is in the direction of abduction. The *x*-ray should clear up the diagnosis.

Impacted Fracture of the neck of the femur occurs in children, and in its acute stage resembles hip disease somewhat. The signs are the same as those of coxa vara after the irritation has passed, and an *x*-ray examination would establish the condition at any time.

Arthritis Deformans of the hip may occur in children and resembles hip disease so closely that no established

FIG. 3012.—Tumor Albus. Acute Case of Marked Severity.

rules for the differential diagnosis have been formulated. The *x*-ray would be the chief reliance. The early symptoms resemble hip disease closely, and only when it has become evident that a chronic inflammatory process is persisting with little or no destructive tendency, should the condition be seriously suspected. It is apparently comparatively uncommon.

Infantile Paralysis of the muscles about the hip is accompanied in some cases by symptoms of joint irritation which are at first hard to differentiate from those of true hip disease.

Acute Infectious Osteomyelitis in the neighborhood of the hip is a condition occurring at times and simulating very severe hip disease. Abscess forms rapidly and the presence of pyogenic organisms in the pus is suspicious, as they do not as a rule occur in tuberculous abscess. The rapidly destructive character of the process, in connection with the results of a pathological and bacteriological examination, would suggest its presence. The *x*-ray should be of value.

II. *Synovitis of the Hip-joint.*—Serous synovitis of the hip-joint is not uncommon. In a majority of cases, its existence must be inferred rather than demonstrated.

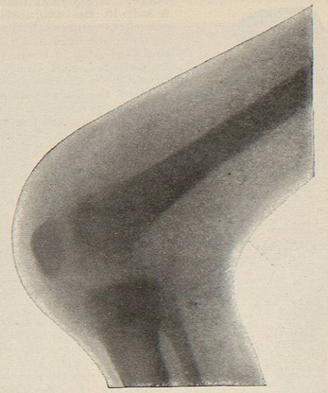

FIG. 3013.—Radiograph of same Case as Fig. 3012, showing Indistinctness of Lower End of Femur, where Focus of Disease is Situated.

It is not uncommon to see cases with the usual symptoms of hip disease at an early stage, viz., limping gait, muscular atrophy, stiffness, restriction of motion at the joint, peculiar and characteristic attitude, and slight pain persisting perhaps for weeks, yet in which complete recovery takes place in a few weeks or months. In a case of this sort death occurred from intercurrent disease six months later, and the remains of a synovitis, in the form of thickening and congestion of a part of the synovial membrane, were found.

The course of acute, subacute, or chronic synovitis of the hip-joint (if limited to the synovial membrane and not

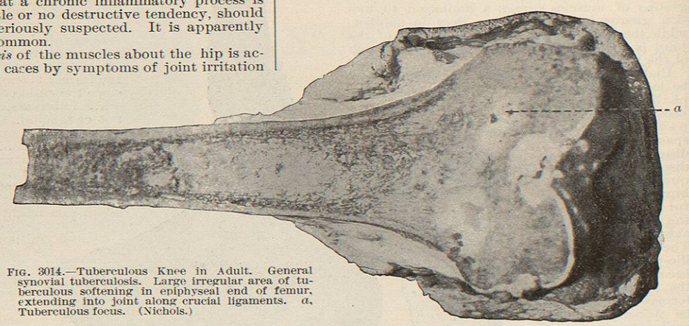

FIG. 3014.—Tuberculous Knee in Adult. General synovial tuberculosis. Large irregular area of tuberculous softening in epiphyseal end of femur, extending into joint along crucial ligaments. *a*, Tuberculous focus. (Nichols.)

extending to the cartilage or bone) is not so protracted as that of epiphyseal ostitis.

Synovitis of the hip-joint from traumatism may occur in sprains and contusions; the extent and course of such

synovitis depend upon the nature and amount of the injury. In patients with a predisposition to tuberculosis, such injuries may produce tuberculous disease.

III. *Arthritis Deformans* of the hip-joint (senile coxitis, malum coxæ, malum senile, etc.), occurs chiefly in adults, but in children at times. It may be limited to the hip or

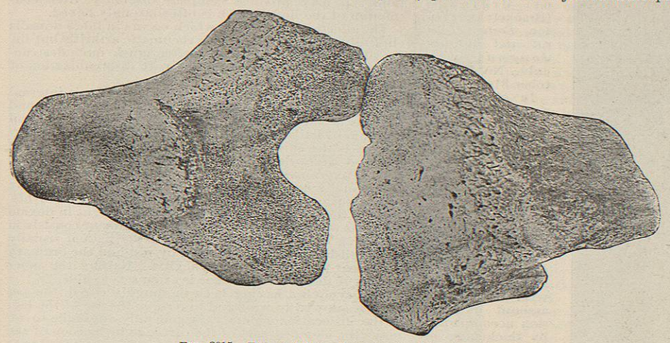

FIG. 3015.—Tumor Albus. Appearance of dry bones.

it may occur in connection with disease of the other joints. Hypertrophic changes such as enlargement, thickening, and increase in density, occur in the head of the femur, or the changes may be atrophic. The synovial membrane shows the characteristic appearances. The symptoms are pain, painful movement, especially in hyperextension and rotation, a limp, and stiffness of the joint, and there may be a creaking of the joint on manipulation. There are atrophy of the muscles and, later, muscular fixation, with perhaps resulting deformity, until finally in severer cases the joint becomes stiff in a normal position or perhaps adducted or flexed. The condition does not go on to suppuration. The differential diagnosis from hip disease is aided by the *x*-ray. Hip disease is as a rule more acute, especially in adults, more rapidly progressive, than arthritis deformans. In children a differential diagnosis is difficult.

DISEASES OF THE KNEE-JOINT.—Of the common chronic affections which are found in the knee-joint, *tumor albus*, or tuberculous ostitis, is the most important (Figs. 3012 and 3013). This is also known as tuberculosis of the knee-joint, scrofulous disease of the knee, and chronic purulent or fungous synovitis of the knee. This condition begins most often as an inflammation of the epiphysis (Fig. 3014); usually either the tibial or the femoral epiphysis is first affected; occasionally the primary focus is in the patella or in the head of the fibula. In severe cases a destructive, fungous, or purulent synovitis generally develops, and it may end in complete destruction of the joint, or in arrest and recovery by absorption and cicatrization (Fig. 3015). The disease begins insidiously with stiffness and limp in gait. The head of the tibia or the condyles of the femur become enlarged or the whole joint may be attacked with swelling, pain, and effusion into the joint; there is usually elevation of surface temperature; and, later, flexion or subluxation of the limb at the knee occurs as the result of long-continued muscular spasm. If the condition persists for any length of time enlargement of the bone is characteristic. The swelling is that of bone and periarticular tissue and not altogether due to fluid in the joint. If this condition of the joint develops and there is much fluid the patella floats. There are tenderness on pressure about the joint and atrophy of the thigh and calf muscles. Shortening is not usually present until late in the disease and there is usually lengthening caused by the overgrowth in all directions of the tibial and femoral epiphyses due to the inflammatory hyperæmia. Actual pain may be absent, but is usually present in acute cases and may be severe. Muscular fixation is less prominent than in hip disease and in the early stages may be absent. Lameness is always present. The distortions which occur are due to the greater power of the flexor muscles of the thigh as compared with the extensors (Fig. 3016). The limb in severe and untreated cases is most often gradually flexed from the first, and unless treated flexion may reach a right angle. Accompanying severe flexion and subluxation is external rotation of the tibia or the femur resulting from long-continued muscular spasm. Sometimes an abscess develops in the joint and it may spread to the periarticular structures; in which case it is accompanied by acute symptoms.

FIG. 3016.—Subluxation in Tumor Albus.

Chronic Synovitis.—Chronic synovitis may occur in the knee-joint and is of the usual type. It is usually the result of the acute or subacute forms or may be due to exposure, wet, or cold, or follow an injury or sprain. It may be due to dislocation of the semilunar cartilages, to loose bodies, to elongated synovial fringes, and to the constitutional affections mentioned above.

One form of the affection is *Intermittent Hydrops*, which is an affection without discoverable anatomical basis, and without proof of infection; it gives rise to a simple non-inflammatory serous effusion in the joints, occurs at regular periods without any apparent reason, and is associated in some instances with what are usually classed as functional nervous disorders. The disease seems to be a functional, as opposed to an organic, trouble. Vari-

ous drugs are advised, some of which have at times been successful; change of air and surroundings may also be of use. But if all these measures fail, it is best to resort to exploratory incision of the joint and washing out or drainage (Brackett and Cotton, *Boston Medical and Surgical Journal*, vol. cxlv., No. 18, October 31st, 1901).

FIG. 3017.—Tumor Albus of the Knee.

In chronic synovitis swelling is marked and the patella floats. Tenderness is not marked except in acute cases, but it may be present on the inner side of the patella. Chronic synovitis of the knee-joint may remain indefinitely in a subacute condition, with a slight amount of effusion accompanied by thickening of the synovial membrane, or a large amount of serous effusion may take place with slight inflammatory symptoms. Chronic synovitis of the knee cannot always be differentiated from chronic tumor albus beginning as an epiphysitis.

Hydrops Articuli differs little from the ordinary type of synovitis. The chief symptom is effusion, which gradually develops and which disappears slowly, or which remains for a long time unchanged. In old and resistant cases of the ordinary type an exploratory incision is advisable.

Periarticular Disease at the knee is distinguished by the different location of the swelling, the absence of effusion in the joint, and the fact that the characteristic limitation of motions is not present. Bursitis is a common type of the affection.

Bursitis of the prepatellar bursa (housemaid's knee) occurs as a fluctuating swelling anterior to the patella; there is no fluctuation in the joint and flexion is slightly limited (Fig. 3018). Suppuration occurs in both the acute and the chronic cases in a certain proportion of cases. In chronic cases the bursa must be removed. In ordinary cases rest on a splint is sufficient.

The deep pretibial bursa may be affected, especially in children. The symptoms are apparent enlargement of the tubercle of the tibia, local swelling and tenderness, and limitation of full extension of the knee. The treatment is as described above. Bursitis in the hamstring region may occur.

Arthritis Deformans.—The pathological appearances have already been described. They are found more characteristically developed in the knee than in any other joint. The disease always develops gradually in persons of middle life or older. Occasionally it is seen in children. Effusion is not the rule, though it may exceptionally occur. Enlargement of the joint is almost constant. The symptoms are rarely acute, the most marked being a limping in gait, a sense of stiffness, especially after sitting for some time, limited motion, and eventually an irregular enlargement in the contour of the joint. The pain when present is usually caused by motion or jar; it is absent when the joint is at rest.

The disease is chronic, yet subject to acute exacerbations. It may produce complete disability from contraction of the limb, which is often strongly flexed.

The affection of the knee which occurs in tabes dorsalis clinically differs from chronic rheumatic arthritis but little, except that the disease is often much more destructive, causing complete disability with disorganization of the joint.

Dislocation of the Semilunar Cartilages (Hay's internal derangement).—The affection is traumatic in origin, and consists in the tearing loose of the internal or external semilunar cartilage from its tibial attachment. The internal one is the one most frequently displaced. A sudden twist on slight flexion or a wrench is the accident which most often causes this condition. The symptoms are effusion and tenderness over the cartilage, and there may be protrusion of one of the cartilages. The general history of the accident is that the leg was caught in flexion and that the pain was severe. The treatment consists in reduction of the dislocation (which the patient usually accomplishes himself), followed by rest and the ordinary treatment for the ensuing synovitis. Raising the inner border of the sole of the shoe is often serviceable.

The synovitis having been thoroughly cured, the patient is allowed to walk and to resume the use of the leg. If the dislocation recurs it is generally advisable to remove the loosened part of the cartilage by incision of the joint.

Dislocation of the Patella may occur spontaneously or in consequence of some slight twist of the leg. It usually attacks young girls with lax muscular fibre and a feeble development; boys are exceptionally attacked. The dislocation occurs most often outwardly (Fig.

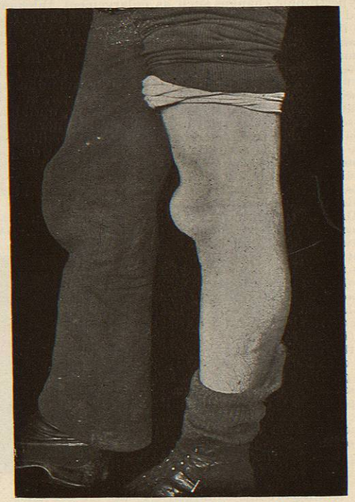

FIG. 3018.—Prepatellar Bursitis ("Housemaid's Knee").

3019). The proper treatment is to extend the leg fully and then gently to press the patella back into place. Massage and electricity are indicated in all cases. Operative treatment consists in the removal of an elliptical piece of the front of the capsule of the joint internal to the extensor tendon, and a stitching together of the edges of the opening, thereby tightening the inner part of the capsule. In some cases the tubercle of the tibia has been transplanted to cure the affection.

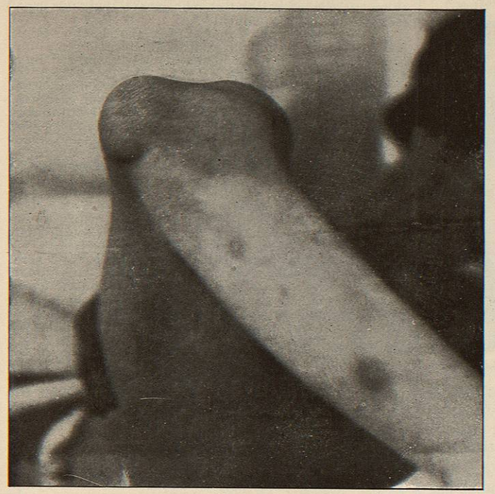

FIG. 3019.—Patella Dislocated.

Synovial Fringes.—In certain conditions of the synovial membrane folds exist, which, if a laxity of the ligaments of the knee is present, may be caught between the moving bones forming the joint. This causes symptoms similar to those following a displaced meniscus, but more momentary in character.

Cysts of the Joint.—Subsynovial cysts may be formed about the knee-joint as about other joints; they may enlarge and produce an unusual appearance in the shape of the joint. In many instances they are connected with the joint by a small opening. A common place for such cysts is in the popliteal space.

It should be remembered that a number of bursæ are to be found about the knee-joint, and may become enlarged.

Rupture of the quadriceps extensor femoris may occur.

In *hæmophilia* a joint disease resembling clinically tuberculosis, occurs at times in the knee-joint. The symptoms are pain, swelling, and limitation of motion. The diagnosis is made by the history of the patient and the long continuance of the affection without much change. The treatment is protection and rest.

Functional disease (hysterical, neuromimetic) of the knee is to be recognized by the absence of objective symptoms and the prominence of subjective symptoms.

DISEASES OF THE ANKLE-JOINT.—In *chronic tuberculous disease* of the ankle the seat of the disease may be in the articular end of the tibia or the astragalus and other adjacent bones may be involved secondarily or simultaneously. There is usually little pain, and tenderness is present over the joint capsule in front, perhaps under the malleoli. Swelling, which is boggy, uniform, and œdematous in character, a feeling of heat over the joint, and marked muscular rigidity are present (Fig. 3020). Lameness is an early symptom, and the foot, owing to the abnormal muscular contraction, may be distorted, being in a position of equinus or calcaneus. Atrophy of thigh and calf muscles occurs and abscess may form. The diagnosis is made from the symptoms of limp, limitation of the motion of the joint, stiffness, swelling of the joint, pain, increased surface temperature, tenderness, and *x*-ray appearances. The other bones of the tarsus may be affected without involving the ankle-joint (Fig. 3021).

Chronic synovitis of the ankle may result from acute synovitis, perhaps the result of a sprain. The symptoms do not differ from those of chronic synovitis in general, and, as a persistence of the symptoms for many weeks or months may occur, the condition is sometimes spoken of as a chronic sprain in which disability of the foot results. In such cases any static disability of the foot is to be remedied. The ankle is to be supported as the occasion demands. The mobility of the foot is promoted by massage and manipulation, and the circulation may be restored by hot-air baths and douches.

Functional affections following sprains and injuries may occur, especially in hysterical women, and they are often difficult to diagnosticate, but careful consideration of the symptoms is usually sufficient. In such cases it is necessary to rule out organic disease, and to correct malpositions of the foot. The *x*-ray is of especial use in the diagnosis of ankle-joint disease.

DISEASES OF THE METATARSO-PHALANGEAL ARTICULATIONS.—These joints are occasionally attacked as a result of injury. In arthritis deformans they may also be attacked. Inflammation of the

FIG. 3020.—Ankle-joint Disease at an Early Stage.

metatarso-phalangeal articulation of the great toe takes place as a result of the distortion of the toe called "hal-

lux valgus," or in-toe, the result of imperfect shoeing, and also secondarily to the affection commonly known as bunion. An ankylosis of this joint occurs in adolescents, being probably a sequela to a long-continued sub-

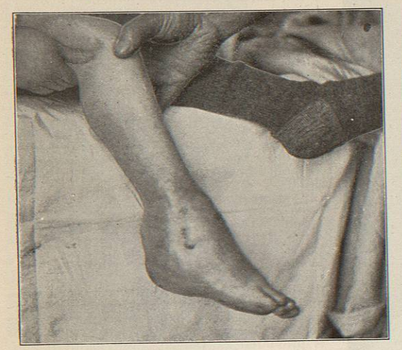

Fig. 3021.—Tuberculous Disease of the Ankle; Advanced Stage.

acute inflammation. Nothing especial need be said of inflammations of the phalangeal articulation, except that they are not common.

Diseases of the Shoulder-Joint.—*Chronic Tuberculous Ostitis.* The general symptoms of ostitis of the shoulder differ in no way from those in the usual form of this disease in other more commonly affected joints; but stiffness at the joint is less noticeable on account of mobility of the scapula. The disease is insidious, extremely chronic, and decided impairment of the joint is certain to result. The earliest sign of this disease is pain, of a dull aching character, which is usually aggravated at night, and is referred either to the joint itself or to the middle of the arm near the insertion of the deltoid. In many cases this symptom is absent or very slight, and probably in these the origin of the disease is in the synovial membrane. About this time the patient is noticed to use the arm much less, and upon examination a certain amount of stiffness is found. A slight increase of surface temperature may be detected, but the thickness of the coverings of the shoulder-joint renders this uncertain. The deltoid and scapular muscles early show signs of atrophy, even at this stage. There will usually be found a tenderness, frequently localized over a small area, and it is often a prominent symptom, especially in epiphyseal disease. The patient instinctively holds the arm at rest, and any attempt at passive motion provokes muscular spasm, and, if this attempt is persisted in, the humerus and scapula are seen to move together.

Early in the disease a change in contour of the joint becomes apparent, and is due to enlargement of the head of the humerus as well as to muscular atrophy. This enlargement may not be symmetrical, perhaps more often presenting localized swelling representing the situation of the disease.

The course of the disease is slow; the early symptoms, which were perhaps slight, gradually become more pronounced, this being particularly true of the swelling and stiffness. The amount and character of the swelling depend upon the course of the disease. The stiffness may increase to complete, or almost complete, loss of motion of the humerus on the scapula. The natural depressions in front of and behind the joint become either obliterated or are the sites of prominences. When suppuration does not occur the symptoms gradually subside, the swelling disappears, and recovery takes place after several months, leaving a joint more or less stiff.

Chronic synovitis may also occur in the shoulder-joint. It has the characteristic symptoms and appears in those types already mentioned above, except that it is especially resistant to treatment.

Arthritis deformans also occurs in the shoulder-joint, and is associated with the same characteristic symptoms as are found in the other joints, namely, pain, swelling, and limitation of motions.

Periarthritis of the shoulder is described as a condition of stiffness following slight injuries. Pain, stiffness, and atrophy are its characteristics. The description of these not uncommon cases as periarthritis is not based on pathological evidence. The terms bursitis and synovitis would probably cover some of them.

The shoulder-joint may also be the seat of gonorrhœal synovitis, Charcot's disease, and synovial cysts, as well as of bursitis and tenosynovitis.

Diseases of the Elbow-Joints.—*Chronic Tuberculous Ostitis.* An *ostitis* frequently follows an injury to the joint, but in many cases it develops with no apparent cause. It usually occurs in children.

The disease may begin with pain, but this is not severe, and often is entirely absent. Limitation of extension of the forearm is a constant and early symptom, motion in this direction being distinctly restricted when flexion, pronation, and supination are free. A slight increase of surface temperature is usually found, but its absence does not exclude the disease.

Careful examination will reveal a slight amount of swelling even at this stage of the disease; it takes the form of a fulness and thickening on either side of the triceps, and, if we look at the elbow from behind, the joint appears broader than normal. As in other joints, wasting of muscles occurs, and in severe forms of the disease it is very great, especially on the forearm.

As the disease progresses the stiffness increases, motion in other directions is restricted and resisted by muscular spasm, and the joint is held at an angle of about 140°. Starting pains may be added to the other symptoms, and become the source of great discomfort. In severe cases the whole joint becomes involved in the swelling, the enlargement assuming a fusiform shape, and displaying a greater prominence on the lower radial side of the joint. As the cartilage disappears, and the destructive process in the articular extremities of the bone becomes established, the signs of abscess may appear.

Stiffness of the elbow without active disease may result from fracture, from synovitis with formation of adhesions, or from chronic arthritis of tuberculous or rheumatic origin. The elbow-joint may be the seat of Charcot's disease as well of arthritis deformans and synovitis with the characteristic symptoms.

Diseases of the Wrist.—*Tuberculous disease* of the wrist is characterized by swelling, heat, and stiffness. If the disease is advanced deformity will be added and the hand may be flexed on the forearm to 120°–130°, a fairly constant symptom. There are atrophy of the muscles, heat, and limitation of motions. Suppuration is very likely to occur, and the course of the disease is long and slow.

Arthritis deformans when it attacks the wrist shows the ordinary symptoms of this affection which are seen in the other joints. The wrist is frequently flexed, and the fingers and hand are adducted.

Synovitis, and especially tenosynovitis, occurs in the wrist.

Diseases of the Phalangeal Articulations.—Owing to their increased liability to sprains, blows, etc., the phalangeal joints are frequently found enlarged, slightly deformed, and stiff, extension being limited.

Arthritis Deformans.—The hand is a very common seat of this affection, the disease often beginning in one or two joints of one finger, and a considerable period of time elapsing before others are attacked. The joints become much enlarged, and distortion usually occurs to

the ulnar side, this adduction being chiefly in the metacarpophalangeal joint.

The fingers remain permanently distorted, becoming flexed, or adducted, or both; the second phalanges of the fingers, as well as of the thumb, are usually extended, giving a characteristic appearance to the hand.

Diseases of the Sterno-clavicular and Acromio-clavicular Joints.—Enlargement of these joints sometimes occurs in persons accustomed to hard work with their upper extremities. Inflammation of the sterno-clavicular articulation, followed by destructive suppuration, is occasionally observed, but it presents no unusual symptoms.

Diseases of the Temporo-maxillary Articulation.—By far the most common affection is arthritis deformans; other diseases are rare.

Tuberculous disease may occur; it is usually secondary to disease of the ramus or of the ear.

Diseases of the Symphysis Pubis.—Inflammation of this joint has been described (see Holmes' "System of Surgery," article, "Diseases of Joints"). A relaxation of this joint may occur in pregnancy.

Diseases of the Sacro-coccygeal Joint.—Inflammation of this articulation has been mentioned as following injury.

Treatment of Chronic Joint Diseases in General.

In cases influenced by constitutional states constitutional treatment is manifestly indicated, and the reader is referred to the articles on *Tuberculosis, Rheumatism, Gout,* etc., for details of appropriate medication. It is self-evident that the better the patient's health is, the better are his chances for recovery, even in affections comparatively localized. In tuberculous joint affections the benefit of fresh air and exercise is particularly to be borne in mind.

The general methods for surgical and local treatment of chronic diseases of joints may be enumerated as follows: (1) local applications (counter-irritation, cauterization, inunctions, frictions, massage, douches, hot-air baths, subcutaneous injections); (2) compression; (3) fixation; (4) protection from jar; (5) distraction (extension). In addition to these the operative measures (aspiration, incision, excision, and amputation) are needed at times.

Local Applications.—The benefit to be derived from local applications comes chiefly from an alteration in the circulation of the parts and a relief of a condition of congestion, if such exist. Blisters, counter-irritation, and cauterization play less of a part in modern therapeutics than formerly, but in certain cases they appear to afford relief. The application, however, of heat and cold is of undoubted benefit in some cases.

Friction and massage, in certain cases, by improving the circulation, improve also the condition of the joint. It is probable that in this way galvanism is beneficial.

The benefit of inunctions is probably that of frictions generally; that is, there is established an improvement in circulation and with it a diminution of congestion. The application of moist heat—poultices, wet-pack—is often agreeable. And if there is inflammatory heat in the part, the application of cold in some form (douche, compresses, ice-bags, Leiter's coil, etc.) will be found advantageous.

Compression.—Compression promotes absorption of fluid from œdematous tissues or from the cavity of a joint. It can most readily be applied to the knee by means of rubber bandages or other elastic compresses. Dried compressed sponges bandaged around a knee and then wet, will, by expansion, produce pressure in cases of chronic synovitis of the knee-joint or hydrops articuli, and they are occasionally used in this manner. Elastic cloth or flannel bandages can be used, but sheet rubber bandages will be found best. In arranging for compression, it is important that the pressure should be exerted chiefly on the synovial membrane and affected tissues, and not on the more prominent healthy parts of the bone. To effect this, thick felt pads cut so as to fit in the depression are sometimes needed, and the bandage is to be placed over the depressions of the joint, as at both sides of the patella or of the malleoli.

Fixation.—Fixation, *i.e.*, the prevention of motion at a joint, is indicated in all active inflammatory conditions of a joint. In subacute conditions of inflammation a limited amount of careful motion is not injurious, the amount of motion varying according to the state of the joint. Sudden, violent, or jerky motion is, however, injurious.

In cases of active synovitis pure and simple, there is manifestly greater indication for fixation than for protection, the reverse being true in epiphyseal ostitis in a subacute stage. Passive motion, massage, active motion, and forcible motion of a joint, all may be indicated in stages of convalescence, for the purpose of breaking up and stretching adhesions, or to diminish the thickening of the synovial membrane. Motion being a normal function in a joint, it is manifest that as much motion should be permitted as is compatible with the inflammatory state. The question when fixation should be interrupted and passive or active motion allowed, is one of judgment in each case. It should, however, be borne in mind that passive motion begun too early, or employed with too great force, is apt to increase the existing synovitis, and the ultimate recovery of the joint is thereby retarded rather than hastened. It should also be remembered that the absence of pain or tenderness does not indicate the absence of ostitis and the safety of unprotected motion in a joint. Bone is not a sensitive structure, and there is comparatively little increase of sensitiveness accompanying a subacute localized ostitis.

Passive motion is of more use in combating periarticular contractions than in cases of pure arthritis, and it is for the prevention of these chiefly that passive motion is advisable. But it is also true that motion is a normal function of a joint, and that its tissues are not in normal condition unless this function is brought into use.

Protection.—Protection from the jar incidental to locomotion is of importance in ostitis of the joints of the lower extremities, except in the latest stage of convalescence; and fixation, that is, prevention of flexion or extension, or the normal motion of the joint, is important in the acute stages of synovitis. The importance of protection is often overlooked in the supposition that, if a knee or ankle is fixed by a stiff bandage, the patient can bear weight upon the limb, forgetting that in an ostitis jar to the inflamed epiphyses is more injurious even than motion. The simplest method of protection in affections of the lower extremity is by the use of crutches, but, as will be seen under the headings of individual joints, other more convenient means can be used. Protection from jar in joints of the upper extremity is readily effected by the means used for fixation.

Distraction.—The "distraction" of the bones forming a joint, that is, the pulling them apart, is manifestly desirable when the inflamed epiphyses are being crowded together, either by jar or muscular pressure. Exaggerated pressure of two inflamed bony surfaces of a joint upon each other increases the danger of necrosis, and the extent of the destructive ostitis, by diminishing through pressure the blood supply proper to the separation of the inflamed parts, and the development of the formative or cicatricial ostitis, from which a cure is to be expected. In certain joints, as the elbow, sacro-iliac, symphysis pubis, distraction is impracticable, and in certain others, as the shoulder, it is not difficult, while in the hip it is of great importance. In pure synovitis, where there is no danger of extension to the bone, there is little need of distraction.

The operative procedures, aspiration, arthrectomy, and arthrotomy, will be considered severally under the headings of each joint, where they are to be borne in mind as therapeutic methods.

The employment of these several methods varies not only in the different affections of the joints, but also in the different joints, certain methods being especially adapted to the anatomical conditions of certain joints. The subjects, therefore, will be separately considered under the heads of the various joints.