The Cameron Lecture

ON

THE NECESSITY OF ORTHOPAEDIC
TRAINING :ITS RELATION TO THE PREVENTION AND
CURE OF DEFORMITIES.DELIVERED AT THE UNIVERSITY OF EDINBURGH ON
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BY

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ONE of the greatest of all honours that a surgeon can receive is the Cameron prize from the University of Edinburgh. It is needless to say how deeply grateful I am to have been selected by your university, and when I think of the distinguished men from various countries who have been recipients in years gone by, I am only too painfully conscious of my unworthiness. Were it not for the tragic incidence of war and the opportunity given me to organize schemes of physical reconstruction the prize must needs have fallen into better hands. It is because it bears relation in this instance to war work that I venture to give you a very simple address relating to the cripple problem generally, both infant and adult, pointing out some of the lessons which the war has taught us—more especially in relation to segregation and the prevention of deformity, emphasizing the necessity of paying more attention to the education of students in orthopaedic principles if they are to be efficiently equipped in after-life. The prevention of surgical tragedies is largely dependent upon the general practitioner, and his usefulness is largely dependent upon his academic training. He frequently sees the beginning of diseases when he enters practice—a phase of work which he has hitherto only studied theoretically—for his hospital experiences have been largely concerned with more advanced stages. He fills an extremely responsible position in most departments of his work, and this is especially true in regard to the early advent of deformities. These deformities are mainly associated with tuberculosis, rickets, and infantile paralysis, but then there are others of congenital origin.

It is evident that many of the deformities due to these conditions may be altogether prevented, and that practically all of them may be so corrected as to enable the patient to become ultimately a valuable industrial asset. An uncorrected deformity may often be the result of parental obstinacy, but not infrequently it is due to a want of knowledge on the part of the practitioner. We have only to visit any out-patient department to be satisfied as to the prevalence of the uncured cripple—often the *untreated* cripple. They are seen in every corner of the earth. If we inquire into the causes of these failures, we find that many of them were not seen in the early stages; many were refused hospital accommodation; others admitted into wards had to be evacuated early because of the pressure on beds; others suffered because there had been lack of continuity of treatment; most of them had not been supervised by surgeons sufficiently interested in that type of work. It is evident, if we are to prevent deformity, we must teach the fundamental principles in such a way that the teaching will bear fruit in remote places. We must reach the *practitioner* because we have to trust to him for an early diagnosis, and he should at least know the possibilities of modern treatment. The most effective way to accomplish this is through the mind of the student.

To illustrate the value of early corrective treatment we will consider for a few moments a simple type from each of the four groups from which deformities are derived. From the congenital group we will select an ordinary case of congenital equino-varus.

Congenital Deformities.

It is quite common in England to see these cases left for many months without any treatment of a systematic kind. Indeed, some surgeons of repute speak of postponing treatment until the child can walk. They do not

realize the irregular growth that takes place in the tarsus blocking and fixing the foot with increasing effect. It is quite true that a club-foot requires the final act of walking to complete its recovery, but the deformity itself can be completely eradicated in days or weeks, and by methods which can be easily taught to the practitioner in charge if the attempt is made *sufficiently early*. Every one should be taught that the earlier treatment is started, the better the functional result. How often we hear of "recurrences"; that they take place is constantly affirmed by writers as if they were enunciating a principle. Here, again, it should be insisted that a cured club-foot (an over-corrected club-foot is not necessarily a cured one) cannot recur—an over-corrected one frequently does. It is futile to correct obstructive and skeletal elements if the other factors are ignored. One of the causes of these so-called "recurrences" is weakened overstretched dorsiflexors and peronei. Until the child can over-correct its own deformity by a voluntary act, the foot is subject to the same influences that bring about foot-drop in infantile paralysis. If you examine many so-called "cured" club-feet, you will note the weakened condition of these muscles; if simple methods of treatment were applied for rectifying the deformity and restoring the function of the foot, there would be no need for cumbrous antiquated instruments reaching to the pelvis to keep a foot from turning in. Such implements suggest a serious misunderstanding of fundamental principles.

Rickety Deformities.

Take another group of deformities—those associated with rickets. The etiology of this condition is sufficiently known to merit some organized method of control. Recent investigations with regard to vitamins have served to confirm us in our view that it is largely a dietetic disease intensified by insanitary conditions. It is the practitioner who, here again, appears first upon the scene. He knows that mother's milk is better than the pernicious substitutes, and he knows the benefit of fresh air and the evils of overcrowding. If he preached this doctrine with enthusiasm, considerable headway would result in the prevention of rickets. When the disease appears he should know of the danger to soft bones of crawling and walking; he should realize the direct harm done to the child by the way the mother carries it; and, later, when deformity has become evident, how dangerous it is to tell the parents that "the child will grow out of it." When the bones are soft, the recumbent position, a frame and a bandage, without any drastic surgical methods, will correct the worst deformities in the young, and the bones will harden in their correct alignment provided feeding is suitable and the child is kept in the open air and not allowed to walk until the bones are firm.

Then we surgeons are often to blame when the rachitic come to us with their deformities. It is the osteotome, the saw, or osteoclast which we rely upon to straighten the limb, but how rarely do we take adequate protection against recurrence! Our out-patient departments abound with cases in which deformity has been corrected, and has recurred worse than ever, because of deficient after-care. This very properly brings our surgical methods into disrepute. For here again we have not merely to correct the deformity, but to cure the disease—not merely to straighten the soft bones, but to harden them. Deformities of the extremities should never be allowed to occur in rickets, and to fail to rectify them if they appear is a reproach either to the parents, to the surgeons, or to both. If the deformity, having been corrected, returns, it is a serious reflection upon someone.

Deformities due to Tuberculosis.

Again, let us refer to tuberculosis in children. We should be able, given reasonable State facilities, to eradicate this dreadful evil from our midst. If it does appear we should be able to prevent any deformity due to faulty alignment. Most practical and suggestive work on the etiology of tubercle in children, as you know, emanated from Edinburgh under the direction of Sir Harold Stiles, assisted by Mr. Fraser and Mr. Mitchell, who, with scientific methods and infinite labour, traced the infections from cows to children, and were able to correlate their clinical and pathological findings. No less than 60 per cent. of bone and joint disease were due to bovine infection. They found that 37 per cent. were due to the human bacillus, and in 62 per cent. of the human type a history of pulmonary

trouble existed in a parent whereby direct infection could take place. These experiments should be repeated on a large scale all over the country. Even now, at a minimum computation, one specimen of mixed milk in every ten contains living tubercle bacilli. Stenhouse Williams, an acknowledged authority, states that about 30 per cent. of the cattle in this country are affected with tubercle, and that of the total cattle only 2 per cent. will be in such an advanced stage of disease as to be affected by the Tuberculosis Order. "What," he pertinently asks, "is to become of the remaining 28 per cent.?"

What good can result by promulgating theories as to the immunizing of the race by feeding our children on living tubercle bacilli when we see the havoc and tragedy around us? It discourages any preventive effort which the State may make, and supplies the careless dairyman with an argument of immeasurable evil. Is it too much to insist that our milk should be so purified that no living tubercle bacillus should be allowed to enter the mouth of a child? The practitioner here again has a great gospel to preach. If in spite of all a joint becomes involved it will come under his observation first. Again, I have only to refer to the deformities of tuberculous joints, and to insist that a knowledge of the beginnings, and of the sequence of events, would relieve our hospital beds of much pressure and the child of much suffering.

Deformities after Acute Anterior Poliomyelitis.

We do not know enough of infantile paralysis, in spite of the investigations that have recently been made by Flexner, Clark, Osgood, and Lovett, but we have sufficient knowledge to treat it as a dangerously infective disease which should involve placing the family in quarantine, and guarding the healthy children as strictly as they would be guarded against any other acutely infectious disease. The early treatment of infantile paralysis, again, is in the hands of the family doctor. The surgeon very rarely sees the case in the acute stage, and then only when pain occurs or paralysis is discovered. Treatment should be undertaken at once, and should consist of complete rest of the nerves and muscles. I should make it a rule in every case, whether pain is present or not, to keep head and spine at rest just as if we were treating an inflamed area. During both the acute and early convalescent stage the treatment should be protective, and this term should include the prevention of postural errors such as tend to give an initial bias towards deformity. The rapid recovery of muscular groups in extensive paralysis suggests a pressure upon nerve cells which, under given conditions, is rapidly dispersed. Complete destruction of nerve cells is comparatively rare—hence the very late recoveries which often follow treatment. The family doctor may materially shorten and limit the disease, and prevent infection by early rest and isolation, while the risk of the advent of deformity and functional disability can be materially lessened by recognizing as a principle that the paralysed muscle should not be allowed to stretch.

Orthopaedics in the War.

Nearly all the crippling deformities of children and adults are included in the branch of surgery which, for the want of a better name, we call "orthopaedic," and the upper and lower extremities present its main field of activity. This type of surgery formed a large proportion of the injuries of war, and it will readily be admitted that many early failures would have been avoided if British university and hospital training all over the country had embraced in the curriculum the practical teaching of orthopaedic surgery.

Frequent visits round our Command Dépôts revealed the shortcomings of the routine teaching, for one found segregated every type of deformity; most of it need never have occurred had sufficient time been spent in educating the student in the principles which govern the development of deformity. These revelations implicated not merely auxiliary hospitals, but the best known hospitals in the land. The cases we met with were malunited and ununited fractures, stiff and ankylosed joints, injuries of peripheral nerves, partial destruction of the spinal cord, faulty fixation of joints, deformities due to the contraction of scars, and malposition due to functional causes. We found ankylosed joints being massaged, the limb often fixed in the position of least functional usefulness. We found old arthritic joints being

moved with calamitous results, simple adhesions treated as if inflammatory activity were present, the after-effects of peripheral nerve injuries treated without regard to the stretching of paralysed muscles; frequently cases in which nerve had been sutured arrived at the camp without any protection for the disabled muscle, and many cases had been allowed to contract so as to deprive joints and fingers of all usefulness. These tragedies did not necessarily originate in Command Dépôts, but often arrived there when the mischief had been done. They were not all necessarily due to ignorance or neglect; often they were the result of scarcity of beds, early evacuation, want of continuity of treatment, but the conclusion was also forced upon one that they displayed a lack of orthopaedic training on the part of surgeons and practitioners generally. The Command Dépôts in point of fact presented large groups of cases where Nature unassisted had been allowed to do its curative work without regard to restoration of function. The orthopaedic mind is taught to think in terms of function. It has mainly to deal with a pre-operative and a post-operative stage. The operative stage, although often essential, has only a proportionate value. Orthopaedic operations are usually measures preliminary to the re-education of muscle and restoration of function. They include the maintenance of joints and limbs in proper position in order that injured tissue may recover functional efficiency. The period of disability is materially shortened if the limb is protected against deformity while the wound is being allowed to heal. We may be certain that gross malunion of a fracture is not only deplorable but preventable. Most of the malunited fractures of the war were due to the inefficient fixation of the limb in the presence of sepsis, or to inexperience of the surgeon in regard to completion of consolidation. Later in the war, the soft tissues were allowed to heal with the bone in good alignment, and this position was maintained while body pressure was permitted. Attention to these two points resulted in a marked decrease of deformity, and, in consequence, an improvement of function. Even yet surgeons do not fully realize that a fracture of the femur which has recovered sufficiently to be unyielding to manipulation may yield to the incidence of body-weight. Pain on pressure over the site of fracture suggests an unsound or delayed union. Pain on pressure, and an excessive callus display, requires special protection in order that yielding may be avoided.

The deforming contraction of scars which we found in Command Dépôts could be avoided by recognizing certain principles. The wound should be allowed to heal with the limb placed in a position opposed to the contractile force, and the surgeon should remember that the bigger the mass of granulation, the more massive and contractile the organized fibrous tissue proves. Wounds in the axilla should be allowed to heal with the arm abducted; in the flexure of the elbow, with the forearm extended; of the wrist and palm, with the joint dorsiflexed, and so on with the other joints. Fully matured fibrous tissue has no more tendency to contract than any other tissue; as a scar takes a long time to be composed of fully matured tissue, the precautions taken against contractures must be prolonged.

It was in consequence of this ever-increasing stream of deformity that the Orthopaedic Centres were started, where the principle of segregating special groups of cases came to be recognized as clamant. From all parts of the country cases poured in. We started with 250 beds in Liverpool, and rapidly extended into the principal towns of Great Britain and Ireland until our beds eventually numbered over 20,000. The staffs were made up of general surgeons, orthopaedic surgeons, neurologists, and chiefs of special departments. We were permitted to keep our cases longer than in the general military hospitals, and were given every modern facility in the way of equipment. For psychological and reconstructive purposes we introduced the curative workshops. These Orthopaedic Centres completely transformed the mental attitude of the derelict, and inspired every surgeon who worked there. The spirit of friendly rivalry and enthusiasm which infected all became part of the atmosphere. Consultations among the members of the staff were of daily occurrence. Any advance made by one surgeon was at once the common property of all. There were no watertight compartments anywhere. The successes and the failures were equally advertised without

mental reservation, and the secretive mind had no place amongst them. Needless to say, that spirit of comradeship and interest in each others' achievements and failures could not fail to make for progress. Each surgeon followed his case from the beginning to the end. It did not pass from one department to the other without an agreement as to the continuity of treatment. The surgeon discussed the line of treatment to be adopted with the chiefs of the special departments, and at stated intervals all the cases were collected, so that progress might be recorded and alterations discussed. As time passed, it was found that certain surgeons had special aptitude for dealing with certain types of cases, and they were encouraged to devote themselves to these and refrain from work which others could do better. This principle of employing a special talent and discarding lesser ones will doubtless in time to come obtain in our general hospitals, to the great advantage both of the surgeon and of the patient. The growth of surgery has been so rapid of recent years that only a very few surgeons have been sufficiently gifted to deal efficiently with all types of cases, and it is common to hear from old students that certain chiefs were only interested in the surgery of the nervous system, or of the abdomen, or of the extremities, and yet they had to plough through the uncongenial work as best they could. Their brilliance in one department was tarnished by their lower efficiency in another. A spirit of comradeship whereby the staff would interest each other in the work in which they each excelled would result in a sound, practical education, and in impressing upon them their values and their limitations.

The advantage of segregating certain cases under surgeons specially interested in them has been proved by the experiences of war. It was very marked in the case of fractures. In the early days of incomplete organization nearly all the fractures of the femur admitted into special surgical centres exhibited marked malunion and deformity. Some were treated abroad, but most of them were treated in general hospitals in this country. Rapid evacuation at home and abroad due to military exigencies, and, often, defective handling by surgeons with no mechanical training, accounted for an appalling number of deformities, many of which took years to rectify. Later it was recognized abroad that these cases should be segregated, and it was most interesting to note the improvement that occurred. By this time the principle of the Thomas knee, bed, and calliper splints, with modifications introduced to facilitate the treatment of large wounds, was recognized. The cases arriving from the fracture base hospital at Boulogne were invariably so well placed, both as regards fixation and alignment, that they rarely required more than casual attention; when some relapsed into deformity it was due to ill-advised changes adopted by surgeons at home, who frequently removed the splints too soon, and allowed walking before consolidation had occurred. Cases which had given skilled surgeons abroad the greatest anxiety and endless care, on arriving home failed to secure that continuity of good treatment essential to success. I received many a heart-breaking letter from abroad complaining of all this. Several special fracture hospitals were opened in France later, and, as a result, an end came to deformity. After the bombing of Etaples all fractures were sent home, and the expert staffs were housed in our special orthopaedic centres. At one time at Edmonton we had 300 cases of fracture of the femur with an average shortening of less than half an inch. This is an extraordinary achievement when we consider the severity of the injuries. Results equally good were obtained at Alder Hey by the use of the Thomas splint employed in its original simplicity. The lesson we gather from this is that by simple methods taught in a few hours the practitioner in remote places can be safely trusted to start a fractured femur on a safe career.

A general training in the treatment of fractures would have saved thousands of lives during the war. If our universities and teaching hospitals would fix upon the simplest types of appliances, and thoroughly ground the students in the principles which govern the application, humanity may yet be spared numberless deformities. The appliances should be of the simplest kind to be of wide-spread use. In every large hospital there should be a fracture ward, and the chief should be both interested and competent. The treatment of fractures in this country is at present a sadly neglected art, and every effort should

be made to place it on a more scientific plane. A walk round our hospital wards indicates clearly the apathy displayed by many surgeons. Fractures are looked upon as a nuisance and generally relegated to a junior house-surgeon, who, in his turn, exhibits but little interest or ingenuity. The surgeon's attention is devoted to the vagaries of the abdominal contents, and he has no desire to waste his time or beds on mere fractures. His attitude of mind finds its reflex in that of the students. The crippling and deformity is looked upon as a necessary sequence of injury rather than as a reproach.

When our military Orthopaedic Centres were started their extension was hindered because we had at our disposal only a few men who had received special training. At that period every young man was expected at the seat of war, and only a very few could be spared for home work. The American Government, realizing our plight, very generously sent us twenty-five well trained young orthopaedic surgeons, who were to help us, free from expense, for the duration of the war. Without that help we should have been very seriously handicapped. In return for this we undertook to train large numbers of their young surgeons at our centres to enable them to be of greater service abroad. This training specially fitted them to deal with injuries of the extremities, and they received an intensive education in the use of a few well considered splints which were standardized by the American Government. These splints were plentifully supplied to the whole of the medical service, together with the code of instructions. By this means in a very short time they were enabled to acquire knowledge which we had learnt only from bitter experience. They distributed splints at once to the regimental aid posts; each knew the working of the splint, from front to base, and so continuity of treatment was secured along the line. What a saving of life this represented! Sir Henry Gray, in 1916, collected statistics over one of the army areas, and found that 80 per cent. of compound fracture cases died, mostly before arriving at or after they arrived at the casualty clearing stations; and when, in 1918, immediate fixation in the Thomas splint was secured at the first possible moment, Sir Anthony Bowlby tells us that the mortality was reduced to 30 per cent. This is an interesting reflection in regard to team work, the treatment of shock, and the standardization of simple methods. It would be a calamity if the knowledge forced upon us in such strenuous times and through so much sacrifice were lost in time of peace.

Need for Orthopaedic Training.

We hear frequent criticism from both continents of the lack of orthopaedic training in this country. While lectureships and clinics abound abroad, it is only quite lately—and this largely owing to the war—that there has been a very strong feeling expressed in this country as to our need of orthopaedic instruction. I think this is due to the limited definition which has so long been associated with the term "orthopaedics." So long as the specialty was confined to flat-feet, knock-knees, club-feet, and certain other deformities, it seemed useless to trouble about it. So long as expensive, cumbersome, and consequently useless appliances were in evidence, one is not astonished that the surgeon not only neglected Orthopaedic Surgery but looked upon it with contempt! Fortunately, however, that day is past. It is now recognized that an essential preliminary to orthopaedic efficiency involves a thorough practical training in general surgery. With a gradual expansion of its definition a higher degree of skill is demanded by its votaries, and no one will now venture to practise it with any false notion that the road is an easy one. In addition to operative skill, it demands special qualities of mind; mechanical aptitude and untiring perseverance and patience are not the least important of these.

Since the war several hospitals have decided to embrace in their curriculum the teaching of Orthopaedics, and I have often been asked to help in regard to organization and requirements. An Orthopaedic Department is too often a mere out-patient clinic, sometimes under the control of a physio-therapist with no supervision by a specially trained surgeon. At times a junior man is in control, with no interest but to make it a stepping-stone to another post, which he accepts with alacrity at the earliest opportunity. This is, of course, futile, and can bring nothing but discredit upon all concerned. It is

better to have no orthopaedic department at all than to make it a pretence. The essential and fundamental corner-stone of an Orthopaedic Department is a surgeon who knows his work and intends to devote his life to it. Less than this dooms any scheme to failure.

Organization of an Orthopaedic Department.

At the risk of repeating what I have said in other places I venture to put before you my ideas as to what an Orthopaedic Department attached to a university or teaching hospital should be. Whatever definition of Orthopaedic Surgery is adopted, the general surgeon should have a perfect right to admit into his wards, for teaching or other purposes, any case or as many as he likes included in that definition. The Orthopaedic Surgeon should alone be limited, and should be precluded from treating any other cases except those covered by the definition.

No Orthopaedic Department should be confined to the treatment of out-patients. It should be a complete unit, with beds commensurate with out-patient demands.

The staff should consist of an Orthopaedic Surgeon, who should be in charge of the department and be responsible for its efficient conduct. His practice out of hospital should be confined to Orthopaedic Surgery. He should have a seat on the medical board and hold rank equal to that of the general surgeon. An Orthopaedic Registrar or assistant surgeon, who should be selected as a man desirous of practising Orthopaedic Surgery. A house-surgeon, who should be appointed for at least six months, and clinical assistants and dressers.

The staff should run as a team, in which the nurses play an important part. It is important, therefore, that the matron should give security of tenure to the sisters in charge of the ward and out-patient department. It takes much time and perseverance to train nurses in this particular work, involving, as it must, the application of splints and the renewal of plasters; a considerable responsibility attaches to them. For these reasons they should remain part of the permanent staff.

In a hospital of 300 surgical beds I have estimated that forty should be retained for the orthopaedic service. They should be segregated. The department should have well-equipped physio-therapy rooms under the superintendence of a chief, who should, of course, be a member of our profession.

The orthopaedic registrar (or senior house-surgeon) should hold his appointment for at least two years. If his work proved sufficiently promising, opportunity should be given to him during his tenure of office to visit clinics at home and abroad in order that the hospital work and university teaching should be kept well in advance; this educational course should be financed from hospital funds, and the clinics to be visited could be arranged by the orthopaedic surgeon. The registrarship should be a whole-time appointment, and the assistant surgeon should be understudy to his chief.

The plan of one officer being appointed head of all sections of physio-therapy has much to recommend it. The post is a very responsible one, and presupposes a knowledge of massage, physical exercises, and electro-therapeutics, and possibly hydro-therapy. Although the physio-therapy department should be closely allied to the orthopaedic, it should still be independent of it, because it is a department used by all the physicians and surgeons.

Difficulties sometimes arise between the chief of the physio-therapy department and the rest of the staff on the question of responsibility. It is well, therefore, to define their relationship clearly in order to harmonize work. The rules which are in force at the Liverpool Royal Infirmary and St. Thomas's Hospital, London, with both of which hospitals I am associated, are satisfactory, and are as follows:

Rules for a Physio-therapy Department.

(a) In-patients can be sent to the department with general instructions that they require treatment. In such cases the nature of the treatment will be decided by the medical officer of the department, who will be entirely responsible for the case, and who will only refer such cases back at his own discretion or on a definite request from the physician or surgeon who originally had charge of the patient.

(b) Cases may be sent to the department by the physicians or surgeons with a definite request for certain detailed treatment.

Such cases will be sent back to them at stated intervals. Should any sharp difference arise between the medical officers of the department and the honorary surgeon, the honoraries will take full responsibility.

(c) Cases sent by casualty surgeons should be under the control of the chief of department.

These, or similar rules, will settle the tendency to friction which might possibly occur, but obviously friendly consultation and understanding is the only real basis of good comradeship.

In a teaching hospital with a large out-patient clinic there is a great advantage in starting a workshop for the manufacture of splints. It is not only an economy, but it adds immensely to efficiency, and affords the surgeon an opportunity to develop his mechanical ideas.

The Scope of Orthopaedic Surgery.

When we begin to discuss the scope of orthopaedic surgery, the atmosphere is perhaps not quite so clear. On the one hand, it is desirable not to limit the activities of the general surgeon; on the other hand, it would be unfortunate to deprive the orthopaedic surgeon of work he has been trained to do. The general surgeon is protected by the right he undoubtedly has to treat any case he desires, and justice will be done to the orthopaedic surgeon if he is allowed to admit to his wards those cases which, in ordinary circumstances, he would undertake in private. I think these cases should consist of:

(a) Congenital and acquired deformities of the spine and extremities.

(b) Infantile paralysis after the acute stage.

(c) The deformities of adult paralysis.

(d) Stiff and ankylosed joints.

(e) Torticollis.

(f) Disabilities of joints, such as rupture of crucial ligaments, injuries to semilunar cartilage, snapping hip, slipping patellae, and those conditions which are included under the aggressive title of "bonesetting."

I think also that the orthopaedic surgeon should have the right, in common with the general surgeon, to treat recent fractures. If he is competent to deal with mal-united fractures, he should find it easier to prevent deformity than to reconstruct the limb. I have already dealt with the necessity of segregating fractures, and a very healthy rivalry would be maintained between all the surgeons interested in the branch of work if the cases were under close observation in one ward, presided over by nurses specially qualified to nurse them.

This definition admittedly covers a large area of surgery, and for this reason will attract the very best of our young surgeons. These are the men whom we specially desire to attract in order that they may devote themselves to a very intricate branch of work, bristling with problems which require solution, and demanding the highest operative skill.

The Teaching of Orthopaedic Surgery in a Medical School.

Well, given our Orthopaedic Department with its complete equipment and well organized staff, what part is it to take in the training of students? It should take a place, I maintain, proportionate to the area of work it covers.

It is useless to suggest that the student's time is already fully occupied. The endeavour is that it should be better occupied. All the subjects embraced in the definition have to be taught, and the proposal is that some of the teaching should be delegated to a department efficiently staffed for the work. The student is not asked to give more time, but is offered greater facilities for acquiring knowledge. I do not think that a university or teaching hospital can at first face the problem of training both graduate and undergraduate. The courses should be separate and, in the case of the graduate, he should have facilities for doing a considerable amount of clinical work. The undergraduate training is a more pressing and important problem. My suggestion is that a student is more fitted for orthopaedic training towards the end of his curriculum than at an early stage. It is, of course, essential that his attendance be made compulsory for a specified number of attendances.

The orthopaedic chief should carefully prepare a

systematic course of clinical instruction to be given once a week at an hour which fits into the curriculum, and the student should be required to show at least twenty attendances. The demonstration should last for about two hours. For instance, one afternoon might be devoted to the discussion of club-foot, illustrated by living specimens of every type; the deformity of the newly-born contrasted with that of later life; the nature of the deformities and the effects of weight-bearing; the fundamental principles of treatment governing success or failure; the various gaits and the tests of recovery. All this could be taught with a wealth of illustration, together with a detailed demonstration of the various methods of manipulation and fixation, and of muscle re-education. The student could here have instilled into him the tragedy of removing bone before a preliminary reduction of deformity by forcible means had been effected. The demonstrations should be simple in character, very practical and quite free from controversial matter. Most of his instruction could be given in the out-patient department, which is a more wholesome place for elementary study than the more attractive operation theatre. He should be thoroughly taught, and that by actual practice, the principles underlying the application of plaster and the objects to be obtained by appliances. All this can be done to great advantage if the cases are grouped in such numbers and order as to impress upon the student's mind the difference in degree and type. One afternoon could be devoted to stiff joints, starting with the various types of ankylosis; impressing the importance of position in regard to function; illustrating the various types of arthritis and the differential diagnosis between these conditions and joints bound down by adhesions; the mobilization of joints by safe methods contrasted with those of danger, ending by a practical exhibition of procedure. The student should not be allowed to leave the clinic until he has a knowledge of the practice of physiotherapy. There is no better place than the out-patient department for the teaching of the treatment of fractures of the upper extremities by splints with mobilization. The Orthopaedic Surgeon, in combination with any members of the staff who are interested, should form a committee in order to fix upon the appliances which, by reason of their simplicity and efficiency, may be safely standardized, and the student should be obliged to become thoroughly conversant with their use by frequent exercise in their application, both in the out-patient department and in the wards.

Country Hospitals for Crippled Children.

Country hospitals for children, staffed by well trained surgeons, are essential to any scheme dealing with cripples. Having been associated with such hospitals for over twenty years, I can speak with some authority. I have worked at hospitals where children are indoors day and night, in others where they are out during the day and in at night, and in others where the children are out day and night, and there is no comparison as to their relative values. Children out in the open air day and night are at a great advantage. I think one can prophesy that the time will soon come when the town hospital for children will practically cease to exist. The energy, vitality, and nutrition of the children brought up in open-air wards are a revelation to all who visit them. Infectious disease, the bane of closed wards, never spreads when the wards are fully exposed to fresh air; no matter how low the temperature, the children never take cold. Such a hospital should be attached to every teaching centre, and in every orthopaedic scheme it should hold an important place. This hospital should not be a convalescent home if by the term is meant that no active surgical work is done there. It should be equipped with an operating theatre, plaster rooms, and a physio-therapy installation. In this way nurses can be trained to do special work and obtain their massage certificates—which involve a working knowledge of electro-therapy—and young surgeons gain much-needed experience in the way of practical work.

Some of you may have seen such institutions. We have at Heswall, near Liverpool, due mainly to the vision and generosity of Mr. Andrew Gibson, one of the most beautifully situated hospitals in the world. It lies above the banks of the Dee, surrounded by heather, facing the Welsh hills. One side of each long ward is completely absent; and it is an inspiration to see how everybody—nurses, children, and staff—reflect the joy of living. Treatment

is intensive, for every factor is present which ministers to recovery. The orthopaedic department should have a considerable number of beds in such an institution as this, retaining only a comparatively small number in the town for the more acute conditions and for the purpose of teaching. The surgeons from the city should have their regular visiting and operating days, and some of the clinics should be conducted there.

There is another type of hospital at Baschurch, in Shropshire, which was the first open-air hospital ever built. The wards consist of wooden sheds built upon an open field. The operating theatre and the post-operative wards were largely built by cripples. There are four well known orthopaedic surgeons attached to it—one lives in London, another in Birmingham, another in Oxford, and one in Liverpool. The operative work is all done on Sundays, and each surgeon pays a visit once a month. They are all busy men, and yet, so fascinating is the work and its environment, that they look forward to the visit with eager enthusiasm. This is a sufficient answer to any argument that may be employed in reference to distance. A country hospital in association with a teaching centre need, however, only be a few miles from the city.

This hospital at Baschurch has spread its net over a large area in Shropshire. The difficulty of reaching cases in an early stage and in securing adequate after-care, led to the formation of clinics or subcentres, in small townships. There are at present about seventeen of these. Every week or fortnight one of the house-surgeons, accompanied by an orthopaedic nurse, visits each centre. New cases are examined, treated, or referred to the main hospital. Old cases arrive for reapplication of plaster, splints, or appliances. In attendance at these clinics are usually found a representative from the medical officer of health, the school doctor, the local doctor, and representatives of the invalid cripple aid and child welfare societies. You can imagine how inspiring it is! This association and discussion in remote townships disseminates a spirit of helpfulness and enthusiasm which will largely help to solve the cripple problem. The National Scheme, drawn up by Mr. Girdlestone, and published by us,¹ now in the hands of the Central Committee for the Care of Cripples, was inspired by the work so excellently begun and carried on at these two open-air hospitals.

Diplomas and Degrees in Orthopaedic Surgery.

Post-graduate teaching must be prepared for two types of students—a short course for a graduate who can only spare a few weeks, and another of a more intimate kind for those who desire to qualify as expert orthopaedic surgeons. The former will be composed of men who feel the responsibility of not knowing, and should be welcomed and helped, and the tuition should be carefully planned so that the education may be intensive. The university should, however, be prepared with a higher course of training lasting from one to two years, in order to qualify the surgeon to be admitted for a diploma or a degree. During this course the student should be given every opportunity of approaching the subject in its scientific and practical bearing. His curriculum should not allow him an idle moment, and the anatomical, physiological and pathological departments should occupy a considerable portion of his time. If his work has been satisfactory he may obtain a diploma from the university at the end of the first year; and if he studies for the second year he will require to take an assistant's position at one of the hospitals, perform most of the operations that may be required of him in practice, and write a thesis based upon original research. This may secure for him a university degree in orthopaedic surgery. I am pleased to say that, on the initiative of Professor Adams, our Vice-Chancellor at the University of Liverpool, we are engaged in working out the details of such a scheme for the advanced group.

Proposed Orthopaedic Department for the University of Edinburgh.

Now may I be allowed to refer to the University of Edinburgh, which, I am rejoiced to learn, is about to found an Orthopaedic Lectureship? I do this with less hesitation as I am sure that such old friends as Professor Alexis Thomson and Sir Harold Stiles will pardon an enthusiast who loves his art perhaps to the verge of indiscretion. Edinburgh is the largest medical school in

the British Empire, and has traditions envied by all. For generations it was the last word in education. Its graduates are found in every part of the globe, and they display an affection for their Alma Mater and an admiration for their teachers which in my experience is unique. For years I appointed as my house-surgeons Edinburgh graduates, not because of their practical knowledge, which was often deficient, but because they had been carefully taught how to observe. There were many men who had come into closer contact with their patients, who had been given more responsibility, but for receptivity of mind and the ingestion of new ideas the Edinburgh student always excelled. In early days, when views I held were less popular, I knew so well their incredulous look, and how closely one had to reason in order to convince. I recall the case of one man, now a distinguished orthopaedic surgeon and a close friend, who, after following my rapid flight around a ward, pushed into the board-room when I was putting on my coat, leaned against the table, and almost angrily pelted questions at me; and when in a timid way I tried to answer him, he clinched all argument by an unanswerable sentence: "This is not Edinburgh teaching." Edinburgh graduates, over and over again, have complained to me of their lack in orthopaedic training even up to recent years.

This is not worthy of a university of so singular a reputation, and which has always displayed an almost fatherly solicitude for the efficiency of its graduates. Now that it is about to make up for its deficiency, I commend for its consideration a scheme such as that which I have advanced. When the work starts let it begin on good lines for defects soon become stereotyped, and are always difficult to amend. At St. Thomas's Hospital in London they have started their department on progressive lines. At King's College in London, also, a distinguished orthopaedic surgeon runs his unit, and has been granted forty beds together with the treatment of fractures. I would like to see the new Orthopaedic Department at Edinburgh add lustre to the glorious traditions of the University.

With the generous gift, which is soon to be expended on a new country hospital, what a magnificent prospect is opened up! It can be started on the most modern lines, with an unequalled equipment. I trust the children will be allowed to live in the open air. Surgeons might renew their youth by working in such ideal surroundings, and the child have the benefit of skilled supervision from first to last. The chronic case could be educated, trades taught him, and a spirit of joy and hope would reign. Those who minister to it in any capacity will realize that they are not only doing a personal and kindly service, but one of invaluable importance to the State. I should rejoice to see such an institution become a national centre for the prevention and cure of cripples in Scotland, spreading its influence over the whole of the land, and conducting an educational and reconstructive campaign of inestimable service to mankind.

REFERENCE.

1 BRITISH MEDICAL JOURNAL, October 11th, 1919, p. 457.

A PRELIMINARY NOTE ON THE USE OF VITEX PEDUNCULARIS IN MALARIAL FEVER AND IN BLACKWATER FEVER.

BY

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HAVING noted the occurrence of a large number of cases of blackwater fever, and also of very severe malignant malaria in the Ranchi district, I made inquiries as to whether there were in this locality any plant with virtues similar to those of *Aphloeia theaeformis* (which is used in these conditions in Madagascar), and was informed that there is such a plant actually used by the aboriginal tribes, and that blackwater fever does actually occur among them was evident enough from the clear description of its leading symptoms given me by one of themselves, who sent me samples of the leaf of the plant used.

This plant is locally known by various names:

1. Hindi	Minjurgorwa, Chhagriamba, Charaigorwa, Nagpheni, Nagbail,
2. Uraon	Eratakhia.
3. Kol	Simjanga.
4. Bengali	Baruna, Goda.
5. Assamese ...	Oasi.
6. Santali	Badumarak, Rhadumarak.
7. Cachari	Hila Anwal, Krawra (Pra-n).
8. Garo	Shelangri.
9. "	Navaladi.
10. Burmese ...	Kyetyo.

Of these vernacular names, numbers 4 to 10 have been taken from J. S. Gamble's *Manual of Indian Timbers*, 1902 edition, p. 541. The superintendent of the Royal Botanic Garden at Sibpur has identified the plant botanically as the *Vitex peduncularis* Wall (variety *rozburghiana*). I find it mentioned also in Kirtikar's and Basu's *Indian Medicinal Plants*, Part II, page 1001, and figured, but not very accurately, in their plate No. 741. They give its habitat as "Bihar at Parasnath, Eastern Bengal, and Khasia Terai," and state that "in Chutia Nagpur the bark is used for making an external application for pains in the chest (Rev. A. Campbell)."

The plant is fully described in the two works mentioned above, and in Haines's *Forest Flora of Chota Nagpur*. It is only necessary to add that the leaf characters vary somewhat with the age of the plant, the petiolar expansion on the leaf stem being very inconstant in the older specimens. The aborigines state that there is a variety of vitex with a dark-coloured root—they call it a "red root"—and that this is better to use than the usual pale-rooted plant, which, however, is the only kind I have been so far able to obtain and to use.

My information is that it is used in various ways, chiefly as an infusion of the leaves or of the root bark or young stem bark, in fever of malarial type, and especially in blackwater fever. As to the dosage, I followed in the first instance, since October, 1919, and in the main still follow, what amounts practically to the original directions given me by my Uraon informant as regards the method of use. These are as follows:

Two ounces of the leaf used fresh, or dried in the shade, is dropped into 40 oz. of boiling water, and is boiled in it for five to ten minutes, and then allowed to soak in the water in which it has been boiled, for an hour at least. The resulting infusion, amounting to about 40 oz., is poured off the soaking leaf and given as required in doses of about 8 to 10 oz., distributed over twenty-four hours, or given over the day only, the patient resting all night undisturbed. The infusion is of about the colour of strong cold tea and not unlike it in taste, and is given sweetened with a little sugar to taste.

As soon as we decided by the results that the infusion was quite a useful preparation, we attempted to prepare a concentrated infusion on the lines of the infusion gentianæ compositum (conc.) of the *British Pharmacopoeia*. This has also proved useful, but we found it less reliable than the simple infusion of 1 oz. to 2 oz. of leaf yielding 40 oz. of infusion with plain water. With further experience we found it in certain cases necessary to give larger doses, and to avoid too great a volume in each dose we prepared a 40 oz. infusion from 1, 2, and 4 oz. of leaf, and we called these, for easy reference, infusions of 1 in 40, 2 in 40, and 4 in 40 strengths, and used these as required.

As to results, generally speaking, in malarial fever, we have in almost all instances identified the parasite of malaria before commencing the treatment. This preliminary has only been omitted in a very few of the cases on which this paper is based, and these latter have been, I think, quite undoubted cases of malaria also. The results, as a whole, show that, whereas there are cases that will quite readily yield to a 1 in 40 infusion, there are others that require a very much larger dosage. This may be due to, perhaps, the fact that we have not so far been able to standardize dosage, as the active principle has of course not yet been identified. The actual experience with the use of both the infusion and the concentrated infusion has been that, whereas a proportion of cases have quite readily yielded to a dosage based on the infusion of 40 oz. of infusion from 1 oz. of leaf given over twenty-four hours of administration, and have yielded in some cases in twenty-four hours and in others in the course of seventy-two hours, there have been other cases which have not yielded even in seventy-two hours, but which have yielded at once when the dose was doubled or considerably increased by either giving a larger actual dose of the 1 oz. to 40 oz. infusion, or by using a very much stronger infusion, even up to one of 4 oz. of leaf to the 40 oz. infusion, and there are others which have been even more obstinate. The results, however, have been uniformly encouraging.

The drug seems to have no toxicity at all in the dosages