrosis.

Prof. RUSHTON PARKER would not attempt to criticize severally the many points taken up by Mr. Jones, but in general terms agreed with most of the views he expressed. There was no doubt that among surgeons who had carefully devoted themselves to the improvement of their mechanical treatment of joint affections, the necessity of excision had greatly declined in frequency. Not that excision could ever be totally abolished, but they had certainly come to be less relied on in Liverpool and London. By the force of example, too, the number of such operations had been further diminished, just as in a former time the same influence had led to their multiplication.

Mr. PUZEY congratulated Mr. Robert Jones on having been able to collect such a large number of patients to illustrate his views. The cases showed the result of great patience and perseverance on the part of the surgeon, and of great patience and faith on the part of the patients, many of whom bore abundant marks of the trials through which they had passed. There appeared one serious objection to this expectant treatment in the case of the working classes, and that is the length of time over which it extends—two or three of the cases had required seven years, one or two nine years, and one over ten years for cure. Surely in such cases excision would be preferable. As an example of his meaning, Mr. Puzey mentioned the case of a boiler-maker who had been off work for three years under expectant treatment for elbow-joint disease; when he came to the Northern Hospital Mr. Puzey excised the joint, and the man returned to his old work in six months' time with a strong and perfectly-movable elbow. With young people and children, of course, time is not such an object, but even in their case serious risk is incurred from prolonged and exhausting suppuration, with its frequent result of visceral mischief. The cases shown that night were most interesting, and in themselves remarkable successes; but the most important point was what proportion did they bear to the non-successes; to the cases which had ended in excision, or amputation, or death? The experience of surgeons to general hospitals and parish infirmaries was that too prolonged reliance on the expectant treatment of joint disease ended too frequently in amputation or in death, either directly from the joint mischief, or indirectly from induced visceral disease.

Mr. BARK congratulated Mr. Robert Jones on his paper. He remembered the epidemic of excisions about the year 1874 or 1875 so feelingly referred to by Mr. Rushton Parker, and had a vivid recollection of the exhaustive suppuration, the long and tedious character of the healing process, the flail-like movement of the limb after healing took place, and the numerous secondary operations in the form of amputations. He had an experience of more than twelve years in the treatment by rest and proper drainage, so ably advocated by Mr. Jones, and had never been disappointed, or ever felt a desire to return to excision. Mr. Puzey mentioned a very successful case of elbow-joint excision as an unanswerable argument in favour of his side of the question; but all surgeons knew that this joint was the most favourable for the operation. He would have liked Mr. Puzey, or the other gentlemen who vaunted excision, to have produced a few cases of hip or knee-joints as favourable in duration and ending as his elbow case. He maintained that Mr. Robert Jones had proved, theoretically and practically, what he intended—viz., "That diseased joints may be treated by prolonged rest and drainage, even after extensive suppuration, without impairing the mobility of the joint."

Mr. GEORGE HAMILTON regretted not having reached in time to see Mr. Robert Jones's cases, but he thought that generally excisions gave better results than rest. He had witnessed some excisions which had been performed very early, where good movement resulted. He, Mr. Hamilton, knew of a case of hip disease in his neighbourhood, where, after treatment by complete rest, and that by one who was well acquainted with the method, the child now wore three inches under the sound foot. He thought that was worse than excision. He felt sure that if Mr.

Jones knew the end of his cases he would find some of them gravitated to the Northern Hospital. He thought Mr. Robert Jones would one day begin to excise.

Mr. RHINALLT PUGHE believed in the usefulness of excision. He thought there was no merit in curing joints if the patients ultimately died of amyloid disease.

After a few remarks from Dr. BARR, who suggested a verbal alteration in the paper, Dr. ARCHER asked what became of patients who were the subjects of amyloid disease. Did they recover, or ultimately die of phthisis?

The PRESIDENT expressed himself much interested in the discussion, and asked Mr. Jones whether he noticed any diminution in the size of the amyloid livers during treatment. He related a case of Mr. Paul's where, after an operation for suppurative disease, the amyloid disease disappeared. It would be very interesting to learn whether Mr. Jones's amyloid cases fully recovered.

Mr. H. O. THOMAS, while agreeing with some of the opinions expressed by previous speakers, drew attention that in neither medicine nor surgery have we infallible forms of treatment; whether joints be treated by the utmost attainable rest, excised, or amputated, there must be a mortality. He further maintained that if our principles were reformed the mechanical treatment of joints would also improve; and that no improvement in the construction of instruments will avail until the theory of treatment is set right. The mortality attendant upon attempts to conserve diseased joints will not diminish so long as we continue so heedless in searching after correct principles. He contended also that the best excision never equalled a conserved though anchylosed joint. Mr. Hamilton referred to a case of conserved hip-joint in which there was shortening of three inches. The case had been under treatment some years ago, when the patient was only four or five years of age, and had recovered with anchylosis. There was no trace of lardosis or angular deformity. As in excisions, the shortening is relative to the age of the patient, and to the time at which the operation is performed; for if the patient is a very young one the shortening when she arrives at the adult period is much greater than would remain after excision in adult life. The history of the case Mr. Hamilton alluded to is, that some years ago, the patient was treated for slight hip-joint inflammation, and during which treatment a practitioner of medicine casually visited the patient's home, and also examined the case, giving at the same time the emphatic opinion that the child was not, and had never suffered from hip-joint inflammation. This diagnosis induced the parents to suspend all treatment, with the result that the hip-joint suppurated, sinuses formed, and the kidneys became affected; still it ultimately recovered with a useful limb. It is true with the defect of anchylosis and shortening, yet much more to be preferred to the defect known as flail, and the greater shortening to be observed after some excisions. In his own practice, in principle his treatment of joint disease was characterised as the indirect method. All retention being applied to sound parts, just as in medicine, sometimes the beneficial action of the remedy follows from its effects upon parts healthy, affecting only indirectly the diseased area. Joints suffering from traumatism, the speaker admitted, were very tolerant of the direct method of retention. Referring to Mr. Bark's early experience of excision, he also had a vivid recollection of the fearful epidemic for excising, that lasted from about 1857 to 1877, and could exhibit, if required, flail hips and elbows, and hips still discharging pus. He met with one case of hip flail after a recent excision. It was an excellent case as regards sound recovery, but the lower extremity remained attached to the trunk by what might be fairly termed a pedicle, permitting of such liberty that the subject could tickle his ear with his big toe, and that only when the hand was used as a guide.

Mr. ROBERT JONES, in reply, said that many cases of amyloid disease recovered during treatment, and that five or six cases had been shown

that evening. He added that vexatious and irritating treatment would be likely to induce the amyloid condition. Mr. Puzey had chosen the cases that had taken the longest time in order to disparage the treatment by rest. Mr. Jones, however, had chosen samples of such cases in order to show the motion that ultimately accrued in cases which text-books would denounce as disorganised joints. He had, however, shown suppurative joints cured in nine months. Mr. Puzey, however, had not referred to the movable joints obtained by rest and precluded by excision. He thought it was too much, after upwards of twenty cases had been shown, all of them recovered from the worst type of disease, to be asked what became of the others. It might be equally asked of Mr. Puzey's excisions. Nor did he think Mr. Hamilton's reference to the Northern Hospital likely to assist in the discussion. It was far better not to compare the merits or demerits of individuals or institutions. Most of the cases shown that evening had had previous treatment elsewhere ; but the patients had been specially told not to refer to it. After answering various speakers, he hoped that the cases shown that evening would be a plea on behalf of joints threatened with excision, and he thought that members would agree with him that long confinement and extensive suppuration of joints did not preclude recovery with good motion.

A FEW COMMON ERRORS IN THE TREATMENT OF FRACTURE.[1]

By Robert Jones,

SURGEON TO THE LIVERPOOL STANLEY HOSPITAL.

If we wish to succeed in the treatment of fractures, we have to regard at least three points. The first is that fixation should be efficient and sufficiently long continued. The second, that apposition be good, and the third, that the circulation of the limb be not unduly hampered. Elementary as these canons appear to be, most failures can be traced to disregard of them, and this not because of scepticism concerning their importance, but by reason of defective knowledge of the means to attain desired ends.

If we wish fixation to be efficient, we must see that leverage is not deficient. We must not treat the surgical neck of the humerus by an inside splint reaching only so high as the axilla. Nor should any theories we may hold concerning stiff wrists prevent our remedy for Colles's fracture from extending to the knuckles; nor should fractures of the upper third of the ulna and radius be treated without locking the elbow joint; nor for similar reasons should the knee be left free when the upper portion of the tibia has been severed.

To secure efficient fixation we should employ splints with sufficient concavity to permit of their slightly overlapping limbs. By this precaution we avoid that constant twisting which characterizes the movements of limbs confined in the old-fashioned plane splints. In relation to circulation we should bear in mind that any interference with the blood supply to the fractured ends materially retards the curative results, and for this reason we should avoid tight bandaging. Many cases of non-union are due to this error. A badly set fracture generally gives rise to no worse complication than deformity, but tight bandaging may be guilty of any crime between simple discomfort and gangrene. Most frequently, however, delayed-union is the evil result which must be laid at its door. On several occasions I have been shown cases which have far exceeded the normal period of treatment where the fractures have apparently made no effort at repair. Success is generally assured in such, provided free circulation be encouraged and local stimulation applied by means of fist or hammer. Gentlemen will bear me out when I say that in nearly all

[1] Read at the North Wales Branch Meeting at Colwyn Bay.

cases of ununited fractures, say of the femur, patients will unrol yards of bandage, which leave marked depressions behind, and which strongly suggest the continuance of an initial error.

The same results occur if splints are chosen which are not sufficiently wide. It is always better in cases of fracture to apply splints wide enough to admit of a space between the bandage and flesh. Under the bridge so formed the blood supply to the limb is unhindered, and there is little or no danger of any congestive disturbances. Again, in this connexion, we have many errors in the distribution of pads. There is a danger of so placing them, that although apart from each other, they would if approximated form a ring around the limb. The mechanical power of the pad is almost unlimited, and it requires, therefore, much care that error be excluded in its application. Pads should never be applied over large blood-vessels.

A very common mistake consists in carrying the splints for fractured forearms or legs too high. This is very easily overlooked, and should be remembered. In setting a forearm it is well to flex the elbow, and so make sure that the top of the splint does not press into the bend of the elbow. The same principle holds good in the case of the popliteal space. I have committed both these blunders, and the patients rarely forgot to indicate their contempt for my mechanical *acumen*.

Doubtless it is very important to attain good apposition, but with the exception of fractures of the lower end of the fibula and radius, it is not important to attain immediate reduction of deformity. It is one thing to strive for immediate symmetry of limb, another to aim at putting the bones in absolute line. No matter how great the swelling or painful the limb, it should not be allowed to remain crooked, and any bone pressing on the skin should at once be replaced. Neglect of this precaution may result seriously, either in relation to the vitality of the limb, or in transforming into a compound that which should have remained a simple fracture. A careful adjustment of pads will rectify without any difficulty any bone irregularity during the first fortnight, and with special methods will correct misplacements much later. Great care is necessary from the point of view of apposition in the choice of splints, and without going into details I would condemn the routine use of plaister-of-Paris and of Gooch splints. The former if put on at once, as is now a growing custom, becomes slack as soon as the swelling has subsided, and admits of motion. It practically does away with the intelligent use of pads. It does not allow harmless inspection, and, therefore, what should have

been corrected becomes confirmed. If put on when the swelling has disappeared, it is still a form of circular compression, which tends to interfere with the vitality of the limb, and often delays union. When placed round the thigh in fracture about the fifth week, to allow of walking, its action is very pernicious. A thigh of normal length may be indefinitely shortened, as the support merely represents a casing sufficiently loose to allow of a telescopic action of the leg within it. The drawback in principle of the Gooch splint, now so generally used, should be very apparent. For example, consider its bearings in fracture of the radius: it will not yield lengthwise, but laterally it will to any extent, the result being that it may press the fractured ends of the radius on to the ulna, if the bandaging is sufficiently stern. In fact, the splint depends largely upon the bandage for the shape it takes—a defect surely sufficiently grave.

Unless very carefully superintended, pads should not be placed on thinly-clad bones, otherwise a slough will result. Twelve hours should be the outside limit allowed it to remain. Then, whether a complaint be made or not, the spot should be inspected. Over and over again I have told house-surgeons not to mind the patient's sensations, but to feel convinced that after a certain pressure a slough may be expected. To the astonishment of some who have neglected my advice, they have discovered a black slough, although the patient has been in absolute comfort. If therefore it becomes imperative to employ pads in such positions, we should remember to change frequently, and at stated intervals, regardless of the patient's feeling or comfort. Perhaps the most serious error in the treatment of fractures is the two early casting off of restraint. This in the case of pauper patients is unfortunately more or less inevitable, because of the coercive tendencies of hospital committees, but in the well-to-do classes some rule should govern our conduct. Over and over again we read of cases sent out with normal limbs, coming back two months later with two and three inches shortening. Here it will be of interest perhaps if I state the time I am in the habit of keeping patients under restraint for various fractures.

	Total Restraint.	With further Partial Restraint.
Femur	8 weeks	3 months
Tibia and fib.	5 weeks	2 months
Fibula	4 weeks	2 months
Potts	4 weeks	1 month
Humerus	6 weeks	6 weeks
Radius and ulna	4 weeks	2 weeks
Colles's	5 weeks	2 weeks
Clavicle	4 weeks	2 weeks

It is well to place a patient suffering from fractured femur in a calliper splint so soon as the seventh week is past, and then no amount of perambulation will interfere with the length of limb. It is very necessary during the period of total restraint not to fall into the error of curiosity. Some surgeons are never content unless they worry the fractured ends week after week to see how consolidation is getting on. Such procedure is as unscientific as the action of a cook who opens her oven every five minutes to see how the hot pot progresses. Until the normal period of the onset of consolidation, absolute rest should be ensured. In spite, however, of this injunction, the progress of the fracture should be watched, and deformity from time to time remedied. This can only be done by so arranging splints, that while one is off there remains a sufficient support for the fracture during inspection. There is no difficulty in this, and it should always be insisted on. If union is delayed, patiently wait without panic for three weeks longer, and give the seat of fracture meanwhile a severe pummelling with a covered pestle, after Mr. Thomas's method. Books warn us against putting pressure on riding fragments; and, of course, common sense would tell us not to press against a sharp end of bone. It is often, however, excellent practice to forcibly keep a riding fragment down, and only requires the exercise of ingenuity for its attainment.

When fractures take place into joints, great care must be taken to ensure perfect and uninterrupted rest. Avoid the text-book advice of passive motions. Time will not admit of my discussing this, but I may briefly state that if the joint becomes inflamed, motion will increase its severity; and if there be no inflammation of joint, motion will increase the quantity of secreted callus, and limitation of joint function will be thereby facilitated.

Just a word or two in regard to the treatment of special fractures. I have elsewhere treated more fully of Colles's fracture, but I would repeat here the necessity of at once thoroughly reducing the deformity. If this be done it will give but little subsequent trouble. The after-treatment enjoins rest for the wrist joint; five weeks incarceration, and no passive motions. Should, however, deformity meet the efforts of surgeons, this can be rectified even so long as nine months after injury, by means of a special wrench used by Mr. Thomas for club-foot. I was the first to attempt the reduction of old Colles' and Potts' fractures, and published a list of six successive cases. Since then Mr. Thomas has added to the number, and I have operated on fifteen patients. The only additional point to remember about Potts' fracture is that the ankle during

treatment should be kept at right angles, otherwise tenotomy may have to be ultimately performed. Nearly every practitioner dealing with Potts' fracture counsels and practises delay during the swollen condition of the injured ankle. This is a bad practice, and for it should be substituted early and complete reduction.

We all know that despite the worst treatment, fractures will recover, and that oftentimes patients left to the tender mercies of nature will recover from even serious injuries. Now and again, however, failure will threaten, and we have to fall back upon principles which, if of advantage then, should be our routine custom. By aiming always at restoring the limb to the condition prior to accident, we do not merely avert non-union, but promote an elegant and artistic result.

NOTES ON THE USES AND APPLICATION OF THOMAS'S HIP SPLINT.

THOMAS'S splints are at present in such general use that it may be thought an unnecessary task to demonstrate the principles of their application. Such, however, is not the case, and the frequency with which, during the last two or three years, I have been asked to explain at hospitals and Branch meetings their somewhat puzzling functions proves the need of information on the subject. In the present article it will be impossible to do more than briefly run over the main features of the hip splint, without regard to those splints designed for the knee and ankle.

The hip splint is composed of wrought iron, which must be sufficiently malleable to admit of being moulded into shape by suitable wrenches, and sufficiently unyielding to prevent any modification in shape by movements, voluntary or accidental, on the part of the patient. Most surgeons give their instrument makers instructions to make the splint light and narrow, apparently unconscious of the fact that the bed and not the patient has to bear its weight. If the splint be made light, the patient usually soon distorts it, and is cured if at all in a deformed position, while motion is allowed to a joint which requires uninterrupted rest. As each splint should be moulded to its patient, and may frequently require readjustment in conformity to the progress of disease, it follows that splints made of unyielding material, such as steel, will be badly fitting and inefficient.

The splint (Fig. 1), which is covered with leather, consists of three wings, A B C (Fig. 1), and an upright or stem (Fig. 3).

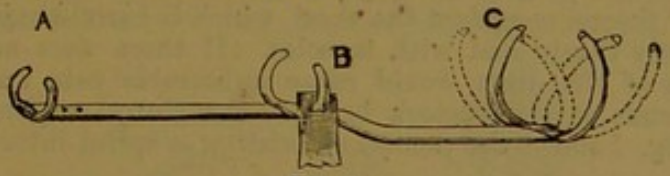

Fig. 1.

Wings.—The top wings extend two-thirds around the chest, at about the level of the nipples. The second extend two-thirds around the thigh, about an inch or two below the groin. The leg wings bear similar proportions, and reach lower than the middle of the calf. They should all be much more easily bent than the upright, and the uppermost should terminate in loops, meant for the reception of

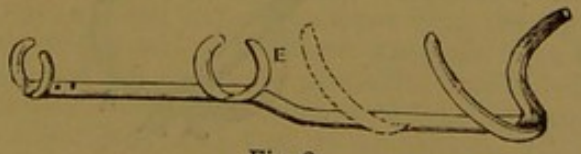

Fig. 2.

bandages, which extend from the top of the stem (Fig. 5, A) and round the shoulders.

Upright or Stem.—It consists of a body portion, a thigh portion, and a buttock bend. The body portion should be parallel to and longer than the thigh portion. This question of direction is extremely important, as any modification of it will invariably tend to the

maintenance of deformity, and often to the production of pain. The incline in the buttock bend is variable, and in a case where a trochanter is enormously hypertrophied, it may almost be dispensed with. In that case the body and thigh portions are not merely parallel, but almost complete a straight line.

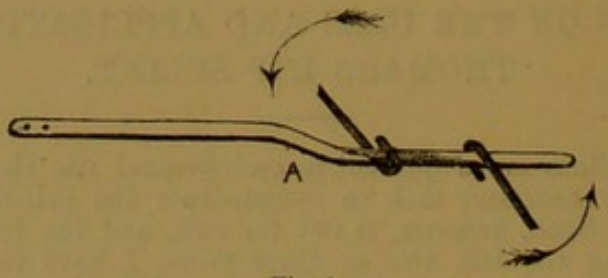

Fig. 3.

Measurement.—In measuring for a splint, the distance from the axilla to middle of leg should be stated, with the side affected.

Application.—The buttock bend (A, Fig. 3) should be *in situ* midway between the sacrum and the trochanter major. The body portion of the stem requires in every case a twist with the wrenches (Figs. 10, and 3). This will be readily understood when we recollect that it lies to

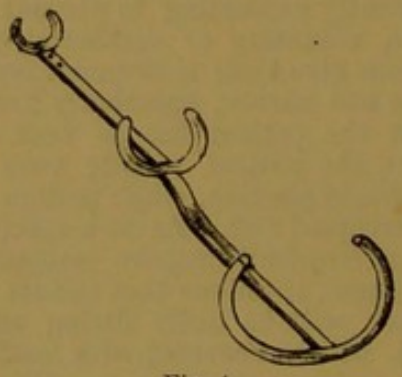

Fig. 4.

one side of the spine against the chest, which is barrel-shaped, and the ribs are only thinly clad with muscles. If there were no twist the inner edge of the stem would cause unbearable pain and soreness. The twist ends at the buttock bend as the gluteal region is flat and fleshy. Fig. 3 shows the process of twisting a splint intended for the

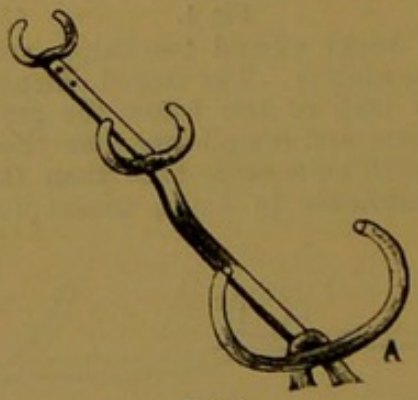

Fig. 5.

left side. The wings have been dispensed with for convenience of demonstration. Obviously the twist should be just sufficient to permit the chest-wall to lie in juxtaposition to the flat surface of the splint. It is important to remember that in the majority of cases there is a strong tendency for the splint to escape to the outer side of the diseased limb, and it is very necesaary to counteract it. There

are three principal ways of doing this, and in each the wings play their part. It is necessary to adopt a combination of the three methods rather than trust to any one. The methods are (*a*) making room for the body in a direction calculated to keep the splint towards the spine ; (*b*) fixations of the inner wings ; (*c*) special bandaging.

Fig. 7 clearly shows methods (*a*) and (*b*) in action. It represents a transverse section through the trunk, thigh, and leg, with a right splint in position. As the tendency, therefore, is for the splint to escape towards the right, the wings B, C, and G are left open, so that all movements of the body will carry it towards the right side. At the same time this tendency is intensified by our manipulation of the inner wings A, D, and E, which are pressed moderately tight against the body and limb. The splint, therefore, cannot escape without cutting its way through the patient.

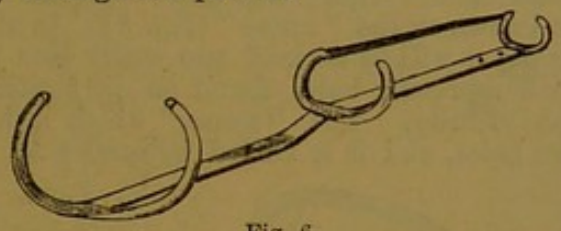

Fig. 6.

These preventives are fortified by another very simple expedient, which consists in making a small hole in the bandage, and passing through it the outer of the thigh wings, and rolling it under the thigh and round the limb, so that a pull is instituted upon the appliance in the direction opposite to its tendency. These three methods in combination render outward displacement impossible. And now is a favourable time to draw attention to the correct and incorrect methods of bending the body wings. As the chest is not quite circular, it is necessary that the body wings should not be made circular, else, in addition to grievous mechanical blunders, much soreness may result. By closely examining Fig. 7 this will be seen. The part between A and B, upon which the patient lies, is but very slightly curved, and this allows the body to travel easily towards the outer side B, which has been shown to be a mechanical necessity. Fig. 5, which is

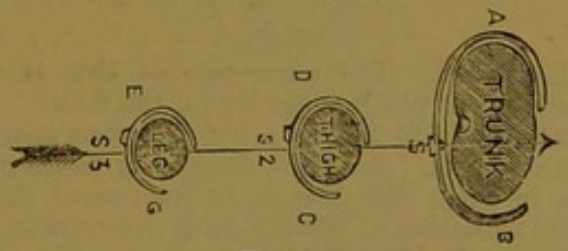

Fig. 7.

correctly modelled, may be compared with the diagram Fig. 4, which represents the almost circular erratic body wings.

Where there is a tendency to adduction combined with genu valgum, Fig. 6 displays a small bar of iron fixed from the tip of the outer thigh wing to that of the calf. The knock-knee can then be bandaged to the outside bar, and the deformity gradually accommodated.

But we frequently have to combat a deformity requiring more watching than adduction, and that is abduction, where the body forms a concavity to the inner side of the stem, and where, in advanced cases, the stem lies altogether to the outside of the body. Fig. 2, which is a right splint, illustrates the manner of meeting this complication. The body wing to the inside of the disease is drawn well down, and pressed firmly against the body convexity in order to get leverage upon the spine sufficiently low not to be counteracted by the mobile character of the vertebral column. Sometimes with the same

end in view an additional wing is fixed, shown in dotted lines on Fig. 2. The outside body wing, to enhance the effect of its opposite, is drawn upwards to allow the body to return into normal shape.

A splint may be either too large or too small, and it is important to modify or increase its length. This is quite simply done. If the splint is too large, draw both body wings towards the abdomen ; if too short, draw body wings towards the neck. The dotted lines (Fig. 1) will illustrate this.

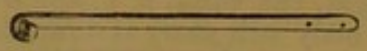

Fig. 8.

One great drawback in the treatment of hip disease in children is their strong efforts in the absence of overlookers to hobble across the ward or to another room. This is now quite overcome by Mr. Thomas in his appliance known as the "nurse" (Fig. 8). In all the diagrams attached to this paper will be noticed two small dots just above the leg wings, which represent holes found on perforating the leather covering in that vicinity. The "nurse," which is merely an iron bar, also has two holes, and it is affixed by screws to the under ex-

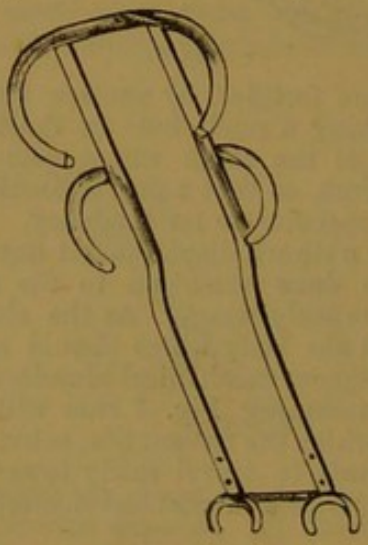

Fig. 9.

tremity of the hip splint. The advantage of this is obvious, as it prevents any attempt at placing the leg on the floor.

The hip splint may fulfil several other functions apart from that of treating morbus coxarius. Amongst these may be mentioned its use in psoas abscess, in sacro iliac disease, in fracture of the neck of the femur, and in the reduction of old hip-joint deformities. In fractures of the neck of the femur it is of great service, as it admits of easy nursing, so important in the case of old people; and the rest it secures is almost complete.

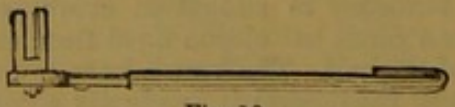

Fig 10.

When there is double disease, a splint similar to Fig. 9 is often used, but this pattern is of more service in the reduction of deformities. Malpositions which will not budge to any amount of extension yield very readily to the powerful (from its uninterrupted character) leverage which bandaging to this appliance entails. Fig. 11 illustrates a case of extreme rachitic deformity undergoing resolution.

I have purposely said nothing regarding the methods of using the pair of wrenches, one of which I have illustrated (Fig. 10). This is

because I believe no amount of writing will serviceably describe it. Suffice it to say that it enables the surgeon to accurately fit the patient without taking the splint off. Mr. Critchley, of Liverpool,

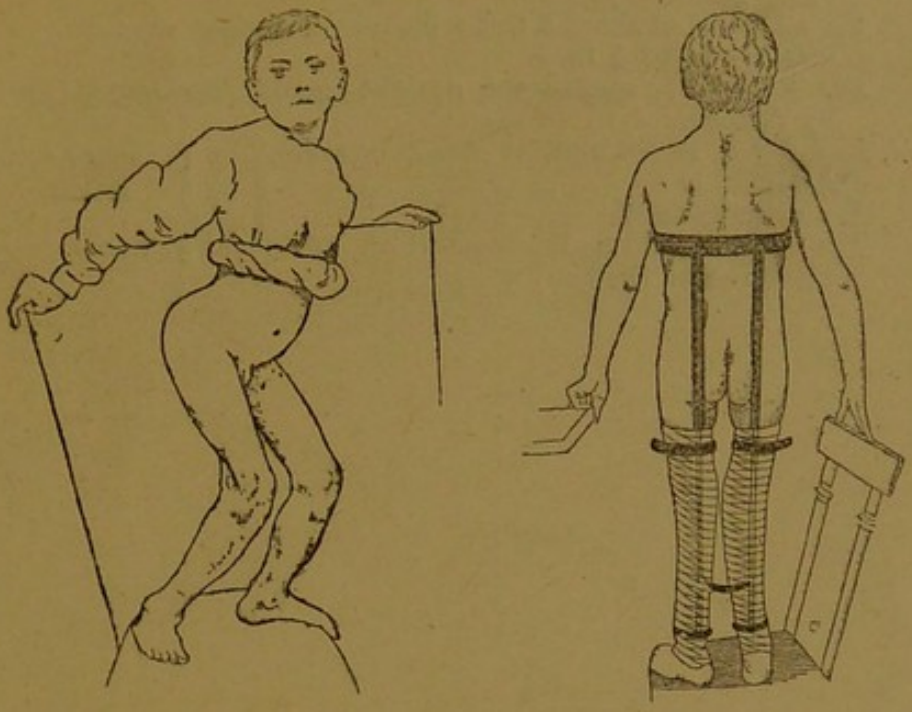

Fig. 11.

who makes these splints for most people, is instructed to give the upright or stem the appropriate twist which I have said is so necessary.

Fig. 12.

In conclusion, I need but briefly draw attention to the fact that at a certain stage of joint disease the patient can transform his bed splint into a walking splint, by crutches and a patten on the sound foot. The annexed diagram (Fig. 12) illustrates this.

The most common errors result from making splints too light, and the following practical instructions may be useful:

For an adult of about 6 feet the upright should measure $1\frac{1}{4}$ by $\frac{1}{4}$ inch.

For an adult of about 5 feet 6 inches the upright should measure $1\frac{1}{8}$ by $\frac{1}{4}$ inch.

For a youth or woman the upright should measure $1\frac{1}{8}$ by $\frac{3}{16}$ inch.

In a boy of 10 the upright should measure $\frac{3}{4}$ by $\frac{3}{16}$ inch.

For a child of 5 ,, ,, $\frac{1}{2}$,, $\frac{1}{8}$,,

For an infant of 2 ,, ,, $\frac{1}{2}$,, $\frac{3}{32}$,,

The wings should be the same width, and about $\frac{1}{3}$ of the thickness of the body wings.