PROCEEDINGS AND REPORTS OF UNIVERSITIES, COLLEGES, COUNCILS AND ASSOCIATIONS

GREAT BRITAIN

BRITISH ORTHOPAEDIC ASSOCIATION

SPRING MEETING

The spring meeting of the British Orthopaedic Association was held in Dublin from April 23-25 under the presidency of Sir Reginald Watson-Jones. This is the first time that the British Orthopaedic Association has met in Eire and although the festival of flowers and flags and street-decorations in Dublin may not have been planned especially for us, the warmth of welcome at this time when Eire was “at home” not only by the president of the Royal College of Surgeons in Ireland, the professors of the medical schools, and the Master of Trinity, but by every policeman, hotel attendant and man and woman in the street, was so generous that we all felt happy and came away with a warm sense of satisfaction.

The Executive Committee met at 7 p.m. on the eve of the meeting and did not finish its work until nearly 5 o’clock the next morning—many members being so tired before they began that they were utterly exhausted when they had finished. But steps have now been taken to prevent repetition of such marathon activity which is unfair to the president and unhelpful to the members of the Executive.

During the meeting a message from Her Majesty the Queen was read, expressing appreciation of the birthday greetings which had been sent by the president on behalf of the fellows and members of the Association.

At the dinner the toast of the British Orthopaedic Association was proposed by Dr J. Ryan, Minister of Health in Eire. The vigorous and forthright response from Dr William Doolin disturbed many of us who were not fully aware of the Irish temperament—but apparently all was well and all still is well. Dr Doolin gave to the president the first original medal struck in honour of Edward Hallaran Bennett—the first of the awards now given each year to the most distinguished student in surgery. This first copy of the Hallaran Bennett Medal will be preserved with the treasures and archives of the British Orthopaedic Association which are now being collected and will be displayed in the Exhibition Hall of the newly rebuilt Royal College of Surgeons of England.

Transfusion of blood, plasma and plasma substitutes—Dr W. E. R. Hackett (Dublin) discussed the advantages of transfusions of blood, plasma and plasma substitutes before and during surgical operations. In anaemic patients who required transfusion before operation it was important that the blood be given several days beforehand so that the body might be enabled to benefit as fully as possible. Blood given during operation had its greatest usefulness in replacing blood lost. This was often greater than was realised. An often unsuspected source of blood loss
was bleeding into the tissues, and this was an important cause of oligaemic shock after injuries such as fractures and extensive limb wounds. The risks of overloading the circulation by overtransfusion were small; a commoner error was not to give enough blood. With expert laboratory facilities reactions from mis-matching were exceptional; mistakes, when they occurred, were more often due to clerical errors or confusion of patients with similar names rather than to mistakes in grouping. In practice the only Rh factor of real importance was the D-antigen.

So far there was no true substitute for blood. So-called blood substitutes were really plasma substitutes, and none was equal to plasma itself. A perfect plasma substitute must have the same osmotic properties as plasma; this was very difficult to achieve in practice. The best types at present available were the polyvinyl polymers such as "plasmasan" and the sugar polymers such as "dextran."

The close-packed position of joints and its practical bearing—Professor M. A. MacConaill (Cork) defined the close-packed position of a joint as one in which the surfaces were completely congruent and the ligaments taut: it was a position in which the component bones of the joint were inseparable by traction. There was only one such position for most joints (there were two for the elbow, which was essentially a combination of two joints). For example, in the shoulder joint the close-packed position was one of abduction and lateral rotation; and for the hip it was one of slight abduction, extension and slight medial rotation; for the fingers, the close-packed position was extension, and for the metacarpo-phalangeal joints, flexion. The close-packed position imparted the greatest stability and rigidity to the joint, but it was used only during special effort.

Ocular torticollis—Professor L. E. Werner (Dublin) recalled the significance of imbalance of the ocular muscles as a cause of tilting of the head in infants and young children. When due to an ocular imbalance such tilting could be corrected by an equalising operation upon the eye muscles, though in long-standing cases secondary contractures of the neck muscles might occur. Professor Werner assessed cases of torticollis as being 1) purely ocular, 2) purely cervical, or 3) combined. From the orthopaedic point of view it was necessary to determine as soon as possible in every case of torticollis whether or not there was an ocular element in the deformity, if necessary by referring the patient to an orthoptic clinic. If an ocular defect was overlooked orthopaedic treatment directed to the neck would be incompletely successful.

Fracture of the head of the radius treated by excision and substitution of an acrylic head—Mr J. C. Cherry (Dublin) had replaced the fractured radial head by an acrylic prosthesis in selected cases in which the head was badly comminuted. He described and illustrated the prostheses and the special instruments used for their insertion, and gave details of the operative technique. A full account of the method was published by Mr Cherry in the February 1953 number of the Journal (Vol. 35-B, page 70). Mr C. C. Jeffery (Exeter) believed that the operation had a definite place, especially in cases of fracture in which the radial shaft was displaced upwards. Such fractures were, however, exceptional. He had examined radiographs of the wrists of a large series of patients who had submitted to excision of the head of the radius, and in none was he able to find evidence of radio-ulnar subluxation. If replacement by an acrylic prosthesis could be shown to limit new bone formation it might have a place even when the radial shaft was undisplaced. Professor Bryan McFarland (Liverpool) had found no tendency for the radial shaft to migrate upwards, even when the radial head had been excised in children. Mr F. G. St C. Strange (Canterbury) recalled that the position of the radius depended upon the integrity of the interosseous membrane. If this was torn by the force of the injury the radius was displaced but if the membrane remained intact displacement was not to be feared. Mr Philip Wiles (London) thought that it was necessary to know the late results of prosthetic replacement before the place of the operation could be determined. Mr Arthur Chance (Dublin) believed that the radius might move upwards when weight was put on the wrist (e.g., leaning on a table) even though it appeared in normal position in routine radiographs. There was an established place for the operation, but if the capitulum was found to be badly damaged at operation acrylic replacement was better avoided. Sir Reginald Watson-Jones (London) had no doubt that the operation was appropriate for the rare but definite cases in which fracture of the radial head was associated with rupture of the interosseous membrane and marked upward displacement of the radius. Mr Cherry, closing, emphasised that he preferred to reserve acrylic replacement for exceptional fractures; he still relied, in most cases, upon conservative treatment.

Treatment of club foot—Mr A. T. Fripp (London) discussed the treatment of relapsed or neglected congenital club foot in children of from six months to ten years of age. For the past four years he had given an extensive trial to the Kite technique in which wedged plasters are used and he had been impressed by the results. The technique aimed at gradual correction without harmful force and without anaesthesia. Each of the four components of the deformity (varus,
inversion, equinus and plantaris) was corrected successively by removing appropriate wedges from the plaster and closing the gap, the adjustments being made at weekly intervals. The average duration of plaster treatment was twenty-one weeks. Mr Fripp had found that during treatment the foot became progressively more supple and that in nearly all cases satisfactory correction was obtained. In his series the period of plaster treatment had been followed routinely by transfer of the tibialis anterior tendon towards the lateral border of the foot; occasionally it had been supplemented by a soft-tissue operation of the Brockman type. Associated congenital anomalies and stiffness from previous unsuccessful bone operations might offer insuperable difficulties to correction. Professor Bryan McFarland (Liverpool) agreed whole-heartedly with the principle of gradual correction without the use of force. He thought there might be advantages in repeated plasters rather than wedged plasters. He emphasised the importance of correcting the individual components of the deformity one by one. Such a method reduced the necessity for operation, though it did not eliminate it. Mr K. I. Nissen (London) doubted the wisdom of transposing the tibialis anterior tendon to the lateral side of the foot as a routine; over-correction might result.

Pott's paraplegia and its operative treatment—Opening a discussion jointly with Mr D. Lloyd Griffiths and Mr R. Roaf, Mr H. J. Seddon (London) spoke mainly of pathology, prognosis and indications for operation. He recalled that much of our knowledge of the pathology of Pott's disease was owed to French workers at Berck, and especially to Madame Sorrel Dejerine. In paraplegia of early onset the cord might be involved by an inflammatory lesion (fluid or solid), rarely by thrombosis of the vessels, and sometimes by mechanical collapse of the spine. When paraplegia arose towards the end of a period of conservative treatment it almost merited the term "intermediate paraplegia"; its pathology was the same as that of early onset paraplegia except that it was never due to a fluid abscess. Paraplegia of late onset was associated either with an inflammatory process or with pronounced bony deformity. The cord changes in paraplegia were of four kinds: simple compression, infective thrombosis, pachymeningitis (rare) and longitudinal shrinkage. With conservative treatment alone paraplegia of early onset persisted in about one quarter of all cases and paraplegia of late onset in over half the cases. Operative treatment offered a good prospect of mechanical relief: fluid pus could be drained by costo-transversectomy, but solid matter interfering with the cord was best removed by antero-lateral decompression (except in the neck and in certain lumbar lesions, where laminectomy offered advantages). Operation was indicated 1) when paralysis had become complete; 2) in all late onset cases; 3) if continued improvement was not occurring under conservative treatment; 4) when paraplegia was associated with uncontrollable spasms of the legs; and 5) if paraplegia recurred after initial recovery. Operation should be considered relatively early in older patients. In cases with visible abscess shadow costo-transversectomy should be tried first but if it was unsuccessful antero-lateral decompression should be undertaken.

Mr D. Lloyd Griffiths (Manchester) described in detail the operation of antero-lateral decompression as employed by Mr Seddon, Mr Roaf and himself. He emphasised that operation was by no means required in every case. It was a difficult, formidable and hazardous operation and patients should not be submitted to it unnecessarily. A wide exposure, with removal of the medial ends of three or four ribs, was recommended. The spinal theca was exposed by removal of one or more pedicles and any source of pressure lying anteriorly in the region of the vertebral body was removed. After antero-lateral decompression stability of the spinal column depended almost entirely on the posterior structures. Mr Griffiths summarised the combined results in forty-eight patients operated upon by Mr Seddon, Mr Roaf and himself. Thirty-four recovered sufficiently to walk normally; eleven patients made little or no recovery, and three patients died. In successful cases recovery was often dramatic. Results were better in early cases with active disease than in late cases with marked bony deformity. Spinal fusion was always advisable after antero-lateral decompression. Mr F. W. Holdsworth (Sheffield) said that with the introduction of antero-lateral decompression our ideas on the treatment of Pott's paraplegia had been revolutionised. Operation seemed strongly indicated in any case in which recovery was not occurring with conservative treatment. Antibiotics had helped to make operation safer. Mr Norman Capener (Exeter) stressed that operation should not be undertaken lightly. The operation he had described was essentially the same as that recommended by Mr Griffiths, but he thought it unnecessary to remove more than one or two ribs. He was interested in Wilkinson's suggestion that the usefulness of operations of this type might be extended to cases in which there was no paraplegia. Mr J. Dobson (Wrightington) agreed that antero-lateral decompression represented a great advance. It should be done only in specially equipped centres. He emphasised the importance of treating the tuberculous patient as a whole by constitutional measures. Mr R. W. Butler (Cambridge) believed that antero-lateral decompression would greatly shorten the duration of paraplegia and would permit recovery in many patients who would not otherwise recover.
The orthopaedic treatment of early poliomyelitis—Sir Harry Platt (Manchester) opened a discussion with some general observations on the problems of poliomyelitis. He recalled the characteristic features of outbreaks of poliomyelitis of a generation ago. Such outbreaks were always small and children were almost exclusively affected. The main problem was that of preventing and relieving crippling deformity. As a result of the greatly increased incidence of poliomyelitis and the frequent affection of adults the subject had assumed an even greater importance in recent years. The prevention of deformity was still one of the main problems. This could be tackled efficiently by the orthopaedic surgeon only if the patient came under his care at an early stage. There was unfortunately a tendency for patients to be brought too late to the orthopaedic surgeon. Mr D. M. Brooks (London) outlined a programme of treatment for patients with poliomyelitis. He recalled that the aims of treatment were to save life, to prevent deformity, to restore function and to rehabilitate the patient. The orthopaedic surgeon should have access to the patient at an early stage and he should have a full knowledge of the complications that endangered life and of their management, including the use of different types of respirator. In preventing deformity the surgeon must remember its two causes—faulty posture and muscle imbalance. Faulty posture, which might sometimes be assumed in an attempt to minimise pain, was always preventable by appropriate splints and early passive movements: drop foot and back knee were common examples. Deformity from muscle imbalance—essentially a phenomenon of childhood—was more difficult to control. Experience showed that if muscle imbalance was marked it was impossible to prevent the occurrence of deformity simply by external retentive apparatus. Relatively early tendon transplantation was often necessary.

In planning the programme of treatment designed to restore the greatest possible function Mr Brooks advocated a commonsense approach. Active use of recovering muscles should be begun with caution at first and increased gradually. It was wrong to “flog” the muscles from the beginning of treatment with the idea that hypertrophy of muscle fibres would necessarily be induced by fatigue. Fatigue could be harmful, especially within the first three months. Electrical muscle tests were of value in determining at an early stage whether paralysis was doomed to be permanent. In general, it was true that if a muscle showed no sign of recovery within three months it was unlikely ever to recover. In such circumstances any necessary tendon transplantations could be proceeded with without delay. Mr H. H. Langston (Winchester) said that it was important that the orthopaedic surgeon should have early access to patients with poliomyelitis. There was a tendency for too much delay. Professor Bryan McFarland (Liverpool) believed that early orthopaedic management would best be secured by the efforts of individual orthopaedic surgeons each in his own area. Mr R. I. Stirling (Edinburgh) suggested that in times of epidemics blocks of beds in fever hospitals should be put at the disposal of the orthopaedic surgeons, who otherwise might be unable to accommodate the large numbers of cases in their own wards. Mr J. C. Scott (Oxford) believed that in the early stages the ideal arrangement was a close co-operation between orthopaedic surgeons, paediatricians and fever physicians. Orthopaedic surgeons should strive to contribute more to the solution of problems of the early phases of the disease.

Dupuytren’s contracture—Mr J. I. P. James (London) reviewed some of the features of Dupuytren’s contracture. He described in detail the anatomy of the palmar fascia and especially of its digital extensions. He recognised contracture of the fifth finger as a distinct clinical type in which the distal interphalangeal was not uncommonly involved. He had found “knot” knuckle pads associated with Dupuytren’s contracture in nearly a quarter of all his cases; the histology of the pads was similar to that of the palmar fascia. Plantar involvement was also frequent. Subcutaneous tenotomy was occasionally justified in the elderly, but in the ordinary case excision of the palmar fascia, through a skin-crease palmar incision and through mid-lateral digital incisions, was recommended. The greatest hazard was oedema of the hand which might lead to a type of “frozen hand” possibly analogous to Sudeck’s atrophy. This was the commonest cause of failure. Of eighty-four cases reviewed the result was perfect or good in sixty-four, and fair or poor in twenty. Metacarpo-phalangeal contractures could usually be overcome whereas interphalangeal contractures were very liable to persist.

Metatarsalgia—Mr D. F. Thomas (Scunthorpe) recalled that metatarsalgia was nothing more than a symptom. Often there was no precise cause and the site of the pain was ill-localised. Mr Thomas believed that in many such cases the underlying disorder was a weakness or insufficiency of the tibialis anterior, which allowed dropping of the forefoot. Treatment was by physiotherapy, but if this was unsuccessful transplant of the toe extensors into the metatarsal heads should be considered.

The place of amputation of all toes—Mr K. I. Nissen (London) said that there was a definite place for amputation of all the toes. The operation seemed to have become rather neglected. It was most applicable to cases of gross deformity with rigid, functionless but painful toes. Such
conditions most commonly followed "burnt out" rheumatoid arthritis; occasionally they were induced by peroneal muscular atrophy or by frost-bite. The nature of the proposed operation should always be clearly impressed upon the patient, whose written permission should be secured. After operation it was often possible for ordinary shoes to be worn, but sometimes special shoes were required. There might be a tendency to persistent trouble from pressure over the metatarsal heads, and irritative cysts might require excision.

**Tendon transplants for claw toes**—Mr R. G. Taylor (Oxford) had studied the results, in sixty-eight patients, of Girdlestone's operation of transplantation of the long toe flexors into the extensor expansion for claw toes. This paper was published in full in the 1951 number of the Journal (33 B, 539).

**Colles fracture**—Mr W. Doolin (Dublin) opened a discussion on Colles fracture of the wrist, sketched the scientific, cultural and social background against which Abraham Colles occupied with such distinction the Chair of Surgery in Dublin. Though he was undoubtedly the leader of his profession in his lifetime he was nevertheless a man of exceptional modesty. He was admired by his colleagues and students alike for his upright character and intense honesty. (This paper will be published in full in a future number of the Journal.) Mr G. N. Golden (Guildford) had studied the late results in 110 cases of Colles fracture treated one to twenty years before. Most fractures had been treated by junior residents and the usual method had been manipulative reduction and immobilisation in plaster for four weeks. Fifteen fractures had required remanipulation for secondary displacement. Results were assessed on the basis of pain, functional disability and deformity. Mr Golden concluded that age alone was not an important factor in the result. The type of fracture was of some significance, the incidence of poor results being greater after comminuted fractures and especially after fractures complicated by radio-ulnar subluxation. There was a definite and striking relationship between the quality of the reduction maintained and the results. It was suggested that more stable reduction and consequently improved results might follow the use of above-elbow plasters. Dr W. R. Harris (Toronto) said that one of the difficulties was to maintain reduction. He and his colleagues in Toronto believed that the use of plaster-of-paris was an inefficient method, especially in comminuted fractures. In selected patients a trial had been given to mechanical fixation by pin units of the Roger Anderson type, the pins being passed into the radius above the fracture and into the shaft of the second metacarpal distally, and retained for six weeks. Tension on the skin around the pins was avoided by reducing the fracture before the pins were inserted. In twenty-three cases observed for from two months to five years after treatment there had been no recurrence of deformity and no patient had lost more than 5 degrees of wrist movement. In two cases the pin fixation had to be abandoned because of pin-track infection.

**Median nerve compression in the carpal tunnel**—Mr J. S. R. Golding (London) recalled that pain and tingling in the distribution of the median nerve in the hand were commonly due to compression of the median nerve behind the flexor retinaculum. He had studied the clinical features and results in fifty patients subjected to operation. Most patients were women in middle life and the symptoms were bilateral in half. Tingling at night was prominent and was often relieved by hanging the arm out of bed or shaking it. There was usually impairment of sensation and sometimes there were motor weakness and wasting, which might be confined to the abductor pollicis brevis and opponens pollicis. The causes of the narrowing of the tunnel fell into two groups—non-traumatic and traumatic. Non-traumatic conditions included ganglion, tenosynovitis, changes in the flexor retinaculum itself (acromegaly, Lévi's pleonosteosis) and idiopathic. The traumatic group included early lesions such as haematoma, carpal dislocation and fractures with displaced fragments, and late lesions such as old fractured scaphoid and gross traumatic arthritis. The results of decompression by division of the flexor retinaculum were good. The symptoms were almost always relieved. There was usually good or moderate recovery of sensibility, but motor impairment often persisted. Mr F. C. Dubein (Exeter) thought that the nocturnal paraesthesiae might be aggravated by a tendency to lie with the wrist flexed. He believed that night-splints to hold the wrist in a neutral position might reduce nocturnal discomfort and might sometimes obviate the need for operation. Sir Reginald Watson-Jones (London) recalled that in certain cases of median compression by haematoma after direct injury to the palp operative decompression might be required urgently.

**Edward Hallaran Bennett**—Mr W. Gissane (Birmingham) paid a tribute to the memory of Edward Hallaran Bennett (1837–1907) who was at one time Professor of Surgery in Dublin and who described the injury now widely known as Bennett's fracture. The original specimens on which Bennett had based his accurate description were demonstrated. Mr Gissane said that the injury was now believed to be an adduction injury, and stressed that although it might be reduced clinically without difficulty (as had been claimed by Bennett before the days of x-rays) it was difficult yet
essential to obtain and maintain close radiographic reduction. Operative suture of the ruptured joint capsule might be required to prevent redisplacement and, when necessary, this should be done early while the damaged tissues were still recognisable and easily handled. For late disability after inadequate reduction arthrodesis was preferable to arthroplasty.

**Posterior ischio-femoral arthrodesis by a femoral graft**—Mr N. S. Martin (Belfast) traced the evolution of ischio-femoral arthrodesis of the hip from its first description by Trumble in 1902. He recalled that Brittain’s technique (1942) had itself been modified by Foley (1949) who recommended an open approach with the patient prone. Mr Martin had been impressed by the disadvantages of taking a large graft from the tibia and had developed a technique of open posterior fusion in which a femoral graft was obtained through the same incision. He showed radiographs to prove that the technique had been uniformly successful in over thirty cases.

**Clinical meeting**—A clinical meeting was held at Dr Steevens’s Hospital, Dublin. A large number of interesting and instructive patients had been brought together from many parts of Ireland and were demonstrated by Mr A. Chance (Dublin), Mr H. F. McAuley (Dublin), Mr J. E. C. Cherry (Dublin), Mr P. A. M. Fitzgerald (Dublin), Mr St J. G. O’Connell (Cork), Mr R. F. O’Driscoll (Waterford) and Mr J. F. O’Sullivan (Dublin).

**ROBERT JONES GOLF CUP**

The annual competition for the Robert Jones Golf Cup was played on the links of the Portmarnock Golf Club near Dublin during the Spring Meeting of 1953. The Portmarnock Golf Course is beautifully situated on the edge of the sea, just north of Dublin, and we were fortunate in being blessed by warm, sunny weather.

The Cup was won for the second time by Mr G. K. McKee of Norwich who returned the excellent score of 88—15 = 73. He won by three strokes from Mr N. Roberts, Mr Maitland Smith and Mr J. Quinlan, who returned net scores of 76. Eighteen competitors took part in the competition—a very satisfactory entry as the total number of members attending the Dublin Meeting was considerably smaller than usual. The captain of the Portmarnock Golf Club visited the course to meet us and we were all made extremely welcome, both by him and the other members of the club.

**ROYAL SOCIETY OF MEDICINE**

A meeting of the Orthopaedic Section of the Royal Society of Medicine was held at the Heritage Craft Schools and Hospitals, Chailey, on May 9, 1953, under the presidency of Mr H. Jackson Burrows. About 120 members and guests were present. The morning session was devoted to short papers read by members of the hospital staff.

**Infantile hemiplegia**—A symposium was presented. Dr E. P. Quibell gave a preliminary report into the incidence of chronic subdural haematoma in infantile hemiplegia in a group of school-age children at the Heritage Craft Schools and Hospitals. So far, four proven cases with large lesions had been found, in boys between eleven and sixteen years old: all had had fits, usually in early life, with a history of difficult birth. Plain radiography was valuable in showing thinning and bulging of the skull overlying the lesion. The haematoma had all been left-sided. The investigation was continuing, to establish diagnostic criteria, the age at which the radiological changes appear and to study the effects of drainage of the lesions on the intelligence.

Mr E. J. Radley Smith emphasised that this was purely a preliminary investigation. He said that the paralysis was most often left-sided and widespread, but in spite of this intelligence was little affected and there was no speech defect. There was a bulge on the fronto-parietal region of the affected side. The cerebro-spinal fluid was normal. Ventriculography showed a deviation of the ventricular system towards the side of the haematoma. Operation for drainage had produced subjective improvement in these late cases. He did not know the reason for this.

Dr A. M. Rackow spoke of the radiographic appearances. He said that the points to be noted were: 1) calcification of the haematoma; 2) flattening of the skull; 3) evidence of pressure on the great and lesser wings of the sphenoid; 4) forward bulge of the anterior wall of the middle fossa.

Dr Aldren Turner suggested that angiograms might be a better method of study than air ventriculography. He wondered whether operation was justified in late cases as the damage to the brain had already occurred.

**Phocomelia**—Mr W. D. Collart read a paper on phocomelia. This proved to be a classification of congenital defects of the lower limb under three headings: 1) proximal femoral dysostosis; 2) congenital short femur; 3) cervical dysplasia. A case was described and radiographs shown.

**Management of the bladder in paraplegic children**—Mr Ellison Nash spoke on the treatment of the bladder in paraplegic children. He stressed the importance of residual urine and stated that if more than one ounce was present the child needed two-hourly manual expression. Bladder neck resection was sometimes necessary, also the removal of diverticula which might necessitate
Correction of deformities by splinting—Dr E. E. Harris showed ten children illustrating the effect of prolonged splinting in plaster, resulting in clinical loss of spasticity. This effect could be maintained in many cases by suitable night splinting only, and could therefore in them be long-term treatment as well as a factor in assessing operative results.

Contribution of paediatrics to orthopaedic surgery—Dr C. P. Pinckney spoke on the contribution of paediatrics to orthopaedic surgery. He discussed measures for the protection of the mother against virus infections during early pregnancy, and for the prevention of nutritional disorders. The need for vitamin D in the diet of city children was emphasised and the types of rickets classified. The management of rheumatoid arthritis and tuberculosis was in conjunction with the paediatrician.

Members and guests were invited by the Hospital Management to lunch, at which Mr S. I. Higgs told the story of the Heritage and of its founder Mrs Kimmins. The afternoon was devoted to a tour of the hospitals and workshops.

REGIONAL ORTHOPAEDIC CLUBS

SOUTH-EAST METROPOLITAN REGION ORTHOPAEDIC CLUB

Two meetings of the South-East Metropolitan Region Orthopaedic Club have been held during the winter.

Films—The meeting on November 29, 1952, at King’s College Hospital was devoted to a series of films of orthopaedic interest. About forty members and guests were present. The following films were shown: 1) Mould arthroplasty of the hip—Mr W. A. Law; 2) Spinal bone grafting by anterior route—Professor Merle d’Aubigné; 3) Conservative operations for paralytic deformities of infants’ feet—Professor B. McFarland; 4) Treatment of injuries of the extensor and flexor tendons of the hand—Mr R. G. Pulvertaft.

Mr Law was present to introduce and discuss his film. Time did not allow the showing of two other films which had been requested, and it was decided to devote an occasional meeting in future to orthopaedic films. After the meeting we were entertained to lunch by kind invitation of the Governors of King’s College Hospital.

Clinical meeting—A clinical meeting was held at the Miller General Hospital, Greenwich, on March 21, 1953. About forty members and guests saw a wide variety of cases demonstrated by Messrs J. E. Buck, R. H. Sewell, M. B. Cashman and Dr J. Gold.

Among the cases demonstrated by Mr J. E. Buck were the following.

"Frozen" shoulder—A severe case in a woman of forty-seven treated by manipulation under anaesthesia and an intra-articular injection of 100 milligrams of cortisone at the same time. A relatively short course of physiotherapy had then resulted in excellent restoration of painless movement. This treatment had been used while the joint was still in an irritable acute phase, which Mr Buck felt sure would have been aggravated by manipulation without cortisone. Mr Buck had treated several similar cases in this way, and he had been struck by the great improvement in symptoms and the relatively rapid recovery. In discussion, Mr Le Vay related that he had recently been treating "frozen" shoulders by manipulation in conjunction with intramuscular injections of cortisone for two weeks. He also had been impressed, using this routine, by the marked clinical improvement even in patients who were manipulated during the irritable phase of the disorder. It was generally agreed by those present that the use of cortisone in this condition appeared to be a considerable advance.

Judget arthroplasty—A man of forty treated by Judet arthroplasty after fracture of the femoral neck with avascular necrosis of the femoral head. This patient had a good range of movement but complained of pain. Discussion ranged widely around the possible causes of pain after Judet arthroplasty.

Spastic flat foot—Two patients with spastic flat foot in whom relief of symptoms had followed excision of the contents of the sinus tarsi. One was painless and the other had some residual discomfort, but in both cases the feet remained valgoid.

Genu valgum—Severe genu valgum in a boy of fifteen treated by epiphyseal stapling of the femora. Complete correction had occurred within a few months of the operation and the staples had subsequently been removed. The use of epiphyseal stapling for severe genu valgum in young children was discussed. Mr J. I. P. James suggested that this method should not be used before the age of about ten.
Curettage of acetabulum—Mr. David Trevor described a case of acetabular dysplasia with a congenital subluxation of the hip. This was corrected by curettage of the acetabulum with insertion of acrylic. The results were good, and Mr. Trevor demonstrated the improved ratio of the head to the acetabulum compared with the pre-operative state.

Great toe—Mr. D. H. S. Pym reported a case of a great toe amputation for a malignant ulcer. The patient was a young girl who had been previously amputated elsewhere. The new amputation was carried out with a good result, and Mr. Pym described the technical procedures involved in such cases.

Supination—Dr. R. H. Sewell, who had recently returned from a trip to New Zealand, reported on the use of supination in the treatment of fractures. He described several cases where supination had been successfully used, and emphasized the importance of early mobilization in the post-operative period. He also discussed the indications and contraindications for supination, and the potential risks associated with its use.

Mr. H. S. Pym—In response to questions from the audience, Mr. Pym clarified that the use of supination was not without its risks, and that careful consideration should be given to each individual case. He also mentioned that the success of supination often depended on the experience and skill of the surgeon, as well as the cooperation of the patient.

Rupture of extensor pollicis longus tendon—Bilateral rupture of the extensor pollicis longus tendon following Colles fractures. On one side Mr. Buck had produced a good functional result by tendon transplantation. The second side had not yet been operated on. Mr. David Trevor enlivened the discussion by an emphatic re-statement of his views on the superiority of end-to-end suture of the ruptured extensor pollicis longus tendon with a nylon suture bridging the gap. The length of incision needed to find the retracted proximal end of the tendon was regarded by some members as a disadvantage of this operation, but Mr. Trevor exploded this view by pointing to the scar resulting from tendon transplantation in the case under discussion.

Compound fracture—Ununited compound fracture of tibia and fibula with infection. Sound union and healing of the infection had resulted from compression applied by pins and clamps after other methods had failed.

Mr. R. H. Sewell presented a variety of cases which included the following.

Primary Judet arthroplasty—Sub-capital fracture of the femoral neck treated by immediate Judet arthroplasty. Many members favoured this treatment for high femoral neck fractures on the view that avascular necrosis commonly follows nailing in these cases, whereas early weight bearing can be resumed in safety after Judet arthroplasty, particularly if the operation consists simply of replacing the femoral head without separation of the rectus origin, or excision of joint capsule.

Dysmorfies after poliomyelitis—Old poliomyelitis in a boy of eight with pathological dislocation of the left hip and pes cavus. Suggestions for treatment were invited but it was felt that the lack of useful muscle power in this limb would make it extremely difficult to improve his function by any operative measures.

Slipped epiphysis—Two cases of slipped upper femoral epiphysis, bilateral in one case. Excellent results had followed wedge resection of the femoral neck in the unilateral case and on the worse side in the bilateral case.

Other cases—Dr. Joan Gold demonstrated a young woman with advanced rheumatoid arthritis. Earlier treatment elsewhere with cortisone had improved her greatly but the condition had retrogressed when treatment was discontinued and she had become completely bedridden. She then started further cortisone treatment with careful physiotherapy and joint manipulations. A remarkable improvement had been effected and after several months of this treatment she was just starting to walk. It was agreed that cortisone must be continued in these cases to maintain the improvement.

Mr. B. Cashman demonstrated and discussed an interesting case of caisson disease of the left hip in a man of thirty-six whose work exposed him to increased area pressures and who had previously suffered minor attacks of the "bends."

SOUTH-WEST ORTHOPAEDIC CLUB

A very successful spring meeting of the South-West Orthopaedic Club took place in Paris from May 27 to June 1, 1953, when ten members visited the clinics of Professor Merle d'Aubigné, Professor Robert Judet and Dr. Pierre Petit, who had kindly arranged a programme.

At l'hôpital Cochin a clinical conference, a ward round, an out-patient clinic and an operating session were attended.

Arthroplasty of the hip—Arthroplasty of the hip was discussed and many follow-up cases were seen. Professor d'Aubigné had carried out an investigation of hips operated on for insertion of an acrylic prosthesis during the last four years. He had noted that during the first two years a certain number with fair results improved in function, but after this time some with good results deteriorated—the proportions of each being approximately equal. He demonstrated a collection of eighteen prostheses which had fractured and which it had been necessary to remove. He was now inserting an acrylic prosthesis of his own design. Many problems of reconstructive surgery after fractures and trauma were seen.

Spinal fusion for spondylolisthesis—Professor Merle d'Aubigné also showed a film demonstrating his method of fusion of the lumbo-sacral junction in spondylolisthesis, using an anterior trans-abdominal route. The operation was carried out in collaboration with an abdominal surgeon. A graft from the iliac crest was inserted into the space between the fifth lumbar vertebral body and that of the first sacral after the disc had been curetted. The graft and vertebral bodies were then held in position with a long stainless steel screw. The method was only suitable for mild degrees of spondylolisthesis. Another film was shown of the treatment of Dupuytren's contracture.

Quadriicepsplasty—A method of quadriicepsplasty was demonstrated for overcoming the disability of the stiff knee after immobilisation. The quadriiceps tendon was lengthened and the expansions were freed. This method improved the range of flexion, but resulted in about 20 degrees loss of extension.

Judet arthroplasty—At Professor Robert Judet's clinic at Square Desaix, the visitors attended an operating session, where an arthroplasty of hip for osteoarthritis was demonstrated. The usual
anterior incision favoured by Judet was used and an excellent view of the acetabulum was seen. This is obtained by the aid of an ingenious orthopaedic table, designed by Professor Judet, which allows extreme flexion of the hip, and thus permits the neck of the femur to be displaced posteriorly.

Professor Judet was using a new type of prosthesis, as the type previously used by him was giving unsatisfactory long-term results. A lumbo-sacral fusion for spondyloisthesis, through a posterior route, and an operation for open reduction and grafting of a comminuted fracture of the calcaneum were also performed. In these cases stored bone was used, the bone being obtained from a full-term foetus foal under strictly aseptic conditions. The graft was stored in a ‘‘deep freeze’’ in penicillin and streptomycin solution.

Club foot—At the hospital of St Vincent de Paul, Dr Pierre Petit read a short paper on the treatment of club foot. He emphasised the importance of radiographs in the clinical examination to determine the extent of the bone deformity. He favoured conservative treatment with wedged plasters by the Kite method. In cases seen late, or after the failure of conservative methods, an operation for ‘‘medial release’’ was done. This consisted of lengthening the tibialis posterior and the tendon calcanei and opening up the mid-tarsal and subtalar joints. At an operating session Dr Petit demonstrated clearly his ‘‘medial release’’ operation.

Congenital dislocation of the hip—Dr Meary discussed the treatment of congenital dislocation of the hip by open operation, and its results, and showed a series of most interesting radiographs.

Scoliosis—Dr Queneau read a paper on the treatment of scoliosis. A rehabilitation unit for poliomyelitis at St Fargeau, outside Paris, was visited. This unit is sponsored by the Association des Paralysés de France.

The success of the meeting was in large part due to the great kindness and hospitality of the hosts to whom all the members are much indebted. A visit to the house where Delius died in a pretty little village in the forest of Fontainebleau was much appreciated. The language difficulty provided no problem because of the excellent English spoken by our lecturers and demonstrators and the more than adequate French spoken by Messrs Eyre-Brook and Bourdillon.

MANCHESTER REGION ORTHOPAEDIC CLUB

Demonstration of buoyant bathing suits—At a recent meeting of the Manchester Region Orthopaedic Club Mr Ian D. Kitchin (Lancaster) described the use of buoyant bathing suits, which have proved valuable in rehabilitation after poliomyelitis. A demonstration of the suits was given.

Mr Kitchin said that teaching the children to swim was at first an extremely slow process. Those rehabilitating after poliomyelitis required a great deal of assistance because of their disabilities, but many patients with poor posture and scoliosis presented even more difficult problems, for these conditions were frequently associated with marked timidity and lack of self-confidence.

The use of the buoyant swimming suits had greatly reduced the time necessary to teach the children to swim. They gained confidence quickly and could often be floating free and making some progress through the water before the end of one lesson. After a time they graduated to ordinary costumes.

The buoyant material of the swimming suits* was attached as a pad to the ventral surface of the costume, and was quite small (Fig. 1). It was not kapok. It was a woven material which was ‘‘water-repellent’’ and was so designed that, when it was immersed, air was trapped between the fibres of the material and remained imprisoned so long as the fabric remained wet—it never became sodden, never sank, and dried quickly after use. The additional buoyancy provided by the suit was just sufficient to keep the wearer floating comfortably, and, as the pad was attached in front, no matter how the patient entered the water or how helpless, he floated face upwards.

If the full suit was not required, small pads of

* The suits are supplied by J. M. Dry (Rainwear) Ltd., Anchel Works, Upper Camp Street, Salford 7.

Fig. 1 Bathing suit with buoyancy material incorporated in the ventral surface.
the material could be fastened to individual limbs in cases of poliomyelitis to keep them buoyant, and so maintain the child’s balance and assist the disabled limb.

It had been found that the suits were very popular and that children taught to swim at the class would often attend the baths afterwards on their own; moreover they persevered with their swimming far more enthusiastically than with ordinary routine gymnastics exercises. A considerable gain in self-confidence was frequently observed.

The photographs (Fig. 1) give a good idea of the appearance of the suit. The pad, in this case, is rather larger than necessary for a child of this size.

LEEDS ORTHOPAEDIC CLUB

The first clinical meeting of the Leeds Orthopaedic Club was held at Bradford Royal Infirmary on March 20, 1953, under the chairmanship of Mr A. Naylor. A ward round was conducted by Mr A. Naylor and Mr J. Wishart. After tea clinical demonstrations were given.

Severed tendons in the hand—Mr A. Naylor showed a large series of miscellaneous tendon injuries in the hand treated by suture or tendon graft with excellent restoration of function.

Hallux valgus and rigidus—Mr J. Wishart demonstrated patients treated by arthrodesis of the first metatarso-phalangeal joint and all had complete relief of pain and an excellent gait. One patient so treated for metatarsus primus varus showed real improvement in the deformity since the operation.

Non-union of fracture-separation of lateral humeral condyle—This patient promoted lively discussion which centred round the advisability of performing anterior transposition of the ulnar nerve in anticipation of delayed ulnar paralysis and the consensus of opinion was that the operation ought to be deferred.

Osteoclastoma of femur—The lesion had presented in a condyle and clinically and radiographically appeared to be a tuberculous process. After excision the lesion proved histologically to be an osteoclastoma.

Chronic villonodular synovitis—Mr Wishart showed a case in which synovectomy of the affected knee had resulted in almost full function.

Poliomyelitis—Mr Naylor presented a series of tendon transplantations in the leg and foot in children and included hamstring transfers for quadriiceps paralysis.

Lytic bone lesions in the skull—Radiographs of a well child showing punched-out areas in the skull were discussed. Biopsy had revealed only necrotic material and all present agreed that it should be repeated. Speculation on the diagnosis finally crystallised into a lipoid storage disease or metastases from a neuroblastoma.

BONE AND TOOTH SOCIETY

1953 MEETINGS

The Society held a meeting for Casual Communications at the Institute of Dental Surgery, The Eastman Dental Hospital, London, on January 21, 1953. Professor F. C. Wilkinson was in the chair.

Hydroxyproline in enamel keratin—Dr M. V. Stack described how four-fifths of the nitrogen in the acid-insoluble protein obtained in 0.18 per cent yield from pure enamel appeared in a soluble form after treatment with purified collagenase or with crystalline pepsin, trypsin or chymotrypsin. Dentine collagen samples dissolved readily under the conditions chosen. The hydroxyproline content of such enzyme-treated enamel protein preparations was nevertheless 3 to 6 per cent, averaging three times less than that of collagen. Similar values were shown by protein samples submitted to prolonged treatment with cold mineral acids or with boiling water. Dentine collagen yields an insoluble protein containing only 0.3 to 0.6 per cent hydroxyproline under these conditions. This amino-acid is therefore likely to be a component of the insoluble protein of enamel. It is doubtful whether hydroxyproline has been detected before in a keratin. The present finding, in conjunction with others, indicates the need for a reconsideration of the classification of the acid-insoluble protein of enamel as an eukeratin.

Action of parathormone—Dr C. E. Dent described experiments carried out in conjunction with Drs A. D. Kenny and G. Philpot to test further the Albright-Ellsworth theory of the action of parathormone—namely, that the immediate result of an injection of parathormone is an increase in urinary phosphate output, followed by a fall in serum phosphate, and that this produces later on a slow rise in serum calcium levels. In twenty tests on fifteen subjects (mainly normal) they failed to find consistent increases in urinary phosphate. Plasma phosphate levels likewise showed no consistent changes except for some definite falls in four cases in all of which the phosphate was high to begin with. A chronic fall in plasma phosphate was brought about in three subjects by continued ingestion of aluminium hydroxide. No appreciable change in calcium levels took place. These results are taken to weaken the theory that the primary action of parathormone is on the kidney.
The parathyroid in relation to citrogenase activity and bone citrate—Dr H. R. Perkins had studied the citrate content and citrogenase activity of bone in parathyroidectomised and normal rats, and in normal rats injected with parathyroid extract. In animals examined five weeks after parathyroidectomy the bone citrogenase activity was much lower than in the other two groups, but their bone citrate content and alkaline phosphatase activity did not differ from normal. However, only four days after parathyroidectomy the bone citrogenase activity had not fallen below the normal value.

P exchange in new medullary bone of laying pullets—Mr T. G. Taylor described an experiment on which he had worked with Drs D. H. Tomlin and J. H. Moore. Six pullets on the point of lay were fed with P 32 continuously for periods varying from fourteen to twenty-seven days. Each bird was killed immediately after laying and the specific activity of the P in old (cortical) bone was found to vary between 6-7 and 15-7 per cent of the activity of the new (medullary) bone, which gives a measure of the extent to which P exchange had occurred. In other experiments the optical density of localised regions of autoradiographs prepared from bones of rats which had been fed on Ca 45 continuously for fourteen days were measured with microphotometer, which enabled a clear discrimination to be made between new and old bone. One-month-old rats showed 15 per cent exchange, six-month rats 8 per cent and nine-month rats 5 per cent.

Tartar-like deposits on animal teeth—Mr S. L. Rowles read a paper compiled by the late J. D. King, Dr K. Little, Dr J. Thewlis and himself on the significance of certain deposits on the teeth of experimental animals as causative factors in paradontal disease. Such deposits appeared to resemble closely salivary calculus (tartar) in man. Material was obtained from hamsters fed on high cereal and high sugar diets, and from ferrets fed on a diet of bread, meat and milk. The deposits were principally on the molar teeth of the hamster, and on the premolar and molar teeth of the ferret. Chemical analysis showed that the deposits found in both species contained a considerable proportion of calcium and orthophosphate in ratios like those found by Glock and Murray (1938) for human salivary calculus, and x-ray diffraction produced patterns closely resembling the hydroxyapatite patterns given by bone and dentine. (Glock, G. E., and Murray, M. M. 1938: Journal of Dental Research, 17, 257.)

Metaphysial cellular changes in relation to growth rate—Dr H. A. Sissons gave an account of the experimental determination of rate of longitudinal bone growth. In rabbits and rats, the rate of growth of the epiphysial cartilage plate at the lower end of the femur had been measured radiologically. A figure of 0.31 millimetres per day was obtained for the rabbit (age nine weeks) and 0.18 per day for the rat (age fifty days). This information was used in interpreting the microscopic structure of the growing region of the bone in each species, and in determining the duration of each of the cellular processes concerned in the formation and maturation of bone trabeculae in this situation. The relative duration of the various cellular processes varied from species to species, and, in addition to variation in absolute growth rates, was responsible for the differences in the microscopic structure of the growing region in the two species studied.

The articular surface of joints—Mr C. H. G. Price showed slides which demonstrated the appearance of a fresh unfixed normal articular surface viewed by incident polarised light. Between the cartilage cells the matrix showed marked birefection and appeared particulate rather than fibrous. The same surface in transverse section showed a markedly birefringent outer layer approximately 0.005 millimetres thick. This layer, and the subjacent tangential layer of the matrix were molecularly orientated parallel with the surface, with no clear evidence of fibres. It was further shown that on drying the cartilage, a fibre structure became visible at a magnification of × 100, to disappear again on replacement of the water. This difference was associated with the optical change from translucency to transparency, indicative of reduction of "pore size" of the matrix gel. The essential conclusion reached from this work was that surface tension at a gel/liquid interface is the basis for orientation of the surface layers of the gel—this process being aided by gravity and friction to form the articular surface. It was further suggested, from observations on cartilage and gelatine gels, that dehydration and chemical fixation might cause mutation of the collagen component of cartilage from a gel to fibre form. Since both of these processes are often preliminaries in preparing material for electron microscope and x-ray diffraction studies, collagen fibres demonstrated by these techniques should be accepted only with great reserve. These methods are eminently suited for producing a reversal of phase in cartilage matrix, thus leading from orientated gel to fibre structure.

Cutting machine for undecalcified hard tissues—Dr G. C. Blake demonstrated an adaptation of a commercial diamond-cutting instrument. A ½ horse-power electric motor running at 2,850 r.p.m. drove a spindle at 10,000 r.p.m. by a special belt. The spindle ran between centres in replaceable fibre bushes, and carried a phosphor bronze disc 7 centimetres in diameter, 25 microns thick. The cutting edge of the disc was prepared with fine diamond powder. The material to be
sectioned was held in a rigid mount which was fed on to the disc by hydraulic pressure. Water was used as lubricant. Four sections per millimetre of hard tissue could be obtained; the sections were about 100 microns thick and their surfaces were smooth enough for immediate mounting. Examples of the sections demonstrated were of bones and teeth embedded both in paraffin wax and acrylic resin, some of which showed part-preservation of the soft tissues.

Innervation of the palate—Dr F. W. Garvins described and demonstrated how soft tissues of the buccal surface of the human palate have been prepared, sectioned and stained by a silver diammion ion method (Bielcherswsky-Gros; see Garven and Garvins 1982). Many nerve endings of various types were present. The pattern of innervation resembled that of the gum, and included endings not found over the general skin surface. The dominant type of ending was a large “whorl” lying at different levels of the connective tissue papillae. From some of these “whorls” fine nerve fibrils could be seen to penetrate the epithelium and end in its outer layers.

Vitamin C and Bone: a Symposium

A symposium on “Vitamin C and Bone” was held at the Institute of Orthopaedics, Royal National Orthopaedic Hospital, London, at 5 p.m. on April 9, 1953, with Dr C. E. Dent in the Chair.

Radiography of scurvy—Dr E. H. Allen described and demonstrated the radiological changes in scorbutic bone, such as the broadened epiphyseal line and rarefied shaft.

Vitamin C and ground substance—Dr L. E. Glynn described the study of the polysaccharides in normal human subcutaneous connective tissue after extraction and hydrolysis by electrophoresis and partition chromatography. Uronic acid was not found, and it must therefore be concluded that hyaluronic acid and chondroitin sulphate can be present only in trace amounts. The predominant hexose found after hydrolysis was galactose, with smaller amounts of mannose, glucosamine and glucose. Similar methods had been applied, combined with histochemical studies, in an investigation of granulation tissue, both in normal and scorbutic animals. Preliminary results confirmed the early work of Wohlbach that vitamin C was essential for collagen and reticulin formation, but were not in agreement with Penney and Balfour, who found that the vitamin was necessary for the production of intercellular (ground substance) polysaccharide. Some results on the non-collagen protein of connective tissue, presumably the ground substance protein, were also presented.

Vitamin C and ossification—Dr G. H. Bourne recalled that the effect of scurvy on healing of fractures had been known for about 200 years. That this delay was in fact due to vitamin C deficiency had been shown by experimental work of the last thirty years. Vitamin C deficiency exerted its effect in a number of ways: 1) it delayed the reaction of the osteogenic membranes, endosteum and periosteum, to the injury; 2) it retarded the development of osteogenic fibres; 3) it delayed the migration of polymorphs and macrophages to the injured area. The apparent reduction of phosphates in the injured area in the deficient animal was due to failure of development of phosphatase-impregnated fibres. Those fibres that did develop appeared to possess normal enzyme activity. In enchondral ossification vitamin C deficiency reduced the number of bony trabeculae formed in the cartilage. In costo-chondral junctions the pre-ossification alignment of cartilage cells was prevented and less phosphatase was present.

The relationship between cortisone and vitamin C—Dr B. E. Clayton discussed the role of the adrenal cortical hormones in bone formation, with special attention to the osteoporosis seen in Cushing’s syndrome. ACTH or cortisone modified or inhibited epiphyseal growth, and cortisone delayed the union of experimental fractures, depending on the doses employed and the species of animals used. Reports in the literature concerning the effect of cortisone on acute and chronic scurvy were very conflicting. Experience showed that it had not affected the final outcome of the disease. In acute or severe chronic scurvy, epiphyseal structure was unchanged by cortisone therapy. In mild chronic scurvy, however, cortisone might favour the formation of new bone at the epiphyseal line and subperiosteally. Experiments establishing these points were described and reference was made to relevant literature.

Hospital for Sick Children, Great Ormond Street

Simpson Smith Lecture

Recent knowledge of affections of the skeleton in children—Sir Thomas Fairbank, consulting surgeon to the Hospital for Sick Children, then in its hundredth year, delivered on October 10, 1952, the annual Alex Simpson Smith Lecture, a memorial to a former junior colleague who fell in North Africa in the last war. The full lecture has been published, with illustrations and further references, in the Great Ormond Street Journal, December 1952. The lecturer confined attention to the rarer affections, only recently recognised and of unknown cause. In classifying the dysplasias the lecturer
thought it dangerous to do more than collect together those in which the same part of a bone (for instance, epiphysis or metaphysis) was the chief, though not necessarily the only, site of change. The mechanical origin of some congenital deformities had been strenuously and ingeniously supported by Denis Browne; Jansen had gone much further, but it was difficult to see how excessive intra-uterine pressure could account for cleido-cranial dysostosis, for instance. Sir Thomas referred to Duraiswami's notable work on environmentally induced foetal deformities, with evidence that could be transmitted.

Thoraco-lumbar angular kyphosis, as in chondro-oste-o-dystrophy, might well come from "spacial impairment" (Gordon 1950), being a variant or exaggeration of a normal foetal state (Kemp 1950). Here, a small, slightly displaced vertebral body might be seen in several conditions (Kemp 1946), for instance achondroplasia, neurofibromatosis and cretinism, and even in otherwise normal children; Dr Blair had shown him a small typically shaped body without kyphosis. He had found that its shape was always like that in gargoyleism. In one case of the Morquio-Brailsford affection T.11, T.12 and L.2 were all affected (Fawcitt 1952). Sir Thomas knew three cases of complete absence of a vertebral body at the thoraco-lumbar junction without other skeletal errors, and in one of these two were deficient.

He believed that vertebra plana (Calvé 1925) would prove eventually to be one manifestation of lipiodosis, but unfortunately the whole skeleton was not radiographed in every case. This view was suggested by a case of xanthomatosis in the Great Ormond Street Hospital under Mr Eric Lloyd with osteolytic lesions in the skull, the ilia, the neck of one femur and the lower end of the other besides the characteristic changes in the ninth thoracic vertebral body; biopsy of one iliac crest revealed cholesterol deposits, the case being regarded as intermediate between eosinophilic granuloma and Hand-Schüller-Christian disease (Davies 1949). The vertebral changes had been seen in a rather similar case without biopsy (Little 1948), in a case of Gaucher's disease under Mr Buxton, in a case of multiple eosinophilic granuloma illustrated by Snapper (1949), and in a probable case of xanthomatosis, without biopsy, under Sir Harry Platt, with other bony lesions in the right ilium and femur and one humerus, all of which had cleared up eleven years afterwards though there was now considerable collapse of another vertebral body (Fawcitt).

Of conditions recently described, two presented the chief changes in the shafts, namely infantile cortical hyperostosis and Engelmann's disease. In the former the changes were mainly periosteal, in the second cortical. Infantile cortical hyperostosis had been described and named by Caffey and Silverman (1945), but two cases had been published in 1939, one by Caffey and the other by R. W. B. Ellis. Of about sixty cases now published, only eight had appeared in British journals, though Sir Thomas had seen three others unpublished. It was twice as common in boys as in girls, and the average age was about two and a half months if four possible cases at eighteen months and more were excluded. In eight cases signs appeared within the first month of life, and, in one, were present at birth (Kitchin 1951). Facial swelling, though stressed, was less often noticed than swelling or pains in a limb. Irritability, fretfulness and local tenderness were common; fever occurred sometime in at least half the cases; pseudoparalysis and respiratory troubles were other early indications. Usually several bones were affected, most commonly the ulna, humerus, tibia, mandible and radius in that order, often asymetrically. Swelling involved the clavicle in twenty-three cases, the calvaria in two, facial bones in two, ribs in eighteen, the pelvis in three; the vertebrae escaped. The skin over affected bones was never red or hot. Soft tissue swellings often preceded evident bony change. Leucocytosis was observed in more than half the cases; the serum alkaline phosphatase might be increased and the blood sedimentation rate raised. Radiographic signs began with a subperiosteal shadow, at first on one side but soon surrounding the shaft, frequently throughout its length; the shadow never showed spicules; it was often denser than the shaft, but soon blended with the cortex so that the bone itself appeared large and dense. Later, loss of calcium changed the appearance to that of an enlarged, rarefied bone with a thin cortical shell, with, later still, a gradual return to normal. Sometimes the affected shaft bowed and a tibia had remained so as long as two and a half years. Recovery started in a few weeks or months and was usually complete in about eighteen months or sometimes two years. No treatment affected the course. Biopsies from fifteen cases had thrown little light on causation. There was periosteal proliferation with many osteoblasts forming new bone; in one case the marrow was fibrous and very vascular with many osteoclasts. Inflammatory changes were found twice only. The radiological appearances were distinguished from those of syphilis by the thickness and density of the periosteal shadows and by the absence of metaphyseal changes. The present condition usually struck younger children than scurvy, the tenderness was less acute, the whole shaft showed changes, and vitamin C was ineffective. Osteomyelitis had to be considered, especially if few bones were involved. Hypervitaminosis-A, reported in over twenty patients, of one to three years, but not seen in this country, presented tenderness and swelling of one limb or more, with marked...
irritability, in one-third of cases pruritis, and often an enlarged liver. The vitamin A in the serum was increased. The subperiosteal shadows were less thick and dense than in infantile cortical hyperostosis and were always smooth. Osteoporosis, as in experimental animals, had been reported. The ulnae appeared to be almost always affected, with the tibiae, clavicles, some metatarsals and ribs next in frequency; only one doubtful case presented a thickened mandible. Stopping the excessive vitamin would lead to recovery. In early gargoyleism, Caffey (1951, 1952) had observed subperiosteal shadows in the first weeks of life with some osteoporosis and spurring of the lower ends of the femora.

Swelling of the face at so early an age seemed to be peculiar to cortical hyperostosis, but Jones (1938, 1950) had described a curious condition of familial fibrous dysplasia, which he named cherubism, in a family of Moravian Jews in which the girl and three boys out of four first presented a bilateral swelling of the jaws at the age of two or three years. Radiographs showed cyst-like enlargement of maxillae and mandibles without other skeletal abnormality, and biopsy in one case revealed fibrosis. The swelling increased, demanding cosmetic operation at sixteen to eighteen years of age, and there had been no recurrence four years later. Caffey and Williams (1951) observed five further cases, including a father and son and a mother and son. Jones (1938) had a comparable case traced through five generations.

Engelmann's disease has been recognised widely and called after him in recent years only, though he published his case in 1929. Twenty-three cases have been published. The first case had been seen with Dr Cockayne (1920) at the Hospital for Sick Children thirty-two years ago and was shown by him at the Children's section of the Royal Society of Medicine. It was in a weak, mentally dull boy of nine years, with hyperostosis of the femora, tibiae, one fibula and both humeri, thickening of the frontal regions, and increased density of the base of the skull. The condition was commoner in males and usually in childhood. Familial affection had occurred in two out of twenty-four patients, among whom fourteen were under ten years of age and five between twenty and thirty. Pain in the legs, weakness, difficulty in walking and waddling gait might be complained of. Some had been thin and long limbed. The thickening of the long bones might be palpable. Various neurological signs had been reported, seemingly not significant. One patient had an enlarged spleen. The essential feature was bilateral hyperostosis of the shafts of the major long bones without epiphysial involvement, in this order of frequency: femur, tibia, humerus, fibula, radius and ulna. Both clavicles were reported thickened in four cases, some metacarpals in one, metatarsals in none. Increased density and frontal thickening had been found in seventeen skulls of twenty-four patients, but thickening of the mandible was seen in only one. The fusiform enlargement of the long bones only exceptionally showed roughening. At least six cases presented a double enlargement of each femoral shaft, the larger one involving the lower two-thirds or more, with a much smaller second enlargement in the upper third. Biopsy in ten cases threw no light on etiology, the changes amounting to sclerosis. The hyperostosis invaded the marrow as well as being subperiosteal. In one case cortical bone was replaced by cancellous bone. The fatty marrow showed some fibrosis. The periosteum was thickened, and there might be some thickening of vessel walls in the adjacent soft tissues. In cases followed up the changes have slowly increased. The speaker agreed with the suggestion of a congenital fault though bone changes might not be recognised for some years.

Another obscure affection particularly of the shafts of long bones was melorheostosis, which was not always recognised. Seventy cases had been reviewed. Typically the bone changes were confined to one limb, with pain and sometimes limitation of joint movement. This might be partly accounted for by neighbouring fragments of bone in the soft tissues and by scleroderma. Distortion of a finger or two had been noticed at birth in three cases. Any combination of limbs might be affected, even all four. The distribution did not follow the arterial or nervous anatomy of the limb. Occasionally changes had been found in the sacrum, vertebrae, skull and ribs. McCarroll (1950) found three cases in about a hundred cases of neurofibromatosis. In the epiphyses the increased density might take the form of dots and splashes closely simulating osteopoikiosis, in which, however, they were seen in all the major epiphyses and also in the ends of the diaphyses and there was often a familial incidence, absent in melorheostosis. Biopsies revealed sclerosed and normal bone, overcrowding of lamellae irregularly arranged, and, in only three cases out of fourteen, marrow fibrosis. Putti's supposition of ischaemia from local autonomic disturbance had not been generally accepted.

Another curious affection of the shafts of long bones—important because of confusion with sarcoma, which might be distinguishable only by biopsy—was hyperplastic callus formation. This occurred usually in cases of osteogenesis imperfecta, occasionally without a causative fracture or even without obvious trauma. It might follow fracture of one bone while fracture of another might unite at the same time without excessive bone formation. Early callus might be excessively
dense. Bony excrescences on the long bones might be found, notably on the interosseous borders of the forearm and leg bones. The new tissue infiltrated the adjacent muscle. Biopsy revealed: oedema and muscle destruction near the surface of the mass; beneath this mucoid oedema, cellular proliferation and early chondroid formation; deeper still chondroid tissue containing islands of true cartilage; finally trabeculae of calcified woven bone and calcified cartilage (Baker 1946). Mucoid and chondroid tissue were absent from normal callus. An un doubted case was published by Battle and Shattock in 1908.

Radiographs rather suggestive of hyperplastic callus were found in parosteal osteoma of bone, of which sixteen cases had been reported by Geschickter and Copeland (1951). These more localised tumours, usually situated on the popliteal surface of the femur, grew more slowly than hyperplastic callus but might recur after excision. The pathological appearances varied from those of spongy osteoma to low-grade fibrosarcoma.

Finally the speaker recalled a rare type of metaphy sial lesion described by Jansen (1934) as metaphysial dysostosis, but a like case studied by Müller and Sissons (1951) had shown histological changes in the bone consistent with renal rickets and secondary hyperparathyroidism, though unfortunately the parathyroids and kidneys were not available.

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Royal College of Surgeons of England

Film Display

Development of plasma substitutes—Professor A. M. Boyd, Professor of Surgery at Manchester University, gave an introduction to the film "Dextran—the new narrow fraction," shown at the Royal College of Surgeons, Lincoln's Inn Fields, London, on May 20, 1953. Over two hundred surgeons and anaesthetists were present. The film, which is sponsored by Benger Laboratories Limited, describes the progressive selection of the clinically optimal range of dextran molecules contained in "Dextran," a new form of Dextran, which it is claimed obviates the drawbacks of colloidal solutions previously available for use in place of blood or plasma for blood volume restoration.

Professor Boyd recalled that the problem of providing and conserving adequate supplies of human blood and plasma was one that had engaged the attention of medical scientists since the earliest attempts at blood transfusion. In more recent times intensive research into the possible use of synthetic colloids which could, in certain circumstances, be used in place of blood or plasma, had been undertaken. Several colloids had been suggested and used in patients to combat shock due to loss of blood or serum. These ranged from gum arabic, first employed towards the end of the first world war, to polyvinyl pyrrolidone, the plastic discovered by the Germans and used by the Wehrmacht in the second world war. One of these colloids—dextran—had been found suitable for extensive clinical investigation. It was produced in crude form by a special strain of bacteria from sugar solutions, and it could be purified into a syrupy liquid of about the same viscosity as human blood. The aim of recent work had been to ascertain the type of dextran solution that would be most suitable for infusion into patients suffering from shock due to loss of blood. Firstly, it was necessary to discover the fate of dextran following infusion, and, secondly, to discover ways and means of producing the most suitable solution for routine use.

Crude dextran, a polymer of glucose, possessed molecules with a molecular weight of many millions. Such molecules produced toxic reactions. Careful fractionation was necessary to reduce the molecular weight to a few thousands, which was the most suitable therapeutic range.

Molecules below a weight of approximately 50,000 were rapidly excreted from the body and, therefore, failed to increase blood volume—the essential requirement in the treatment of shock. Indeed, in view of the high water holding capacity of these comparatively small molecules, they could actually deplete blood volume further by carrying water out of the circulation.

Molecules of molecular weight between 50,000 and 130,000, though too large to be excreted in the urine, nevertheless left the circulation and entered the tissue fluids. Here they continued to exert their water holding capacity and, like the smaller molecules, tended to produce the opposite effect to that desired.

Only molecules between 130,000 and 250,000 were suitable and were retained in the circulation for a sufficient length of time to raise and maintain blood volume.

There was every prospect that narrow fraction dextran would revolutionise supportive therapy, conserve supplies of blood and plasma at home for those special cases in which these are essential, and prove invaluable overseas where blood banks are few and far between.

The Journal of Bone and Joint Surgery
THE REHABILITATION OF INDUSTRIAL INJURIES IN ONTARIO

Dr. A. Zinovieff* and Dr. B. H. Young,† of the Canadian Workmen’s Compensation Board’s Rehabilitation Centre at Malton, Ontario, have sent a report of the development and present state of industrial rehabilitation in the province. Ontario covers an area about eight times the size of England and has a population of four and a half millions, over one million of which is concentrated in Toronto (Fig. 1).

Workmen’s compensation—Beginning in 1910, by Royal Commission, Sir William Meredith investigated various types of workmen’s compensation administration in North America, Britain and Continental Europe. As a result of this study the present Act‡ was framed. It provides better recompense to workmen injured at their employment. It extends protection to all accidents sustained at work, instead of only to those caused by negligence on the part of the employer. It prohibits private litigation for damages. It ensures prompt and certain payment direct to the injured workman or his dependants. It places the adjudication of claims in the hands of the Workmen’s Compensation Board, instead of the Civil Courts, and in most of the industries to which it applies it makes the employers’ liability mutual instead of individual.

The Workmen’s Compensation Board is made up of a Chairman, Vice-Chairman and Commissioner, who are appointed by the Provincial Government. Their duty is to interpret and administer the Act. Broadly speaking the Act provides for a compulsory insurance scheme that covers all industries engaged in manufacturing. Certain other employers such as retail businesses or farmers may also join this compensation scheme by application; only domestic servants are excluded. The annual rate the employers pay into the Board’s accident fund is based on their assessable pay-roll and on their previous year’s accident experience. The accident fund provides money for the compensation of the injured workmen, for all medical aid payments, for pensions, and for the Board’s salaries and administrative expenses. An employee of the covered firms is entitled to compensation up to 75 per cent of his earnings to a maximum of $4,000.00, provided that he has been injured at work and that he is off work for five days or more.

Development of rehabilitation services—The Act provides “that the Board may take such measures and make such expenditures as are deemed necessary or expedient to rehabilitate injured workmen.” Some physical medicine was made available in 1933, when a single room at the Board’s offices was used to provide electro-therapy and massage. Within a year it was necessary to increase this space, and in 1935 an out-patient clinic was established in the heart of the city of Toronto, providing facilities for physical medicine which included physiotherapy and introduced occupational therapy. These facilities showed increased usefulness in the treatment of the injured patient, and with the increasing growth of industry as well as of the services provided, an average of approximately 200 patients per day was being treated. Dr. H. D. Storms§ was then director of this programme and under his leadership the use of occupational therapy in the rehabilitation of the injured was greatly developed. Certain disadvantages of out-patient treatment became apparent, particularly for those patients brought into the city from outlying parts of the province, and in 1947 it was decided to start a residential rehabilitation centre and a move to the present premises at Malton was made.

The rehabilitation centre—The Centre is situated eighteen miles from Toronto on the edge of the city airport (Fig. 2). This situation is rather too far from the city and it is considered that a rural site outside the city limits would be better.

* Director of the Division of Physical and Occupational Therapy, University of Toronto.
† Medical Superintendent, Workmen’s Compensation Board’s Rehabilitation Centre.
‡ Workmen’s Compensation Act (1915). Ontario.
There are two treatment units in the Centre—a hospital section and a clinic section. The hospital section has 190 beds and is used to house and treat not only bed patients, but also those who need help with self care, those who are on crutches and those who cannot manage stairs. The latter two groups are there because there is no covered way connecting the living quarters of the clinic section to the main treatment block, and this is necessary in the snow and ice of winter. Two sunrooms are used for early gymnasium classes; there is a screened room for short wave diathermy treatments (also used for electromyography) and a room for craft work for the up-patients.

The clinic section consists of a treatment block providing physiotherapy, remedial gymnastics and occupational therapy, as well as consulting rooms and secretarial offices. Its 315 patients are housed on the upper floors of the hospital section and in two buildings adjacent to the main treatment block. Recreational facilities include cinema and variety shows, bingo and card tournaments and games such as darts, billiards, etc. A library also is available.

The patients—The patients are drawn from all the industries in the province that come under the Act and most of them are from heavy industries. They represent many different nationalities, many being recent immigrants from European countries, and an increasing number of them do not speak or even understand English. This complicates the problem of rehabilitation, as the medical officers, unless they are accomplished linguists, have to rely a great deal on interpreters and there is no "personal touch" in this method of communication.

In the year 1952 there were 209,974 industrial accidents reported in the province. Of these, 56,508 resulted in an absence of five days or more from work; from this group, 3,736 (15 per cent) patients were admitted to the Centre. They stayed there an average of six weeks each and 80 per cent returned to their former work.

Treatment arrangements—Patients are transferred to the Centre either at the recommendation of their own surgeon or in some instances at the recommendation of the Board's medical officers. They come from all over the province and consist mainly of longer term cases; some short term cases come from Toronto and its environs.

The Board had had to do a great deal of education of the profession at large in getting them to accept the principle that rehabilitation begins as soon as the patient has been injured, and that transfer to a rehabilitation centre should take place as soon as the fracture is uniting satisfactorily; or, in the case of surgical operations, as soon as the wound is healed and some objective of physical recovery can be worked on—so much better than leaving it to the stage when the psychological outlook of the patient has reached one of stubborn pessimism and relatively intractable apathy! This situation has gradually improved over the years, but still about one-third of the patients admitted to the clinic section arrive more than a month beyond what would have been an obviously reasonable time for transfer. More time is also lost by the fact that, as yet, adequate facilities for physiotherapy in general hospitals are not too common.
The surgeon referring the case is notified of progress every two weeks by letter and is always consulted in case of any difficulty. The surgeons are encouraged to visit the Centre and, to encourage this further, a clinical conference, run by the orthopaedic surgeon, is held once every two weeks, and is open to all surgeons who care to come.

*Treatment team*—In addition to the medical superintendent, who is a specialist in physical medicine, a full time orthopaedic surgeon and a part time consultant in physical medicine, there are eight full time medical officers, two of whom are certified specialists in physical medicine and two others in training. It has been found that, with untrained medical officers, it is impossible to operate efficiently if the number of patients per doctor rises much above fifty; this is in accord with Watson-Jones's war-time recommendation for the Royal Air Force rehabilitation centres. Even with skilled medical officers the number cannot rise above seventy without loss of attention to the detail on which good rehabilitation depends.

The Centre employs twenty-one physiotherapists, eight in the hospital, and thirteen in the clinic; twenty-one occupational therapists, four in the hospital and seventeen in the clinic; and eight remedial gymnasts, two in the hospital and six in the clinic section.

![Fig. 3](image)

Physiotherapy: instruction in active movement—the keynote.

*Treatment programme*—In the hospital section the medical officers do rounds with the therapists and charge nurse attached to their wards once a week. An individual programme is prescribed and this varies according to whether the patient is bedfast or not. If not, he may attend one or two classes daily with a remedial gymnast, as well as having individual treatment from the physiotherapist and occupational therapist. The classes are arranged anatomically: thus there are arm, back, foot and ankle, hip and knee and walking re-education classes. Whether the patient is up or not, both the morning and afternoon programmes start with bed exercises in the ward taken by the physiotherapist. The bed patients are encouraged to do "key" exercises every hour, and an electric clock system rings a bell in each ward every hour to remind them.

By the time the patient is transferred to the clinic section, he is ready for a full or nearly full day's programme. The clinic day is a six-hour one; all this time is spent on actual treatment divided between physiotherapy, occupational therapy and remedial gymnastics. There is, however, a "diversional" room in the occupational therapy department, which is used to give rest periods. A patient for whom diversional occupational therapy has been prescribed rests his injured part while occupying his mind. This is better than providing sitting room facilities which the patients would tend only to usurp.

Physiotherapy and remedial gymnastics follow a conventional pattern. Active movement is the keynote of both (Fig. 3). The usual arrangement of individual work by physiotherapists and group work and games (Fig. 4) by remedial gymnasts is followed, though the latter also look after individual muscle building exercises using weights. Several methods of these are used, including

those described by de Lorme* and by Zinovieff.† In the physiotherapy department various forms of heat are usually given as a preliminary to exercise or as a means of pain relief, but massage is seldom prescribed and hardly ever continued for more than two weeks. It is used mainly to loosen recent scars, or to help get oedema rapidly under control. Electrical stimulation of denervated muscles is given as a routine. Occupational therapy takes the most space and is also somewhat unconventional. In addition to the usual craft techniques such as weaving, basketry, metal work and carpentry, the occupational therapists are responsible for certain remedial games, such as shuffleboard, darts, bowling and badminton, and also for an industrial section, which is designed

![Fig. 4](image1.png)

**Fig. 4**
Remedial gymnastics: group exercises in later stages.

![Fig. 5](image2.png)

**Fig. 5**

to meet the special needs of the group of patients that are being rehabilitated at this Centre, and to provide for their vocational preparation and work assessment. Thus patients may be seen building walls, shovelling, sawing, logging (Fig. 5), or track laying.

Resettlement—If a patient is fit to return to his own job the ideal of rehabilitation has been achieved; if not, a final problem arises. It is complicated in this province by the absence of legislation such as the Disabled Persons (Employment) Act (1944) in Great Britain; by the difficulty of obtaining


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lighter work when so many relatively or completely isolated communities depend only on heavy labour; and lastly, by the fact that so many of the patients lack either the intelligence or educational background to do other than heavy manual labour, or to justify vocational training.

The Board has a department that deals especially with these problems and its representative is attached to the Centre. He sees all patients on admission, and when the medical officer's notes inform him that there is a likelihood of sufficient permanent disability to require a change of job, he investigates other possibilities, either with the patient's employer or within the patient's community. These are noted and discussed between the medical officer in charge of the case and himself when the patient's treatment is nearing completion. In many instances a successful placement can be made; in a few, vocational training may be recommended and paid for by the Board. However, the function of this department is somewhat limited by the fact that the Act does not make the Board responsible for resettling a disabled patient, but only for helping in the process; the final responsibility being the patient's. So far the Board has not established any sheltered workshop facilities.

When a patient's definitive treatment has been completed, if there is no disability, his compensation payments cease. If temporary disability exists which leads to loss of earnings, either through reduced efficiency or change of job, this loss is cushioned somewhat by a temporary disability rating. This is reviewed at intervals, either until full recovery, or until a state of permanent disability has been reached. In cases of permanent disability a permanent pension is assigned. The amount of pension is based on a rating schedule, though the degree of disability in relation to the patient's own employment is also taken into account. The following figures are examples of this rating schedule: below-knee amputation 40 per cent; above-knee amputation 60 per cent; above-elbow amputation 60 per cent; below-elbow amputation 40 per cent. A permanent pension is effective for life. Lump sum payments are made only on those disabilities in which the pension comes to $10.00 a month or less. On all other pensions payment is made monthly for life.

The authors wish to thank the chairman and members of the Workmen's Compensation Board of Ontario for permission to publish this report.

NEW ZEALAND

NEW ZEALAND ORTHOPAEDIC ASSOCIATION

1952 MEETING

A meeting of the New Zealand Orthopaedic Association was held in Dunedin on November 19, 20 and 21, 1952. Mr Leslie Will, of Christchurch, was elected president in succession to Mr Alexander Gillies, and Mr Rex Blunden, of Christchurch, was appointed Secretary.

Immediate internal fixation of the compound fracture—Mr A. B. McKenzie (Christchurch) had tried to overcome the disadvantages of the usual conservative method of management of compound fractures, without exposing the patient to the greater risks of infection, by performing immediate internal fixation of the fragments and at the same time obtaining wound healing by first intention. Provided the case was carefully selected, metallic bodies could be placed in compound fractures without prejudice to wound healing.

If infection was going to supervene it would do so in any case, in which event it would be an advantage to have the fracture already under control. Experimental work on the intramedullary nailing of the grossly contaminated compound fractures had shown that these united more rapidly than control fractures that had lacked the immobilisation of internal fixation. Definite criteria had to be satisfied: there must be no absolute skin loss and primary skin closure must be possible without tension, there must be no gross contamination evident, and above all the open operation must be performed in that golden period of the first six hours, i.e., when many would repair tendons and even nerves, but not bones. With these criteria satisfied, it seemed most desirable to perform internal fixation when the patient had unstable or multiple fractures. Fourteen cases had been treated in this way so far. In all, the wounds had healed well by first intention, and union had occurred or was in the process of occurring.

Review of poliomyelitis epidemic, Auckland (1947-1949)—Dr A. R. Brown (Auckland) said that during the epidemic 388 cases were admitted to Auckland Hospital. In the infectious period they were under the combined care of the infectious diseases physician and the neurologist. The physical treatment was supervised by the specialist in physical medicine. After the isolation period was over, the physical medicine department was responsible for further treatment, and the orthopaedic surgeons were consulted regularly and took over when surgical intervention became necessary.

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The routine treatment consisted of hot packs in the early stages supplemented, or superseded, by hot baths and accompanied by stretching when necessary in cases of painful tightness. Re-education in those suffering from lower motor neurone paralysis was carried out according to customary methods, and included under-water exercises and muscle training in Guthrie-Smith suspension. Painful muscle tightness occurred in most cases. Splintage was seldom used.

The following is a statistical summary of the epidemic (up to August 1952): Number admitted, 388. Died, fifteen. Average in-patient period, 2-6 months. Average age, ten years. Tightness recorded, 85 per cent. Tightness cleared up (average time), five weeks. Early paralysis, 45 per cent. Final major paralysis, 8-8 per cent. Final minor paralysis, 14 per cent. Scoliosis observed during treatment, 28 per cent. Scoliosis on discharge: major, 1-5 per cent (all spines grafted); minor, 6-2 per cent. No residual disability, 68 per cent. Surgery necessary, 6 per cent.

The high percentage of potential scoliosis in cases which had no sign of paralysis was striking. It was suggested that non-paralytic poliomyelitis is a possible cause of a proportion of cases labelled idiopathic scoliosis.

The management of acute anterior poliomyelitis—Dr J. E. Caughey (Otago) discussed at length the treatment of poliomyelitis, prefacing his remarks with a reminder of the manifestations of the disease and our objectives in therapy. He emphasised the differences between muscle tightness, muscle spasm and muscle contracture and stressed the importance of careful clinical examination. Whatever might be the pathogenesis of muscle tightness and spasm, they were significant factors in the disease and treatment in the early stages was directed largely to their relief.

Dr Caughey believed that in epidemics of poliomyelitis patients should be under the care of neurologists, paediatricians and general physicians who work in conjunction with a specialist in physical medicine, rather than the orthopaedic surgeon. The place of the orthopaedic surgeon in the picture was in the field of corrective surgery a year to eighteen months after the acute illness was past.

In the early treatment, tactful and sympathetic handling was of great importance. Patients should be nursed as recommended by Kenny on a firm mattress with boards between it and the springs. The feet should be rested against a foot board four inches beyond the end of the mattress; rotation of the leg was prevented by sandbags or by movable blocks which stood out from the foot board. In this way adequate splintage was obtained without the ill effects of the severe restriction with immobility of a plaster splint. Moist heat was of great value in relieving pain; in the early stages hot moist packs were extensively employed; later hot baths were effective in loosening muscle tightness and enabling passive and active movements to be carried out.

Passive movements were begun in the acute stage of the disorder as soon as the temperature had settled. Physiotherapists worked as a team with the "packers" and after the packs were removed passive movements of all joints were carried out short of pain. When severe pain had settled down, active movement and stretching of tightened muscles might be commenced. Training in gait was important in order to maintain a correct pattern of walking and other movement. The methods advocated were essentially those developed by Kenny. These methods were now in use in most centres in the United States and in some centres in New Zealand.

Muscle biopsy—Dr Barbara F. Cubit (Dunedin) presented a preliminary report on a series of biopsy specimens taken from skeletal muscle at the site of previous operative damage, and also at various distances from the initial operation site. An attempt was made to ascertain the extent of the damage to muscle that might be expected following routine operative procedures. In the preliminary series it was found that there were indications of muscle damage as far as four centimetres from the initial operative incision. The commonest lesion was fibrosis between the muscle fibres accompanied by degeneration of the fibres, and patchy round cell infiltration. These lesions were attributed to damage to the arterial blood supply associated with the previous operation. Seemingly the collateral blood supply in these areas was inadequate.

Nuclear herniations of the intervertebral disc—Dr A. C. Begg (Dunedin) described the features of four distinct types of intervertebral disc lesion, with special reference to their radiology.

1) Herniation of the nucleus pulposus into the vertebral spongiosa: These herniations—Schmorl's nodes—in the adolescent, resulted in the thoracic or upper lumbar kyphosis of Scheuermann's disease. In older persons they might extend and lead to collapse of the vertebra. 2) Nuclear herniation through the anterior part of the annulus: The nucleus pulposus might protrude forwards to impinge upon the tough anterior longitudinal ligament which deflected the nuclear material caudally to cause a pressure erosion of the anterior superior border of the centrum. These lesions were often mistaken for inflammatory or tuberculous disease. They caused the characteristic vertebral erosion of the first lumbar vertebral body in some types of dyschondroplasia. 3) Nuclear herniation beneath the epiphysial ring: The cartilage plate was thin at the junction of the centrum with the epiphysial ring and nuclear material not infrequently burrowed into the vertebra here,
and, as a result of mechanical factors and the firm attachment of the anterior longitudinal ligament, a crescentic fragment of bone separated from the upper anterior margin of the centrum. This appeared in the radiograph as a triangular fragment of bone, the so-called "persistent epiphysis." 4) Posterior nuclear herniations: These were well recognised clinically. It was almost always possible by plain radiography and movement studies to indicate the level of the protrusion. By myelography these lesions could be divided into four groups—projections, intermittent prolapses, extrusions and scarred discs.

Anomalous calcaneo-navicular articulation—Mr R. H. Dawson (Palmerston North) briefly discussed the causes of spasmotic flat feet and demonstrated three cases of anomalous calcaneo-navicular articulation. One of these patients presented with the typical symptoms of spasmotic flat feet and was treated by excision of the anomalous bony bridge with a satisfactory immediate result. The other two patients were asymptomatic, one being the father of the first patient and the other being discovered in the routine radiographs after a foot injury; both appeared to have a normally functioning joint between the calcaneum and navicular.

Congenital metatarsus varus—Mr William Parke (Gisborne) presented a series of seventy-five cases of congenital metatarsus varus. He classified cases with this deformity into two groups, mobile and fixed. Attention was drawn to the late age at which these cases were presenting for treatment, as compared with countries elsewhere. The treatment was discussed and half-boot splints were shown, which were used to maintain correction.

Arthrography in congenital subluxation and dislocation of the hip—Mr James R. Kirker described the technique of arthrography and illustrated its use in diagnosis, prognosis and treatment. In approaching the problem of the management of a congenitally dislocated hip one should determine early whether one was dealing with primary subluxation or a primary dislocation of the hip. If established dislocation was present, it was necessary to determine what the pathological anatomy was in the particular case, and whether it was reasonable to expect that conservative reduction by gentle manipulation or frame traction and abduction would be possible. If conditions appeared favourable, conservative methods were employed. If conditions appeared unfavourable, gradual reduction by frame traction was still employed initially, in preference to forced manipulation or open operation, because it sometimes succeeded even in the presence of reverse anatomy, and, even if it did not do so, the stretching of the soft parts would facilitate whatever further form of treatment was decided on. If the dislocation remained unreduced, it was wise to proceed with open operation. If the above approach was correct the only way to implement it scientifically was to employ arthrography freely.

Review of acute osteomyelitis—Mr James R. Kirker reviewed two years' cases of acute osteomyelitis admitted to Middlemore Hospital. The years chosen were 1950 and 1951. The number of cases of acute primary haematogenous osteomyelitis admitted in the year 1950 was twenty-two, and in 1951 thirty-five (the number recorded in 1947 was thirty cases, so that the incidence was unchanged). The average time in hospital was three and a half weeks in 1947, three and a half weeks in 1950, and five and a half weeks in 1951—the increased period in 1951 being due to the routine prolonged course of penicillin. The dosage employed in the 1947 series was 15,000 units three-hourly, and on this dosage the 46 per cent of the patients who were septicaemic took eleven to twenty-one days for the temperature to settle. The time taken for the temperature to settle in 1950–1951 was 3-5 days in cases of comparable severity, and the average dose given was 200,000 units six-hourly. In the 1950–1951 series, there were four acutely ill delirious children after two to three days of treatment, whereas in 1947 a large number of cases were acutely ill for a week or more. It was believed that the larger dosage, and the use of a purer penicillin preparation, were responsible for the different clinical course seen.

Ten cases of the 1950–1951 series underwent surgical intervention (incision of subperiosteal abscesses plus bone drilling) because of failure to show satisfactory response to conservative treatment after three days. In all except one primary skin closure was successful. In the other case healing followed delayed primary closure. So far no patient operated upon has returned with recurrent flares or with chronic infection.

Three patients who failed to settle on three days' conservative treatment did not undergo surgery. Their radiographs still show multiple areas of rarefaction in the bones involved; one sustained a pathological fracture after discharge, and one has a degeneration of the hip joint.

Recurrent dislocation of patella—Mr Rex Blunden described the pathological anatomy, clinical and radiographic features of recurrent dislocation of the patella. He had found that the posterior surface of the patella, instead of having two nearly equal surfaces divided by a ridge, was unequally divided; the medial surface was much shortened, and more nearly vertical. The bone was considerably thicker, and narrower from side to side. In traumatic cases there may be a separated "ossicle" on the medial side. The fascia and joint capsule were abnormally lax on the medial side.
The patella ligament was longer than usual, allowing the patella to ride high on the femoral condyles; it was often attached to the tibia lateral to the line of the femur. The lateral femoral condyle was flatter, and there might be a mild genu valgum. Clinically, subluxation was commoner than dislocation. There was abnormal mobility of patellae, but before mobility is judged to be abnormal the central ridge must pass over the lateral condyle. The patella was higher than normal. Subluxation occurred at approximately 45 degrees, and was corrected by extension or further flexion. The patellar tendon had an unusually lateral insertion. Radiographically the features were: high patella; unequal facets, the medial smaller and more vertical; thickened squat patellae; and often a detached ossicle on the medial side. Axial projections should always be made.

DENMARK

DANISH ORTHOPAEDIC ASSOCIATION

1953 MEETINGS

A meeting of the Danish Orthopaedic Association was held in Copenhagen on February 28 and March 1, 1953. The main topic was the treatment of poliomyelitis.

Orthopaedic treatment of poliomyelitis—E. Thomsen (Arhus) gave a survey of the principles in the orthopaedic treatment of poliomyelitis, and his collaborators reviewed the results obtained at the Orthopaedic Hospital in Arhus.

Management of paralytic feet—E. Hjalmar Larsen (Arhus) reviewed 253 cases of paralytic feet, ninety-eight having been treated by tendon transference with or without additional soft tissue operations. sixty-three by lengthening of the calcaneus tendon, and 100 by arthrodesis. Concerning cases of tendon transferences—almost all done in childhood—no effect was seen in activation of the triceps surae, in the other groups good or improved results were seen in almost half the cases. It was mentioned that in only seventeen cases was the transference done within two years after the infection, and in forty cases not until five years after or even later. In the discussion on this paper it was stressed that a tendon transference should be performed early, direct fixation into bone should be done and post-operative bracing maintained for years. Forty-seven panarthrodoses, twenty-nine ordinary triple arthrodeses and sixteen Lambrinudi arthrodeses had been performed with very few bad results.

Tendon transfer for quadriceps paralysis—Ib Christensen (Arhus) reviewed forty cases of tendon transfer for weak quadriceps and found a satisfactory result in half the cases. He also reviewed thirty-nine cases of operation to restore opposition of the thumb. Some degree of function was obtained in twenty-nine cases and it was classified as satisfactory in sixteen cases.

Retraining of weak muscles—N. Bukh (Viborg/Arhus) had studied the regeneration under training of muscle power in five different muscle groups. The muscle strength was tested by the accepted classification from 0 to 5. Out of 318 0-muscles 70 per cent were still 0 after two years, only 13 per cent became 3 or more. Among seventy-one 1-muscles 64 per cent, and among seventy-one 2-muscles 74 per cent, gained strength of 3 or more.

Other papers—W. Permin (Copenhagen) gave an account of the prognosis for scoliosis based on a study of 357 cases recorded by the Disablement Insurance Board. Seventy-six per cent of 195 patients were recorded as having died from heart or pulmonary complications at an average age of 48-5 years. Those who died from other reasons averaged 55-6 years of age. E. Thyge Madsen (Copenhagen) reported an investigation of birth fractures and emphasised the importance of perfect reduction and retention in all cases except fractures of the clavicle.

Clinical cases and films—From the Orthopaedic Hospital in Copenhagen cases of poliomyelitis and films were demonstrated to illustrate results of various treatment by Sv. Kjaer, K. Jansen, B. Sury and K. Bang Rasmussen.

The spring meeting was held in Copenhagen on April 25 and 26, 1953.

Compression in fracture treatment and arthrodesis—R. Movin (Copenhagen) gave a preliminary report of treatment by compression methods in seventeen cases of fractures, pseudoarthrosis and joint fusions.

Overgrowth of leg complicating neurofibroma—I. Lou (Kolding) described a case of a neurofibroma localised to the trochanteric-pelvic region with overgrowth of the leg. The tumour had been excised.

Sarcoma of the extremities—O. Nygaard (Copenhagen) reported fourteen cases of sarcoma of the extremities operated upon at the Orthopaedic Hospital, Copenhagen. It was felt that operation was justified in such cases as some patients could survive for years thereafter. The operation should be radical, for some patients had had to undergo several operations.
Spondylolysis—P. Lütken (Ålborg) gave an account of seven cases of spondylolysis, in three of which there was also spondylolisthesis, seen among twenty-five patients who had previously sustained fractures of the spine. He believed in the possibility of a traumatic origin of the defect in the neural arch.

Arthroplasty of the knee—Sv. Kiær (Copenhagen) gave a preliminary report on fourteen cases of knee arthroplasty with acrylic prostheses. It was too early to evaluate results but the procedure was considered promising.

ORTHOPAEDIC APPOINTMENTS

Dr E. Thomasen has been appointed surgeon-in-chief to the Orthopaedic Hospital in Aarhus in succession to Dr P. G. K. Bentzon who has retired owing to ill health. Dr Arne Bertelsen has been appointed to Department I, the Orthopaedic Hospital, Copenhagen, in place of the late Dr Aage Berntsen.

Two new appointments have been made as chief of the physiotherapeutic departments in Copenhagen/Sollerod and Århus/Hald, Dr Jens Bang and Dr Niels Buxh being appointed. An orthopaedic clinic has been opened in Odense—the "capital" of Funen—under the leadership of Dr Aage Randlov-Madsen.

DEVELOPMENT OF ORTHOPAEDIC CENTRES

Owing to the need of hospital beds during the recent large epidemic of poliomyelitis a country branch of the Orthopaedic Hospital in Copenhagen has been established by the purchase of the large seaside hotel in Hornbæk, the leader of the physiotherapeutic work there being Ole Remvig. A cerebral palsy clinic has been opened at the Orthopaedic Hospital in Copenhagen, the children being examined by a team of doctors who include Dr Sv. Brandt (neuropaediatrician), Dr Jens Bang (physical medicine), Dr J. Mortens (orthopaedic surgeon), Dr Westergaard-Nielsen (neurosurgeon), Dr Anna Frandsen (ophthalmologist), and Dr A. Arnfred (psychiatrist). A cerebral palsy clinic in connection with the physiotherapeutic department of the hospital is already established and includes a kindergarten. Additionally a children's home and a residential school for cerebral palsied children has been opened in Sollerod outside Copenhagen. Last year Professor Temple Fay, of Philadelphia, Pennsylvania, and this year Professor R. P. Schwartz, of Rochester, New York, spent some months at the Orthopaedic Hospitals and have given valuable instruction concerning the screening and treatment of cerebral palsied children.