

**Diseases of the hip, knee, and ankle joints : with their deformities, treated by a new and efficient method / by Hugh Owen Thomas.**

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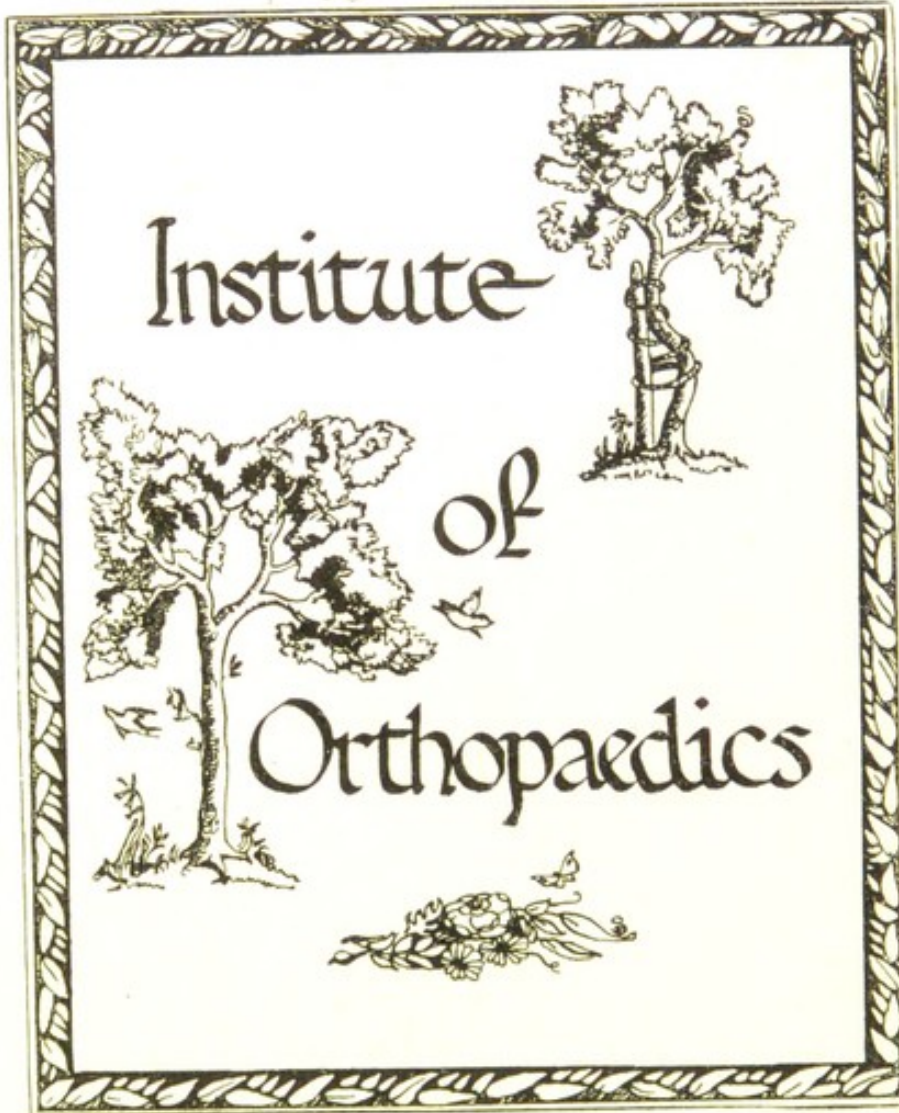
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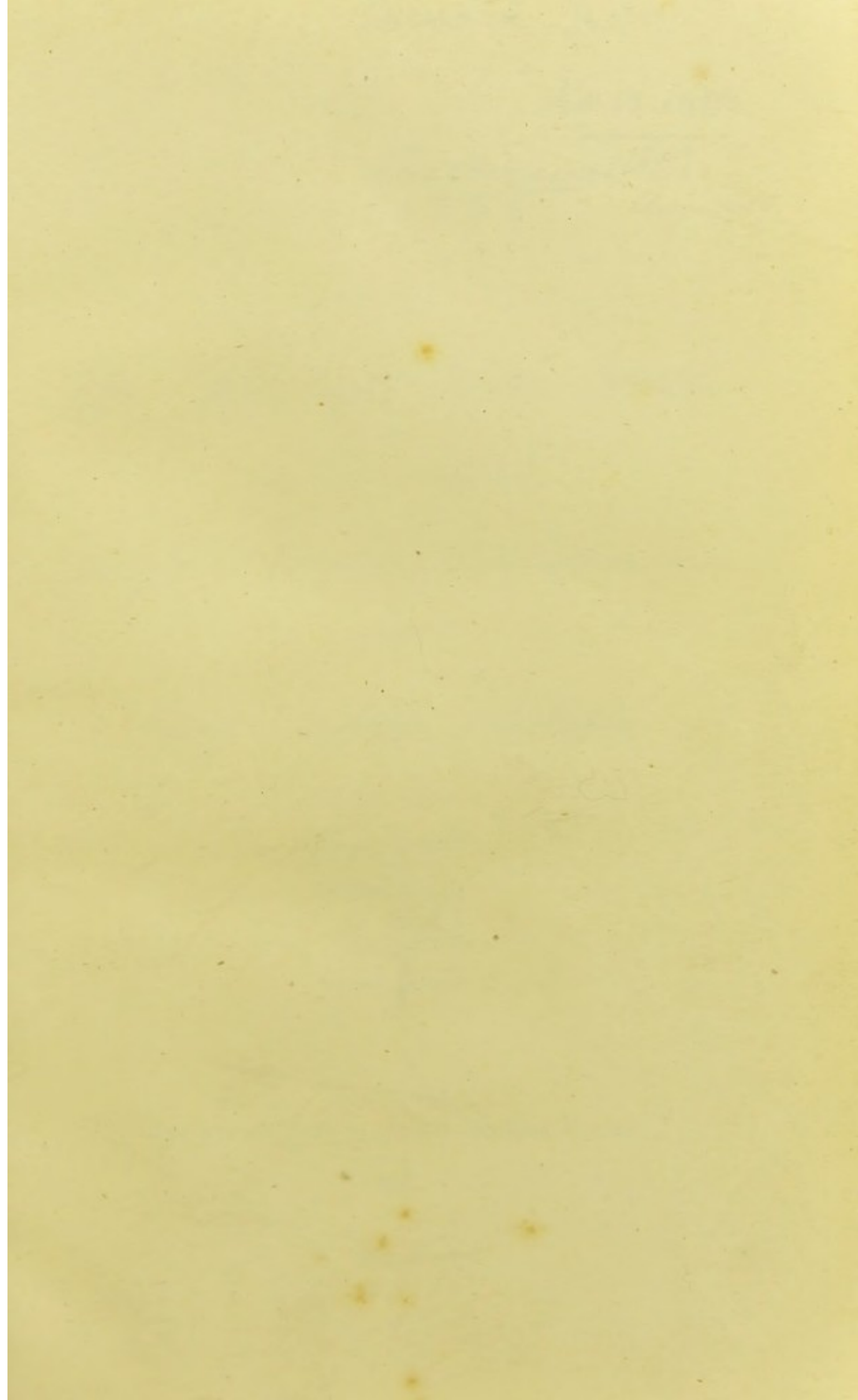


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Nov 13. 1883.

Paul Bernard Roth

DISEASES

May. 1915.

OF THE

Hip, Knee, and Ankle, Joints,

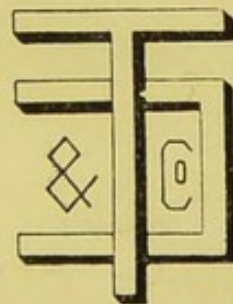
WITH THEIR DEFORMITIES,

TREATED BY A NEW AND EFFICIENT METHOD

BY

HUGH OWEN THOMAS.

SECOND EDITION.



LIVERPOOL:

PRINTED BY T. DOBB AND CO., 69, GILL STREET.

1876.



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# P R E F A C E

TO THE SECOND EDITION.

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IN this, the Second Edition of my Treatise, I have again limited myself to an attempt at rationalizing the diagnosis and treatment of diseased articulations of the lower extremity, and amplifying some details which appeared obscure. Many of the statements may appear to some readers dogmatic and strained, but, after careful consideration, I am satisfied that I have understated my success in the practice of my theory by the method herein advised. I particularly urge the discontinuance of specific constitutional treatment, and especially that which is usually known as counter-irritation. This practice is curiously and exhaustively advocated by Mr. Furneaux Jordan, of Birmingham, who, in his remarkable Treatise on

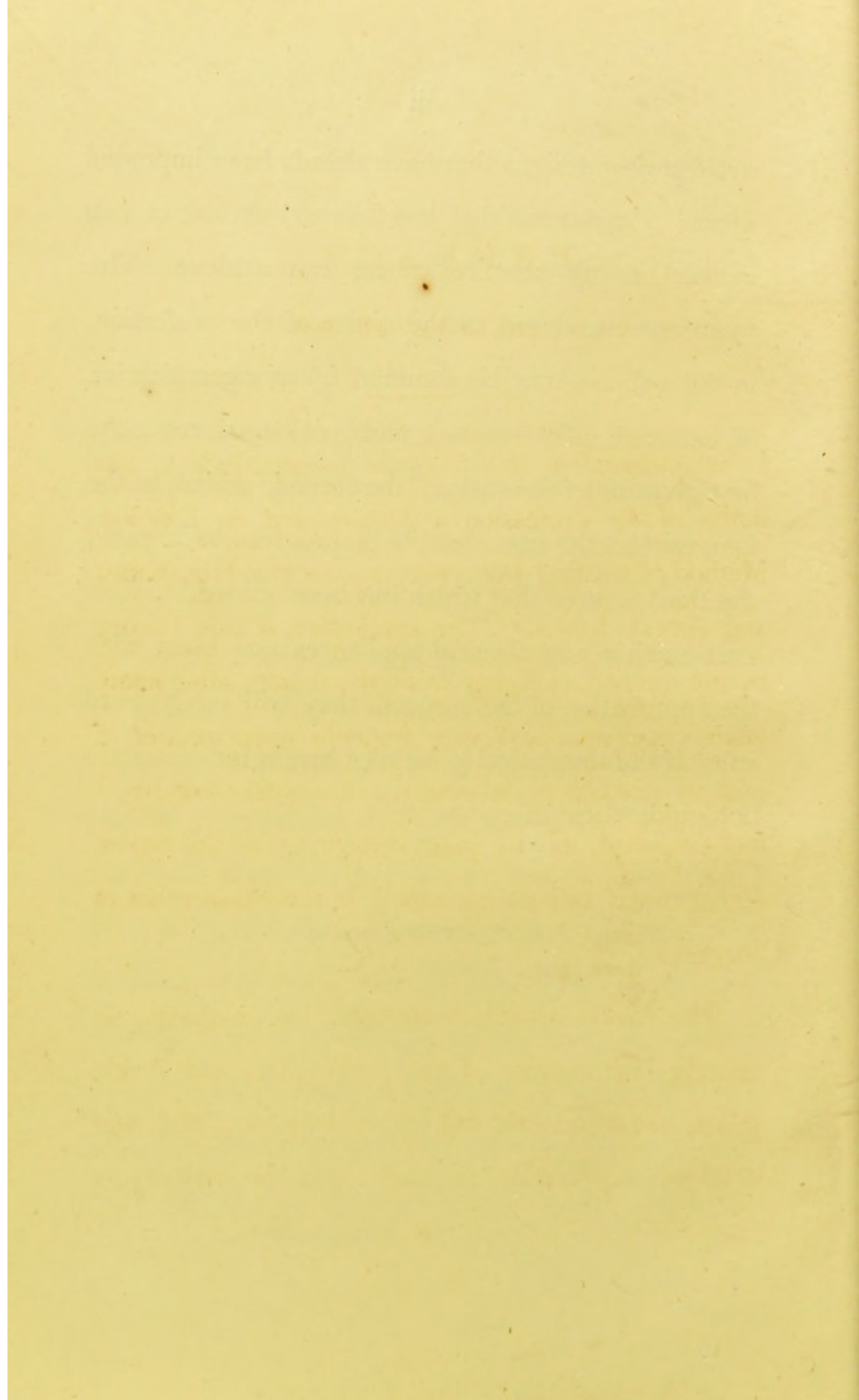
Surgical Inflammation, unintentionally confirms my views, that the farther the counter-irritation is from the joint, the more rapid and satisfactory must be the result. It is but a step further, too, if we carry out the "sympathetic" treatment of our forefathers, and gravely anoint the offending rapier with the specific of the period, and allow the patient's wound mercifully to have the benefit of an "expectant" method,\* the "*Vis medicatrix naturæ*."

I have made special reference to the views of some few gentlemen who have advocated principles which I decidedly believe to be retrograde as regards articular therapeutics. Since the first edition was published, many suggestions have been made, some of which would have diminished the utility of the machines employed; others I had already tried and set aside at some period during my practice. Some improvement, probably, will be made in the practical parts of my methods, and by strict adherence to the details I have indicated, the innovator will probably

\* See John Bell, vol. i., page 25.

avoid trying designs that have already been improved upon. The success that has followed the use of this method in my practice, others can achieve. The treatment introduced to the notice of the profession, in this volume, may be summed up as a combination of enforced, uninterrupted, and prolonged rest; the first gives relief from pain; the second, added to the first, enables the case steadily to progress to a cure; the third secures that which has been gained. However much my mechanical appliances may meet with the approbation of the surgeon, they will rarely be of value if the theoretical principles herein inculcated do not guide their use.

11, NELSON STREET, GEORGE SQUARE,  
LIVERPOOL, January, 1876.



# P R E F A C E .

TO THE FIRST EDITION.

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IT is proposed in this Treatise to introduce to the notice of the Profession a Theory and an Efficient Method of treating INFLAMMATION OF THE HIP, KNEE, and ANKLE JOINTS. The application of this Theory by my method, (judging from the results, after many years experience and very frequent opportunities of trial in practice upon over one thousand cases,) is, I feel confident, a vast improvement on all the modes of treatment hitherto practised in this department of Surgery.

The means usually employed by Surgeons, in treating Inflammation of the Hip, Knee, and Ankle Joints, are frequently not followed by resolution, and it is no exaggeration to assert that the majority of cases are benefited with remaining defects.

The attention of the reader will be drawn to surgical appliances and details, which involve radical changes of treatment, and are now for the first time made known to the Medical Profession.

I feel assured that my method will reclaim this class of diseases from the domains of excision and amputation. I shall not enter into the pathology of the various stages of these diseases, as this has been already so minutely described by abler writers.

By following the treatment now counselled, the practitioner will be agreeably surprised at the absence of many of the usually recorded symptoms. Even in those cases where the disease has run a course of some severity, recovery is attained with but little perceptible defect.

I fear that these pages, written as they have been during hours which should have been devoted to rest, will be found faulty in many respects ; but an anxiety that the Profession should test these methods has induced me to submit this Treatise to their judgment

without further delay, now that I have crucially tested the theory by a practice extending over many years.

I cannot omit this opportunity of thanking the Artist, Mr. Lewis, for his care and fidelity in copying the original Photographs.

Messrs. KROHNE & SESEMANN, Duke Street, Manchester Square, London, have made themselves practically acquainted with my practice, and can supply the appliances.

11, NELSON STREET, GREAT GEORGE SQUARE,  
LIVERPOOL, July, 1875.



In France, Bonnet seems to have designed the favourite appliance ; but in vol. ii. of his " *Traite des Maladies des Articulations,*" page 327, he does not report well of it, for the reason, I believe, that it extends no higher than the pelvis. Charrière prolonged the upper portion of the instrument, causing it to embrace the trunk—an important improvement. See (plate 1, fig. 1.) This machine is an efficacious one, but very cumbrous ; and owing to its high price (250 francs), is only attainable by wealthy patients and the larger charities. We may describe this instrument as one of "posterior fixation."

Our professional brethren in the United States have been most prolific in the invention of means for treating this disease. To Dr. H. S. Davis, of New York, is accorded priority in the invention of the "Perineal and Side Splint with Counter Extension," (plate 1, fig. 2.) It is arranged with the intention that the patient should not remain at rest, but that he might continue to perform all the movements of his joint. The designer of this instrument supposes that

by its use the weight of the trunk is removed from the joint, and the surfaces relieved from pressure.

Following in the wake of Dr. Davis, we find Dr. Louis Sayre, of New York, whose appliance, (plate 1, fig. 3,) is the same in principle as the last named, but designed as an improvement upon it.

Taylor's, (plate 1, fig. 4,) again, is a modification of Sayre's appliance, the difference consisting principally in the extension of the steel bar down to the ankle. This is also advertised as permitting the limb to be adducted or abducted, an objectionable feature superadded to the other faults of the Davis-Sayre design.

We have also Washburn's Splint (plate 1, fig. 5), designed for poorer patients. This appliance is devoid of such complications as screws, racks, and pinions, which mar so much the usefulness of instruments employed in this department of surgery. It consists of a pelvic band, outside steel bar, and knee cap; the end of the steel bar being attached by adhesive strap to the ankle; and is, in principle,

identical with that of Davis'.

Another variation met with is the instrument of Dr. J. C. Hutchinson, of Brooklyn, U.S., (plate 1, fig. 6.) This is a design similar to Taylor's, but it possesses an inside as well as an outside steel bar, the bars being attached by means of an iron joint to the sole of the shoe.

The last five appliances are variations of one type, and may be called "perineal extension instruments," illustrating alike the erroneous principles which led to the construction of the original splints of Davis and Sayre, each equally possessing their practical defects. These gentlemen have attempted to cure hip joint disease by relieving pressure, while yet permitting movements of the joints.

I hold that for mechanical reasons, this relief of pressure must be infinitesimal, if at all, and I know, from practical experience, that a cure, free from defect, is impossible with the use of these appliances. I admit that, when applied, some relief from pain may, and often does occur, (whatever be applied,) and not

as a result of the application of this instrument; and I do not regard such relief to be of benefit to the patient under the circumstances.

I know that often when rupture of the joint takes place, some relief follows, and I am disposed to offer this as an explanation of those instances in which marked relief follows the application of this irrational method. I confidently believe that the non-resolution of the inflammation is due to pressure and friction of the inflamed joint surfaces, which these machines increase rather than arrest.

In the year 1863, Dr. Davis published a description of his instrument. I became acquainted with it in the same year, but on rational grounds I was opposed to, and did not venture to use it.

Since the visit of Dr. Sayre to England, and the exposition of his method to the London surgeons, I have seen several instances in which his apparatuses were skilfully applied, and from personal knowledge I am satisfied that in not one of these cases was the disease arrested or even benefited.

The best commentary upon this method is the remarkable frequency with which its principal advocate has had to perform excision of the joint.

The next class of instruments are those we find designed upon the principle of ischiatic support, and to Dr. Andrews, of Chicago, is ascribed the merit of having designed an ingenious contrivance—(plate 1, fig. 7.) This consists of the ordinary crutch-head, attached to a steel stem passing down the inner side of the thigh, and fixed to the heel of the boot, and is supposed to support the body effectually by counter-pressure against the tuberosity of the ischium and groin. This may take a fraction of the weight of the body off the hip, but makes no provision for controlling the joint movements, and consequently it is of no practical value.

Dr. Bauer, of New York, has also adopted a modification of this design, which consists of the inside stem and crutch-head, with the addition of an external stem, both stems being attached to the shoe. (Plate 1, fig. 8.)

Another method, which has occasionally been made use of in this country, is that practised at the Verral Institution, and consists of an anterior reclamation of the whole body upon a double inclined plane: much the same position as that used for treatment of spinal curvature in that establishment.

Another instrument, partaking of the perineal type, is that designed by Mr. Barwell, of London, and which consists of an outside wooden splint, perineal band, pulleys, and pelvic band, with an arrangement for elastic extension. (Plate 1, fig. 9.)

Appliances which are intended to effectually fix the hip joint must be attached to the Thoracic portion of the trunk, as well as to the lower limb. Instruments, however ingenious, which extend no higher than the pelvis, seldom attain the desired result. When the patient is disturbed, the length of the splint, attached to the lower extremity, acts as a lever, to resist the force of which leverage the pelvic portion and band are not sufficient. Owing to this defect, Bonnet's original design was not satisfactory

to himself. But Charrière has converted Bonnet's instrument into an admirable appliance, by continuing the body portion up to the scapula, as shown in the figure. It is possible, with great care and attention, to obtain some benefit occasionally with Mr. Barwell's apparatus, and I admit, that with the exception of the old-fashioned long splint, it has been, for years, the best instrument at the surgeon's disposal. Mr. Barwell's appliance possesses an advantage over all the American designs, in that it has some little control over the movements of the joint. Painless nursing of the patient, however, is impossible with his appliance, or with any "side splint," a fault possessed alike by all the others to which I have referred.

Professor Hamilton's apparatus for hip joint disease, as described in Tineman & Co.'s Catalogue, seems constructed to control the movements of the joint, but is not long enough, and so is of very little value, and I can best convince the reader of this by referring him to plate 1, fig. 10, which is taken

from the above catalogue; allied to the last two is Mr. Hilton's appliance, a drawing of which is given in his essay on "Rest and Pain."

Finally, we come to the old-fashioned long splint, which, when applied from the axilla down to the ankle, is an instrument possessing merits beyond any of those I have previously discussed; yet, it has its faults, as, being applied laterally, it can only partially control the movements of the joint, and the nursing of the patient is not performed without pain, while, where deformity is present, it cannot be applied.

I will conclude by referring to the method of treatment by weight and pulley, which amounts to no more than confinement to bed. Dr. H. G. Davis, the author of the perineal system of treatment of hip joint disease, is credited with having suggested the use in hip affections of this useless, and, worse than useless, injurious method of treatment, when applied in hip disease, and in its application, deceptive and irrational; for surely if relief of pressure be



required, the only direction in which this is possible is clearly in the axis of the neck of the femur; any method of extension in the axis of the body merely transfers the pressure from the upper part of the acetabulum to its lower quarter. Continuity of extension, "per se," is not a remedy in joint disease, as I shall subsequently show; in its application it involves unavoidably a fractional degree of fixation which is sufficient to mask the evil of this ridiculous mal-practice. The idea of practising extension in joint disease has originated, no doubt, from observing its effect in the treatment of fractures, under the supposition that it is the best antidote for muscular spasm. I assert that a fractured thigh, if treated by extension only, would be accompanied with vastly more muscular irritability than if the same case was placed in a modern appliance with retention in which the limb was retained and fixed immoveably, in the strict meaning of the term fixation. Then we should not have the slightest muscular excitement. Traction is a very inefficient sedative in joint

disease, as well as in fractures, compared with the effect of the immobility modern surgical appliances place at our disposal, while I admit that continuous extension is next in value to retention as an aid in the treatment of certain fractures, though of secondary value compared with an immobility that places the limb at perfect ease.

Our Transatlantic brethren deserve praise for having studied diligently to improve the treatment of these joint affections, but by ignoring in all their designs the fact that friction is a greater evil than pressure, they have devised methods of less efficacy than those previously in use. Friction may be defined as a combination of motion and pressure, consequently it is to be specially avoided in joint disease. Efficient enforced rest in joint disease, as well as in fractures, is the infallible remedy for quieting the irritated muscles; not extension.

In confirmation of the correctness of my opinion as to the evil of friction in joint inflammation, I refer to the lower jaw articulation. In this joint we

rarely have inflammation, but when this does occur, it is more liable to be followed by ankylosis than in any other joint, in consequence of the fact that the patient is obliged to make some use of this joint daily.

In chronic inflammation of shoulder joint we have an illustration of the continuous extension method readily provided for us, by the weight of the limb itself, yet, when the movements of the joint are not effectually arrested, which they seldom are, we have ankylosis to that degree, that even the great mobility of the scapula cannot mask. Any practical surgeon will recollect the marked relief in some cases, given to the patient by supporting the upper extremity, the reverse of continuous extension.

The various mechanisms to which I have referred may be described as of two classes: first, those models which are intended to permit the joint to be in action, and are supposed to relieve pressure; secondly, those that are constructed for the purpose of attempting an arrest of the joint's movements.

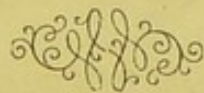
The first I shall dismiss as useless and injurious ; it includes all the American models, Hamilton's design excepted : this last is a step in the right direction, but has no value in practice. The second I regard of some value, and can be subdivided into lateral and posterior fixation.

The first includes Barwell's instrument and the old Long Splint, single and double. The second includes Charrière's model of Bonnet's "grand appareil." As to the lateral fixations, I have already stated my opinion when referring to the instrument of Mr. Barwell, that the long splint is an useful means to success when skilfully and frequently adjusted, and when the patient lies still ; but that its palpable defects are the readiness with which it may fail, for instance in nursing, or should the patient endeavour to rise, or not remain contentedly still, as is often the case with children, who continually attempt to flex the limb, or especially to turn in bed, thus causing the splint to rotate from its position towards the front. I have already expressed my approval of

Bonnet's apparatus, and only take exception to its cost and cumbrousness. My method illustrates the superiority of posterior fixation over all other methods, and is the only one by which, efficiently, friction and concussion can be arrested, pain alleviated, and a cure secured and that without deformity, no matter to what stage the case has progressed, conditionally on a strict observance of the principles and details which I have found essential, and shall explain in the following chapters.

The design that I shall submit to the profession is free from the defects of all the previous appliances; is cheap, and within the reach of the poorest: is light, and can be applied under the clothes without much disfigurement to the sufferer's appearance, and enables the attendant to nurse and handle the patient, as though he were a toy, without pain; and can be applied for the purpose of rectifying cases of hip-joint deformity, though they may have existed twenty years. (See Plate 2.)

I have not entered into the demerits of the shellac, silicate of potash, and other solutions, as they are not usually applied beyond the pelvis.



## CHAPTER II.



### DIAGNOSIS OF INFLAMMATION OF THE HIP JOINT.

WE have hitherto had no method of determining with certainty the existence of this disease at a very early period, except in very rare cases, where, for example, acute inflammation is very rapidly developed without the usual premonitory warnings, such as lameness, pain round the patella, disturbed sleep and wasting of the nates.

We have also to guard against the possibility of mistaking abscesses, (connected with the spine, or arising within the pelvis), sciatica, or hysterical simulation of this complaint, for *Morbus Coxæ*, the method of diagnosing which is here detailed. I have

tested it during ten years, and never once has it failed in enabling me to detect the disease at even so early a stage as the first week or day, if there is any effusion into the joint. ??

The diagnostic method which I shall demonstrate is of value to the surgeon in the cases of children in particular, as he can get all information in defiance of the struggles of the patient, and without administering an anæsthetic, and it enables him to estimate how long a time the patient has have been suffering, whether one week or twelve months. For all practical purposes the symptoms are often as well defined in twelve months as they are in as many years. Plate 3 illustrates the manipulation in this diagnostic method.

Having undressed the patient and laid him on his back upon a table or other hard plane surface, the surgeon takes the sound limb and flexes it, so that the knee joint is in contact with the chest. Thus he makes certain that the spine and back of the pelvis are lying flat on the table; an assistant maintains



the sound limb in this fixed position; the patient is then urged to extend, as far as he is able, the diseased limb, and this he will be able to do in a degree varying with the previous duration of the affection. While the patient is retained in this position the operator will be able readily to note a rigid cord corresponding to the origin of the adductors, which are invariably the first to shorten.

In fact, this method demonstrates two invariable symptoms of hip joint inflammation, flexion of the hip joint, and curve of the spine, in a greater or less degree, so early as the first or second week, limiting the normal range of extension,\* which not only is

\* Dr. Taylor, of New York, in a paper read before the New York Medical Library and Journal Association, discusses "constant, excessive, and unre-  
laxing tonic contraction, varied or not with spasms, but always present when there is any disease in the joint. The latter may exist so slightly as not to prevent the extremest flexion and extension." The above quotation I hold to be a contradiction. How is it possible to have contraction of a muscle, and its utmost extensibility, coexisting? Indeed, our transatlantic brethren, having adopted during the Davis-Sayre period the wrong premises of these gentlemen, have set aside the little good that was in the practice of our predecessors. We are told that the continuous extension is carried so far that weights, nearly as heavy as the sufferer, are attached to the diseased limb, with, in my opinion, the effect of masking one pain by another; and I can not perceive that such would be any benefit to the patient.

the patient unable to overcome by his own efforts, but which will not yield to the forcible manipulation of the surgeon without the production of some degree of pain. However, on releasing the sound limb from its flexed position on the chest, the patient may, if not an extreme case, be able to apparently extend the limb, but a compensatory curve of the spine is formed, as shown in Plate 4. This diagnostic manipulation enables the surgeon to note at a glance the amount of flexion. The degree of flexion is an important symptom during the first nine months of the affection, if the case has been uncontrolled. By noticing the amount of flexion, the surgeon will, with practice, soon be able to guess the previous duration of the disease. For instance, I consider that an angle of about 170 degrees is reached in six weeks, and one of about 100 degrees in nine months. Thus, in Case No. 4, when the child's parents asserted that he had been two or three weeks lame, I was able to correct them. As soon as a right angle is nearly approached this rule is no guide, indeed by

that time there are changes within and around the joint appreciable to digital examination.

This flexion explains the peculiar limp these sufferers have at the commencement of this disease. Thus, if we suppose the pelvis to be represented by A, (Plate 5, fig. 1,) the ground by BC, and that FE represents the lower extremity extended, then on any movement of the limb FE, forwards to G, FG will represent FE flexed, and would be too short to reach the ground BC. To make FG reach the ground, the pelvis is tilted forward, and this can only be done by an extra curving of the lumbar spine, hence the necessity of fixing the spine and pelvis to detect this flexion. This diagram exactly shews the cause of the apparent shortening in the disease, before absorption of the head of the bone, &c., has taken place. Then we may have actual shortening at an advanced period.

Plate 4 represents the patient's spine as curved when the leverage of the sound limb is taken off the pelvis. The flexion here shown indicates a period

of many months. Plate 6 shows the same case with the leverage of the sound limb fixing the pelvis, and so controlling the spine. In cases of abscess connected with the pelvis or spine, this curving of the latter is absent when the patient makes an attempt to extend the limb, though the hip may be flexed to a greater or less degree. Here we have contraction of the flexors without hip disease. In simulated or hysterical affections of the hip joint, the patient is able, though the pelvis is fixed with the leverage of the sound limb, to extend the simulated one. I have frequently successfully diagnosed cases in this manner that were judged serious, the subsequent termination of the case confirming my diagnosis. The supposed lengthening of the limb, which is sometimes noticed in this affection, arises from obliquity of the pelvis, which may at an early stage be sufficient to hide the slight flexion and apparent shortening that always co-exist. As the inflammation progresses, if uncontrolled by any appliance, the flexion increases, so that the obliquity

of the pelvis is masked, though often even then present. This method of diagnosis will demonstrate the existence of slight flexion and contraction as co-existing with the apparent lengthening. This obliquity of the pelvis, and deceptive elongation of the limb, is sometimes present in knee joint disease, when the complaint has advanced to a chronic condition, and the joint is deformed by fixed flexion.

Extreme flexion, with thickening and enlargement of the acetabulum and head of the femur, in disease of the hip joint, is, even now, frequently described as dislocation of this joint, an occurrence which I have never yet observed, and which must be extremely rare. There may be displacement of the trochanter, as far as the tubercle on the outer lip of the crest of the ilium, causing a shortening varying with the age of the patient and proportion of the parts, when the head of the femur has been destroyed. This certainly cannot correctly be called dislocation of the hip joint, and to attempt its reduction would be absurd. In nearly every case reported, and in

those I have observed, the so-called reduction has only been a diminution of the fixed flexion; and many cases simulate dislocation even without any displacement from destruction of the epiphysis of the femur. For example, when inflammation of the hip joint progresses to the suppurative stage, there is thickening around the joint and inversion of the limb, with rupture of the capsule posteriorly, if the case has not been treated in the fixed extended position. The last calamity allows of an increased inversion combined with thickening at this aspect of the joint, which closely resembles dorsal dislocation of the femur. All these local symptoms of luxation can be removed by simply inviting the limb into the extended position, with the adoption of the means I have recommended, without immediate violence.

Mr. Hilton, in his Essay on "Rest and Pain," reports several cases of this so-called dislocation, and describes their reduction; yet there is no evidence, to my mind, of dislocation in any one of the cases reported.

A remarkable instance of this error in judgment is published in Sir Astley Cooper's volume on Dislocations, page 91. The patient had been under the care of Mr. Cline for traumatic injury of the hip joint, in all probability accompanied with inflammatory action. At the expiration of the treatment, some defect remaining, he consulted Sir Astley Cooper, who judged it to be dislocation. Some time afterwards, this patient, whilst on a sea voyage, was "lurched" during a storm, so effectually that his deformity suddenly ceased, and the so-called luxation was reduced, though it had existed many years. I have no doubt that positioning the case of this man, and fixing him in a suitable appliance, would have removed the supposed dislocation, as was done in case No. 6, which had existed fifteen years, and presented all the signs of a so-called dislocation.

A practical question, and one of interest to the Surgeon, is: What is the value of an early diagnosis of this disease? In the volume on Rest and Pain,

page 323, Mr. Hilton thus writes:—

“If we succeed in an early diagnosis of disease of the hip joint, I am confident that it will not fall to the lot of surgeons to see those sad, and sometimes hideous cases which we so frequently observe in private practice.”

With this I cannot agree, since from my own observation the defective results, in the majority of cases, had been in-patients of Public Charities, neither can I confirm the Author's view as to the value of an early diagnosis. With the appliances which were at that time at the surgeon's disposal, inclusive of that which Mr. Hilton recommends in his volume, combined with the erroneous theory that has hitherto directed the treatment, an early diagnosis seldom benefited the patient in times past.

It is to be noted that many cases have a strong tendency to recover. These are the cases that sometimes recover spontaneously (an extremely rare occurrence), or are a long period in a passive condition, and may recover but with defect, never reaching the destructive stage, though neglected. Another class



of cases are those we meet with which have a tendency to non-resolution of the disease.

I have supposed the above classes of cases not to have been under treatment. But the first class of cases, with careful treatment, recover rapidly, though diagnosed late ; and the second class of cases, although diagnosed early, may proceed to the suppurative stage, yet, with my method a patient of this class may be in fair health, have little pain, and ultimately recover perfectly. Cases belonging to the first class may have been neglected for one or two years, yet, under treatment, may recover, rapidly and without defect, nor have any complication during the treatment.

My observation convinces me that the practitioner is by no means to be discouraged by the advent of suppuration, as I have very frequently had recovery without the slightest defect, though the patient did not escape the suppurative stage.

## CHAPTER III.



### TREATMENT OF HIP JOINT INFLAMMATION.

THERE is an opinion prevalent, that only gentlemen on the staff of our public charities can treat, with any chance of success, this affection; and certainly, hitherto, they have had advantages not possessed by the general practitioner, having at command the wealth of the charity to which they are attached, and being thereby enabled to order the costly appliances at present in use.

Persons living at a distance from large towns rarely receive professional assistance, as the one thing supposed to be needful cannot be obtained at home. This has induced me to describe such details as will enable any surgeon to treat his cases at home, with

no more mechanical assistance than can be rendered by the village blacksmith and saddler, and the poorer class of sufferers will, at a small cost, be assisted as effectually as the wealthier classes.

We will suppose the patient, a boy of about ten years of age, having been examined, and the affection diagnosed as disease of the right hip joint; the surgeon then proceeds to measure him for the instrument, suitable for a case in the early stage. He requests the patient to stand on the left limb (the one supposed to be sound), and places under the sole of his right foot a block or a book, one inch thick, telling him to rest the foot of the affected limb on it. If the spine is then straight, he is ready to have the contour of the sound limb and portion of the trunk taken. If the spine be not of normal line, then another block is added, or several blocks, if considered necessary, until the <sup>with</sup> sound limb is raised sufficiently to allow the spine to resume its natural form, as in Plate 7. Now, take a long flat piece of malleable iron, one inch by a quarter for an adult, and three

quarters of an inch by three-sixteenths for children, and long enough to extend from the lower angle of the shoulder blade, in a perpendicular line downwards over the lumbar region, across the pelvis slightly external, but close to the posterior superior spinous process of ilium, and the prominence of the buttock, along the course of the sciatic nerve to a point slightly internal to the centre of the extremity of the calf of the leg. The iron must be modelled to this track, to avoid excoriations. In neglected and extreme deformities, then under such conditions, the patient being in the position represented in Plate 7, the model is taken from the deformed limb, and, as the muscles relax, the appliance is altered at G, fig. 1, Plate 9, by aid of the wrenches, Plate 8, figs. 2 or 3. The lumbar portion of the upright must be invariably almost a plane surface, Plate 9, figure 1, F to G, and rotated on its axis in the direction of the arrows (in Plate 5, figure 4,) more or less in proportion to the plumpness of the patient. This iron forms the upright portion seen in Plate 5, fig. 4.

It is also very necessary that the upright should come below the knee, to enable the surgeon to fix this joint; otherwise the patient would flex the knee, and strain the hip joint. Then measure round the chest, a little below the axilla, deducting, in the case of an adult, four inches from the chest circumference. This latter will be the measure for the upper cross piece, which is made from a piece of hoop iron, one and a half inch by one eighth of an inch. The hoop iron is firmly jointed with a rivet to the top of the upright, as shewn in plate 5, fig. 4, at one third of its length from the end next to the diseased side, as plate 5, fig. 2 s. Fig. 2 in plate 5 shews the upper ring modelled to the outline of the trunk, which is oval in shape. It is important to give the upper crescent this oval shape, to assist in arresting the machine from rotating from its position behind the body; and inversion of the limb. Another strap of hoop metal three-quarters of an inch by one-eighth of an inch, and in length two-thirds of the circumference of the thigh, is fastened to the

upright, at a position from one to two inches below the fold of the buttock, as in plate 5, fig. 4 B, plate 5, fig. 2 D C, according to the age of the patient; then another piece of metal of like strength, equal to half the circumference of the leg at the calf, is firmly rivetted to the lower extremity of the upright, as in C plate 5, fig. 4, and plate 5, fig. 2 E G. In the sectional diagram, plate 5, fig. 2, the forms of the cross pieces there given should be carefully noticed, especially the points of junction with the upright marked at S, as being out of centre. The short portion of the top half circle is next to the diseased side, with a space intervening, while the long portion must be closely fitted to the sound side. If the machine should tend to rotate from the diseased side, then daily contract the long wing of the crescents, and expand the short ones; or should it tend towards the spine TOO FAR, then reverse this manipulation until the appliance becomes set in the correct position. In my earlier experience a second crescent embraced the pelvis,

but I found it painful to wear. In applying an instrument with two uprights, care should be taken to measure the distance between the tip of right and left posterior spinous processes, and then to set the uprights parallel and apart, one inch more than such measurement, or it cannot be tolerated by the patient. The two uprights should be connected by a crossbar, as shown in plate 13, fig. 1 A, when practicable, which is not possible when the double instrument is used for reduction of deformities, as in plate 15; this crossbar when used, will be found useful for the attendant to grasp in nursing. This appliance, with two uprights, is indispensable when both joints are affected, and, if the patient or his friends do not object, will be found easier of application, and therefore of more certain efficacy, even in cases where only one articulation is affected.

The instrument is now ready to be padded and covered. The former is conveniently done with boiler felt, (No. 1 thickness,) which should not be used in more than a single layer; the latter is done

by a saddler with basil leather.\* However correctly it may have been modelled, it will often occur that some slight alteration will be demanded, when it comes to be applied to the patient, either on the first day, or at some period during the progress of the case; or the case may have been one of long duration, uncontrolled, and consequently attended with much deformity: then the surgeon may, for a few weeks, occasionally have to alter the curve G, plate 9 fig. 1, of the appliance. This modification the surgeon should be prepared to perform himself, as the workman can only make the apparatus. To enable the former to do this, I have devised and used the instruments and wrenches shewn in plate 8.

For instance, it may happen that the upright portion of plate 5, fig. 4, may require a little more rotation outwards, which can be done by the hooked ends of the instruments shown in plate 8, or the concavities may require to be increased or decreased,

\* I recommend this quality of leather as it never becomes offensive with the patient's secretions, &c., which is the case with chamois leather, so frequently used in the construction of surgical appliances.



which can rapidly be done with the extremities B B of the instruments Nos. 1 and 4. The two lower short crescents can be altered with end B of the figs. 1 and 4, plate 8. Fig. 3 and 4, plate 8, represent a triple ratchet wrench for bending, and hook for rotating. This wrench will enable the surgeon to alter the apparatus while on the patient. These are very convenient, though more expensive than the simpler form, fig. 1, plate 8. By the aid of these the surgeon is always independent of any mechanic's aid until the case has terminated, or he may remodel an old appliance to use again. The patient being placed in the machine, a strap and buckle close the upper circle round the chest, and the limb is bound with flannel from the calf upwards, beyond the small crescent B, plate 5, fig. 4.

Fig. 2, plate 5, shows how the splint should fit, when applied correctly; the long portion of the upper crescent being close to the trunk, and exercising some pressure on the sound side, the short portion a space from the trunk. This is necessary to

hinder rotation of the instrument, and the upright stem should have a perceptible rotation outwards, as shown in fig. 4, plate 5, from F to G, and be fitted so that it shall pass to the inner side of the popliteal space as indicated by the arrow in fig. 2, plate 5; this will avoid rotation inwards of the limb, a defect easily avoided by attending to these details.

Should the instrument rotate towards the diseased side, and so become a side splint, the surgeon should contract the longest wing of the upper crescent and expand the shorter one; or if the instrument does not rotate, yet the stem is not over the prominence of the buttock and well behind the thigh, then the upright requires more twisting with the hooks, plate 8, figs. 1 and 4. Or should the trunk portion of the upright threaten to ulcerate the skin, the angle at G, plate 5, fig. 4, and seen at plate 9, fig. 1 G, should be diminished, untill the portion from F to G is a plane surface. It is preferable to place the patient in a soft bed, during the first stage, rather than on a mattress, which is objectionable granting that the

surgeon has not selected the iron of too slight proportion, an error I notice many are inclined to commit.

The hip appliance if not moulded by the surgeon so as to remain continually behind the trunk, and painless to wear, then it requires more of the surgeon's skill and perseverance, or it would be useless to the patient. A few minutes of interruption is as great an evil as so many days, and would not be uninterrupted rest, which is so essential to success.

Since the publication of the first edition, several gentlemen have suggested the making of these appliances of steel, instead of iron, so as to reduce the weight; others have recommended the substitution of lighter iron: their so doing, in the construction of either the hip or knee instruments, would make unpracticable models. If the hip appliance were made of steel, it could not be moulded by the surgeon with his wrenches in the reduction of deformities, and consequently could not be used except in a very early stage, and further the surgeon could not exercise his skill in fitting, which, though sometimes success-

ful in one visit, may at other times occupy many days. This is the duty of the surgeon, not the mechanic. And the surgeon should mould by reducing or increasing the various curves, until the instrument ceases to tend to rotate, and at none of its angles irritates the patient. What I can infallibly do, must be possible to others. As regards the forming of the hip appliance of lighter iron, the nursing would not be painless. The instrument must be so strong as to be free from tremor, in nursing in particular, or the stage of inflammation would be prolonged. Again the knee appliance if made of steel could not be altered without unnecessary expense. In the case of children, their growth, wear, &c., necessitate the repair and elongation of the machine frequently, and again the iron is not so liable to fracture; it rather bends, and a stroke of the hammer will directly restore the correct line.

As to constitutional treatment, the local inflammation if of traumatic origin, and the patient suffering from local lesion only; then no therapeutic remedy

may be indicated, or the case may have been of diathetic origin, as rheumatism, or as the sequelæ of blood contamination. If at the time the surgeon is consulted, the constitutional defect has been remedied, prescribing may here not be required. Or, the surgeon may find the patient under constitutional, as well as local irritation; in this condition, I have no faith in any benefit from the internal administration of specific remedies, as Mercurials, Iodides, &c., the contrary is my conviction derived from practical observation. And that the practitioner should prescribe what he rationally judges fit for each individual case to restore health: as to local treatment, nor do I believe in the efficacy of counter irritation, rather the reverse. At an early period in my professional training, I began to doubt the correctness of its use, and practical observation has confirmed, what at one time I only surmised. I well recollect that the late Professor Syme, in his Clinical Lectures, when discussing the method of treating loose "bodies" in the knee joint, taught that blistering this joint caused

collateral inflammation within the articulation. Professor Spence, of Edinburgh, also in his volume on Practical Surgery corroborates Professor Syme, and I am inclined to believe from practical observation that a potent counter irritant is a feature in prolonging the inflammation and consequently tends to the condition of ankylosis. Should suppuration occur, repeated aspirations are necessary, and this practice is usually successful, if performed early, and efficiently carried out. Aspiration, repeatedly practised, is usually successful; but at times this fails, especially if practised late, and the case becomes complicated by an abscess, with communicating sinuses. I frequently note, even in these days, that it is the practice with many to cover the opening of the sinuses with the vile filth, known as linseed meal poultice, or some other glutinous and irrational cataplasm, which does not permit the abscess to drain and contract, and greatly increases the quantity of pus formed. The application I have found to be useful, is either moist carbolic tow, or coarse floor cloth flannel,

which can be had at any draper's establishment.

It is very advisable that the sufferer should be confined to bed for a period, at the commencement of the treatment. This preliminary reclination, I have never noticed to injure the general health, but invariably improves the patient's condition, and shortens the acute stage. During the first stage of the mechanical treatment, the surgeon being satisfied that suppuration has been avoided, he permits the patient to proceed on to the second stage. The patient is then allowed to go about with the assistance of crutches, the frame continued, and an iron patten at least four inches in depth is placed under the shoe of the sound limb, as in plates 10 and 11. These must be continued until the limb is well atrophied around the great trochanter; the outline of which should be more discernable than that of the sound side.

Now we come to the third stage. The patient takes off the framework in bed, and replaces it during the day, still using the crutch and patten for

a certain period.

We now arrive at the fourth stage. The patient totally discards the frame, and uses the crutch and patten only. These he sets aside after the surgeon is well satisfied with regard to the permanence of the cure. If the case does not progress to the surgeon's satisfaction, some of these stages must necessarily be prolonged.

The weight of the lower extremity is equal to reducing any angular deformity of the hip or knee joint, not resulting from true ankylosis, and is capable also in some degree, of diminishing any shortening, should absorption of the head of the bone occur,—provided a suitable mechanical arrangement be applied, and continued during a sufficient period.

The splint ought to be applied at once, whatever be the stage of the disease. Forcible flexion, extension, tenotomy, or chloroform, &c., are to be avoided as unnecessary. In the presence of my method, these operations are undesirable, though they were essential at one time. Even should the deformity be an



extreme one, no violence must be attempted; the limb should be gently persuaded to come back from the erring position, and as it assents, the wrenches shewn in plate 8 should be used to alter the hip instrument towards the normal lines.

I shall restrict myself to a few instructive cases, which will be useful to the surgeon in his daily practice, illustrating the complications and difficulties to be encountered, rather than the success of this method, or my personal skill, as it would answer no practical purpose to burden the treatise by a multitude of cases, most of them being but repetitions.

Case No. 1.—On the 17th of April, 1872, one of the sisters of a neighbouring convent, accompanied by a child, aged 12 years, (Miss D—) consulted me regarding some pain which the latter suffered in her right thigh. On making an examination, by the previously explained method, I was convinced that she had some slight inflammation of the hip joint, and advised a delay of two weeks while the patient's guardians were written to; the

patient being confined to bed in the meantime. In the course of a few days I received a message stating that the patient was much worse, and on calling I found that her joint was in a state of acute inflammation, and very painful, accompanied by a good deal of constitutional disturbance, and noticed the local symptoms, usually present, intensified. I counselled no further delay, but with the consent of the Superioress of the convent, applied the frame, and fixed the joint, retaining the patient in bed for twelve weeks; at the expiration of this period, the local symptoms subsided, and could not be detected on rough manipulation. During the first three weeks the febrile condition was treated with salines, &c., in addition to the mechanical treatment. At the expiration of the twelve weeks she was taken from bed, much improved in health, and stouter than she had been previous to the attack. For the next six months she went about with crutches, frame, and patten, as in plate 10. Afterwards, for a further period of three months, she continued to use the

frame in the daytime only, at the end of which time the patten and crutches were used during the remainder of the period that she was under my care. It is very essential that the patten should be at least four inches in depth; if made less than four inches, a careless and unruly youth would be able to reach the ground so readily as to delay his recovery. It is preferable to increase the depth of the patten by one or two inches, than to lessen its elevation.

This patient progressed well, and recovered perfectly; and at the expiration of the treatment she was in better health than at any previous period of her life. During the progress of this case, there was neither inversion, nor eversion, abduction, shortening, nor lengthening, at any time; nevertheless at one period in the treatment, I feared that there would possibly remain some amount of adhesion, and consequent stiffening of the joint, impeding its future action, as the inflammation was more rapidly developed and more acute than any I had ever before witnessed in this class of cases. But it did not occur, and it is

my opinion—and this is quite consonant with reason—that the more effectually an inflamed or irritable joint is fixed, and the sooner this is done, the greater is the certainty of its future freedom of motion and absence of defects.

No rule can be laid down as to how long a joint ought to be kept under treatment. The surgeon must judge, by the disappearance of the symptoms of disease, when to modify or discontinue it.

Stiff joints are not the results of too long confinement in an immovable position, but are caused by inefficient or interrupted control of the diseased articulation, and by permitting its use too soon; it may be too soon even if the joint be sound.

It matters not from what causes these affections arise, whether from an injury, rheumatic attack, or constitutional defect, the main thing needful, especially in the chronic stage is, that the joint be mechanically fixed, the general health being attended to, if necessary. The fact of a person suffering from chronic articular inflammation is not of itself any

reason for nauseating the sufferer with internal remedies.

Case No. 2.—On the 18th of February, 1872, Mr. J. D., of Cumberland, brought his son, a boy eight years of age, to consult me respecting a lameness affecting his left limb. On examination I found flexion of the hip joint to an angle of 150 degrees. I considered this to indicate that the joint had been unsound for at least five months, and I advised the use of my hip appliance, with the patient's confinement to bed. This was done, and had the effect of removing the flexion of the thigh by the end of the second week. He remained in bed twelve weeks, at the expiration of which period I found the affected joint had become normal in appearance. He was now permitted to get up, using the frame, patten, and crutches, as in plate 10. These were continued for another five months, when the frame was set aside, and his recovery was, by the end of another four months, completed. In this case no constitutional or local medical treatment was adopted.

This patient did well, although his early treatment had been very unsuitable, as he had been treated for dislocation by a bone-setter in the neighbourhood of his home.

Case No. 3.—In July, 1867, Mr. J. G., of Aberayron, consulted me concerning his son, a boy six years of age, whom, on examination, I found suffering from morbus coxæ, with an amount of flexion 150 degrees, indicating to my mind, an inflammation of five months' duration, with some amount of thickening around the joint. I adopted in this case my previously described treatment, carefully fashioning the frame to the trunk and sound limb, but applied it to the diseased limb, and sent the patient home, directing him to be confined to bed, and to return in three months. At the expiration of that time I again examined him, and found the deformities, usually present at the fifth month, gone, the health moderate, but some thickening remaining around the trochanter; consequently, I feared suppuration would occur. I again sent him

home, and advised his continuing in bed for two months longer, and on his return after that time, I found that the limb had continued to improve, with no sign of suppuration. I now allowed him to go about with frame, crutches, and patten, desiring him to return again in three months; and on his return I allowed the frame to be removed in bed, and replaced in the daytime, with crutches and patten; and on his last visit, in 1869, I ordered the removal of all apparatus. This boy was effectually cured. \**2740*

In the above case we have a patient treated at a long distance from the surgeon—which course I have often had to adopt—yet, notwithstanding this disadvantage, the case did well.

It is very advisable when the patient resides at a distance from the surgeon that his return home be delayed a few days, as frequently an appliance that apparently fits well on its first application, may re-

\* The upright portion of the hip appliance was modelled from the contour of the sound limb in this case, which course is only advisable when the deformity is not extreme and of recent date.

quire some subsequent rectification during the first few days.

Children from the ages of one to ten years can be very successfully treated, as travelling at this early age is not such an obstacle to their progress towards recovery as it often proves in the cases of adults.

The patient ought never to be allowed out of the frame, except under surgical supervision; should the patient be taken out of the frame, and happen to assume a sitting posture, thus moving his trunk from the straight line with his limb, he would retard the recovery, and, possibly, may in a few minutes undo the repair of months, and cause suppuration, a disaster he might otherwise have avoided.

At one period in this case I feared suppuration, yet, from the absence of persistent pain, I judged he might escape this evil. A notable sign of suppuration is, that at some period during the third to the sixth month of treatment, a rapid increase of pain is manifested, lasting from seven to thirty days, with an almost sudden cessation, in one or two days, through



rupture of the joint on one or both sides of the ilio-femoral ligament. The contents of the joint escape in this direction, in most cases, when the limb has been retained immovably in a line with the trunk.

Case No. 4.—In January, 1873, I was consulted by Mr. N——, B—— R——, of this town, concerning a slight lameness of his son, a boy eight years of age. The lameness only, had attracted the parents' attention; but, on applying my diagnostic method, I concluded that he had had hip disease for three months. The parents denied its having been so long; but on careful consideration concurred after a few days, with my view of the matter. I commenced the treatment of this case by applying the frame as usual, and by confining the patient to bed at night, and to a couch during the day; and as there was some amount of thickening around the joint, with pain continuing for a long period, I was convinced that suppuration would occur, and directed that the patient should be retained in a horizontal position during six months. He required

occasional constitutional treatment. At the expiration of six months the night pains, which had not previously troubled him, commenced to disturb his rest, and during the seventh month I detected fluctuation, and aspirated the abscess, which lay under the skin over the anterior aspect of the hip joint. I aspirated a second time in two weeks afterwards, which operation was repeated every month; in all, six operations, after which the abscess ceased to refill. Then he commenced to go about on crutches, with the frame and patten. Gradually the joint became atrophied, and he progressed favourably to recovery, without any defect. I advised however the continuation for a longer period of the mechanical aids, so as to ensure the avoidance of a relapse.

This patient, though requiring some medical attention to his general health during the early period of the complaint, became possessed, in the latter part of his recovery, of most excellent health.

Since practising this method of fixing the joints, on no occasion have I had to give the patient an opiate.

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Case No. 5.—In the early part of 1873, Mr. P——, residing in Cheshire called, desiring me to visit and examine his son, a boy of about seven years old. On doing so, I found him suffering from inflammation of the hip joint of four months' duration, general ill-health, much emaciation, and want of sleep from night pain. I proposed immediately to fix the joint, telling the parents that this would of itself restore sleep and appetite. The parents consented, and I applied the frame on the 18th of February, 1873. In three weeks time the night pain had gone, the appetite improved, and the boy rapidly gained flesh. But the local tumefaction around the joint did not subside, and as some tenderness remained, what I expected occurred, viz. : an abscess formed on the anterior aspect of the thigh, which I aspirated once a fortnight for six weeks, afterwards once a month for three months. The repeated formation of the abscess, necessitated his confinement to bed during the long period of nearly nine months, at the expiration of which time he commenced to go

about with the patten and crutches, which I advise in the second stage of treatment. This case also recovered without any defect.

Case No. 6.—In July, 1874, Miss M. R. consulted me, being desirous to have a deformity of her hip joint improved. On examination I found that the angle which the thigh formed with the pelvis and spine was a right angle, so that she could only reach the floor with her toes by arching the spine considerably and leaning to the affected side. I also noticed, that there were several cicatrices, indicative of abscesses, at a previous period. The integument between the ribs and the pelvis formed several folds, caused by long inclining to the deformed side. She had suffered at an early age from hip disease, and was now beginning to have a return of the acute symptoms. She was much emaciated, and appeared in general ill-health. I advised her to undergo a few months' treatment, especially as she had at times much pain, which was the principal cause of her deteriorated health. Acting on my advice, she en-

tered my hospital on the 15th of August, 1874. As the case was one of many years' standing, I decided to model a frame to the deformed side as plate 9, fig. 3, (which I do not advise in recent cases,) and as the case progressed, the spine straightened and the limb became more extended. I used the wrenches—plate 8—to alter the form of the upright portion of the frame. This modification is absolutely necessary in cases of long standing. In sixteen weeks the apparent shortening was corrected, and the spine straight. I then advised a change to her native air in the Principality.

My hospital assistant having mislaid the notes of this case, I wrote to the patient, and requested the history of her suffering. I lay before the reader her note:—

“ DRWS 'REFAIL,

“ ABERWCH, *April 25, 1875.*

“ DR. THOMAS,

“ DEAR SIR,—I am happy to say that my health  
“ is better than it has been for a long time. I am getting to  
“ look so well that you would not think I was the same person

" that entered your hospital on the 15th of August. My back  
 " is not so painful now. The creases in the left side have  
 " almost disappeared. My back is quite flat on the splint now.  
 " The doctor could not push his fist, as he used to do, between  
 " my back and the splint. I can put the other knee up to  
 " the chest quite easy now. I am still wearing a thick boot,  
 " and using crutches. I was afraid of leaving them off without  
 " your permission. You wished to know, sir, how long it  
 " is since I have been bad. Mother says that an abscess 20  
 " formed in my hip about twenty years ago, after scarlet dir  
 " fever; and then I had a fall about three years before I  
 " came to you, sir; and after that I had more pain than I had  
 " before, when walking. I do not think I can explain myself  
 " any better.

" With kind regards from,——."

When I examined this case in October, 1876, I found all deformity gone, and no symptom of unsoundness.

In my early practice I often placed the patient under chloroform, as I believe it is the practice of others in cases of this character, then divided the contracted tendons, and forcibly extended the limb—a process which, though not very risky to the patient, is

very painful. Since however I have practised this method of allowing the body to become unfolded by mere position, the patient has had no pain, and the result has been all that the surgeon could desire, and has not necessitated as much time as the previous practice. The deformity here was great, and had existed fifteen years, at least; this case was certainly a crucial test of my method.

Practically, we may class this case as one of reduction of a deformity which had existed for twenty years. I totally differ with previous writers as to the causes that determine the direction of deformities of limbs affected with inflammation of the joints. I believe that they are the result of the patient's voluntary efforts by muscular action to arrest friction, pressure, and tremor of the diseased part, and in so doing calling into action, simultaneously, muscles that are antagonistic in their action, and these usually belong to the two actions of flexion and extension; and as these two classes of muscles are not possessed of equal power, whichever set of muscles possesses

the greatest force, the limb thus being unequally balanced, must be drawn by those muscles which possess the maximum power.

In those cases where an exception to this rule is noticed, the weaker muscles are in possession of some mechanical advantage, securing to themselves the balance of power; as, for instance, in the case of the elbow. But in the case of the ankle joint, we have the greater muscular power as well as mechanical advantage in the extensors; consequently, early and rapid deformity, and corresponding difficulty of reduction exist.

We have a very noteworthy test of this theory in deformities of the hip joint. At first, we have the deformity of flexion, caused by the greater muscular force of the flexors, and their accessory muscles the adductors, predominating over the force of the extensors; and continuing their action usually up to a right angle. This is also often accompanied by rotation outwards, corresponding to the extra force possessed by the external rotators over that of



the internal ones, this eversion being some times the last deformity noticed. Upon rare occasions, this state is succeeded by inversion, which occurs when the joint has been long in an acute and irritable condition. This inversion comes on by the action of the hamstring muscles at the period when the previously affected muscles have become paralysed from long action, and this inversion results from the predominating force of the inner hamstrings over the external ones, the latter being weaker in power. Indeed, we may look upon the muscular contractions as nature's attempts at the resolution of the disease, and by no means can I see that the muscles are offenders. I am aware that the opposite view has been maintained, and that an eminent United States Surgeon, Dr. Bauer, has proposed division of the tendinous insertions of all these muscles with the object of relieving spasm and pain; but I should say that by that means the destruction of the joint would only be allowed to progress more rapidly.

We have a parallel in Veterinary Surgery, where, by unnerving a horse affected with joint disease, pain is eased and spasm relieved, but with the result, that the joint is destroyed more surely and rapidly. Night spasms and pain are caused principally by the patient's inability during sleep of closely engaging his mind and by his deficiently directed efforts to steady the limb. Again, pain is aggravated by night, to some degree, by altered atmospheric pressure, giving rise to more or less irritation of the joint. Atmospheric pressure has more influence on inflamed joints and tissues than is generally supposed. No symptom is so frequently complained of by patients than what is popularly termed "Rheumatic pain" from approach of night and "change of weather."

Case No. 7.—J. P., fourteen years of age, was brought to me by his parents, in May, 1875, suffering from inflamed hip joint, in the destructive stage, abscesses having formed, and sinuses communicating with the joint.

Plate 12 is a carefully copied engraving of the

patient's photograph taken after eight months' treatment in a large hospital, previous to my examination of him. On examination I found the patient in the condition which is so well illustrated by the artist, namely, that of flexed thigh, and curved spine, with large abscess and ulceration over the trochanter, and inability to reach the ground by three inches. This boy had had skilful advice for eight months. The disease had existed about one month previous to his admission into the charity. The treatment he had received was, according to his own report, the long splint, at first, and latterly the weight and pulley.

This patient was placed in my appliance, and in the short space of three weeks all deformity had been removed, and he was free from pain, but will require a long period to become sound.

I admit that abscesses, and some amount of destruction, may occur under any method, but I also assert, that to whatever stage the patient progresses with my method, his recovery will be at least without

angular deformity; an unsightly and crippling defect and a serious obstacle to the patient's future usefulness.

Case No. 8.—In the early part of 1874, I was requested to visit Miss D——, 14 years of age, who resided in this town, and who had suffered from lameness for five years.

On making an examination, I found that she had been suffering from inflammation of both her hip joints, which had terminated in the formation of abscesses and sinuses on both sides. The joints were acutely tender, and flexed to an angle of about 140 degrees, the spine was greatly curved, and she was unable to stand upright. Her history was, that five years previously she had slipped in the street, injuring her left hip, and from that time had commenced to limp slightly—gradually more so. In one month after this slight accident she consulted a surgeon in this town, practising as a specialist, and supposed to possess hereditary skill in this department, who advised rest and medical treatment; (not surgical

assistance.) Not satisfied with this advice she consulted another surgeon, who advised rest with linaments, codliver oil, &c. In nine months after the accident, the right limb began to suffer. At about the twelfth month she was placed under the care of a homœopathic practitioner, but the deformity, which had been increasing, now became stationary, and continued so for four years. At the termination of this period, a little over exertion brought on the acute symptoms again, when she consulted me, and I advised her being placed in the horizontal fixed position, and in twelve weeks both her limbs became unfolded and in a direct line with the trunk.

In this case, during five years, there was no attempt at any mechanical assistance, though she consulted a specialist. When I saw the patient she was much emaciated, and the parents at first were not willing to have her confined to bed; but confinement to bed, and fixation of the joints, had the usual effect of giving her undisturbed sleep, increase of appetite, freedom from pain, and a rapid gain of flesh.

In this case I had to place an upright on to each limb instead of on to one, and I have always found it much easier to fit and retain the hip instrument with two uprights to it, than with one (as in plate 13, fig. 1.) It is of importance that the two uprights should pass to the outer sides of the posterior superior spinous processes of both hip blades, with an inch of space from the processes, or the machine cannot be tolerated by the patient. When an instrument with two uprights is applied, and both the hip joints are affected, then it is necessary to prolong the first stage of treatment, as crutches can only be used in the second stage, there being no sound limb to attach the patten to, and take the weight of the body off the diseased one. My experience informs me that cases of disease of both hip joints, are of more frequent occurrence than double affections of the knee joints, and that twin affections of the ankle joints are rarer than the latter. Double inflammation of joints are usually of diathetic origin.

Case No. 9.—In May, 1868, I was consulted by

O. E., a timber merchant of Utica, United States. He had brought his son over to have assistance in a case of flexed hip joint, the result of inflammation, followed by suppuration, and the sinus formed had not yet ceased discharging pus.

In this case I put the patient through my usual treatment, and he remained in town for two months by my advice. He was then taken to the Principality for some months, and again consulted me on his way home to the United States.

I instructed him how the treatment was to be continued, during certain periods, and his report to me in 1871, was that he had recovered perfectly. He had had skilful assistance from United States surgeons, previous to his being brought over to this country, but the disease resulted in deformity.

Case No. 10.—James H——, Dalton-in-Furness, aged eighteen years, suffering from pain, lameness, and deformity of the left hip joint, consulted me on July 1st, 1874. On examination I found also the usual symptoms of formation of abscess. The

history of this case was, that two years previously he had met with a slight accident to his hip joint, and, as some lameness remained, he consulted a qualified specialist in this town, who advised alkaline fomentations, cod liver oil, and other remedies prescribed by surgeons who take a diathetic view of nearly all chronic joint affections. This treatment he had continued for two years. I advised that he should enter my hospital, and be placed in the horizontal fixed position, which treatment had the usual effect of improving his health and appetite. As soon as he had become well fixed, and settled in the instrument, his joint was aspirated at intervals of two weeks, until the 10th of September, when, perceiving that aspiration would not succeed in controlling the formation of pus and drain on his constitution, I laid open the abscess by an extensive incision. It, however, continued to discharge more or less until the latter part of November, when the patient became decidedly hectic and exhausted, from the drain of pus. I then decided to excise his joint, which operation was performed by the method



explained in plate 13, figs. 2 and 3. Commencing by Sayre's semi-lunar incision through the soft structures, exposing the bone ready for the saw, and then taking a fine-bladed keyhole saw, I removed the top of the great trochanter, leaving it attached to the rotator muscles; then passing my finger into the depths of the wound, and feeling for the lesser trochanter, I placed the saw on the front aspect of the femur, just above the lesser trochanter, and sawing through the bone, I easily removed the head and neck and a portion of the shaft (as seen in fig. 3, plate 13). I found the head of the femur carious, with perforation of the acetabulum, through which about ten ounces of pus escaped. The operation was successful in temporarily relieving the constitutional irritation, but did not arrest the drain and increasing depression, and the patient succumbed in twenty days after the excision.

In this case the operation was imperatively demanded, and I was prepared for a very extensive amount of disease, as the patient had had no rational

treatment for nearly two years previous to his consulting me, and had made use of the limb to some degree daily, though not in any employment.

I performed the operation on this occasion, deviating from the methods hitherto practised, by leaving the upper portion of the great trochanter. The usual justification for removing the whole trochanter and head of the femur, is that it facilitates drainage from the wound. This modification of the usual operation, leaving part of the great trochanter, would not interfere with the drainage from the joint, and I judged it to be quite as rational a course as that of leaving the calcaneum in Pirogoff's operation, and calculated to assist in developing more bone in the place of that removed, and finally to unite with the femur.

Plate 13, fig. 2, shews the course of the saw through the bone. My limited experience of excision of the hip joint, derived mainly from what I have observed in the practice of others, convinces me that it is not an operation desirable except as a last resource, where all other means have failed to control

the disease, and when the patient is suffering an amount of irritation, that must be fatal to him if not relieved. This operation, which, by surgeons of the United States, is looked upon as involving but little risk, has been performed, according to their own evidence, upon patients whom I should consider amenable to treatment, with a fair presumption of success, which accounts for their dictum, that the operation involves no risk, for doubtless their patients were operated upon long before the disease had reached an advanced stage. In fact, excision was not indicated.

Since publishing the above, I have perused a very instructive treatise on the Pathology and operative treatment of hip disease, by Mr. Thomas Annandale, of Edinburgh, in which he reports a series of 22 cases of excision of hip joint with a result, certainly not encouraging to those who incline to this operation. I find, on analysing these cases, that in seven out of the 22, the results were fatal. In one out of the non-fatal cases, the operation gave no

relief; whilst the remaining 14 cases were what is usually termed a success; that is, they recovered with a shortening varying from two to four inches, according to the age of the patient. A shortening of two inches at the age of six would of course become four inches of shortening at the age of 21. This explains why in the case of adults the shortening was so much greater than in the youthful period. In the practice of my method, even if the head of the femur has been destroyed, the shortening would not exceed two inches in an adult, and scarcely one inch in a youth; a result worth some trouble to secure. I notice that out of the seven fatal cases in only one case is it reported that the symptoms were urgent, and necessitated an operation; and out of the remaining fifteen cases, only one is reported as having been accompanied with urgent symptoms, calling for an immediate operation.

Certainly to my mind, 14 out of the latter cases could in all probability have been successfully treated, and I have reasons for asserting, that there was a

probability that some of the seven fatal cases might also have recovered, as I find that the patients were subjected to no effective mechanical control, such as would have a definite purpose towards resolution of the inflammation existing in the joint; and even where the possibility of a fractional amount of rest were possible to the patient, it is reported that means were employed, such as the weight and pulley, which negatived the rest the patient is supposed to have had by mere reclination.

In many of these cases that recovered after the operation, their recovery occupied so long a period that I cannot see any occasion for its advocacy on the score of time, as such a period would have sufficed to cure the majority of them, and certainly with less defect. In no one of these cases was the joint aspirated, an important *omission* in the treatment of joint disease when effusion or suppuration is saspected.

With regard to the reported state of the excised portions, there is nothing to be learnt in his treatise at variance with my firm conviction. Without enter-

ing into minute anatomical details I assert in general terms, that the pathological conditions met with in joint diseases (excluding of course tumours) are the results of motion and pressure in an articulation which has become inflamed, and is unfitted to submit to the exercise of its normal functions (motion and pressure) so long as any inflammation remains. And, as attending circumstances, variable symptoms of exacerbation are frequently present, due to the various constitutions of patients, but in no way necessitating any departure from strictly mechanical treatment, and still necessitating an adherence to the principles taught in my treatise. Again, I note at page 48 of Mr. Annandale's volume, the explanation of the delayed recovery of some of these cases, even after excision. The author advises, as do other writers indeed :—

“ Movement of the new joint should be commenced  
 “ at the end of three weeks, unless there is painful symptom  
 “ or condition of the wound, then the movement should be  
 “ employed as soon as this condition has passed off.”

Thus we see that after excision, the dread of prolonged inaction even here haunts the Surgeon, and the patient too frequently loses again a chance of recovery, when he has had excision performed.

Some of my readers might, however, put the question, "Then do you think excision never required?" My answer would be, that, if carefully applied, efficient and constantly watched, mechanical treatment had failed, and the patient had commenced to suffer the sympathetic fever, then the operation *ought* to be performed. I have, however, very frequently seen cases where all the constitutional sympathetic irritation was present, and which had *existed* a long period, and where the patient had all the appearance of succumbing to the prolonged local irritation, speedily relieved and finally cured by mechanical control alone, without any constitutional or local application beyond ablution of any sanious discharge—with a piece of coarse floor cloth flannel. Excision should be the exception, not the rule. I have never excised a case of knee joint, and only one of hip joint, and

this was the only case I ever met with, that urgently demanded this operation, and had the patient been efficiently treated at an earlier stage, his case probably would have been a successful one. I refer to Case 10, which for two years had been treated only with medicine internally, and local irritants externally. Better he had never had any advice.

On three occasions, I felt certain I would have to excise the shoulder joint, but the patients recovered. It is my opinion that the carpal and tarsal joints are the most tedious in recovering and require operative interference most frequently.

This year, Dr. Sayre has also published some valuable data concerning excision in his volume, "Orthopedics and Diseases of the Joints." I find that he gives, in tabular form, a history of 59 cases of excision, extending over a period of 21 years; and, interesting as the information he gives us is, it would have been more useful had he described the treatment of each patient previous to his operation. Dr. Sayre has *excised* upon an average  $2\frac{3}{4}$  cases per



annum, whilst Mr. Annandale has averaged  $3\frac{1}{2}$  per annum; but I must do Dr. Sayre justice, and admit that his cases, (though he omits all history of previous mechanical treatment, if there had been any,) appear to have been nearer the conditions requiring excision than those of Mr. Annandale; in fact they were urgent, provided efficient mechanical control had been tried; though the symptoms which he relates as attending each case, justifies us in concluding that there was no treatment adopted which could be dignified by the title of "efficient control" of the joint. It is, however, a significant commentary, that many of the cases were judged to be beyond the reach of our art at periods varying from four to 21 months. For instance, on analysing the table of excisions, page 314, Cases 5, 8, 9, 23, 27 and 56, had been 18 months diseased. Case 46 had been 21 months diseased. Granting that they required excision, Cases 58, 43 and 21 had been respectively only 12, 10, and 9 months diseased. Surely, if these cases had been treated with anything

like efficient control they could not have arrived at such a condition of destruction as to necessitate excision so early; but what value are we to set upon the efficiency of so-called mechanical treatment in the United States, when Cases 22, 28, 52 and 2 had been, the three first only four months, and the last one only six months diseased, yet they were ready for excision at this early date? These last four cases are, to my mind, conclusive proofs that the theory of treatment must have been utterly incorrect, and the appliances more harmful to the patient than leaving the case to the *vis medicatrix naturæ*. With regard to shortening after excision, as recorded in this table, it appears to vary in proportion to the age of the patient; yet, in the case of a girl only ten years of age, there is recorded a shortening of three inches. This was, I suspect, not actual, as Dr. Sayre remarks that the patient was wearing a high boot with a three inch sole. This was probably too high for her, and caused the patient to acquire a corresponding elevation of the pelvis of the diseased side.

Such, probably, will account for the extreme shortening recorded in Case 28. Are we to judge from the remarks of Dr. Sayre, appended to Case 31, that the treatment and reduction of double hip deformity are not understood by Surgeons ?

Case 11.—W—— F——, a boy seven years of age, of very cachectic appearance, was admitted into my hospital September 20th, this year, suffering from extreme deformity and slight tenderness of right hip joint, which was flexed to rather more than a right angle; there were several cicatrices indicative of previous extensive suppuration and also actual shortening from absorption of the head of the femur, the so-called luxation. Plate 14, is a copy of his photograph taken previously to his admittance into my hospital; this is a representation of his condition after four years surgical treatment in private practice, and also as an inmate of a large charity; during that time the long splint was mostly employed. Knowing that by reason of his early age he would not assent willingly to treatment, I decided to place him in an

appliance with two uprights, so as to make it impossible for him to thwart my efforts.

Plate 15, represents the patient placed in position for the reduction of his deformity. The angularity of the right upright (as plate 9, fig. 3) was reduced towards the horizontal line by the aid of wrenches every seven days. By the seventh week the deformity was reduced, and in the ninth week an appliance with a single upright was used, with a patten to the sound limb, also crutches to enable him to go about during the confirmation of the cure, thus to gain fictitious diminution of the actual shortening caused by destruction of the head of the femur.

In this case there was ankylosis as far as absence of any motion at the junction of the femur with the pelvis, but it must have been fibrous, or the flexion could not have been reduced so readily.

Case No. 6, had been deformed for fifteen years at least, and when I commenced treating her I had not anticipated being so successful, or I would have secured a photograph of her case previous to my

commencing her treatment; the deformity in case No. 6 was greater than in this latter one.

Case 12.—July 21st, 1875, I was consulted by Mr. W. F., of B——Street, near this town, whom I found suffering from Periostial Inflammation of the right Ulna, accompanied with fever. For this condition I prescribed local and internal remedies. By the tenth day the constitutional symptoms were aggravated and the patient was found to be suffering from acute inflammation of the right hip joint, which had become intensely painful. I applied one of my splints, which gave immediate ease from pain. After three weeks had elapsed the inflammation over the Ulna terminated in suppuration. In the fourth week of treatment, the case became further complicated by inflammation of the left hip joint, upon which I removed the single splint, and placed him in a double appliance, which had the same effect as before in alleviating all pain. In this appliance he remained for ten weeks. At this period, the nurse in charge allowed the lower extremity to be very suddenly

jerked, and the right thigh was fractured, thus further complicating the case, and as the accident was not reported to me, the lesion was not detected for ten days. I perceived that the thigh bone below the trochanter was enlarged, and on making a careful examination lest aspiration should be indicated, for I suspected fluid, and then detected the fracture. However, I enjoined more care in handling the patient, and applied an extra quantity of bandage; and the fracture was firmly united at the end of six weeks. At this date, the existence of fluid in front of the right hip joint became apparent, which fluid was at once aspirated and did not reaccumulate. The patient was kept in the double appliance for twenty-four weeks, when a single one was applied to control the right hip joint only; for the left joint having completely recovered was, by the aid of a crutch, used for locomotion.

Here we have a case of inflammation of the periosteum of the right Ulna, ending in suppuration and necrosis, where the necrosed shaft of ulna exfoli-

ated and was reproduced. Secondly, inflammation of the right hip joint. Thirdly, inflammation of the left hip joint; and lastly, fracture of the right thigh, and yet the patient recovered mainly through mechanical treatment. After the symptomatic fever had subsided he took continuously for a long period Tincture of Iron in well diluted doses, no medicated local treatment nor irritant was applied; yet the patient, who, without this mechanical fixation, would very probably not have lived over the first six weeks, finally recovered. During the treatment of this case, the value of efficient mechanical assistance was tested in this manner. The nurse persuaded the patient and his friends that the appliance was uncalled for, painful, and injurious to the sufferer, and that some other method such as she had observed elsewhere was better, the result of her interference was that the appliance was taken off, but the patient's experience of its omission for twelve hours (though he was on a water mattress) was such, that he was delighted to have it replaced, and he dismissed his officious

attendant as he dreaded she should interfere with what he thought was a pleasant bedfellow.

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### SUMMARY.

1.—Inflammation of the hip and other joints is sometimes of diathetic, at other times of traumatic origin, but is generally continued by traumatic causes—pressure and friction, whatever may have been the primary origin. It may also be caused by the patient's indulging in prolonged and unaccustomed exercise.

2.—There are three deformities which may occur in hip joint disease—apparent lengthening, apparent shortening, and actual shortening:—

Apparent lengthening is caused by the patient's effort to keep all weight off the diseased limb by placing it forwards at a period when the flexion is not extreme enough to keep the foot of the diseased side off, and a degree of apparent lengthening may be actually acquired after the occurrence of resolution, by wearing a shallow patten on the sound foot for a sufficiently long period, when actual shortening has occurred. Under such circumstances the deformity is an advantage, as it serves to



conceal the real shortening, so as to avoid a roll in walking. This the surgeon should instruct the patient to attain.

3.—Apparent shortening is produced by muscular action (flexion,) or from a tilting up of the pelvis on the diseased side, this latter state is usually found in cases where an unnecessarily high soled boot has been worn. This phase of shortening may be met with in any one of the so called "stages of inflammation."

4.—Actual shortening is often caused by erosion of the bones composing the joint, and though usually noticeable in conjunction with suppuration, it does however often occur where no suppuration has taken place.

5.—The hip joint should always be cured with the lumbar concavity strictly corrected; that is, with the thigh and spine in line, whether ankylosis be present or not, so as to avoid recurring troubles in the future, and to eventually insure in the non-ankylosed condition the utmost range of action.

6.—If the hip splint be not so fitted as to remain continuously in its proper position, it must not be expected to give ease from pain or to benefit the joint. So to avoid pain and eversion or inversion of the thigh, and to bring on early resolution, the upright portions of the splint must be so fitted as to remain, uninterruptedly, close to the body and limb, but external to the posterior superior spinous process of the ilium of the affected side, and over the prominence of the buttock, and so as not to shift towards the diseased side.

7.—Should the splint shift outwards when on the patient, and turn round the great trochanter, the body wing of the sound

side, and the inner wings of the limb portion, should be turned up so as to grip the patient more closely, and the twist in the stem must be increased at that point which lies behind the upper margin of the ilium. These manoeuvres must be performed without removing the splint from the patient, and they demand the use of the wrenches, by means of which all the necessary alterations in the shape of the splint are effected with accuracy, facility, and speed.

8.—Should the splint shift inwards towards the spine, and cover or tend to cover the anus, the inner wings must be extended, (and the outer, of course, turned up if necessary,) while the rotation of the upright portion must be decreased.

9.—The rotation of the upright portion is effected thus:—The plane of the trunk portion is inverted, so as to lie more aptly on the convexity of the thorax. This twist is generally imperative in the case of thin patients, but is required in a less degree by stout ones, in whom alone it may, if ever it can, be dispensed with.

10.—If pain be not efficiently alleviated after the first three days, the surgeon may conclude either that the fitting is not accurate, or that during his absence the patient is able to rotate himself within the splint, consequently the appliance requires to be more carefully adapted to the body.

11.—The less padding there is on the iron of the appliance the more tolerable it is to the patient. During the period of treatment, a soft feather bed or water mattress is to be preferred, but a firm mattress is the most convenient in the

reduction of deformities if no inflammation exists. Deformities are reduced with less pain and more rapidly in the unsound than the sound stage.

12.—Aspiration of fluid should be practised as soon as it can be detected, whether within or external to a joint, and repeated as often as it may re-appear. This operation is attended with no risk.

13.—When open suppuration exists, with direct or indirect apertures (sinuses), it is of importance that the part be treated with simple ablution, and without any form of dressing. By this means alone, if the aperture or apertures be also free enough to permit easy exit of fluid, perfect antiseptic conditions are ensured.

14.—Abscesses may be opened by incision with but little risk, if for a time previous to, during, and after this operation, the joint be kept well fixed.

15.—Abscesses that have arisen within the hip joint and have existed long enough to travel some distance down the thigh, have often ceased to be connected with the joint. Such abscesses are often "curdy," and practically cannot be aspirated; but they may be safely opened without risk to the joint. Thus the practice of our predecessors, who, before the introduction of aspiration, advised delayed incision, was occasionally good.

16.—The gradual increase of pain without extraneous cause, and its sudden cessation, frequently indicates a rupture of the joint, though there may be no appreciable increase of heat or effusion.

17.—Occasionally, absorption of the head of the femur may occur without suppuration in the practice of this method, and should shortening take place from absorption it may be practically diminished if the use of a shallow patten under the foot of the sound limb be persisted in for a sufficiently long period after recovery. Under these circumstances, a lateral spinal curve is acquired without alteration in the normal level of the shoulders.

18.—A correct application of the appliance prevents pain, eversion or inversion, and angular deformity of the hip joint.

19.—It is essential that the first stage of treatment of hip disease should be strictly uninterrupted in principle.

20.—When the acetabulum is ulcerated through and its fluid communicating with the pelvis, this method may, but will not always, arrest constitutional irritation, and the same may be said of excision.

21.—The indication of permanent cure of hip joint disease in those cured with anchyloses and with the thigh in line with spine, is the nonrecurrence (after a period of use) of the flexion and lumbar concavity. If cured with partial anchyloses, or what is termed stiffness (a temporary condition) and the thigh in line with spine, my diagnostic method should not indicate any angle with the spine (after a period of use.)

22.—The consulted may have occasion to apply the hip appliance to a case where, from the omission of aspiration to accumulated pus, and where sloughing has occurred, there exists a surface of ulceration corresponding to the parts covered by the instrument. In such a case, let the hip appliance be adapted

to the sound side, then placing a pad between the two limbs bandage them firmly together.

23.—From observation, I am inclined to believe that in hip joint disease, when fluid is indicated close to Poupart's ligament, and slightly external to the femoral artery, it denotes that the acetabulum has been primarily affected, and its floor ulcerated through. This occurrence requires the practice of aspiration as I have already advised.

24.—The casualties of hip excision are of like character to those met with in disease of this joint.

25.—The deformities of inversion and eversion usually become corrected by use after resolution, consequently they may be ignored during treatment.

## CHAPTER IV.



### DIAGNOSIS AND TREATMENT OF KNEE JOINT INFLAMMATION.

THE diagnosis of chronic or subacute inflammation of the knee joint is usually easy when somewhat advanced, but its existence at an early period is some times undoubtedly obscure.

The earliest symptom which I have noticed is a tenderness on firm pressure over the internal lateral ligament. This symptom is very rarely absent in any stage of the disease. The external lateral ligament becomes tender on pressure usually at a later stage. There may be tenderness of the internal lateral ligament previous to any apparent effusion or

perceptible distension of the joint. This tenderness is, I think, generally due to effusion and consequent distention, though the quantity effused may be very small; and the practice of aspiration, in cases of simple synovitis, has shewn me that this tenderness of the internal lateral ligament immediately ceases after an aspiration of the articulation, for a short time, but recurs if the fluid re-accumulates.

Another symptom noticed at an early date is an inability to extend the knee to its utmost. I believe that in hysterical knee joint affections, if the condition of the internal lateral ligament of the side complained of be compared with that of the other, it is a useful guide to the formation of an opinion, inasmuch as firm pressure on both will give equal uneasiness to each, but if real unsoundness of the joint exists the patient will describe the pain there as being of a different character to that of the uneasiness produced by mere pressure on the sound one.

I have frequently noticed a form of simulated inflammation of the knee joint which occurs in

children from 6 to 12 years of age, the principal symptom being a spasmodic condition of the flexors and extensors of the knee, yet no tenderness or alteration in the form of the joint; and in these cases, I observed that they resolved themselves without any assistance beyond cold douche and confinement to their couch, and were cured in a period of two weeks at the most. This condition has always appeared to me to be more muscular than articular.

The deformities to which an inflamed knee joint is subject are usually, flexion, dislocation of the head of the tibia backwards, rotation of the leg, and an enlargement of the condyles of the femur; never can I recollect having seen enlargement of the tibia. The inflammation is either of traumatic or diathetic origin, but I hold that whatever the origin, the surgeon should employ mechanical means in every case, and attempt to correct any abnormal condition of the general health. In the mechanical treatment of inflammation of the knee joint, I believe that the arrest of pressure as well as of



friction is essential ; yet this double proviso is not essential in simple synovitis. The arrest of friction alone, is in this latter condition, enough. My attention was called to this fact by my friend Mr. Rushton Parker, and I have frequently since verified it in practice ; but in chronic cases, a fractional degree of pressure, caused by the splint being too short and permitting a slight touch of the toe upon the ground, will thwart a satisfactory result.

My mechanical treatment consists in fitting an appliance, as shewn in plate 16, and bandaging the limb to the machine, to secure it in position ; the bandage is to consist of two flannel rolls, one for the thigh portion and one for the leg portion, the former is to be firmly applied, so as to carry the splint with the thigh rather than with the leg, in locomotion ; the latter less firmly so as to permit the leg to give way and not resist the downward pressure of the femur, and so to avoid risking an injury to the inflamed joint ; but yet not bandaged loosely enough to allow the leg to shake within the

splint. This detail I have found to be a necessary precaution. If fluid be detected, whether it has existed one or twelve months—or whether it be serous or purulent—it is better that Dieulafoy's operation\* of aspiration be performed at once, and repeated so frequently as fluid re-appears. If suppuration exists and the pus has become too condensed for aspiration the joint should be laid freely open, and the incisions treated by ablution only. Incision can be practised with but little risk to the patient if before, during, and after the operation, the joint be kept strictly immovable, with as little "after manipulation" as possible.

\* This operation I have practised with perfect safety, and with marked benefit (as regards ease of pain and acceleration of cure), at all ages, from one month to 40 years. For many years I was much puzzled by noticing that, generally speaking, while inflammations of the hip, knee, ankle, and elbow joints were usually accompanied by effusion, painfully distending their capsules, the shoulder joint was an exception, but that even an acute or a prolonged chronic stage of inflammation of the shoulder was often accompanied by extreme atrophy and complete absence of effusion, the explanation of which I now suggest is, that the effusion probably escapes from the capsule by the side of the biceps tendon. Thus we seem to have in this joint a natural arrangement which prevents tension, and is called into action as soon as any excess of fluid commences to accumulate. This explains why cases of inflammation of this joint are so often mistaken for cases of paralysis—which they somewhat simulate—so extreme is the atrophy.

The knee and ankle joints are frequently subject to localised inflammation, which may appear in the case of the knee joint on either side of the ligamentum patellæ or on either side of the hamstring tendons, between the hamstring tendons and the patellæ, or, in rare cases, in front of the leg between the tibia and fibula. The symptoms of this condition, which I have noticed, are, that patients who were apparently doing remarkably well, with no tenderness and with but slight thickening of the joint, will suddenly feel great pain, with no appreciable indication of heat or effusion within the joint, and will become as suddenly relieved by a rupture of the joint, diagnosed by the appearance of a small area of fluid elasticity—the product of localised inflammation. On attempting the aspiration of such collections, or if this be impossible, on laying them open, the discharge seldom exceeds a drachm or two of pus. These collections rapidly resolve themselves if careful immobility is secured for a time previous, during, and after either incision or aspiration.

Deformities of the knee joint are always more easily corrected in the inflammatory stage, even though suppuration with sinuses exists, as in this condition reduction can be accomplished with less pain and with more rapidity and effect, than when resolution has taken place.

A correction of deformity that might occupy two days in an inflammatory or even suppurative state, would require, after resolution, probably ten times as many weeks, and be accompanied with some pain.

The knee should always be cured in a strictly straight position, the Surgeon ignoring the condition which it may happen to be in when presented to him. In this way relapses and increased deformity are avoided in the future, should the joint become ankylosed, and the patient is enabled to progress without any roll of the body, whilst the joint is eventually more certain to enter upon its utmost range of action.

It is my practice to wait a few days after apply-

ing mechanical assistance, previous to prescribing for the constitutional state, as by that time it may be apparent that nothing is required.

Specific medicines, as iodine, mercury, lime, silica, &c., administered with the intention of producing local action in these complaints are, in my opinion, ridiculous.

I hold that the improvement of the patient's assimilation is next in importance to mechanical treatment, and it is also my belief that a too frequent or a too liberal allowance of food is an evil, whilst a slight deficiency of aliment is not; for, in the former case, by over-taxing the stomach digestion is frequently deranged, whilst, in the latter, what is taken is well digested, and the patient gets the full benefit of what little he takes.

Another remedy which is in my opinion, of little value in these diseases is change of air,\* it is however very rarely requisite, but a luxury neverthe-

\* Those of my patients who are the favorites of fortune do not do any better than those who have not the means of luxury at command.

less which those who can afford, may be allowed to indulge in. As to the frequent practice of applying compression, shampooing friction, passive motions, galvanism, injections of sulphuric acid, iodine, and filthy poultices, or any other heavy or sticky forms of dressing, they are all, to my mind, only modes of prolonging the inflammation, and the patient has to get well in spite of them.

As to the application of cold lotions, it is ideally correct, but, as the removal of friction, pressure, and tension cools the joint more efficiently, cold applications are not necessary.

So little has been attempted for the improvement of the mechanical treatment of inflamed knee joints that, in my opinion, there has not existed up to the present time any appliance worthy of special notice ; for, although many ingenious means have been devised to improve the treatment of hip joint affections it certainly appears as if this joint had monopolised the attention of Surgeons in the mechanical department.

The popularity of excision of this joint explains the absence of any tendency towards true conservation of this articulation. For example, Professor Spence, in his address on Surgery, delivered to the members of the British Medical Association at Edinburgh, in reviewing the Surgery of the Articulations, remarks :

“ A wide field opens before me, but I must limit myself to one or two points. In regard to excision of joints, now so firmly established as a conservative measure, and so obviously an advance in the right direction.”

Mr. Spence evidently has but little hope for improved treatment, except by excision, for chronic diseases of joints.

Excision of the hip joint has not been a popular operation amongst surgeons in this country, but they have made up for their abstinence in this particular by a much too frequent practice of excision in affections of the knee joint.

When Mr. Filkin, of Northwich, Mr. Park, of Liverpool, and Mr. Jeffray, of Glasgow, (the designer of the chain-saw,) the Moreaus in France first proposed and practised this operation, they selected only

those cases where destruction of the articulation had occurred, but their modern successors have frequently excised joints which have only just entered the chronic stage, and are not what is popularly termed "diseased."

Many cases thus condemned, which certainly had not arrived at the chronic stage, but which could have been successfully treated, have come under my notice.

The apparatus here advised for fixing the knee, taking off all concussion, and arresting friction, in diseases of this joint, is more satisfactory and remarkable in its effects than the hip appliance. By it, we are enabled to control the joint more effectually, the patient is able to go about at a much earlier period than in the case of hip disease, and is frequently competent to attend to his usual avocation long before the knee has recovered.

As in hip joint disease, so in this, position and weight of the limb are sufficient to remedy any deformity, not the result of true ankylosis, and to reduce deformities which cannot be removed by immediate force.



The appliances employed in this treatment are shewn in plate 13, figs. 4 and 5, and are applied as depicted in plate 16. Plate 17 B is a representation of an useful arrangement to be applied temporarily if the patient has to be confined to bed for any period, and it can be easily attached. It consists of a bar of iron with a slot in its length, but with bosses and screws to grip the end of the knee appliance.

The knee appliance, as shown in plate 13, fig. 4, can be made by the same mechanics as the hip appliance. The upper crescent is formed of an iron ring  $\frac{3}{8}$ ths of an inch in thickness, varying according to the age and weight of the patient; the ring is nearly ovoid in shape and is covered with boiler felt and basil leather; from its upper and lower portions two iron rods pass down to the lower end of the machine, where may be noticed a small staple for retention purposes, only used for the reduction of flexion.

The ovoid ring should join the inner stem, forming an angle of 55 degrees, which, when correctly padded,

becomes reduced to 45 degrees. This arrangement of the splint will be the most acceptable for wearing. The staple can be cut off at a subsequent stage, and replaced by a patten,—as shown in plate 16,—which is welded on in its place, for the use of the patient in locomotion.

Across the two bars is stretched an apron of basil leather to support the limb, and in the leather are two slits for the insertion of the bandage—plate 13, fig. 4. The patten which is worn under the shoe of the sound limb when the patient walks in locomotion is shown in plate 13, fig. 5. An exact diagram and side view of the nearly ovoid ring is shown in plate 5, fig. 3 (for left side), by which the reader will perceive that the anterior crescent E is much straighter than the posterior one D, and that the inside stem G is connected anteriorly to the centre of the nearly ovoid ring, the stem A being connected to the central and uppermost portion of the ovoid. The stems of the machine should extend several inches below the foot so that the toe of the diseased

limb may be fully one inch short of reaching the ground. A strap passes over the shoulder of the sound side and is attached by a buckle anteriorly, and posteriorly to the ovoid rim. This completes the mechanism of the knee apparatus as shown (when applied) in plate 16, and the carrier attached plate 17 B. for use in bed during any painful period or reduction of deformity.

I do not wish it to be supposed that the retention arrangement is always required in a recent case of chronic inflamed knee, when there is none or only a slight deformity; it is only essential when the case has been of long duration and is accompanied by much deformity. This "retention" may appear to be a method of extension; it, however, is only so in appearance, as it only answers the purpose of retaining the limb in the splint during the progress of reducing any deformity. It is occasionally impossible to retain an extremely deformed limb between the bars without this application, and its continuance may be required for a few weeks; the deformity being re-

duced, this retentive arrangement may be discontinued.

This retention need not be pushed to any extreme extension, as it would thereby interfere with the patient's ease and comfort. I have always observed that the hip, knee, and jaw joints at the termination of treatment, enter more rapidly upon their functions if cured in the position of extension, while the elbow and ankle joints recover their action the more readily if cured when flexed; yet the hip, knee, and jaw, when inflamed and uncontrolled, tend to flex, whilst the elbow and ankle joints tend to extend when not controlled.

In the use of the knee appliance the surgeon should note carefully whether the cutler has his details correct, or, in the case of an adult patient it will not be tolerable to wear. A youth may do with an ill-fitting appliance, but an adult must be carefully fitted.

The surgeon may meet with a neglected case, in which the knee is much larger than the thigh at the groin; consequently the ring of the appliance which will pass over the knee may be too large to grip

the thigh at the groin, and fix the whole limb. The joint may also be acutely tender, making it imperative to secure the utmost immobility for a time, then the machine shewn in plate 24, fig. 1, is suitable with the carrier, (plate 17 B) attached. In constructing this caliper splint it should be noticed that the inner head B is below the outer A, plate 24, fig. 1, otherwise they would pinch the integument and distress the sufferer. At C, an embayment is also arranged to allow room for the enlarged joint. Fig. 6, pl. 24, shows a caliper splint for arresting friction used only in the treatment of the early stage of synovitis. The length of the outer stem A fig. 1, pl. 24, can be varied, to avoid pressure on the trochanter, by means of the set screws.

I will here again introduce a few typical cases of special interest, they having been crucial tests of the efficiency of this method of cure, and will be guides to the treatment of the varieties usually met with.

One or two of my critics have found fault with my not having given more numerous instances of

the successful results of my method of treatment in this class of diseases. But I beg to intimate that my object was rather to guide my fellow-practitioners than to gain credit for any personal skill; consequently I have selected cases of varying complications, some not having been primarily subjected to my method of practice, and upon which other methods had failed—certainly a very trying test of my method. With this mechanical treatment of knee joint affections, as I remarked of my application in hip joint disease, the surgeon will note the absence of many symptoms, both local and constitutional, that have hitherto been supposed to usually accompany this disease.

Case No. 1.—In May, 1872, I was consulted by M. P., of Dalton-in-Furness, twenty-six years of age, who was suffering from chronic inflammation of the knee joint. He had been a sufferer and unable to work for nine months previously. There were the usual symptoms of chronic inflammation, but no effusion; the knee was contracted to an angle of

about 160 degrees. The symptoms not being acute, the knee machine, fig. 4, plate 13, was fitted, with a patten end attached, as in plate 5, fig. 7, and the usual patten under the foot of the sound limb. From the date upon which the appliance was fitted, the patient went about daily, with no treatment other than an occasional aperient, together with firm bandaging to the machine, which he retained night and day for twelve months. This man's recovery had continued when examined in October, 1875.

Case No. 2.—On the 10th October, 1873, Mr. S—, of Workington, brought his son, a child four years of age, to my hospital for examination and advice. I found him suffering from disease of the knee joint at the destructive stage. Suppuration existed, and there were several sinuses discharging pus, and the leg was contracted to a right angle with the thigh. The hamstring tendons were tenotomised under æther, and a safe amount of force was used to extend the knee, but without success in totally removing the angularity. The patient was

13. 14

then placed in the machine. Plate 5, fig. 6. A very gentle fixed retention in the machine was continued for four weeks. At the end of this period, the limb was perfectly straight, and the child ultimately recovered.

In this case the adhesions were so strong, that a justifiable amount of force was not sufficient to tear them, but four weeks of uninterrupted retention between the parallel rods, without any posterior leather support, sufficed to straighten the limb. Tenotomy was performed in this case, for the purpose of shortening the period required to diminish the deformity. In this opinion I was wrong, and the case convinced me, that it made no practical difference, whether the tendons were divided or not. After this experience I totally laid aside the operation. This case was last examined by me in January, 1876, and his recovery was confirmed.

Case No. 3.—In March, 1872, I was consulted by Mrs. H., thirty-two years of age, residing in London, concerning a chronic inflammation of her knee joint, the joint being contracted to an angle of about



one hundred and forty degrees. She could make but very little use of the limb, and suffered continuous pain, night and day.

This patient's history was, that when about eleven years of age, she fell and injured her knee, and was placed under the care of a bone setter in the neighbourhood of Wakefield, who pronounced the case one of dislocation. She was under his care up to the age of nineteen, when she consulted a celebrated bone setter in this town, who advised the counter irritants in vogue in those days, but which did not benefit the patient. In the year 1862 she consulted me. I prescribed the usual remedies taught in our schools, but with no beneficial results. Soon after, having removed to London, she had the assistance of a professional gentleman of the highest reputation and skill, and who deservedly stands at the head of the profession. His advice, however, was followed by no improvement in the limb, nor any diminution of the pains or other signs of local irritation.

I was consulted by her again in the early part of

1872. At this time I was practising my new method of treating such cases, and had used it successfully for some years. I advised a trial of this method of treatment. The machine was applied with the patten, as shown in plate 16. No retention arrangement was used, but merely posterior support with leather across the bars, and flannel bandages. The limb, which had been flexed to an angle of one hundred and forty degrees for several years, in four weeks was perfectly straight in line with the thigh. With the aid of the machine she was enabled to go about, and attend to her duties, &c., and at the expiration of her third year of wearing it, the joint became perfectly sound; she set it aside, and its disuse has not been attended with any signs of relapse. A slight degree of stiffening remains, which is an advantage towards her recovery; moderation however, in the use of the limb will remove the stiffness. Had passive motion been employed to overcome this, I feel assured that it would be an invitation to a return of the disease.

Case No. 4.—In June, 1875, E. W—, residing

in London, was brought to me by his parents, for advice. He suffered from chronic inflammation of the knee, accompanied by an enlargement, and an angular contraction nearly to a right angle with the thigh. There was neither effusion nor suppuration, but tenderness on manipulation.

From the history of the case, I found that he had been a sufferer for nine months, and had had skilful assistance from a surgeon in one of the hospitals in the metropolis specially devoted to this subject. It had been decided to excise the joint. I applied my new instruments with the staple end for retention, and bandaged the limb, but omitted posterior support. The result was that the limb became perfectly straight in ten days, and quite free from pain. By this time the child was able to walk about, with the additional aid of a patten under the sound foot, although he had not walked for nine months previously.

Without wishing to reflect upon the earlier treatment of this child, the new method proved of more benefit to the limb in ten days than the old

method had in nine months. It enabled the child in a few days, without pain or distress, to go about, and this without the aid of crutches or walking-stick. The termination of this case I cannot record, as the child and parent removed to another district.

Case No. 5.—In October, 1872, Miss H—, of Bootle, nine years of age, was brought to me by her mother, suffering from inflammation of the knee joint which had existed for twelve months. There was a good deal of effusion, and tenderness of the joint, with flexion to an angle of one hundred and forty degrees, and consequent lameness; she did not seem to be suffering constitutionally. The patient had been for twelve months in this condition, though she had had skilful assistance. I advised the use of the instrument, and the application was followed by the limb becoming straight in six weeks. The effusion diminished but slowly, occupying a period of nearly three months; there was no retention practised in this case. From that time up to the present all trace of the disease has dis-

appeared, leaving no stiffening. I advised, however, a continuation of the appliance a little longer, to confirm the recovery.

This patient's knee was placed in the appliance when partially ankylosed, and retained in it for four years continuously; yet was found at the expiration of that period with the movements of the knee restored.

Case No. 6.—In February, 1871, whilst making a professional visit to Mr. H—, of L— Street, in this town, I noticed that his daughter, Miss A. J. H—, twelve years of age, was a cripple, and on inquiry was informed that when only 12 months old she had had a fall, and from that time commenced to be lame. This lameness continued to increase until she was twelve years of age. Upon examination, I found that her knee had suffered for a long period from chronic inflammation. There existed at this time a partial dislocation of the head of the tibia, from the condyles of the femur, and excruciating pain on slightest manipulation, together

with a right angled flexion. Although this case had not gone on to suppuration, yet during the whole of that time it had been more or less tender, so as to incapacitate the sufferer from even the use of crutches. I volunteered to do what I could to relieve her, and applied one of my instruments. Her condition at present is represented in plate 18, taken from a photograph. The left knee, although not perfect, she is able to use with some defect of motion. During the time the patient wore the machine, she attended to her household duties. Some defect must ultimately remain in this case, as twelve years of neglect one cannot expect to totally remedy.

Case No. 7.—In January, 1869, a patient, M. J—, came from Palestine to consult me. She was suffering from a long standing chronic inflammation of the knee joint. The joint was enlarged, slightly effused, very tender, and angular flexion to one hundred and twenty degrees had occurred. The patient was much emaciated, in depressed spirits, and in ill health. The history of her

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case is, that in the winter of 1856 she fell on the ice and injured her knee. She received no professional assistance for six months, and on consulting a doctor he pronounced it a dislocation of the knee cap, but that it was not possible to reduce it. After this she consulted several doctors and bone setters in search of relief, but in vain. In 1859 she was taken to the Queen's Hospital, Birmingham, from whence, after a period of two months' treatment, she was discharged much relieved, but not quite free from pain. This improvement continued for three years. In 1864 she went on the Continent, and whilst there, in that year, was laid up for three months with a return of her previous symptoms. She was again relieved, and able to travel for twelve months.

In 1857, while at Jerusalem, she had a return of all the previous symptoms, intensified. This attack continued for four months, and not being able to get sufficient relief to enable her to look after her duties, she returned to England for the purpose of

consulting me. I applied the machine with a patten attached; no retention was used, but leather was placed across the bars and flannel bandaging. I also prescribed certain details to promote her general health. She was so much improved in six months that she commenced to travel about the country as a public lecturer in connection with the Canaan Mission, and continued to do so for three years, at the expiration of which time her recovery was complete, though with a stiff limb. She tells me, that she can now walk many miles per day, without feeling in the least distressed.

The improvement in her general health was rapid after the first six months. There remained an unusual amount of stiffness in this case, which is not to be wondered at, when the many repeated attacks of acute inflammation she had suffered from during the previous fifteen years are taken into consideration.

This was the first time I applied this machine to an adult. I had been using it for children for many years previously.



*5 years*

Case No. 8.—In January, 1865, Master J. W—, of Bootle, seven years of age, was brought to me by his parents, suffering from a diseased knee joint.

On examination I found that suppuration had occurred, and that there were several sinuses communicating with the joint, one through the popliteal space, and others on either side of the joint. I had never before seen so much apparent destruction of the articulation. There was also flexion to a right angle.

The history of the case was, that in consequence of a fall the knee became attacked by acute inflammation. The patient had been placed under the care of a bone setter in this town, and also under that of his son, a surgeon, who professes specialism in this department.

The usual methods of treatment had been adopted up to the period when I examined him; and I decided to place him in one of my new appliances with retention, cutting out from the leather stretched

across the rods an opening sufficient to admit of drainage from the knee. The limb soon became straight and the leg (inclusive of the machine) was bandaged with flannel, up to the knee and from thence to the thigh, but leaving the knee exposed. The only treatment applied to the knee was frequent swilling with water, and a little oil to prevent the opening into the joint from scabbing, and the joint itself to become distended by pus. It is, even now, too frequently the practice to surround the joint with a poultice, a mercurial ointment, or some other specific, a proceeding very injurious, being a remnant of the effete surgery of the middle ages.

The patient was under my treatment for five years; during this period he had first an attack of kidney disease, and then fever.

This case ultimately attained a perfect recovery. Plate 19, taken from a photograph, shows the boy standing; plate 20 shows him with his knee extremely flexed. These two plates enable the reader to see what amount of action the knee possessed, and

the extent of its recovery. This case was very complicated at one period of the treatment, owing to kidney disease and typhus before adverted to. This did not, however, induce me to interrupt the treatment of the knee. I have always objected to removing the appliances in cases that have become complicated, as the additional irritation of the second complaint, superadded to the existing disease, would much diminish the patient's chance of recovery.

Here we have a case of knee joint disease with ulceration of the articular cartilage and partial ankylosis, placed under enforced, uninterrupted, and prolonged rest for five years, at the end of which period there was no ankylosis, and finally at this date, 1875, the patient recovering, with perfect motion.

Case No. 9.—Miss McG——, from near Kirkinner, Wigtonshire, consulted me in April, 1872, suffering from splay foot of the right side. I noticed, that she also suffered from some lameness of the left limb, concerning which, however, she had no intention of consulting me. Perceiving that she

was seriously lame on that side, I advised her to allow an examination of it. On thus examining, I found that she suffered from an angular deformity of the knee joint with an extreme curve inward, as in the ordinary knock knee. The joint was much enlarged and abnormally sensitive and stiff. So I advised that it should be placed under surgical treatment, to which, after some persuasion, she consented. The splay foot was first completely remedied and then her knee was placed in my usual knee appliance with patten under the foot of the sound limb, &c. The thigh and leg were so much diverted (knock-kneed) from the straight line that I had great difficulty in getting them into the appliance. The patient was in excellent health, and required no prescribing.

The mechanical treatment was continued for two years, the lady returning to consult me at intervals of three or four months until January, 1875. The limb, which she had thought was beyond all remedy, had been so far relieved, that she was

desirous of making use of it. It had become perfectly straight, the joint being nearly normal in size, painless, and free from the stiffness which had characterized it when first placed under control, though it had not been released from the restraints, even for a moment, for two years. I advised her to continue the appliance for some portion of this year, to confirm the cure, after which I have no doubt that the absence of restraint will, during the following twelve months, restore motion of the joint to its extreme radius.

Case No. 10.—Master R—, of Pwllheli, Carnarvonshire, was brought to me, suffering from chronic inflammation of the knee joint, accompanied by a great amount of constitutional disturbance; the joint was enlarged with effusion, together with flexion to a right angle, and much pain, from which there was but slight remission day or night.

The history of this case is, that in April, 1874, the sufferer had received a slight injury, and not recovering at the expiration of three months, his

parents consulted a bone setter, now practising in the Principality, who pronounced the joint luxated, and who subjected the patient's knee to manipulations, (so severe as must have satisfied any of the distinguished modern surgeons who are converts to this antiquated barbarity,) with the result of adding greatly to the patient's local distress, and producing the constitutional disturbance under which he laboured.

These manipulations were followed by the standard local remedies, rubbing with oils, baths, iodine, and other trifles, *ad nauseam*.

He was brought to me three months after this maltreatment, and six months after the injury. This was in October, 1874. I first placed his limb in one of my knee appliances, and then attended to his general health, and he was taken home; when brought for examination again in three months he had greatly improved. I then advised the discontinuance of constitutional treatment, and the use of the limb (controlled by the

machine) in locomotion. On his return on the third occasion, in six months from the second visit, I found the knee sound and free from defect, normal in function, and healthy in appearance; yet I advised a continuance of the appliance for six months longer to confirm the cure, as experience has convinced me that six months, though apparently in excess, is no evil, but a too restricted period of restraint, may result in imperfect recovery, or no recovery at all.

Case No. 11.—In June, 1874, Mrs. B—, residing at Santander, in Spain, brought her daughter, a child ten years of age, to have my assistance.

The child suffered from chronic inflammation of the knee joint, and right angle flexion, with acute tenderness and constitutional irritation. She had been a sufferer for nine months previously. The limb was placed in one of my appliances, and the knee joint aspirated, removing about one ounce of fluid. In the fourth week she was going about

without assistance even from crutches, though her previous sufferings rendered "the crutch" indispensable when taking exercise.

This patient stayed at my hospital four months, at the expiration of which time her joint was painless; there was no deformity, and no effusion. When she left the hospital she returned to Spain, and Mrs. B—— reports her daughter as doing well, and not requiring any further medical or surgical assistance.

In this case I was convinced that the pain was the sole cause of the constitutional disturbance, and I was confirmed in my view, for as soon as complete mechanical rest was established, the general health rapidly improved without my prescribing, and the angular deformity gradually disappeared, by my adjusting the limb, as in plate 16. In this case aspiration was performed; an operation in my experience not merely harmless, but one which can be resorted to early with benefit to the patient.

I am glad to be able to add independent testi-



mony to the value of the treatment here advocated, in the following case attended by my friend, Mr. J. P. Harris, of this town, who has kindly furnished me with the following particulars :

“ Elizabeth H——, aged 30, consulted me about ”  
 “ six months ago for an affection of the knee ”  
 “ joint. Her history is as follows : About eight ”  
 “ years ago she fell in going up some steps, ”  
 “ and slightly bruised the left knee. She did ”  
 “ not experience much inconvenience at the time, ”  
 “ as she used the limb afterwards, though ”  
 “ attended with some little uneasiness and slightly ”  
 “ impaired motion.”

“ Six months later she obtained a situation ”  
 “ as a school teacher, where she took some ad- ”  
 “ ditional exercise and was exposed to cold and ”  
 “ damp. The knee became inflamed, and was ”  
 “ treated with leeches, blisters, &c., rest being in- ”  
 “ sisted on. From this time the joint became more ”  
 “ stiffened, and nine months later an abscess ”  
 “ formed on the outer side of it, which discharged ”

“for twelve months. The joint now became fixed”  
 “in a semi-flexed position, allowing her to walk”  
 “very imperfectly on the points of the toes with”  
 “the aid of a stick. Attacks of recurrent inflam-”  
 “mation of the joint continued to trouble her, and”  
 “these deteriorated her general health very much.”  
 “On the 11th of May, 1876, Mr. Thomas’ splint”  
 “was applied according to his method. In about a”  
 “month the limb resumed its natural straight”  
 “position, the joint becoming less in size and free”  
 “from all tenderness, though somewhat larger”  
 “than the opposite joint. The splint continues to”  
 “be worn, and by the use of the patten for the”  
 “opposite foot, she is able to move about with”  
 “comparative comfort.”

Case No. 13.—In April, 1872, Mr G. D—, residing at Hanley, Staffordshire, brought, (at the recommendation of my late friend Mr. Tillet) his daughter, a girl eight years of age, to have my advice for a chronic inflammation of her right knee, the joint having been in an impaired state for seven

months. When I examined the joint, there were effusion, tenderness, and angular deformity with partial ankylosis. The limb was placed in one of my appliances, with a patten under the sound foot as usual.

This was the only treatment she received for three years—care being taken to lengthen the machine when required; which was attended to every three months. The restraint was continued uninterruptedly for three years, at the expiration of which time I dismissed the patient, possessed of perfect movement of the joint.

The reader will have noted that in remedying deformities of the articulations, the force I advise is never continuous, but interrupted by a few days rest, after each diminution of angularity. This is the secret of the force being so easily tolerated by the patient. Three days of non-interference at least should be allowed, but in cases much deformed double that time is requisite between each correction of the machine, and with a correctly fitting

appliance, any deformity, however extreme, if not ankylosed by bone, will be corrected more easily and with vastly less pain by this, than by any of the prior methods, such as tenotomy, forcible rupture, or continuous extension.

No. 14.—T. H., Everton. This case was a boy, who, when brought to me was eight years of age. He was of a very unhealthy and strumous appearance, and had been suffering for two years from disease of the knee joint. The joint had already suppurated and there were sinuses communicating with it, and it was flexed to a right angle. The patient had lost one eye from disease, and during the time I attended him he suffered from albuminuria with general dropsy. He had two immense abscesses, one in the loin and the other in the thigh. This boy was under my treatment for two years. At the commencement of, and many times during, treatment, I felt confident that I should save neither joint nor life, but I was astonished to see him recover with a very useful knee, though with defective mobility.

Cases of pure synovitis can be treated with success by the use of my "calliper foot splint," shown in plate 24, fig. 6. This is to arrest motion in the joint only; the lower end being inserted into an iron tube in the heel of the patient's boot. As an example, a personal friend of mine lately consulted me, suffering from simple synovitis, without any pain, only slight stiffness. The calliper foot splint was applied, and the joint aspirated every third day on four occasions. During this time he attended to his duty as superintendent of extensive masonry works; and after wearing the splint for six weeks he laid it aside, having quite recovered. This splint may be used in the early stage of knee joint inflammation, where, as I know, arrest of friction alone is often sufficient. It is astonishing how much fluid the knee joint will accommodate itself to, without subcutaneous rupture. As an instance, my friend, Mr. Rushton Parker, assisted me in one case, when we aspirated from the knee joint no less than three pints of non-purulent fluid. The elbow seems to come next in disten-

sibility ; and though I have but seldom had occasion to aspirate this joint, I not long ago removed in this way as much as ten ounces of liquid from a case of huge enlargement of the elbow produced apparently by chronic rheumatic arthritis.

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#### S U M M A R Y .

1.—The student who has acquired a knowledge of the casualties and correct treatment of knee joint inflammation will find that this knowledge will always qualify him for efficiently treating inflammation of the other articulations, inasmuch as the knee joint is subject to the general inflammation common to the other joints, with the addition of a feature peculiarly characteristic of itself, i.e., localised inflammation.

2. In this joint as in all others there is no position of ease, whether straight or flexed, in the absence of efficient fixation. The extended position insures the utmost future usefulness.

3.—The deformities of the knee joint are flexion, luxation of the head of the tibia backwards, accompanied occasionally by slight rotation, and sometimes by the deformity known as

genu valgum. I have noticed this last deformity on several occasions in knee cases, though not connected with the joint inflammation, yet corrected spontaneously while the joint was simply retained in the knee appliance without the addition of any retentive arrangement.

4.—The knee joint appliance should be so fitted that after a few days' wear it may be easily tolerated by the patient; again, a space of at least one inch should be allowed between the extended toe and the ground in the case of an adult, whilst in the case of a child a space of two inches is preferable. And the length of the splint and patten should be so adjusted that the shoulders of the patient are level.

5.—~~If the patient complain of too much pressure on the groin, the depth of the patten on the sound side should be increased. If complaint is made of pressure on the ilium the patten should be decreased.~~

6.—As the patient grows (supposing he is under the adult age), he must grow *from* the patten on the sound side and *towards* the lower end of the splint on the diseased side; consequently, while the depth of the patten never needs to be increased, the splint has to be watched, and lengthened as the toe nears the ground.

7.—If the patient be able to touch the ground when the ankle and toes of the affected limb are well extended, the appliance should be lengthened, as a very slight touch of the extended toe on the ground during progression will delay resolution and cause flexion, except in some cases of mere synovitis.

8.—It is of the utmost importance that pneumatic aspiration, so fully expounded in the masterly work of M. Dieulafoy, should be practised (and repeated daily if necessary, which it seldom is), as the distension of the articulation with fluid, however small the quantity, is very frequently the sole cause of the irritative fever often present.

9.—All counter-irritants, applications of heat, shampooing, passive motions, should be avoided. Under this head is included that venerable relic but “strange device” “Scotts dressing,” the undoubted occasional advantages of which I hold are in exact proportion to its rigidity.

10.—When the joint has been laid freely open on both sides (2 to 3 inches incision) aspiration not being practicable, it is better to abstain from all dressing and avoidable manipulation, and occasional ablutions should only be practised.

11. Incision of the joint may be done with but little risk if for a period before, during, and after incision, the joint is efficiently fixed.

12.—The signs of resolution of all inflammation in the knee joint are :—

Absence of unusual tenderness on applying moderate pressure over the ligaments around this joint, especially the internal lateral ligament.

The absence of all evidence of effusion.

The tolerance of concussion without discomfort.

The power, after use, of fully extending the knee, to the straight position acquired while in the splint.

The non-recurrence of flexion, after use, in cases of unavoidable fibrous ankylosis.



## CHAPTER V.



### INFLAMMATION OF THE ANKLE AND TARSAL JOINTS.

THE diagnosis of inflammation of the ankle joint is not so easy as that of other joints, the symptoms, on manipulation, simulate so closely those arising from a simple sprain of the articulation. It will be noticed that the ligaments around the joint are equally abnormally sensitive in both conditions, but when the joint has been in a chronic state for a long period, then it may be observed that the joint has ruptured, and its contents point to the outer side of the tendo Achillis, or on both sides. The patient at this period is also unable to flex the ankle, which has a tendency to become fixed in the extended position, and he is disturbed by nocturnal pain, and by symptoms denoting constitutional sympathetic irritation. It is my

practice, in an advanced case of chronic inflammation of the ankle, occasionally to ignore the accompanying deformity, and correct it after resolution, especially if the patient is not close at hand, so as to be readily watched. It may occur that the surgeon cannot see the patient except at long intervals, in which case the ignoring of the deformity and securing resolution first is the more convenient practice. The principles followed by myself in the treatment of these and of all other joints are identical, with merely variations in mechanical detail. For the ankle I usually use the knee appliance simply; but when I wish to keep the foot at a right angle to the leg, there is added a foot piece, (plate 21, fig. 1,) to which the foot is bandaged. This slides up and down on the rods, which must be strictly parallel between D. C.; or if the patient be confined to bed, the angular splint, fig. 2, can be applied. The application of this (if the surgeon can watch the case daily for a few days,) will rapidly correct deformity of the ankle.

Though the knee appliance is not so effectual in restraining the use of the ankle and tarsal joints, as it is that of the knee, yet the cases which follow shew the benefits of the method.

Case No. 1.—Elizabeth J.——— residing in G——s Street, in this town, two years ago, while alighting from a chair on which she had been standing, fell and twisted her ankle, which caused her great pain and swelling, so that it prevented her using it. Cold douche was applied immediately after the accident, by the continued use of which she improved so as to be able to go about at the expiration of two weeks after the accident. But its use in locomotion was followed by a relapse of the previous symptoms. At this period she consulted myself, when I applied a method of stiffening only, and advised her to discontinue the use of the joint. However, she, being dissatisfied with my advice, sought admission into one of the public charities, where she remained about twelve weeks. During the first five weeks, “Scotts Dressing” was applied, and retained uninterruptedly for

five weeks; on the removal of which it was discovered that the ankle joint had suppurated. This casualty was treated by linseed meal poultice for seven weeks, during which time sinuses formed, communicating with the joint, and amputation was urged by the surgeon in charge. This she declined, and left the Hospital. When she consulted me again, on examination finding the condition of the ankle joint such as I feared might not recover, or occupy a very long period in resolution, I also advised amputation, and took her into my Hospital for the purpose of performing the operation. But previous to operation I showed the case to my friend, Mr. Rushton Parker, who remarked "that as no mechanical method had been tried, it would be well to test its efficacy before removing the foot."

To this I assented, and after detaining the patient in the hospital long enough to fit her with the knee appliance, she was dismissed, and directed to apply pieces of coarse flannel, "floor cloth flannel," wrung out of cold water, slackly around the joint, changing

this many times a day. This treatment was continued for nearly eighteen months, and the joint became sound during the first seven months' wear of the machine, but with the deformity of fixed extension; this I corrected in the fourteenth month. This patient recovered, with perfect motion at the ankle.

I frequently permit the use of cold water douche in the treatment of inflammation of the ankle and foot joints, being easily applied; not so with the knee or hip: the use of the cold douche in the latter would soil the appliances, these again would irritate the patient's skin.

Case No. 2.—In October, 1872, Mrs. D—, of Ridgway, Iowa County, Wisconsin, U.S., came over to England to consult me concerning a lameness of her left foot. On examination, I found slight tenderness, with a little swelling and stiffness of several of the tarsal articulations. She was totally unable to place any weight on her foot. The ankle joint was healthy and in no way affected.

The history of her case is, that she had strained

her foot some seven years previously, and had consulted several doctors in the States ; most of the gentlemen consulted concluded that there was a displacement of the tarsal bones. Various remedies were advised, and on one occasion she was subjected to violent manipulation, for the purpose of reducing a displacement which was believed to be present. She also had applied a remedy (which luckily has not as yet found favour in this country), the Junod boot, but with no beneficial result.

On finding that her ankle joint was inflamed, I decided to apply the knee apparatus and patten, which treatment was continued for two years. In the last communication received from her, which reached me this year, she represented herself as having completely recovered, and that she had laid aside the appliance after two years' use.

The kind of appliance worn in this case is shown in plate 16, but without the "retention." In diseases of the foot joints, a very excellent method is

the application of the ordinary patten, plate 13, fig. 5, to the shoe of the sound foot, placing the heel patten, plate 5, fig. 5, under the heel only of the diseased foot, and so enabling the patient to go about without touching the floor with his toes.

Case No. 3.—Mrs. D—, of Denbigh, consulted me in the month of December, 1873, concerning a chronic inflammation of her tarsal bones, which had existed six months. In this case I advised constitutional treatment, cold douche, painting her skin with Tincture of Benzoin, to protect it from the irritation which, in her case, the water always produced. Under the heel of the affected foot was placed an iron clog, plate 5, fig. 5, with the usual patten under the sound foot. My instructions and mechanical appliances were continued for six months, with the result of perfect recovery.

Case No. 4.—Miss R——, near Llanrwst, consulted me in February, 1868, suffering from long standing chronic inflammation of her tarsal articulations. In this case the only application was,

strapping for the purpose of stiffening by adhesive plaister, spread upon paper, with the foot appliance, plate 5, fig. 5. This treatment was continued for seven months, when the patient recovered. Plate 22 shows a very useful method of relieving the metatarsal and phalangeal joints from both pressure and friction.

The reader will have noted that in none of the cases reported did I practice counter-irritation. Mr. Cline, in the past, and Mr. Furneaux Jordan, in the present time, have taught that counter-irritation is best applied at some distance from the joint. I am convinced that its total omission is the correct procedure. I believe the local application of cold water though not essential, to be not objectionable, and that the application of heat ought always to be avoided; the arrest of pressure and friction being the indispensable remedy for gradually diminishing the inflammation present in the articulation.



## CHAPTER VI.



### ETIOLOGY, CASUALTIES AND THERAPEUTICS OF INFLAMED ARTICULATIONS.

THERE are several difficulties which beset the surgeon in his attempts to treat chronic inflammation of the joints rationally.

In the first place, an extended experience has convinced me, that as a rule, it is easier to cure the disease than to remove the doubts of the patient and his friends, prompted as the doubts too often are, by members of our profession, who ascribe to a faulty constitution the origin of nearly all joint inflammations, and advise partial, or ignore all, local restraint, and trust to counter-irritation, with so called rest, and specific medicines ; or they believe that prolonged rest

is the principal factor in the production of ankylosis, and especially dread rest continued beyond the acute stage for any prolonged period. This error is very general even in this country, but more so among our Transatlantic brethren, and has culminated in the maturing of the "Portative-extension" appliances of the Davis-Sayre type. As illustrations of the opinions held by them, I quote some of their principal authorities. Bauer, in his "Orthopedic Lectures," published at New York, 1867, page 57, says:—

"Gentlemen, absolute rest of inflamed joints however  
 "beneficial for a time, has likewise its therapeutical restriction  
 "and experience teaches that if the immobility of healthy  
 "articulations is unduly prolonged, they will become stiff, dry,  
 "and even ankylosed by fibrous bands."

Another quotation from the same page shows clearly to me how ridiculously inefficient this so-called absolute rest must be:—

"Do not expect to mitigate the frightful nocturnal pain  
 "and convulsion and muscular quiver by anodynes; they have  
 "very little effect in large, and none in small doses."

Again, in Barwell on Diseases of the Joints, page

324, we have the above opinions re-iterated :—

“It is of great importance to annul, or at least to  
 “mitigate these spasms, not only on their own account, but  
 “also because they accompany lasting contraction of the muscles,  
 “and because their amount corresponds sufficiently closely  
 “with the rapidity of the destructive process. Now, no opiate  
 “which our art supplies annuls these pains: it has been allowed  
 “me to watch patients, thus suffering, who have taken a heavy  
 “dose of laudanum, and in one or two instances it has seemed  
 “to me that they slept more through the pain; but, that it was  
 “still there, was evidenced by their starting up momentarily and  
 “falling back again to sleep, or by sudden sharp cry or groan;  
 “in fact, opium may dull the perception a little, but does not  
 “check the spasm, if, indeed, it does not increase it; for the  
 “limb, in cases I speak of, has jerked with much force, and  
 “while this lasted patients were bathed in sweat. The  
 “pathological condition of the nerves, already described, is not  
 “one which could be diminished by an opiate, or by any means  
 “tending to decrease the controlling action of the nervous  
 “centres.”

These quotations satisfy me that their authors have never been able to secure for their cases more than a fraction of the needful rest, or they would have observed that an anodyne is very rarely required. Yet some of my critics assert that my theory and

method of rest, which abolish all these horrors, is not new.

It is remarkable, as I show by quotations from authors who have made this department their speciality, that their treatment is certainly specially irritational; for instance, Dr. Sayre thus teaches: (American Clinical Lectures, Vol. I, No. 1, Diseases of Hip Joint, page 14.)

“When this instrument is employed, it is necessary that the  
 “child should be taken from it very frequently, and have all  
 “the joints carefully moved, otherwise, too long continued rest  
 “of the joints may end in ankylosis. In moving the diseased  
 “joint, care must be taken to hold the pelvis, and to make slight  
 “extension upon the diseased limb when motion is given  
 “to the joint. Perfect rest, long continued, even of the diseased  
 “joint is decidedly injurious, as there is danger of its resulting  
 “in ankylosis.”

No method can be devised, in my opinion, to more effectually thwart any tendency to resolution than the practice which the advise—it may be characterised as Rest simulated, interrupted, with prolonged suffering; no wonder Dr. Sayre judges ankylosis to be a favourable termination, (see page

17 of same lectures).

“In fact, ankylosis should be considered in this stage of the disease a very favourable termination.”

I maintain that such treatment would produce ankylosis in any stage of joint inflammation.

In the “Clinical Lectures and Essays,” by Sir James Paget, Vol. I, page 93, article “Bone setting, &c.,” he says:—

“With rest too long maintained, the joint becomes and remains stiff and weak, over sensitive, even though there be no morbid process in it, and this mischief is increased if the joint have been too long bandaged, and still more if treated with cold douche. I need hardly say that it may sometimes be difficult to decide the time at which rest after having been highly beneficial may become injurious.”

The foregoing quotation is utterly at variance with my own personal observation,—that treatment may be continued beyond a necessary period is very possible, though surgeons usually err by the practice of a too restricted period of rest: the former is certainly, in my opinion, no evil, but the latter occurrence might thwart the resolution of the disease.

Another writer lamentably instruct us, Mr. Wharton Hood, in his treatise on Bone-setting, page 113 :—

“It is also manifest that if permanent ankylosis be the result arrived at by the surgeon, rest must be a necessary condition for bringing it about.”

Certainly not; for in support of this he reports cases of partial ankylosis, the result of what is usually mis-called rest.

Most of the evidence contained in Mr. Wharton Hood's treatise is second hand, derived from an unreliable source; consequently not deserving of the serious consideration of practical surgeons. This author has been cited by me inasmuch as his treatise has been judged deserving of special consideration by some who ought to be well able to judge of its value. Nevertheless, I believe that joints treated according to the doctrine laid down in this treatise cannot, with very rare exceptions, have any chance of relief, without permanent defect.

\* This treatise is principally devoted to an exposition of the purely imaginary merits of the practice of one Hutten, who practised a method of manipulation of joints.

A fallacy with the public, and a growing one among the profession, of late years, has been that some unqualified practitioners are in possession of an occult art in this branch.

I have, after extended observation, ventured to declare this a fallacy; having been during the early portion of my life in the confidence, for years, of as many as seven of these manipulators, male and female, in various parts of England and Wales; and, indirectly, watched the practice of six such others, distributed over England, Wales, and Scotland.

In the sanctum of one I had the pleasure of meeting (incognito) one of our metropolitan professors of surgery in search of knowledge.

These opportunities have given me the right, and in the interests of the progress of rational surgery, I feel it my duty, to record the experience thus gained, which experience amounts to this: that this class of practitioners are not in possession of methods "not dreamt of in our philosophy."

Frequently I have heard patients express themselves relieved in twenty-four hours, when, as a practical surgeon, I could plainly see that they were sufferers. I never met with one of these practitioners "but loved his trade rather than his art." Many of them are only successful competitors with shrines, relics, and other nervine remedies; and I certainly would not advocate the addition of even a genuine relic to the surgeon's armamentum.

Mr. Barwell supplies me with another quotation which plainly indicates the prevailing dread of rest even if prolonged to that indispensable period, necessary for resolution to take place, but not by prolonged fixation secured beyond possibility of relapse.

"Yet in strumous synovial disease, all inflammation having  
 "ceased, my recommendation that passive motion might be  
 "used, is often met by the question—'Had we not better wait  
 "till the tissues are consolidated?' What a strange query  
 "that is. Wait till the joint is all but immovable before we  
 "try to establish mobility? Wait till the house is burnt down  
 "before we attempt to extinguish the fire!"



My answer to this is, that the practice he advocates is more like rushing into the house and attempting to occupy it whilst the fire is raging, or we might object to play the hydrant on a burning house lest the contents might be damaged by the water, though this is the only method of saving some of its valuable contents.

In none of the cases reported by the two last authors was there complete rest of the joint. I believe consequently that the cases were not in a condition fit to enter gradually upon their normal functions, even if sound.

Again at page 274, of Dr. Sayre's recent Volume on Orthopedics and Diseases of joints, we are warned of the imaginary evils of fixation.

“But I must again warn you of the danger of permitting the  
“patient to wear such fixed dressings too long. If employed  
“at all they must be frequently removed and passive motion  
“employed, else ankylosis, more or less complete, will take  
“place, and the last state of the patient may be worse than the  
“first.”

Indeed! In this last quotation we are warned against a remedy most preventative of ankylosis, and urgently advised to practise the main cause of ankylosis, i.e., motion of articulations while in an inflamed condition.

Again, at page 399 of the same Volume, he reports thus :—

“I have seen one case in a gentleman under thirty years of age, from Providence, Rhode Island, on which both hips, one knee and both ankles, were apparently completely ankylosed, as the result of rheumatic inflammation. I have seen another case in a young lad of fifteen, from Kentucky, who had disease of his right hip joint, and for the purpose of procuring rest of that joint, was put by his attending surgeon into a fixed apparatus, embracing the trunk, pelvis and both lower extremities, and so retained for several months. At the end of this time the diseased hip was cured by ankylosis, and the knee and ankle of the diseased limb, as well as the hip, knee, and ankle of the opposite one, completely ankylosed and still remain in the same condition. In this case there had been no inflammatory action in any of the diseased joints, except the right hip, and he had never complained of or suffered pain in any of them. This case is of importance, showing as it does that ankylosis can take place, even in a young person, on a perfectly healthy joint, by long continued rest.”

This case and its interpretation, involves, the whole question in dispute between myself, contemporaries and predecessors. That these cases are correctly reported, I will admit; but that the extra articulations mentioned became ankylosed, and that without any abnormal condition pre-existing beyond rest of the part, I hold to be impossible. As regards the first case, it is given as one of rheumatic inflammation of all the joints that recovered with defect; the second, it is highly probable, was also of rheumatic origin, and was so carefully and skilfully "put up" by the surgeon in attendance that the implication by inflammation of the other joints was not felt by the patient, nor noticed by the surgeon.

Had this case not been so well treated (fixed) he possibly would have recovered with hideous deformity and would be fit to earn a livelihood at a street corner.

During the period I was qualifying myself for the profession, I was asked to go and see a case of general Rheumatism, where every joint in the body was completely ankylosed as regards any motion, and

the patient could be handled by the nurses as though he was a plank, yet beyond reclining in bed he had had no method of fixation applied to him.

For many years I believed and practised the principles of treatment of joint difficulties, as laid down in our Surgical Text books, and special treatises, until their imperfect results induced me to attempt some improvement in the practical part, during which period I discovered, that it was the Theory of treatment that was the cause of non-success and had for ages relegated the majority of these casualties as incurable. After many years of labour devoted to constantly improving the details of mechanical treatment, gradually I observed that inflamed joints recovered, as regards time and freedom from after defects, just in proportion to the efficiency of their fixation (arrest of motion), and freedom from concussion with the application of certain practical details required by the accidental variations of each case. With my theory as his guide, the surgeon can with confidence treat these difficulties "in such a wise that

knowinge the nature of the infirmity there may thereby through natural reason (ye though there were no practice) be procured a speedy remedye.”\* Joints not controlled, or when placed in what is usually termed “rest” if in a state of inflammation, become the seat of a degree of stiffness; which I confidently state is not usual when joints have been fixed immoveably.

The conditions tending directly to ankylosis are continued friction and pressure, while the joint is in a state of inflammation; absolute rest is not a factor in causing ankylosis, but the means of avoiding this casualty, and my observations convince me that rest cannot be too long maintained nor ever become per se, an ailment.

At page 206 of Sir James Paget's *Clinical Essays, &c.*, a very interesting case is reported, as described by Professor Flower, which confirms my theory as to the effect of rest on healthy joints.

“A man, whose skeleton is at Marburg, was encased by

\* John Halle, A.D. 1565.

“his relatives for 20 years in a space in which he could only  
“sit with his limbs doubled up, and in which he could have  
“had only very narrowly restrained movements of his joints,  
“yet his limbs did not become deformed, and his joints retained  
“their normal textures.”

The Professor quotes this as an instance of exception to his own belief, but he omits to inform us whether the man's relatives wished to kill him or merely to stiffen him. If the latter, they certainly tried it according to the commonly supposed means, but failed, as there was wanting irritation of them this would have assisted in stiffening his joints, but granting that he had this irritation or inflammation of the joints, and had also been compelled to roam about, the ankylosis would have been a certainty, and instead of the experiment occupying twenty years, stiffening the joints of the tortured person would only have occupied one thirtieth of the above term.

Two years ago I operated upon the feet of a lady suffering from contraction of the Achilles tendons, caused by the weight of the bed clothes during a long

period of confinement to bed. The contraction had existed five years, and totally prevented any locomotion, and she was consequently confined to a couch or bed during the whole of that period.

Ten days after the operation she walked from my hospital, a distance of 800 yards, yet this joint had been fixed for a period of five years; there was not the slightest stiffness or adhesion in it. The stiffness was confined to the Achilles tendons only.

I had occasion during the same year to operate upon the feet of a young lady who had been confined to bed for three years from the same condition of the Achilles tendons. As in the previous case, she was totally unable to walk or to place her feet upon the floor. In six days after the operation she went about. There was no evidence of ankylosis. Ankylosis will occur in a degree always relative to the inflammation present, and the imperfect fixation of the joint prolongs this inflammation. Whatever stiffness occasionally remains, after the fixation of a joint, that stiffness would have been still greater after deficient

fixation. It has been my practice in certain cases of paralysis of the extensors of the hand, to place the hand at nearly a right angle with the forearm, in the position of extension, and to keep it fixed for six months, without a moment's relaxation or intermission. Yet this amount of fixing alone, has never in any case produced permanent stiffening of the articulation, as the one thing needful was absent, namely:—internal irritation of the joint. Articulations that were stiffened, inflamed, and falsely ankylosed, when fixed and retained so without interruption for one, four and five years, became relaxed as knee joint cases, No. 5, 8, 13, previously reported; the more an inflamed joint is efficiently fixed, the sooner does the inflammation subside, and consequently, the less damage will be done and the better the result; a certain amount of mere stiffening, remains for a time, which assists in confirming the cure by preventing the patients' making a too free use of the limb on removal of restraints. Once resolution has been secured beyond a possibility of relapse, let the restraint be removed,



and the limb will regain its utmost range of usefulness by use alone; it may happen that the inflammation has been so severe and prolonged, that ankylosis may remain limiting the limbs' usefulness; in these cases the surgeon can boast of having saved the limb, and perhaps the life of the patient, by having firmly continued a course of treatment that reason dictated, and which my experience indicates to be correct.\*

My experience compels me to disbelieve the possibility of ankylosis, where there has been complete mechanical rest, and not an inordinate degree of inflammation.

What is usually meant by "Rest" is confinement to bed, without any fixing of the joint. In the case of the hip joint such rest is of no value, as the patient sits up in bed many times during the day, and so

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\* While insisting on the importance of arresting friction and pressure in unhealthy articulations, and also that rest cannot of itself ankylose a joint; it must not be forgotten that prolonged or unusual friction or pressure in the use of healthy joints will produce inflammation in them which may go on to ankylosis. Many cases illustrative of this could be cited but as this has no doubt been frequently noted by other surgeons, such reports would not be of any value and they require no special treatment.

flexes his limb more effectually than he would have done had he been going about. Confinement to bed, in the case of the knee joint, may be called partial rest ; and in the case of the ankle joint it is more effectual. If this so called rest is tolerated ; some stiffness must ultimately remain in the majority of cases, as ankylosis will occur in proportion to the inefficiency of the immobilization of an inflamed articulation. The preceding quotations, represent the opinions held by representative men in this department of surgery, and show unmistakeably, that the profession hold tenets at variance with the views taught by myself, regarding the effect of rest on both healthy and inflamed joints, we differ also as regards the possible result of over friction and pressure on even healthy joints at times.

As a general rule both in surgery and medicine the "rest" prescribed is only hypothetical, inasmuch as, that in the generality of cases where rest is advised, means are prescribed that effectually nullify any benefit that could be gained by it, for instance, in

affections of joints, the weight and pulley, Sayres' apparatus, counter-irritants, rubbing, unguents, shampooing, and last of all there are indications of a desire to popularise the most irrational of all so called aids, viz.: Dr. Bauer's suggestion that the tendons controlling the inflamed joint should be divided, ere they become affected by prolonged action. From the volume of the '*Lancet*' for 1876, is extracted the following paragraph by a Professor of Surgery, on the treatment of knee joint inflammation.

*Treatment.*—" Good diet, change of air, and tonics, including  
 " preparations of iodine, are indicated by reason of the chronic  
 " nature of the complaint, implying a serious constitutional error.  
 " Perfect rest to the joint must be ensured by splints, with an  
 " occasional counter-irritant in the shape of a flying blister; and  
 " when heat and tenderness have nearly subsided, strapping and  
 " bandage, to support the cell-mas and prevent venous con-  
 " gestion, must be applied—when all danger of resuscitating  
 " inflammation appears to have ceased, friction and passive  
 " motion will much avail. Thomas' splint, such as I show you,  
 " as used by one of the above children,—with a patten attached  
 " to the boot of the sound foot—will allow the patient to take  
 " exercise in the open air; will provide extension, and yet secure  
 " a certain amount of repose to the joint.

There is one very hopeful feature in this formula, the absence of the traditional "linseed meal poultice" and "mercurial unctions." Most of my critics assert that there is nothing new in my theory or method, yet it is in every particular the reverse of the mode here counselled. In the first place we have here "good diet change of air and tonics," though they are not so valuable as securing ease from pain, because the daintiness of the patient's appetite and digestion, as a rule, disappears in proportion to the relief of pain and local irritation; when this relief has been achieved, the patient seldom requires special attention or stimulation of his appetite.

As to the use of the "preparations of Iodine" they have not in my opinion, any curative value in these difficulties, and I do not believe that any surgeon will be able to demonstrate, that Iodine has any beneficial effect in producing resolution of inflammation of joints.

Again the chronic condition of the complaint is attributed to a "Constitutional error," and not to

irritation caused by friction, pressure, and tremor of parts not tolerant of such, which I assert to be the case.

“Perfect rest,” is also enjoyed by means of so called “splints,” which are very inadequate for their intended purpose, and that this fractional rest may be still detracted from in value, an occasional “counter-irritant” is added in the shape of a “flying blister,” and “when the heat and tenderness diminish, or have nearly subsided,” in spite of all this treatment, then strapping and bandaging are urged, and when “all danger of resuscitating inflammation appears to have ceased, friction and passive motion will much avail.” Certainly, but only to bring back the difficulty. And finally Thomas’ splint is applied at a period, that had a more rational mode been practised, the sufferer would have been able to dispense with surgical aid.

Again in the same lecture is contained the following commendation of a practice that I had hitherto thought was confined to Transatlantic surgery.

*Tenotomy.*—“You will have remarked that, of my three cases,

“in that of the lad, the disease is in its first stage, while in the  
 “two girls the malady has terminated in ankylosis with deformity.  
 “Now as prevention is better than cure, I would suggest, as a  
 “rule of practice, that an attempt be made to prevent that  
 “deformity that you have witnessed in these children by a  
 “subcutaneous section of one or more hamstring tendons—at  
 “any rate the biceps, the power of which to rotate the leg out-  
 “wards, you can readily appreciate on your own person. I  
 “adopted this plan in the case of a child of a professional friend  
 “and I believe with marked benefit. I propose to do the same  
 “in the instance of the lad above mentioned.”

The adage here applied to illustrate this operation, most certainly does not indicate its value, though it may express one of the principles of conservative surgery. How any surgeon who has had a moderate experience of Tenotomy can urge or practise it in these cases is to me inexplicable; as it is well known that division of healthy tendons only suspends the action of the muscular fibre for a very short period, sometimes not for more than three days, consequently, this practice, if done on limbs efficiently controlled, can answer no end—nor temporary purpose; but if done upon an extremity not

controlled (granting that such division of tendons were not followed by rapid union—which is not the fact) then the joint would rapidly retrograde as the patient would have lost the ability to secure rest even in a slight degree by the action of his will, and thus fail to imitate what art should, and can, do effectually.

\*Dr. Bauer's suggestion is only an imitation of the operation practised by veterinary surgeons, i.e., unnerving a horse for navicular disease, which enables the animal to be free from pain for a short period at the expense of a rapid retrogression to destruction of the foot, that otherwise would have lasted a long period. The operation of unnerving is certainly the less irrational of the two, though there is sense in neither—if conservatism is the aim of the surgeon. The operation of tenotomy, as proposed by Dr. Bauer can relieve no pain nor answer

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\* From the reports of cases published in the Metropolitan Journals this year, 1876, it is apparent that this hitherto Transatlantic procedure has now been tried in London with reputed benefit. It would take a very high numerical evidence of success to induce me to try it—an operation in my opinion the most irrational item ever introduced into the treatment of diseased joints and which "out bids" all other suggestions in the wrong direction.

any purpose I know of, but the operation of un-ner-ving does make the inflamed part painless for a time at least, and makes its use tolerable until it is ruined. With the action of the tendons, the surgeon need not concern himself, for as soon as the limb is placed at rest, their action ceases ; as soon as immobility is attained by art, nature, the irregular practitioner, disappears from the scene, in the treatment of joint diseases as well as in that of fractures. The more skilful the surgeon, the less we see of nature's rude surgery.

Several examples confirmatory of this occur in both Medicine and Surgery as well as in the Veterinary Art.

Dr. Sayre's views as given in his recent Volume, convince me that he has never observed the effect of, nor secured for any of his cases a curative amount of, rest ; for at Page 199, he thus informs us.

“ You may keep the limb perfectly still, and locked up in every conceivable way, and yet you do not overcome the tendency of the muscles to contract, you do not prevent reflex action.”



It is astonishing the attention that many surgeons give to the muscles, and to thwarting their efforts at conserving the articulation, all this correcting of muscular action is wrong, for as soon as sufficient fixation of the articulation has been attained, their action ceases, in fact their "occupation's gone."

"Passive motion" so generally insisted upon in our Surgical text books, as a necessary item to gain the utmost usefulness of the joint, is I believe attended with danger to the patient, and often undoes that which the surgeon had well achieved, never have I seen a case of recovery where it was required, and deny that it is indicated except in extremely rare cases, such as never came under my observation. Once the articulation is sound beyond relapse, let the restraint be removed, and the part will usually regain its utmost usefulness through use alone, but to enable the recovered joint to resume its utmost extent of action, it is necessary that it should have been retained during treatment, and to be on the occurrence of resolution, in the posture which theory and ex-

perience indicate as the right one to permit the patient to use the limb more and more in the direction of its usual purpose, as for instance, in the hip joint, the thigh must be in line with the body; the knee joint, the thigh, and leg, should be also in line while the ankle joint should be, if possible, cured square to the leg or corrected by tenotomy after the occurrence of resolution and previous to its use by the patient.

There is yet one more feature of joint disease that requires notice, namely: wasting of the affected limb. And as evidence of the opinion held by the profession, I cannot do better than quote from the 6th chapter, vol. I, page 209, of Sir James Paget's Essays, &c.

“ It seems dependent on disordered nervous influence, and  
“ often appears proportionate to the coincident pain.”

From this opinion I feel compelled to differ, and hold that the absence of pain, especially if combined with effective rest, favours wasting.

Atrophy, in these diseases, I believe (contrary to the usual teaching) to be an advantage, for the more the muscular tissue becomes atrophied, the less will there be of spasm and consequent irritation of the joint, and the less power the patient will have to put his joint to an excessive strain at the commencement of use, and so he will be prevented from inviting back the irritation.

It has been my lot to meet with several cases of hip joint disease, in which this symptom of wasting as well as that of lameness were wanting, and had I not applied my new method of diagnosis, I should not have detected the existence of any disease in the hip. The patients had only complained of obscure pains at night in the limb. In one such case where I had been consulted, I informed the parents of the patient that hip joint disease existed. They doubted me, and two other surgeons were called in consultation, but through not having had sufficiently early notice, I was not present. The parents judged themselves slighted, and I was set aside. My successors did

not judge it a case of serious import, yet it ended fatally.

The absence of wasting is no good omen to the sufferer. Rapid and early atrophy of the muscles often coincides with early relief of the local irritation. I know of no degree of muscular atrophy the result of joint disease, which is not recoverable, once the joint is well.

In the acute stage of articular disease, or when reducing deformity, it is advisable to confine the patient to bed, and I cannot do better than quote Mr. Holmes' excellent advice in his volume on the Principles and Practice of Surgery, page 445:—

“But prolonged rest in bed is the main agent in the cure of the disease, and the confinement to bed, far from being deleterious to health, is generally attended with considerable improvement in the general health.”

This is in conformity with my own observations.

A second difficulty that frequently meets the surgeon is the solution of the question, What duration of time do these cases require for recovery?

A month may be sufficient in the case of A, while the case of B, commencing with the same symptoms and under almost the same conditions, might demand forty months. It is the duty of the surgeon to give no heed to the duration of the difficulty, but to ascertain if the limb is sound and beyond probable relapse, before pronouncing it fit for use. The period of treatment can of itself be no guide to the formation of an opinion as to whether or not resolution has been arrived at; the surgeon need have no anxiety of any resulting evil should he, through over caution, prolong the rest unnecessarily.

I admit that a vast number of acute cases arising from rheumatism, gout, and other constitutional disturbances, recover with but little or none of what I would term rest; but enforced uninterrupted and prolonged rest, is a necessity for the joints that may have entered upon the chronic stage.

The signs of recovery usually to be noticed are, that the soft parts around the joint appear and feel well

atrophied, and that there is an entire absence of pain or tenderness in the part, for instance, as to pain, the patient should awake from sleep in perfect ease, even though he may have been reclining on the affected limb, again when pressure is applied to the ligaments between their attachment, or when percussion is performed on the limb unawares, the tests should give no pain, but the most crucial and infallible test is the ability of the patient, after using the limb, to return it at will to the posture it was maintained at during treatment; or if a case of anchylosis it should remain after use, in the posture it was retained in during treatment.

I assert that this is an infallible test, which may be tested and used only when all other guiding symptoms are not possible of being detected this is an unerring test, like the "Mariner's Compass" when all landmarks are out of sight to the navigator, so the surgeon by this test can get to know for certain whether a joint that appears sound is genuinely so.

As regards the excision of joints, my experience will not allow me to endorse the opinion of Prof. Spence, that this operation is "so obviously an advance in the right direction;" but I have been convinced that it is a step in the wrong direction, and is too frequently an excuse and a ready way of disposing of the difficulty to the neglect of sufficient attempts at saving the articulation; joints when treated by the ancient method or by some of those recently introduced by some of my contemporaries may, nay do, frequently arrive to a condition when no alternative remains except excision. From the testimony of their advocates and my own personal observation of results, this is very apparent. Again joints, not subjected to art, but permitted to remain in charge of the "irregular practitioner" known as nature, which usually acts through the medium of muscular action, these may occasionally require operative interference by excision of the joint. But articulations early diagnosed and treated by rational principles and by efficient mechanical control,

these as a rule will never so deteriorate as to require excision.\*

An exception to this rule will be found an extreme rarity, the exact value of the mechanical aid advised in this treatise is not to be judged from its effect in cases already neglected or mistreated, valuable as it is even in these difficulties. While granting that the hip, knee, ankle, and wrist joints, may some times, though rarely come to excision, I feel constrained to say excision of the shoulder, and elbow, joints, are still more improbable and should be an extreme rarity, though since Prof.

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\* Accompanied by my friend, Mr. Rushton Parker, I visited the Rhyl Convalescent Home when there was under the care of the medical staff a great number of cases suffering from diseased joints, sent to the Institution from all parts of the country. After a careful examination of the cases we observed that those which had been subjected to no assistance from art were in a much better condition as regards soundness, i.e., freedom from inflammation and its stages, but there was present more deformity in this class than existed in those that had been perseveringly assisted by modern surgery. This latter class had but a very slight deformity, but a serious amount of destruction of the parts composing the joint and a peculiar sodden œdematous condition of the articulation and surrounding tissues and this discouraging feature existed just in proportion to the amount of traction or extension employed. Mr. R. Parker and myself here acknowledge our indebtedness to Miss Vizard, the matron, and Dr. Turnour, Denbigh; Drs. Roberts, Girdlestone, and Lloyd of Rhyl, with whom we carefully examined and "noted" 18 cases, which fully confirmed our previous experience in private practice.



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 Syme popularized excision of the elbow, it is a frequent procedure. I never saw occasion for excising this joint in my own practice, but I have seen the operation performed by others when not necessary, in cases that were amenable to resolution by rational treatment, and with a cure securing a more useful limb than could have resulted from the operative interference by excision.

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 With confidence I maintain that if the methods and details I have counseled, in this Volume, which is the result of the closest daily personal supervision and scrutiny of the cases submitted to me during a period extending over twelve years (this surely a sufficient time amply to test the value of anything that might be considered an innovation on the principles of a time honored practice) be accepted by the profession, most of the deformities and deficiencies caused by inflammation of joints, will be rareties in the practice of our successors. To the younger practitioners of Surgery I especially appealed and expect that they will make themselves proficient in this

department, and I would urge them to be adepts practically, before introducing alterations, which too frequently in the absence of experience must be either useless or injurious.

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### GENERAL SUMMARY.

1.—The following conclusions have forced themselves on my mind, in the application of my theory and method in practice.

That, like all other lesions, however early we may detect diseases of joints it does not follow with certainty, that difficulties and prolonged treatment can be avoided; yet an early diagnosis is of great value in the majority of cases. Again, by the practical application of my theory, there is a greater certainty of success, there are lesser and rarer difficulties, prolonged treatment is not an evil, deformities are avoided while the operations of excision and amputation are set aside for rare cases.

2.—That the main cause of joints entering into the chronic stage is imperfect immobilization of the articulation; friction and pressure being permitted in a greater or less degree.

3.—The causes of the variability of the symptoms in diseases of the joints, do frequently arise from variations in treatment.

4.—That the most effectual method of avoiding ankylosis, is the practice of uninterrupted and prolonged immobility.

5.—The main obstacles to the cure of an inflamed joint are, principally friction, and secondly, pressure on its surfaces; consequently the attainment of rest, i.e., immobility of the articulation ought to be the primary principle, which should guide us in the treatment. Pressure and concussion are less to be feared than friction.

6.—The correct use of proper appliances are followed by resolution of inflammation in most cases—the avoidance of deformity when applied at a later stage; the position of the limb is not an item in producing resolution, but requires attention to secure future usefulness.

7.—This mechanical treatment when applied early, and when well adapted, always benefits every case of joint disease, and the pain may be so great that no anodyne drug in less than toxic doses would alleviate it, yet, the mechanics of this method correctly applied, will invariably give ease. Emaciation usually present in these cases is the direct result of continued pain, but it is thus prevented at an early stage and arrested when present in a later stage.

8.—To insure permanency of cure the control should be maintained for a period beyond the time when resolution has taken place. This prolonged immobility of the joint's movements even for an unnecessarily long period can be productive of no harm.

9.—The more an inflamed joint is uncontrolled the stiffer does it become, while the more effectually it is fixed the sooner and the more complete is its capability of movement restored.

10.—Temporary stiffness does, and must, always occur after resolution, but is equally certain to wear off without

interference such as passive motion, which is highly objectionable.

11.—True ankylosis after correct mechanical treatment is extremely rare.

12.—That previous to pronouncing the articular inflammation resolved beyond probability of relapse, the joint should be carefully observed after removal of restraint, and notice taken, whether after use it can be restored by the will of the patient without any supplementary force, to the position it was in when under treatment. This is a crucial and unerring test.

13.—The arrest (or more strictly immobility) here advocated must be enforced so that the patient's ordinary movements will not materially disturb the joint, it should be uninterrupted not even momentarily, and prolonged so to secure beyond any probability a return of inflammation.

14.—No joint ruptures when distended by simple non-purulent fluid.

15.—The symptoms that indicate the presence of articular inflammation, differ in accordance with the degree of fixation secured.

## CHAPTER VII.



### THE METHOD OF RELIEVING ARTICULAR DISTENSIONS BY ASPIRA- TION AND INCISION.

THE first consideration of the operator should be the selection of a useful and safe aspirator, if he is not already in possession of one. That made by Weiss & Co., of London, and consisting of a three way tap, attached to a bottle, which is exhausted by means of an air pump, is certainly the safest, inasmuch as it is impossible to make any mistake with it; but it has its disadvantage, being liable to leakage, in consequence of which there is defective vacuum power after it has been some time in use; but, where

the surgeon has time to prepare it for use, its defects can always be made right before operating.

My own aspirator depicted in Plate ~~25~~, ~~fig.~~ is the simplest and least liable to get out of order of any that has yet been designed; and where the surgeon has occasion to aspirate many times in a day, it has decided advantages over all others hitherto placed before the profession.

The successful treatment of articular inflammation is so far dependent upon the correct and early practice of this operation, that aspiration merits special notice, and in this chapter I purpose recording my own experience in its practice.

It must, in the first place, be borne in mind that articulations are liable to accumulations of fluid though there be present no inflammatory action; while, on the other hand, inflammation may exist unaccompanied by any perceptible distension of the articulation.

While thus recording my experience of articular distension, and its relief by aspiration, I would ask

the reader to presuppose that the limb under treatment is already fixed and uninterrupted in the position and manner advised in the previous chapters; inasmuch as many of the symptoms which are referred to, cannot be noticed in joints treated by the so-called (but only fractional) rest.

The joint, above all others, from which the surgeon can gain most experience as to the value of aspiration, is the knee joint.

This joint, on the front aspect, is so thinly covered that many of the physical changes can be early seen and felt. Accumulations of fluid, in this joint when treated by my method may become localised, so that the joint may contain two or three separated collections, which cannot be pushed by manipulation from one, to any other part of the joint.

These localised collections of fluid I have always found to be purulent, and that aspirating one doth not relieve the others, though they be in the immediate neighbourhood and on the same side of the joint. As a notable instance of this I can recollect the case

of a lady, who had a localised purulent collection in the right side of the right knee joint, just above the patella. This I successfully aspirated after several operations, after which the patient absented herself for six months, in the meantime retaining my appliance, but being able to go about in the discharge of her duties. On her coming to me at the end of that time, I found fluctuation and distension above and below the patella on the inner aspect, and that aspirating the lower collection, had no effect upon the upper one, which had to be subjected to a special aspiration; as however they repeatedly reformed, it was decided to lay them open; this was done; and a digital examination fully convinced me that these two collections were independent.

On another occasion I aspirated a boy's knee on the left side of the ligamentum patella, with success; yet in nine months afterwards a small collection formed on the outer side, above the patella; which, having failed to successfully aspirate, I laid open. These two cases are reffered to as typical of many A.



which have come under my notice.

Granting that the operation of aspiration has been correctly performed, and that proper means to fix the joint have been made use of, I know of no mishap to have occurred to the joint after this operation, but more than once I have noticed the formation of extra-articular abscesses occurring in the track of the needle. In those cases where I noticed this complication the articulations were successfully aspirated, but the extra-articular abscess (which much simulated articular distension) had to be treated by free incision, aspiration having failed. An exploration with the finger confirmed my diagnosis.

The knee joint may be aspirated with special benefit as soon as it is distended, either with simple fluid, pus, or with blood, as immediately after an injury; a couple of aspirations usually suffices to relieve pain, and shortens the time necessary for recovery in traumatic cases. Aspirating this joint is an operation attended with absolute safety, if carefully performed, and an efficient control is maintained over the motion

of the limb by my ordinary knee appliance or, if an immediate traumatic case, then the knee can be controlled by the calliper foot appliance. I am aware that fatal cases of aspiration of the knee joint have been reported, but I firmly believe that the disaster in such cases, granting that no mistake was made in the operation, arose from the omission early to repeat the operation, as in some cases the first operation is followed by rapid and painful distension in a few hours. To abstain from an early repetition of the aspiration, and thus fail to relieve the distension would be serious; as extreme distension like undue pressure would give rise to suppuration. Aspiration should be repeated every twelve hours, if the fluid reaccumulates so as to distend the capsule. I have frequently noticed that the first aspiration has given rise to irritation and rapid refilling of the joint, this might alarm the inexperienced, and cause him to abstain from a renewal of the procedure though it is urgent, as irritation is sure to subside if the joint is kept relieved from distension by the repetition of

the operation in time. I have myself in urgent cases relieved the joint twice in twelve hours, but once every two days, for three or four occasions, is the usual indication.

Two very instructive cases occurred lately in my own practice illustrating the correctness of this policy. Both of these patients consulted me at my surgery, suffering from simple synovitis. Their joints were aspirated and partially fixed, not being judged as requiring complete immobility. The following day their joints were acutely painful and had refilled with extreme distension. Aspiration was repeated in one case every twelve hours for five or six days when the fluid ceased to accumulate and the difficulty subsided without any after defect of the joint.

In the other case I had to aspirate twice in one day, and daily for two or three days. Had I not persisted in the repeated aspirations, no doubt these cases would have been accompanied by surgical fever, extreme distension, destruction of the joint, &c.

When the joint is suspected of containing, or known to contain, pus the aspirating needle should equal in "bore" Nos. 3 or 4 catheters, but needles of the "bore" No. 1 and No. 2 catheters will do when the articulation is distended by non-purulent fluid.

My observation justifies me in asserting that distension of the articulations by simple fluid or healthy pus can always be relieved permanently and safely by aspiration, combined with efficient fixation. Again, joints distended by purulent fluid and of recent formation are frequently got rid of by the same process; but where the collections are old and dense, failure is a probability, though after failure they are more amenable, and with greater safety, to the treatment by incision and the practising of other details when aspiration has failed.

Frequently cases are presented to the surgeon for treatment where the joints have been distended with pus for some months, and the collections have become condensed and flakey, this condition, may

sometimes, be successfully aspirated, while on other occasions, though the fluid removed ceases to appear purulent, and though it has become serous in appearance it may persist in reforming. Purulent collections in articulations can nearly always, by repeated aspirations be made serous, yet this may persist in reforming and finally necessitate the opening of the articulation by free incision.\*

When the condition of the joint is such that the accumulation cannot be permanently corrected by repeated aspirations, and the surgeon has reduced the quantity as well as quality of the articular contents, there is no alternative but to make an incision into the joint and the question which naturally presents itself is,—What should be the after treatment of the opening? He has to chose whether he will make use of the traditional filthy poultices, lotions, and supposed specific linaments, or carry out

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\*In this condition I would suggest a trial of some method of continuous aspiration, i.e., to leave the needle in the joint puncture and attached to an exhauster and receiver, having only thought of this but recently I have not had an opportunity of practically testing this plan.

Professor Lister's antiseptic method, or practice an open method. That the first mentioned is now quite out of the question ought I think to be the opinion of the majority of modern surgeons. I can see no benefit attached to it, but on the contrary believe it to be highly injurious, and therefore I think it is only a question whether we ought to follow Professor Lister's method or an open one. Much as I admire the antiseptic method, it yet seems to me to be but the old method made safe and harmless, in fact a correct method of ritualistic surgery, and I venture to assert that had Professor Lister's ability and zeal been expended in perfecting an open method, we should have now been in possession of a method more simple, easy, and safe, than the antiseptic, great as its merits are.

For some years previous to the introduction of the antiseptic method I practised the open method and was well satisfied with the results obtained, but on the publication by Prof. Lister of his successes I at once commenced the practice of antiseptic

surgery and continued to practise it for three years with the result of being perfectly satisfied that its merits have not been overstated nor the trouble necessary for carrying out the details exaggerated.

I returned, however, at the end of that time to the open method and have since laboured to improve it, so much so, that I am emboldened to assert that by the open method, results and successes, equal if not superior, to anything to which antiseptic treatment has yet attained, can be arrived at.

My usual method of treatment in the case of joint accumulations, where aspiration has failed, and where there is continued redistension, is to aspirate and reduce the area of the cavity (whether an abscess or a joint collection) as much as possible and then to incise, laying the joint freely open so as to obliterate any cul-de-sacs which are often allowed to remain at either end of the incision. (Here I presuppose that the limb is well fixed, and the patient kept reclining; with all other precautions to render him immovable and free from tremor and concussion.) Then I instruct

that the part is to be frequently washed with water and oiled. The oil is to be applied to the surface of the wound to hinder it from closing by scabbing, and so from the possibility of retaining fluid. This is all I usually do after incision into articulations or abscesses, and I hold this to be sufficient. As I am obliged to allude here to the "open method," it may not be out of place to append a few examples as evidence of the value of a systematic open method of treatment.

In cases of compound fractures, it is my custom to place the limb in an apparatus which retains it immovably fixed, so that there is no occasion to disturb its immobility for the purpose of changing bandages or dressings, until it has recovered.

Having fixed the limb, I treat the wound in this way :—

Supposing that the bone is projecting through the skin, the wound is enlarged before reducing the fracture, then the finger is passed in, and the wound explored for any cul-de-sacs which may have formed



during the accident, and if present they are laid open, the blood clots removed, bleeding arrested, and such drainage secured as to make retention of any fluid an improbability if not an impossibility ; then direct the attendant to simply wash the wound with water, or salt and water, pouring in every three or four hours a little oil to prevent scabbing.

If the case is one of compound fracture not complicated by protrusion of bone, then the opening is always enlarged, cul-de-sacs searched for and if present, laid open in all directions, then the simple ablutions are practised with the addition of applying a little oil at intervals until recovery.

In the case of large incisions for the removal of tumours, &c., the wound is left gaping, being sponged and oiled and assisted gradually to come together. Again in cases of amputation, the flaps are never brought together earlier than after 24 hours, and then they are "put up" immovably, and treated by simple ablutions, and oil, until recovery. If after

operation or injury, any portion of the wound, especially the skin, be much detached and appears of low vitality, it may be necessary to cover for a time such portion with tin foil or gutta-percha-tissue to ensure its vitality, or it otherwise might from loss of heat and moisture become gangrenous. In cases of Lithotomy the after treatment of the operation by this open method, consists in passing into the viscus, through the wound, a glass tube, and in retaining it there a few days until all post-operative irritation has passed away, when a rubber catheter is to be passed into the viscus per urethram, so as to continue an efficient drainage after the removal of the glass tube from the perineal wound. Operations involving abdominal section present difficulties which require special attention, but which I am informed surgeons have surmounted, as for example drainage by tube through "Douglas's pouch," or by a suitable arrangement at the abdominal wound; again many operations on the upper and lower jaws, are unavoidably treated by the open method and usually do exceptionally well.

As examples of the success of an open method as practised by myself, appended are reported a few cases that were so treated.

No. 1.—A case in which a fractured leg was placed in a permanent immovable appliance, two inches of the front portion of the Tibia was removed, and “put up” with the open method simple ablution and oiling, with the result of no suppuration, nothing but a continual running of serum; the bone was renewed, and the recovery was so complete that there is no deformity or defect of the tibia, and but a slight scar upon the skin. This was the case of one Wallace, a shipwright, of this town.

No. 2.—On another occasion, last year, I was called to attend an old gentleman, aged 82, who, while on a visit here from the Isle of Man, had indulged rather too freely in spirits, and on leaving a friends' house he had a fall and sustained a compound dislocation of the tibia inwards. On my arrival at the house I found him still under the influence of drink, and he commenced to swear at me and otherwise misconduct himself, and it was with difficulty he could be kept under control. I incised the skin, enlarged the wound, replaced the bone, and searched for cul-de-sacs or bagging spaces, laid them open, placed the limb in an immovable appliance, and instructed the nurse simply to wash and oil the wound. There was no suppuration and in the ninth week the patient was walking about.

No. 3.—On another occasion during this year an engine driver in the employ of a corporation was just leaving his employment, when, there being a heavy gale at the time, he was

thrown down by a gust of wind and sustained a compound fracture of the leg. There was no protrusion of bone. I made the necessary incisions to obliterate bagging spaces, placed him in a permanent immovable apparatus, no dressing being applied, and sent him home in a cab. He was placed on the bedroom floor where he remained for two hours awaiting my arrival. On reaching the house I ordered him to be put to bed, and gave instructions that the wound should be simply washed and oiled. This case made an excellent recovery, no surgical fever or any difficulty occurred.

No. 4.—A gentleman, living in Denbighshire, whilst riding home sustained a compound fracture of humerus by his horse jumping into a railway cutting. On the third day after the accident I visited him, in conjunction with Dr. Pierce of Denbigh. I placed the limb in a permanent fixed appliance. On exploration it was found that there was no occasion for incising the wound which was treated by simple ablution and oil. The treatment resulted in an excellent recovery with no suppuration.

No. 5.—The case of a young man who had got entangled in the hoisting gear of a Warehouse and sustained a compound fracture of the humerus, &c. The limb was placed in a permanent fixed appliance, explorations were made with a probe, and several extensive cul-de-sacs laid open. It was treated by the open method ablutions, and oil, and resulted in an excellent recovery.

No. 6.—The case of a Cabman, who, having occasion to remove the head gear from his horse, while on the "stand," the animal took fright, and in attempting to arrest it, he was thrown

down and the cab passed over his forearm, which sustained a compound fracture. The limb was put up in a permanent immovable appliance suited to such an injury, the wound was explored with a probe pointed knife and all bagging spaces obliterated. It was treated by the open method and resulted in an excellent recovery with no suppuration.

No. 7.—The case of a Carter, who, whilst in attendance upon a vicious horse was seized by the forearm which was consequently much crushed. He was taken to a public charity where amputation was decided upon, but his friends objecting to this he was afterwards brought to me. I extensively incised his arm so as to obliterate all spaces where fluids might accumulate, put the limb into a suitable appliance and it recovered, with no suppuration.

No. 8.—A female, residing in Seacombe Street, having occasion to go into a back passage where there was a quantity of refuse, and decayed vegetable matter, placed her foot on a portion of it and fell, sustaining a compound fracture of the leg. The limb was put up in a permanent immovable fracture appliance, and as there was no protrusion of bone the wound was explored with a bistoury and opened in several directions. I advised simple washing and oil. There was no suppuration and the case recovered in the tenth week.

No. 9.—The case of a Railway Porter, from South Wales, suffering from a loose cartilage in the knee joint. The joint was distended also with synovial fluid. The limb was placed in a permanent fixed apparatus, the joint aspirated and the knee kept

in the appliance for a week, then incised through the skin and subcutaneous tissue, and when the bleeding had ceased the loose cartilage which was fixed between my two fingers, was cut at through the capsule, grasped with forceps, and drawn out. The wound was afterwards treated by simple ablution and oil. There was no suppuration. No surgical fever, no rise of temperature and no symptom indicative of the procedure.

No. 10.—The case of a foreigner in the employ of E. Holt, Esq., who consulted me, having a shortening of four inches of the right thigh bone, which had been fractured abroad while away at sea. Having failed to refracture the bone with the aid of two powerful iron wrenches, I decided, assisted by Messrs. Parker, Williams & Owens, Surgeons, to sub-cutaneously incise the femur with chisel and hammer. An incision was made square to the thigh on the outer side, the chisel introduced, and the bone which was as thick as an ordinary man's wrist was cut half way through, and finished by forcible fracture. I then introduced my finger into the wound, found a large chip portion of bone the size of a thumb, which I removed and then passed my finger into the wound again and found one large cul-de-sac corresponding no doubt with the splinter which I had removed. This I laid open, thus converting the wound into a T shape. Extension was kept up steadily for six weeks, during the supervision of this case on no occasion was there the slightest elevation of temperature, no suppuration, nor any other evidence of surgical interference beyond the local wound. This case recovered—without any shortening though it was over 3 inches short previous to operation.

No. 11.—The case of a patient in suffering from non-union of the Tibia of 10 years standing. Several attempts having been made for the production of union, the details of which need not be entered into, as they failed; I decided, with the aid of my friends, Drs. Parker & Williams, to incise the limb, and split both ends of the bone with a chisel, and the limb was afterwards placed in a very carefully fitting permanent apparatus.

The wounds were treated by the open method, simple ablutions and oil. No sympathetic irritation followed.

Case 12.—A girl, 12 years of age fell, from a height, and landed on some loose bars of iron, the end of one of which penetrated the inner and middle aspect of the thigh just above the femoral artery, and passed oblique afterwards, and onwards for a space of four inches. This wound was complicated by the thigh being fractured at the same time. This was a consultation case, and I advised enlarging the primary wound which only admitted the index finger; the gentleman in charge concurring with my view, we enlarged the wound to nearly three inches, turned out a quantity of clot, placed the limb in an immovable apparatus with retentive—extension, and treated the lesion by ablution with water and occasional oiling, the patient never had any surgical fever or pain, nor rise of temperature, suppuration or any other symptoms indicative of the serious nature of the accident.

No. 13.—During May, this year, a young girl from the country, and an inmate of my hospital, had a tumour removed from the neighbourhood of the carotid artery, which involved

dissection and much manipulation of the wound, and after the removal of the adventitious growth, there remained a gaping wound, into which the fist could have been buried, yet the treatment by this open method was not followed by any symptoms indicative of operative interference.

No. 14.—Being present at the Stanley Hospital, when my friend, Dr. J. K. Smith, removed a large tumour from the neck, which necessitated the exposure of important blood-vessels, at my request, he tried the open method of after treatment, and the operation was not followed by any constitutional sympathetic irritation, indeed the patient was perambulating the wards on the second day, wound gaping wide, the flap of which was only gradually allowed to come together.

No. 15.—Sometime during 1876, I was called to one of the filthy courts in Vauxhall Road, to see a patient with compound fractured leg, a travelling crane having fallen and killed some of the workmen and injured this man's leg. This patient had been taken to a public charity, and had refused to submit to amputation, consequently he had come to what he termed "a home," though it contained only a bed and that was but so in name. I set the leg—fixed it in an immovable apparatus, enlarged the wounds, reduced the protruding bones, &c. This was one of the most serious fractures of leg ever presented to me for treatment, yet with a systematic open method, sympathetic irritation was avoided, only a slight degree of suppuration occurring, several pieces of bone coming away by exfoliation. Here there was no convenience it being a case of surgery under difficulties, with vile smells, dirty utensils, filthy rags and sheets on the so-called



bed and impure water to wash the wound, but I must admit that his wife was very attentive in attending to the instructions given. Inadequate as her means were to assist the surgeon, she gave the open method a fair trial and it triumphed, as it must do, under conditions where the antiseptic method would fail. This case, after the third day was not visited more frequently than once a week. By the open method an unskilled assistant, as in this case, if he acts as instructed can do as well as a skilled assistant for a time.

The advocates of the antiseptic method are able to assert that with it success is more insured than by the open method; but hitherto, the open method has been in all recorded instances, and probably in all cases, only a do-nothing method. To insure success by an open method, details of practice consistent with certain principles must be observed, as immobility, the avoidance of irritation, whether in the form of accumulations causing distension, or, pressure fatal to the vitality of the part, and lastly frequent ablutions with oiling to keep the part clear and free from undue scabbing. Immobility both facilitates healing, and is an important item in avoiding or diminishing suppuration, again

distension should be guarded against as it is well known that it will lead to suppuration, surgical fever, &c; these may be guarded against by securing an efficient drainage. As to the evil of pressure some in the profession must have noticed its injurious tendency when allowed to act upon parts of abnormal vitality, as we see in chronic inflammation of the knee joint compression is injurious; but in my opinion the most notable example is to be observed in the practice of tenotomy; however well the subcutaneous operation may be performed, three to four days tight bandaging afterwards will cause suppuration in the track of the knife; removing the dressing on the second day, and re-applying it with less firmness is an infallible preventative of suppuration after tenotomy, no matter how clumsily the operation has been performed. Here we have an example of pressure causing suppuration, and under conditions, least likely for it to occur. Ablutions and oiling, are very useful in diminishing the tendency to scabbing, as neglect in attending to them would permit the accumulation

on or near the wound, of discharges that might become both injurious and offensive.

To carry out the details of the open method, certain surgical appliances are of great assistance. All the splints I have designed for use in injuries of the upper and lower extremity have been constructed with the special intention of improving of the open method of treatment of wounds, which occur in connection with such injuries.

## A REVIEW OF THE PAST AND PRESENT TREATMENT OF INFLAMED JOINTS.

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“The other method whereby, in my opinion, the art of medicine may be advanced, turns chiefly upon what follows, viz., that there must be some fixed, definite, and consummate *METHODUS MEDENDI*, of which the commonweal may have the advantage. By *FIXED*, *DEFINITE*, and *CONSUMMATE*, I mean a line of practice which has been based and built upon a sufficient number of experiments, and has in that manner been proved competent to the cure of this or that disease. I by no means am satisfied with the record of a few successful operations, either of the doctor or the drug. I require that they be shown to succeed universally, or at least under such and such circumstances. For I contend that we ought to be equally sure of overcoming such and such diseases by satisfying such and such intentions, as we are of satisfying those same intentions by the application of such and such sorts of remedies; a matter in which we generally (although not, perhaps, always) can succeed. To speak in the way of illustration, we attain our ends when we produce stools by senna, or sleep by opium.

I am far from denying that a physician ought to attend diligently to particular cases in respect to the results both of the method and of the remedies which he employs in the cure of disease. I grant, too, that he may lay up his experiences for use, both in the way of easing his memory and of seizing suggestions. By so doing he may gradually increase in medical skill, so that eventually, by a long continuance and a frequent repetition of his experiments, he may lay down and prescribe for himself a *METHODUS MEDENDI*, from which, in the cure of this or that disease, he need not deviate a single straw's breadth.

Nevertheless, the publication of particular observations is, in my mind, of no great advantage. Where is the particular importance in just telling us that once, twice, or even oftener, this disease has yielded to that remedy? We are overwhelmed as it is, with an infinite abundance of vaunted medicaments, and here they add a new one. Now, if I repudiate the rest of my formulæ, and restrict myself to this medicine only, I must try its efficacy by innumerable experiments, and I must weigh, in respect to both the patient and the practice, innumerable circumstances, before I can derive any benefit from such a solitary observation.”—SYDENHAM.

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Since the publication of the first edition of this volume on Diseases of the Hip, Knee, and Ankle Joints, the subject has engaged the special attention of surgeons, and the merits and demerits of various

methods have been debated more fully than before ; and as one of the gentlemen I dissented from expressed the opinion in a communication to myself, that my notice of his views and means was too limited (which I now believe), I therefore decided to review more fully than I had hitherto done the various methods championed by gentlemen whose views are worthy of being well considered. One notable feature is prominent in the discussion of the last three years, namely, that it has principally concerned the treatment of the hip joint. Why this joint should be referred to as though its treatment involved special theoretical principles I have failed to perceive ; indeed, the press reports of lectures and discussions amply confirm my former assertion, that those who have devoted special attention to the surgery of the articulations are also specially wrong in their theories, and, consequently, in their practice. The methods advocated in and out of the surgical profession, may be subdivided into two classes, namely, those believed to be based on scientific principles and professional experience, advocated by surgeons trained to practise their profession scientifically, and, again, the other methods heralded by unqualified practitioners, who generally claim to have arrived at their knowledge from intuition, or accidental experience ; while some even credit themselves with a special mission to relieve mankind.

In the first class may be included these authors:— The Coopers, Ford, Beale, Coulson, Little, Huggan, Wildberger, Bauer, Prince, Barwell, Coote, Brodhurst, Taylor, Sayre, and others who have insisted upon principles of treatment diametrically opposed to those I inculcate. In fact, I find that the writers have not attained, or even wished to attain, but that all have rather dreaded enforced, uninterrupted, and prolonged rest.

In the second class may be placed the late Grosvenor, of Oxford, (flour cure); Evan Thomas, of Liverpool, (pitch plasters); Taylor, of Manchester, (issue peas); Hutton, of London, (manipulation); Clucas, (manipulation); the Penrith bone setter, (manipulation), and a number of others, (male and female) whose names I cannot now recollect, but whose treatment and its results I know too well. To me it seems inexplicable how educated men\* can seriously discuss evidence not verified by unbiassed witnesses. Having had exceptional opportunities of watching the practice of many of these individuals, and having seen its results I assert with the utmost confidence that there is nothing to debate, and I never yet met with one case, relative to which, on my making a careful analysis, there remained a single fact worth

\* See Sir James Paget, article on bone setting. Mr. E. R. Bickersteth's Address on the recent Progress of Surgery, page 11. Bauer's second edition, page 303.

noting as an addition to surgery. Frequently I have seen cases in which the patient asserted that he was cured by so and so, when it was only too apparent that he was unconsciously attributing an effect to a wrong source. Ignorance of the first principles of treatment of this form of inflammation is the true explanation of the unwarranted opinion of even members of our own profession regarding this class and their practice.\*

Before noticing in detail the treatment of articular diseases of the lower extremities in vogue during the last thirty years, I shall show from authors that up to this time all writers of authority differ from my views :—

“One thing, almost essential to the production of ankylosis, is the part being kept motionless ; and as M. Sanson well observes, this condition has such influence that it will of itself bring on the changes which will terminate in a joint becoming incapable of resuming its functions, in consequence of true or false ankylosis.” (ANCHYLOSIS, COOPER’S DICTIONARY OF SURGERY).

“In addition to the direct effects of inflammation in the production of ankylosis, a variety of other circumstances facilitate its progress and augment its severity. Among these are the long-continued rest of the limb in one position.” (LITTLE ON ANCHYLOSIS.) Page 2.

Dr. Prince devotes five pages to quotations from authors expressive of their opinion on the evils that arise from immobility (so called). (DR. PRINCE ON DEFORMITIES, &C.) Page 52-9.

“On the contrary motion of the joint without pressure is not only not injurious, but it is highly beneficial.” (TAYLOR ON THE MECHANICAL TREATMENT OF THE HIP JOINT). Page 15.

\* This opinion refers only to the treatment of inflamed joints by these unqualified professors ; that some of them may have skilfully treated other lesions I am not prepared to deny.

"Gentlemen, absolute rest of inflamed joints, however beneficial for a time, has likewise its therapeutical restriction, and experience teaches that if the immobility of healthy articulations is unduly prolonged they will become stiff, dry, and even ankylosed by fibrous bands." BAUER ORTHOPEDIC LECTURES, 1864). Page 57.

"The treatment which prevents either of these contingencies (ankylosis) and establishes mobility of the joint, is passive movement, with shampooing and pressure." (BARWELL). Page 379.

"Sayre thus teaches :—When this instrument is employed, it is necessary that the child should be taken from it very frequently, and have all the joints carefully moved, otherwise too long continued rest of the joints may end in ankylosis. In moving the diseased joint, care must be taken to hold the pelvis, and to make slight extension upon the diseased limb when motion is given to the joint. Perfect rest, long continued, even of the diseased joint is decidedly injurious, as there is danger of its resulting in ankylosis." (AMERICAN CLINICAL LECTURES). Page 14, 1875.

At page 157, Sir B. Brodie on Diseases of Joints, 1850, also refers to a case which he judged as indicating that long rest would produce ankylosis.

(1568). "The growing together of the joint surfaces may be produced in various ways. It is usually consequent on inflammation of the parts composing the joints, especially when if long standing and when the joint has been long at rest." (CHELIUS'S SURGERY).

"It is also manifest that if permanent ankylosis be the result arrived at by the surgeon, rest must be a necessary condition for bringing it about." (WHARTON HOOD, page 113.)

These extracts express the opinions maintained by past and contemporary authors, as to the effect of prolonged rest of diseased joints. My teaching is the reverse of the theory advanced in these quotations, and it is my conviction that the principles inculcated by these my predecessors and contemporaries have been the cause of the minimum



success attending the treatment of articular inflammation. Yet I am informed constantly that my theory and method of treatment is not original. One critic affirmed that the appliances have been in use sixteen years in America ; another, that they have existed "from time immemorial in this country"; others, ere they had had a day's experience of their use, not understanding how they should be made or applied, commenced to make innovations to suit their own defective knowledge.

Firmly convinced that my theoretical principles are correct, and that the appliances are suited to the application of these principles, and that they have not been improved in efficacy by any other surgeon up to this date ; and that better, quicker, and more useful results are obtained by my method than by any other ; holding this opinion (at the same time inviting a practical demonstration of the contrary), it is not possible for me to be tolerant of methods which must be wrong if mine are right. To me it appears an anomaly that the surgeon should have to make a choice of theories, the principles of treatment should not be left to the discretion of the surgeon, but should be unalterable. No doubt ere long it will not be a question, "How shall we treat this patient? Shall it be by Bauer's, Barwell's, Sayre's, Taylor's, or Thomas's principles?" The theory must first be settled, and the mechanics will "right themselves."

and at no distant time after. It is the desire to assist in this settlement that has induced me to review those incorrect methods which have been received with such acclaim during the last fifteen years. I will also attempt to answer the objections, advanced since the publication of my view, and also point out the mistakes of the crowd of tyros who have taken the field and given forth their limited experience with the confidence of veterans.

The writers on this subject are many, but I shall notice only those who have influenced the practice of surgery in latter years. Some have deviated but little from ancient principles and practice; as, for example, "Dr. Little on the Stromeirian method (tenotomy) in ankylosis;" Brodhurst on ankylosis (a method of tenotomy and passive motion), Wildberger (a mere manual of so-called orthopraxy). Dr. Louis Bauer, of St. Louis, late of New York, on the publication of his lectures in 1864, became entitled to priority in attempting to improve the mechanical means of treatment of inflamed joints. Some of the appliances were designed by himself, whilst he adopted others designed by Dr. Davis, and modified by Dr. Sayre. In his writings, the ancient theory of rest is taught, as shown by his warning his readers of the supposed evil of rest. He, like all his predecessors, is ignorant of the one fact upon which all treatment should be based, namely, that rest is a

remedy, an over dose of which it is not possible to give the patient. Of the work published in 1864, entitled, "Lectures on Orthopædic Surgery," the second and third chapters are devoted to the etiology and treatment of diseases and deformities of the knee and hip joints. On page 36, the second column from the last paragraph, to the end of the first column on page 37, injury of the knee joint is advised to be treated by extension.

If, however, "the contraction of the hamstring muscles have become permanent, extension alone is hazardous, for it may give a new impetus to the active disease. . . . In these cases, the division of the contracted muscles or their tendons, should precede the use of extension."

He also recommends a firm back splint, yet remarks—

"But we feel persuaded that a simple pulley and a proportionate weight is the gentler and more reliable remedy ;"

And at page 37 adds, concerning the weight and pulley method—

"The water-bed secures cleanliness in case of suppuration, and the elastic extension and counter extension enables you to move the articulation as often as is needful to prevent ankylosis."

Referring, again, to Ankylosis, on the same page—

"Repeated gentle movements effectually prevented the consolidation of inter-articular effusion."

Here we have the dread of prolonged, nay, of an almost unavoidable degree of rest, and a thwarting-of-resolution policy set forth. In the remainder of this chapter the method of reduction of deformities

of the knee is explained. The author objects to any attempt at reduction without the previous practice of tenotomy in each case, dreading by the exercise of force the return of the previous inflammation. In 1868, Dr. Bauer published a second and enlarged edition of his lectures, and it was very interesting to me to peruse this latter edition, as it was only too evident that his views theoretically, though still antiquated, were undergoing a gradual change, but still he had not got rid of the dread of prolonged rest. Among his changes of treatment may be noticed that at page 290 he advises the immediate fixation of the knee in the straight position and tapping; and again at page 288, he denies that blistering is of any value to the knee joint in relieving distension. At page 291, he refers to the very objectionable practice of compression.

“Compression of the articulation for some weeks after the operation,” (tapping). “Compression of the affected joints is one of the most estimable auxiliaries in their treatment, and should be resorted to when practicable; but when resorted to, it should be thorough and decided.”

This has not been my experience, as I have found that only cases of simple synovitis do tolerate compression, and those that do, would be better treated by its omission. It is not in my opinion, correct practice.

At page 292 are laid down rules for our guidance previous to puncturing the knee joint for the relief of accumulation; these rules are not confirmed by the

experience of those who have practised aspiration of this joint. The mechanical appliance designed to fix the knee joint is shown at pages 290-1 and is very inefficient, being but a mere sheet iron gutter.

In this (latter) edition, Dr. Bauer still adheres to the practice of tenotomy and forcible rupture in the reduction of deformity of the knee, and there is no evidence that he has ever had reduction of deformities of this articulation by simple fixation; nay, at page 308, he expresses his doubts of the possibility of its being attained, except by tenotomy and forcible rupture. Chap. third, first edition, is devoted to disease and deformity of the hip joint. Deformity of this joint is due, he says:—

“Chiefly from the presence of effused liquid of some kind within the joint,” attended with “peripheral and nocturnal pains, culminating in tonic contraction of certain muscles and deformities.”

And at pages 51-2 nocturnal pains are said to arise from:—

Antagonistic directions of forces, muscles inclining one way, hydraulic forces another.

And in the same paragraph he attributes the inclination of the so-called deformity of the third stage to the diminution of distension of the joint, and the consequent increased control of the limb from muscular action. At page 54 his treatment is prescribed, and he also reviews that of Sir B. Brodie, Bonnet, and Physick, and complains that though their treatments were good, yet they “were not

heeded by the profession." He fails to perceive, why the long splint and its modification were set aside, namely, that the results gained by the appliances of Brodie, Bonnet and Physick were seldom secured to the patient both from a dread of prolonged rest and from the absence of any means to allow a prolongation of the period of repose after the patient was removed from bed. At page 54, he insists on the importance of rest and "suspension of all locomotion," and also prescribes the antiquated local applications :—

"By leeches, cold and other appropriate applications."

But, at page 57, he delivers an eloquent tirade against complete prolonged immobility ; and in the same page proves his treatment to be sadly defective in efficient rest by reporting that :—

"Nocturnal pain, &c., cannot be relieved by even opiates" or the "wire breeches,"

Except aided by powerful extensions ; yet in the same page we are told that :—

"Extension can prevent, but not cure active contractions of the muscles, and its indiscreet application will certainly stimulate the disease."

My observation of the practice of others amply bears out this observation, and I can add that those cases treated by the addition of or by (continous) extension alone do not do so well as when they are even left to the method of nature (muscular action).

At page 59, the Davis—Taylor—Sayre type of appliance is discussed ; and he reports that :—

“ However useful and indispensable the hip splint obviously is, its application in hip disease is nevertheless circumscribed.” And only fit in those cases of “ incipient hip disease, when the inflammation and reflex actions are moderate ; secondly, after active symptoms have subsided ; thirdly, after the contracted muscles have been successfully treated.”

At page 60, we are informed of the effect of extension by Sayre’s splint.

“ The usual effect which the splint exercises is the alleviation of pain.”

But, he also adds, that the pain may increase by its use, and—

“ To persist in extension would be to aggravate the disease.”

In the second column of page 60, he gives his opinion that Idiopathic diseases of joints are not amenable to mechanical treatment.

“ That a constitutional disease is equally unamenable to mechanical remedies need no proof.”

With this I cannot agree, as those diseases of Idiopathic origin require mechanical aid just as much as those of traumatic origin, and those inflammations that occur from malaise are quite as frequent as those that arise from injury.

In the second edition of Dr. Bauer’s volume, the treatment of hip joint disease commences to be discussed at page 284, and in the first paragraph he lays down the rule that more fixation is required during the second stage than during the first, and re-

commends his wire breeches, which extend only to the pelvis and lower limbs. This apparatus is in my opinion defective, not being of sufficient length in the trunk portion, and, consequently, it cannot possibly give the joint that amount of immobility which it would have done had it been carried up to the angle of the scapula. In the last paragraph, page 285, he gives cogent reason against using the pulley extension method. At page 287 is to be seen a pictorial illustration of his own Portative-Appliance, which he extols as able to effect that which Sayre's modification of Davis's apparatus cannot. The practical difference between the two (Bauer's and Sayre's) I fail to perceive, as the arguments he advances at page 206 against Sayre's are equally applicable to his own invention, which he says also resembles the apparatus of Dr. Andrew's, of Chicago—the ischatic crutch. This similarity does not exist in practice ; for Dr. Andrew's instrument can be regulated to undoubtedly take the weight of the trunk from the hip, though it cannot fix the limb ; and as the arrest of friction is of more importance than the arrest of pressure, Dr. Andrew's appliance is thus very defective. These are Dr. Bauer's views regarding the treatment, &c., of the hip and knee joints ; in his first edition the general treatment of articular inflammation is not discussed ; but in this edition the omission is supplied in a chapter specially devoted to its con-



sideration. Chapter thirteenth is devoted to the "Causation of joint disease," in which he attributes to all articular inflammation a traumatic origin; and in proof of this relies (page 238) upon the fact that mechanical treatment benefits all cases. That the majority of cases arise from traumatic causes few will deny, but many cases too plainly indicate during the process of the after treatment that they are of Idiopathic origin, such have occurred in my own practice, where the local lesion has resolved but where the patient has died from a constitutional fault.

I fail to perceive what the cause of the disease has to do with the mechanical details of treatment, neither can I understand how, as Dr. Bauer says, it would fail if the disease was of Idiopathic origin. Mechanical aid appears the one thing needful above all others, whether the difficulty arises from rheumatism, prolonged use,\* injury, scrofula, or as a sequelæ to some zymotic disease.

\* Unusual prolonged use (friction or concussion) of a joint will produce inflammation of it, and is not a rare occurrence. At page 315 of the second edition, Dr. Bauer reports a case of friction producing the lesion; and I was consulted during this year by an omnibus driver who attributed the inflammation (chronic) of his knee joint to the continual (concussion) jar of his limb, which he kept on the pedal of the omnibus break all day. We have no reliable evidence of prolonged rest producing inflammation in ankylosis. The Fakirs of India are sometimes referred to as examples; but I am of the belief that they produce stiffness only by prolonged disuse, and as they have no desire to use again the stiffened joint, it remains stiff. This condition cannot come under the term ankylosis, true or false, as it depends on the person's will.

Chapter fourteenth is devoted to anatomical changes, &c., of inflamed joints, and contains much interesting original information.

Chapter fifteenth contains his views of the "Clinical character of joint disease;" and when referring to the general symptoms of articular inflammation, he says—

"Pain is the most prominent, usually the first to appear, and the last to disappear."

Except in seven traumatic cases, I have always noticed that a feeling of weakness was the initial symptom and the final one to disappear.

Pages 250-54 are devoted to the symptoms in general, which indicate articular inflammation, and here he unfolds a tale of horror and mentions symptoms, showing beyond doubt that in the treatment of these difficulties, he has not been able to attain a modicum amount of curative rest by his methods of fixation. From the first paragraph, page 250, it is apparent Dr. Bauer does not think that the will of the patient, calling the muscles into action to steady the extremity, decides the direction of deformity. I cannot endorse his assertion that—

"In affections of the tibio-tarsal and tarsal articulations, the peronei muscles are retracted."

This contraction of the peronei in disease of the ankle or foot joints is extremely rare in my opinion. Again, he says—

"In affection of the elbow joints, the biceps muscles and pronator-teres are involved."

With this I also dissent. It were well if they were involved.

At page 256 the will of the sufferer is admitted to sometimes affect the position and mobility of the limb, at other times "hydraulic pressure," "osseous material," and "muscular contractions." At page 258 the author very properly says—

"To speak of a dry point in these affections is an absurdity."

Chapter sixteenth is devoted to prognosis and treatment of joints, and commences with a summary of symptoms and conditions which, luckily for sufferers, do not occur where correct treatment is undergone. He also warns (very properly) the reader that the primary symptoms are not a reliable barometer of the actual difficulties which the surgeon may have eventually to grapple with. At page 273 we are informed that the therapeutics of joint disease

"Is infinitely better to day than it was fifty years ago,"

Certainly not in the United States. Their theory is ancient though their practice is new, but they have omitted what was good in the old practice, and held on to that which was bad. At page 274 the cause of articular disease is again discussed, and Dr. Bauer asserts that they are all of traumatic origin,—to myself it would matter little whether idiopathic or traumatic. I anticipate, however, few among those who have had an extensive field

observation, will agree with the author that all these do arise from injury. In page 275 diagnosis is discussed, where all those antiquated signs, which are of little value to any except experienced practitioners, are enumerated.

At page 277 the treatment of joints in general is laid down.

“The very first therapeutical axiom in the treatment of joint disease is rest, absolute and unconditional ; and the next proper position of the affected articulation. The efficacy of these two is greater and more reliable than the entire antiphlogistic apparatus, and they generally suffice to meet the exigencies of the first stage.

This quotation shows that since the publication of Dr. Bauer's first edition he has materially changed his views, and, in my opinion, has considerably progressed; yet, at the end of the second paragraph, page 277, it is apparent to me that he still prescribes local medication. Again, discussing the position of the affected joint, last paragraph, page 277, he says :—

“The position of the affected joint should be that in which the patient is most comfortable and at rest.”

This, again, is proof of his methods being defective in obtaining rest, inasmuch as all positions are those of ease, provided a curative degree of fixation is secured, but all positions are not such that the utmost future use can be obtained.

At page 278, he says :—

“Some surgeons advise to give the extremity such an angle as will be most conducive to its usefulness.”

"We have nothing to do with that object at this juncture; our object is to relieve disease, and thus preserve the entire usefulness of the joint; their advice is in place when the joint is about anchylosing."

The policy laid down here is, in my opinion, exactly the reverse of the proper method. It is in the diseased condition that deformities can be corrected quickly, safely and with least pain, and he seconds my dissent from the above at page 280.

"If the affected member has already been placed in mal-position, you have promptly to reduce the same to insure articular rest."

This contradicts the last paragraph in page 277. Again, at page 281, second paragraph, he insists on the necessity for reduction of deformity in the inflammatory condition. This latter statement again is a direct contradiction of paragraph 278, commencing with "We have nothing to do, &c.," which has been previously quoted by me. At page 282 the value of extension (continuous) is summarized thus:—

1.—Extension cannot part the inflamed articular surfaces, for which it has been erroneously designed by its author.

2.—Powerful extension is perhaps the promptest remedy against an ephemeral muscular spasm, as every one has experienced himself if he has happened to be suddenly attacked by spasm of the muscles of the calf; but it cannot be relied on in persistent spastic agitations of the muscles.

3.—In many instances extension will not fail to relieve the spasms, but will react unfavourably upon the violence of the existing joint disease, if persisted in.

4.—The division of the contracted muscle is the surest and unfailing remedy."

"The most violent periods in the course of joint disease I have observed in consequence of keeping a restricted muscle on the stretch."

I most cordially agree with all the reports against the practice of continuous extension in joint inflammation. At page 296 it is satisfying to note that he protests against the application of blistering or any other derivant to the region of the joint

Chapter fourteenth is devoted to the treatment of the sequelæ of joint disease, and commences with a paragraph which might cause some to doubt that Dr. Bauer ever saw a case of genuine resolution (secured soundness).

The second and third paragraphs in this chapter are devoted to the treatment of stiff joints, and manipulation is commended with passive motion, and the lumbæ, known as emollients, are advised, also cold and hot douche, or a visit to Germany. The remainder of this chapter is devoted to teaching that "Brisement force," combined with myotomy, will correct deformities which continued extension cannot correct, and his teaching appears to coincide with that of our countryman, Mr. Broadhurst, the special advocate of tenotomy, "Brisement force" and passive motion. My experience will not permit me to endorse the opinion of the author as regards the purpose of these last three items of treatment, viz., Tenotomy, "Brisement Force," and Passive Motion.

The two first procedures in my opinion are very rarely required. I have repeatedly seen

reduction of deformity by simple retention after failure by "Brisement force," though this latter was employed while the patient was under æther. As to "passive motion," this is a phrase, that in this year of grace, conveys to my mind no information. I cannot see a place for it in the art of surgery.

Whatever difference of opinion may exist as regards the treatment of these lesions by the methods advised in this volume, I have great pleasure here in acknowledging that surgery is much indebted to Dr. Bauer for his labours as an innovator in the treatment of inflamed joints, and he has given courage to others to venture on a voyage of discovery in the treatment of these difficulties.

Dr. Bauer's labours have been the means of inspiring several surgeons in the United States to attempt the improvement of the mechanical treatment of articular inflammation, and among others, Dr. C. F. Taylor, of New York, has appeared as an exponent and practitioner of the theory, but his method of practice varies from that set forth by Dr. Bauer. His opinions have been published in the "NEW YORK MEDICAL RECORD," Sept. 1, 1867, and May 8, 1875, and in a treatise "On the Mechanical Treatment of Diseases of the Hip Joint," Ward and Co., New York, 1873. I find also that he is patentee to a form of hip appliance,\*

\* See foot-note, Dr. Bauer, second edition, page 286.

also Surgeon to a Hip Hospital, in which establishment (if there is the same mania for specialities in the United States as exists in this country), he has had sufficient opportunities to test his speculative views as regards hip inflammations. Dr. Taylor's writings\* contain many clinical observations which I am glad to find corroborate my own notes ; and judging from his writings, had he simply made deductions from clinical observations of cases while treated by simple fixation, he would have evolved the same theory as myself, but starting with his mind stocked with the opinions of "the fathers," together with an additional idea that the muscles are at the root of all the evils attending hip inflammation, he has made his appliances to enable him to apply this idea in practice. This he informs us in page 289, vol. ii, "MEDICAL RECORD,"—

"An apparatus, like a remedy, should be the embodiment of an idea."

With this none can dissent if a maximum amount of success follows the application in practice of the idea, otherwise we are called upon, as the navigators term it "by sounding," to feel our way to correct principles, and try by a method of deduction, to gain a correct theory.

In the commencement of this article (MEDICAL

\* To Dr. Taylor I am indebted for his collected writings, and here acknowledge his courtesy in sending them to me, and at his request I now more fully notice his views.



RECORD, Sept. 1, 1867), Dr. Taylor discusses the causes of failure of cure by the use of his appliance, which he attributes—

“To the inefficiency of the instrument employed, and to a practical disregard of the true end to be sought by its use.”

And he further objects to “elastic extension,” and condemns Dr. Sayre’s appliance, which he claims as his own design a model of which he had laid aside after using it only once. In last paragraph, page 289, when referring to the advisability of preventing motion at the knee joint in hip inflammation, he writes :—

“Primarily it is an advantage when the counter extension is complete, but not otherwise, to cause the motion of progression to be at the hip instead of the knee, as it would be if the latter were not confined.

The meaning of this quotation is better expressed at page 23 in his treatise on the “Mechanical Treatment of the Diseases of the Hip Joint.”

✓ “But motion at the knee is a decided disadvantage. It prevents, or at least diminishes, motion at the hip joint.”

This is not correct as anyone can observe that fixing the knee limits the friction and motion at the hip joint, while permitting motion at the knee increases friction, and allows more action at the hip.

An ankylosed knee always diminishes the extent of the radius of action and friction at the hip.

At page 290, Dr. Taylor expresses his disbelief

in the possibility of drawing out the head of the bone by extension, and very properly remarks—

“It would be harmful if it did occur.”

On the same page he expresses his opinions on the necessity that—

“Muscular tonicity must be temporarily destroyed.”

This, to my mind, is inexplicable. I should rather say, place the limb at ease, and the muscles will be quiescent and remain so until wanted by the patient to resume duty. Again, when discussing the supposed destruction of muscular “tonicity,” we are informed that it may be, and generally is, followed by weakness of the muscles about the joint, which may require special treatment to restore their tonicity.

“This is a sacrifice we must make to the greater good of arresting the diseased action in the joint.”

We have never noticed that atrophy of the muscles after the treatment of lesions of joints required special attention to induce them to resume their functions, for as soon as the articulations are sound, they are certain to regain their action and power, and the more they are delayed, the more certain the surgeon is of securing his resolution beyond the possibility of a relapse.

In the same paragraph we are told that—

“On the other hand, if contractions accompany or follow disease, we may be sure our counter extension has been efficient, and therefore worthless, and that the improvement, if any, is due to the quiet fixation of the joint, which the splint has been a convenient means of accomplishing, and I suspect this is very often the case in the use of both splint and pulley.”

When expressing my conviction of the incorrectness of the treatment of joint inflammation by any system of extension, I have always expressed myself in the sense contained in the above paragraph, that all these injurious methods of treatment,—namely, those of extension treatment, involve inseparably in their application, a certain amount of “quiet fixation,” which is the remedy, which benefits the patient despite the extension he is too frequently tortured with.

At page 291, Dr. Taylor reports that he has advised a clog under the sound foot, but evidently with neither method nor success, as he says—

“The difficulty is in carrying the plan into practice .”

From this it is apparent that since I introduced this addition to the treatment of hip affections, Dr. Taylor had become acquainted with the method, as he informs us that—

“Indeed many have advised, as I sometimes have when circumstances were such that nothing better could be done—patients to wear a thick sole on the foot of the well leg, and use crutches, letting the lame leg hang. The only difficulty is in carrying the plan into practice, with sufficient perseverance and uniformity.”

This article concludes with testimony to the injurious tendency of the extension methods.

“I have seen several legs irretrievably spoiled by applying the straps on the leg only, neglecting to include the thigh. This has been generally done when the treatment had been by the weight and pulley, force enough to relax the powerful muscles about the hip joint must be liable to pull asunder the weaker ones at the knee and ankle if traction be made only from the foot and leg.”

If all this damage can occur from extension applied to a sound joint, what may be the amount of damage done to an unsound articulation, the structural surroundings of which are softened by inflammation?

Again, we are informed that—

“With the best appliances disease of the hip joint is not easy to cure.”

I dissent from this, as the hip joint presents no difficulty which does not also present itself in diseases of other joints of the lower extremity.

Dr. Taylor concludes by very properly drawing attention to the fact that the treatment of joints is not so much a question of splints as of principles.

“There is no magic in surgical apparatus, let them be ever so cunningly devised. They should have a function corresponding to our idea of the requirements of the case.”

In the New York “MEDICAL RECORD,” issued May 8, 1875, is a further exposition of Dr. Taylor’s views, the paper is entitled, “On some of the elements of Diagnosis of the different stages of Diseases of the Hip Joint,” and he commences by asserting:—

“The importance of an early and correct diagnosis of disease in the hip joint must be apparent to all. But diagnosis implies much more than a recognition of existing disease. It embraces, or should embrace, such a careful analysis of the existing facts, as to resolve the condition into distinct and well-defined elements, which are separately comprehended, and which, being correctly interpreted, are the indications to which our treatment ought directly to respond.”

From this quotation it is apparent that the author is of opinion that each stage requires special treatment. In the second paragraph, page 321, he says ;—

“Of course there are stages and degrees of this disease which advertise it to the dullest comprehension and to the most careless observer.”

Here is an admission that the early stages of this disease are not readily diagnosed by the methods of diagnosis hitherto in vogue, but he will find in practice that the diagnostic method I have introduced to the notice of the profession, will enable the most obtuse among us to detect early the presence of the slightest inflammation in this joint.

In the third paragraph Dr. Taylor says :—

“The symptoms generally relied upon as diagnostic of disease of the hip joint are worthless for all practical purposes of either anticipating the graver stages of the disease, or of affording indications for treatment.”

Yet the reader is not introduced to any other method of diagnosis, though he admits the worthlessness of the usual symptoms relied on for detecting this lesion. In the first paragraph, page 322, when contrasting the effect of art or non-interference in a case presented to him for treatment, he says :—

“Without treatment it was only a question of time, for death of the bone, with its attendant dangers, would occur ; and with treatment, increased physical suffering was inevitable.”

This is a deduction from Dr. Taylor's own experiences ; if so, it is by no means creditable to his method.

Page 323 is principally devoted to the consideration of the value of flexion as a sign of joint inflammation, but nowhere does the author give a method (beyond the rough one of digital manipulation) by which one can measure this flexion which he admits always exists from the earliest period, and he concludes his remarks with an opinion which demonstrates beyond doubt that he has not a correct appreciation of the value of this very symptom. He says:—

“ A very slight injury of the joint, the merest trace of inflammation resulting from such injury will cause an immediate response of muscular action, which can be appreciated by the examiner for the purpose of diagnosis, still while the disease must have advanced to a considerable degree before the patient becomes mentally conscious of anything wrong. Of course, I reject Etherization as being utterly valueless as a means to assist diagnosis, and am simply amazed that it has ever been used for that purpose. To relax the muscles is to destroy the most delicate evidence of suspected disease.”

This latter paragraph certainly amazes me, as no amount of Etherization would relax joint flexion caused by inflammation so long as no violence was used.

Also at page 323 Dr. Taylor gives an illustrative case of reduction of flexion, when the inflammation was only of two weeks duration; yet it required six weeks for his method to reduce the flexion; even if the inflammation had existed four weeks, my splint, by obtaining mere fixed re-  
clination, would have succeeded in reducing it in one or two days at the utmost.

At page 324 the author enunciates his own views as regards the muscular contraction which accompanies and indicates articular lesion. It is here given in extenso.

“The mistakes in diagnosis arise from confounding as identical two conditions which are entirely different and wholly separable. A condition of so-called contracture is a permanent shortening of the muscles. It is characterized by increased rigidity and diminished contractility. The DIMINISHED CONTRACTILITY and diminished irritability are important to be remembered.

This condition of the muscles may result from various causes. It is specially likely to be found after long disease accompanied with the absence of all direct or reflex nervous excitation to action ; as after fibrous or bony ankylosis and disuse of the joint.

But this condition of the muscles must not be confounded with nor mistaken for the constant, excessive, unrelaxing, tonic contraction, in greater or less degree, varied or not with spasm, but always present when there is any disease whatever in the joint. The latter may exist so slightly as not to prevent the extremest flexion and extension, or it may exist to such a degree as to arrest all motion as completely as true ankylosis ; but it can always be detected when we have a clear conception of its distinguishing characteristics. In the earliest stages of any injury to the joint, supposing such injury to be so slight as to produce the least possible inflammatory action, there may be a mere stiffening of the muscles, not enough perhaps to prevent motion, but always enough, when one is looking for it, for the educated touch to detect what I have named A RELUCTANCE TO RELAX. It is quite independent of the patient's volition, though it often requires careful management to prevent the voluntary efforts from mingling with and obscuring this condition, which is independent of the will. It is the first feeble involuntary intimation of an effort to arrest motion, which, further along, and after the disease have increased, becomes palpable enough to the most ordinary observation. It is chiefly in the earlier and later stages when mistakes of diagnosis are most likely to be made. In the beginning this symptom, being less pronounced, may be overlooked ; and later, when it has increased to its greatest degree it may be mistaken for contracture or permanent shortening ; and it is also often mistaken for ankylosis when it is sufficient to arrest motion. In the stage of its higher activity there are two conditions by which muscular contraction—the increased, constant, tonic contraction here meant—may be distinguished from so-called contracture, or the muscular shortening for which

it is so often mistaken. There is increase of irritability, (independent of muscular power), accompanied with what may be called a relaxibility, while muscles in a state of contracture or permanent shortening are characterized by want of irritability and by inelasticity. The former RELAXES on the application of force. The latter stretches by its physical elasticity, or by the rupturing of inelastic fibrous tissue."

Here are defined two abnormal conditions of the muscle—one contraction, which relaxes on the application of force; the second where the muscle stretches from physical elasticity, or ruptures from inelastic tissue.

Although the writer maintains the existence of two characteristic changes in the contracted muscles he mentions three—first, relaxing by application of force; second, stretching by its physical elasticity; third, rupturing of inelastic fibrous tissue.

This classification is not warranted by any clinical observation given us by the author or any other writer on this subject; and as soon as Dr. Taylor has mastered my diagnostic method for detecting recovery of inflamed joints, the incorrectness of this classification will become apparent. The conditions he separately defines are but degrees of the same abnormality of the muscles.

At page 325 is given the history of a case of hip joint inflammation which had existed fifteen months, and at the time the patient consulted Dr. Taylor his joint was evidently in a condition of inflammation; yet to correct the deformities present, the author's splint, with counter-extension was used



together with weight and pulley as extra tractors. This latter item was equal to a pull of fifty pounds added to that of the counter-extension apparatus, which equalled in all one hundred and fifty pounds, and all this had to be continued uninterruptedly for six weeks, whilst simple fixed reclamation would have succeeded under ten days. I make this assertion, basing it on the history given, viz., that the disease was active; this being the easiest, quickest, and safest period for reduction of deformity.

Another case is related at page 325, a perusal of which shows a poverty of diagnosis—

“ Peculiar quality of muscular action and the educated touch ”

appear to have been the signs depended upon; and there is mentioned in the history of this case rupture of the joint and burrowing of the pus down the thigh, which is referred to as—

“ Showing how extensive disease of the thigh may depend on previous disease of the hip joint; and, secondly, how the former may go on while the latter is recovering ”.

This is a misinterpretation of a casualty that sometimes occurs in hip inflammation. Dr. Taylor has evidently not noticed what others have namely, that the hip joint distended with pus after rupture, forms a collection external to the joint, which collection may travel downwards, and by the time it has got below the middle of the thigh cease to be connected with the joint. This is not

always the case. This progression of the joint contents down the thigh cannot be correctly termed disease of the thigh. Page 326, first paragraph, Dr. Taylor says—

“I hope I have been successful in satisfying those who have followed me so far, that it is never safe to dismiss a case as cured, no matter what may have been the method of treatment employed, merely because the pain has been relieved or that there is no hurt in locomotion.”

With this opinion and useful hint I quite concur, but of what value is it in the absence of some test to enable the surgeon to end his treatment. Dr. Taylor has here made an omission which cannot be explained, except by the supposition that he has no method of testing the genuine recurrence of soundness. What are here wanted are the signs of resolution. At Page 328 the author gives another of his clinical deductions, as regards indications of treatment, which he says depend—

“On delicate shades of muscular conditions,” “imperceptible amounts and qualities of motion.”

If this were correct, none but the experienced veteran could treat these cases with any reasonable chance of success.

In a treatise “On the Mechanical Treatment of Diseases of the Hip Joint,” published in 1873, Dr. Taylor further explains his peculiar views and mode of treatment. Although this volume is mentioned in the preface as “The completer system of

Mechanical Treatment." He evidently does not think mechanical treatment applicable to all cases.

"There be cases in which the mechanical treatment on account of Pathological conditions, is not applicable, let such be left out of consideration."

Knowing of none such myself, it would have been instructive to have had this class of cases specified. Chapter first contains statistics of cases occurring in the New York Orthopædic Dispensary and Hospital, and deductions therefrom. In chapter second, the cause of hip joint inflammation, he attributes to a traumatic origin in the majority of instances. And at page 12, the crusade against muscular action commences.

"But the muscular rigidity made necessary to diminish the immediate pain and injury of motion, increases the ultimate damage to the joint, not only on account of the steady pressure from the increased muscular action—*itself sufficient to destroy the vitality of the parts—but every movement and the weight sustained are transmitted directly to the joint, because of the rigid and inelastic condition of the muscles.* So that, on the very first intimation of a diminished ability to bear pressure—which is the great obstacle to a spontaneous arrest of any morbid process within the joint—the exigency of arresting motion to save the joint from immediate pain, causes the muscles to take on a contraction of such a rigid and permanent character as to be a condition of perpetual wounding of the parts. Their own excessive action as well as their inelasticity constitutes a continual source of severest injury.

Hence, there is established a self-continuing traumatic condition calculated to increase and prolong any diseased action once commenced in this joint; the more the disease, the more the muscular contraction and rigidity to avoid motion, and the greater the pressure on and injury to the affected tissue. The purely mechanical force of pressure—that which is due to the confinement of the disease within inelastic walls and the vastly increased muscular action which expends its force on already inflamed and sensitive structures—is sufficient to prevent, one would think, any diseased movement, once ever so slightly set up, from terminating by resolution while the pressure con-

tinues. But add motion to a diseased and compressed joint, and can we wonder at the destructive course disease of the hip-joint ordinarily runs.

We find, then, from our premises as well as from clinical experience, that it is pressure or motion under pressure, which is the destrutive agent in disease of the hip-joint. Hence we derive our two prime indications for mechanical treatment.

1st. To relieve the pressure in the joint due to muscular contraction, by temporarily destroying the muscular irritability and contractility.

2nd. To protect the joint from weight and concussion.

The indication for arresting motion in the joint, which is well met by the gypsum bandage and similar expedients, pertains only to a condition of rigid muscular contraction, and consequent increased constant pressure in the joint. But no such necessity exists after the muscular rigidity has been overcome to the degree of entirely removing all pressure within the joint.

On the contrary, motion in the joint without pressure is not only not injurious, but it is highly beneficial."

From the last paragraph in this quotation, it is apparent that its author, judges motion in an inflamed joint to be less injurious than pressure ; as to the first portion of this quotation the best illustration of its fallacy is to imagine ten cases of hip-joint inflammation identical in degree &c., with the exception that the muscles controlling the joint, in five out of the ten cases are paralyzed. Which of the two sets of cases would go to destruction or spontaneous resolution first? If art does not interfere I should say that set paralyzed, to the destructive stage, and that set with muscles unaffected to resolution first. Had Dr. Taylor given as much attention to what he designates "quiet fixation" as he has spent in torturing the muscles, he would at this date have held very different ideas, and such that

when embodied in an appliance, would have had a most gratifying result, with a saving of much unnecessary trouble to him and time and pain to the sufferer. Chapter iii commences with a complimentary reference to Dr. H. G. Davis, who first applied counter-extension with locomotion in the treatment of hip-joint inflammation (better I say that he had never entered the profession,) as far as articulations are concerned; he also refers to Dr. Gordon Buck as having introduced "extension and counter-extension in fractures for overcoming muscular action," this is incorrect as J. H. James Esq., of Exeter was the originator, and first practised this method, and published it to the profession in July, 1839, at the Meeting of the British Medical Association at Liverpool; Dr. G. Buck published his description &c., in 1867, and on a comparison of the two publications, that of J. H. James's is the better, and has the more detail, namely—arrangement to diminish the friction of the limb on the couch.

What is most remarkable to me in the writings of Drs. Bauer, Taylor, and Sayre, is their emphatic protest against the extension treatment, yet they all advise some form of extension—for instance in this chapter.

"The painfulness usual during activity is lessened by the quiet of the patient's position, and this is wrongly credited to the effect of extension;

while the muscular contractions are still not overcome, the pressure in the joint continues practically the same, and while the surgeon may fancy that his patient is being cured by extension and counter-extension, he often is really getting only a certain amount of temporary relief from fixation."

"In careful, experienced hands, the weight and pulley may be made a valuable means : as frequently employed by the careless and inexperienced, my observations in this country and in Europe satisfy me that it is inferior in practical results to the plaster of Paris bandage, which does not seek so much and generally accomplishes the ankylosis which it seeks, and with the leg in a better position than is generally obtained by carelessly employed extension."

At page 22, the author condemns Dr. Davis's appliance, and at page 23, Dr. Sayre's appliance meets with the same fate, and on carefully perusing chapter iv, which describes the Taylor appliance, I, also feel compelled to pass an adverse sentence on Dr. Taylor's apparatus, which, as he tells me, was made to suit an idea, for after a careful consideration of his opinions set forth in his publications, it is only too apparent that his erroneous principles, which his appliance represents, makes it unnecessary for me to consider the value of the appliances made to apply those principles in practice, as to the treatment of some of the casualties which complicate the mechanical treatment Dr. Taylor makes but imperfect reference.

The next gentleman whose advocacy of the "American Methods," deserves special notice is Dr. L. Sayre who is certainly the "great apostle" of this system. Drs. Bauer and Taylor have hitherto

filled the position of clinical labourers in this department while Dr. Sayre has taken the part of missionary; indeed his incessant zeal has (much to his credit and honour) induced him to visit other countries to instruct surgeons, in what he judges to be a valuable addition to the treatment of articular inflammation and orthopedics, and so his name has become known among the many in connection with the "American Method," this combined with the publication last year of his volume on Orthopedic Surgery and Diseases of the Joints has brought him to the front so prominently that on the publication of his volume it was reviewed in most of our professional periodicals with unqualified approval and in such a manner commended, that indicated to me that insufficient knowledge on the part of reviewers accounted for no dissenting comments.

\*The first twelve chapters of Dr. L. Sayre's volume are devoted to Orthopedics. With the practically Orthopedic portion of the volume, I note no advance on the traditional treatment. It may represent the condition of the mechanics of this department of surgery in the United States, and, if so, it is behind time compared with British Orthopedics as I understand it. I exclude the so-

\*Lectures on Orthopedic Surgery and Disease of the Joints, by DR. LOUIS SAYRE, published by CHURCHILL, LONDON, 1876.

called orthopraxy which seems to be much in the same condition in the new world as in the old.

The author begins the discussion of articular inflammation in lecture xiii, with inflammation of the ankle joint, the symptoms of which appear to me, as recorded in pages 156 and 157, to be obscure.

At page 156, the symptoms of sprained ankle are enumerated and a method of manipulative diagnosis is advised such, that if practised in this country, would "stamp" the surgeon in the opinion of the patient as been "a novice," and "at sea" in the matter; granting that the questionable distinctions he makes can be detected, then detection is here mere curiosity, which injures the sufferer and gives no aid to treatment. In page 158 also is enunciated Dr. Sayre's favourite theory "Blood Blister," which, I believe, is a pure speculation as no where in his volume does he refer to any actual proof supporting this "Blood Blister" theory.

Let us, then, next consider how such disastrous results may be brought about. We will take, for example, a simple sprain of the ankle, which is very common, and from which all of you, it may be, have suffered. As I have already told you, a "Blood Blister," or extravasation, is first produced. Such a "Blood Blister," is considered as insignificant under ordinary circumstances, if it be allowed immediately to heal. If, however, the "Blood Blister," is constantly irritated by friction, an ulcer is formed which rapidly increases in size, and involves the deeper tissues.

This, I believe, is exactly the morbid process going on in one of these neglected sprained ankles. The small quantity of blood effused behind the



synovial membrane, or between the cartilage and bone, would be speedily absorbed, if sufficient rest were allowed to the part ; but there is no swelling, and little pain, it may be, to give warning of the mischief done, and the patient does not stop his usual walks and exercise. The "Blood Blister," becomes irritated and increases in size, and finally, on account of the disturbance produced, he is obliged to lay by for a short time.

This "Blood Blister," theory as laid down in this quotation, refers to joints in general, and the only way to give my grounds as to the incorrectness of this teaching is to discuss that which usually takes place in sprains of the knee joint in particular, (this is the joint that gives us the best field for observation and deduction). I will suppose a Mr. B. who has (during the hour previous to his consulting me) fallen whilst alighting from an omnibus while in motion, and twisted and rotated inwardly his knee, (this is usually the history of knee accidents short of not involving fracture) he is able, in a few minutes after the accident, to walk a short distance, two to three hundred yards, but the joint becomes more painful, distension rapidly occurs until at the expiration of an hour the joint is acutely painful and extremely distended, the history and appearance of the knee induces me to introduce, without delay, a No. 3 aspirating needle, and to aspirate the articular contents, which, in the majority of cases, is fluid blood, and coagulates into a firm clot as soon as removed, patient now has much relief, and the joint is fixed, he is sent home

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and about the third day the same distension of the joint recurs, this is aspirated, and is usually composed of bloody serum, a third aspiration is seldom required; how this hemorrhage within the joint occurs I am not prepared to say, certainly a blood effusion, which equals four fluid ounces, often more, cannot come from "behind the synovial membrane," or "between cartilage and bone," and be referred to as a "Blood Blister."

With the author's views as to the cause of intermittent night pain in joint distension, with its evils and the unnecessary dread of joint incisions, so well stated at page 159, I concur, but with many of his details of treatment, pages 160-3, of inflamed or sprained ankles, I am obliged to dissent, such as "hot water", "elastic compression," "friction with the hand," manipulation and friction," all this, "when the injury is first received," and, he adds, at the conclusion of lecture xiii,

"could such treatment be faithfully carried out in every case from its earliest commencement there would rarely be need of the mechanical appliances and surgical interference to be described in our next lecture."

In my opinion these items of treatment when practiced are a "Royal Road" to the so called "disease of the joints," the sufferer has to recover despite this malpraxis which has been in vogue from time out of memory, and which I am glad to

say surgeons have surely but slowly begun during the last thirty years to lay aside.

Lecture xiv is devoted to the consideration of inflammation of the ankle and joints composing the foot, and the reader is introduced to a new appliance which is advised as the best form of mechanical aid in the treatment of ankle joint inflammation, and is designed so that it may and can take a little of the weight of the body off the ankle, and, it is evident from its construction, that it effectually arrests motion of this articulation, why he should here arrest motion, and not advise its limitation but advise the reverse in inflammation of the hip-joint I fail to perceive.

“By the splint I prevent motion which would be the cause of relapse.”

I should do well, I think, to explain to you when motion is injurious, and when it is demanded.

So long as there is active inflammation in a joint, motion is injurious, and rest absolutely necessary. In the first stages of inflammation of any joint, rest is also imperative, and, in fact, is the essential element of the treatment; and, as long as acute pain is produced by pressing the synovial surfaces and articular cartilages together, rest must be enjoined; or, if motion of the joint is requisite, in order to prevent ankylosis, then this motion must be always accompanied with extension, in order to relieve this pressure. But, when pressure can be borne without pain, and the difficulty in motion depends upon the contraction of tissues around the joint from want of use or from deposits, as the result of an antecedent inflammation, then motion—passive motion—applied with discretion, is just as much a part of the treatment as rest was in the earlier stage of the disease.

I hold that neither here or in any other portion does Dr. Sayre explain how we are to detect that

motion is injurious, he certainly informs us under what conditions, he would allow the patient to use the limb; (though what he says on this point contradicts his teaching in the "American Lectures.") I hold that in the case of the ankle joint the condition of soundness would be indicated thus; after moderate use there would be increase of power to flex the joint, and an equal ability on the part of the patient, by the exercise of his will only, to extend the joint, and these two motions of the articulation should increase, by exercise and by volition, not by passive motion, which would give needless pain and trouble. The cases of ankle and foot-joint disease reported in this volume are to me of no value, as with two exceptions, all occurred in patients at an early period of life, 3 to 7 years of age; my experience informs me that at this early age the sufferer can recover from an extensive destructive inflammation of the joints of the foot with very little aid from art even despite a method of prolonged fallacious treatment beginning by poulticing, with linseed, cow-dung, bread, sea tang, oatmeal, marsh mallows, and other filth, whose name is "legion."

In pages 181-4, are given details of the mechanical treatment of the Tarso-Metatarsal articulations which is a mode by extension such as will be highly prized by the anti-muscle and extension practitioners in America and this country.

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"The patient should at once be placed upon his back in bed, and extension made from the toes by slipping an Indian Juggle on each toe, and attaching them to a cord fastened in the ceiling."\*

Chapter xv is devoted to the anatomy and diagnosis of the abnormal conditions of the knee-joint; at pages 186-7, are described the symptoms and mode of diagnosing, acute and chronic inflammation of this joint. The symptoms given as attendant on the acute stage are those generally accepted by surgeons, but when he instructs us as to the manner of diagnosing the chronic condition he informs his clinic that—

"The erosion can be very easily detected by crowding the articular surfaces together and slightly twisting them upon each other, when the most intense pain will be produced."

This is certainly an injurious degree of manipulation and might do more harm in ten minutes than the surgeon could undo in ten days, and is needless if the surgeon has any acquaintance practically with his art, as the condition he here refers to is such that the unqualified can almost detect at sight.

\*I recollect a learned professor, when testing the knowledge of his students, asking an impertinent fellow what he would do if suddenly called to a case of bleeding from a varicose vein of the leg, this occurring in the public street, he answered that he would elevate the limb and tie the patients foot to the nearest "door knocker," a proceeding quite as reasonable as the Indian Juggle extension treatment.

In this chapter is also described a condition of the bones comprising the knee-joint, which I have never met with and consequently cannot comment upon—indeed some of the casualties indicated by Dr. Sayre appear from a perusal of the lecture to be purely speculative, for in pages 190-3 are given supposed pathological explanations of some of the symptoms of articular lesion. This is a subject I must confess my unwillingness to debate, holding as I do the opinion that the pathology of articular lesions requires much correction. Dr. Bauer in his writings has furnished the profession with much valuable information in the pathological department.

In lecture xvi, the treatment of the knee-joint is laid down and is divided into two-heads,

“Treatment for the earlier stages of the disease and treatment when the disease has become so developed that the case requires extension and counter-extension operative interference &c.”

For the first stage “posterior splint,” “confinement to bed” “until recovery is well advanced,” “hot or cold water” “after a few days have elapsed write for a linament” “a liberal amount of hand rubbing and passive motion” “firm compression,” no wonder the author adds, “these cases are slow in recovering” this is the treatment when the ligaments alone are involved, but when “synovial membrane becomes involved” “an active plan of treatment” is sketched.

This active plan of treatment is appended here in extenso, it almost reminds me of John De Vigo and the good old times gone by.

“When the injury has been followed by effusion into the joint, next to, absolute rest, elastic compression is the most essential element in the treatment. Place the patient in bed at once. It may be, and quite probably will be, necessary, in the majority of cases, to make some local depletion by means of leeches or wet cups before resorting to any measures for the purpose of promoting absorption of the fluid. The necessity of local depletion, and its amount, will be decided by the vigor, general health of the patient, and the degree of inflammatory action present, as manifested by increased heat about the joint, increased frequency of pulse, pain, and general constitutional disturbance. After local depletion, hot fomentations and elastic compression, secured either by means of a fine India-rubber bandage, or, still better, by the double India-rubber bag before referred to (see Fig. 131), will be of the greatest possible service.

If absorption of the fluid does not take place rapidly under this treatment, counter-irritation may be resorted to by applying blisters above and below the joint. Never apply your blisters directly over the knee-joint, but apply them above the capsular ligament, and below the ligamentum patellæ. In addition, iodine-ointment may be applied over the joint, and covered with oiled-silk. Never use iodine locally in the form of tincture, for the reason that it is painful, the alcohol is soon evaporated, thereby leaving the iodine as a coating upon the skin which permits only a very small quantity to be absorbed. After the first application, succeeding applications are of no service as far as absorption goes; for they simply facilitate the destruction of the cuticle, and until this layer is removed further absorption of the iodine cannot take place. The objection to iodine, therefore, in the form of tincture, is that it renders but little service except when its effect as an escharotic is desired!; but, used in the form of an ointment, scarcely any pain is produced, no exfoliation of the cuticle follows, and therefore absorption can go on, and in this manner the remedy renders continuous service.

When the acute symptoms have subsided, great benefit may be derived by freely shampooing the parts, slightly rubricated with cosmoline, vasoline, or any substance which will permit the hand to glide over the surface freely without producing too much irritation to the skin. Friction should be applied in this manner with very great freedom for from twenty minutes to

half-an-hour at each sitting; and, while one hand is made to do rubbing around the joint, the other hand should rub up and down upon the limb above the joint, thereby greatly facilitating the absorption of the effused fluid. If the case does not yield to this treatment, and the effusion increases so as to make tension sufficient to paralyze the absorbent vessels, it may be necessary to aspirate the joint and remove all the fluid possible. In many instances, if only a small quantity of the fluid is removed, the tension upon the absorbent vessels will be relieved to such an extent that the remainder may be absorbed by the means already mentioned. This is an application of the same principle that governs us in the management of certain cases of ascites; namely, first, removing a portion of the fluid from the abdominal cavity in cases where great distention is present, and then resorting to diuretics, hydragogue cathartics, etc., for the removal of the remainder."

What labour to the Surgeon and annoyance to the patient consequent upon pain and delay, is here shadowed forth when with an aspirating needle the joint can be relieved in a few seconds, ease secured, and time economized. Aspiration of joints is evidently an unexplored field to Dr. Sayre, for the contents of page 197 unmistakably point out dangers and practical difficulties which, I say without the slightest hesitation, do not exist in practice. In the last paragraph of the same page he advises the making of a fine incision if the joint contains pus; this is not as conservative item of treatment. I have frequently succeeded in making a perfect and rapid cure of knee joints distended with pus, by the practice of repeated aspirations with efficient fixation, that such joints may sometimes have to be incised I admit, but aspiration and fixation usually succeeds and much shortens the treatment,



and with vastly less risk than incision. Incision is the "dernier ressort" and an excellent one at times when the joint contains very old collections of condensed pus &c, but this will not occur unless mismanagement or neglect has extended over at least twelve months. At page 199, Dr. Sayre when discussing the treatment and the *modus operandi* of his procedure, makes this, to me, extraordinary statement—

"For the tendons will heal by the time the articular surfaces have resumed a healthy action."

Now, tendons are usually only a few days healing; surely it is not meant here that they will take as long a period as the inflamed joint which may take weeks. In the same page commenting on Sir Benjamin Brodie the lecturer says:—

"In looking over Sir Benjamin Brodie's works, I find he recommends positive rest, and that is all. But you may do this—you may rest the joint in splints—but you do not do all that is required. You may keep the limb perfectly still, and locked up in every conceivable way, and yet do not overcome the tendency of the muscles to contract—you do not prevent the reflex action."

Here Dr. Sayre is certainly mistaken, for in page 139 of Sir Benjamin Brodie's volume on disease of the joints, fifth edition, 1850, he will find that the extension method (or counter-extension) is advised, and details for its practical application are given, but I must admit the arrangement would not allow of the application of a hundred and fifty

pounder as Dr. Taylor reports, but this, Dr. Sayre says, is not essential,

“ simply enough extension to overcome the reflex contraction of muscles.”

Sir B. Brodie's mode of applying extension was I judge, such as would, if required, permit double this amount of traction, but he does not report well of it, and the veterans in the medical profession in Great Britain, will readily vouch for Brodie's acuteness of Clinical Observation, and, had there been any merit in extension, it would not probably have escaped his observation, interested as he was in this department.

On page 200 is a diagram of the Sayre knee apparatus, and both the drawing and text inform us that while it is intended to diminish pressure (take it off altogether it cannot) it is also designed to arrest friction, although Dr. Sayre is an advocate for friction in other joints while yet in the unsound state. On the same page we are informed that,

“ When the joint is filled with liquid acting like a foreign body, as in the ankle-joint, it is advisable to give the patient the benefit of the doubt as regards being able to secure absorption, trusting that fixation of the joint in such a manner as will relieve the patient of all pain and remove all pressure from the diseased surfaces, will diminish the amount of irritative fever, and give us the opportunity to build up and invigorate the general system, so as to render the absorption of fluid practicable.”

This again shews that its author is a novice in the aspiration of joints, “to give the patient the benefit

of a doubt" here is to delay the abnormal condition, and in many cases the delay would be fatal to success.

At page 201 is a pictorial illustration of a case of inflamed knee-joint with angular deformity, and posterior luxation of the head of the tibia. On page 206 is a like exhibition of the same patient after the application of the knee support, and the accompanying text is so worded that it may be supposed that the deformity and luxation had been corrected in one hour. Now this was in this case impossible, and I base my criticism upon the contents of pages 202-4, where details are given of a tedious process which the patient must undergo previous to having the knee splint applied. A perusal of pages 202-204 convinces me that days, not an hour, would have to elapse before that patient could have been exhibited as free from deformity. In the preface to this work Dr. Sayre informs the reader that it contains—

“Many expressions which I would like to change”

It was Dr. Sayre's duty as a public teacher to change anything of the correctness of which he had a doubt.

He continues to discuss treatment in lecture xvii, and he advises that—

And he advises us that:—

“The instrument must be worn until the joint is well ; until concussion, produced by bringing the tibia and femur together, does not cause pain, and until pressure over the coronary ligaments is painless. When this can be done, you may remove the instrument and commence the passive movements and manipulations that are to restore motion to the joint, and complete the cure”

Here are given symptoms, supposed to indicate the sound state, and that the limb is fit for use, but, these are not infallible criteria of the soundness of the joint. Again “passive movements and manipulations” are not required “to restore motion to the joint.” The whole of page 208 is devoted to the recommendation of manipulative details which at pages 209 and 211 he warns his listeners are dangerous—

“There are some cases in which the disease progresses reasonably well until passive motion is resorted to, and then there is at once an almost constant tendency to new inflammatory action, in consequence of such movements, however careful they may be made.

In these pages also, the success of pretenders he professes to divine, and their means he extols.

At page 210 is introduced an illustration of a knee machine made by Mr. Darrach, New Jersey, which, from its appearance, might have been taken from “Scultetûs’ armamentum.” In referring to ankylosis of the knee joint, Dr. Sayre strongly advises the “straight position,” and I have much pleasure in seconding his opinion. At page 211 a series of illustrating cases are given, and, when

relating the history of case No. 1, he refers to the marked relief from pain on extending and counter-extending the bones of the joint.

“When Dr. Cleveland took hold of her foot to move her in position for the operation, she seized him by the arm with her teeth, and held on with the grip of a tigress, until I grasped her limb above and below the knee, and by firm extension and counter-extension, to separate the bones from each other, gave her such relief that she let go her hold upon his arm.”

That immediate relief followed Dr. Sayre's manipulation I feel confident, as his procedure involved in its practice that “quiet fixation” which Dr. Taylor points out as inseparable from extension and counter-extension.

Any surgeon who has had moderate experience, must have occasion at times to raise from a McIntyre splint a compound fractured leg, for the purpose of cleaning beneath the limb, and he will admit that the way to do it with least pain, is to grasp the ankle and knee of the injured extremity and counter-extend it, raising the leg at the same time; but, no surgeon would be so unreasonable as to throw away the McIntyre and take to extension only. Extension per se is an evil, and, in serious cases, every item must be carefully considered, and that method with least defect should come into general use. What is the very best method? Clinical observation alone, can solve this question. After a careful perusal of Dr. Sayre's typical cases of knee-joint disease, I fail to note anything specially

instructive in them. They were treated by the usual routine of treatment common among specialists here and abroad, viz.:—"Tenotomy," "Brisement force," "passive motion," "manipulation," and "imperfect fixation." There was no stated theory, yet they all did remarkably well. That Dr. Sayre is not usually so successful, I gather from the prominence he gives to "exsection or amputation" in this lecture.

In exsection Dr. Sayre is almost without an equal; and, as the exponent of a method of treatment of joint disease which I hold is a straight way to exsection, his opportunities of operating may have been many. During twenty years I have been on the look out for a case to excise, but have had the ill luck not to succeed in securing more than one. My last disappointment occurred about two years ago when after I had judged a knee which for 15 years had suffered chronic inflammation with suppuration as one fit for exsection, I asked the opinion of Mr. Rushton Parker, who differed from me on the ground that as no mechanical treatment had been tried, it would be well to try it. We did so, and the patient did well. Excision is also argued in lecture xviii., the mechanical treatment of which is "poor indeed."

In lecture xix., inflammation of the hip-joint is expounded, the anatomy, pathology, etiology, and

symptoms of the first stage, of this disease are given and with Dr. Sayre as with others, the treatment of hip-joint inflammation is looked upon as being the best test of methods. In my opinion the knee-joint is the best field for clinical teaching.

The discussion of the causation of this complaint, and the views held by Dr. Bauer are repeated; at page 234, the symptoms are given of the first stage, this is continued in pages 235-40, where are enumerated very many useless and fallacious details.

He informs me at page 241 thus:—

“We have thus dwelt upon them at some length, because many of them differ from those of more advanced stages only in degree, consequently require only one description; but more especially because it is in this stage that the diagnosis is most difficult and important.”

I hold the diagnosis by a method now at our service to be just as easy, in an early, as in a later, stage.

At page 240, a means of manipulative diagnosis is prescribed, which, if practised would do more harm in five minutes, than could be undone in five months; he also asserts that no one symptom is diagnostic of this lesion.

Referring to the explanation of knee-pain symptoms, the author appears to have forgotten Dr. Bauer's very conclusive explanation by reference to the anatomy of the obdurator nerve, as given in his works.

In the beginning of lecture xx., is an attempt to solve the causes of the deformity of the so-called second stage of hip inflammation, and all is attributed to hyperdistension of the capsule with fluid. That this may occur in the dead subject I am willing to admit, but I think it does not in the living subject, on the contrary the deformity arises from muscular action, and this Dr. Sayre partly admits at page 244, first paragraph. The first of the author's typical cases is given at page 245, and he informs me that all the symptoms were aggravated by weight and pulley, which had been persevered in for ten months at St. Luke's Hospital.

At page 247 the signs of the third stage are given, and the variation of deformity is referred to rupture of the capsule. With this I do not concur. A rupture of the capsule may take place without the variation of deformity supposed to be characteristic of the third stage, the variation depends upon the fact that another set of muscles are sometimes called into action, namely—those that are inserted into the Tibia. (hamstrings) Dr. Sayre in a very able manner disposes of the ancient theory of dislocation of the head of the femur from disease.\*

\* My fellow townsman Dr. Macfie Campbell informed me that in one case of exsection that he performed at the Northern Hospital after making the usual incisions to expose the joint he found the shaft of the femur separated from the articular head, the separation had taken place at the neck, the articular head he found in the acetabulum, with its vitality unimpaired, and the ligamentum teres intact.



At pages 254-5 the prognosis of this complaint is indicated, and may be summarized thus—first stage, good result, second stage doubtful, third stage hopeless, and fit for exsection. Referring to the treatment of the second stage he says, that—

“To decide what is the best treatment that can be adopted requires the greatest skill and judgment on the part of the surgeon.”

That some knack, genius, or long experience is necessary to treat this, or any other stage, is ridiculous. In reality nothing more is required than consistent principles, and the exercise of common sense\* in applying those principles to practice.

In lecture xxi, treatment—we find that mechanical apparatus, for hip-joint disease and their application, are considered. Treatment is divided into local, and general, whilst tonics, with oil and stimulants, are prescribed, and excellent hygienic rules are insisted upon, together with sea bathing in warm weather. With this latter remedy, is the steel splint taken off?

At page 250 he gives his readers another of his theories of treatment. I say another, for it may be noticed that Dr. Sayre's theory varies according to the locality of the disease, the principles he

\* The late Prof. R. Knox the anatomist when instructing his class, always (jocularly) included this among the special senses, but also remarked that it was this one that was frequently absent in many persons.

advises in treating one joint he sets aside when treating another, nay, he even varies his theory whilst treating the same articulation.

In this case, then, I have accomplished what? By my excavation I have removed the essential morbid cause; by the splint I prevent motion, which would be a cause of a relapse." Page 167. Ankle.

"So long as there is active inflammation in a joint, motion is injurious, and rest absolutely necessary." Page 169. Ankle.

"In all these cases, no matter in how favorable condition the joint may be when the instrument is removed, it is necessary for a time to apply some kind of apparatus to protect the joint against accidents, such as falls, trippings, etc., and also to prevent too free motion of the joint." Page 209. Knee.

"Again, firm support may be given to the limb, and at the same time motion of the joint allowed within the limits of safety, by the use of the instrument which I now show you, made by Mr. Darrach, of Orange, New Jersey." Page 209. Knee.

"Motion is much more painful than rest, even when rest is accompanied by pressure produced by muscular contraction. Hence the patient, naturally choosing the least of two evils." Page 246. Hip.

"The local treatment which has grown into favor during the past few years, but which I have advocated earnestly for the past twenty five years, depends upon the necessity of giving absolute rest and freedom from pressure of the parts involved in the disease, without materially interfering with the mobility of the joint." Page 259. Hip.

"Bonnet's method—fixation without extension—for local treatment has been the plan abroad. In this country, however, fixation with extension has been chiefly employed, and to afford an apparatus that would meet these indications, leathern splints, gypsum and starch bandages, and strong wire gauze, moulded to fit the limb, have all been employed with more or less benefit, but all these plans prevented mobility." Page 259. Hip.

“There are many cases in which the inflammation is so violent, and the pain upon the slightest movement so intense, that absolute rest is requisite for a time, and in such cases the fixed dressing alluded to answers a most excellent purpose. Under these circumstances I employ most commonly the cuirass with extension. (See Fig. 190) But motion is as essential in retaining a healthy condition of the structure about a joint as light is essential in retaining a healthy condition of the eye; for the ligaments around a joint will become fibro-cartilaginous, or even osseous, if motion is denied them, particularly if a chronic inflammation is going on within the joint with which they are connected. It was in consequence of such accidents occurring in several instances that I was led to contrive some plan by which extension could be maintained that would remove pressure from the acetabulum and the head of the femur, and at the same time permit motion of the joint, thereby retaining the capsular ligaments in a healthy condition.” Page 260. Hip.

“It was designed that the motions of the joints should be free, and no harm will attend this freedom of motion, unless the joint itself becomes the seat of disease; but on the contrary, restraint will give rise to more or less ankylosis and deformity.” Page 270. Hip.

“If left to itself, the rest which is so essential to the joint is procured by the firm muscular contraction which prevents motion, and this is so perfect, in many instances, as to assume the appearance of genuine bony ankylosis.” Page 274. Hip.

“If employed at all, they must be frequently removed, and passive motion employed, else ankylosis, more or less complete, will take place, and the last state of the patient may be worse than the first.” Page 274. Hip.

“The patient should then be secured in some apparatus—the wire cuirass (Fig. 169) is most convenient—which will prevent the possibility of motion.” Page 277. Hip.

“This plan is to be pursued until the more acute symptoms have subsided; but as it is a disease chronic in its nature, long confinement in a bed is injurious to the general health, and we must, therefore, contrive some mechanical appliance which will give extension and counter-extension, at the same time admitting motion of the joint while it permits the patient to take exercise in the open air.” Page 13. American Lectures.

"In some cases, where the disease is very acute and the children very small, this is best effected by placing them in a wire cuirass; a modification of Bonnet's grand appareil will be found very useful. When this instrument is employed, it is necessary that the child should be taken from it very frequently, and have all the joints carefully moved, otherwise too long continued rest of the joints may end in ankylosis." Page 14. American Lectures."

"Perfect rest, long continued, even of the diseased joint, is decidedly injurious, as there is danger of it resulting in ankylosis." Page 14. American Lectures."

From quotations such as these the reader has to evolve a theory of treatment, for the author appears to have no method beyond a "rule of thumb"; and "the greatest possible skill and judgment" on the part of the surgeon are required, if he depends on these contradictory principles to guide him.

Again what can be the meaning of the quotation at page 260, Hip? How can the comparison between an inflamed joint, "and a healthy eye," illustrate the matter? There is no similarity of function or state. It reminds me of the stupid remarks that ignorant and senseless people frequently make to their medical attendant. When the patient is prevented by disease from leaving bed, they say, "he cannot possibly get well if you keep him thus in bed," not considering that rising from bed means convalescence.

Further, what is meant by the following?

"It (the appliance) was designed that the motions of the joints should be free, and no harm should attend this freedom of motion unless the joint itself becomes the seat of disease."

Are the machines used where no joint inflammation exists, and if so, for what purpose ?

At pages 262-3, the Sayre hip-apparatus and its mode of application are given, and the inventor mentions that other means must be used during the night, such as the weight and pulley ; this latter he designates "bed-extension." At page 268, the information is given that the appliance cannot support the weight of the body, and crutches are advised as accessories. Until I had read this page I understood that its designer taught that his splint prevented intra-articular pressure, but if it cannot sustain the trunk weight, it certainly cannot relieve intra-articular pressure.

From the last and following paragraphs of page 269, it is apparent that Dr. Sayre, like Dr. Taylor, has not found the value of the simple but very important artifice in the mechanical treatment of this affection, viz :—locking the knee-joint ; which alone, I suspect, would, in the treatment of very early inflammation of the hip-joint, give results quite equal to those obtained by the use of their own very expensive and illusive machines. The treatment is continued in lecture xxii ; and at page 273, the non-mechanical details are discussed, which consist of change of air, leeches, ice, mild mercurial internally and externally, "energetic antiphlogistic," and pressure by strapping. In my opinion Dr. Sayre's

mechanical treatment is a puzzle, the surgeon being introduced to so many appliances, all for the hip-joint, each of which is very complicated as well as very expensive.

The first stage, he says, can be treated by the Sayre or Taylor appliance, but when

“There is a great deal of tenderness around the joint, and other evidences of inflammatory action are present.” \*

Then he advises weight and pulley, but

“If the patient is uneasy, restless, irritative, and does not bear the extension apparatus well,”

it is advised to place him in a wire cuirass, or other fixed apparatus. Much as Dr. Sayre has advocated the extension treatment, more emphatic testimony than he gives here to the superiority of posterior fixation, could not possibly be borne.

The above amounts to this—That if the patient cannot tolerate the irritation of extension, then give him plenty of fixation and ease his pangs.

The second stage is also advised to be treated by extension to reduce deformity, then the hip appliance, and the “wire cuirass.” Hyper-distension of the joint, by accumulated fluid, is to be aspirated, or removed by canula. In the performance of this operation, we are instructed in the details of a

\* Is there no inflammatory action in the commencement of this lesion? I should say yes.

method more injurious to the patient than the tension of the accumulated fluid ; in fact a repetition two or three times of the procedure here counselled would in most cases necessitate exsection of the articulation. Those accustomed to posterior fixation and to the use of the aspirator, know that the latter instrument can be employed with perfect safety, and with such little pain to the patient that anæsthetics are rightly deemed unnecessary,

At page 278, when discussing the treatment of the third stage, the author informs us—

“I only suggest that Nature should be assisted by mechanical appliances in her efforts to bring about this spontaneous cure.”

“It is from Nature’s method, however, that we are to deduce the principles that are to govern us in the treatment of these cases.”

What is the method of Nature ? She attempts to arrest motion, both by muscular action and by the deposit of plastic matter around the joint. How can the Davis method of encouraging motion be termed assisting Nature’s efforts ? For as soon as art slips in with an efficient method of fixation, which includes arrest of motion and pressure, Nature takes away her rude mechanics, without showing any signs of being offended !

At page 208, the description and discussion of the mechanical treatment of hip-joint inflammation

terminates, and it is obvious that Dr. Sayre has recourse to several machines, appearing to have least faith in his own invention. Then the Taylor splint, or if the case does not progress well; the weight and pulley are tried by him, and should these means fail to give satisfaction, the "wire cuirass" a method of posterior fixation, is, as a forlorn hope, pressed into the service.

And, although the "wire cuirass" is such a trustworthy remedy, Dr. Sayre frequently warns his readers of the dangers attending it, which dangers, I hold, are purely imaginary and originate from a theory of treatment which is other than correct. Dr. Sayre, I learn from his lectures, resorts to the "cuirass" in severe cases only; but had he employed it in the early stages of the affection, the grave apprehensions which afterwards impel him to the "cuirass," would in all probability have been spared him.

The accompanying cases given as illustrative of his treatment of hip-joint inflammation, are cases wherein Nature had struggled on to the third stage, when Dr. Sayre interfered and corrected the known deformities that accompany her method. They do not illustrate the correctness of any principle; and he closes his lecture by informing us at the same time the operation of exsection may be unnecessary—



“Surgeons will know sufficient concerning hip-joint disease and its treatment to render the operation entirely unnecessary, for a thorough knowledge of its pathology, etiology, and very earliest symptoms, will lead them to such an early recognition of the disease as will enable them to treat it in a manner that will obviate the necessity of exsection.”

Evidently Dr. Sayre has but little hope of the future successful treatment of cases that have been treated by his method in so-called second stage.

Lecture xxiii is devoted to the history and description, with illustrative cases, of exsection of the hip-joint. This operation, as I have previously asserted, is one of which I have not and hope will never have much personal clinical experience; consequently my opinion of its dangers, success, &c., cannot be of value. I have witnessed several of these operations in various joints, and seen many patients some years after they had been operated upon, and from observation I am convinced that those cases of joint inflammation which did well after exsection, would have done better had they been treated by a correct method. I also believe that some cases are met with, which a correct method may benefit but cannot save: in such cases exsection is in vain. I have seen cases in which the patient having no store of vitality, the disease commenced with inflammation of ankle-joint, then hip-inflammation; and after the accession of brain, kidney, or lung disease, the sufferer succumbed: as the Turks would say “his time had come.” Correct

treatment is no warrant that the sufferer must recover, but granted that the subject when he consults the surgeon, has a fair amount of stamina, then, if treated by a correct method, he must recover, and does so with the aid of art. But if treated by a method based upon erroneous principles, he recovers, which many do and "excellently well," then his recovery was despite the surgeon's interference. This all experienced practitioners well know may occur. Sydenham wrote as an experienced observer when he asked the question—

What is the particular importance in just telling us that once, twice, or even oftener, this disease has yielded to that remedy.?"

A cure does not always commend the reputed means.

While admitting Dr. Sayre's undoubted skill in the department of hip-joint exsection, it is not possible as yet for him or any other surgeon to give exsection its real value until a correct theory has become more general among surgeons, as the treatment both here and on the Continent is some times some aid, at other times an obstacle to resolution.

Even among those who have hitherto sanctioned and frequently performed hip-joint exsection, dissenters have presented themselves. Not to mention others, Mr. Timothy Homes, of London,

has given us his views in the *Lancet*, Nov. 3rd., 1877. His lecture is a very interesting addition to the recorded opinions on this subject, and Dr. Sayre's special teaching is therein ably and fully discussed.

In lecture xxvii, the author commences to illustrate his views regarding the etiology and treatment of ankylosis. A perusal of his volume shows us that this is a casualty, the advent of which he specially dreads, and this special lecture equally shows that when he meets the difficulty he has abundant courage to grapple with it. In fact his deficiency in the knowledge of his subject, is almost compensated for by his untiring zeal in correcting. In this lecture we find no information which is not contained in the treatise by Dr. Little, and also in the works of other surgeons both past and contemporary.

There are cases reported, from which Dr. Sayre deduces special information, but as they have been called in question by so able a clinical observer as Dr. Bauer\* this is in my opinion, a very strong argument for me to withhold my comments.

What is meant by ankylosis? Generally that an articulation has been in an unhealthy condition and

\* In the *Saint Louis Clinical Record*, May, 1877, Dr. Bauer gives a very able resume of the history of operation for relief of true ankylosis and other matters pertaining to this difficulty.

has recovered with permanent or temporary stiffness. Now, all writers, myself excepted, teach that this is the result of rest, and that the more rest, the more certain ankylosis, and they so tone their teaching as to impress the student that recovery with ankylosis is in some way blame-worthy.

But it should be remembered, that patients suffering from other diseases, such for instance as smallpox, scarlatina, and diphtheria, recover from the disease, though they ever afterwards bear upon their persons traces of the malady which afflicted them. Yet no sane person ever thinks of blaming the medical attendant for the pits and scars which his patient presents. Nor should it be otherwise with cases of joint-inflammation. Recovery with ankylosis will ever and anon occur, but it should be the Surgeon's aim to diminish the chance of ankylosis remaining, when the inflammation in the joint has undergone resolution.

Now, it is my opinion that permanent stiffness too often accompanies cases otherwise cured, because of the absence of a correct theory of treatment, and of the failure to recognise the varieties of ankylosis.

To succeed in the surgery of joint-inflammation, I believe it imperative to recognise at least four varieties of ankylosis.

First—True ankylosis: Bony union of the

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bones comprising the joint, the result of a high or erosive degree of inflammation. It may result with or without efficient treatment.

Second—Fibrous ankylosis: A deposit in, and around, the joint capsule, of much plastic organizable material, the result of a high degree of inflammation. It may occur with or without efficient aid.

Third—Latent ankylosis: That is, a condition maintained by a fractional degree of inflammation, not to be detected by any digital or manipulative test, but by use simply, and this condition may result either from ill treatment, or from the want of sufficient prolonged treatment by a correct method.

Fourth—Simple stiffness: A condition remaining for a time only, after genuine resolution, which will pass away quickly or tediously; its progress being stimulated by the will alone.

The first form of ankylosis is usually permanent, and lest any attack of inflammation should terminate in this condition, that position, allowing of the utmost possible use to the joint in future, must be secured at the onset of the treatment. Once consolidated however, the joint is not very liable to have periodical remissions of tenderness.

The second form may become permanent even when genuine resolution of the articulation has

been attained, and is liable (though rarely once it has become sound), to recurrent inflammatory action, such as may not incapacitate the sufferer from attending to his duty; but at this point if aid from art is not secured, a limb that has been cured in a correct position, is very apt to vary from that position.\*

The third form of ankylosis is that which most puzzles the surgeon, who, on examining the affected joint, detects nothing but stiffness, and therefore orders his patient to exercise the articulation. This the patient cannot do. A consultation follows, the patient is put under the influence of ether, passive motion is employed, twists and turns are performed, but in vain; for the patient is unable to make any use of his joint, as his adviser would wish. It would indeed be as reasonable to attempt to cure a fever patient by kicking him out of bed, as to benefit joint disease by wriggling at the articulation, in fact neither the one method nor the other will succeed, until convalescence is well established.

This form of stiffness can always be demonstrated by my method of testing the advent of resolution. At page 211 of Dr. Sayre's volume, the

\* I have not included in this class of ankylosis contraction of muscles, as this may or may not exist with joint stiffness, for cases occur when, after division of tendon or tendons, perfect radius of normal action is at once secured for the joints.

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author refers to this condition, and is at a loss how to explain it.

“There are some cases in which the disease progresses reasonably well until passive movements are resorted to, and then there is at once an almost constant tendency to new inflammatory action, in consequence of such movements, however carefully they may be made.”

Such cases do require to be managed with the greatest caution, if this the third form of ankylosis is unknown to the practitioner; but once recognised, it is not without promise in regard to final results concerning motion. It is the attendant's want of knowledge as to the exact state of the articulation, that obviates a successful issue. I find that Mr. H. Marsh, has noticed what I call the latent form of ankylosis, but has not attributed to it any clinical value, nor has he recognised the lesson which I hold it teaches us. At page 98, British Medical Journal, vol. 11, for 1877, Mr. Marsh says—

“This use of weight at night is a matter of great importance. If it be neglected, you will find in many cases that although all active disease has ceased, the limb will, in the course of a few months, become flexed upon the trunk, so that the child walks more and more upon his toe, and with more and more lordosis.

The fourth form of ankylosis is that condition of joint stiffness in which Bathers, Rubbers, Shampoers, Movement curers, Muscle Thumpers,

Huttonists, Hoodists, and Galvanists, acquire and maintain a reputation for knowledge and curative skill. When a case of this class is transferred to one of these special practitioners, time, and some deceptive ceremony, complete the case, which the surgeon has previously brought to genuine resolution, yet not to perfect use. When the surgeon learns the result, even he too frequently from an imperfect knowledge of the signs of resolution, at once concludes, that here is something "not dreamt of in our philosophy." For example, at page 303 of Dr. Bauer's second edition, is given a case of joint disease successfully treated by the author, yet from his non-recognition of the fourth form of ankylosis, a female quack with neither knowledge, nor skill, secures the credit due to Dr. Bauer; because, if the joint had not been already made genuinely sound by Dr. Bauer, motion could not have been restored by any amount of scrubbing &c., even if all the Huttons and Hoods, et id genus omne, since the days of Adam, had been engaged in the case.

Some of my readers may reasonably ask:—

Will no amount of rest stiffen a joint where there has been none, or only a slight degree, of inflammation? For all practical purposes, I say certainly not. No surgeon need fear to err from over caution. W. J. Little, M. D., the founder of



this department of surgery in England, at page 31, in his volume on ankylosis, gives (though in his published views he dissents from myself) most important evidence corroborating it.

“We are credibly informed, that in India religious devotees, after twenty years’ duration of voluntary contortion of the limbs, are restored to symmetry and activity by the energetic manipulations of the native medical practitioners. It appears not improbable, that a greater natural looseness of the articulations in the inhabitants of warm climates, and some influence exercised by an elevated temperature, in relaxing the contracted tissues, may favour this result of oriental skill and perseverance ; but the practitioner who would expect similar good fortune in our climate would be disappointed.”

Here we are informed that after “twenty years duration of voluntary contortion of the limbs” motion is restored by treatment and favourable conditions of climate. But Dr. Little, ignores the very evident factors which render the restoration of motion possible, viz : first—A joint which though stiff is perfectly sound, and second—a change of ideas on the part of the patient who has become willing to exercise his joint and tries his utmost to do so. The joint being sound, his endeavours are successful and motion is restored—This is the explanation of the result, not manipulation, unctions or warm climates.

Dr. Sayre’s work is entitled “Orthopedic Surgery and Diseases of the Joints,” yet it is confined ex-

clusively to the joints of the lower extremity, with their treatment by the Davis mechanical method, together with additional novelties taught by Dr. Bauer. Indeed the book reads like an elaborated copy of Bauer's second edition. I fail to note in the treatment of the inflamed articulations any originality that can be traced to Dr. Sayre. Even the Sayre splint Dr. Taylor lays claim to. Neither have I noticed any new truths in the work, in fact nothing but the reiteration of the ancient doctrine, dread of prolonged rest, with appliances so constructed as to enable the surgeon to carry this doctrine into practice.

The fact of their being adapted to the requirements of this ancient and well known doctrine, accounts for the popularity of Sayre's splints. Although the recorded teaching of a professor of surgery Dr. Sayre's book contains more contradictions, and errors, than any treatise yet published on this subject. Dr. Sayre has christened his method the "American method:" it has been extensively used in this country and, from personal experience I can confidently assert its utter failure.

It has been said by our transatlantic friends that their method has not been well tried by us. The profession can judge for themselves, by consulting Mr. Howard Marsh's interesting paper, published in the British Medical Journal, page 20, 1877.

We appear from his evidence to have carried out the details of the extension method with more care than even its originators; this can be seen by reference to the illustration, in the *British Medical Journal*, fig. 10, page 98. Extension is so applied that it almost reminds me of the "Charge of the Light Brigade" Extension to right, above, below; splint to the right and left and, a hard mattress underneath; in fact the patient like a warrior of old is encased in mechanism, all of which is in my opinion ridiculous. Mr Marsh reports well of this extension for reducing deformity—but we know that the patient need only remain in a supine position with the knee stiffened, when reduction must take place, even if no appliance is worn.

Concerning the supposed merits of the Davis, Taylor and Sayre form of Portative splint, Mr. Marsh shews so conclusively its defects, that I have reproduced that portion of his lecture; at page 99 he says—

"The time at my disposal does not allow me to do more than thus very briefly to describe the principle of these instruments and the method of their construction; and in so short a notice it is not possible to do them justice. But you may find a full account of them in Professor's Sayre's recently published *Lectures on Orthopædic Surgery*, (Churchill, London), or in Dr. Taylor's essay on the treatment of Disease of the Hip-Joint, (New York). The object at which they aim is undoubtedly most important, and they are constructed with great mechanical skill; yet I confess I have found it extremely difficult to obtain satisfactory results by their use. I

suppose the greatest amount to which the surface of the head of the femur can be separated from that of the acetabulum cannot be more than about the tenth of an inch. And it is very difficult to preserve efficient extension and counter-extension within this range ; for the parts cannot be acted upon as if they were parallel metal plates to be adjusted by a screw ; they must be controlled through the agency of perineal bands and strapping fixed upon the skin, and all these are apt to give when they are subjected to constant traction ; and, if they yield, though it be but slightly, they soon, in the aggregate, lose this tenth of an inch of extension which they should maintain, and then the articular surfaces come again into firm contact. Besides, I may refer to what has seemed another difficulty. Both Dr. Sayre and Dr. Taylor allow to move the thigh upon the trunk by bringing it towards flexion, and it has always appeared to me that, if the perineal band be adjusted, according to their direction, when the limb is extended, it will become loose when the limb is flexed. However, I have not had the good fortune to see Dr. Taylor carry out his treatment (though I once saw Professor Sayre apply his splint to a patient in the hospital) ; but the results published both by him and Professor Sayre are very striking, and are such as all may envy. Still, I cannot help thinking that, with either instrument, extension and counter-extension can only be maintained by such an amount of incessant watching as cannot be secured in the usual course of practice ; for, so far as I have observed, the perineal band requires readjustment—when the child is up and about—several times in an hour, and it always grows loose in the course of the night. Again, perineal bands must always be very troublesome appliances in young children, especially in girls.”

Mr. Marsh is of opinion that the results published by Drs. Taylor and Sayre “are very striking and such as all may envy.” For many years I was a witness of the treatment of joint disease, by methods sometimes purely expectant, at other times consisting of fractional fixation, and the results in some instances were certainly so striking as to excite my envy. But these very cases I now know would have recovered, some

with no attention, and others with but imperfect rest. For one result that excited my admiration, ten failed; deformity or death terminating the history. Isolated instances of excellent recovery by any method, teach us nothing, what is wanted is a method benefiting all. If the past writers and lecturers on this subject are consulted, do they not tell us that Dr. A. cured many cases by mercury, B by cauter, C by leeches, D by repeated blisters, E by plasters, F by baths, &c. ? Many practitioners had a wonderful run of apparent successes—but it was gained by a process of “natural selection”. Dr. A. for instance favoured by circumstances is consulted by a hundred sufferers, and ten of these, even with inefficient treatment get well, the ninety receive no benefit, and the diseases of these non-successful cases being charitably attributed to a faulty constitution, are regarded by all as hopeless, and become neglected. Dr A. now having gained a reputation for skill is consulted by patients from distant parts, who, of course, suffer from but a slight degree of inflammation and therefore do well. Extreme cases could not be transported, owing to the want of efficient fixation to ease their pains, during the journey.

Mr. W. Adams, of London, has become a convert to the treatment of hip-joint disease by extension with or without motion. He delivered an

address on this subject to the Manchester meeting of the British Medical Association, which is published in their Journal, Jan. 5th, 1878.

“On the treatment of hip-joint disease by extension with motion, as practised by the American Surgeons, instead of long continued rest and immobility.”

This (extension with motion) Mr. Adams refers to in the first paragraph as—

“The recent advances which have been made in the treatment of hip joint disease by the American Surgeons.”

“The first principle is that of extension, as a means of relieving the most acute pain in joint-diseases, especially applicable to the knee and hip-joints.

The second principle, is that of extension combined with motion during the progress of disease, the patient being allowed to walk about, so as to promote recovery with free motion in the joint, instead of the ordinary result of ankylosis obtained by long-continued rest and immobility.

There can be no doubt that the discovery and practicable application of these two principles have completely revolutionised the treatment of joint diseases, and changed our opinion with regard to the pathological condition, existing, especially as to the production of acute pain which, formerly was believed to depend upon acute inflammation, requiring active local, as well as general antiphlogistic treatment, such as leeches, blisters, calomel and opium, etc. It has now been proved to depend upon undue articular pressure and contact of inflamed surfaces, produced by reflex muscular contraction, and capable of relief by mechanical means alone, producing extension, whether this be applied by means of the weight and pulley, or by the screw and cogwheel.

The object of extension is not, as generally supposed, to separate articular surfaces, but to overcome reflex muscular contraction, and, by relaxing the muscular rigidity, to prevent undue pressure of inflamed articular surfaces or their margins, when the joint is held in a flexed position by muscular contraction.”

From these quotations it is evident that Mr. Adams has "thrown overboard" the "rest and immobility" of our predecessors. Indeed surgeons from want of confidence in, and means to attain, rest and immobility, have utterly failed to perceive their value. Notwithstanding this, I hold that our forefathers were on the right path to a correct treatment of diseased articulations, and that this so-called "American method" is a stray path.

Paragraphs 6, 7, 8, 9, and 10, are devoted to a short history of the extension method, and in paragraphs 11, 12, and 13, we are told that—

"The English idea has always been rest and immobility to the joint. The American idea, during the last ten years, has been extension with motion, *i.e.*, preserving motion in the joint whilst the pain is relieved by extension.

In the treatment according to the English system, immobility of the joint is obtained by various instruments and splints; from that piece of surgical antiquity, the long straight splint, reaching from the axilla to the foot, necessitating the confinement of the patient in the horizontal position for many months, and many other contrivances, such as metal and leather splints to the joint, which permit the patient to move about on crutches, to the now fashionable Thomas's splint, invented by Mr. Thomas of Liverpool, and described in his recently published work.

All these means succeed, more or less, in relieving pain and promoting recovery, although ankylosis is frequently produced, and this has generally been regarded as the most desirable termination; but in many cases they all fail in relieving pain, for want of the American extension principle, and also they do not prevent the occurrence of dislocation or partial dislocation the effect of which is to produce shortening of the limb with permanent lameness."

There appears one special topic about which the American surgeons are unanimous ; it is, that to one of their countrymen is due the credit of having introduced to our profession the uninterrupted method of extension. Among them I notice with astonishment that Professor Hamilton, who should be well informed in the history of extension, wrote to the Philadelphia Times, Nov. 24th, 1877, ascribing the invention to an United States surgeon. The credit of the invention is due to the late J. H. James, of Exeter, who described the details far more completely than did Messrs. Josse, Crosby, Buck, Davis, or any of his followers. \* At the time that Mr. James published details of his treatment of fractures of the thigh by continuous extension, so great an authority, as the late Professor Syme, asserted that Hildanus had also practised the method ; this however is not the fact. Those who consult John Bell's famous volume on Historical Surgery can there see figured "The Jack Stone of Hildanus." John Bell surmised that certain illustrations in Hildanus's work represented a strap and buckle, two hooks, and a rope, to which was attached, he thought, a stone. In reality, this supposed stone is only an ingenious method invented by Hildanus to cover the pulley blocks of his apparatus, which he only used for the purpose

\* See his address in surgery delivered at Liverpool, July 24th, 1839.



of reducing dislocations and fractures. His illustration certainly looks very like a stone.

There is nothing in the text to warrant John Bell's description of the "Jack stone," which indeed is but an invention of the great historian. The mistake can only be accounted for by supposing that Bell simply gazed at the illustrations and never read the explanatory text. A method of retention was well known to surgeons at a very early date, but must have been difficult to bear and far from satisfactory in its results, for at page 132, book ii, chap. viii, paragraph 8, Heister's surgery, 1745, we are informed that—

"If we had an instrument that would keep the fractured thigh properly extended, and of the same length with the sound one, for about fourteen days, or till the case was perfect, we could go on with more certainty and success."

J. H. James's method of continuous extension was original, and I do not believe that he had any suggestion from the published opinions of his predecessors.

I cannot help protesting against Mr. Adams' contemptuous reference to the long straight splint. In my opinion it has been a very simple and useful appliance for many lesions of the lower extremity, and if well applied, can do more for hip-disease than any one of the complicated American importations that have supplanted it in the practice of

many surgeons. Apropos of Mr. Adams' remark "the now somewhat fashionable Thomas' splint," it exactly expresses my opinion, as most of my splints which have been supplied to the profession are more ornamental than useful, and are practically worthless, because of the impossibility of correctly applying them.

In paragraph 14, Dr. Adams gives an isolated case illustrative of the defects of "Thomas' splint," and although Dr. Sayre confirms the opinion of Dr. Adams, it cannot but be apparent to any observant and experienced surgeon that the case in question illustrates neither the merits nor faults of any method. The case is denominated one of "slight flexion. What evidence have we that the shortening, which was apparent after reduction of flexion, did not already exist whilst the limb was in a flexed position? A state which makes the detection of luxation (unless it be extreme) most difficult.

Again we are informed that nine weeks after the application of my appliance there was "the occurrence of pain," and that this was relieved by the addition of extension. Now the explanation of this may be that the joint was on the eve of rupture—a statement warranted by the interval of ease—and whether extension had been applied or not ease must inevitably have followed. In fact,

the reported case gives some details of the natural course of hip disease, and these are erroneously attributed to peculiarities of treatment. Those who desire to apply an injurious detail of treatment viz.—extension, to my appliance, can do so by applying straps to the thigh, and connecting them to the lower cross bars, then casting off the shoulder braces.

I notice in Dr. Adams paper on extension, the fault that pervades all the writings of the extensionists; they praise it here, and warn us of its evils somewhere else.

Mr. Adams, I notice, does not confine himself to extension, but at times advocates immobility; he says—

“I advise the patient to walk about with the assistance of crutches, wearing at the same time a firm leather splint moulded to the hip, reaching from the waist to the knee, this secures rest and immobility of the joint.”

Despite this, at paragraph 17, Mr. Adams affirms rest and immobility to be factors in the production of ankylosis! In fact it is an utter impossibility to find out from the writings of the so-called extension gentlemen, what they mean by extension; sometimes it is uninterrupted, sometimes continuous (as the weight and pulley,) or again it may be a method of retention—as the Taylor and Sayre machines shew. Again Sayre's method of treating

wrist joints is a plan of retention. In hip joint disease again he advises a combination of fixation and retention, (wire cuirass). In spinal disease he advises temporary extension and permanent fixation.

“My own experience in the use of these instruments is very limited; but during my visit to America last year, I had the opportunity of seeing them applied in a large number of cases, and as it appeared to me with great advantage. In one case, that of a young lady, who was residing in Dr. Taylor's private establishment in New York, where patients are received for the treatment of various deformities, the hip-joint disease appeared to be in a more active stage, judging from the pain she suffered, than I should have thought the walking instrument could have been applicable still, when the extending force was applied pretty nearly to its full extent by Dr. Taylor, she was enabled to walk without pain, and therefore it seemed to be a test-case of the value of extension. Children with hip-joint disease in a more chronic form are frequently seen walking about the streets of New York wearing these supports, and are enabled to get in and out of the tramway-cars without difficulty.

Mr. Adams' experience of Dr. Taylor's practice derived from observation during his visit to America, strongly recalls to my memory what I observed some twenty years ago in the practice of another person, who also had a reputation for skill in the treatment of joint disease. Many cases have I observed enter the consultant's surgery, lame and in pain, who after being well fitted with several layers of stiff adhesive paper plaster, over, and around, the affected articulation, left the surgery less lame, and in less pain; sometimes without even any pain. A great number of these patients having repeated their visits from week to

week recovered, and even to this day, I frequently meet them in the streets of this town, permanently sound. This is the history of some; others indeed had a very different termination. And if we read the writings of the extensionists, it is only too evident that their experience coincides with the above. Indeed they plainly say: that some patients recover with but slight assistance such as, the Taylor and Sayre appliances; that other and more severe cases require more efficient means. If this is so I ask, why not try the very best means at first? By so doing, after regrets may be avoided, for none can predict with certainty, at the commencement of the difficulty, whether it will at once progress to resolution, or retrograde to a stage which involves a cure with defects.

There are certain qualifications that are of assistance, in enabling the surgeon to weigh the pros and cons advanced on behalf of methods, they are 1st. observation of cases not treated, 2nd. observations of those aided by slight treatment, 3rd. observation of cases treated by the supposed most efficient aid. Practitioners of any of these three varieties, can refer to cases of recovery at times, while it must be admitted, that the most correct treatment must fail in a certain sum of cases. We know that there is no disease, however trivial but has attached to it a "death register."

In the February copy of the London Medical Record, there is introduced to the notice of surgeons another eccentric theory said to be applicable to injured joints. This doctrine is embodied in the words "compression, motion, use." \*

\* Compression is a mode of practice frequently resorted to in the treatment of diseased joints under the misapprehension that pressure is a means conducive to resolution. In estimating its position in the treatment of these difficulties we must take into consideration the fact, that its practical application (like continuous extension) involves an unavoidable amount of "quiet fixation." This "quiet fixation" is the actual remedy which in mild cases may be enough to complete resolution. But pressure per se in any form (like friction) would thwart recovery. Indeed advanced cases notably will not tolerate the slight degree of pressure necessarily induced by the method of compression frequently practised in surgery. That which is meant by "compression" in the surgery of articulations is a combination of fixation (itself a remedy) which fixation is inevitable, in the application of pressure (itself an evil.) We have an example in Scott's dressing. It is my opinion, based upon experience, that compression—even when combined with efficient fixation, if used in the advanced stages of articular disease—is a hindrance to resolution. In my practice, therefore, for some years back, I have carefully avoided applying any form of fixation which involves the least pressure on the inflamed joint. The sound parts of the limb are alone used as points for securing fixation, and the unsound joint is not to be interfered with. In fact, motion, concussion, and unnecessary manipulation must be avoided. A case, which came under my notice recently, demonstrates the evil of treatment by pressure. The case is already referred to in the foot note, at 210 of this volume; the patient, an omnibus driver, consulted me suffering from slight inflammation of the knee joint, caused by the continual jar of the pedal of the omnibus break. As he could not ascend to his "box" on the omnibus with any of my appliances attached to his limb, I treated the knee by a method of slight fixation, with some benefit, but I perceived that he must abstain from his avocation, and undergo treatment by absolute fixation. I advised him to that end; but as he had no means of maintaining himself, he became the inmate of a Public Charity, when he was treated first, by simple pressure in the form of a bagful of lead "shots;" then a

The "American"—or rather I should say the Sayre—method would have us believe in the possibility of motion without friction. This last theory introduced by Dr. Pilcher, is based on the supposition that motion can occur without friction and pressure without force. It has been dubbed the "Hood method;" the name is sufficient comment when I recollect that even the "elect" have been led astray.

My own inventions for the treatment of inflamed articulations of the lower extremities, have now been used for only a short time by surgeons generally, yet most of the machines have been what I would designate modifications; modified indeed to suit what are in my own opinion incorrect theories of treatment held by these several innovators.

Plate 25, fig. 1 to 9, represents models of these innovations with their modes of application as observed in practice at a number of public institutions both metropolitan and provincial.

Fig. 1, is a hip appliance with two trunk cross bars, showing that the surgeon had some difficulty in getting the appliance to remain uninterruptedly posterior to the body. He argues that if one cross-bar is an assistance, two are doubly

continuation of pressure and fixation known as "Scott's Dressing;" and last of all, that venerated filth known as linseed poultice, with the result that the knee was soon ready for excision.

so. He is wanting however in that experience which informs one that this second bar is most irksome to wear. Fig. 2, is also a modification, introduced by one who must have been unable to fix the hip splint posterior to the trunk. He has consequently added a foot piece; thus making the most injurious modification of all I have noticed, as the splint, instead of being fitted to remain in correct position, is thus attached to the limb which it rotates inwards, causing increased articular pressure which, should the shoulder braces slacken results in traction also. Figs. 1 and 2, are indicative of ignorance in the method of fitting.

Fig. 9, is a sketch of a splint where the trunk portion of the stem is too long, and the chest band unnecessarily wide. The maker supposed it would be easier to wear, but it is not. I have seen several modifications of my appliances that are not figured on plate 25. Some had the cross bars of the thigh and leg portion made to encircle the limb, opening and closing with a hinge, a modification rarely of use as it does not admit of modelling with the wrenches. Such a modification is figured at page 129, British Medical Journal, Aug. 4th, 1877. This model is notable, as it has many defects, amongst which are—first:—incorrect shape of upper cross bars—second—two mistakes in the upper two thirds of the upright, viz:—no



rotation, and a curve instead of a straight line. Again the two lower cross bars do not admit of being moulded, and the patten figured in the sketch is useless for children, although it might do for adults, because, besides being too low, it can easily be set aside by children, who will not give the surgeon that co-operation which can be had from adults. An adult will do very well with a rise of from one to two inches where a child requires from four to six. There is another fault this modification possesses, namely, too much padding; much is an evil, none is a luxury. Iron and simple basil leather are alone most comfortable, or, one layer of flannel or felt at most, on the anterior surface only.

Fig. 8, is the concoction of some thickheaded mechanic who did not know how to fix the upper cross piece without the stays B and C.

Figs. 3, 5, 6 and 7, are diagrams of modes of application practised at four separate Public Charities, not one of the splints being so applied as to secure the utmost possible benefit from it. Fig. 7, shows a cavity in the bed to allow motion of the knee-joint lest it should ankylose! This model does not extend below the knee, a matter, combined with other defects, rendering the appliance of very little value.

There is one defect that is noticeable in nearly all the modifications in my appliances for both hip and knee. I allude to a determination to ornament them until their usefulness is much diminished. This involves expense, and it almost appears that instruments are valued not in proportion to their usefulness but in proportion to the labour and time spent upon their construction. They add screws, hinges, padding, morocco, or Russian leather additions positively detracting from their usefulness, if making them "fashionable." Again practitioners I have observed will persist in specially providing hard mattresses for hip cases and they are equally neglectful in not allowing the limb to rest on the couch on knee inflammation. Both these points are defects in treatment.

Furthermore, in the majority of cases reported and observed, with the use of my appliances, are associated Poultices, Ointments, Blisters, and Leeches, all which should be positively adverse to resolution.

*Read 3<sup>rd</sup> time. Got 9. 1875.  
Read 4<sup>th</sup> time NOV 20. 1887.*

*B.R.*

The first part of the document  
 discusses the general principles  
 of the proposed system.  
 It is intended to provide  
 a clear and concise  
 summary of the main  
 points of the report.  
 The second part of the document  
 contains a detailed  
 description of the  
 various components  
 of the system.  
 This section is  
 intended to provide  
 a comprehensive  
 overview of the  
 system's architecture  
 and its various  
 parts.

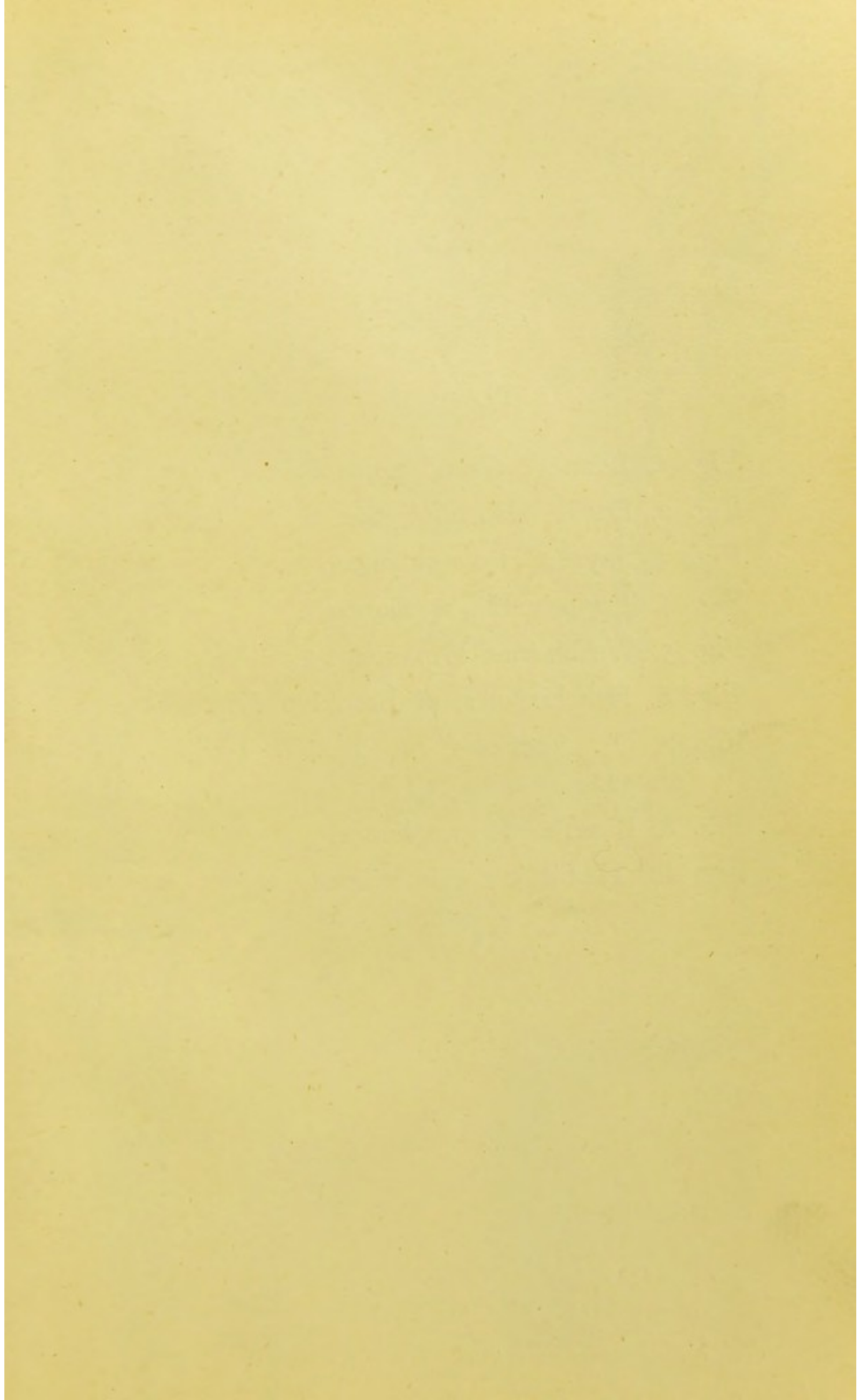
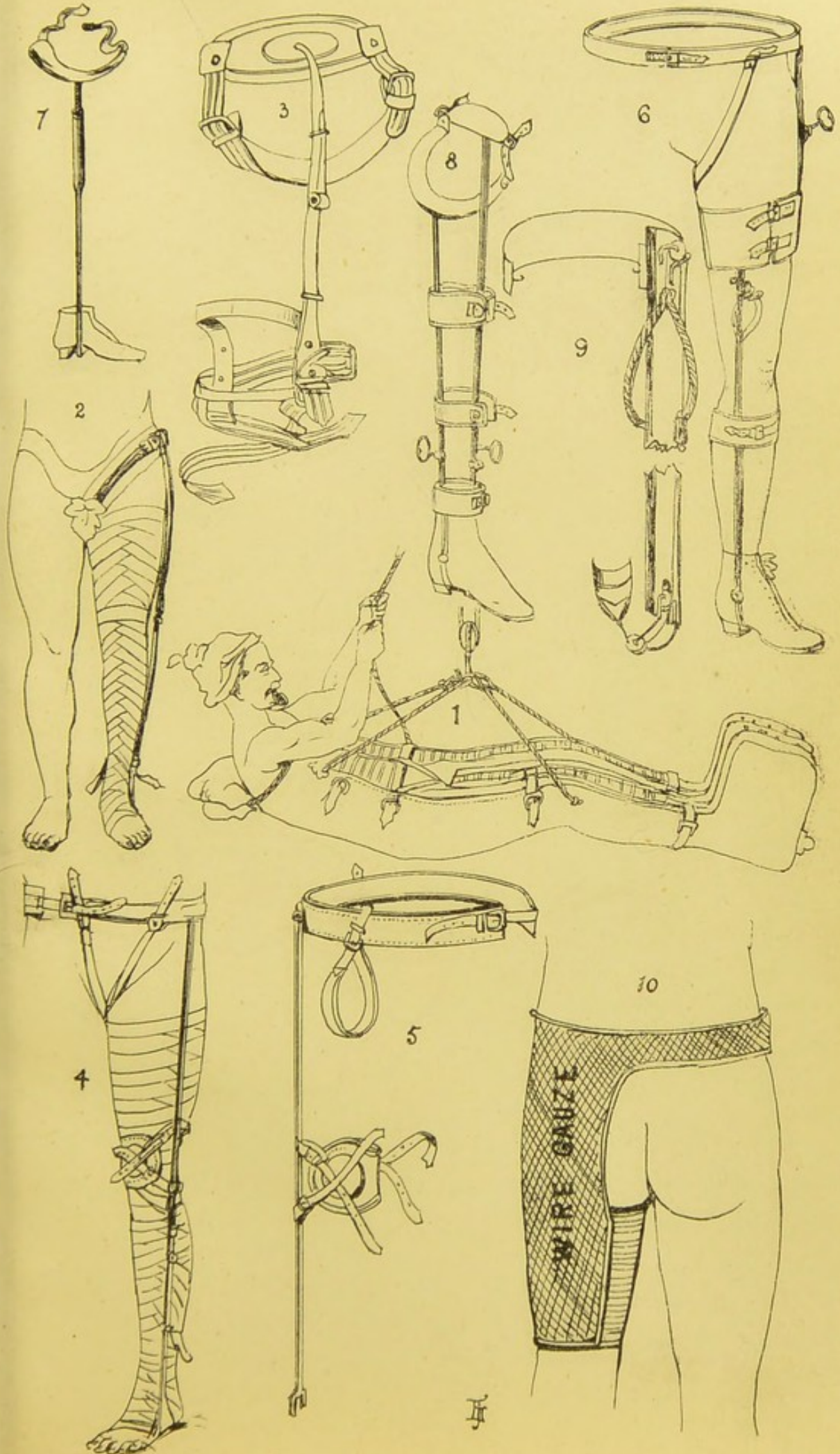
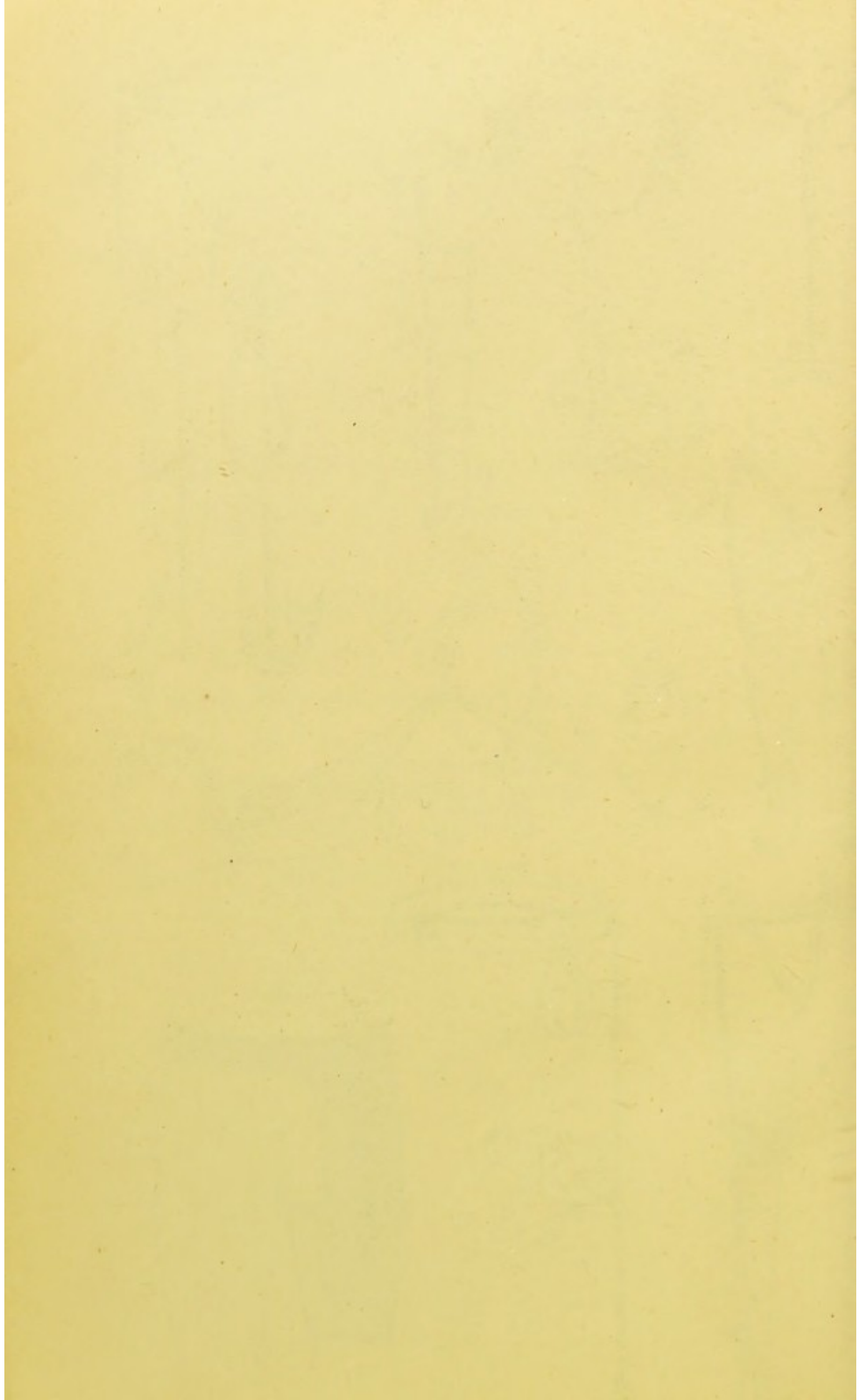


PLATE 1.

- Fig. 1, Bonnet's Grand appareil.  
Fig. 2, Davis' Hip appliance.  
Fig. 3, Sayre's Hip appliance.  
Fig. 4, Taylor's Hip appliance.  
Fig. 5, Washburn's Hip splint.  
Fig. 6, Hutchinson's, of Brooklyn, Hip splint.  
Fig. 7, Dr. Andrew's, of Chicago, Ischiatic  
crutch.  
Fig. 8, Bauer's Hip appliance.  
Fig. 10, Hamilton's Hip splint.

# PLATE 1





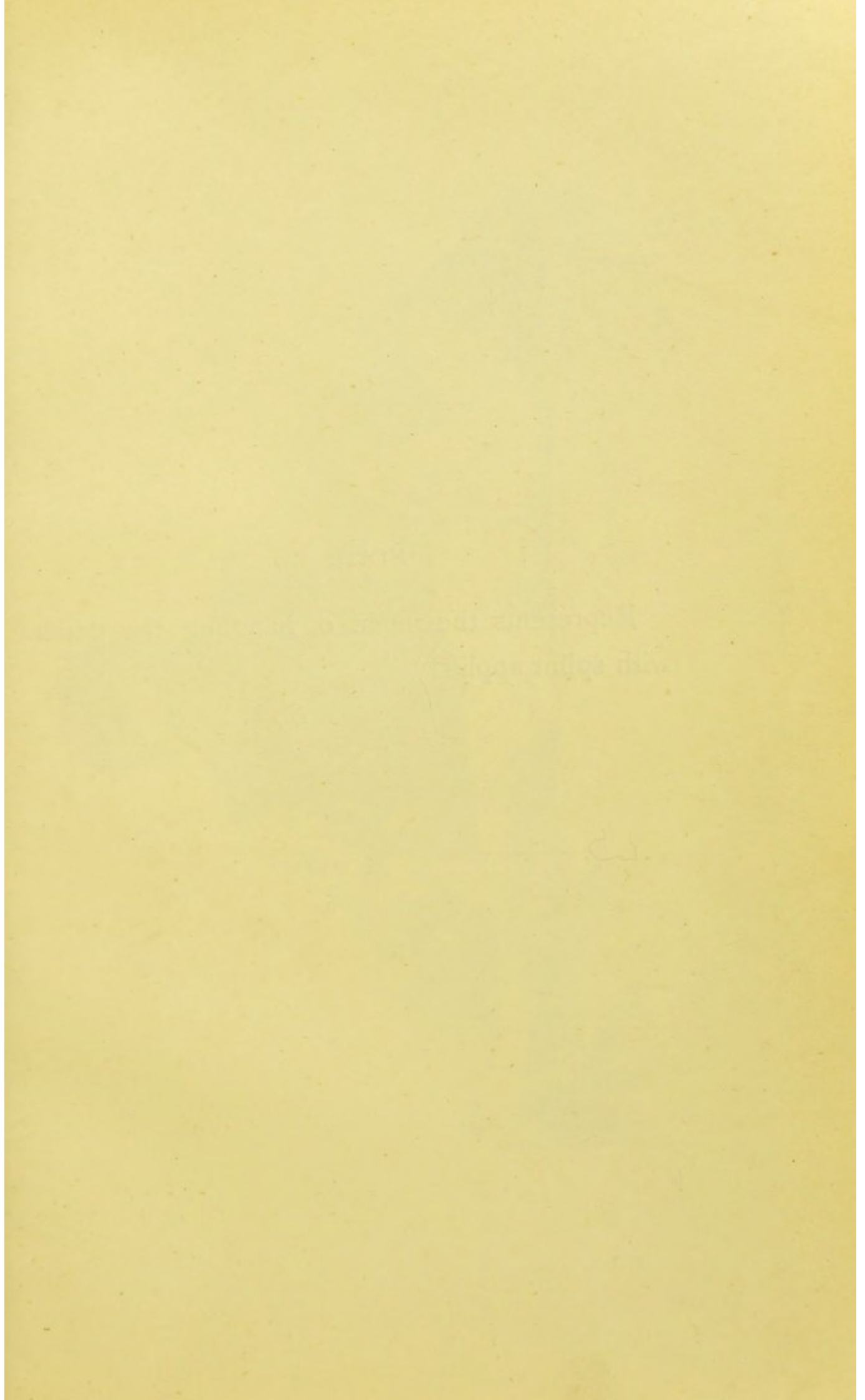
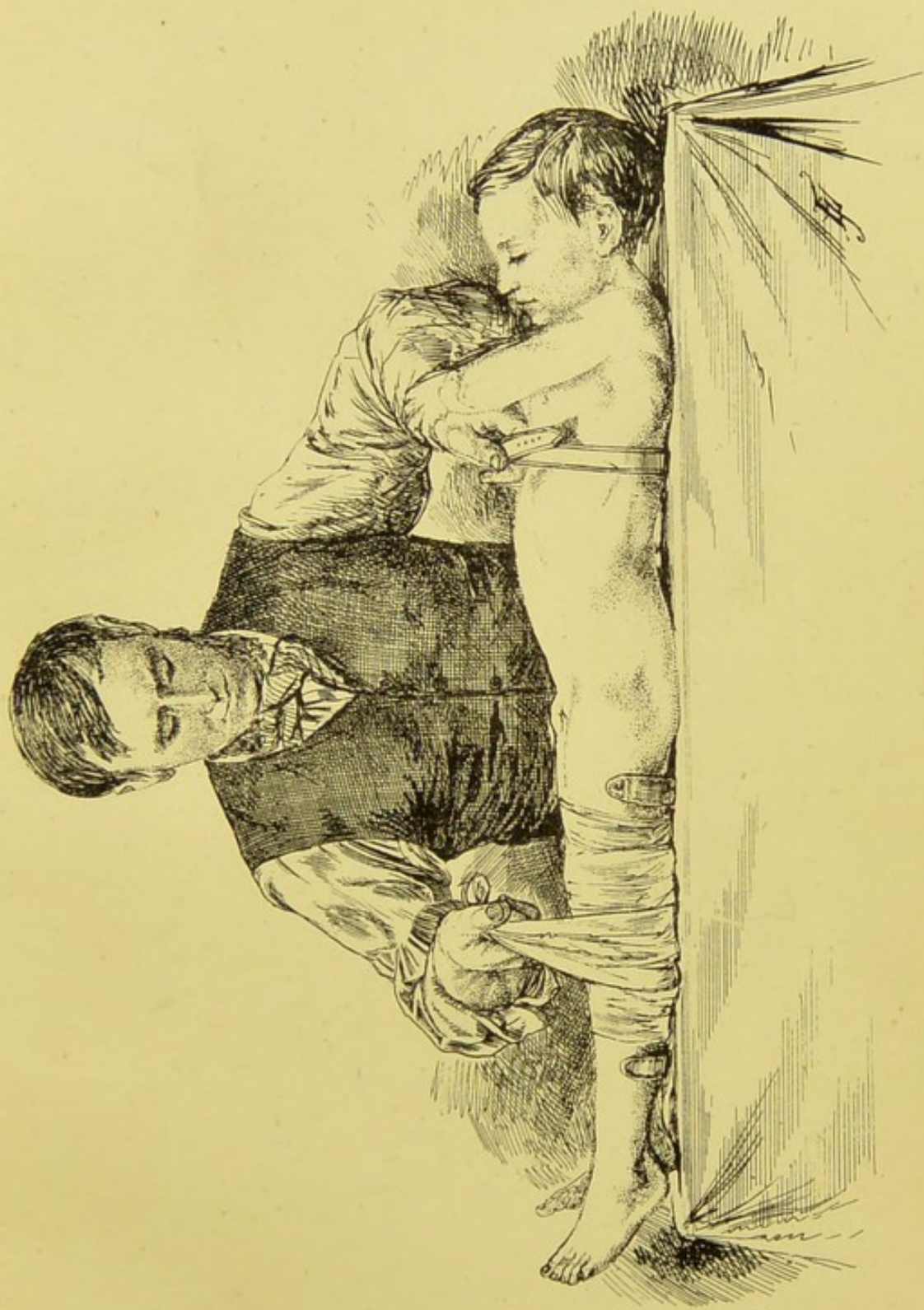
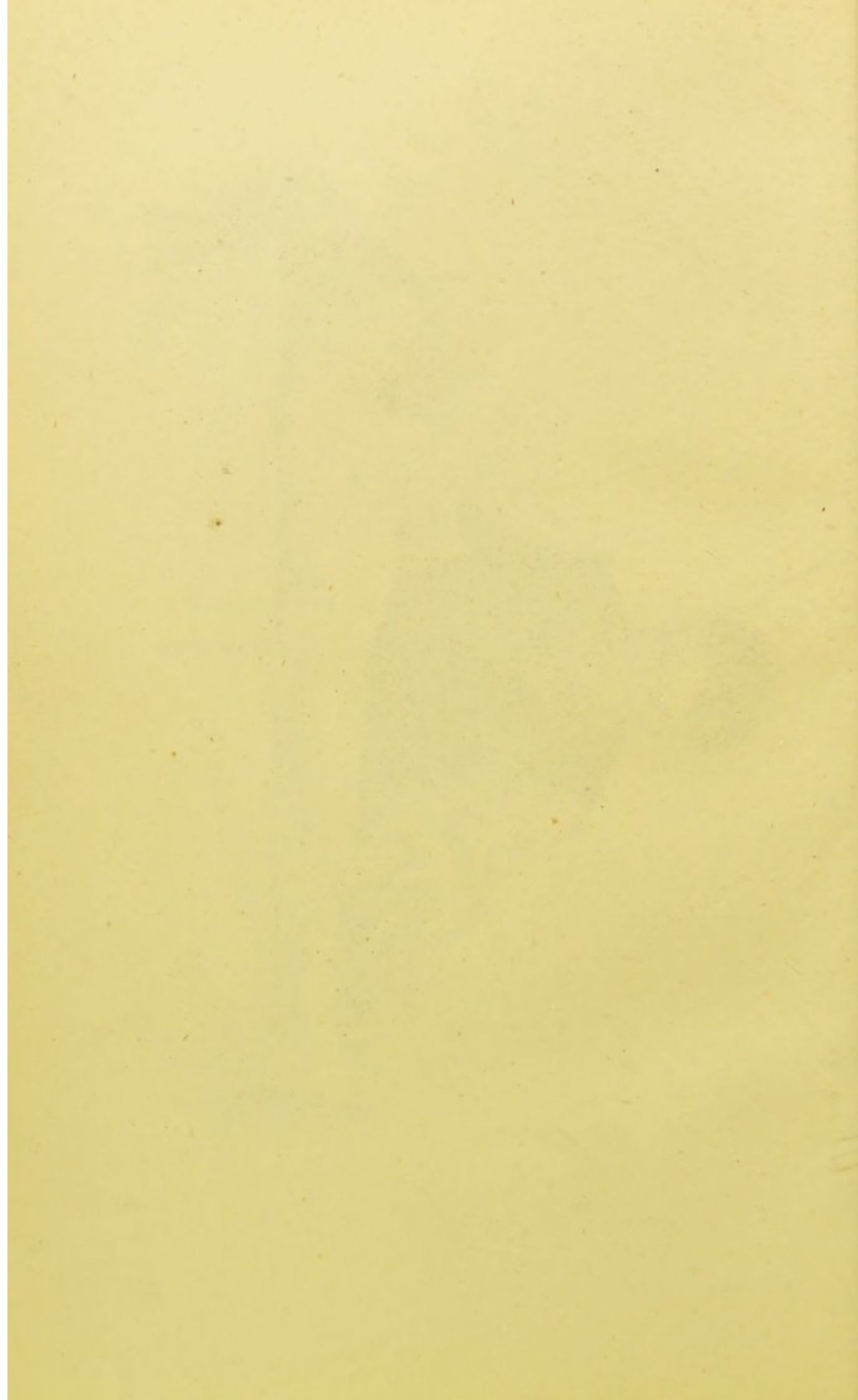




PLATE 2.

Represents the mode of handling the patient  
with splint applied





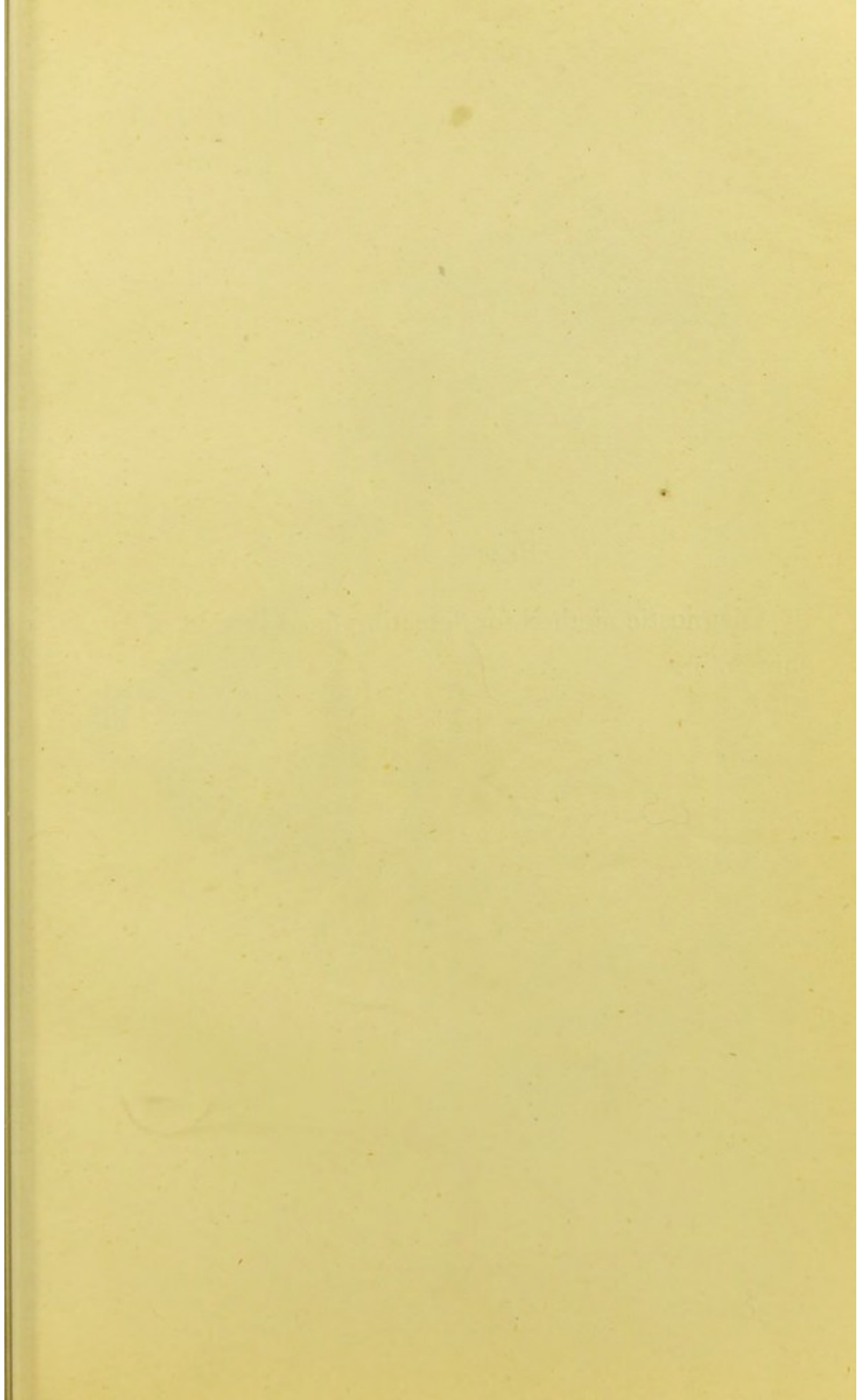
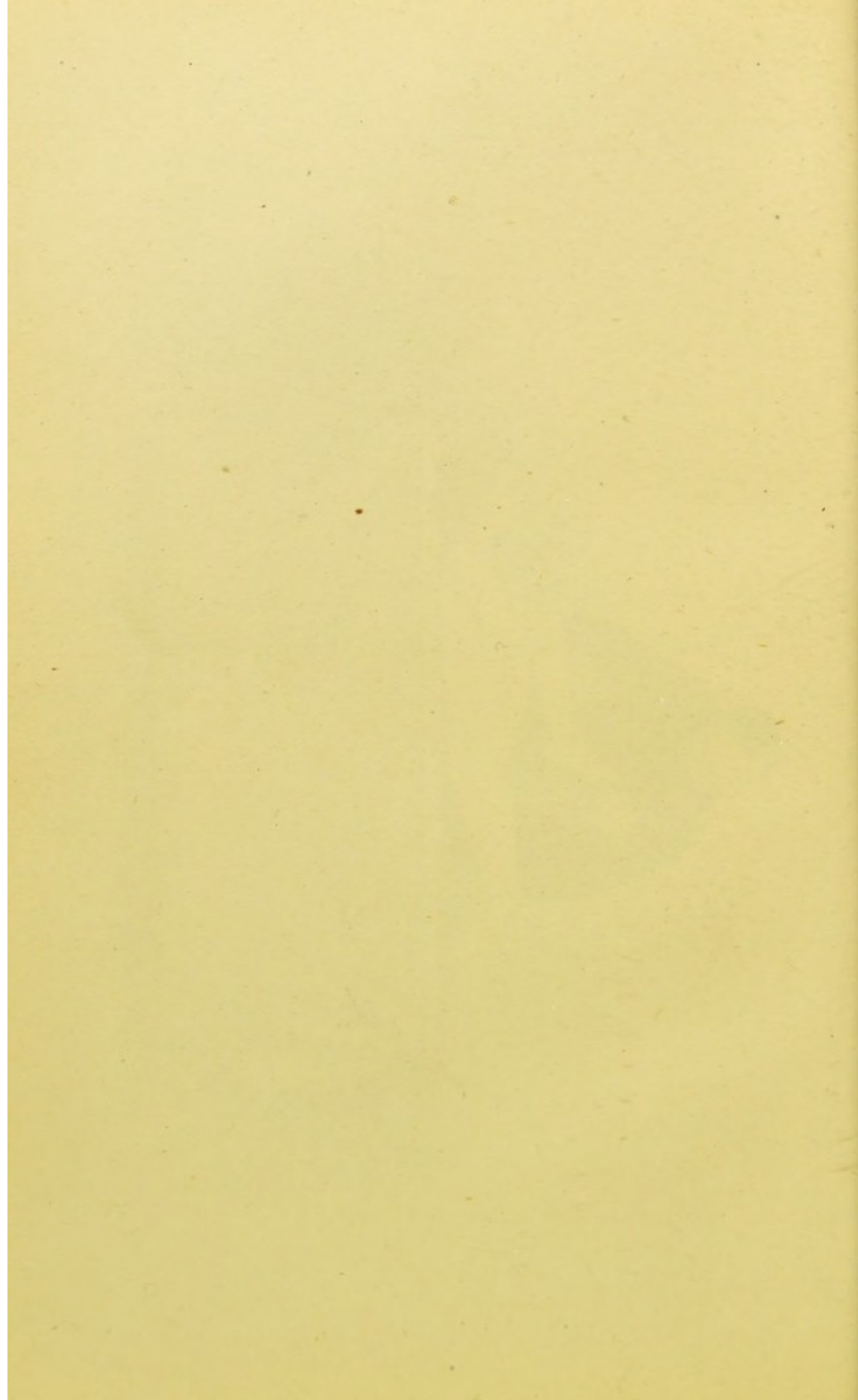


PLATE 3.

Diagnostic method for detecting fixed flexion of  
hip joint.

PLATE 3





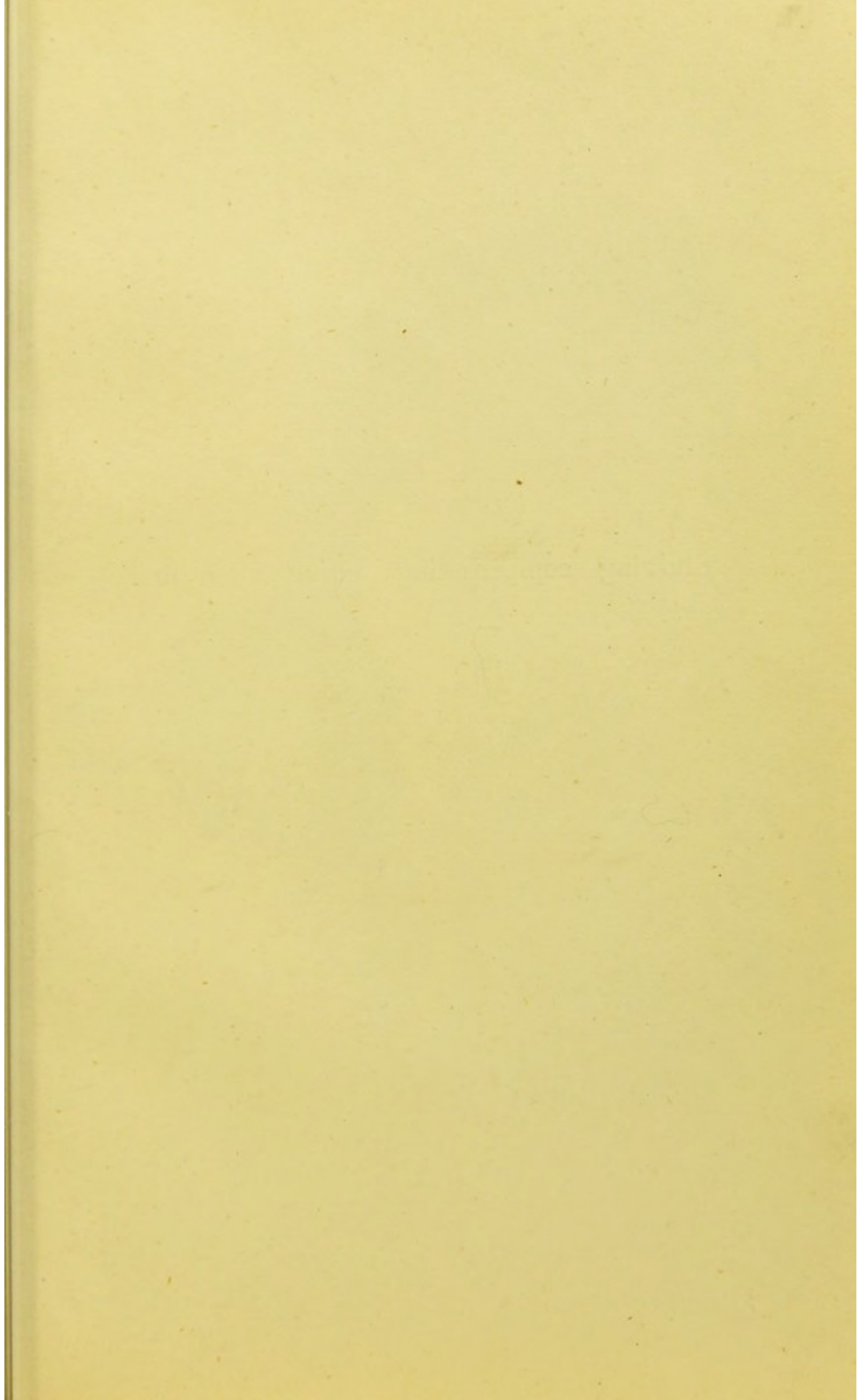
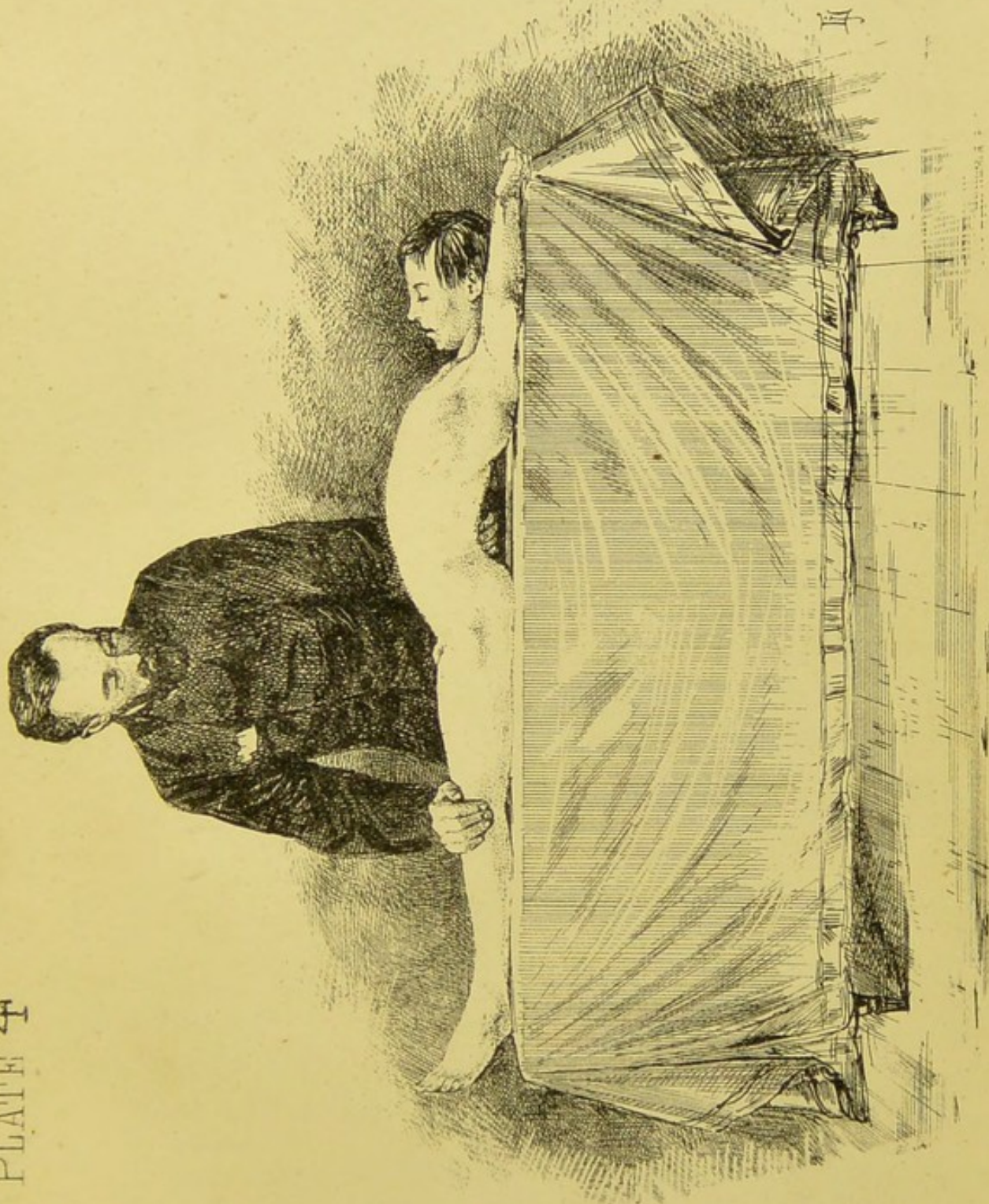


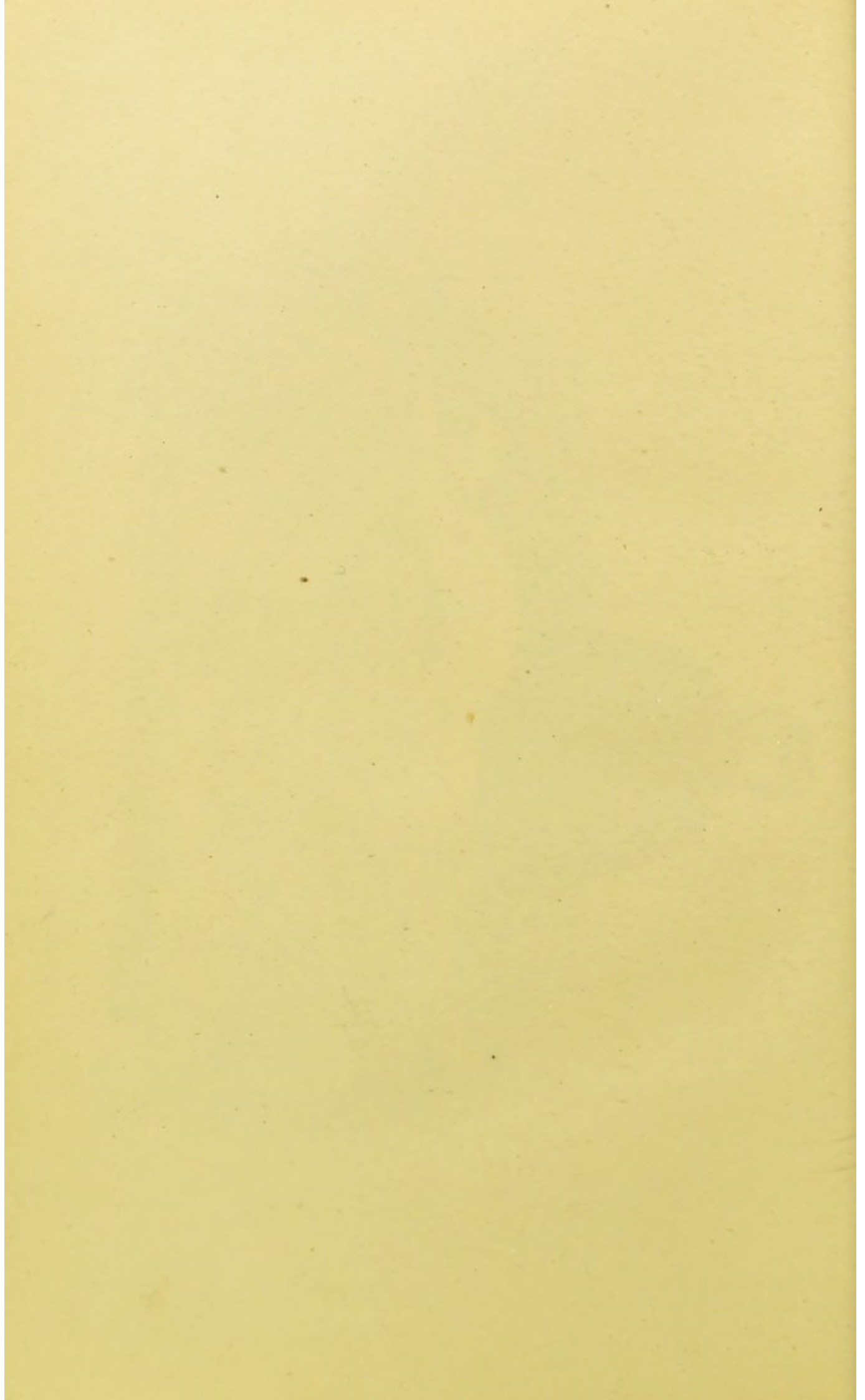


PLATE 4.

Showing compensating curve, when limb is extended.

PLATE 4





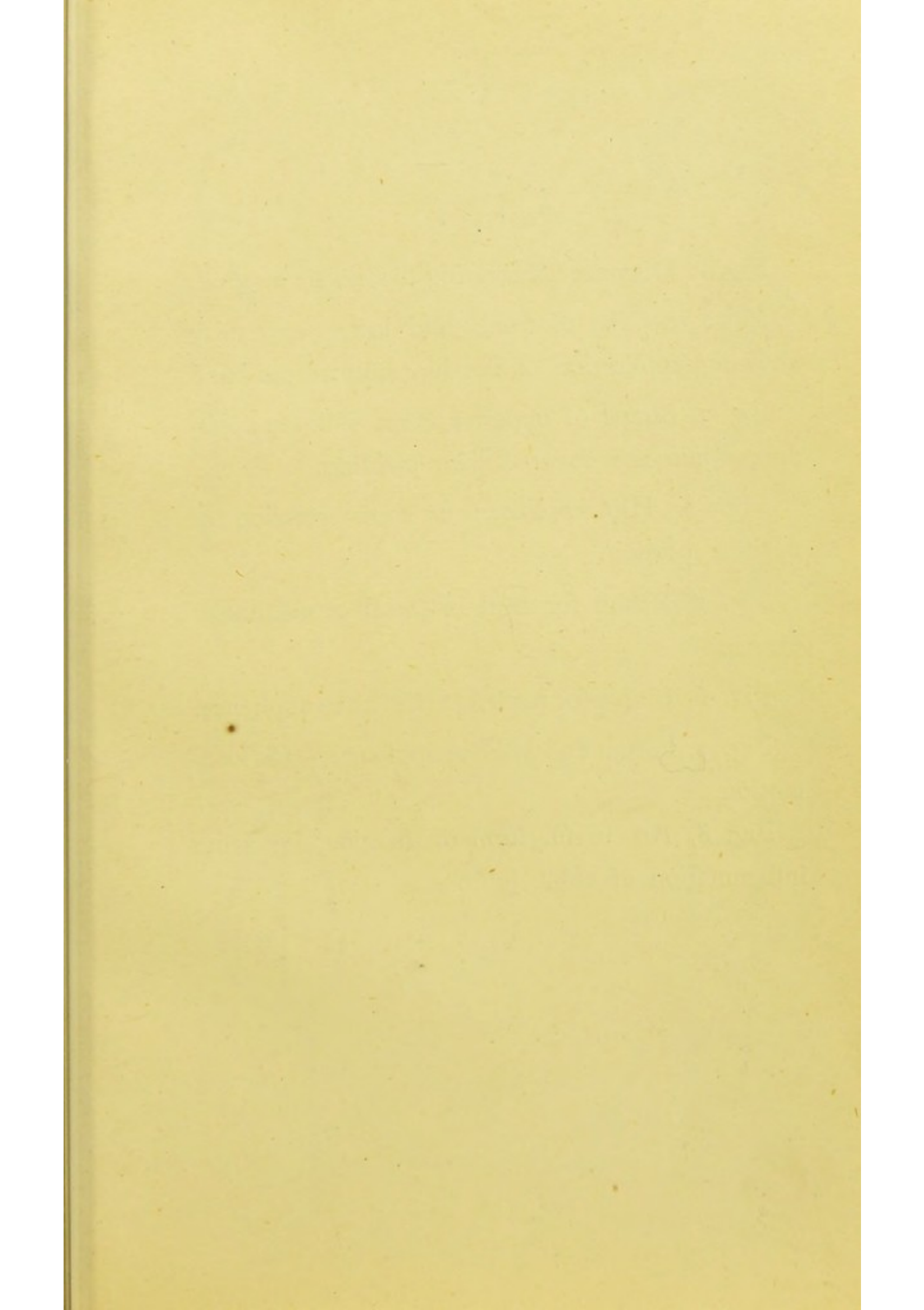


PLATE 5.

Fig 1, Diagram illustrating diagnostic method.

Fig 2. Section of trunk and lower extremity showing application of the hip splint cross bars.

Fig 3, Shape of upper portion of knee appliance when not covered with padding.

Fig. 4, Hip appliance to show rotation of upright portion.

Fig. 5, Patten for heel in tarsal or metatarsal disease.

Fig. 6, Staple for retention with knee appliance.

Fig. 7, Patten end of knee appliance,—for locomotion.

Fig. 8, An useful form of fixation, for acute inflammation of ankle joint.

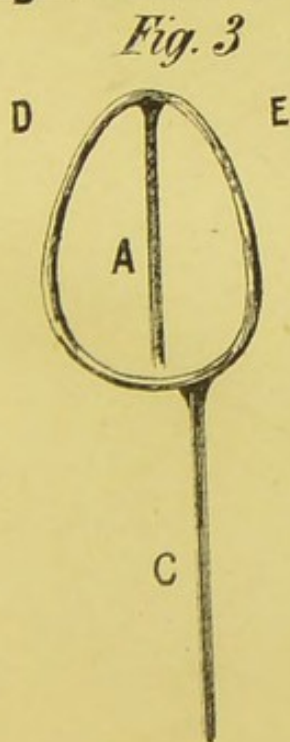
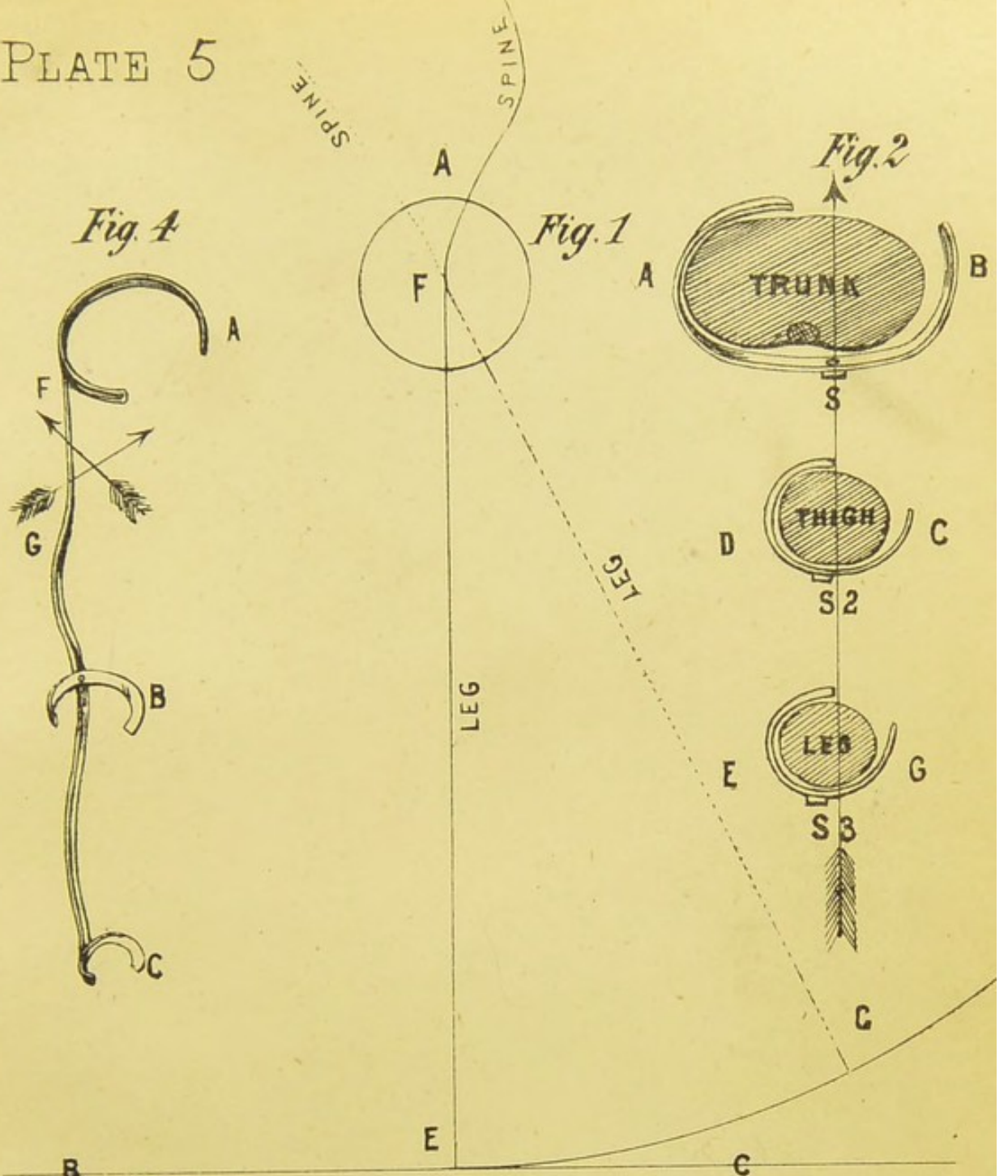


Fig. 5



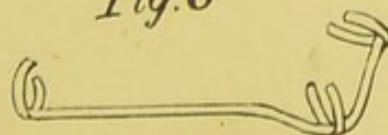
Fig. 6

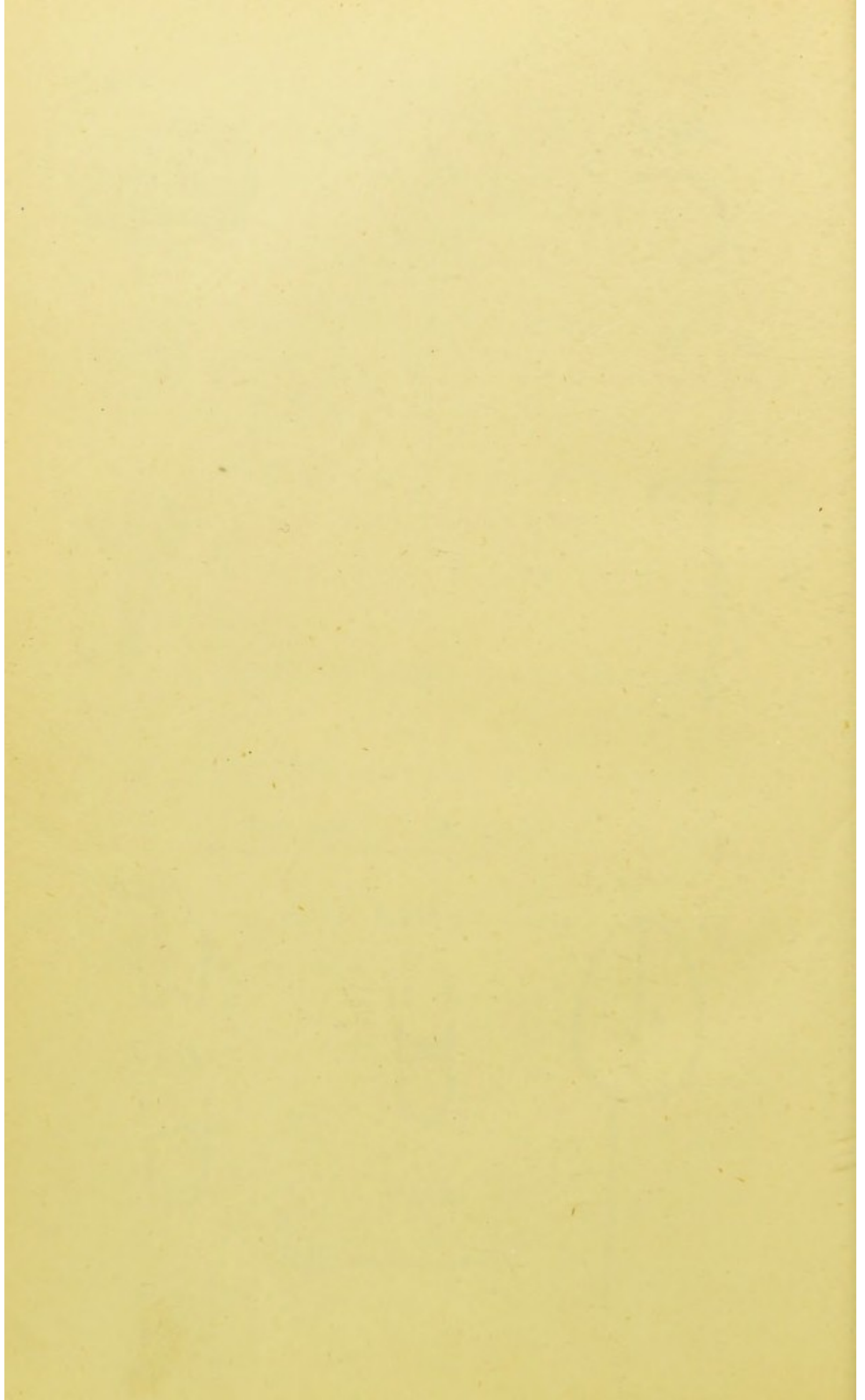


Fig. 7



Fig. 8





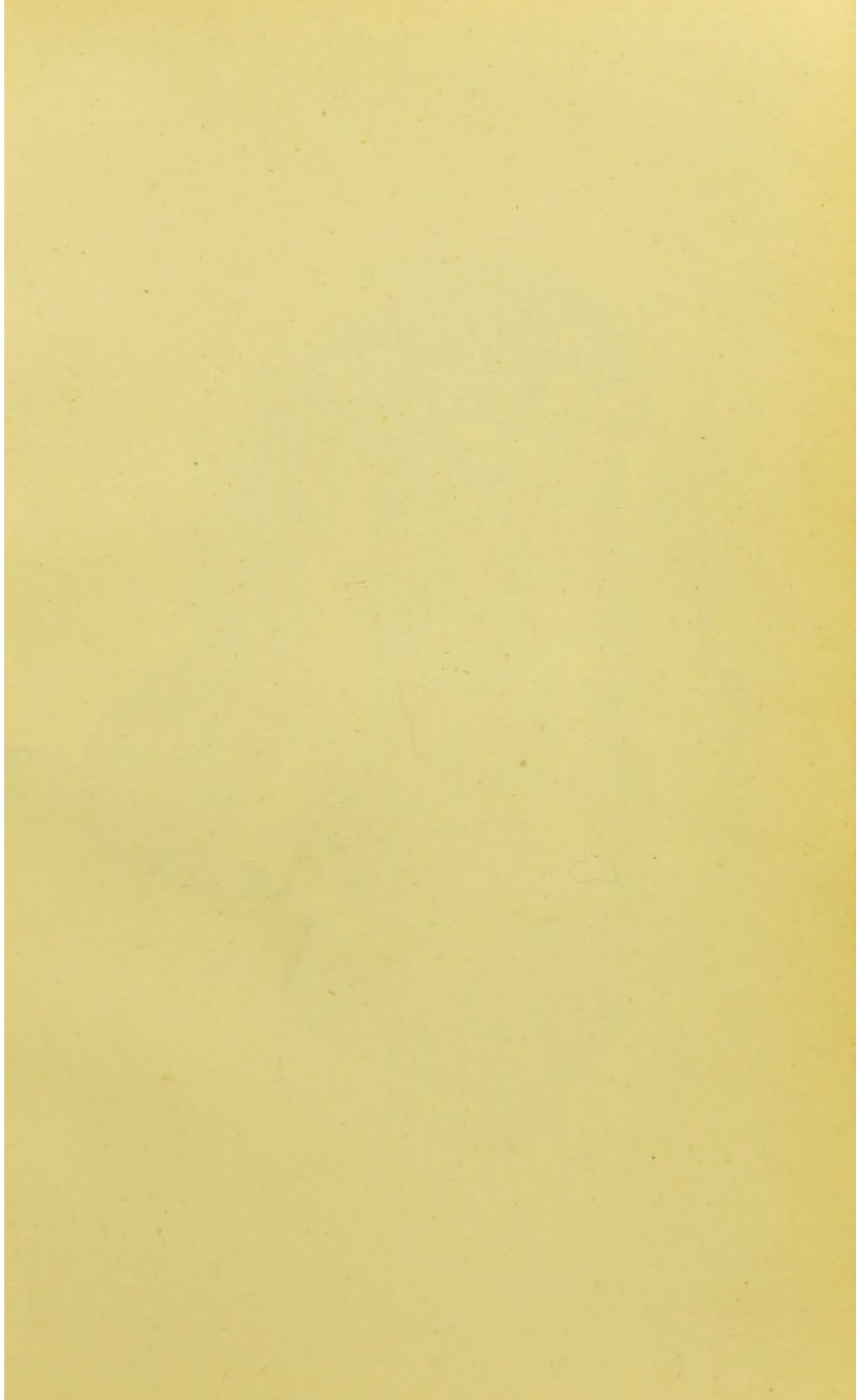
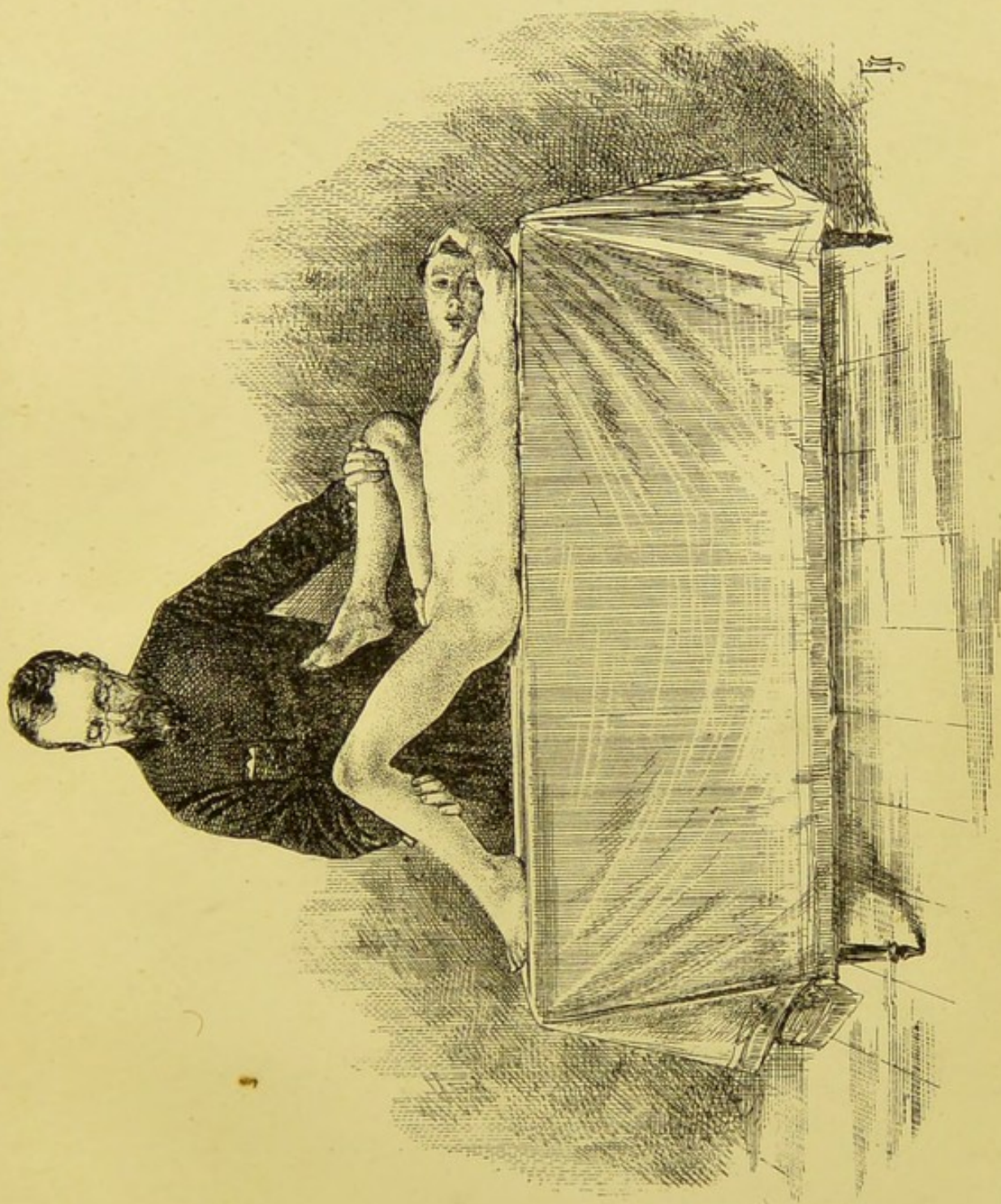


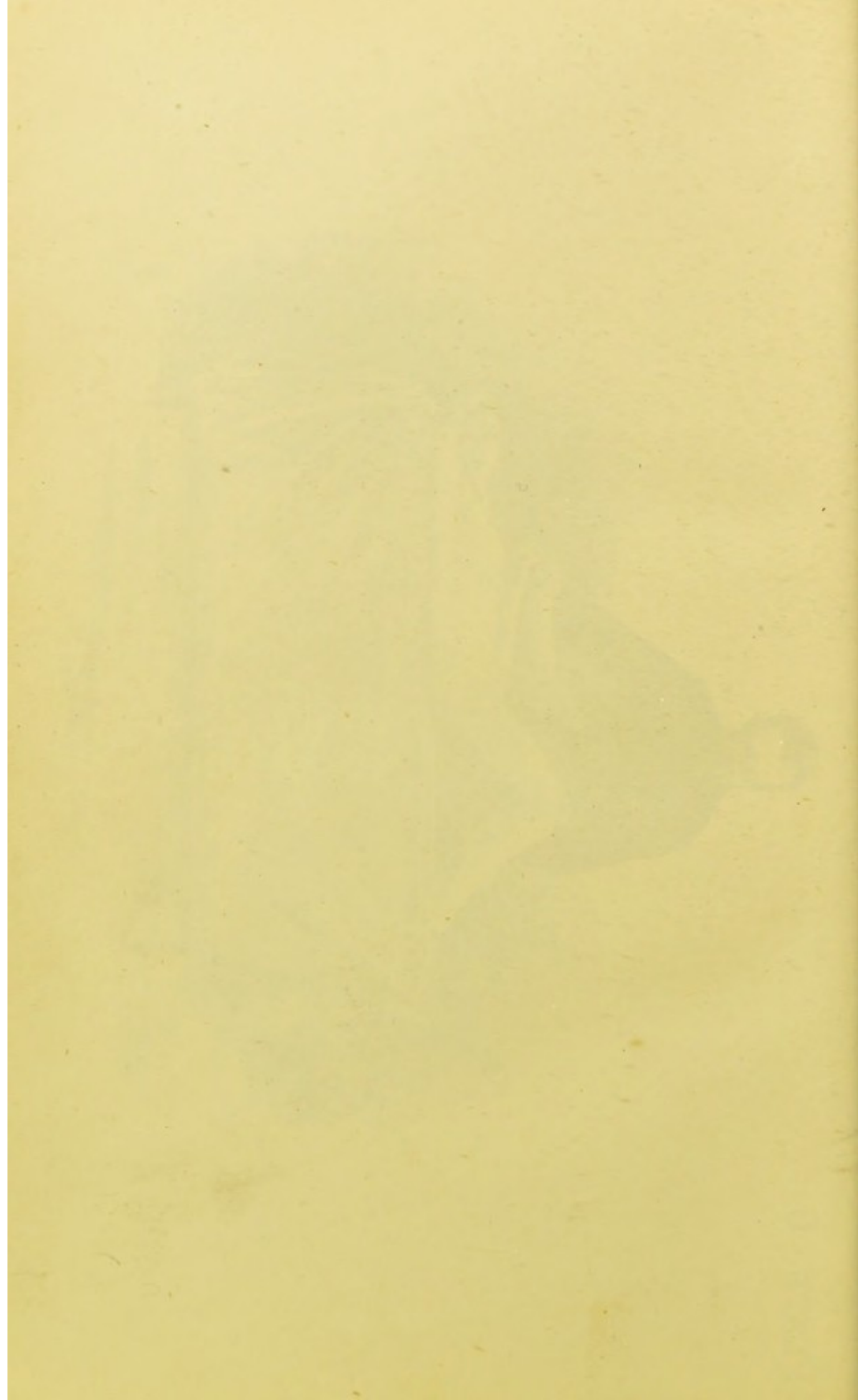


PLATE 6.

Diagnostic method.

PLATE 6





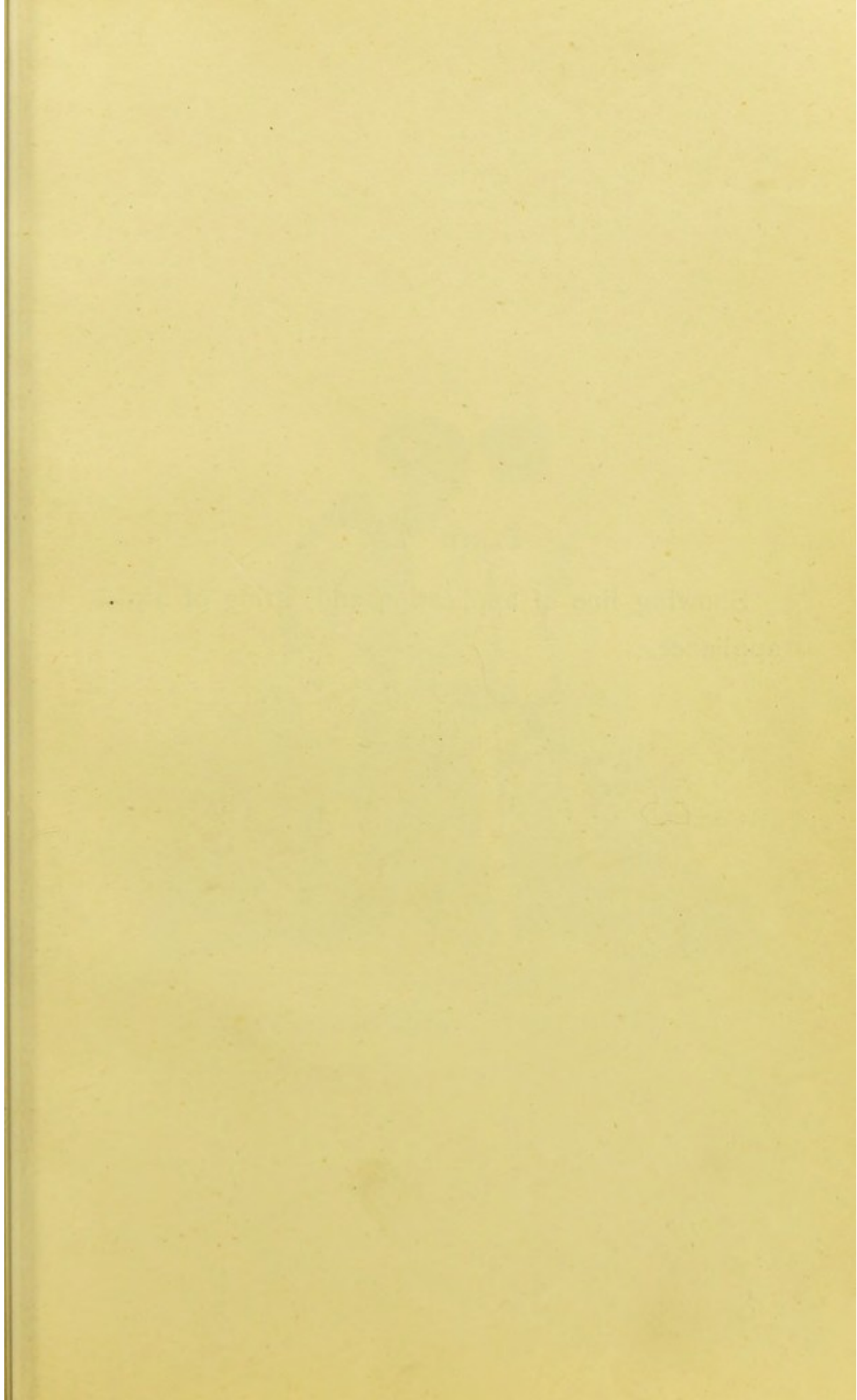
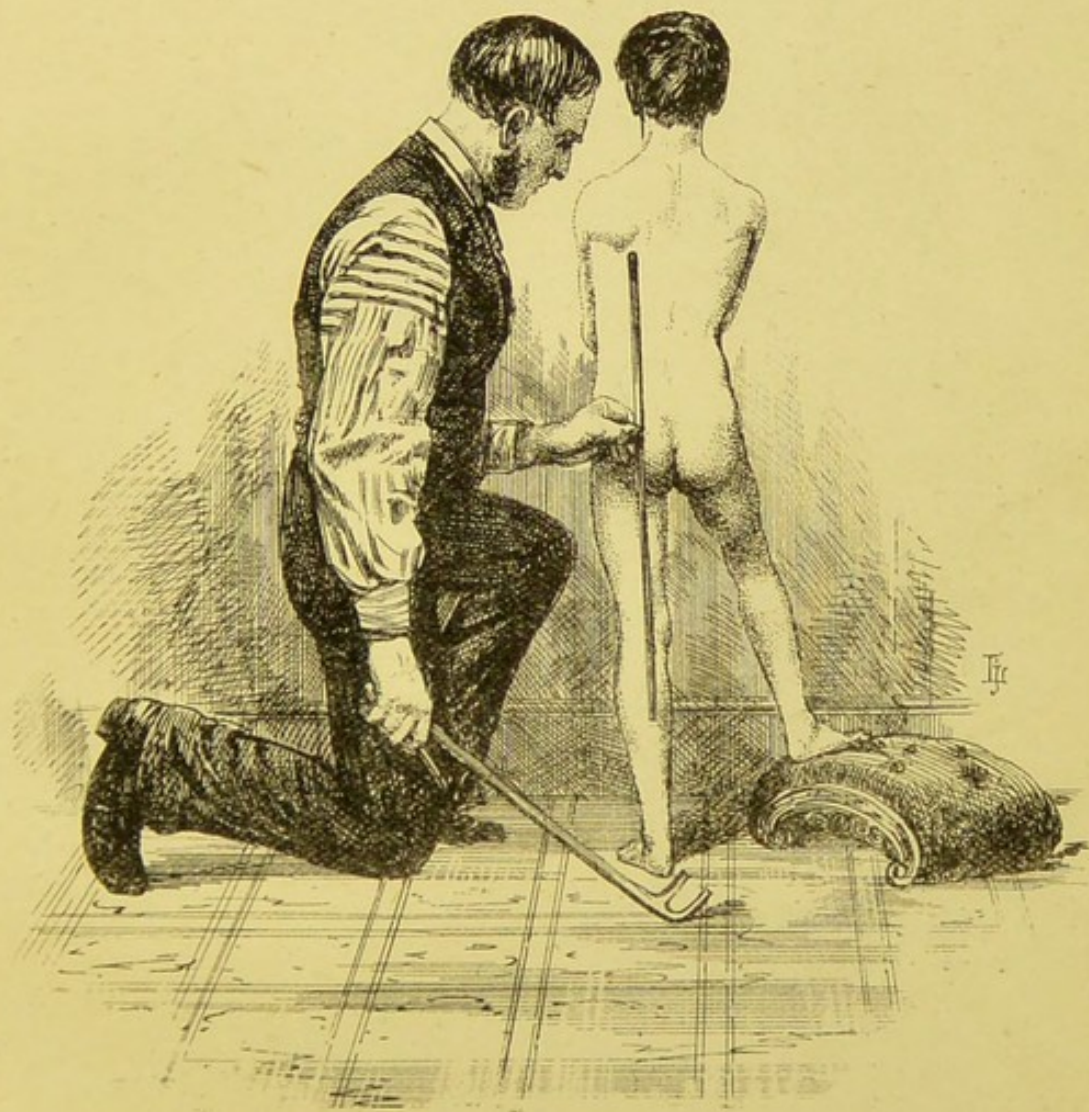
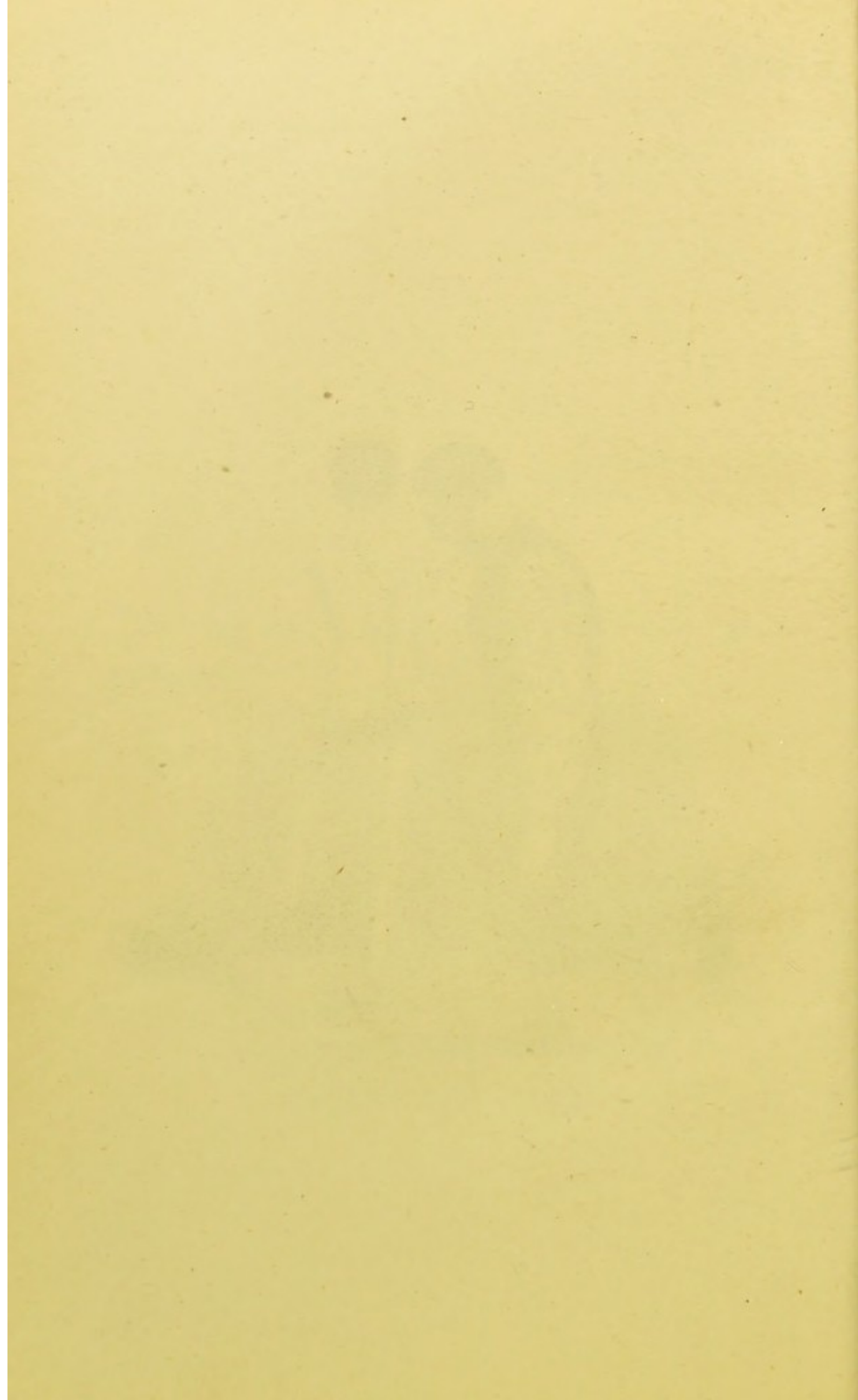


PLATE 7.

Showing line of application and fitting of hip  
appliance.





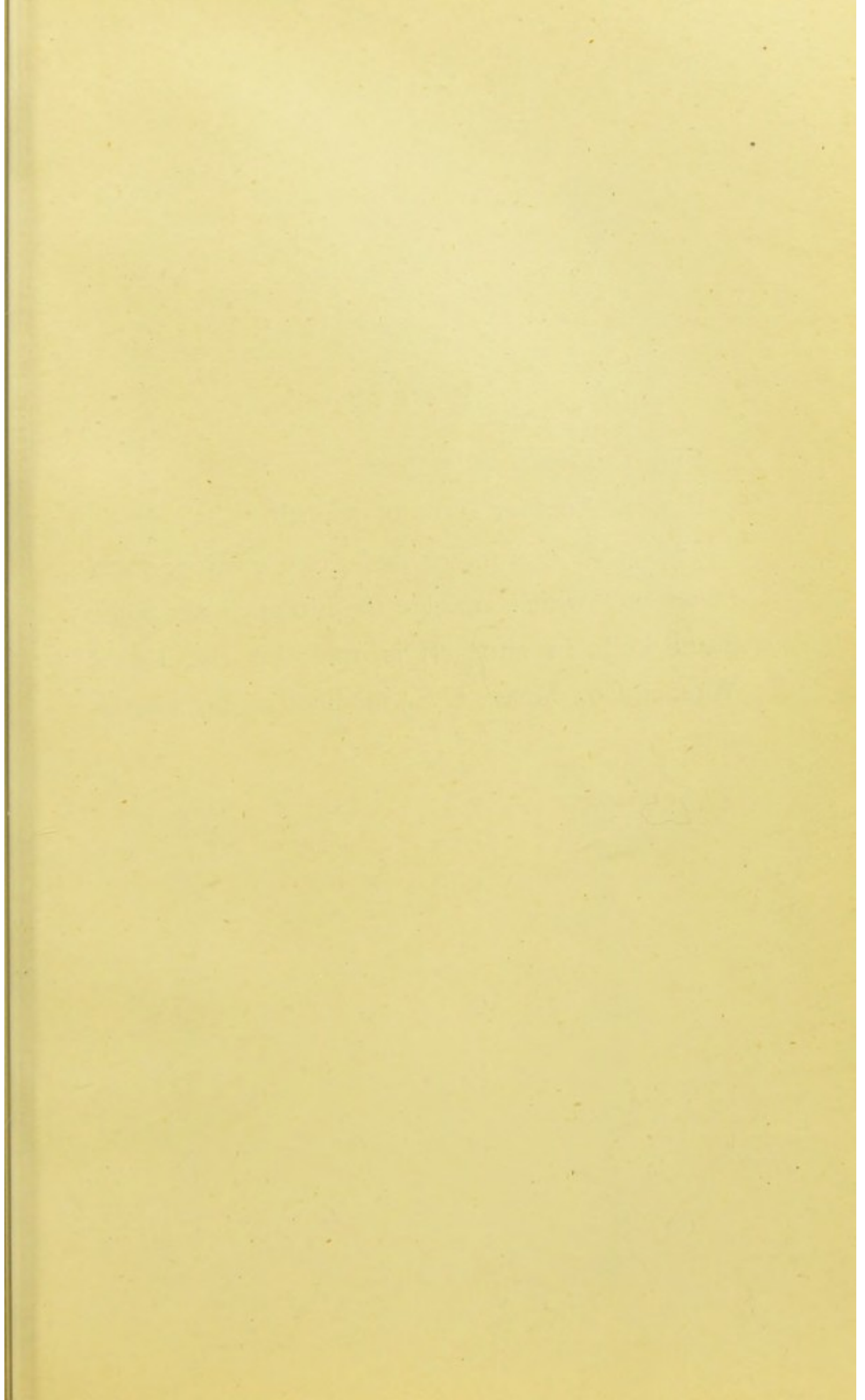


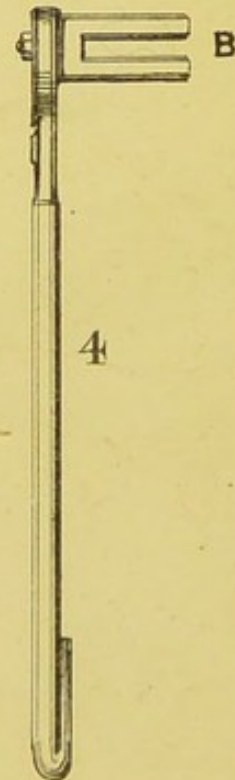
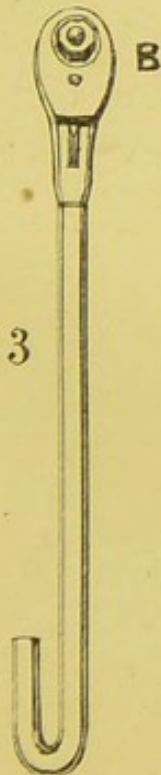
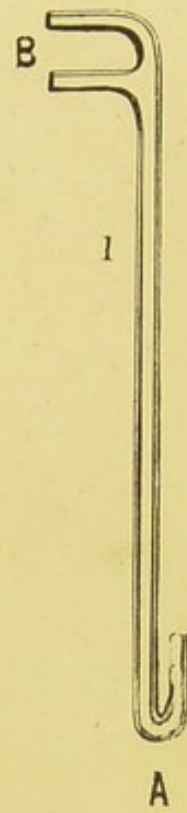


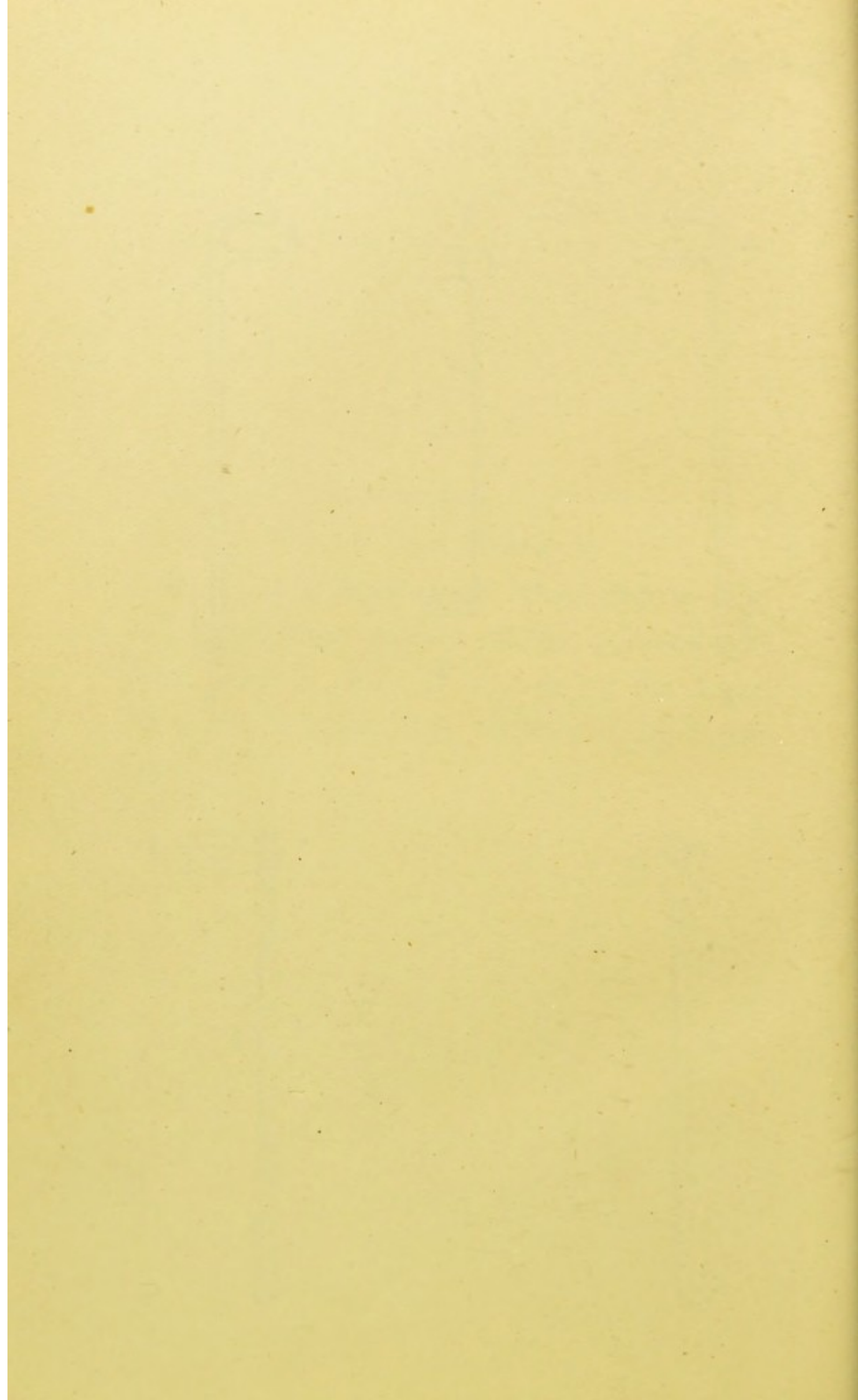
PLATE 8.

Fig. 1. Cheap wrenches.

Fig. 2. Another form of wrench.

Fig. 3, & 4. Another and more efficient form of wrench, which enables the hip appliance to be fitted while in situ. It is made by the Lowel Wrench Co., Mass., U.S., modified at my suggestion.





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PLATE 9.

Fig. 1, Correct lines for hip appliance.

Fig. 2 & 3, For reduction of deformity.

Fig. 4, Incorrect and intolerable forms of hip appliance.

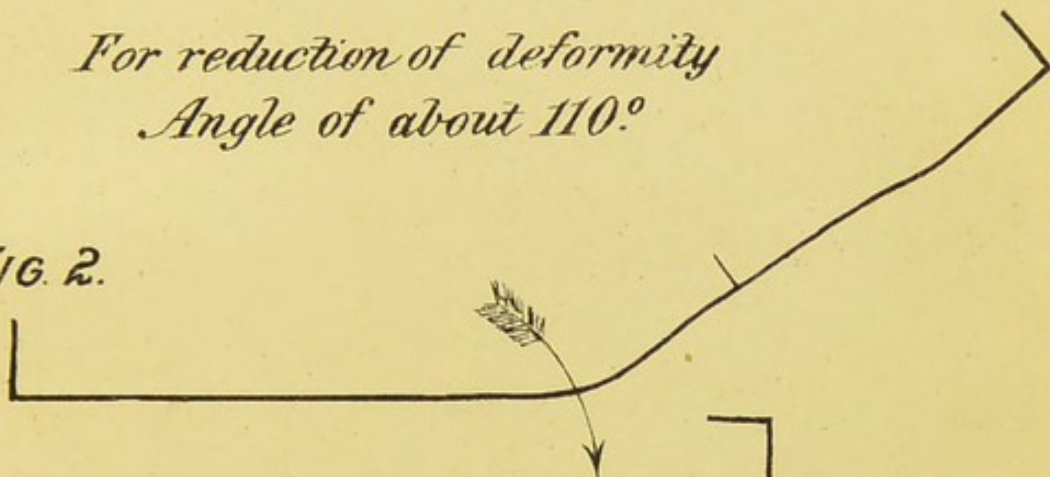
*Ready for a recent case.  
Line of upright.*

FIG. 1.



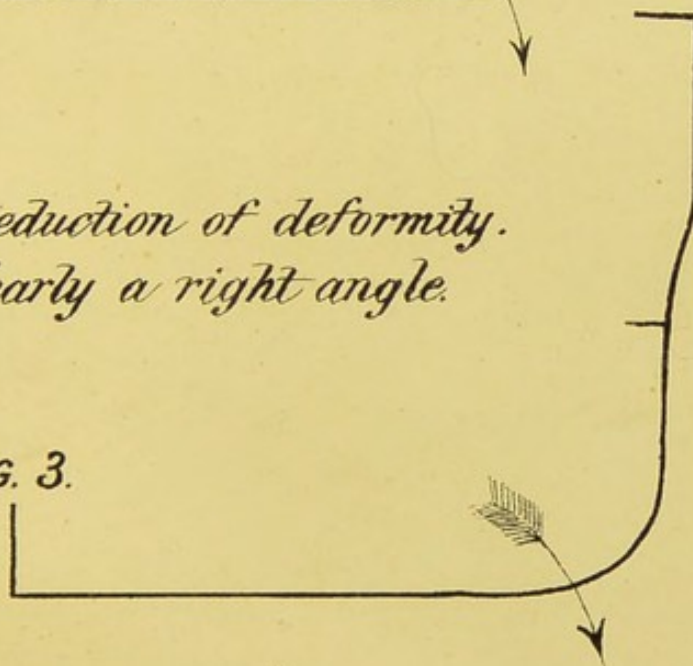
*For reduction of deformity  
Angle of about 110°*

FIG. 2.



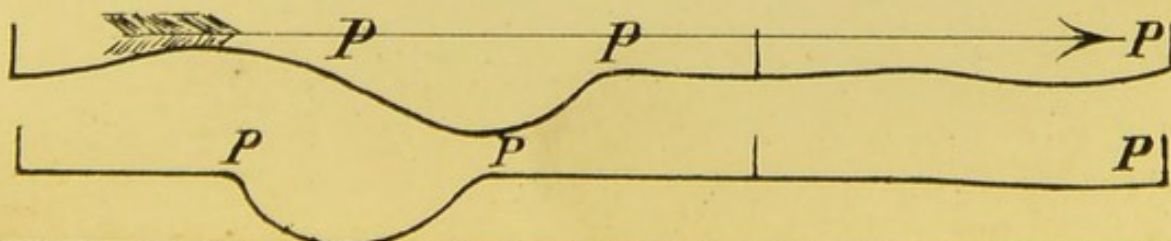
*For reduction of deformity.  
Nearly a right angle.*

FIG. 3.



*Incorrect models would irritate  
the patient at the point marked P.*

FIG. 4.





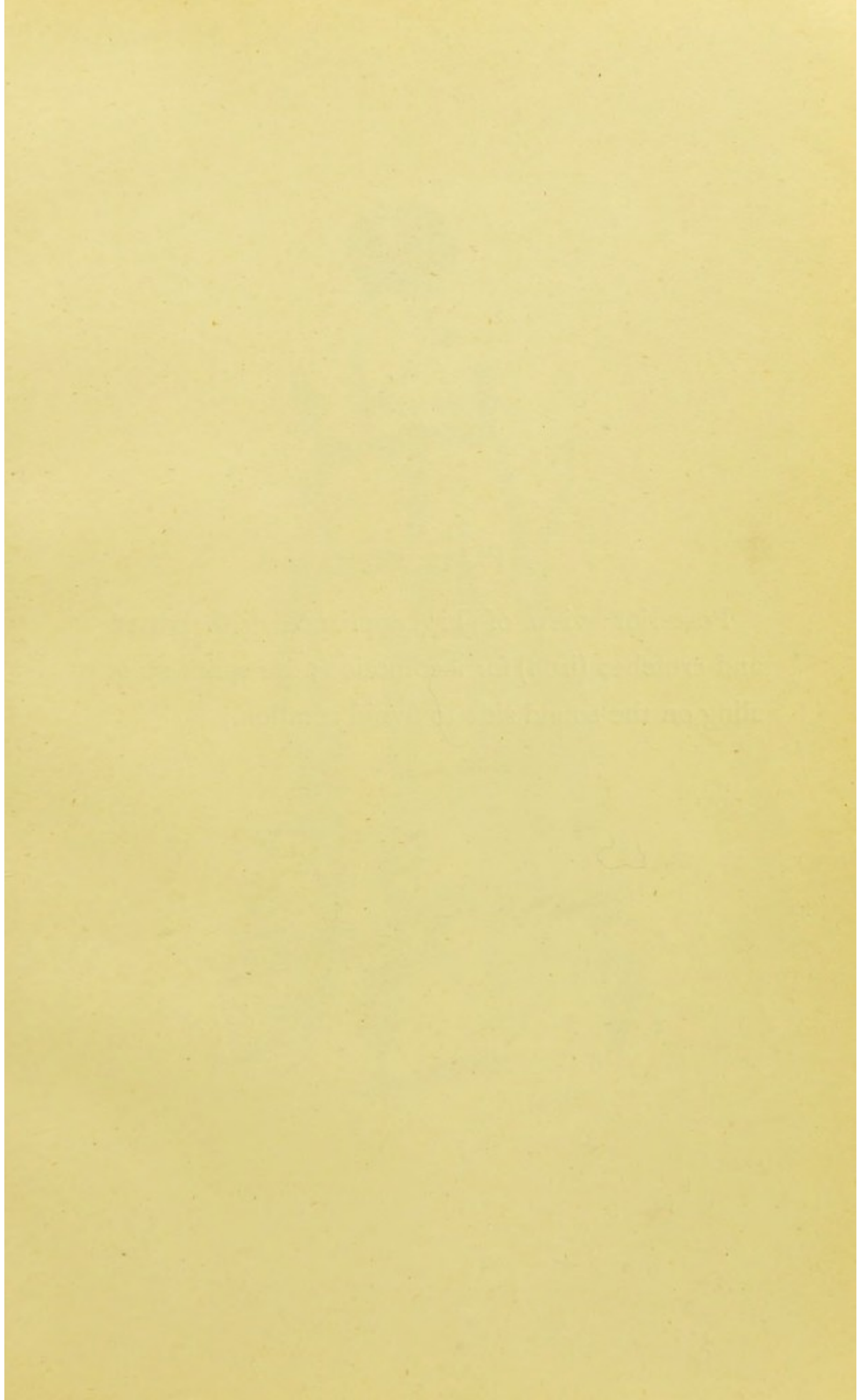
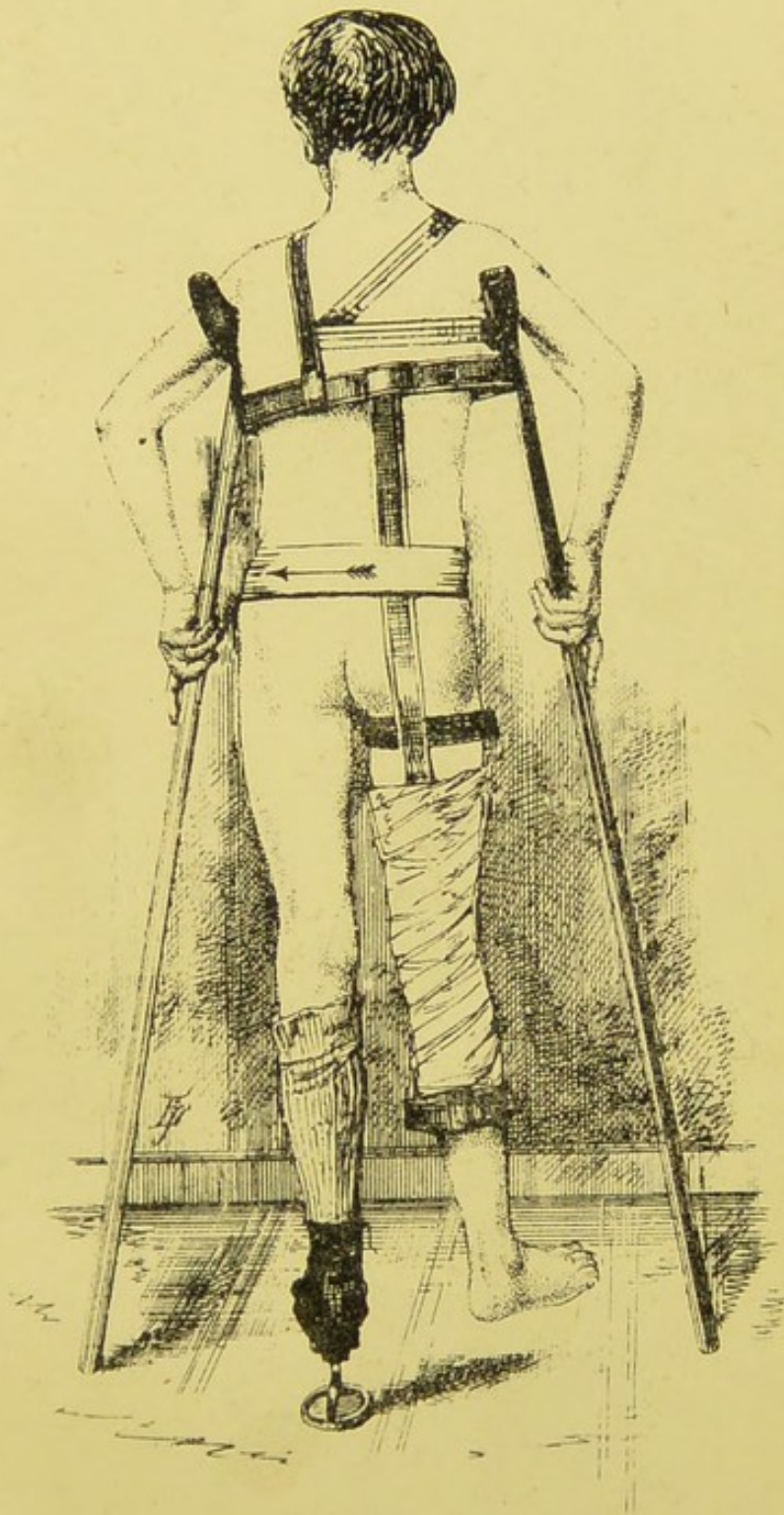




PLATE 10.

Posterior view of hip appliance with patten and crutches (iron) for locomotion; the splint must sling on the sound side to avoid rotation.

PLATE 10



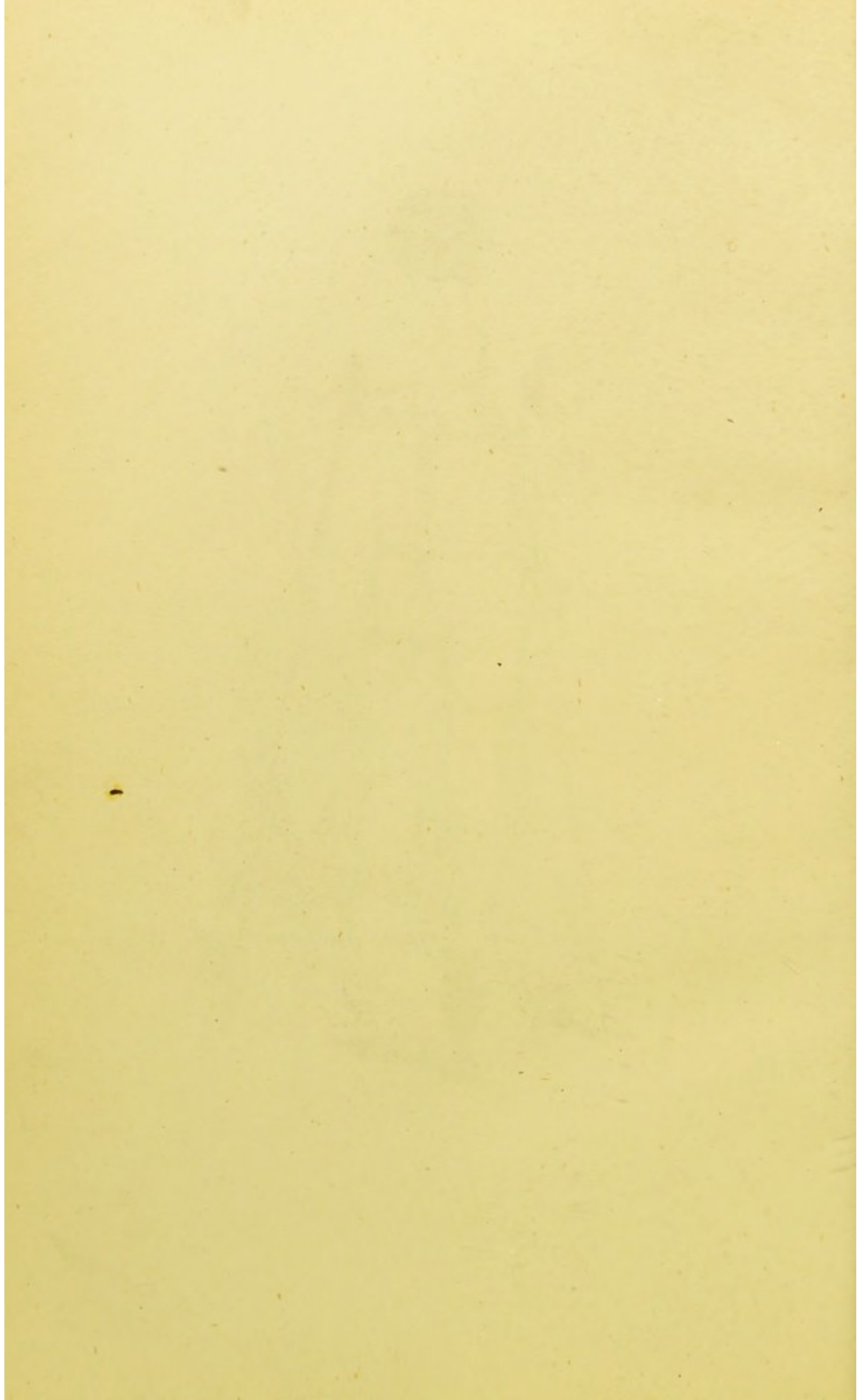
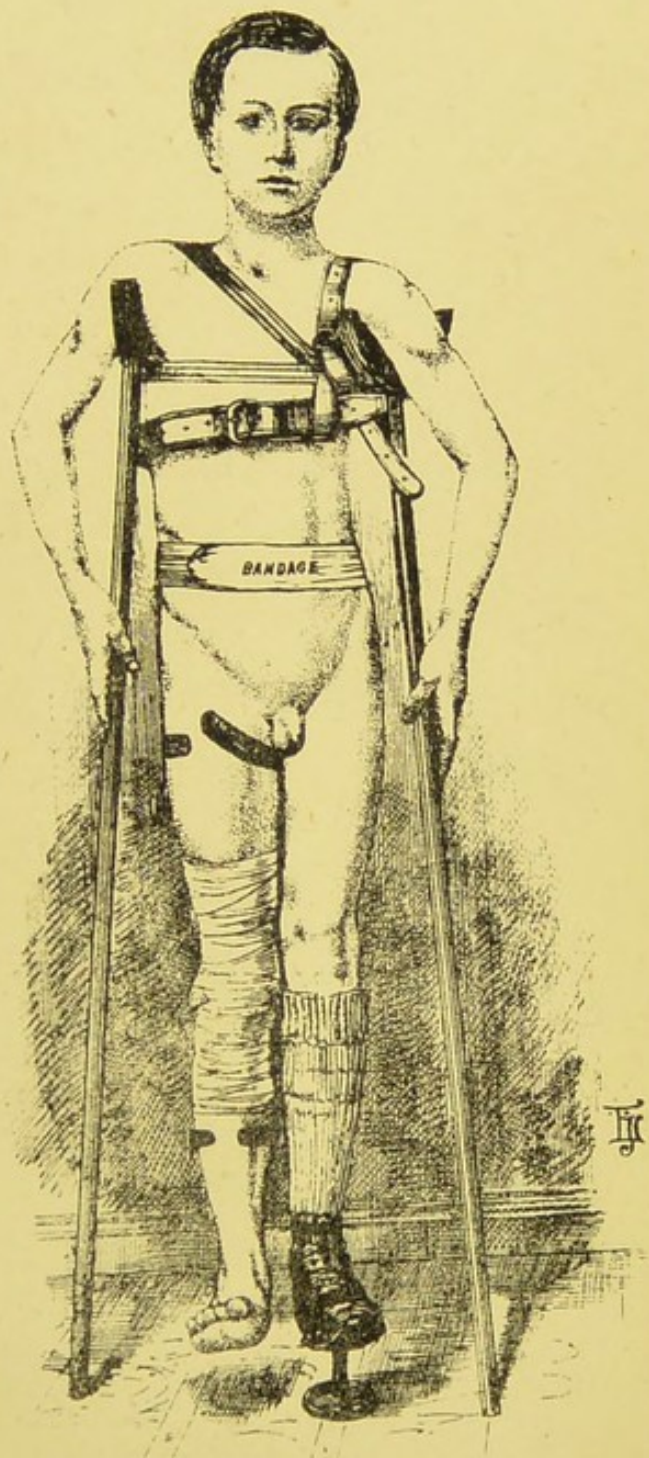




PLATE 11.

Anterior view of Hip appliance with patten,  
and crutches, as used for locomotion.

PLATE 11



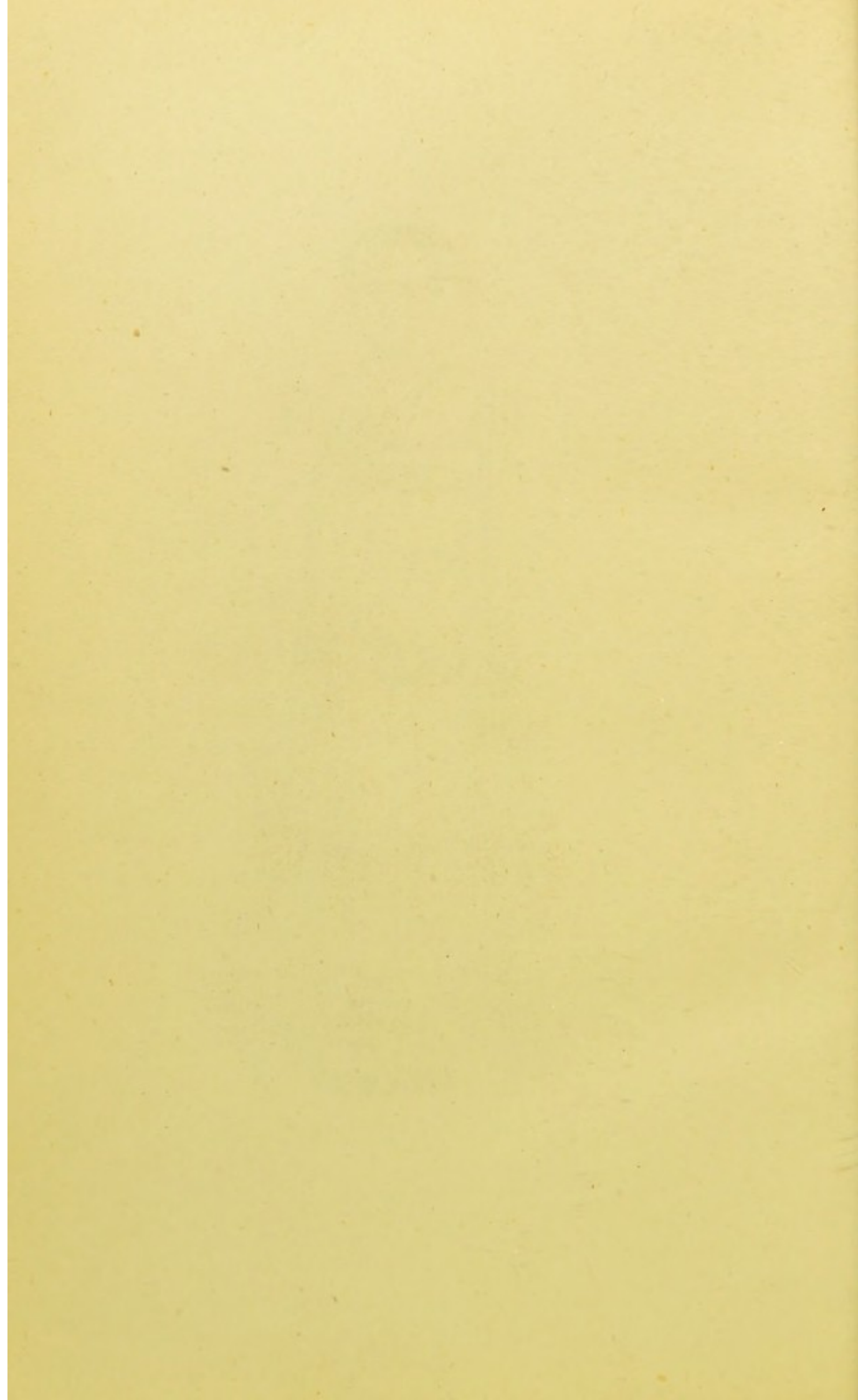
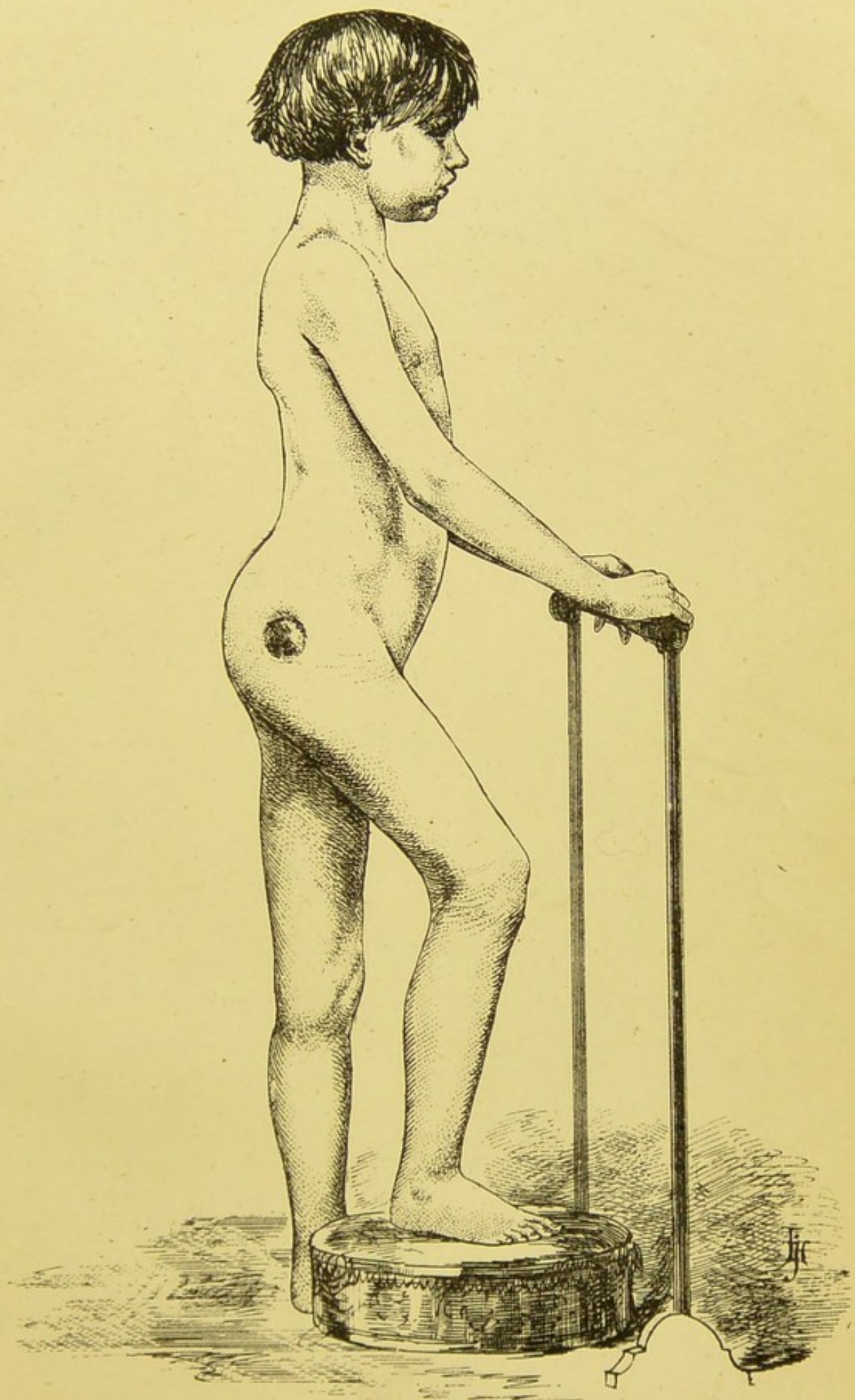


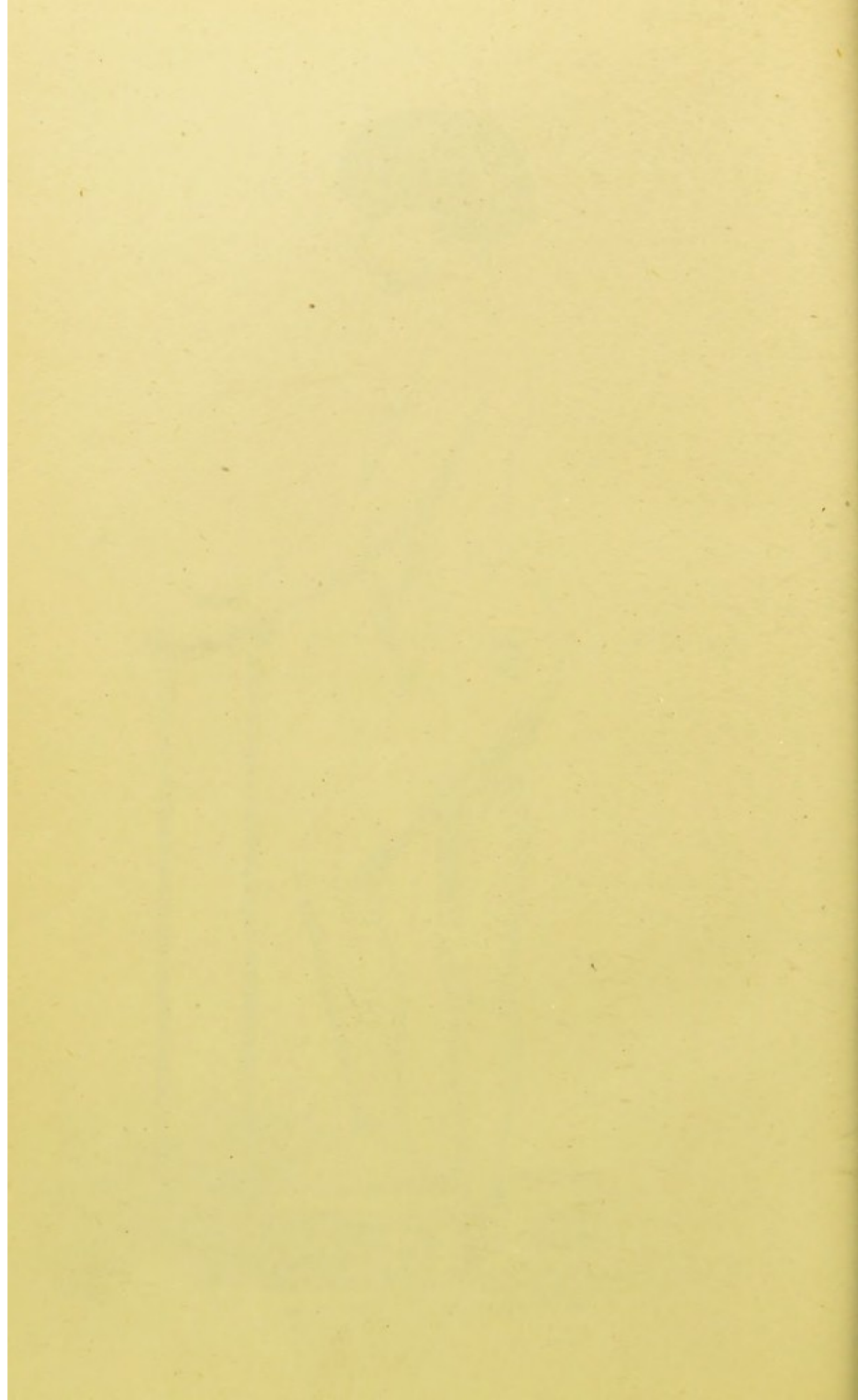




PLATE 12.

Case of hip disease in third stage with unreduced deformity (flexion).





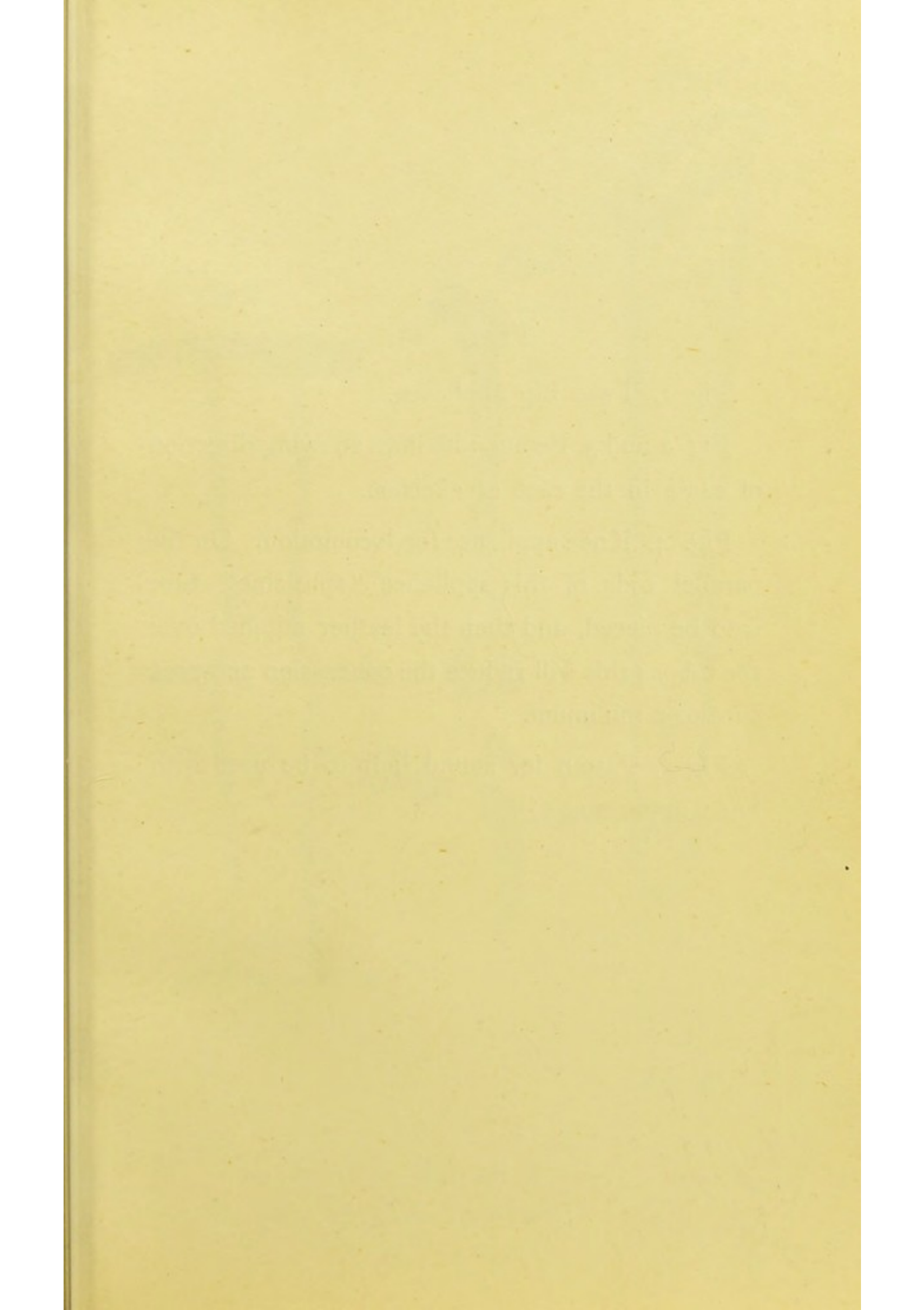


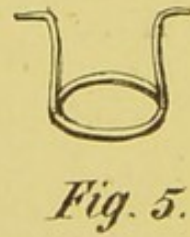
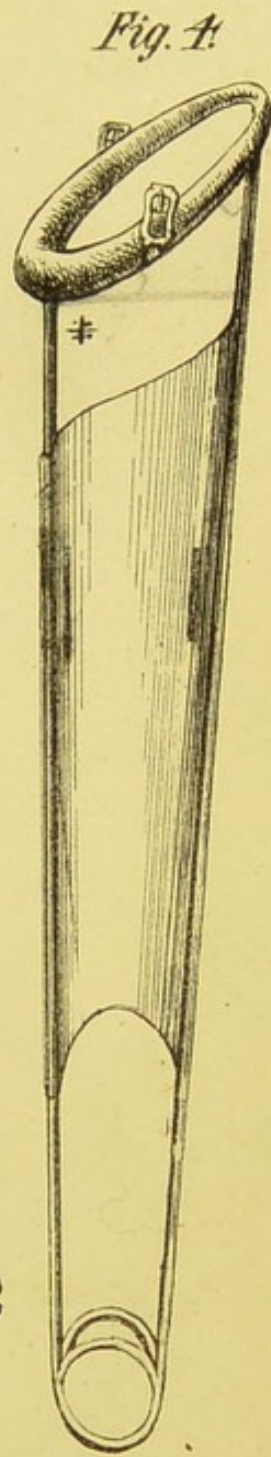
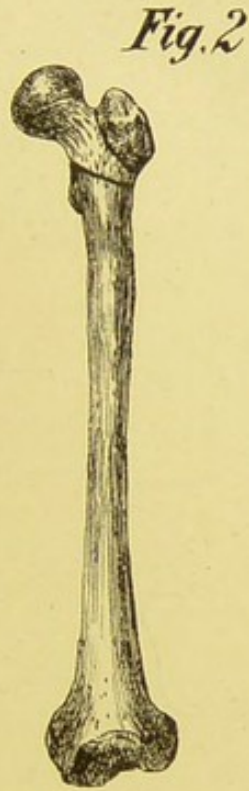
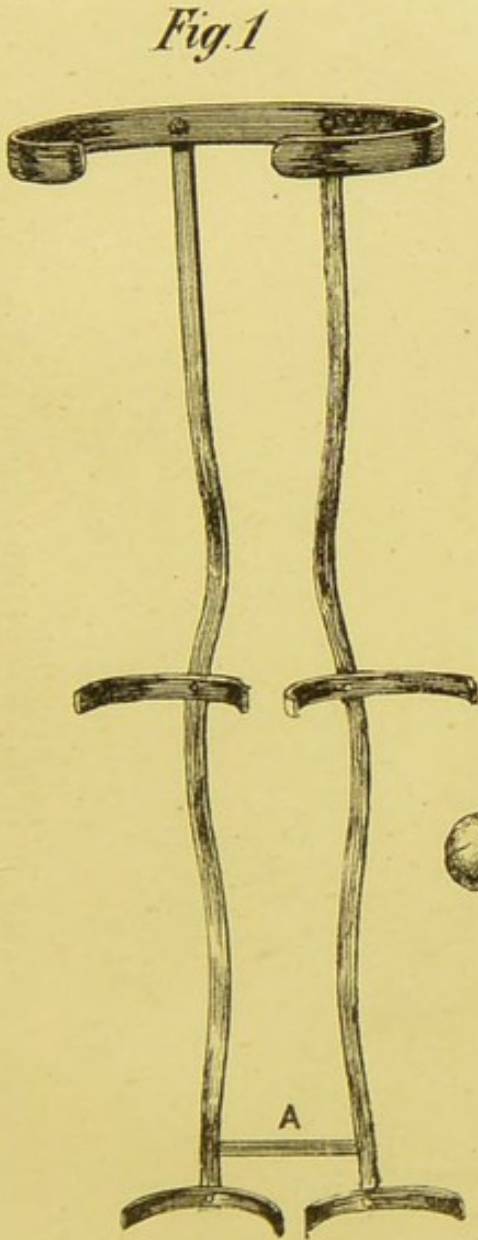
PLATE 13.

Fig 1, Twin hip appliance.

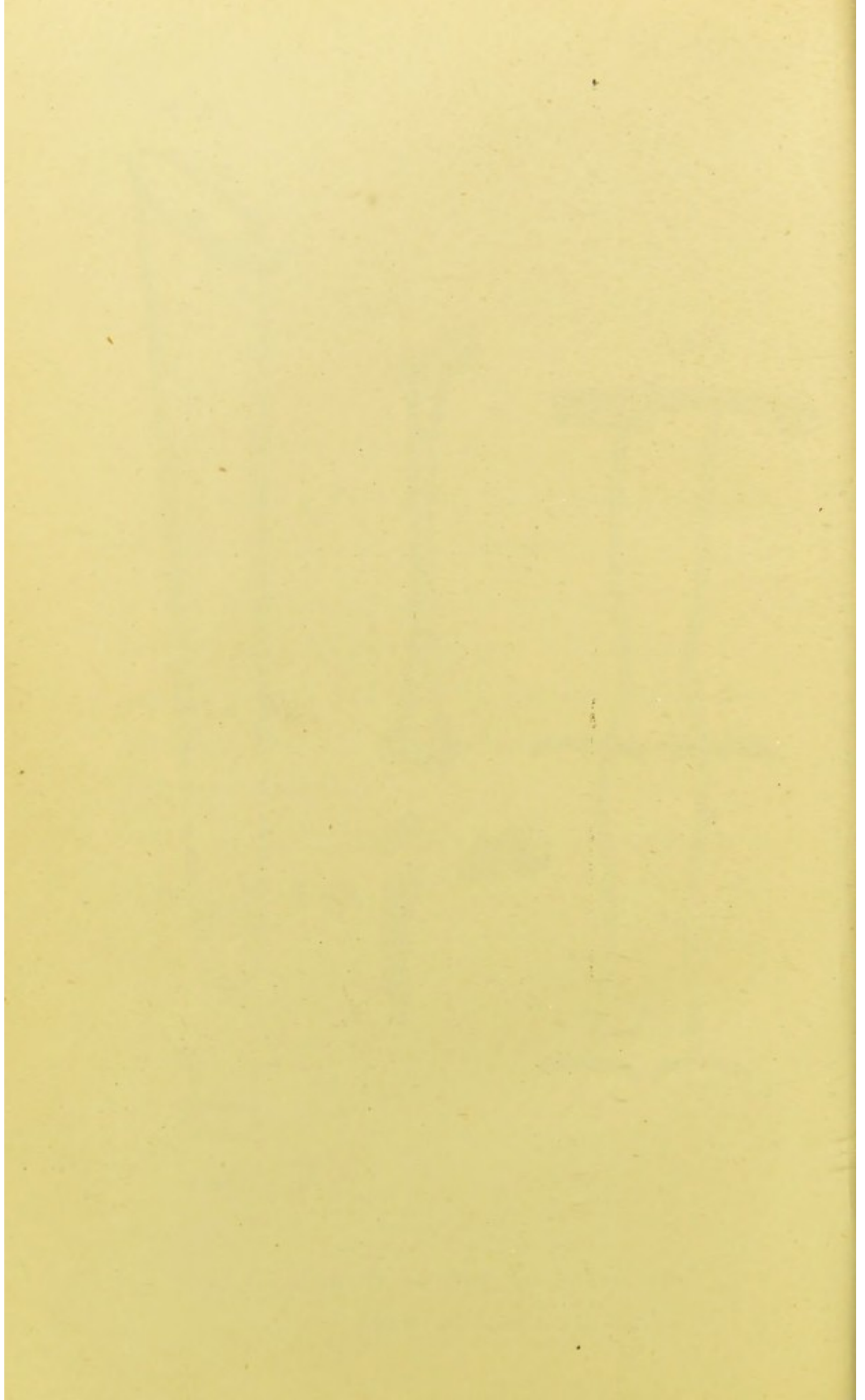
Fig 2 and 3, Femur with lines showing direction of same in the case of excision.

Fig. 4, Knee appliance for locomotion. On the parallel rods of this appliance "split zinc" tube is to be placed, and then the leather stitched over the tubes ; this will reduce the concussion and pressure to a minimum.

Fig 5, Patten for sound limb to be used with knee apparatus.



† AN ANGLE OF 55° OR IT WILL NOT BE EASY TO WEAR.



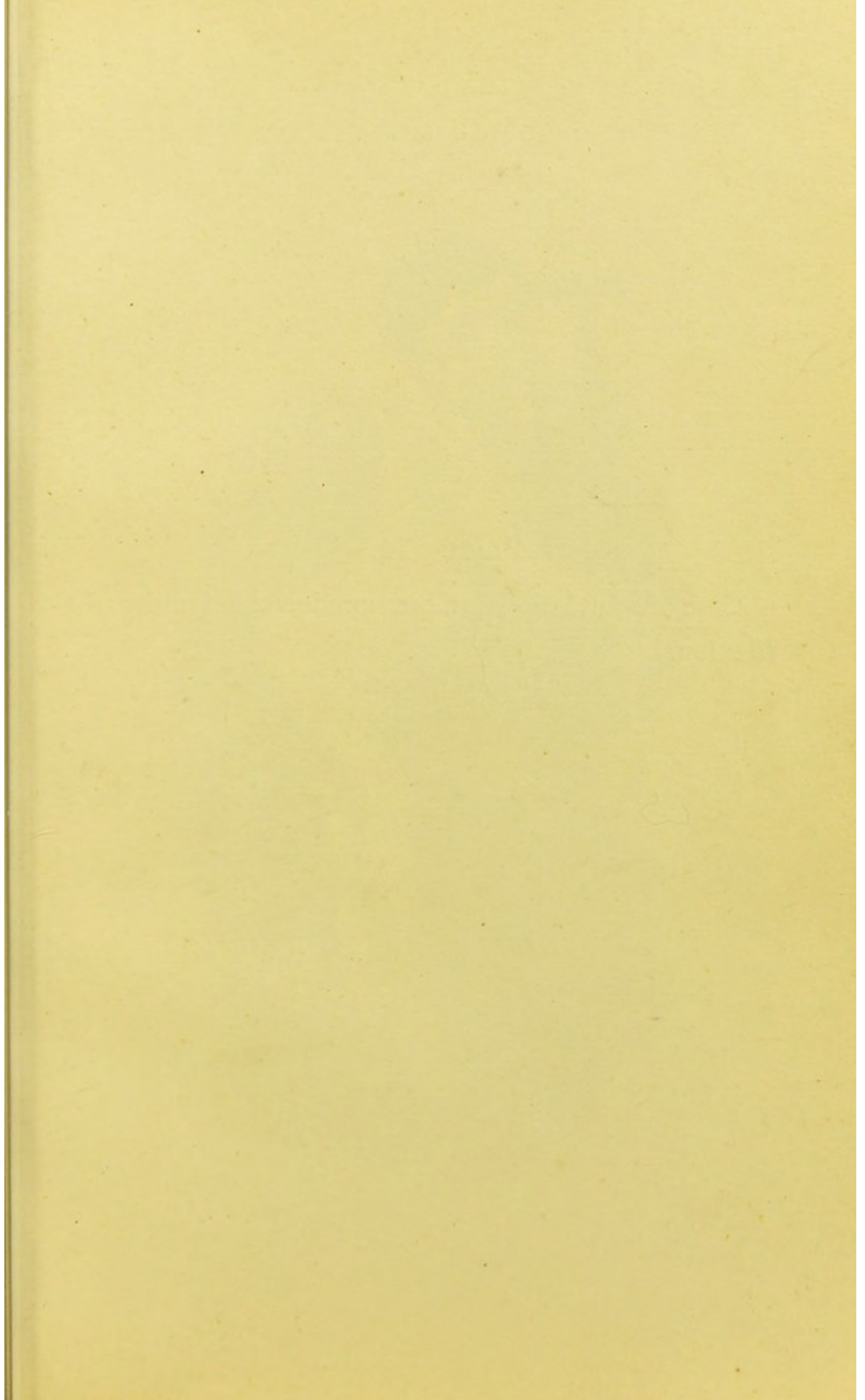
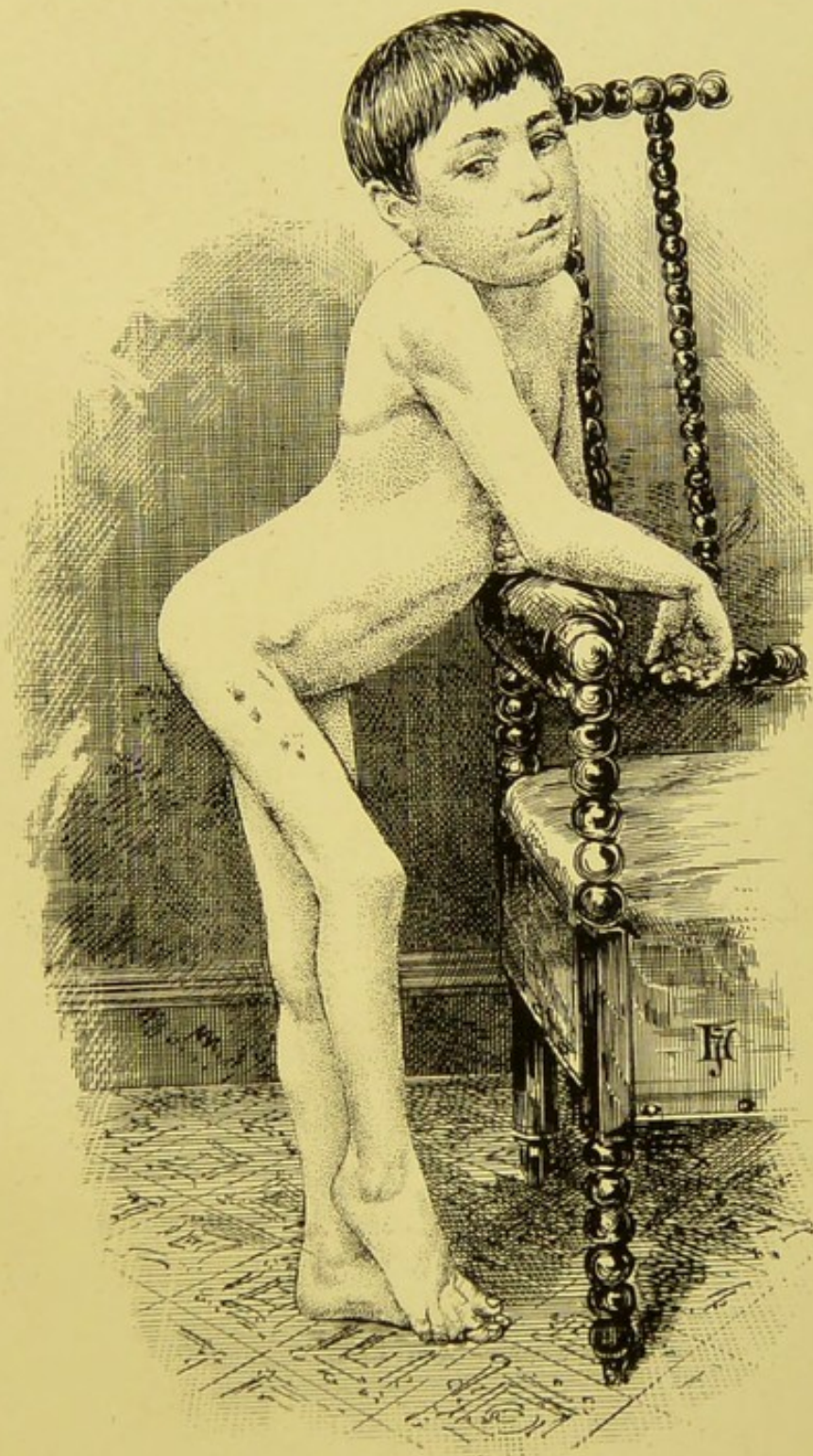
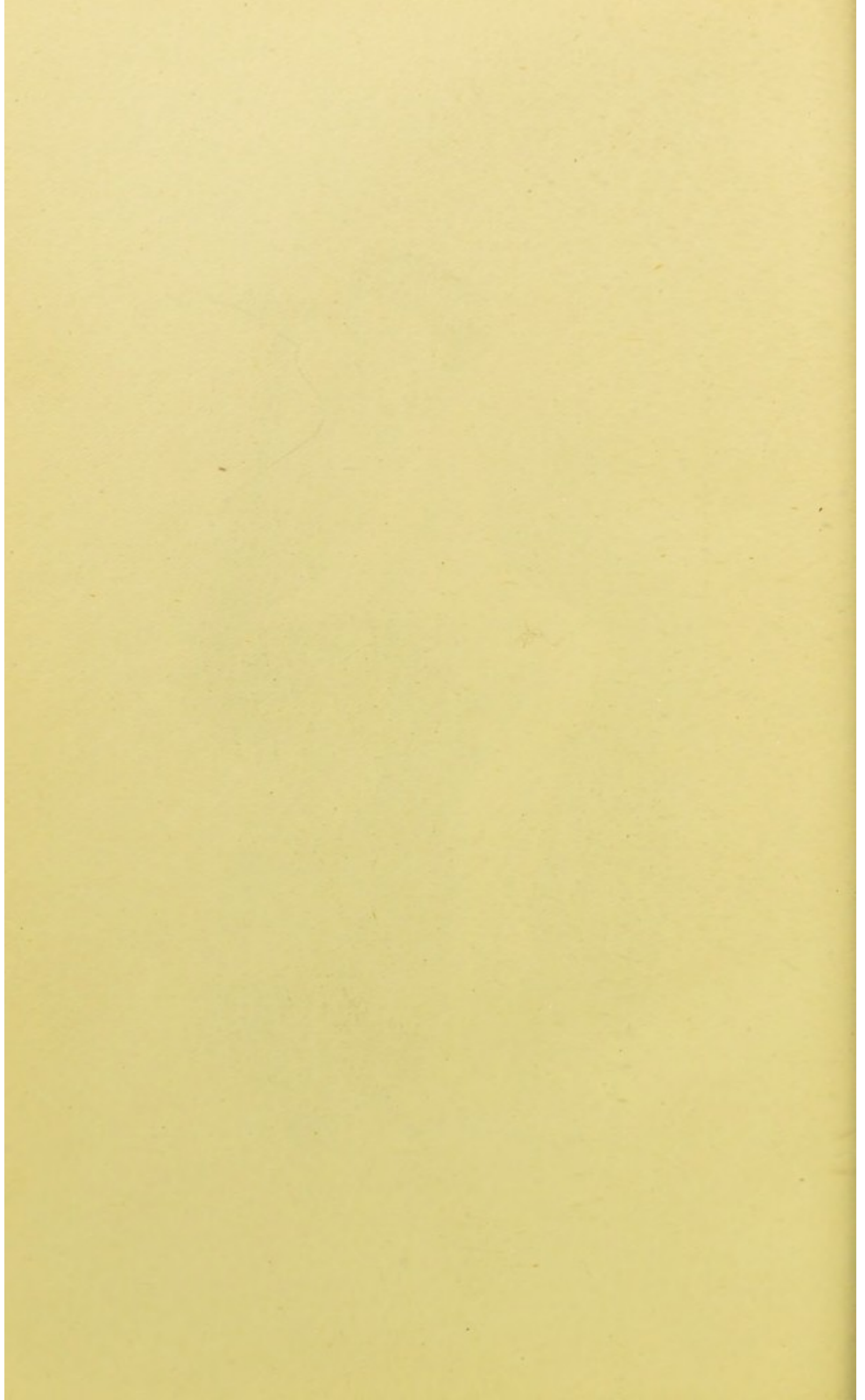


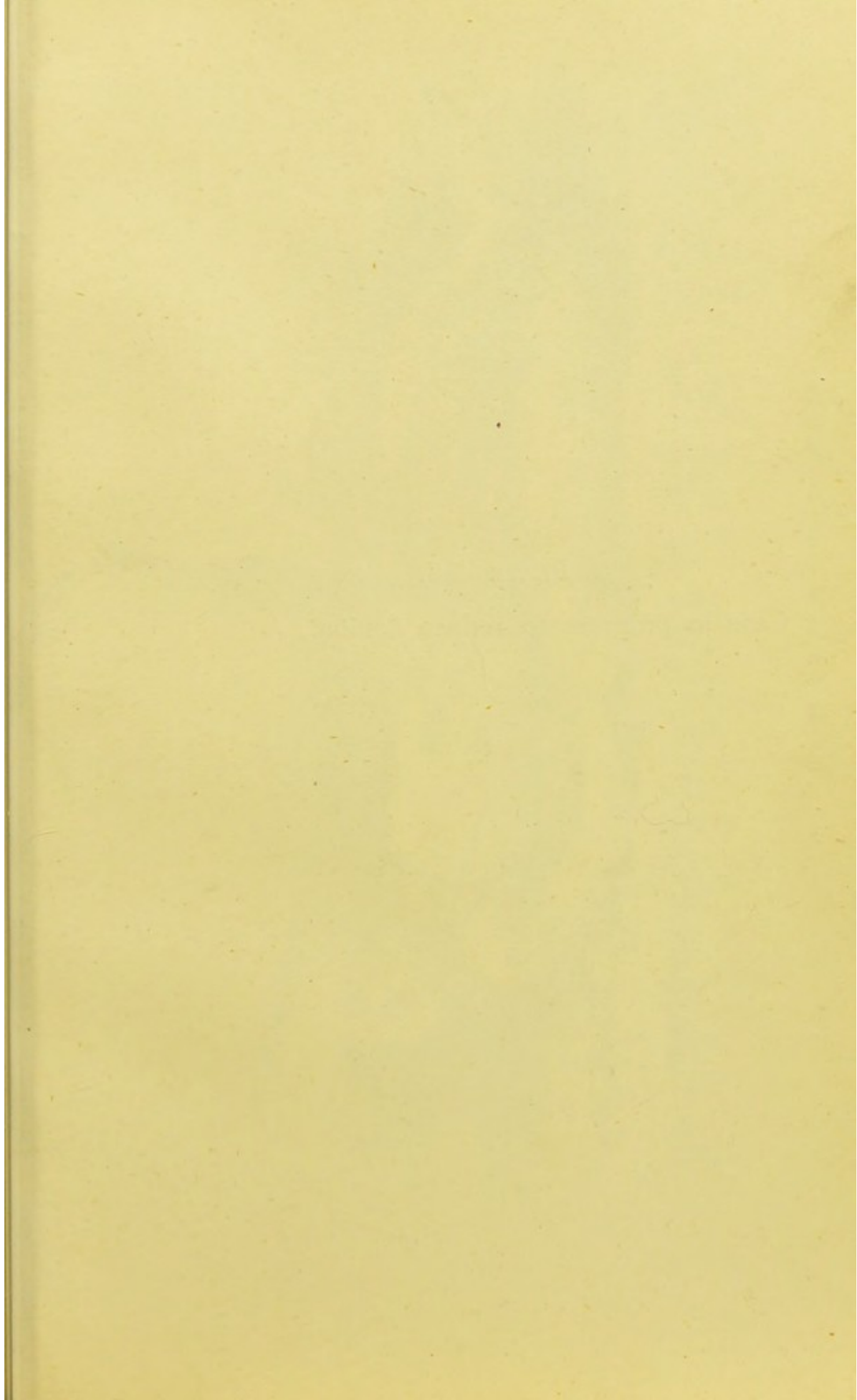


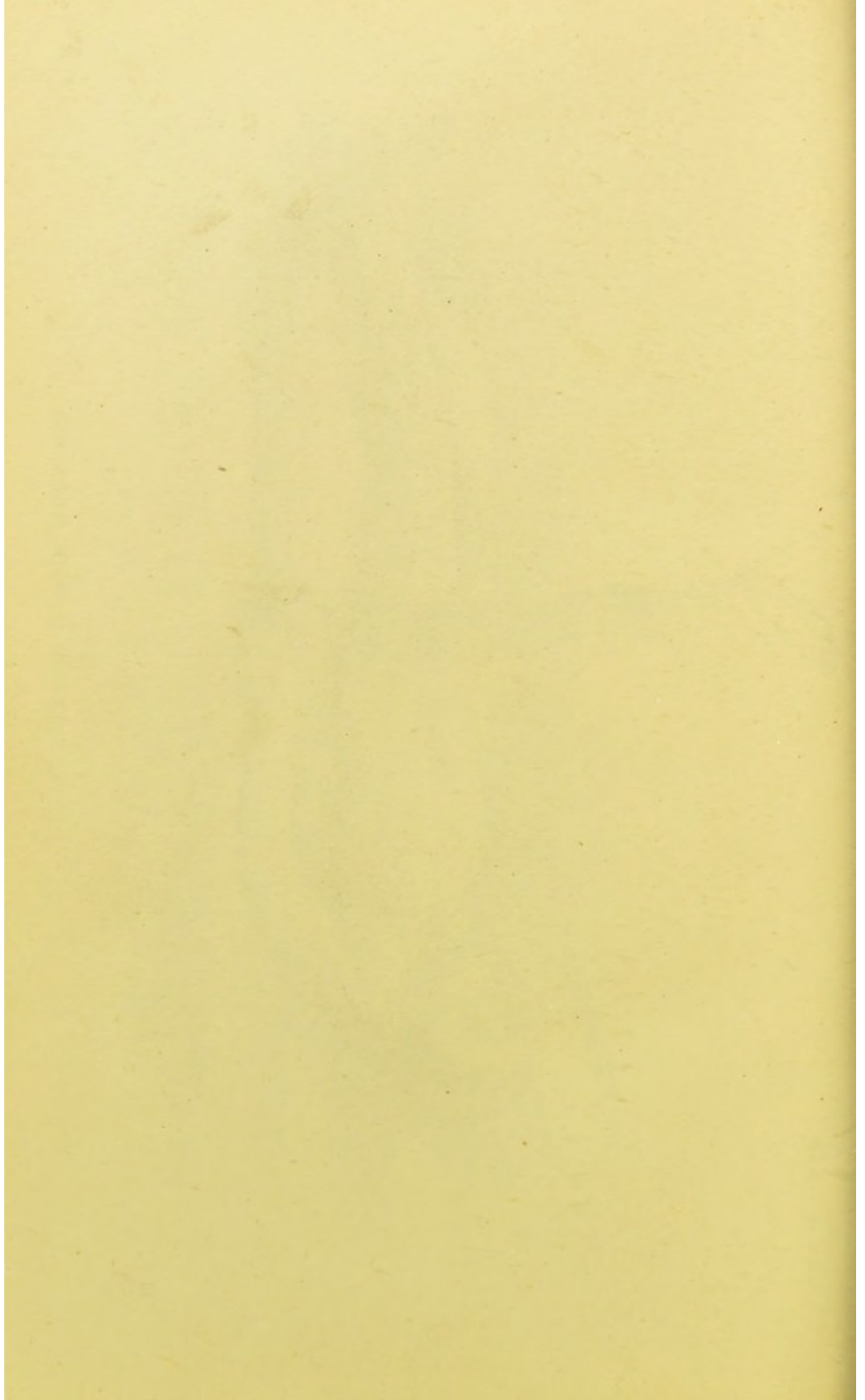
PLATE 14.

Case of sound hip joint, but unreduced deformity  
(flexion.)









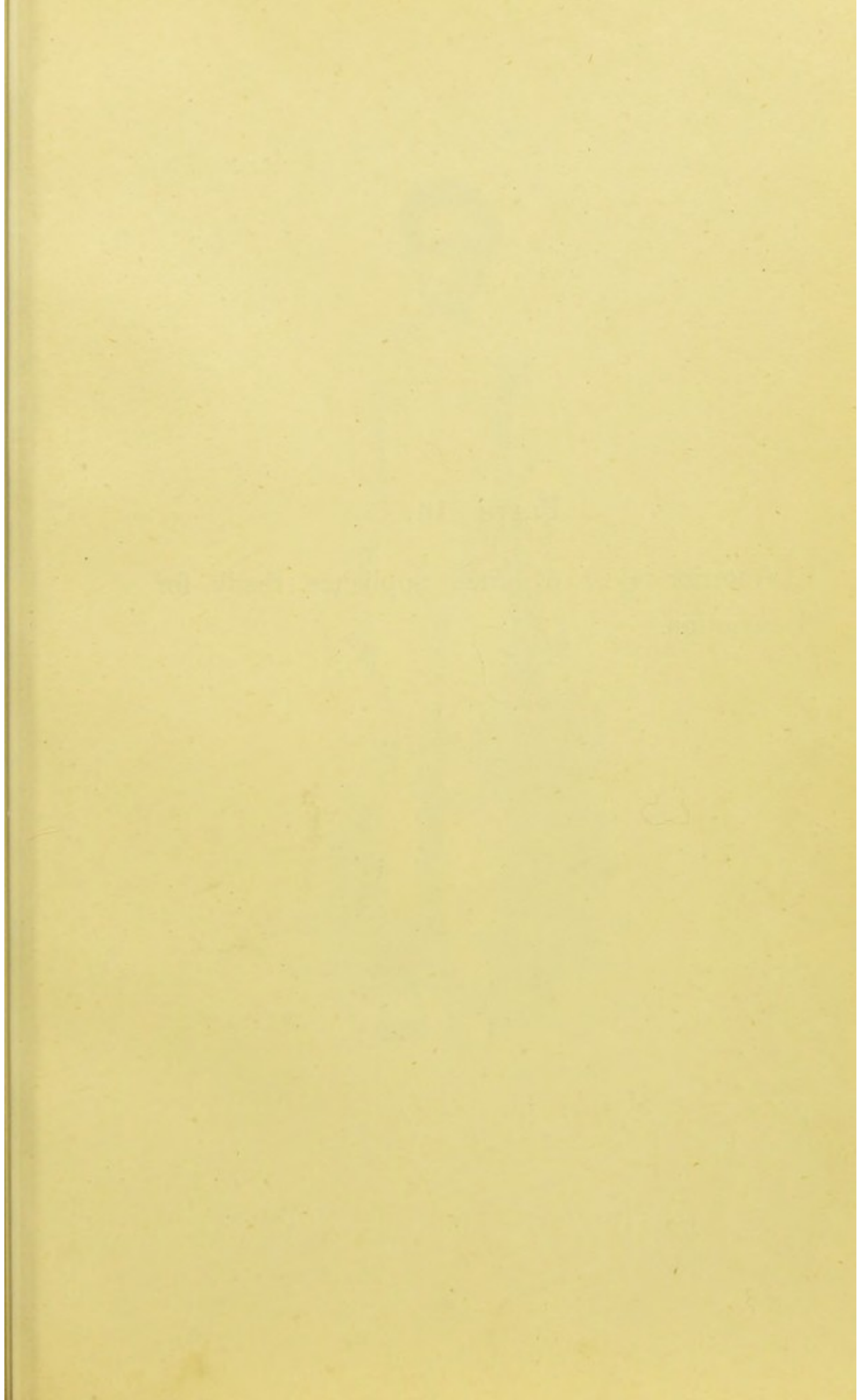
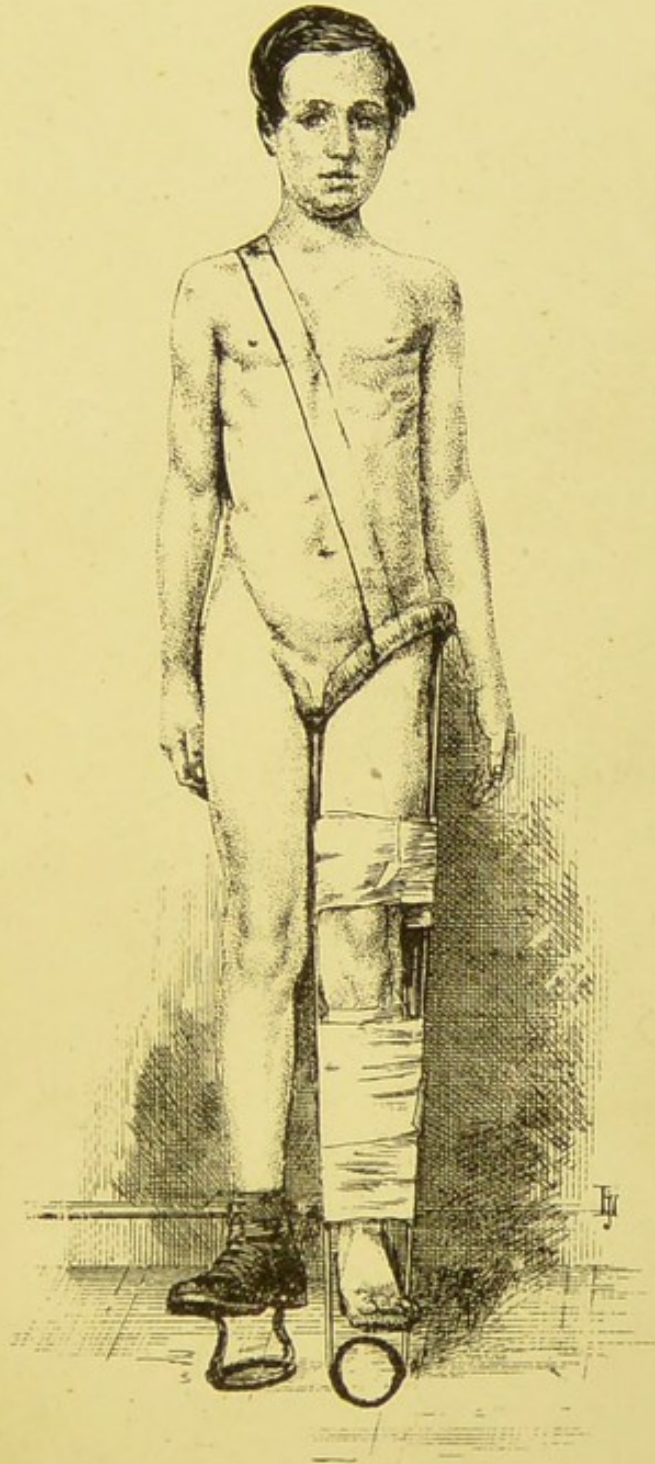
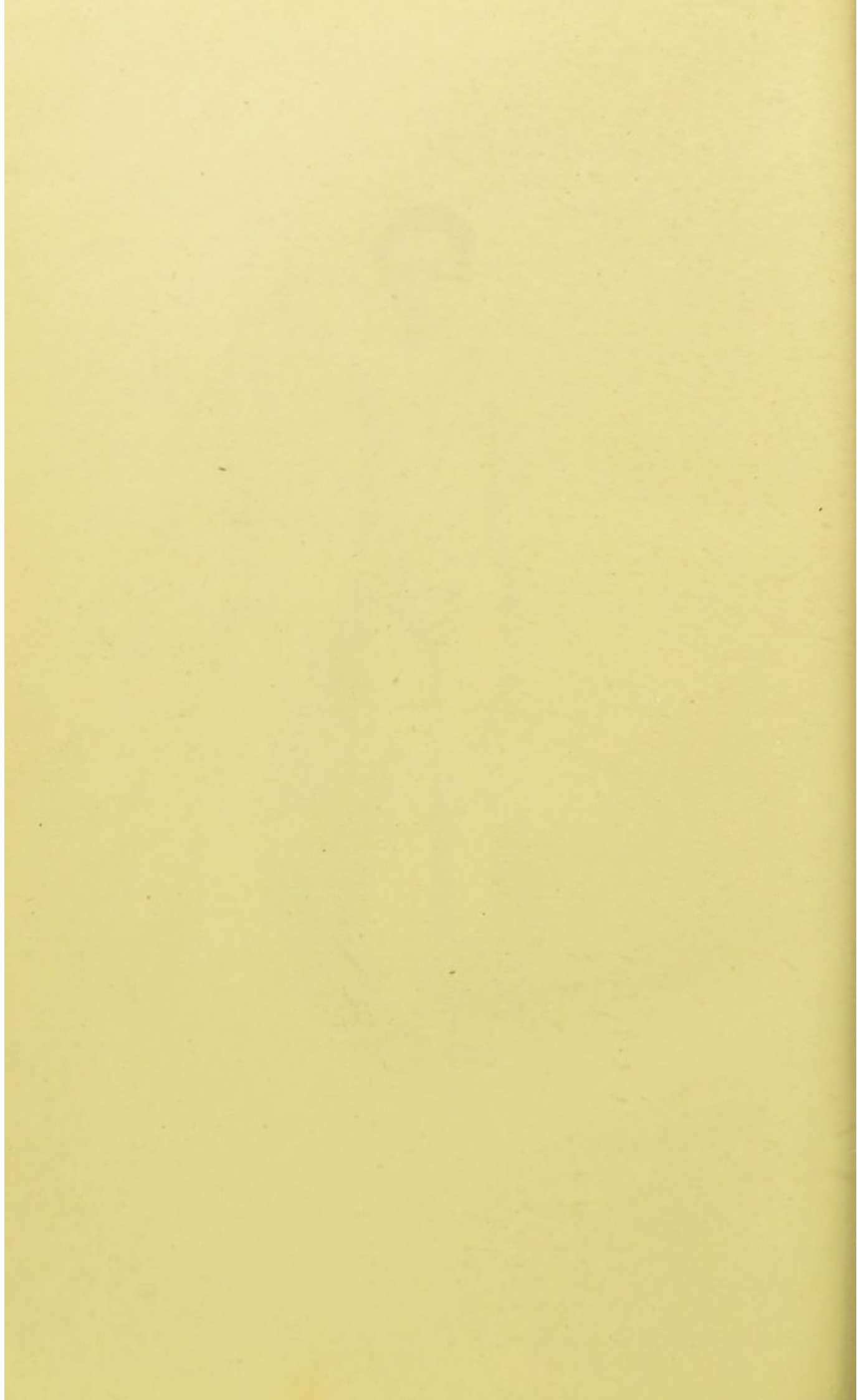


PLATE 16.

Anterior view of knee appliance ready for locomotion.







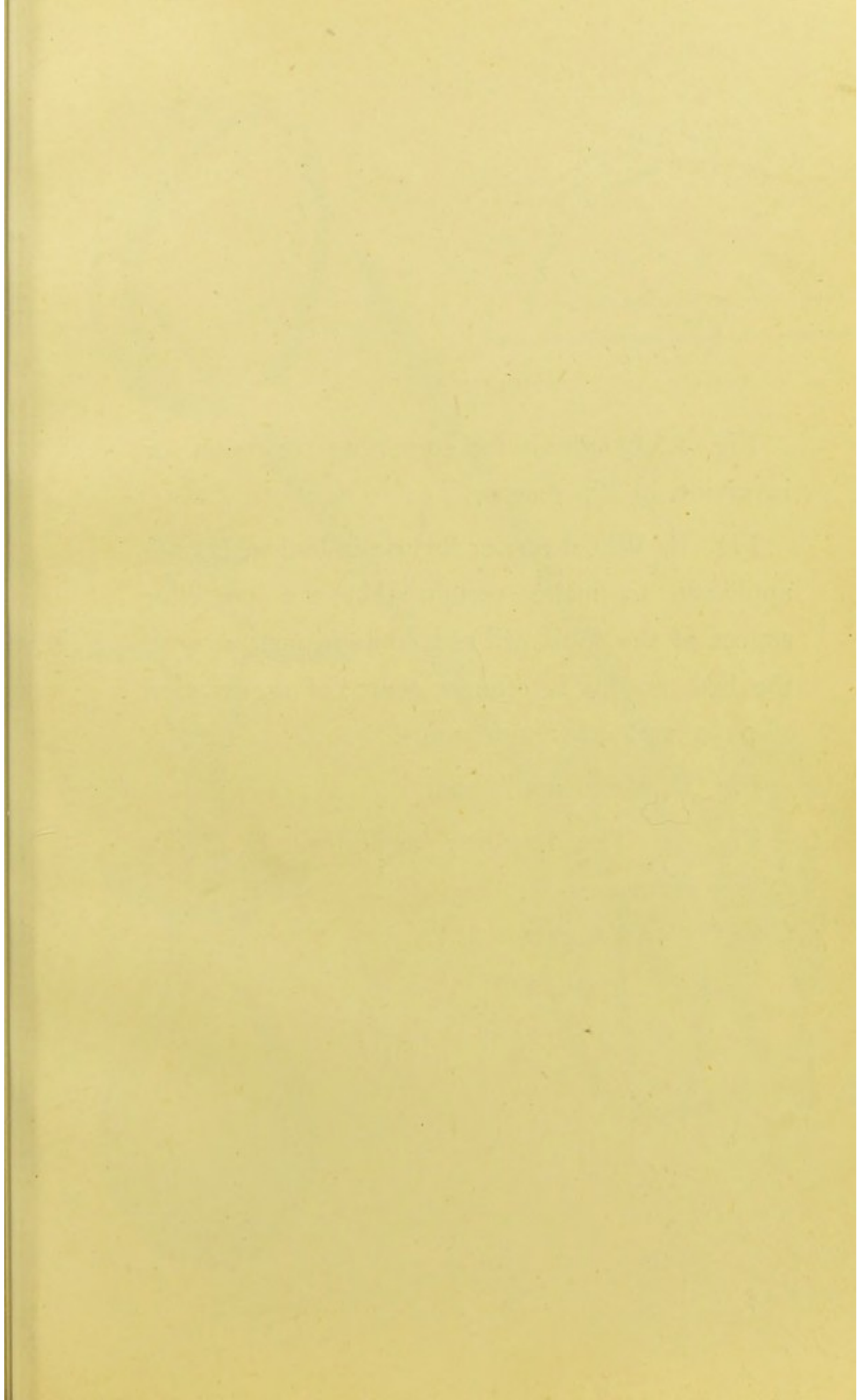


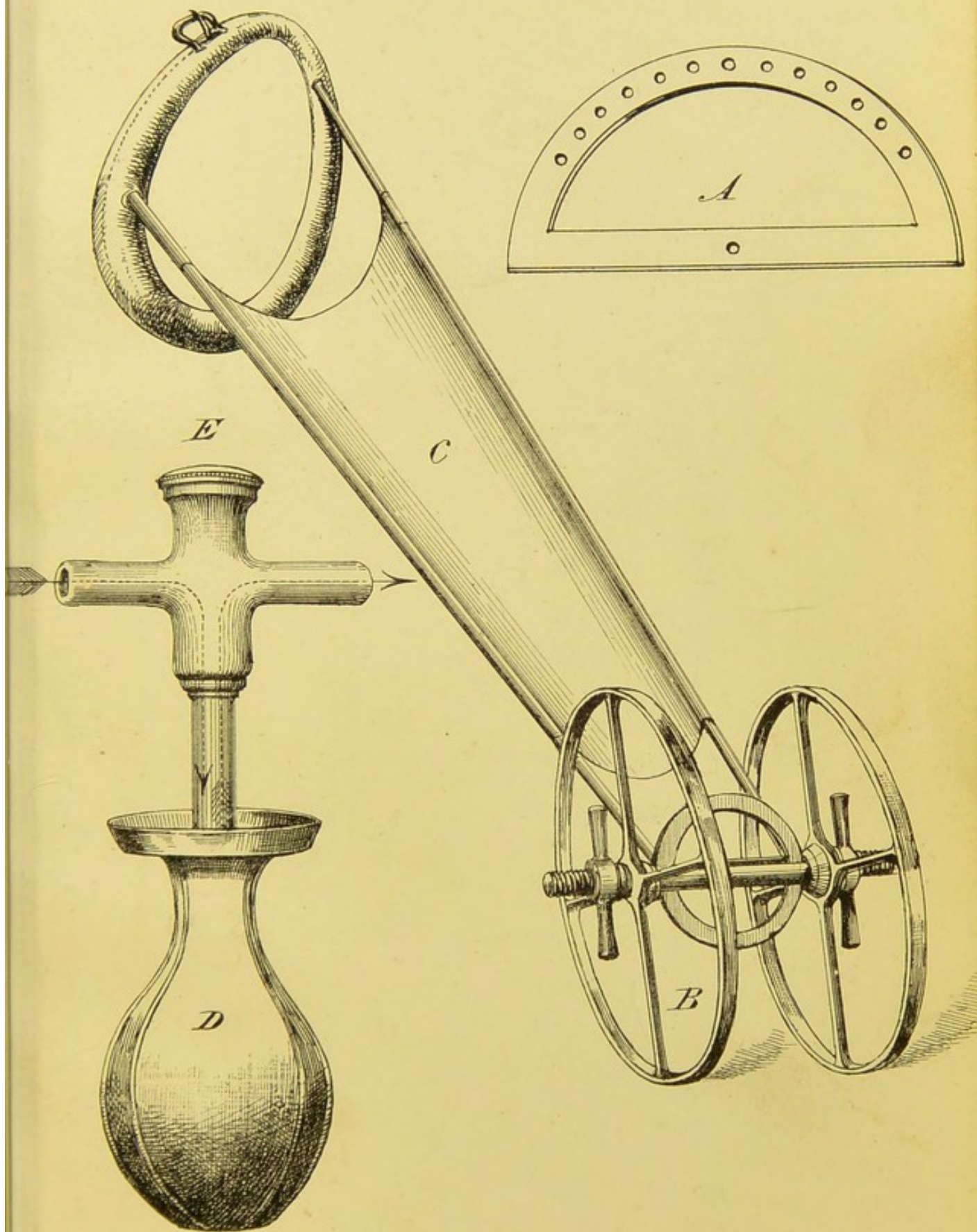
PLATE 17.

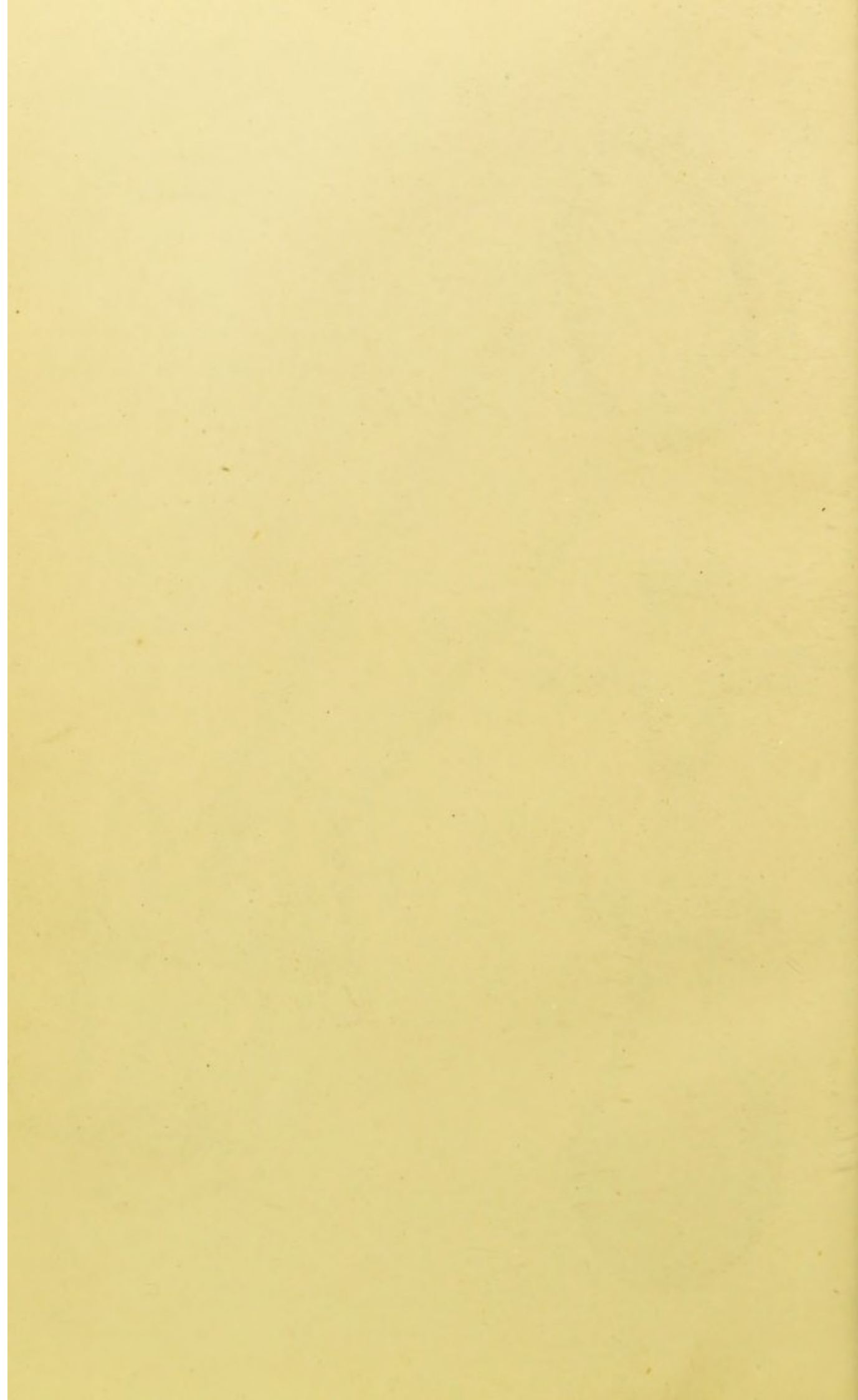
Fig. A, -Quadrant for correcting eversion or inversion in hip disease.

Fig. B, Wheel carrier for use in bed with knee appliance to make certain that the posterior aspect of the limb will not come in contact with the bed, as this is often a source of aggravation of pain and other symptoms.

Fig. C, Knee appliance.

Fig. E, The four-way aspirator. D, India rubber exhaustor.





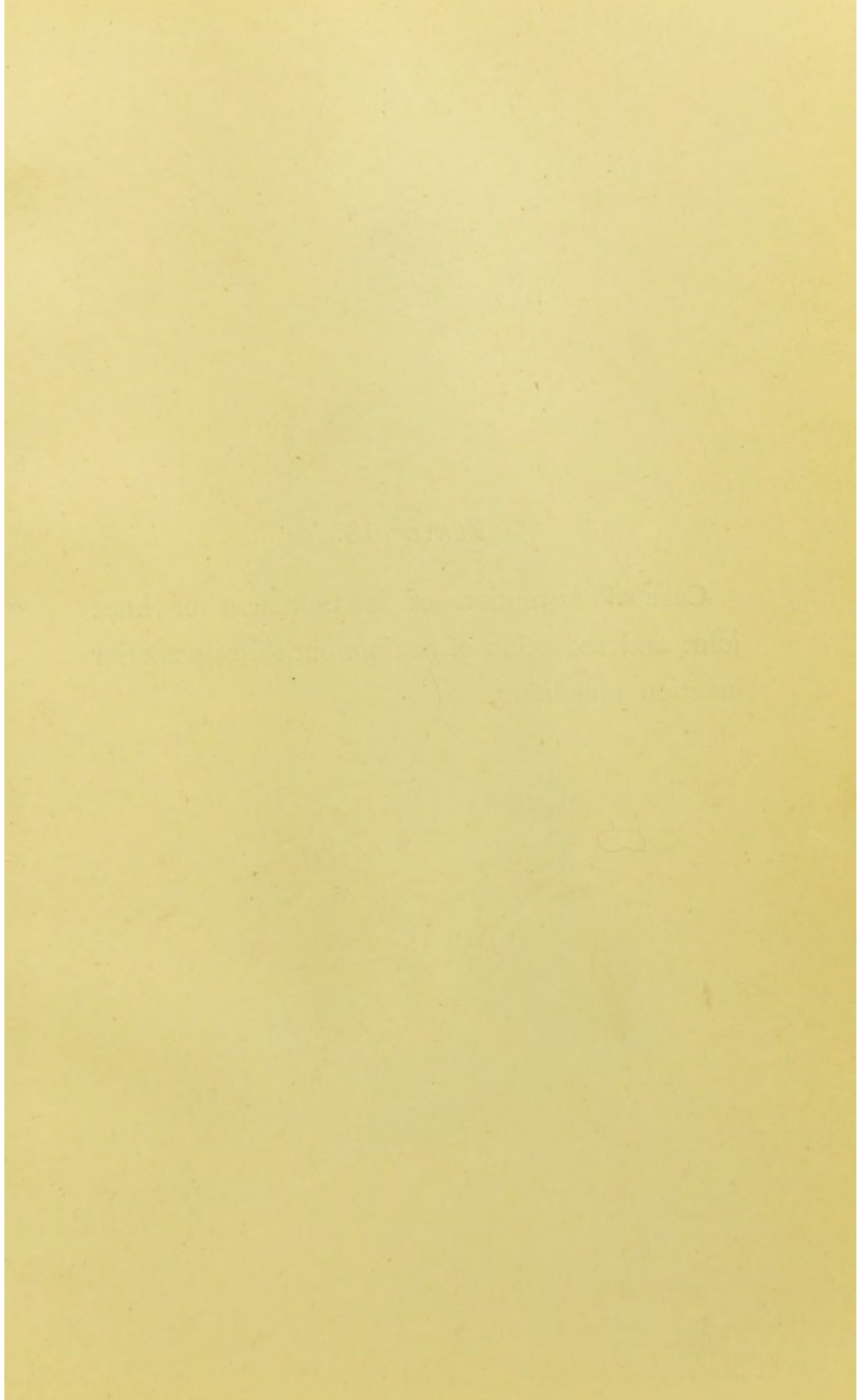
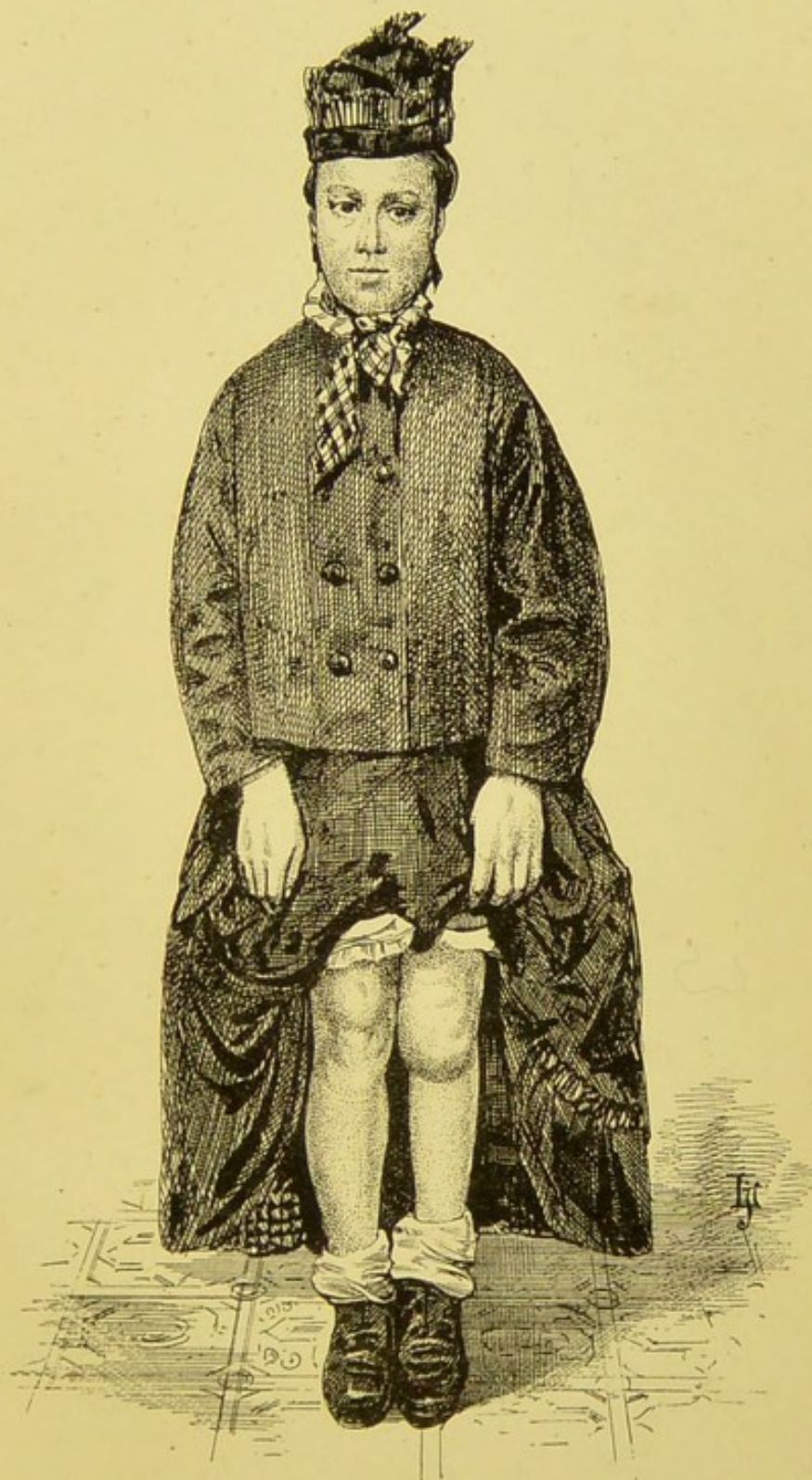
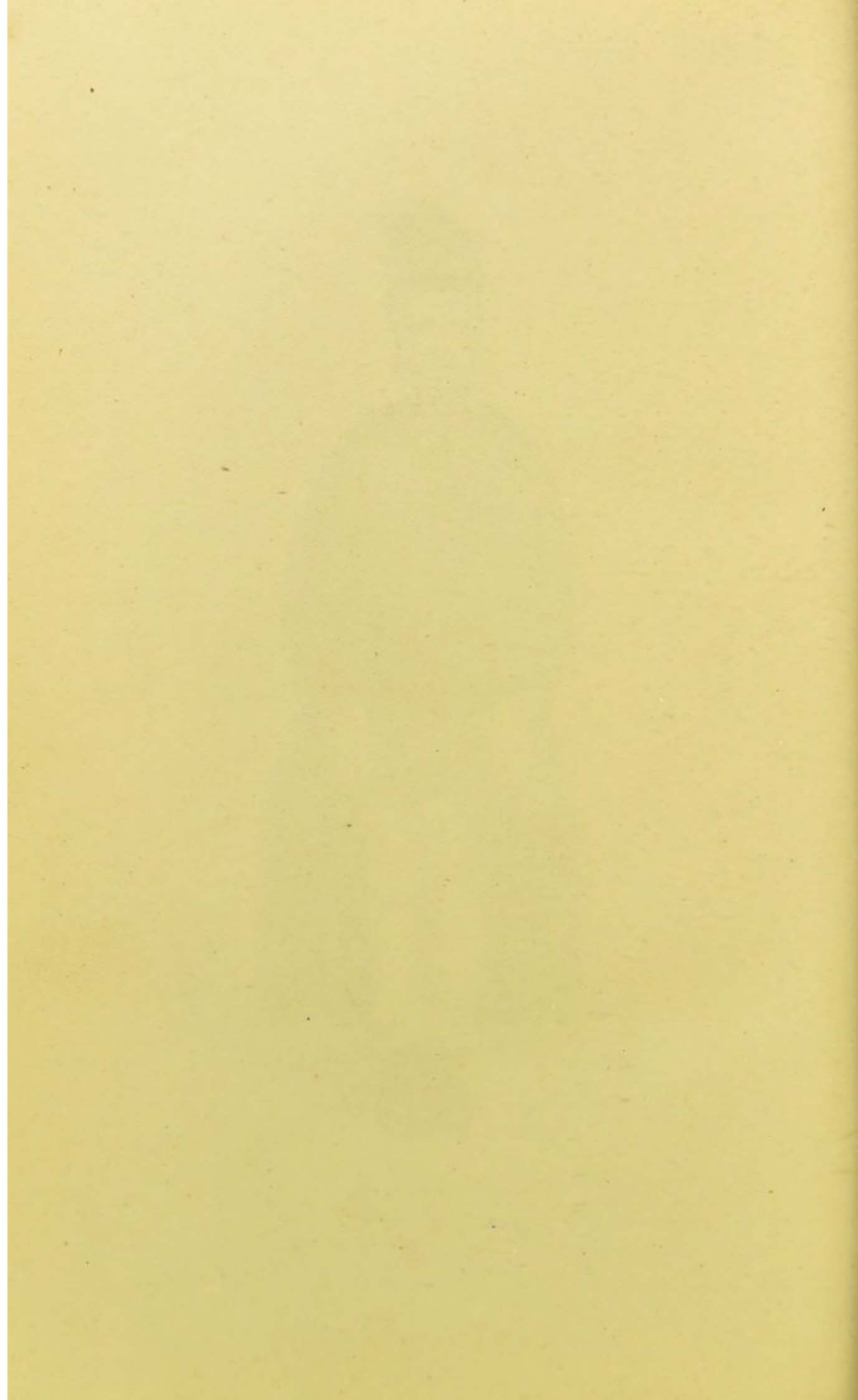


PLATE 18.

Case of resolution of inflammation of knee joint and reduction of flexion, but slight posterior luxation remaining.







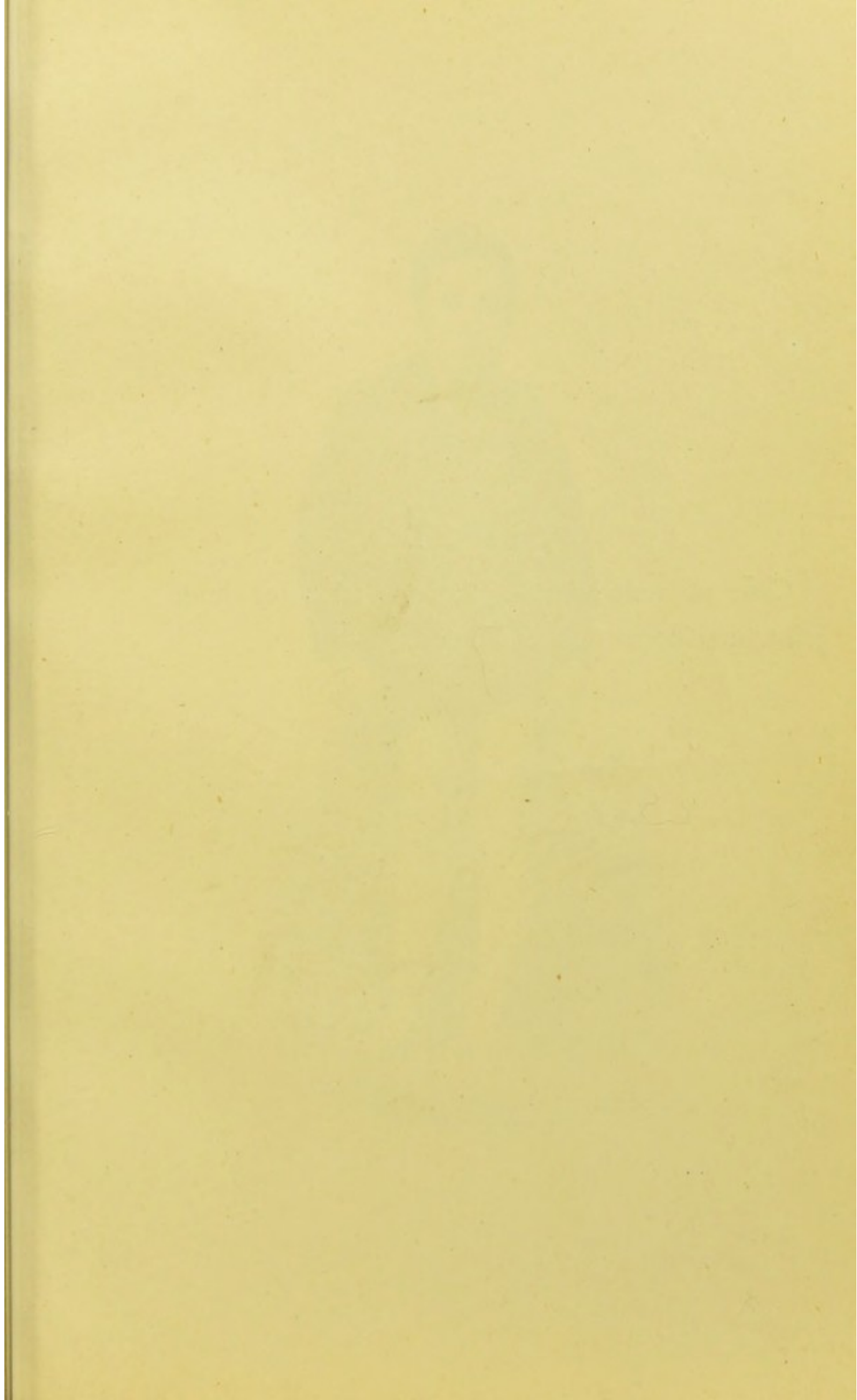
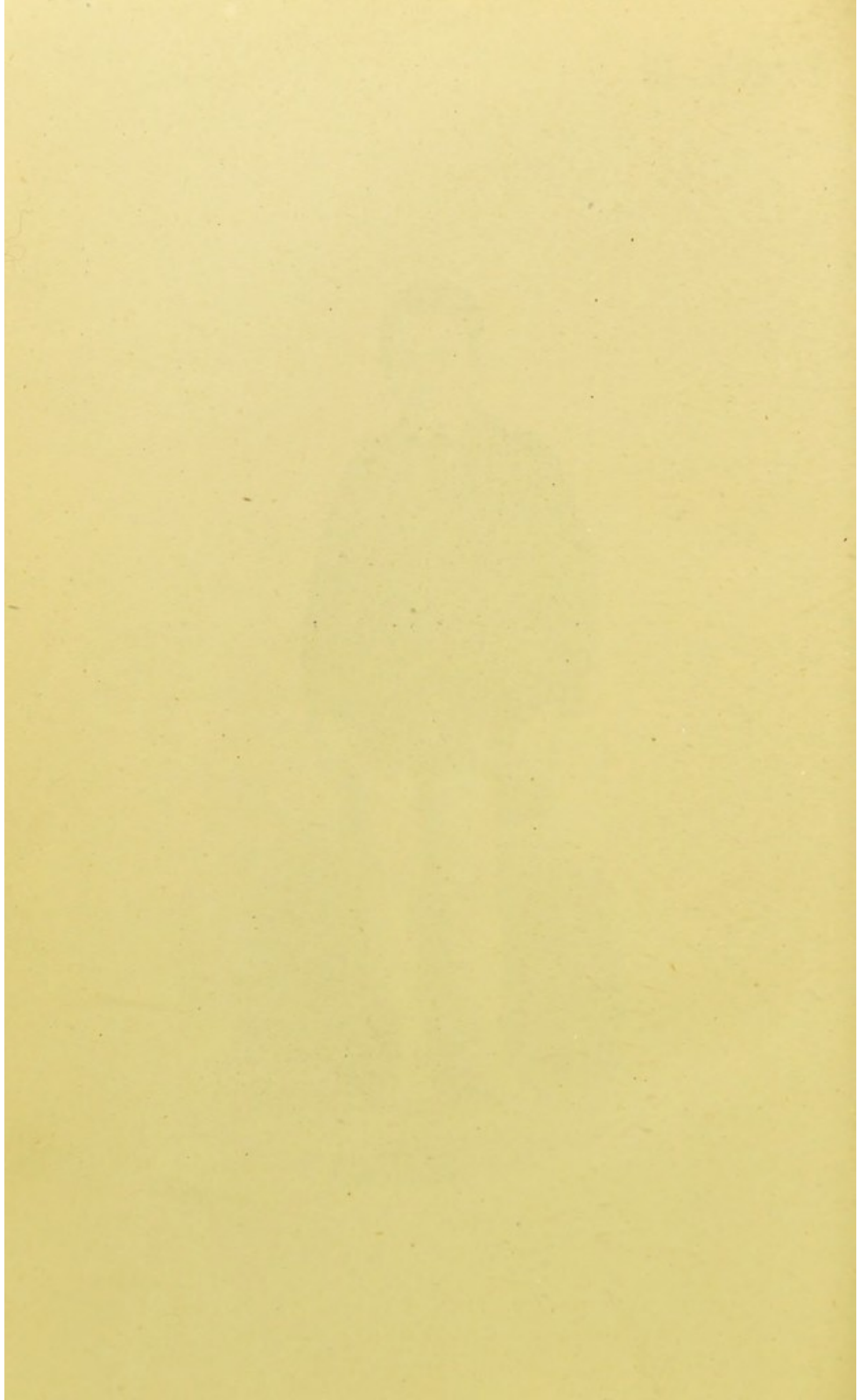


PLATE 19.

Case of reduction of inflammation of knee joint, and correction of flexion.





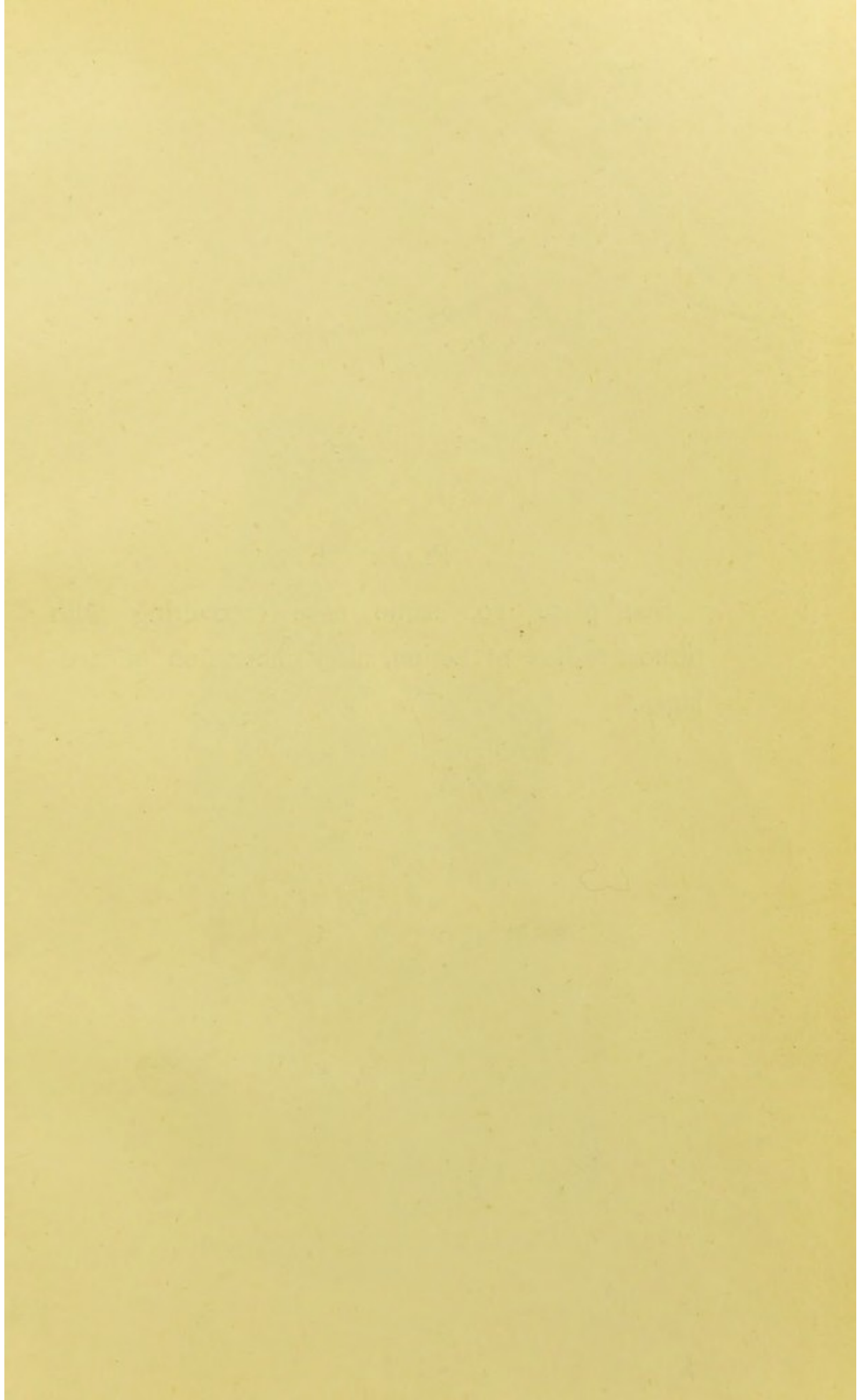
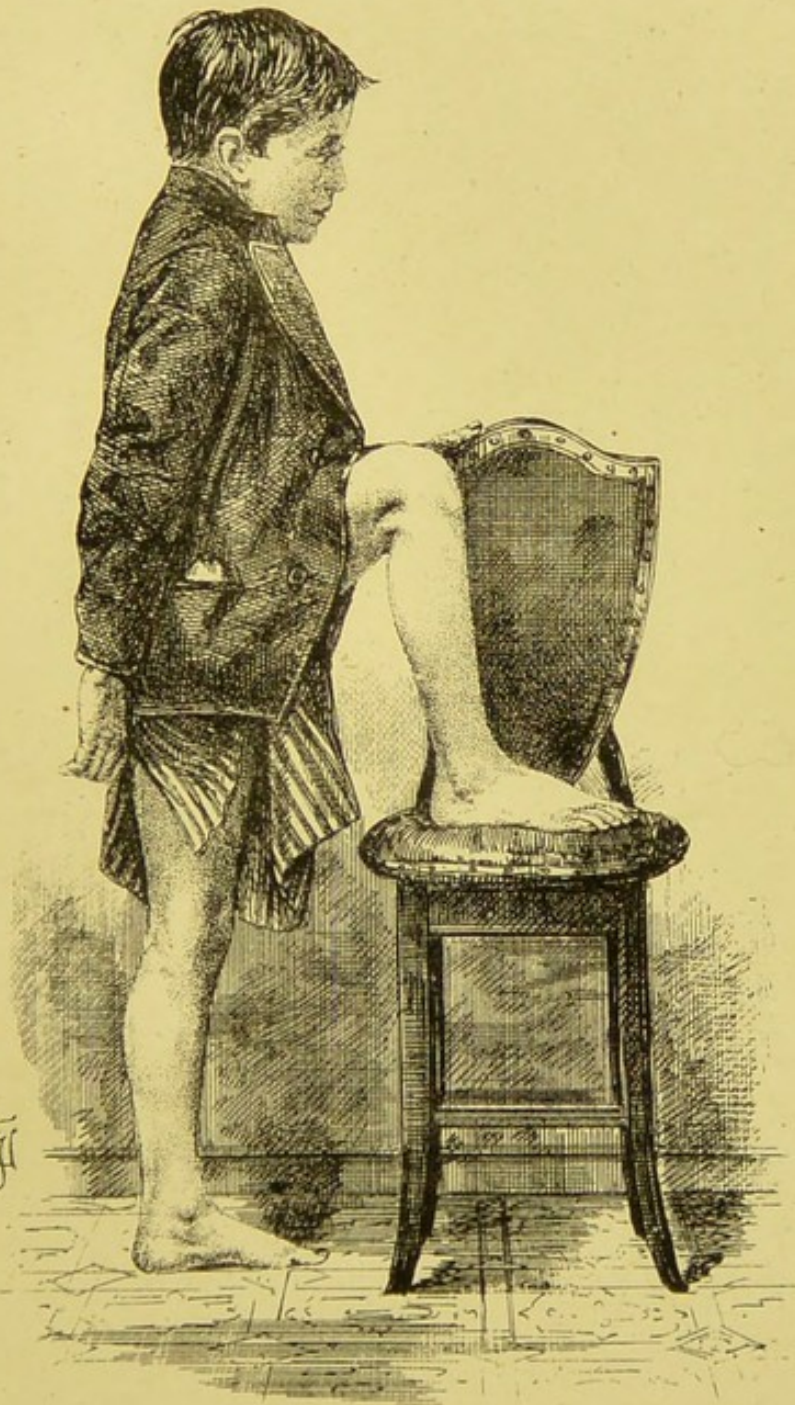
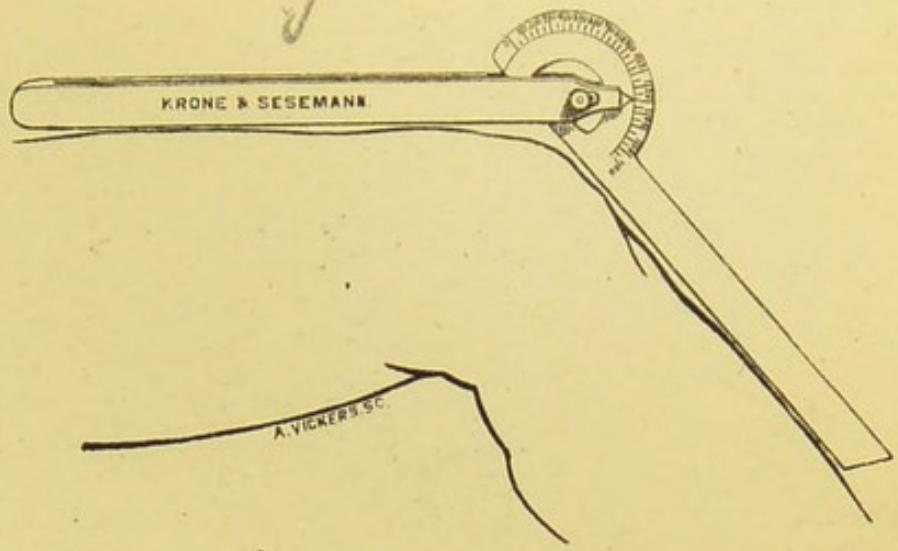


PLATE 20.

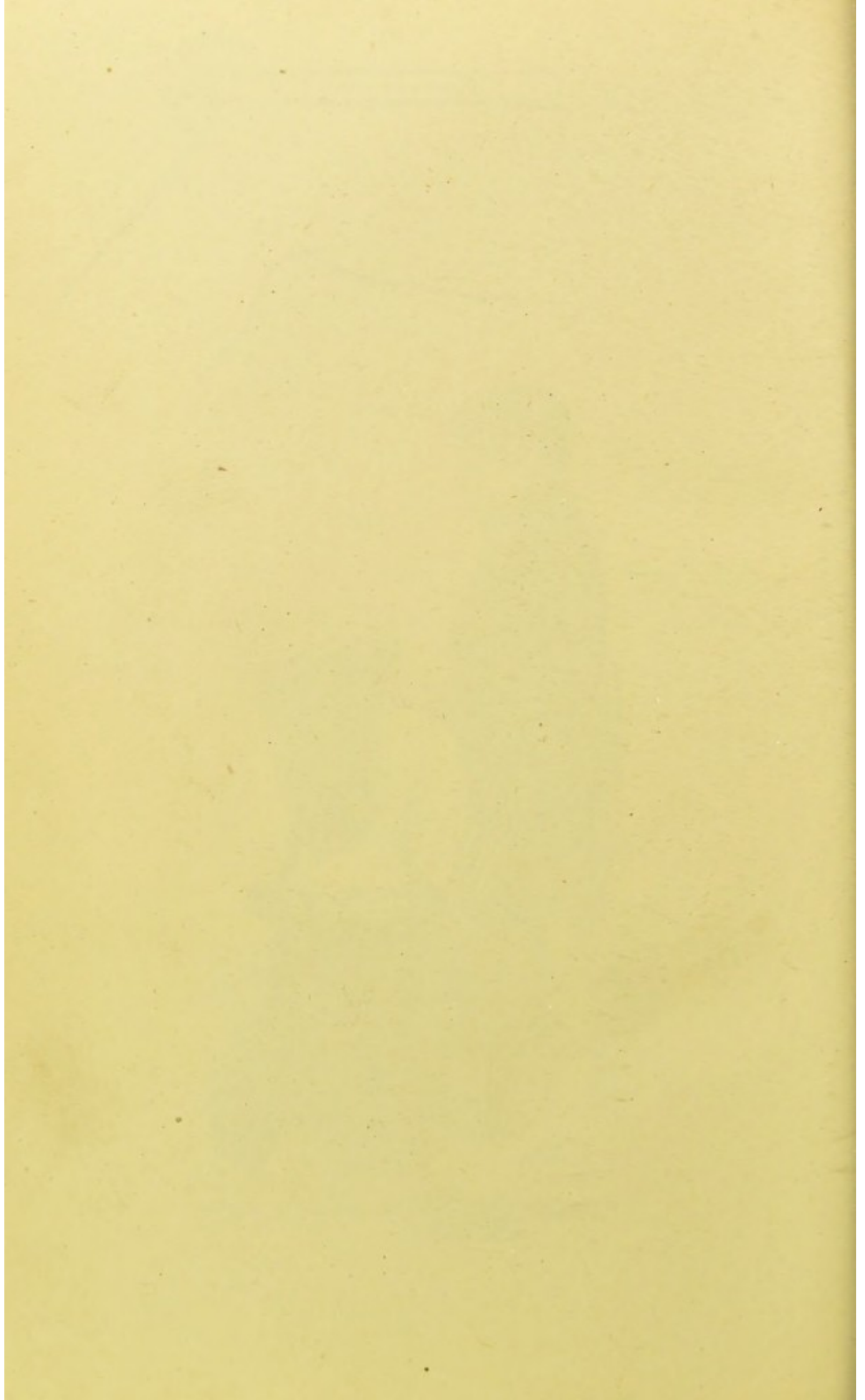
See plate 19, same case recovering with utmost radius of action, after ulceration of cartilages.

*goniometer.*

PLATE 20







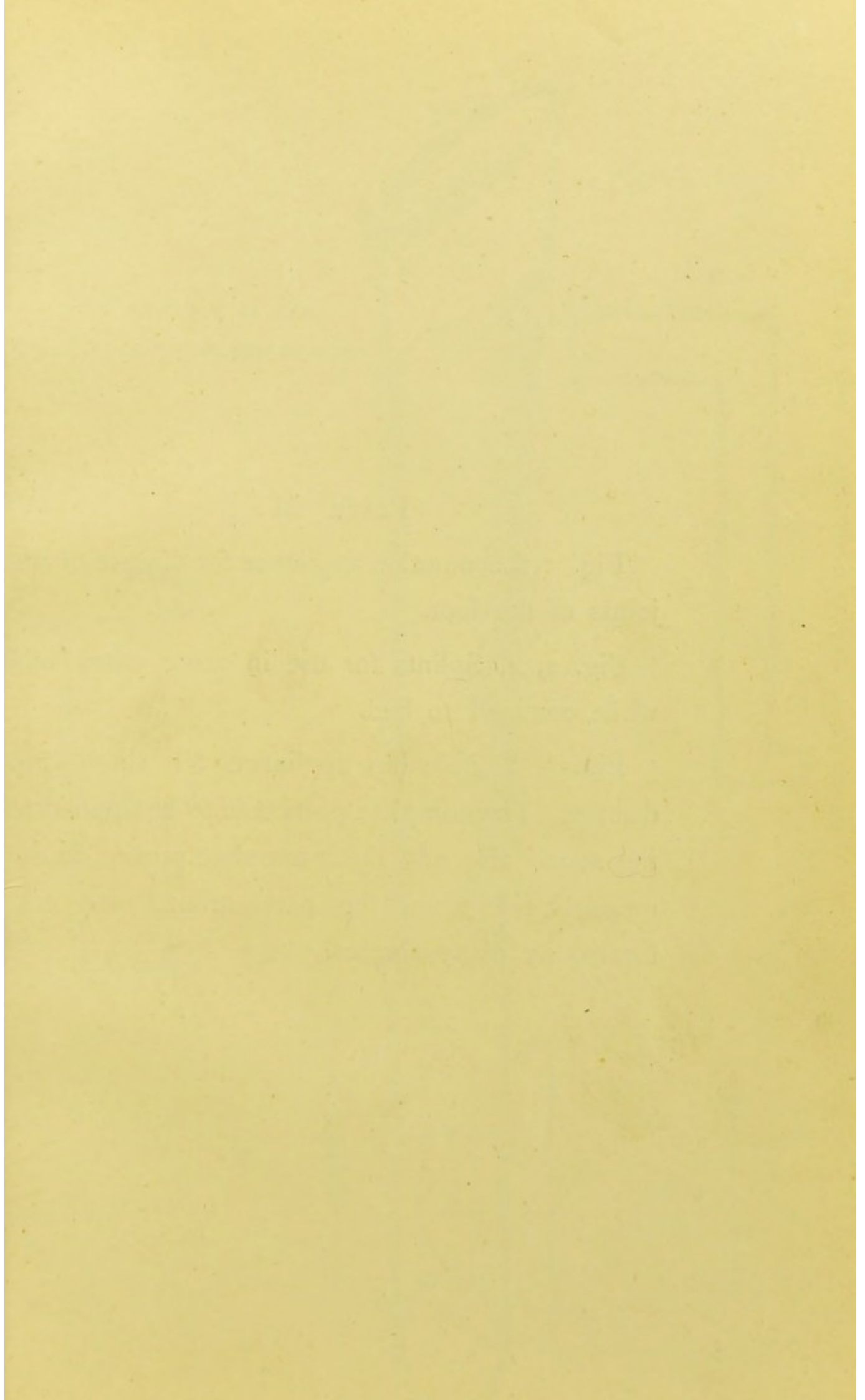
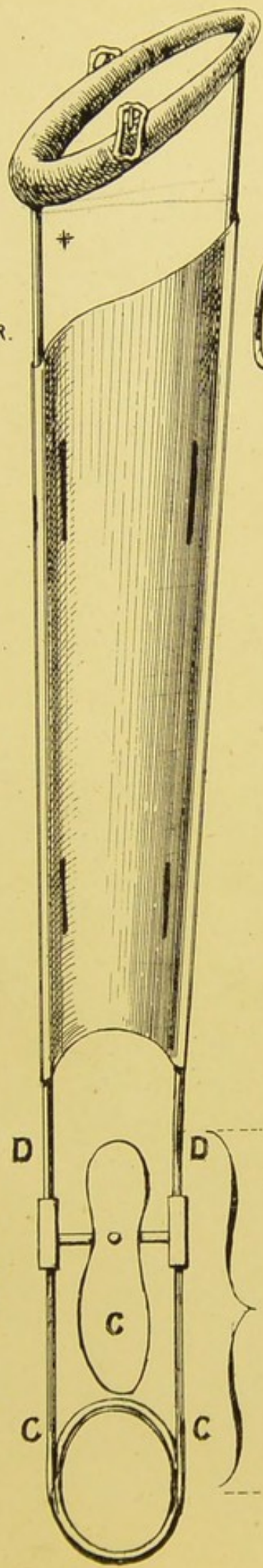


PLATE 21.

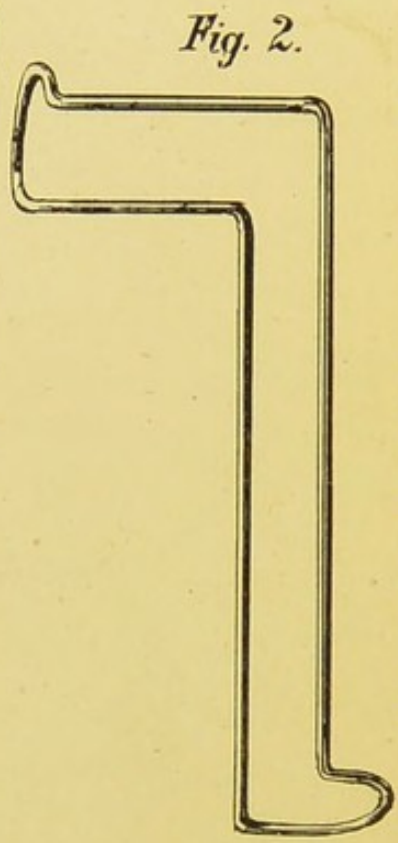
Fig. 1, Locomotion appliance for disease of the joints of the foot.

Fig. 2, 4, Splints for use in acute cases and while confined to bed.

Fig. 3, Double hip appliance for single hip disease. The complete portion is to be applied to the sound side and the incomplete portion to the unsound side when the parts around are perforated by many sinuses.



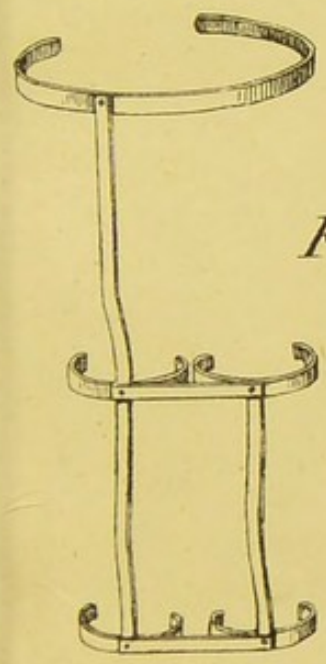
*Fig. 1.*



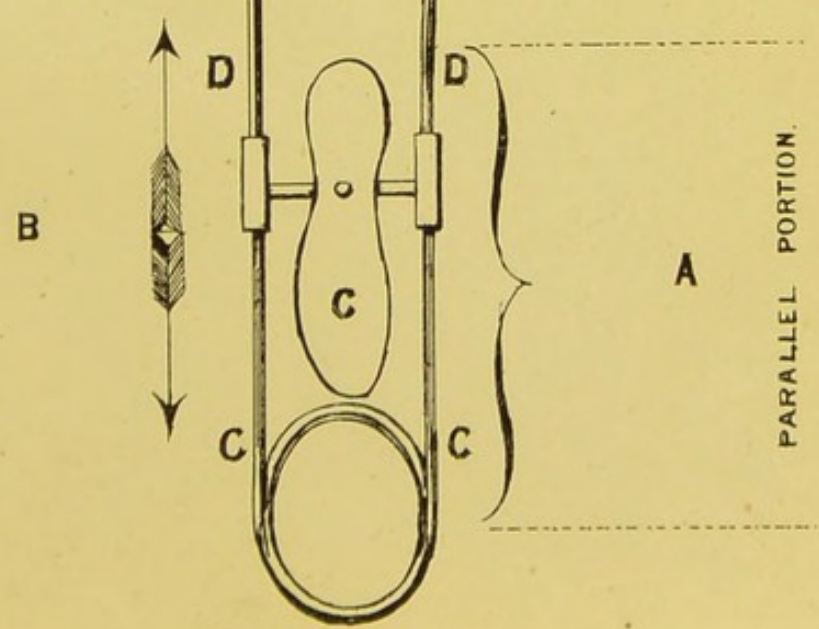
*Fig. 2.*

A WIRE SPLINT FOR THE ACUTE STAGE OF ANKLE DISEASE.

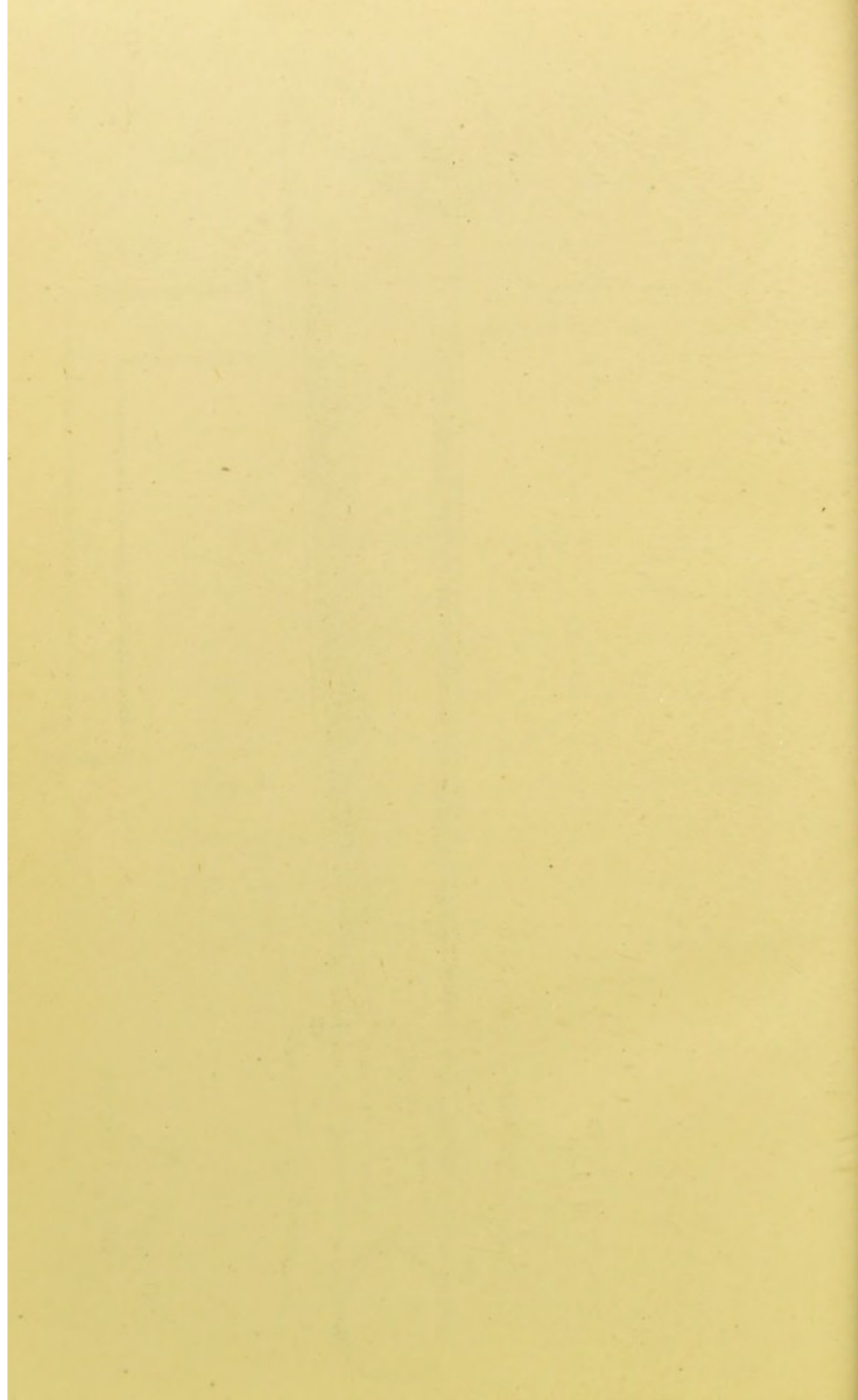
† AN ANGLE OF 55°  
OR IT WILL NOT BE EASY TO WEAR.



*Fig. 3.*



PARALLEL PORTION.



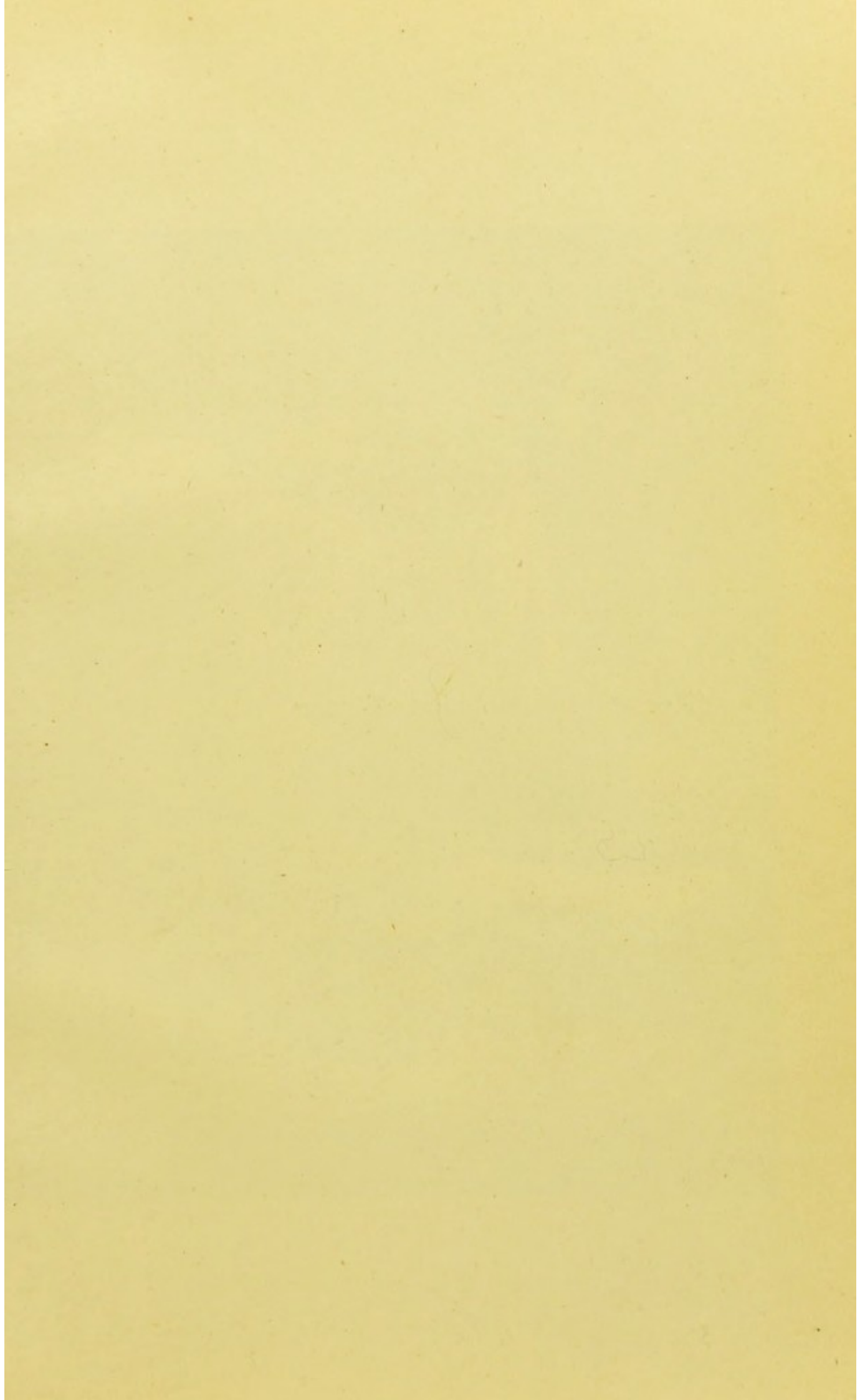
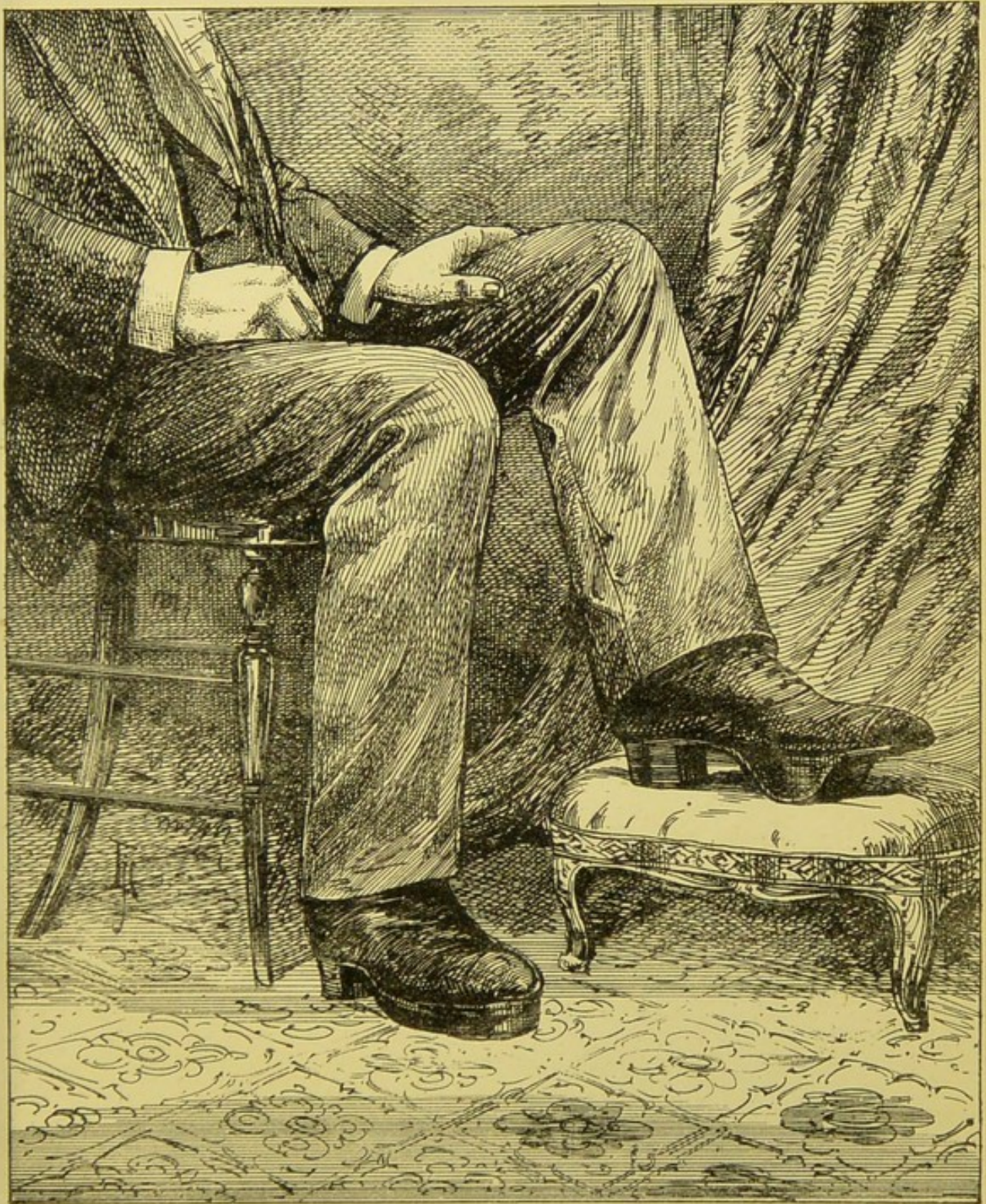


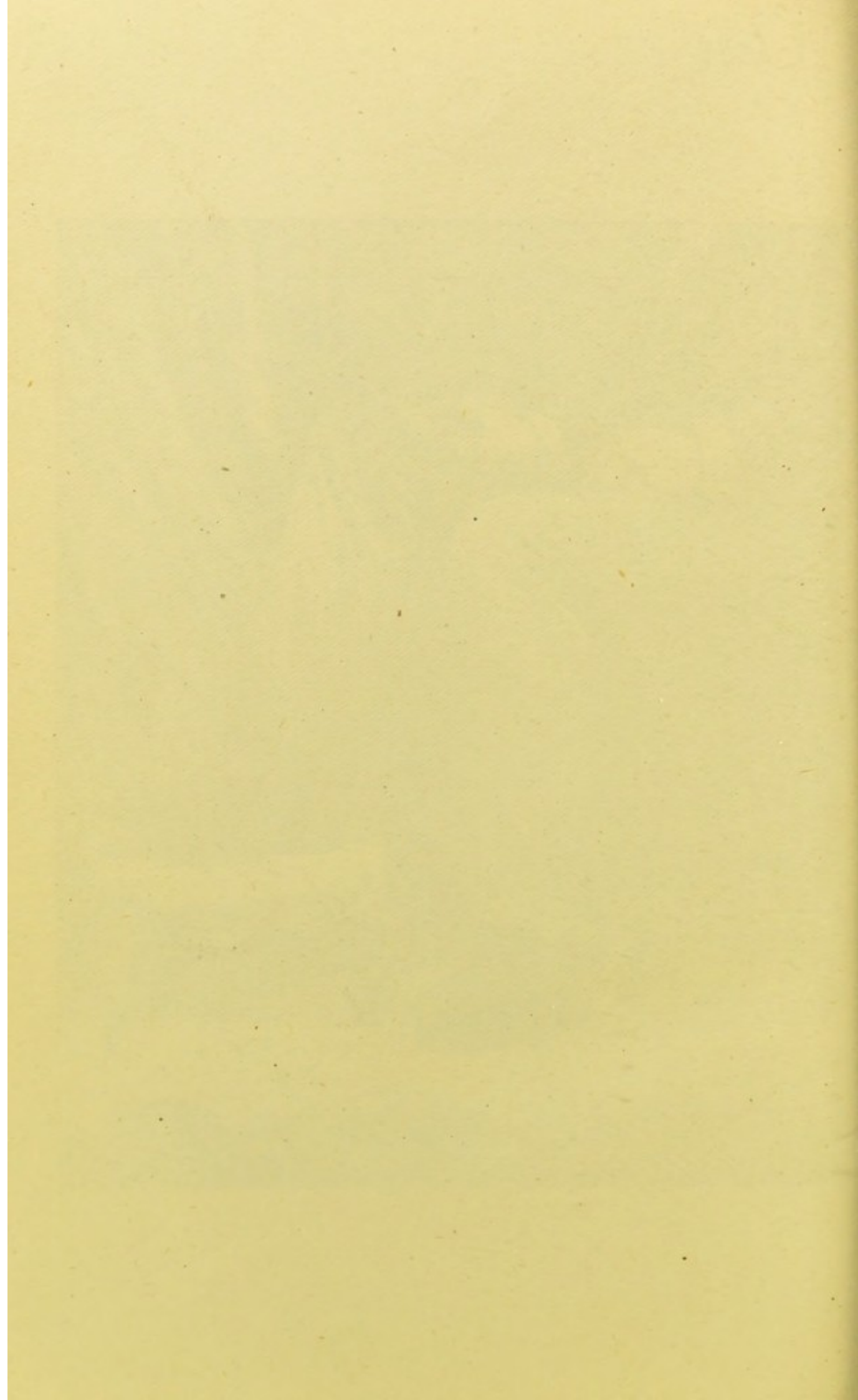
PLATE 22.

Shoe for inflammation of "toe" joints.

PLATE 22







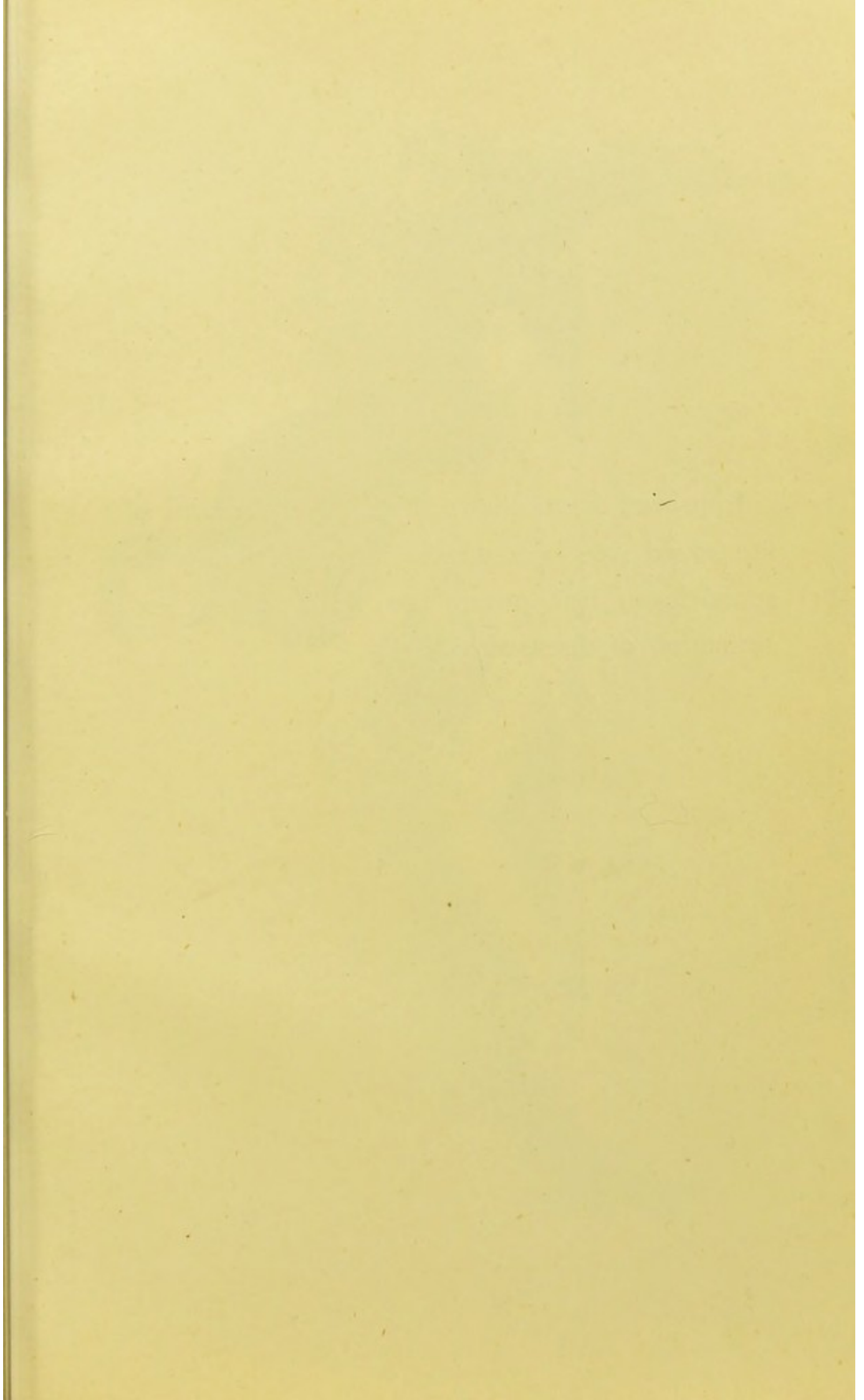
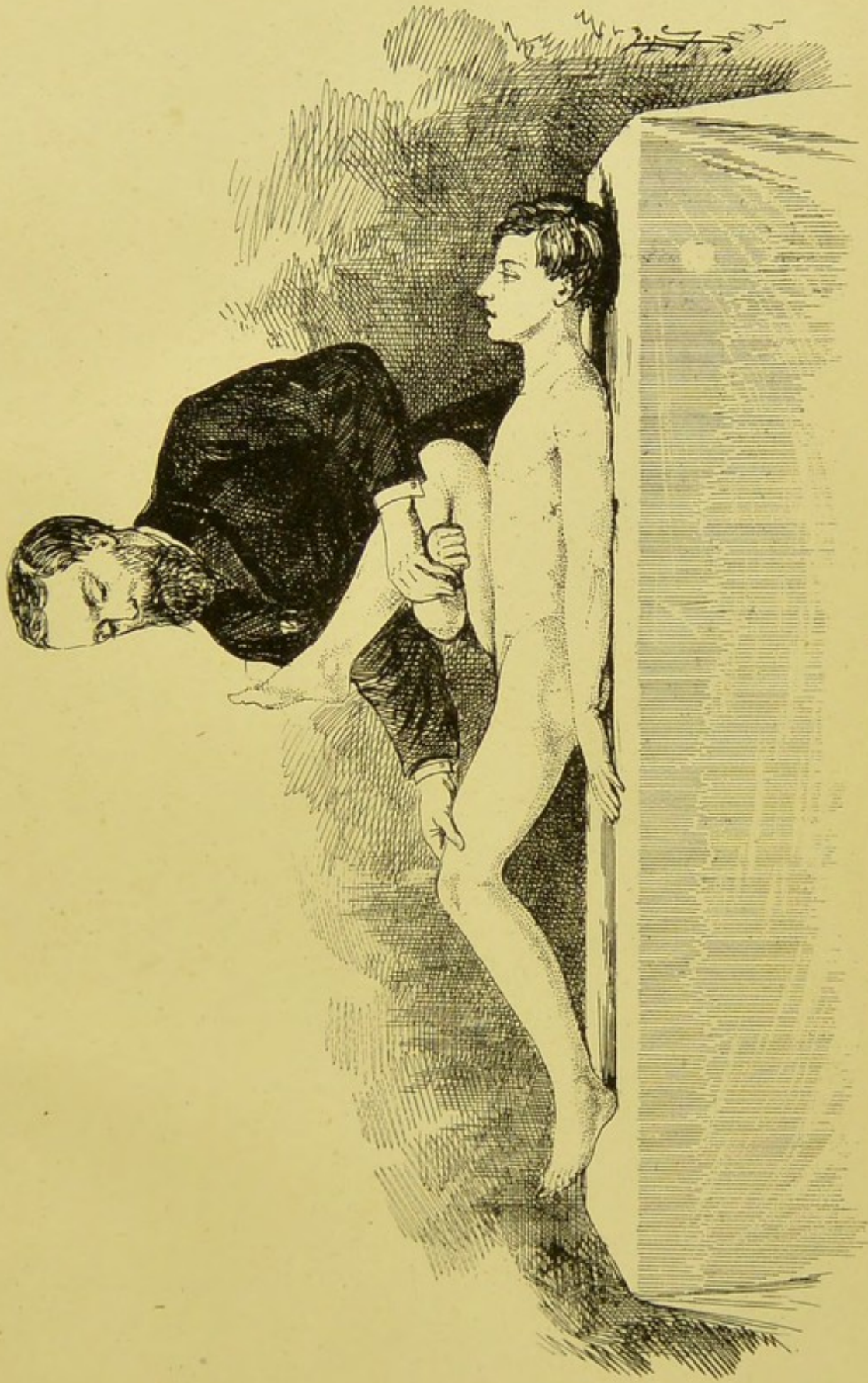


PLATE 23.

Improved diagnostic method. The forearm of the sound side is used as a means of fixing the sound lower limb on to the trunk during examination of diseased side.



IMPROVED POSITION OF THE DIAGNOSTIC METHOD.

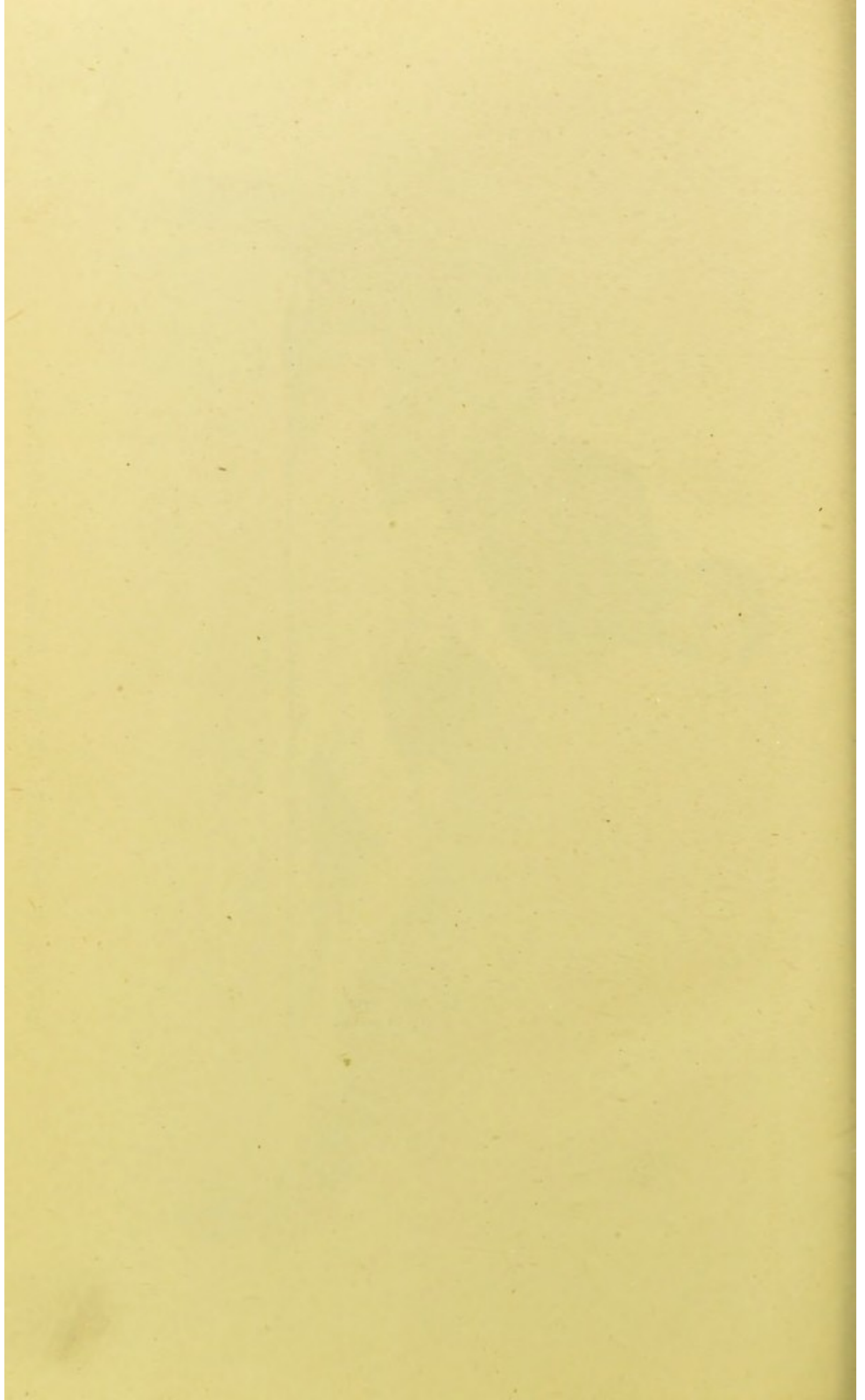




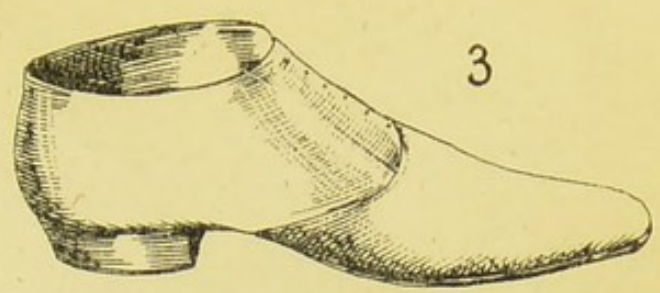
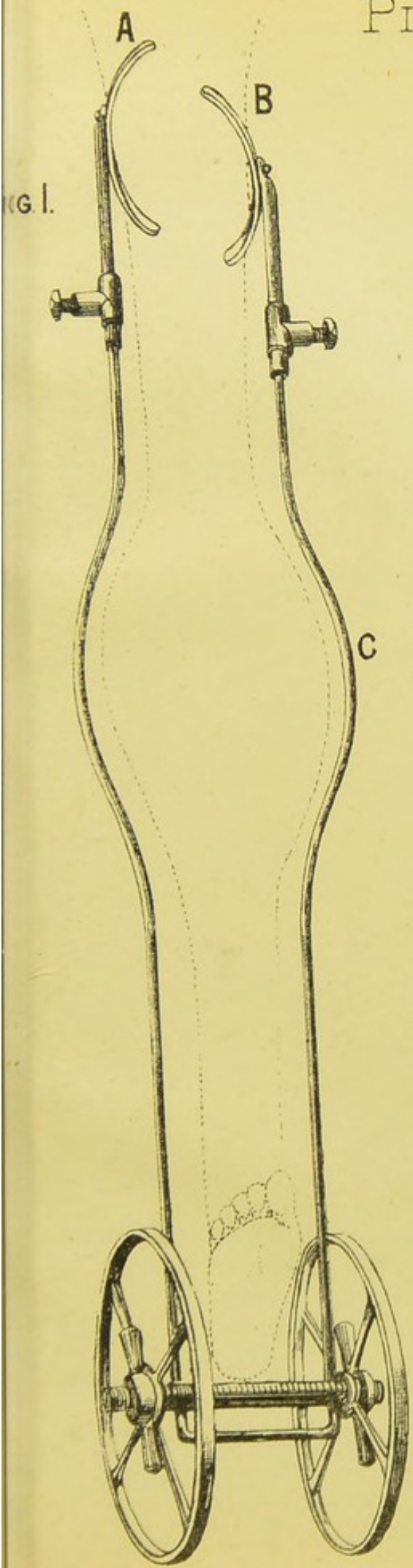
PLATE 24.

Fig. 1, Open knee appliance in cases when the knee is so enlarged that the ring of the knee apparatus is too small to pass over it. B semi-circle is applied to the inner aspect of the thigh close to groin. The length of the stem can be regulated by the screw; the semi-circle A is to be applied just above the great trochanter, both semi-circles being softly padded.

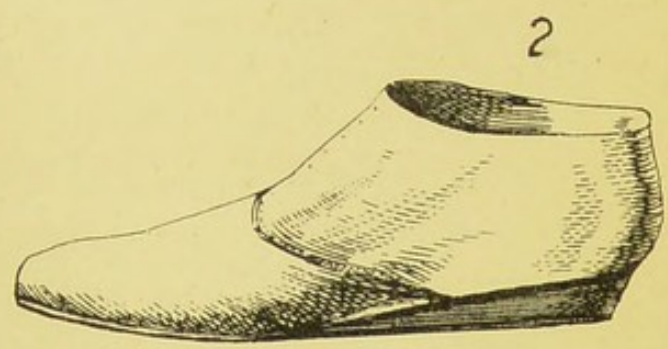
Figs. 2, 3, 4 and 5, represent shoes for splay feet before or after operation.

Fig. 6, Caliper splint for knee joint.

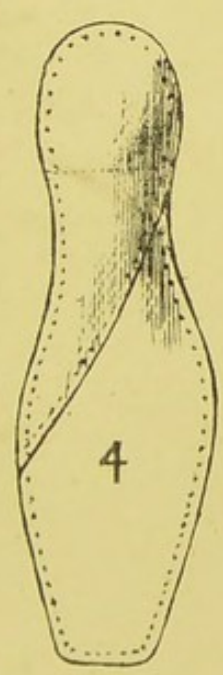
PLATE 24



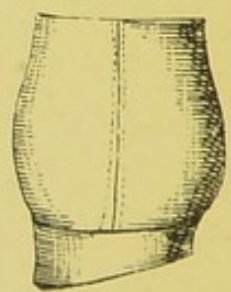
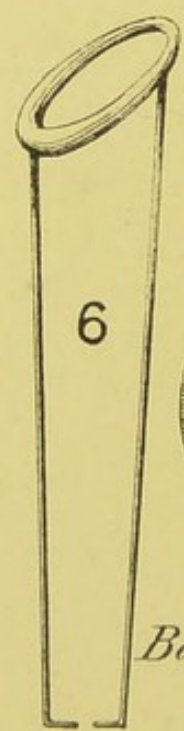
*Outer side of right shoe.*



*Inner side of right shoe.*

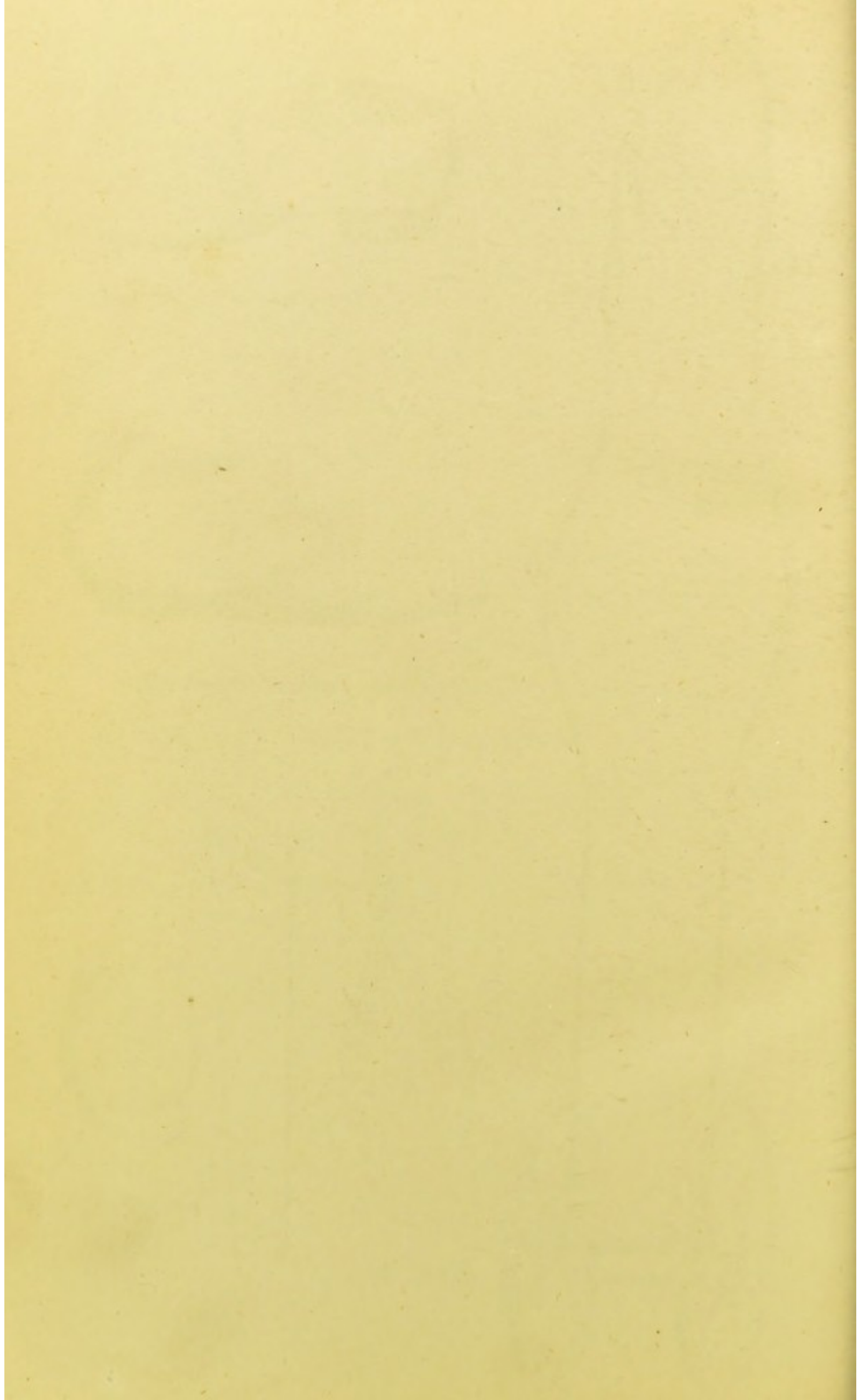


*Right sole.*



*Back of right heel.*





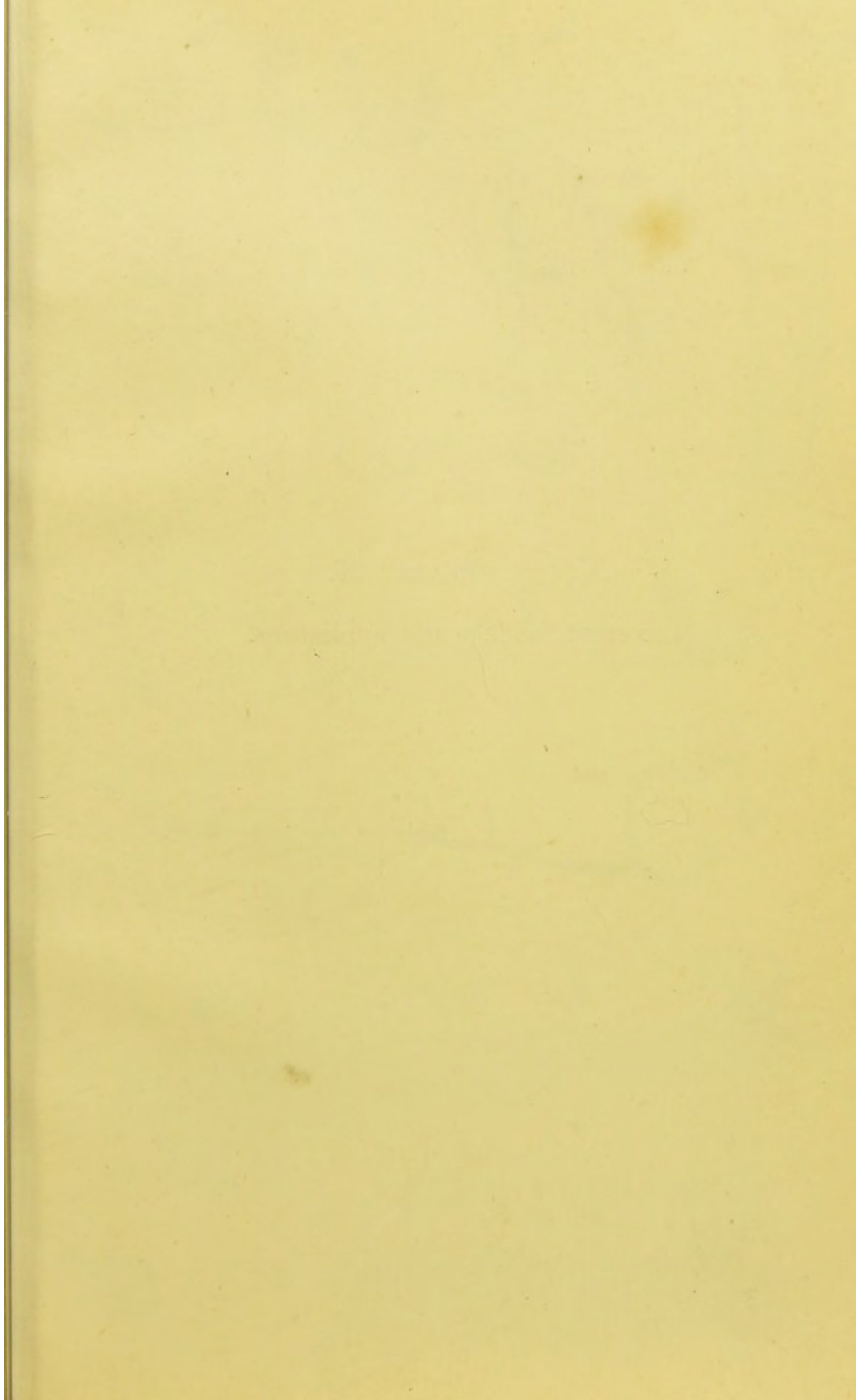
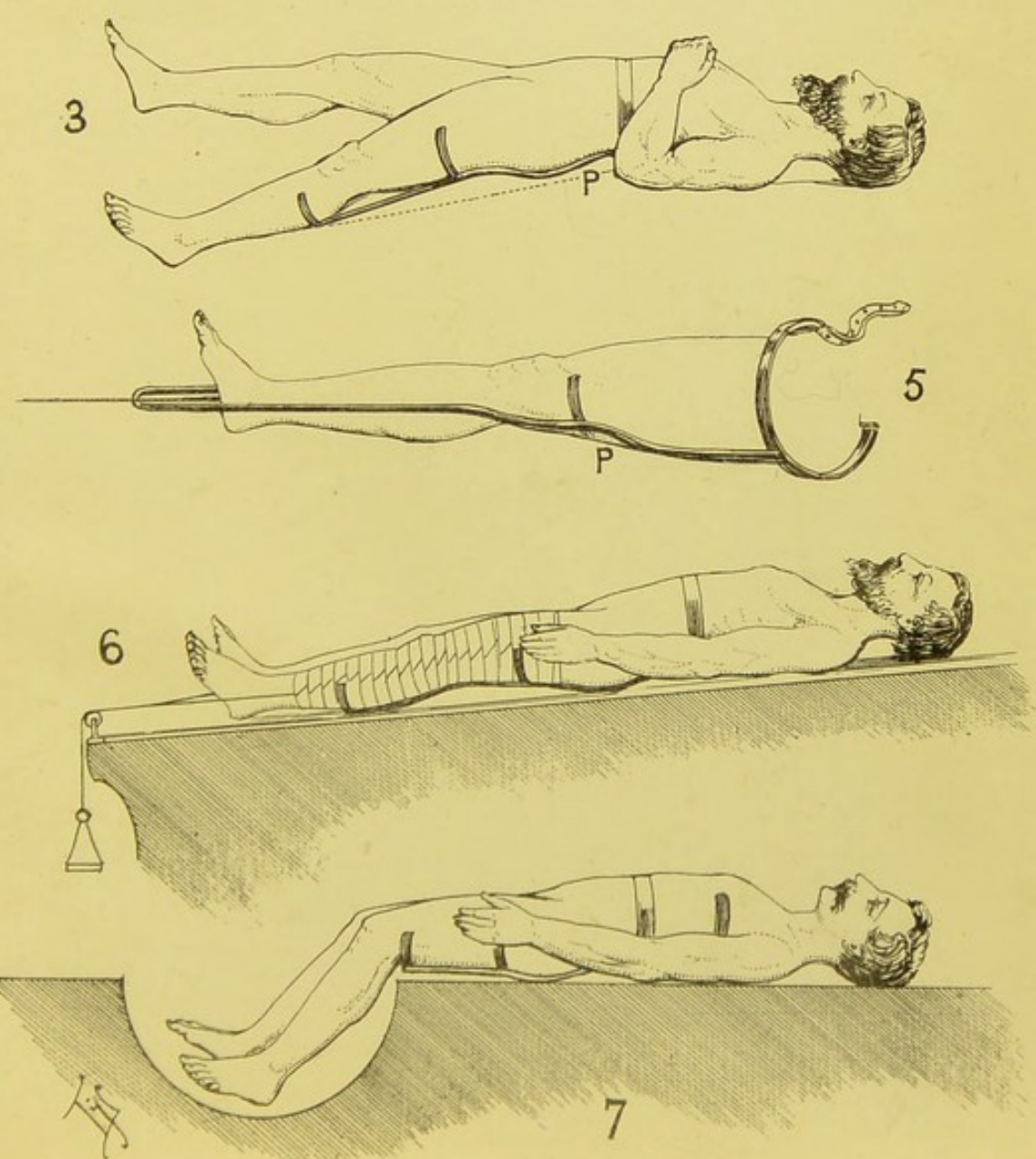
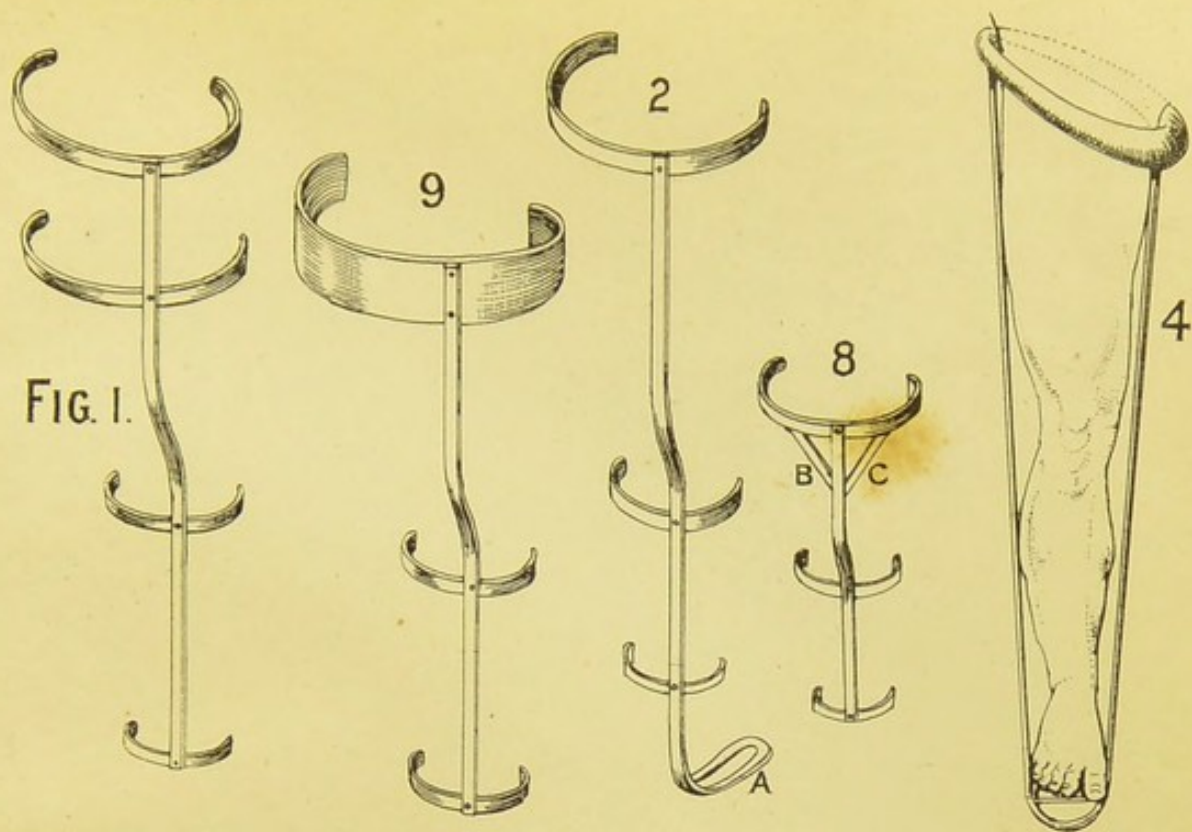
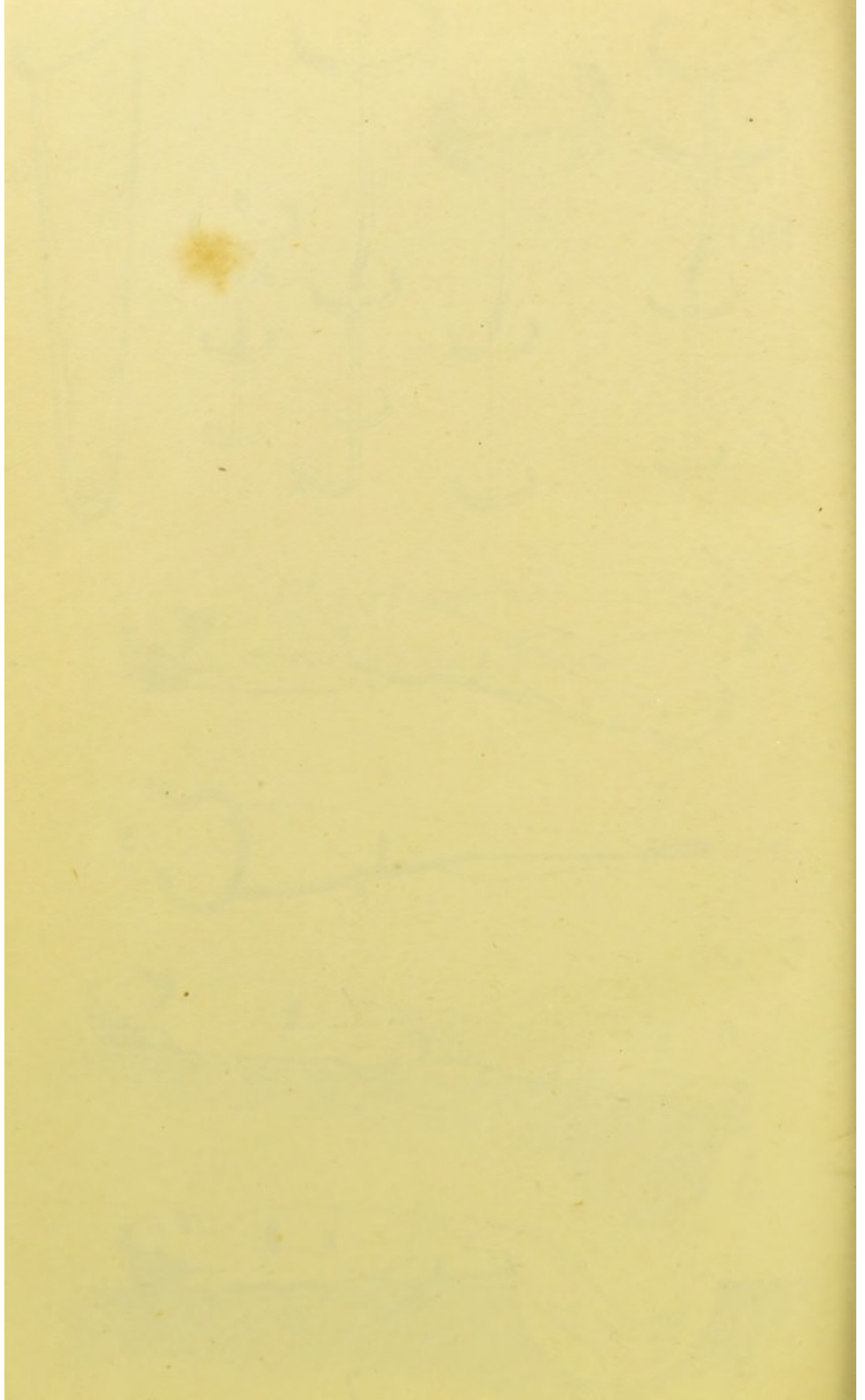


PLATE 25.

Incorrect models and appliances.







The following is a list of the names of the persons who have been appointed to the various committees of the Board of Education for the year 1900-1901. The names are given in the order in which they were appointed. The names of the members of the Board of Education are given in the order in which they were appointed. The names of the members of the Board of Education are given in the order in which they were appointed.

PLATE 26.

This is a representation of a modification of Dr. Andrews' Ischiatic Crutch, modified so as undoubtedly to take all concussion off the neck of femur but to relieve friction, consequently, of no use in articular inflammation, but I have found useful when there is delayed consolidation in case of fracture of the neck of the femur, my hip appliance will be found a very efficient aid in securing bony union in fractures of the neck of femur.



JC



4

