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PRACTICAL POINTS IN THE TREATMENT OF HIP DISEASE.¹

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HIP disease may be called a semi-malignant affection because of its duration and its destructive quality. But it is almost never fatal. In every large community there are many healthy and active adults who are scarred and deformed by hip disease, without ever having had adequate treatment. In all stages of the disease it may be predicted, excepting in patients who are exceptionally unfortunate in their surroundings, that the time will come when the forces of nature will rally and repair take the place of disintegration.

In approaching the subject of treatment it is necessary to bear in mind that the destructiveness and inveteracy of this disease are largely the result of mechanical environment. Its full counterpart in the upper extremity is not found, evidently because in the upper extremity the focus ignited in the cancellous tissue is, as a rule, resolved at an early stage by reason of the exemption of the upper extremities from the labors and hardships attending locomotion. We cannot do better, therefore, than to nullify pernicious mechanical environment. By so doing we directly banish trauma from the part affected, and indirectly fortify the general health, and in both ways invite the advent of a "natural cure."

¹ Presented at the Pan-American Medical Congress, held at Washington, September, 1893.

The three cases which are to be cited illustrate the good effect of mechanical treatment, in the most unpromising cases.

CASE I.—A boy, six years of age, presented an enormous abscess, and all the usual symptoms of the last stage of the disease, which had continued in the right hip for nineteen months. Exsection of the joint had been urged by a surgical attendant. The abscess opened spontaneously on the first day the patient was seen, and before treatment could be begun. The child's general condition was bad. The limb was greatly adducted and flexed, and the slightest disturbance of the joint caused severe pain. Mechanical treatment was begun the sixth day after the patient was first examined. Pain was relieved at once. He was enabled to be out of bed without delay, and out of the house nearly every day, throughout the entire course of treatment, which lasted two and a half years. The affected joint received the benefit of fixation, or a reasonable degree of immobilization, and was thoroughly protected from the traumatic incidents of locomotion. The adduction of the limb gradually and painlessly disappeared as the boy made use of the limb, protected by the splint, in walking, and flexion was reduced till the limb was in a position favorable for locomotion. Wearing the splint the patient pursued the ordinary occupations of a boy of his age, while the reparative process supplanted the ravages of disease. The abscess already referred to was followed at irregular intervals by other purulent collections which were incised or allowed to open spontaneously. At one time there were nine sinuses about the joint, all derived from diseased bone. Five of these extended in a line down the outer side of the thigh from the trochanter to near the middle of the shaft of the femur, as seen in Fig. 1. The position of these sinuses, from one of which a sequestrum was extruded, and the attachment of the resulting cicatrices to the bone showed that the shaft of the femur was, to a great extent, involved in the destructive process. The patient's condition

six months after the cessation of treatment is shown in Figs. 1 and 2. The limb is in good position, neither abducted nor adducted, and flexed at a slight angle, enough to

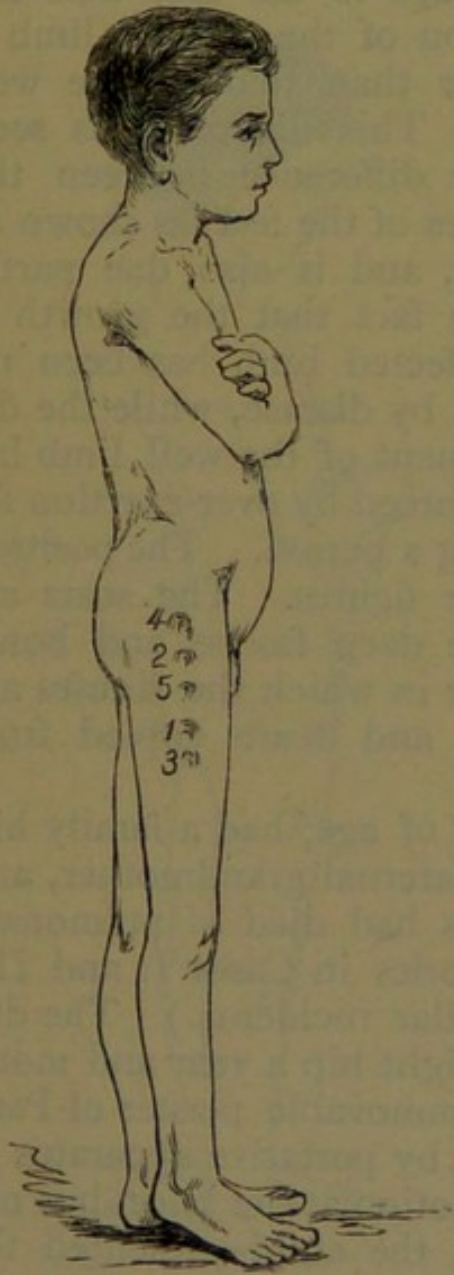


FIG. 1.

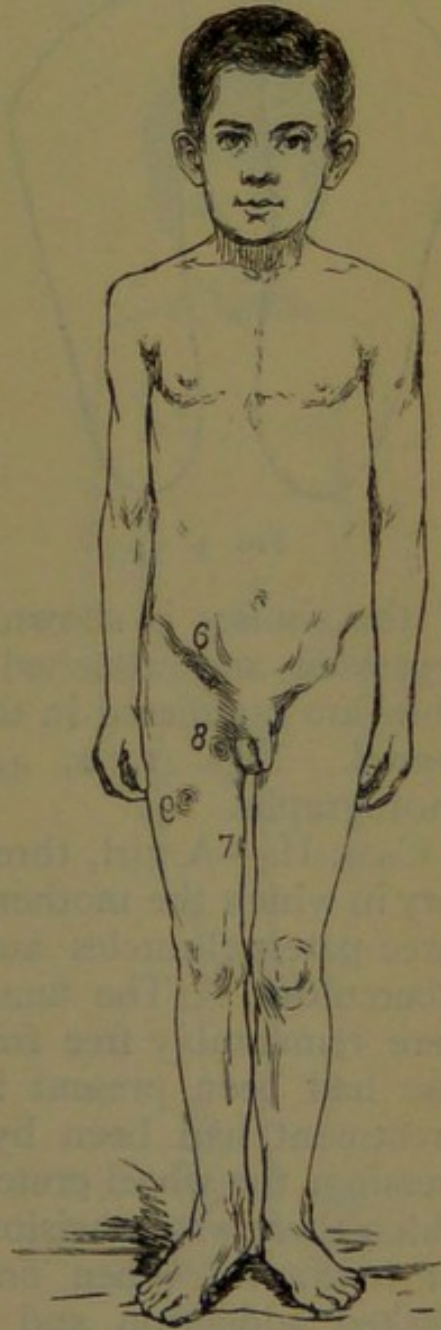


FIG. 2.

allow him to sit comfortably, and yet not enough to interfere with graceful locomotion. He walks with firmness, runs fast, and never uses a cane. There is practi-

cally no "apparent" shortening, that is, the shortening due to adduction and flexion. The "real" shortening

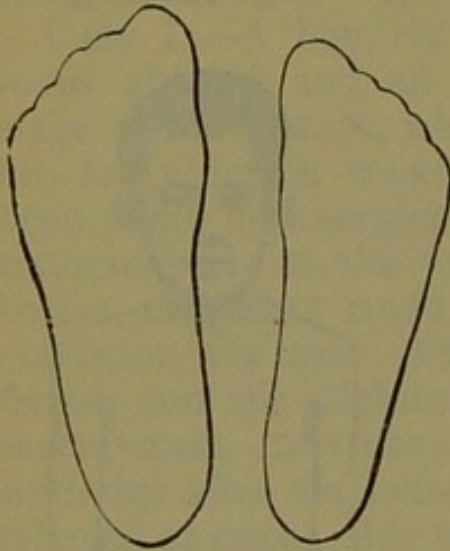


FIG. 3.

is one inch, due partly to changes in the femoral head and neck, but more to the fact that the skeleton of the affected limb is smaller than that of the well limb. This difference is seen in the difference between the outlines of the feet, as shown in Fig. 3, and is also due partly to the fact that the growth of the affected limb has been retarded by disease, while the development of the well limb has been forced by over-exertion for so long a period. The position

of the sinuses is shown in the figures. The scars are depressed and attached to the deep fasciæ and bone. They are numbered in the order in which the sinuses appeared. Figs. 1, 2, 4, 5, 7, and 8 are copied from photographs.

CASE II.—A girl, three years of age, had a family history in which the mother, the maternal grandmother, and three paternal uncles and aunts had died of pulmonary tuberculosis. (The family histories in Cases I. and III. were remarkably free from similar incidents.) The disease had been present in the right hip a year and more. Treatment had been by the immovable plaster-of-Paris dressing, the wheel crutch, and by portative apparatus in which there was provision for motion at the knee, but not for traction. When first seen, the child presented the marked adduction and flexion characteristic of an advanced stage. She had suffered for several weeks the severe pain which forebodes an abscess, and is due probably to the retention of pus in the cancellous tissue of the bone. Soon after the application of mechanical treatment the position of the limb improved, adduction giving

place to abduction, and flexion being materially reduced. The pain ceased, as the result, perhaps, of the escape of pus from the hard shell enclosing the cancellous tissue. Five months after treatment began the pus was re-

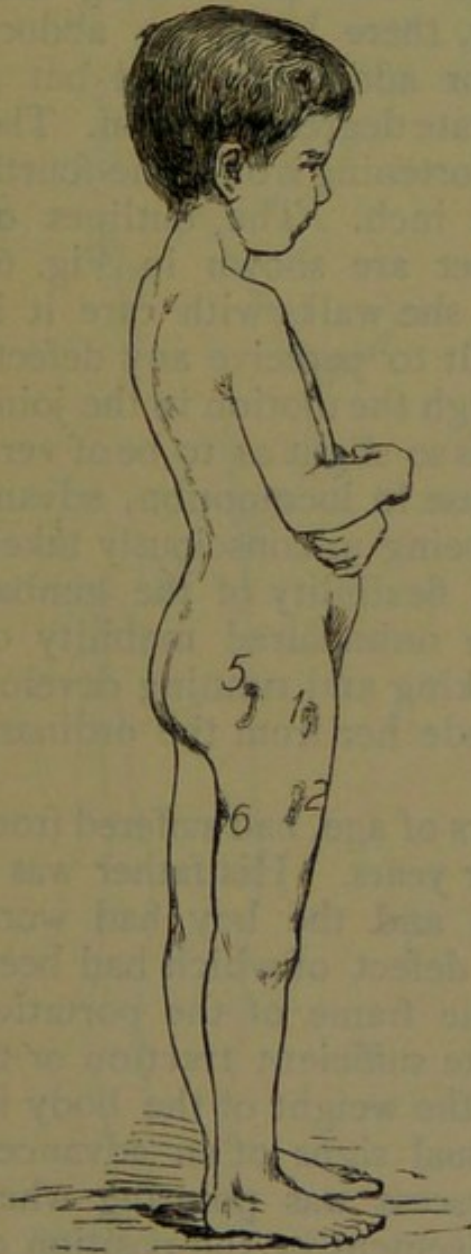


FIG. 4.

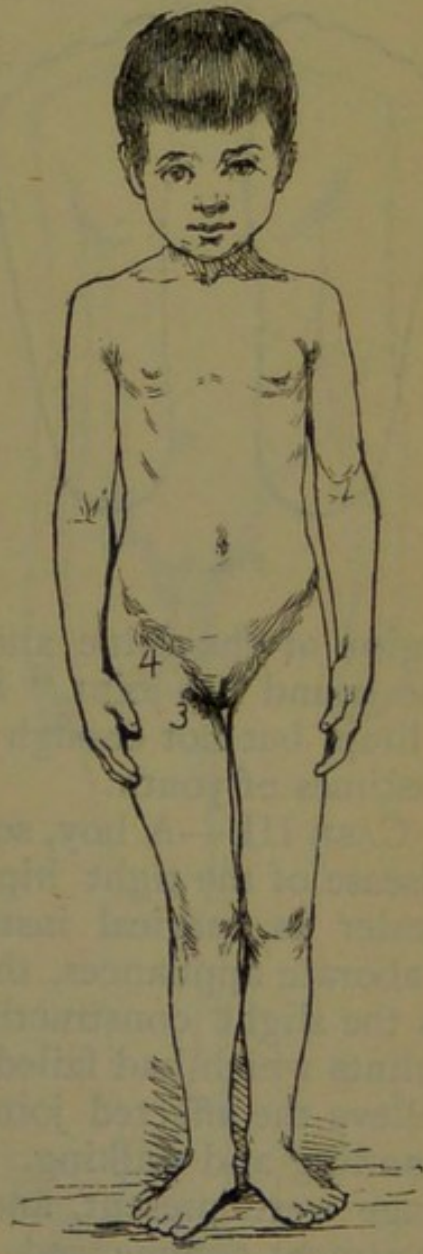


FIG. 5.

leased from the soft parts by incision, and in the following eighteen months five other sinuses were established spontaneously or by incision. Their location and order are indicated in Figs. 4 and 5, which show the child's

condition eight months after the cessation of treatment. The scars are attached to periosteum and deep fasciæ. Her health is perfect and she walks and runs without assistance of any kind. The position of the femur is fa-

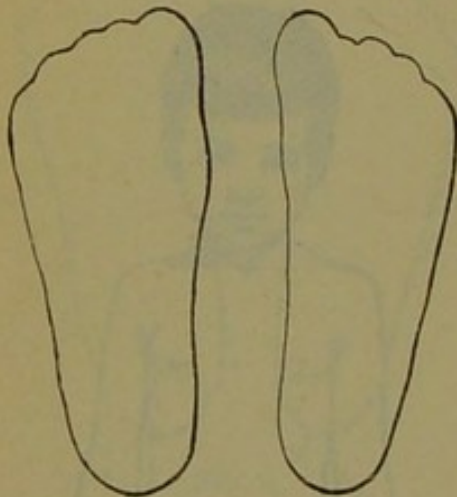


FIG. 6.

favorable both for walking and sitting, there being no abduction or adduction, and but a moderate degree of flexion. The real shortening is only one-fourth of an inch. The outlines of her feet are shown in Fig. 6. When she walks with care it is difficult to perceive any defect, although the motion in the joint itself is so slight as to be of very little use in locomotion, advantage being unconsciously taken of the flexibility of the lumbar

region of the spine and of the unimpaired mobility of the sound hip-joint. Fast walking and running develop a limp, but not enough to exclude her from the ordinary pastimes of youth.

CASE III.—A boy, seven years of age, had suffered from disease of the right hip for four years. His father was a dealer in surgical instruments and the boy had worn elaborate appliances, the chief defect of which had been in the slight construction of the frame of the portative splints which had failed to make sufficient traction or to relieve the affected joint from the weight of the body in standing and walking. The usual signs of an advanced stage were present, and an abscess was pointing when treatment commenced. Improvement in the position of the limb was soon seen. In course of time four sinuses were established, either spontaneously or by incision, as seemed to be necessary. The case progressed favorably and the duration of treatment was four and a half years—longer than was necessary through excess of caution and anxiety on the part of the father. Figs. 7 and 8 show

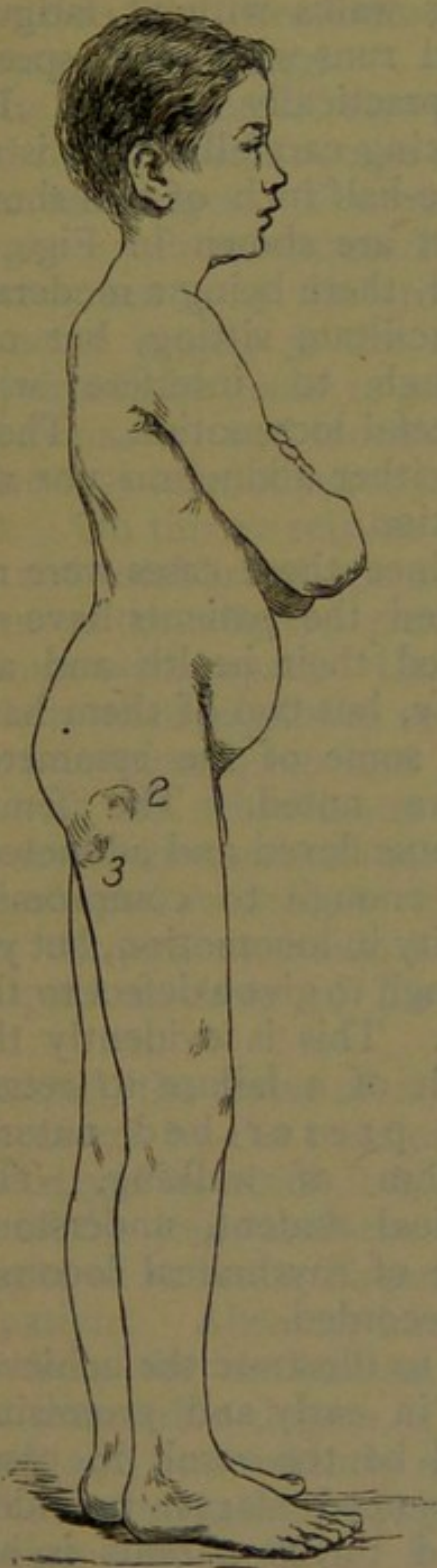


FIG. 7.

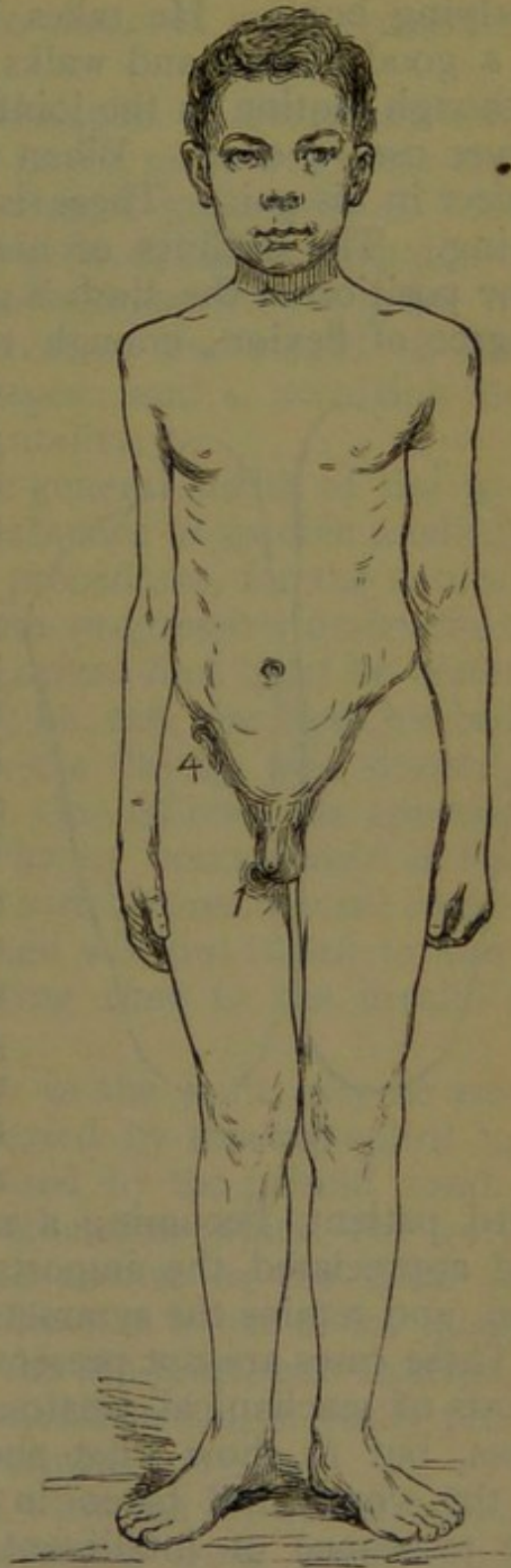


FIG. 8.

the boy's condition eighteen months after all treatment was discontinued. Scars 2 and 4 are attached to the un-

derlying bone. He takes long walks without fatigue, is a good skater, and walks and runs with great speed, although motion in the joint is practically wanting. He never uses a cane. When walking carefully there is no defect in his gait. There is one-half inch of real shortening. The outlines of his feet are shown in Fig. 9. The position of the limb is good, there being a moderate degree of flexion, enough to facilitate sitting, but not

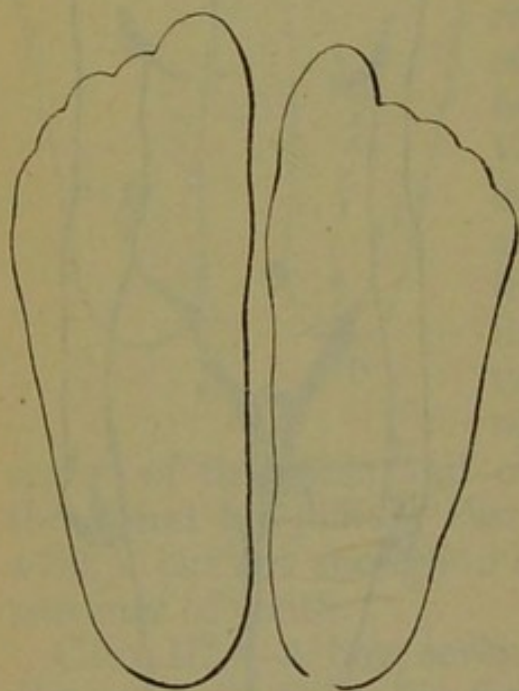


FIG. 9.

enough to interfere with graceful locomotion. There is neither abduction nor adduction.

Since these cases were reported the patients have retained their health and activity, but two of them have lost some of the symmetry above noted. The femur became flexed and adducted, not enough to compromise ability in locomotion, but yet enough to give a defect to the gait. This is evidently the result of a failure to retain the prescribed natural rhythm of walking. The

third patient, becoming a medical student, understood and appreciated the importance of rhythmical locomotion, and retains the symmetry recorded.

These cases are not presented to illustrate the achievements of mechanical treatment in early and promising cases, but to show what should be the result in cases of the worst kind taken in advanced stages, provided the assistance of intelligent and thrifty parents is assured.

In favorable circumstances and with treatment begun at the earliest sign of a focus, the result should be, and sometimes is, such as to make it difficult by careful ex-

amination and measurement to discover any asymmetry or trace of disability.

The same general rules or principles of treatment hold good in the earliest stage and in the most desperate and advanced stages. Treatment should make sure of four things: 1. Preservation of the general health throughout the treatment; 2, the arrest of motion in the joint in the acute stage; 3, the removal of the weight of the body from the joint in all stages; and 4, provision for final symmetry and locomotor ability.

The first consideration is the general health of the patient. On this we rely, in the absence of specific medication and established operative procedures, for the natural return of the affected part from progressive destruction to progressive repair. Can a patient thus beset be better off than when equipped so that he can rise from his bed after a painless sleep and pass the day up and dressed, and with his schoolmates and play-fellows, his appetite and respiration stimulated by happy hours passed in the fresh air and sunshine? With suitable mechanical equipment the patient should not, and will not if left to himself, pass an hour of his waking time in the invalid's bed.

Second, the arrest of motion in the joint may be amply secured by the traction exerted by the hip-splint in those stages in which it is required by the painful condition of the joint and the apprehension which the very thought of articular disturbance excites in the mind of the patient. Absolute immobilization is out of the question from the mechanism of the hip-joint, but fixation, or a reasonable degree of immobilization, is easily produced, and conveniently maintained.

Third, the patient equipped with the hip-splint, when standing and walking, is prevented from putting his weight on the joint. The heel cannot reach the ground. The patient sits on the perineal strap of the apparatus, which is essentially a crutch-head applied to the ischiatic instead of the axillary region. With this arrangement

he wears a high sole on the well foot to make up for the factitious length which is given by the splint to the affected side. It is not entirely fanciful to say that the patient is sitting while walking, because he alternately stands on the well foot and sits on the perineal strap. An adult patient tells me that when tired he rests, while still erect, by leaning against some support and sitting on the hip-splint. It was thought at one time that it was impossible for a patient to go for any time touching the ground with only one foot. With the hip-splint, however, children run about for years, putting their weight on the well limb alone, the affected leg being thus converted into a pendent member, like the arm.

Fourth, the patient while wearing the hip-splint may be induced by instruction and drill to give up the "false time" of his footsteps, which is the chief cause of the deformity and limp of hip disease, and to return to the natural rhythm of human locomotion, in which equal time is given to the two feet. The result of walking habitually in this way is at once the abolition of a great deal of the appearance of lameness and in time the correction of deformity, because the adducted limb will pass, without conscious effort on the part of the patient, from adduction to abduction (with, at the same time, and for the same reason, a decrease in flexion) in order to place itself in that position in which it can best do its half of the work of progression, thrown upon it by the adoption, or rather the resumption, of natural rhythm or "correct time" in walking.

A few words are in place describing the apparatus and its application. Its frame is made of steel. In use it does not require to be bent, as so many pieces of orthopedic apparatus do, therefore it may be well, but not too sharply, tempered. It consists of upright and pelvic band, as shown in Fig. 10. The upright, shown in Fig. 11, extends from the ground to a point about midway between the iliac crest and the trochanter. It is flat, with its width laterally disposed, and its thickness antero-

posteriorly, an arrangement by which the strength of the metal is in the direction of the strain when the patient's

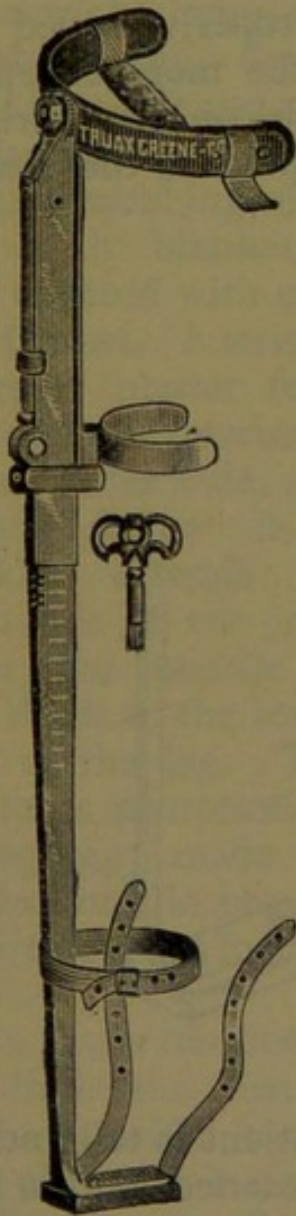


FIG. 10.

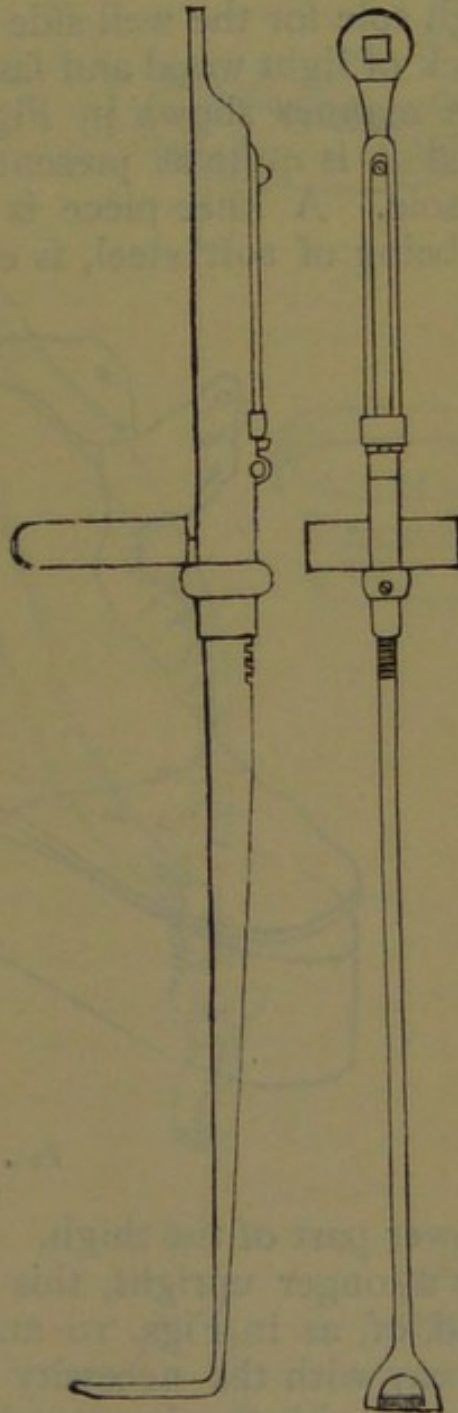


FIG. 11.

weight is borne by the instrument. It is composed of a bar and a box, the former being propelled in the latter by a rack and pinion, and held at the point of election

by suitable mechanism. The box is attached above to the pelvic band, and the bar ends below in the foot-piece, which is shod with leather and carries two leather straps. A high sole for the well side is conveniently carved from a block of light wood and fastened to the sole of the shoe in the manner shown in Fig. 12. Properly shaped and stained it is quite as presentable as the more expensive cork sole. A knee-piece is adjustable on the upright, and, being of soft steel, is easily adapted to the size of

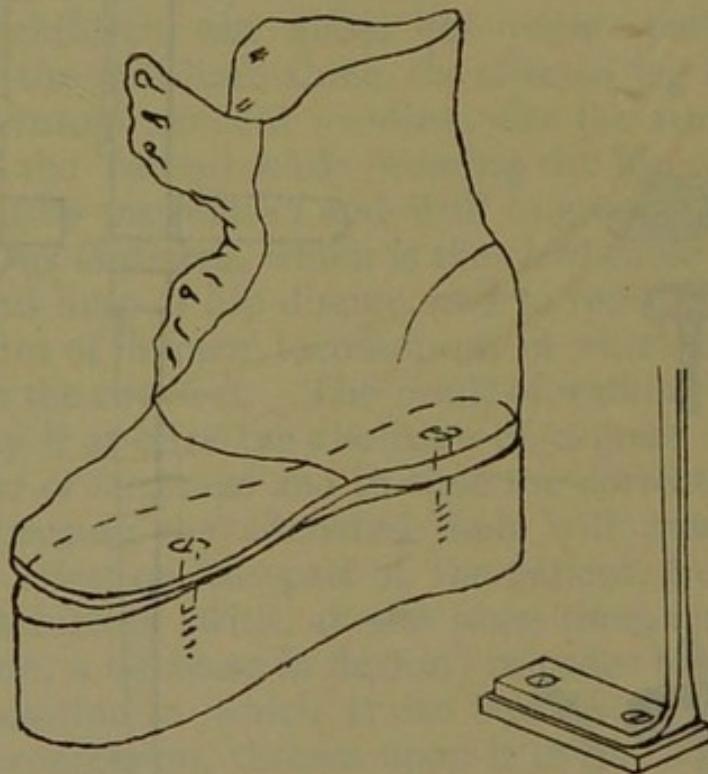


FIG. 12.

the lower part of the thigh. If the patient is tall and requires a longer upright, this piece is carried on the bar, instead of, as in Figs. 10 and 11, on the box, thus doing away with the necessity of increasing the length of the latter with the increased length of the upright. A piece of webbing is buckled around the upright and the limb at the lower part of the thigh, and a leather strap around the upright and the lower part of the leg. The pelvic band, shown in Figs. 10 and 13, is a nearly semi-

circular piece of bar steel, covered with leather, or better, with hard rubber, the angle of its attachment to the upright being adjustable and firmly fixed by a bolt and nut. It carries the perineal strap of webbing, padded with blanketing and covered with canton flannel. A strip of adhesive plaster from one and one quarter to three inches wide, and ending below in a buckle, extends on each side of the limb from the middle of the thigh to the lower part of the leg. The plaster is protected by a legging made of twilled muslin provided with eyelets for lacing.

To apply traction to the limb the leather straps attached to the foot-piece are buckled to the adhesive plaster strips attached to the limb, the perineal strap is buttoned over the ends of the pelvic band, and the rack is propelled in the direction

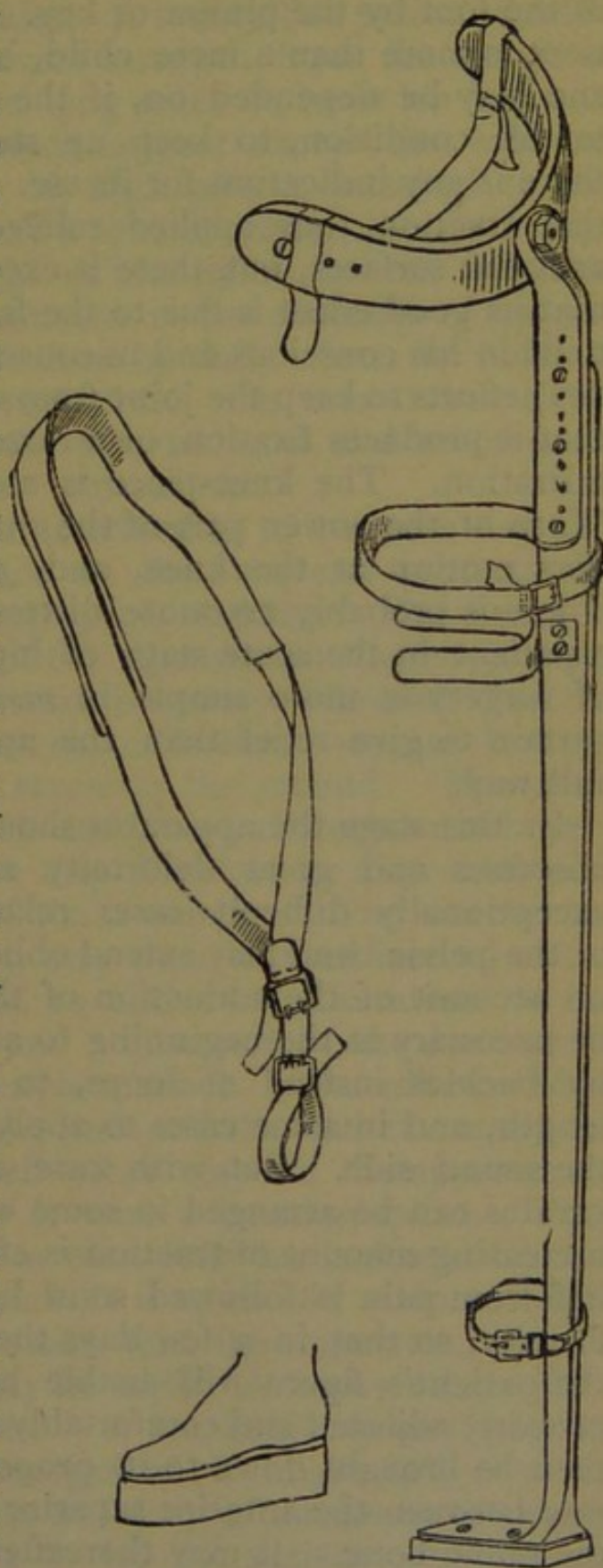


FIG. 13.

of the foot by the pinion or key. In practice, if the patient is more than a mere child, he uses the key at will, and may be depended on, if the joint is in a painful or tender condition, to keep up steady traction as long as there is any indication for its use. It was thought at first that traction thus applied relieved pressure on painful articular surfaces, but there is excellent reason to believe that its good effect is due to the fact that it assists the patient in his conscious and unconscious (voluntary and reflex) efforts to keep the joint from motion, in other words, that it produces fixation, or a reasonable degree of immobilization. The knee-piece is useful in the same way. Worn at the lower part of the shaft of the femur, it hinders motion at the knee, and, *pari passu*, at the hip. There is probably no more distressing sight than that of a patient in the acute stage of hip disease, and no resort of surgery is more simple in *modus operandi* and more certain to give relief than the application of traction in this way.

In this stage the apparatus should be applied although abscesses and great deformity are present, as in the exceptionally difficult cases related above. The end of the pelvic band may extend obliquely over the abdomen on account of the adduction of the limb. It may even be necessary at the beginning to attach the perineal strap by buckles instead of loops, to gain for it a suitable length, and in some cases to apply it to the perineum on the sound side. But with care and gentleness the apparatus can be arranged in some way so that a slight and increasing amount of traction is effected. Immediate relief from pain is followed soon by reduction of the deformity, so that in a few days the restored symmetry of the patient's figure will enable him to wear the splint properly adjusted and comfortably. The pelvic band may then be brought down to its proper place on a level midway between the anterior superior spine of the ilium and the pubic bone. It may thereafter be kept at that level if the perineal strap is of the right length and suspended

by loops instead of buckles. A bed-ridden patient treated in this way soon recovers strength from the return of sound sleep, and before long seeks to leave his bed and try walking without crutch support except that afforded by the perineal strap. A high sole is attached to the shoe of the well foot, and a shoulder-strap, shown in Fig. 13, transfers the weight of the splint to the opposite shoulder, and he is instructed in the necessity of acquiring, as soon as it can be done by daily effort, the habit of moving his feet in correct time. He then ceases to be seen at his home or in the hospital ward, and becomes an "office patient" or an "out-patient."

The splint as thus far described is to be worn day and night. It makes traction on the limb and protects the joint from the traumatism of walking. The latter is necessary in all stages of the disease, but there are long periods when traction is not necessary, when all that the patient requires is a perineal or ischiatic support to keep the affected limb from reaching the ground. The adhesive plasters and the rack and pinion and other machinery for maintaining traction may therefore be dispensed with during a large part of the treatment. The simple upright, shown in Fig. 13, may then be used instead of the upright shown in Figs. 10 and 11. Alteration in the length of this upright and adjustment of the knee-piece are provided for in a simple manner. The adhesive plasters are removed from the limb and the leather straps from the foot-piece, but in all other respects the apparatus is applied and worn as if it were a traction splint. Thus simplified, however, it is essentially an ischiatic crutch, and, like any other crutch, it is to be laid aside at night.

In closing it may be said that the apparatus, thus arranged as a crutch, may be useful in many other affections besides hip disease. If its simplicity and convenience were generally recognized it might facilitate the treatment of any disease or injury of the lower extremity in which it is desirable to let the patient take exercise without using the affected limb.

The first part of the paper is devoted to a general discussion of the problem of the origin of the universe. It is shown that the origin of the universe is a problem which has been discussed by philosophers and scientists since the beginning of time. The author then proceeds to a detailed examination of the various theories which have been advanced to explain the origin of the universe. He discusses the theory of spontaneous generation, the theory of evolution, and the theory of creation. He also discusses the theory of the big bang, which is the most widely accepted theory at present. The author concludes that the origin of the universe is a problem which is still open to discussion and that further research is needed to solve it.