Fig. 1.—Perthes disease.

Fig. 2.—(top right) Slipped femoral epiphysis.

Fig. 3.—(bottom left) Traumatic dislocation of the hip in a boy, aged 8.

Fig. 4.—(middle right) Intra-trochanteric fracture of the neck of femur.

Fig. 5.—(bottom right) Abduction fracture of neck of femur.
Fig. 6.—Adduction fracture of neck of femur.

Fig. 7.—(right) Aseptic necrosis of the neck of the femur secondary to unsatisfactory insertion of Smith-Petersen nail.

Fig. 8.—Unsatisfactory insertion of Smith-Petersen nail due to failure to take X-rays at every stage of the operation.

Fig. 9.—(right) Fracture of mid-shaft of the femur which is already the site of Paget's disease.
Fig. 10.—(top left) Compound fractures of the mid-shafts of the tibia and fibula.

Fig. 11.—(top right) Third degree abduction fracture-dislocation of the ankle joint.

Fig. 12.—(bottom right) Complete fracture dislocation of the ankle joint. This type of case is usually reduced easily.

Fig. 13.—(bottom left) Fracture of the os calcis involving the sub-astragaloid joint.
FRACTURES

Fig. 14.—Fracture of the os calcis.

Fig. 15.—Fracture of the body of the astragalus with sub-astragaloid dislocation and dislocation of the body of the astragalus.

Fig. 16.—Avulsion fracture of the neck of the astragalus see arrow.

Fig. 17.—Rupture of the external lateral ligament of the ankle joint. X-rays should be taken with the ankle in full inversion.
FRACTURES

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FRACTURES OF THE LOWER LIMP

Fractures Involving the Hip Joint

The hip joint is peculiarly affected by injury throughout life from the nature of its position and function. In the child the chief injuries of this joint are Perthes disease and slipping of the femoral epiphysis. Perthes disease, which occurs in boys between the ages of four to ten, is an aseptic necrosis of the head of the femur. This is secondary to injury in which the blood supply to the femoral head is cut off. See X-Ray, No. 1. Treatment consists in absolute rest in bed with strapping extension until the femoral head regains its full circular contour. This usually takes from eighteen months to two years.

Slipping of the epiphysis of the head of the femur occurs between the ages of twelve to fourteen and is commoner in girls. It is frequently a bilateral condition and is associated with the fat type of pituitary disordered child. Diagnosis is confirmed by taking X-rays in the "lithotomy" position. Treatment consists of rest in bed in extension and full abduction until the head of the femur has fused to the neck. (See X-ray No. 2.)

In adults traumatic dislocation of the hip joint is not uncommon. It may be associated with a fracture of the acetabulum. Central fractures of the acetabulum are described in the next article upon fractures of the pelvis. Sciatic paralysis associated with dislocations of the hip are always of poor prognosis. Thirty per cent of dislocated hips show avascular necrosis with secondary gross osteoarthritis. The head of the femur may be dislocated anteriorly or posteriorly.

Clinically, posterior dislocation of the hip puts the leg into abduction and internal rotation. Treatment consists of reduction of the head by flexing the hip at the same time as abducting and externally rotating it. This is best done with the patient on the floor.

The second type of dislocation anteriorly presents itself with one leg externally rotated and abducted. Reduction is performed by flexion, abduction, and internal rotation of the hip at the same time lifting the head into the acetabulum.

Following reduction, all dislocations of the hip should be immobilised in a plaster spica to prevent re-dislocation, and to allow the torn ligaments to heal, and also to minimise myositis ossificans. If the margin of the acetabulum is fractured as well the dislocated hip is best treated on an abduction frame. (See X-ray No. 3.)

Fracture of the Neck of the Femur

A great deal of literature has already accumulated upon this fracture, but the treatment is still far from satisfactory. Fractures of the femoral neck may be classified clinically into three groups. They are inter-trochanteric fractures, trans-cervical fractures which do well with nailing, and thirdly, those which do not.

Inter-trochanteric fractures always unite easily without operation. (See X-ray No. 4.) These should be treated by rest in bed in full abduction to prevent the otherwise inevitable coxa vara. External rotation is prevented by a plaster up to the knee to which is fixed a transverse wooden bar behind the calf.

Trans-cervical fractures unite easily with nailing in some cases, and with great difficulty in others. The first type, which unite easily are abduction fractures. (See X-ray No. 5.) If these are impacted no operation is necessary. They should be treated by rest, but it is important to X-ray them regularly in the first few weeks in case they become dis-impacted. If they do so they should be treated by the insertion of a Smith-Petersen nail.

The third group, which do not unite easily, are adduction fractures. (See X-ray No. 6.)

In this type of fracture the fracture line is more vertical than horizontal and thus more likely to slide. Also there is no impaction. Treatment consists in the insertion of a Smith-Petersen nail and non-weight bearing for twelve weeks.

A vitallium nail should always be used as stainless steel ones slip out. The writer prefers the almost "blind" method with a two-inch incision to the more complicated Hey-Groves, Engel-May, Eric Lloyd, and other methods. The human hand is extremely accurate in the insertion of the guide-wire after practice. X-rays should be taken at all stages of the operation, i.e. after reduction, insertion of guide wire, insertion of nail and after impaction. (See X-ray Nos. 7 and 8.)

Fractures of Shaft of Femur

These may be classified into three anatomical types, sub-trochanteric, middle two-thirds of shaft...
and supra-condylar fractures. All of these are very difficult to treat if perfect anatomical alignment is required, and this must be the ideal result of treatment to be aimed at. (See X-ray No. 9.)

In sub-trochanteric fractures the proximal fragment is abducted by the glutei and flexed by iliopsoas, and the distal fragment is abducted by the abductor muscles. If the proximal fragment is not flexed sub-trochanteric fractures are best treated on a Jones abduction frame. On the other hand, if the proximal fragment is flexed immobilisation is maintained by a Thomas splint, with a Pearson knee flexion adjustment, and a Steinman pin through the head of the tibia. Alternatively, a well-leg traction splint is eminently satisfactorily for this type of fracture. This enables the patient to sit up at the same time abducting and flexing the hip and maintaining the injured femur on traction.

For fractures of the middle two-thirds of the femoral shaft the essential aim is to maintain the full length of the limb. At the same time rotation and angulation must be prevented. Furthermore, it is essential to reduce the fracture within the first few days. This must be done under deep anaesthesia and not by weights on an extension. The purpose of weight extension is only to maintain the reduction once attained by manipulation. Thus a general anaesthetic, either by inhalation or by intra-venous pentothal, is preferable to a local anaesthetic. The latter tends to dilute the fracture haematoma and there is the constant risk of introducing infection.

There are two main methods of fixation of a fracture of the mid-shaft of the femur. These are fixed traction and balanced traction.

In the former method of fixed traction, three-inch wide elastoplast strips are fixed with soft bandage, and not by adhesive strapping, on either side of the leg and thigh. The outer strip lies behind the mid-line and the inner strip anterior to the mid-line to correct external rotation. The knee joint is kept slightly flexed and two thirds of the thigh are maintained in front of the side stems of the Thomas splint with leather slings. A gutter splint is applied from the upper thigh to below the calf posteriorly. The side strips are fixed to the end of the Thomas splint, which is itself tied to the end of the tilted bed. Immobilisation is thus maintained until union has occurred in about twelve weeks. A calliper and cloth shoe is then worn for three months. Quadriceps drill is undertaken from three weeks after the fracture and active exercises three weeks after union has occurred. Passive exercises are harmful.

The second method for the treatment of fractures of the mid-shaft of the femur is by balanced traction. In this method extension is maintained by a Steinman pin through the head of the tibia to which a weight of fourteen pounds is attached. The fracture must first be reduced under a deep anaesthetic. The leg is then placed in a Thomas splint with a Pearson's knee flexion adjustment. This is fixed to a Balkan beam. The foot of the bed is raised twelve inches. Flexion of the knee should be in the region of thirty degrees. Active movements commence gently from the beginning and are further increased when the fracture becomes firm.

The writer has tried both methods, but prefers the latter method of balanced traction. This method tends to give less residual stiffness of the knee joint. It is essential that the leg be adjusted daily by one experienced in the treatment of such fractures.

From time to time it is impossible to effect a reduction of such a fracture by manipulation under anaesthesia. This is due to the intervention of muscles and soft tissues between the bone ends. Open reduction by operation is required immediately. It is harmful to try and reduce the fracture by prolonged heavy traction. The operation should be undertaken with the 100 per cent “no touch” technique. The bone ends are placed in position and the wound closed. The leg is placed in a Thomas splint as described above. Fixation by plates or bone grafts is unnecessary and in some cases harmful on account of the risk of sepsis or the fact that a bone plate may easily keep the fractured ends apart.

Infected Fractures of Shaft of Femur

Infected compound fractures of the femur are surgical problems of the first magnitude. However, with the use of penicillin and sulphanilamides and wide incision of the wound and immobilisation in a “closed plaster”, union always occurs. The incision wound through all layers of the tissues should be about twelve inches long. The infected fracture haematoma is drained. No fascial nor muscle layer is sutured. The wound is lightly packed with gauze, which should be in one length and its measurements noted so that none is left behind on removal. A plaster spica is applied, which is splint in front and which incorporates a tibial pin. The plaster is changed after a month or six weeks when the smell is no longer bearable. Excoriation of the skin by the discharging pus is prevented by covering the wound edges and surrounding skin with vaseline gauze or “tulle gras”. Before the plaster is changed the tibial pin should not be fixed to the traction table. The plaster is changed from time to time. It is, however, kept on as a complete hip spica until full union is obtained. This may take six months or more.

September, 1945
As Watson-Jones has pointed out, non-union is a complication of the past.

"Un-United" Fractures of the Femoral Shaft

Fractures of the shaft of the femur which are regarded as un-united are best treated with a five-inch onlay tibial graft fixed with four vitallium screws. The screws must penetrate to the opposite cortical layer of compact bone. Full "no touch" technique is essential. The bone graft is liable to fracture itself from the eighth to the twelfth weeks. All onlay grafts should be completely immobilised in plaster until strong bony union is obtained.

Supra-Condylar Fractures of the Femur

These are most difficult to reduce. There is no doubt that the best and easiest reduction is effected immediately after the injury under deep anaesthesia. Delay of a few days appears to make full reduction almost impossible.

Reduction is maintained by a tibial pin with the leg on a Thomas splint with knee flexion adjustment and a weight of ten pounds.

Watson-Jones has devised a method of reduction and immobilisation. This is by vertical traction with a pin through the lower femoral fragment, and horizontal traction through the head of the tibia. These are incorporated in a plaster spica. He has had satisfactory results with this method, but the danger appears to lie in the insertion of the femoral pin. If it is inserted too high infection is not unlikely in the fracture haematoma, and if too low, in the knee joint. Mild infection is common with Steinman pins and is due to their rotation in their tracks. This is minimised by incorporation of the pins in the plaster spica.

T- and Y-Shaped Fractures of the Femoral Condyles

Although these fractures appear very serious in the X-rays they unite readily when immobilised on a Thomas splint with pin or skin traction. It is of value to aspirate the haemarthrosis.

Fracture of One Femoral Condyle

These are treated with a Thomas splint and pin or skin traction. Operative reduction and fixation with a vitallium screw may be necessary.

Displacement of Lower Femoral

The lower femoral epiphysis is usually displaced anterior to the lower end of the shaft. The gastrocnemius flexes the epiphyseal fragment. There is danger of thrombosis of the popliteal vessels due to stretching over the lower margin of the shaft.

This type of injury is relatively easy to treat. It is reduced by manipulation under anaesthesia by traction and flexion of the knee to a right angle. An anterior plaster shell with the knee in this position maintains the reduction.

Injuries to the Knee

From the terms of reference of this article only fractures are considered. These include fractures of the patella, the tibial spine, and tibial tuberosity, and Schlatter's disease.

Fracture of the Patella

Fractures of the patella are in every case, where there is a stellate fracture or transverse fracture with separation, best treated by excision of the patella. Exceptions to this rule are fissure fractures with minimal separation, and polar ones.

In the latter instance it may be necessary to excise the polar fragment.

Fracture of the Tibial Spine

This is associated with avulsion of the anterior cruciate ligament, and occurs between the ages of ten and twenty. The best treatment is the conservative one. The knee is plastered for six to ten weeks in ten degrees of flexion.

Fractures of the Tibial Tuberosity

This is quite distinct from Schlatter's disease. Usually no treatment is necessary. The writer has been forced to excise two cases of un-united fractures of the tibial tuberosity, which gave rise to pain.

Avulsion of the Tibial Epiphysis

In these cases operative repair with catgut passed through holes in the fragment and in the tibia is necessary if the fragment is completely avulsed. When the fragment is partially attached manipulation is sufficient.

Osgood-Schlatter's Disease

This is a common condition in which there is aseptic necrosis of the tibial tuberosity. Treat-
ment consists of plaster with the knee straight for two months.

Fractures of the Tibia

Fractures of the Head of the Tibia

Fractures of the external tibial tuberosity are of two types. (See Diagrams Nos. 1 and 2.)

The first type is one in which the outer femoral condyle smashes its way through the outer tibial condyle like a wedge. The cruciate ligaments are torn and the external semi-lunar cartilage is driven into the head of the tibia. The outlook is bad for this type as severe osteoarthritis is inevitable. Treatment consists of reduction under anaesthesia and immobilisation for three months. The main fragment is manipulated and the smaller fragments are crushed into position with a Bohler type of clamp. An arthrodesis may be necessary if pain and stiffness persist.

The second type of injury shows an oblique injury right through the joint. There is a tear of the internal lateral ligament, with a depressed fracture of the external tibial tuberosity, and a fracture of the neck of the fibula. This prognosis is good. Treatment consists of reduction with strong traction and immobilisation for twelve weeks in plaster with quadriceps drill.

Fracture of the Medial Tuberosity of the Tibia

This is a not uncommon injury. The best treatment is to keep the patient in bed and to give him active movements and quadriceps drill from the beginning. Alternatively, operative reduction and fixation with a bone peg may be undertaken with removal of the ruptured internal semi-lunar cartilage.

Fractures of the Shaft of the Tibia

Greenstick fractures of the tibia in children require immobilisation in plaster for twelve weeks to prevent angulation.

In adults, fractures of the tibial shaft are easy to treat provided the surgeon is prepared to accept one half of an inch shortening in the case of oblique fractures. If full length and full anatomical correction are required great risks have to be undertaken. Either the fracture must be treated by some form of distraction apparatus with the risk of delayed or non-union. Alternatively, open operation and fixation with vitallium screws must be undertaken. This involves a risk of infection of the fracture haematoma.

The writer thus prefers to reduce the fracture by manipulation under deep anaesthesia with the aid of a pin through the os calcis or the lower end of the tibia. The reduction is maintained in a plaster up to the groin with the knee flexed to forty degrees. The pin is incorporated in the plaster and removed after six weeks. Watson-Jones has devised an excellent tibial traction apparatus for the purpose of reduction of such fractures.

Rigid claw toes are prevented by flexion exercises and moulding the plaster to fit the concave transverse arch. The plaster is kept on right up to the groin until the fracture is united.

Un-United Fractures of the Tibia

Slow or delayed union of the tibia are best treated by freshening of the bone ends and drilling. Alternatively, and especially if sclerosis is present, a sliding graft is required. In every case a full length plaster to the upper thigh is necessary until union has occurred.

Infected Compound Fractures of the Tibia

This is a serious surgical problem. (See X-ray No. 10.) The secret of success lies in complete and prolonged immobilisation of the fracture and complete drainage of the infected haematoma. This type of injury is thus treated best by the Winnett-Orr-Trueta “closed plaster” technique. The wound is widely opened and gently packed with vaseline gauze. The surrounding skin is also covered with vaseline gauze to prevent excoriation by pus. Penicillin and chemotherapy are indicated. A padded plaster with no windows is applied. Some surgeons prefer to have a window over the wound, but this is not essential. If necessary, sequestrectomy is performed after two months and is done gently with a scalpel and dissecting.
Fractures of the Fibula

Fractures of the neck and shaft of the fibula only require a light walking plaster or even elastoplast.

Fracture-Dislocations of the Ankle

About 90 per cent of such injuries are of the Pott's abduction fracture-dislocation type. The astragalus is displaced outwards and backwards and is tilted outwards. There may be a fracture of one or both malleoli. These are divided into first, second, and third-degree types. (See X-ray Nos. 11 and 12.)

It is important to realise that a first-degree injury must be treated just as seriously as third-degree ones. Treatment of an abduction fracture-dislocation consists of reduction under deep anaesthesia. The heel and astragalus are pressed forwards and rotated inwards. A plaster to the knee with the heel in full inversion is applied. No weight-bearing is permitted for six weeks in the case of first-degree injuries. A walking plaster is then worn for three weeks and an elastoplast bandage for a further three weeks. In the case of third-degree injuries the patient must not bear weight until union has occurred.

Abduction fracture-dislocations of the ankle are treated similarly. Vitalium screws are being increasingly employed for fractures of the malleoli, especially of the medial, the "anterior", and the "posterior" malleoli. These methods are still on trial.

Fractures of the Os Calcis

Fractures of the os calcis have been classified at great length by many writers. (See X-ray Nos. 13 and 14.) There is profound disagreement about the best methods of treatment. The writer prefers to put the patient to bed for twelve weeks. Active movements and radiant heat are commenced from the first day. Valgus insoles are required afterwards on account of pes plano-valgus deformity. Plaster causes stiff and painful feet.

Fractures of the Astragalus

Fractures of the neck of the astragalus may occur without displacement or with sub-astralagaloid dislocation or with dislocation of the body of the astragalus backwards. (See X-ray No. 15.)

In the latter two types the dislocation is reduced under deep anaesthesia or even by open operation. The foot is plastered in equinus. The main complication is aseptic necrosis of the body of the astragalus. This may require arthrodesis of the sub-astralagaloid joint and even of the ankle joint. The X-ray No. 15 is that of a patient treated by the writer. The body of the astragalus was dislocated completely. Although this was reduced back into the ankle joint under anaesthesia, it was not possible to fully correct the dislocation at the sub-astralagaloid joint and to bring the neck of the astragalus into good apposition with the body. A triple arthrodesis was performed at once and the patient has done well.

Fracture of the Tarsal Scaphoid

If the scaphoid is fractured into two halves immediate astragaloscaphoid arthrodesis is indicated.

Fractures of the Metatarsals

These are easily treated by a well-moulded walking plaster for six weeks. Flexion movements of the toes must be encouraged from the beginning.

Fracture of the Phalanges

A collodion gauze dressing and immediate weight bearing in a walking plaster or a boot with the toe-cap cut out and fitted with a metatarsal bar, is the best treatment for comminuted fractures of the phalanges. In the case of the big toe it may become necessary to arthrodese the inter-phalangeal joint.

Operation devised by writer in which half of the peroneus longus tendon threaded through the external malleolus and the os calcis, and back again on itself.

(Published by kind permission of the British Medical Journal).
Recurrent Dislocation of the Ankle

Recurrent dislocation is frequently due to rupture of the external lateral ligament of the ankle joint. Diagnosis is confirmed by X-ray of the ankle in full inversion after the injection of novocaine into the region of the external lateral ligament. (See X-ray No. 17.)

The writer has devised an operation for the repair of this ruptured ligament. The Peronaeus Longus tendon is split longitudinally from above downwards and left attached at the lower end of the wound. The free half of the tendon is threaded through the external malleolus and the os calcis and sutured back on itself. (See diagram No. 3.)

BOOK REVIEWS

PHYSICAL MEDICINE IN GENERAL PRACTICE
Published by Dr. William Berman. Medical Books. Price 37s.

It is a little difficult for me to entirely comprehend for which type of practitioner this book is written, although it is dedicated to the practitioner in general practice in the United States of America, certainly no practitioner in this country could deal with all the many technical problems raised in this book, whereas from a physical medicine specialist’s point of view the book is very unbalanced. There is very little detail about electrical apparatus. There is too much on experimental pathology, yet not enough on the actual mechanical details of giving physical treatment. The chapter on massage is extremely sketchily done. The illustrations throughout the book are extremely mediocre and disappointing and there is a marked absence of pictures illustrating electrical apparatus. The chapters on the Application of Physical Medicine to the Various Systems and Diseases is very helpful, but is hardly full enough.

TEXTBOOK OF MEDICINE
7th edition

A textbook which has reached its seventh edition in sixteen years neither needs the reviewer’s praise nor fears his criticism. Its success is assured, and the chief function of the reviewer is to suggest any further improvements that might be introduced in the future.

Among the duties of every teacher is that of advising his students as to the textbooks they should buy, and this is ever a difficult problem. One common suggestion is the purchase initially of a ‘smaller’ textbook—within which class “Conybeare” is usually included—followed later by a larger book, or by a number of books devoted to individual systems. It is far from certain that this is good advice; indeed, there is a real danger that undergraduates may read too deeply in systematic medicine. Nevertheless, there is certainly great need for a basic book, containing neither too little nor too much for the average student’s needs. “Conybeare” goes far towards meeting this requirement, although with a little judicious pruning, or the introduction of some system of type distinction separating the essential from the non-essential, it would approximate still more closely to the ideal.

An alternative approach would be to include an introductory note on the reading of systematic medicine. Using this particular book, the student might be advised to read certain small sections as early as possible—for example the first fifteen pages of Renal Diseases and the first fifteen pages of Nervous System. Thereafter, for a considerable period, he should read diseases only as he sees them clinically, and it is convenient to tick them off in the contents as they are read; full tabulated contents as printed in this book, are ideal for this purpose. When at last the time comes to systematise his work, the bulk of the ground has already been covered. Some printing distinction might well be made in the contents to indicate which sections must be studied, irrespective of whether they have been encountered clinically or not, and which sections are included for the sake of completeness.

The special features of “Conybeare,” as compared with its contemporaries, are that it is a comparatively compact and elementary account of the subject, although it is completely adequate for all ordinary examination and practice requirements. It is particularly to be recommended to those who prefer the narrative to the tabulative style.

PSYCHOLOGY AND PSYCHOTHERAPY
5th edition

The fifth edition of this popular classic by the Wilder Lecturer in Mental Philosophy and Director of the Institute of Experimental Psychology in the University of Oxford, the last edition of which was published in 1940 and reprinted a year later, contains two new chapters. In Chapter xi the author maintains that in all normal people the sexual instinct can be adequately controlled without the slightest danger to health. Chapter xvii, “The Psychology of Modern Germany,” all the more valuable coming from one who knew the old Germany and realising how great was her intellectual and artistic contributions to modern civilisation, should be read by politicians, legislators, historians, educationists, and social workers. Hitler is described in a penetrating study as the greatest paranoid in history, or at least the most paranoid ruler of modern times. In the last chapter the problems and findings of psychological research are fascinatingly and sympathetically discussed.

Those who do not always agree with the views expressed by the author will nevertheless find this monograph intensely readable throughout, delighting in its elegant, lucid, forceful style.

Could not Dr. Brown be persuaded in the next edition to add a new chapter on Courage?

CLINICAL ASPECTS OF SEPSIS IN GUNSHOT WOUNDS

This monograph by Col. A. V. Melnikov, Consulting Surgeon, Red Army Medical Services, will be welcomed by many British surgeons, though the translation from the Russian original of 1943 is somewhat too literal and tends to be cumbersome. The first 72 pages describe general facts concerning sepsis, while the remaining 103 pages deal with the individual organs and tissues, and with surgical, medicinal, and other forms of treatment. Sulphonamide therapy and blood transfusion are discussed in a page each, and vitamin treatment is dismissed in 25 lines. Chapter xvi is devoted to peculiarities of sepsis in relation to regional anatomy: pelvic wounds, fractured femur, multiple arthritis of foot, etc. There is no bibliography and no index, but the case-histories are interesting and valuable.

The appearance of further monographs from the U.S.S.R. in this series is looked forward to—in a happier translation it is hoped.