The temperature and pulse fell rapidly, reaching normal the third day in the hospital, that is, one week after the first appearance of the local lesion. In the same time there was a marked diminution in the reaction about the eye, while the lid itself became a darker red, violet, then blue-black, with no pus at any time. By the end of the first week in the hospital there remained only an area two inches in diameter about the eye. An eschar had formed where the blebs had been, this including the whole lid. The patient at this time ate, felt and slept well, her only complaint a smarting sensation locally, thought to be due to the irritation of bichloride dressings, which were now omitted, a mixture of hydrogen peroxide and boric acid solution (an ounce of the former to a pint of the saturated solution of the latter) being substituted. This apparently helped the separation of the slough, which soon loosened about the edges. Stimulation was gradually withdrawn, and by the end of the second week the patient was receiving nothing internally other than laxatives as needed.

The crust separated and fell away about the end of the third week, leaving a shallow ulcer with jagged, slightly undermined edges. Except for the palpebral margin where the lashes were intact, this ulceration involved the whole lid, extending into the outer canthus in a quarter-inch tongue-like projection. The slough did not affect the tarsal plate; the lid being raised revealed marked edema of the conjunctiva with no injury to the eye itself.

Under wet dressings and frequent cleansings with peroxide the slough rapidly cleaned up and the lid was soon filled with red granulations, the edema persisting. Balsam of Peru was then used on the granulations. As the area healed in there took place a gradual eversion of the lid, probably due to the contraction of the base of the granulations. No steps were taken to prevent this through fear of re-infection, though at this time there were no anthrax bacilli demonstrable in smears.

Eight weeks after entrance the lid was completely healed, though there remained some edema of the lower lid and of the conjunctiva. There was total eversion of the lid, the lashes coming off at the lower margin of the eyebrow. The patient was sent home at this time, it being thought advisable to give her a short vacation from hospital environment before operation for repair of the lid. A protective covering of sterile vaseline was used during the stay at home. Three weeks later she returned.

Operation. (Ether anesthesia). A transverse incision was made just above the lashes through the scar down to the tarsal plate, the full width of the lid. Above and below this incision the skin was dissected from the tarsal plate far enough to allow the lid to be pulled down over the eyeball to cover it. The apposing edges of the two lids were freshened to promote adhesions between them and then the lids were sewed together with fine silk. A piece of skin the shape of the lid, and a little bigger than it, was taken from the inner aspect of the upper arm, the full thickness of the skin, after removal of the subcutaneous fat, being used. This was fitted into the uncovered area on the upper lid and held there with six fine silk sutures, the whole being kept wet with saline during the operation. A saline dressing was applied to the eye. The wound in the arm was closed with a subcuticular stitch of catgut.

The eye dressings were kept wet with saline for ten days. There was no sloughing whatsoever and

the graft held perfectly. Two of the sutures holding the lids together had pulled through, allowing some separation between the lids in the outer half. All sutures were removed and a dry dressing applied. The tissues bleached out rapidly and motion returned to the lid. Slight contraction occurred under the graft and there developed a very slight ectropion, so that on discharge the lid completely healed, could be raised and lowered freely to cover all but about an eighth of an inch margin of the sclera in the outer half of the eye. The cornea was in perfect condition.

The patient was seen recently, that is, about seven months after the outset of the disease. The eyelid is practically normal, freely movable, covers the eye completely, can be fully raised, and in appearance is like the opposite, except on close examination, when it can be seen to be thicker and less pliable.

As to the source of the infection, the patient worked with bristles imported from Japan, China, Siberia, Russia, Turkey and Mexico, and with grasses from Mexico. It was learned that all bristles handled by the patient are "cured" before coming to the factory by a process that includes prolonged boiling or steaming to remove the fat. There are no crude animal fibres in the factory. There are, however, reeds and grasses used which are simply dried, that is, not subjected to any operation that would kill spores. These crude materials come from Mexico, from the region around Tampico. Efforts were made to learn whether there was probability of anthrax spores coming in on these grasses. The only definite information obtainable was received from the United States consul at Tampico, who writes that anthrax is not known in that region.

Officials at the factory state that they have never known of any similar case among their workers, and they were slow to believe that the infection was probably traceable to their factory. Although there are at least three shops of similar character in this city, two of which handle crude materials, this is the first recognized case of anthrax in Worcester of which any account can be found.

Medical Progress.

THIRD REPORT IN ORTHOPEDIC SURGERY.

BY ROBERT B. OSGOOD, M.D., ROBERT SOUTTER, M.D., HERMANN BUCHOLZ, M.D., MURRAY S. DANFORTH, M.D.

(Concluded from page 357.)

FRACTURES.

The Report of the Special Committee appointed in Great Britain⁶² to inquire into the end results of the treatment of simple fractures is an important contribution to the subject. In children the end results from non-operative

treatment are almost as good as from operative, perhaps even better when one considers the risk sepsis would entail in a very large number of cases operated upon by a large number of surgeons whose technique may not always be blameless. 90.5% of the results of non-operative treatment in children, 1017 cases having been studied, were considered good. 93.6% of the operative results were considered good, sixty-four cases have been studied. After the age of fifteen the non-operative results are less satisfactory and there seems to be a progressively less favorable result as age advances. The percentage of good results is better in the cases operated upon early, the early adult age groups showing a more favorable percentage than the non-operative. Of the operative methods those which secure the most perfect anatomical position and which accomplish the most absolute fixation are the most successful. Operation should be done only by skilled hands, should be done only under perfect asepsis, and should be done early. The results of poor technique and sepsis are serious, and by no means the same percentage of good results follow fractures operated upon to correct a poor result from non-operative treatment as follow those operated upon soon after the injury. The conclusions of this committee are that unless a physician is able to avail himself of the necessary skill and technique the safer method of treating simple fractures, even in adults, is by non-operative reduction.

The splendid results which may be obtained by the employment of special skill in operative treatment of even simple fractures and in children are evidenced in the report of Sampson,⁶³ using Mr. Lane's technique. Of forty-two cases treated by open operation, 88% showed a subsequent perfect anatomical result and 97% a perfect functional result. As regards the use of the Lane plate, Sampson states that in thirty-one "recent" cases there were twenty-seven perfect anatomical results, three perfect functional results, and one slightly imperfect functional result. In all cases except one in which the plate was fixed by catgut instead of screws, the few plates later removed were found firmly fixed, and it was necessary to unscrew the screws. When for some reason the plates were removed after a considerable lapse of time they were found firmly imbedded in bone. (Ed. note.) We believe such results as these may only be expected after much experience and from an almost perfect technique.

Cotton,⁶⁴ whose book on Joint Fractures has been so favorably received, has written a concise and valuable article saying much in small compass. He takes up the consideration of special fractures, and while he does not believe that these fractures belong exclusively to the orthopedic surgeon, he admits that the general surgeon must borrow his methods in the way of free bone cutting, the use of much force if

necessary in correction, and the skillful manipulation of corrective plasters for the best results. He considers that lack of motion may be the result of poor reduction, but is more often the result of failure to early mobilize. Practically no exuberant callus forms within a joint. He considers that the reason for the frequent non-union of the patella and intra-capsular hip fractures is the presence of synovial fluid. If the joint is opened and contact secured between the bone ends union may be expected.

Phemister⁶⁵ has employed Kocher's posterior exposure of the shoulder joint in cases of old and irreducible fracture of the greater tuberosity of the humerus. An angular incision is made starting from the tip of the acromion and running backward over the entire length of the spine of the scapula and thence downward along the posterior border of the deltoid. An osteoplastic resection of the origin of the deltoid is made and then the musculo-cutaneous flap is turned forward. This gives a complete exposure of the seat of fracture and of the muscles attached to the greater tuberosity. There is no danger of interfering with the nerve supply of the deltoid. He wires or nails the freed fragment of the greater tuberosity in place.

It is interesting to remark the favorable impression which the so-called Maxwell method of treating intracapsular fractures of the hip joint makes upon those surgeons who employ it. G. G. Davis⁶⁶ considers that on the whole this method of longitudinal and lateral traction advised by the Phillips and later by Maxwell and Ruth is the best. Its ease of application is one of its greatest advantages. Davis also reports good results in children from the abduction method of Whitman.

Ross and Stewart,⁶⁷ from their clinical examination and animal experiments, have become convinced that practically all dislocations are permitted only by a primary strain of tendons and ligaments followed by a partial or complete avulsion of the tendons and the occurrence of a so-called sprain fracture or gross fracture. At the seat of these sprain fractures and avulsion osteoblasts issue and callous formation is often excessive if the fracture is not sought and found by x-ray and irritative movements avoided.

(Ed. note.) While it is true that the recognition of these sprain fractures is important and that special movements which might provoke exuberant callus should be avoided, we feel that there is a tendency to maintain complete fixation too long. It is possible after making a careful diagnosis to begin certain movements very cautiously, but also very early. The number of stiff joints following comparatively simple dislocations indicates that these movements are not instituted early enough or with sufficient care in many cases.

Darrach's⁶⁸ conclusions as to the operative treatment of fractures are valuable, based as they are on an analysis of 2100 fractures treated at the Emergency Ward of the Roosevelt Hospital. Of these 2100, 104, or about 5%, were operated upon. This Darrach believes to be about the right proportion of suitable cases. He concludes that most fractures are best treated by the closed method, but that if the decision to operate is made the operation should be performed before the eighteenth day and earlier if possible.

In Bartlett's⁶⁹ experimental work with Lane plates in dogs he had several cases in which in spite of sepsis the screws remained tight and the fracture united. He has also had three human cases in which he has applied a plate in a suppurating wound and union has occurred, in one of the cases there being complete healing in three months with the plate still in. He concludes that infection, undesirable as it surely is, does not always mean a complete failure. (Ed. note.) We have had one case also which has completely healed, the plate being applied in the presence of mild infection. We can report one case in which two plates were applied extending from the fourth and fifth lumbar spinous process to the posterior superior spines to fix a rapidly increasing spondylolisthesis in a young subject. A severe streptococcus infection occurred and a sinus persisted for six months. This sinus, however, finally closed and for over two years the wound has been solidly healed with the plates in place as shown by the x-ray.

While these experiences should not make us relax our aseptic technique they may lead us in the presence of unfortunate sepsis to hesitate before we remove plates which are holding well and whose presence is likely to bring about the return of good function.

Robert Jones's⁷⁰ article in the *British Medical Journal* on the Present Position of the Treatment of Fractures is not only helpful in detail, but tintured with the strong mechanical sense of the author. This mechanical sense is made the more valuable since essential common sense is not obscured by it.

Russell⁷¹ has collected 208 cases of traumatic separation of the lower epiphysis of the femur, including the cases of Poland and Hilgenreiner. He calls attention to the fact that this is the first epiphysis to appear and the last to unite (21 years). The accident is generally due to indirect violence through the leverage of the leg or thigh, one or the other being fixed. The femoral epiphysis is firmly attached to the tibia and fibula by dense ligamentous structures and separates under forced hyperextension, flexion, abduction, or adduction, combined with traction and twisting. The commonest direct cause is entanglements in the wheels of wagons. A

direct cause by no means negligible is a separation during orthopedic manipulations for deformities of the lower extremities. The most frequent displacement is the epiphysis forward and the diaphysis backward. The exact opposite of this is the next most common position. In the separation the conjugal cartilage usually remains with the epiphysis. Many of the simple cases can be easily reduced by flexion with traction and manipulation. Sometimes an open operation and mechanical fixation is necessary, but one should avoid resection of the diaphysis or excision of the epiphysis, remembering the statement of Ollier that twice as much growth takes place from the lower epiphysis of the femur as from the upper.

Coues⁷² reports what is apparently the second reported case of pure separation of the lower epiphysis of the first metacarpal bone. In a private communication he reports subsequent observations of two more cases and has heard of a fourth through the courtesy of Dr. Stanton Heck of Salem, Ohio. The constant epiphysis of this bone is situated at the proximal end in contradistinction to the epiphyses of the other metacarpal bones. It is united with the shaft at twenty years. Coues calls attention to the necessity of not confusing this somewhat rare but evidently seldom recognized injury in children and young adults with Bennett's stave fracture of the first metacarpal.

Soubeyran⁷³ discusses the somewhat rare injury of dislocation between the first metacarpal bone and the trapezium. He finds only about thirty cases reported. The lesion is easy of reduction by traction and pressure and has been accomplished even after three years. It is difficult to maintain the correction, however.

An ingenious method of separating overriding fracture ends has been suggested by Gerster⁷⁴. A Lowman clamp is first applied to each bone fragment and then a turn buckle whose ends fit loosely over each clamp shaft is applied, and by screwing out the turn buckle the fragments originally out of line are separated and brought into alignment.

Primrose⁷⁵ reports the use of a dowel of ivory in a fracture of a phalanx following an enchondroma. The enchondroma was removed by a curette, the dowel inserted, and a perfect result followed primary healing. (Ed. note.) Magnusson has demonstrated that the ivory introduced into bone gradually becomes absorbed without undesirable reaction of the tissue. Our own experience with its use as a pin in pegging fractures is very satisfactory. In one case a peg was driven into a displaced humeral condyle and left protruding through the skin, expecting to withdraw it when union was firm. In four weeks time this was attempted, but the peg on a slight twist separated at the level of the bone and an examination of the inner end showed it to be softened, infiltrated, and partially absorbed.

NERVE SURGERY.

Foerster⁷⁷ gives the end results of fifty-nine cases of spastic paraplegia treated by his method of resection of the posterior spinal nerve roots. Forty-six were benefited, five were unbenefited, and eight died as the result of the operation, giving a mortality of somewhat over thirteen per cent. and an unfavorable result per cent. of twenty-two. He believes that the operation can do no good unless the disturbance is of central origin, excluding thus athetosis, chorea, convulsive tics, motor spasms, etc. The affection also must be stationary or only very slowly progressive. Careful oversight and after training are considered to be of such importance that he advises against the use of the method unless these indispensable aids can be employed. He advises cutting a sufficient number of nerves, but to surely spare the third and fourth lumbar roots as they have to do with the extensor reflex of the knee. (Ed. note.) The end results of myectomies, tenotomies, and careful after treatment are so good that it seems to us that this serious operation should be attempted only in special cases.

Foerster's operation has been performed on forty-four cases of tabetic crisis. In some it was not extensive enough and recurrence followed, and in some the crises developed in other nerve regions. There was a mortality of eleven per cent. He considers that in certain cases the vagus is responsible for the crises.

Frazier and Mills⁷⁸ have succeeded in anastomosing by end to end suture the first lumbar to the third and fourth sacral nerves by the intradural route. The first lumbar was identified by an electrode, cut at its exit, pulled back through a slit in the dura and united with No. 1 Chinese silk to the third and fourth sacral nerves after their identification. The operation was performed in a man of twenty-seven who had had a fracture of the right half of the first lumbar vertebra and suffered from incontinence. There had been definite improvement in the incontinence eight months after the operation. Frazier and Mills discuss other possible anastomoses and their application to the many problems of paralysis following poliomyelitis.

Pollock and Jewell⁷⁹ have employed the Schwab-Allison⁸⁰ method of alcoholic injection into the nerve sheaths for spasticities and athetoses, or the so-called muscle group isolation, in six cases. In a case of spasticity of the forearm and wrist the spasticity disappeared immediately, reappearing eleven months later, but the motor function did not return. In one case of adductor spasm the spasm disappeared at once, but returned in ten months. In one case there was no disappearance of the spasm and in two cases there was little apparent change. They conclude that there is some danger of the non return of motor function and the athetosis with motion is better than no athetosis and no func-

tion. They believe the method is chiefly applicable to the spasticity of the adductors in children, where because of the cross legged deformity they are unable to walk.

SCIATICA.

In 1906 Boehm,⁸¹ in investigating the causes of scoliosis noted the great frequency of variations from the normal in the lumbar and sacral vertebrae and the existence of many transitional forms.

In 1910 Adams⁸² in treating a functional scoliosis associated with great sciatic pain in a young girl, discovered an abnormally shaped transverse process on one side of the fifth lumbar vertebra. The removal of most of this transverse process relieved both the scoliosis and the pain. It has remained for Goldthwait,⁸³ however, to call attention to the great commonness of these transitional forms in other than scoliotics, and by an examination of many specimens and cadavera to demonstrate the frequent existence of an actual joint, (named by the late Prof. Dwight the *Sacro transversalis*), or bursa between the enlarged transverse processes of the fifth lumbar and the top of the sacrum, or sometimes the crest of the ilium. He is convinced that these conditions and the susceptibility to strain of the lumbo sacral and the sacro iliac joints which accompanies them, explain many cases of back pain and sciatica formerly hard to understand. Protection of these regions by means of apparatus designed to relieve the strain produced by the individual lesion, and in some cases the operative removal of the impinging process, has resulted in relief of the symptoms.

Kleinschmidt,⁸⁴ in a case of very severe sciatica where every conservative treatment had failed, found one of these abnormal wing-shaped processes on the fifth lumbar, four c.m. long and two to three c.m. wide. The resection of this process gave definite relief.

PTOSIS AND INTESTINAL STASIS.

Orthopedic surgeons must apparently investigate, at least in the arthritic conditions, the position of the viscera and the passage of the food through the intestines. Evidence presented by Lane,⁸⁵ Goldthwait,⁸⁶ and many others of the intimate relation as a causative factor of intestinal stasis and various joint conditions, makes the study of these visceral ptoses and the interference with normal assimilation and the production of intestinal toxins of great importance.

Stone⁸⁷ has demonstrated the extreme toxicity of the secretions of a tied off jejunum and clinical evidence is everywhere at the hand of the poisonous effects of constipation and stasis.

The Roentgen ray now gives us a more definite and accurate method of determining the

position of the viscera and the progress of the food mass. In children, where the normal length of passage should be about 24 hours, we frequently find it to be fifty or even one hundred and sixty hours, and usually the delay is near the cecum.

Barrington-Ward⁸⁸ reports several cases where arthritic conditions, including tuberculosis, associated with proved intestinal stasis, were speedily relieved by surgical measures which divided bands, released kinks, and short circuited the bowel. He believes, as has indeed been before suggested, that tuberculosis of the joints is often another end result of intestinal stasis, and that the bowel is the common route of infection in this disease. This latter view is, as far as we are aware, not as yet wholly proved.

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Reports of Societies.

TWENTY-SEVENTH ANNUAL MEETING OF THE AMERICAN ORTHOPEDIC ASSOCIATION.

HELD IN THE RED PARLOR OF THE NEW WILLARD HOTEL, WASHINGTON, D. C., MAY 6, 7, 8, 1913.

(Concluded from page 360.)

REMARKS ON THE IMPORTANCE OF POSITIVE SUPPORT IN THE CURATIVE TREATMENT OF WEAK FEET, AND A COMPARISON OF THE MEANS EMPLOYED TO SECURE IT.

DR. ROYAL WHITMAN, New York City: In 1890 there were 97 cases of flat-foot mentioned in the report of the Hospital for Ruptured and Crippled, in 1906 there were 1219, and in the last report there were 2109. Flat-foot is an acquired weakness and is understood to be preventable and curable. The lowered arch is the secondary, and not the primary deformity. Palliation is often mistaken for cure. I have a brace which I have used for several years with success. A brace that will not only prevent deformity, but the predisposition to it, and will enforce a proper attitude in walking, may be regarded as a most important measure in curative treatment. The most satisfactory material for this brace is thin polished steel, galvanized. The essential accompaniment of positive support is a proper shoe, inclined somewhat outward by thickening the inner part of the heel and sole. The aim of treatment should be to cure, rather than to relieve flat-foot.

A RAPID AND ACCURATE METHOD OF TAKING CASTS OF THE FEET.

DR. MICHAEL HOKE, Atlanta: This procedure has done away with the disadvantages of the older methods. I take plaster bandages and soak them in water, flattening them out on the table, thus making a square plaster splint four inches wider than