A British Medical Association Lecture ON THE INFLUENCE OF THE WAR ON THE MODERN TREATMENT OF FRACTURES.*

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THE experience which so many doctors gained when serving with the army in the field has not only modified profoundly the method of treatment of cases of fracture and other injuries, but has also changed in a marked degree our outlook on many of the general problems that confront the medical profession.

The first and most important lesson learned was that the treatment of the injured was never the concern of one single individual. It was always the joint responsibility of a team, each member of which loyally co-operated to contribute his share towards obtaining the most painless and most speedy cure of the sufferer. The responsibility for the care of the wounded man commenced on the firing step or even in the field in front of it where the soldier fell, and continued up to the time of his final cure. Let us trace his progress through the various stages of his treatment and see what lessons, useful to civil practice, we can learn thereby.

The regimental medical officer was the family doctor of his battalion. His duties, as regards the care of the wounded, commenced long before his battalion went into action or even entered the line. When on home service there was detailed to him a group of men selected usually by their company commander or squadron leader as unlikely to make efficient soldiers. These were appointed battalion stretcher-bearers and wore the S.B. brassard on their arms. At this stage in their existence they were looked on by the combatant ranks as a necessary nuisance, which unfortunately decreased further the bayonet strength of the firing line. But later the actual experience of warfare altered this opinion, and the quiet heroism they displayed, and only too often the heavy casualties they endured, made them the most respected and admired soldiers in their battalion.

The value of the instructions imparted by the regimental medical officer to his pupils was at first frequently not very apparent when it came to be tried in actual practice, but, in the later stages of the war, some of these bearers became so expert in applying dressings to recent wounds, and in treating such serious injuries as fractured femurs, that their service to the battalion was of the very greatest value. The neatness, expedition and comfort with which they carried out this treatment few medical men could equal.

When confronted with the problem of the treatment of the recently wounded, the duties of the regimental medical officer were clearly defined. They were: to cover the wound to prevent it being further contaminated, to relieve pain, to arrest haemorrhage, to provide rapid and comfortable transport, and to minimize shock.

The success which attended their efforts to minimize the shock following a serious wound was found to depend to a great extent upon the thoroughness with which pain was relieved, haemorrhage arrested, and rapid and comfortable transport provided. The history of the treatment of gunshot fractures of the femur as it evolved during the war illustrates this.

FRACTURED FEMUR: THE THOMAS SPLINT.

In the earliest stages of the war the battalion medical officer relied almost entirely on the application of a rifle splint to immobilize a fractured femur. To apply this correctly is difficult, and when applied it has many disadvantages. The patient is difficult to transport; the result is on the whole unsatisfactory. When he came under the care of the field ambulance at its advanced dressing station, or farther back, the rifle splint was removed and a Liston's long splint substituted, but little

improvement was obtained, and latterly the use of this splint was generally emphatically condemned.

The mortality that attended cases of fractured femurs was at this period appallingly high. Statistics, collected over part of the army area in France in 1916 by Colonel Sir H. M. W. Gray, led him to estimate the total mortality at nearly 80 per cent., a large portion of it being at the casualty clearing station or on the way there.

The battle of Arras, which took place in April, 1917, was about to be fought, and Colonel Gray, being convinced that a great saving in life might be effected in these cases by the use of the Thomas splint as a routine method of fixation, instituted a well organized educational campaign through the medical men of the Third Army to achieve this object. With the knowledge and approval of General Allenby this was carried out. A good supply of Thomas splints was distributed to the field ambulance, and even farther forward, and orderlies were trained to put these on. The result was that cases, instead of arriving at the casualty clearing stations almost moribund from shock and exhaustion, came in well enough to stand immediate operation, and the death rate in the clearing station of one army actually fell from nearly 50 per cent. in 1916 to 15.6 per cent. in 1917.

At that period I was serving as consulting surgeon with the army in Palestine. We knew of the Thomas splint, and were advocating its more widespread employment with partial success, but soon thereafter there arrived in the East the greatest benefactor the surgery of the army there received—General Allenby took over command. At one of his earliest conferences, I am informed, when the medical organization for his forthcoming offensive was being reviewed, he said that he believed there was a splint known as the Thomas splint, which was invaluable in cases of gunshot wounds of the thigh or knee, and it was his intention and desire that there should be one such splint available for every soldier receiving a wound in this region. The driving power behind this decision was magical. The central splint factory in Alexandria, which at the time was completing an order for 2,500, received instructions to make 5,000. Every general hospital, stationary hospital, casualty clearing station, and field ambulance was encouraged to equip itself with them. The regimental medical officer carried them with his field equipment. The field ambulances had them strapped to their sand carts. Every advanced dressing station was well equipped with them, and a report was called for on any case of this nature that came back from the advanced dressing station without one having been applied.

The most valuable illustration of the benefit to the patient of the Thomas splint for the treatment and transport of the fractured femur, that I observed, was during the fighting beyond the Jordan and hills of Moab. This took place at the beginning of 1918, and consisted of raids carried far into enemy country. During the fighting at Amman roads were virtually non-existent, and it was found almost impossible to bring up the guns, and still from here men with fractured femurs were successfully transported twenty-five miles on camel-back or in litters, and a further thirty miles in light Ford ambulances to the banks of the Jordan, where, at the corps main dressing station, they were dealt with by the advanced operating units.

The principles underlying the use of the Thomas splint are few, simple, and easily carried out, but, of course, the circumstances under which it is used were found to modify the method in which it was employed.

For us in the East a standard outfit was manufactured at the R.A.M.C. central splint factory in Alexandria. The aim underlying this outfit was to have one that was portable, and easily and rapidly applied. The rules that were laid down were that whatever method was employed, the extension must be maintained during transport. The ring of the Thomas splint must press against the ischial tuberosity and never slip over it. The lower end of the Thomas splint must be hung but not fixed to the lower stretcher bar. A suitable footpiece supports the foot.

The lesson the war taught us as regards the arrest of haemorrhage, when met with in a case of compound fracture, or occurring independent of that injury, undoubtedly was the danger attending the use of the tourniquet. To allow a patient to whose limb a tourniquet had been applied to pass out of your sight or, worse still, from

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under your care, came to be looked on as a professional disgrace. The advice we gave to the regimental medical officer dealing with a case of severe bleeding from a recent wound, and to the field ambulance officer doing duty in a crowded regimental aid post, was, in all cases where bleeding would not cease from a natural arrest, or could not be controlled by the local pressure of a shell dressing, to grasp the bleeding points with pressure forceps and send the patient down with these haemostats attached to his wound.

A story illustrating the application of this method is of interest:

As day was dawning on the morning after the first battle of Gaza there was brought to the 44th Casualty Clearing Station, then situated north of the village of Khan-Yunis, a convoy of wounded from a field ambulance. The most serious case in it was brought direct from the sand cart into the operating tent, and there came under my care. The patient was an officer of the Royal West Kent Regiment, who had been shot in the neck, the bullet having penetrated his chest and wounded the dome of his right lung. He arrived with two artery forceps projecting from the wound above the clavicle, and his field card informed us that the internal jugular vein had been wounded and the bleeding from it arrested by the application of pressure forceps. The wound was excised, the torn vessel ligatured, and the wound in the pleura and skin closed, and later on he was sent down the line. Some months afterwards I was asked to forward particulars concerning his case, and in reply received from a senior officer of the R.A.M.C., holding a responsible administrative post at the base, a letter thanking me for the services I had been able to render to his nephew, who had been my patient and had now rejoined his regiment. I was asked to transmit to the officer of the ambulance an appreciation of the deep debt of gratitude he had earned for having saved his nephew's life. This I did, and was amused to be shown by that field ambulance medical officer a copy of the correspondence he had recently received asking him to account for the loss of two pairs of artery forceps, for the replacement of which he was held personally liable.

For the transport of cases of fracture of the femur, or injuries involving the region of the knee-joint, or in fact any case of fracture of any of the bones of the lower extremity, the Thomas splint sufficed. Up to the end of the war considerable difference of opinion existed as to the most suitable splint for fractures involving the bones of the upper extremity. From the many splints that were available and used for this purpose, I would recommend most strongly one which is easily and rapidly applied, and permits of the patient being transported in the greatest comfort—namely, the Hey Groves wire cradle arm splint. With this in your possession—and any blacksmith can make it for you in a few minutes—you require nothing more.

The transport and treatment of the case of shattered hip, pelvis, or spine is always difficult, and for such cases a Jones abduction frame is a priceless aid. It is awkward to carry, and the case for which it is suitable may be long in coming under your care, but if available when required it will be found of very great value, and contribute largely to the saving of life.

WAR LESSONS IN CIVIL PRACTICE.

The application of the experience gained by the regimental medical officer and his colleague to the problems met with in civil practice merits consideration. The regimental medical officer was the keystone of the successful medical service in the field. He knew it and was proud of it. Contrary to the regulations, he proudly wore the bonnet of his battalion, or the badge of his regiment, and wherever his men went there he was to be found. Prompt attention and prompt transport were his guiding principles, and in doing these well he did the greatest of the many services the wounded man received.

The general practitioner of medicine is the regimental medical officer of the industrial army, and the solution of many of the most fascinating problems is in his care, where recent injuries have to be dealt with. For example, what arrangements exist for the supply of Thomas splints to the coal pits in our neighbourhood? Where are they to be found at the pit bottom? Who is trained in applying them? Can the arrangements for the transport of the miner with the broken back from the coal face, where he has been hurt, to the pithead be improved?

If our civil advanced dressing station be an office at the pithead, or a neighbouring miner's cottage, the question of its equipment may be put to you. Drugs and dressings, we will never forget, but what is of greater value is likely to be absent. If you receive the offer of help that I did when

stationed with my unit at Suvla Bay on the Gallipoli peninsula, I would advise you to reply, as I wired back, "Send sponges, rubber hot-water bottles (the army called them stomach warmers), and clean pyjamas." If you can deliver your case of fracture clean, warm, and with the fragments well splinted within four hours at corps main dressing station, you have done the best for your patient, even although the wound is uncleansed.

Most of the popular glamour of military surgery was focussed on the corps main dressing station, where the advance operating units worked, or on the casualty clearing stations in France, where these formed the forward surgical centres. The patient having arrived in a suitable state for operation, the first problem was the disinfection of his wound. The evolution of this process underwent is of interest. Chemical disinfection was at first mainly relied on, and when the antiseptics in common use failed, new ones were invented. Watson Cheyne introduced an antiseptic paste with which the wound was filled, with results that proved unsatisfactory. Eusol was found of value, and the Dakin-Carrel method of treatment was employed. Of the latter it may be said, as was once remarked of socialism, it would be an ideal practice in an ideal community, but in an ideal community it would not be required. Something less exacting in its demand on the time of the staff, something less fool-proof was wanted. Then came the saline tide. The introduction of chemicals from without having failed, we turned to a method whereby, with the aid of salt solutions, we flooded the wound with antibodies from within, normal saline solution, hypertonic saline solution, and salt packs being used. Many were cured by this method, and several had serious secondary haemorrhage in consequence of it.

Finally the old adage was remembered, that the best of all antiseptics was the healthy tissues, and the excision of wounds was practised, all the unhealthy damaged tissue being cut away and the wound closed or united later by secondary suture. The many brilliant results that followed this line of practice must not, however, upset our temperate judgement. Many wounds will be found where complete excision of the damaged tissues is an anatomical impossibility. Others will be met with already seriously infected. For these cases two remedies were found of great value, one bipp and the other flavine.

Bipp and Flavine.

The use of bipp, or bismuth iodoform paraffin paste, was condemned as harmful by a number of surgeons with wide experience in the treatment of the wounded. In many cases, however, when the grounds for their criticism were reviewed, it was found that the method that had been employed in using the remedy was not that advocated by the originator of this line of treatment, Mr. Rutherford Morrison, but that, contrary to his advice, a large quantity of it had been left in the wound, subsequently giving rise to harmful consequences. Some seem to have employed it as they would Beck's paste, filling up the entire cavity with it, and even thereafter closing the wound. Naturally the tissues resented such a foreign body containing irritant chemicals and endeavoured to expel it in the abundant discharge that resulted.

In the later stages of the war bipp was used in many cases in the Egyptian Expeditionary Force, and we found it to be of great use in many of them. Owing to the nature of the military operations that were being carried out, where the wounded had nearly always to be treated many miles from rail-head, and in all cases had to be transported through most difficult country before reaching the forward casualty station, or the hospitals on the lines of communication, it was frequently the case that the patient could not be re-dressed within twenty-four hours. When Damascus was captured the wounded were then nearly 400 miles from rail-head.

Where the wound was already infected, or where complete excision of it could not be practised, and the surgeon was compelled to leave behind a certain amount of devitalized tissue, the use of bipp was found of great value. It was possible in such a case to transport the patient in comfort and in safety, leaving the wound undressed for several days. Frequently his temperature was raised above normal, his pulse quickened, and a sero-purulent discharge escaped from the wound, which was swollen and somewhat oedematous, but it was noticeable how little pain he suffered. He slept well, his appetite was good, and later the wound was found to heal rapidly. The method employed was to cleanse the wound thoroughly of all

débris and damaged tissue, completely arrest all bleeding, and then disinfect it with spirit, after which a very small quantity of bipp was rubbed carefully into every corner of the wound, any slight excess that remained being carefully wiped off so that none remained visible at the end of the application. The wound was then packed, or in certain cases closed, and a spirit dressing applied.

The most astonishing results that were obtained by the use of bipp were in cases of gunshot wounds of the knee-joint resulting in acute suppurative arthritis.

Our experience with the use of flavine was interesting. At first from a study of the literature it appeared to us that at last we had here provided for us by Carl Browning the ideal antiseptic. It was non-toxic; it was virtually non-irritant. At first it might be employed in a strength of 1 in 1,000, and for subsequent treatment in a strength of 1 in 5,000. Instead of losing its potency when diluted in the serum of the tissues this was enhanced.

Our experience with the original consignment and with what we obtained later was similar to that of other observers—that it was a remedy with peculiar limitations. We found it an excellent remedy for pickling the wound. The wound remained remarkably dry, quiet, and irresponsive. The process of suppuration and the process of repair both seemed to be in abeyance, and it was found advisable to substitute, after it had been used for a few days, another remedy such as eusol or saline solution, when the wound then actively responded and healing took place rapidly. It will be thus observed that flavine found its greatest sphere of usefulness in cases where there was much damage of tissue which had to be transported long distances.

The lessons applicable to civil practice from these experiences appear to me to be the importance of early operative treatment in the case of a recent wound, such as a compound fracture, and the value of practising primary excision in these. If the tissues are extensively damaged and this cannot be practised, or if the wound is already infected, I would advocate that it be bipped, or, if the patient is to be transported out of your personal care, that it be packed with gauze soaked in flavine solution in the strength of 1 in 1,000.

GUNSHOT FRACTURES IN BASE HOSPITALS.

There are few who will deny the contention that one of the most brilliant achievements in the history of modern surgery is the record of the treatment of gunshot fractures as carried out in the base hospitals in the later stages of the war.

Many factors detrimental to success were present. Pearson and Drummond estimated that there were 5,000 new femur cases in the British army in France alone in the last nine months of the war, and this may be estimated to form only about 5 per cent. of all the casualties that had to be dealt with. Imagine the situation! Hospitals overcrowded at a period when they were being bombed during the night—so much so that some had to be moved and all patients evacuated and transported to England. For the 5,000 cases mentioned only a limited staff was available, and finally the class of injury that had to be treated was one where almost every one differed in some detail in its nature and required careful individual attention, and at any moment it was liable to provide you with that ghastly surgical tragedy—a severe secondary haemorrhage. And still the end results were uniformly brilliant.

Some will naturally seek for an explanation of this success in some new apparatus or new form of operative treatment that was employed. They will certainly discover that the young military surgeon invented and improved many articles of great use in dealing with such cases. These appliances all had this characteristic, that they further improved and simplified the immobilization of the fractured bone and at the same time further mobilized the patient.

The Balkan frame or Balkan bed that was extensively employed by them permitted the limb to be immobilized in any attitude desired, especially with the limb abducted. It also allowed of the patient raising himself in bed and even assuming the sitting posture, and, when the knee flexion piece was attached to the Thomas splint, flexion of the knee-joint could be practised daily without interfering with the maintenance of continuous extension. To obtain this extension Pearson's callipers, which

grasped but did not penetrate the condyle of the femur, were especially beneficial and permitted of direct and accurate extension being carried out in a manner simpler and safer and over a longer period than did a Steinmann's pin. At the same time I must confess that my experience in the use of Steinmann's pins for transfixing the femur appears to have been unusually fortunate, for, out of over a hundred cases in which I have seen it employed, I cannot remember one case that was followed by serious after-consequences due to its use.

In many cases Sinclair's glue proved of value, and for fractures in the region of the ankle his skate was of great assistance. The properly designed fracture bed with the biscuit and half-biscuit mattress helped most materially to increase the patient's comfort.

The possession of all these, however, was not the secret of the success obtained. This was mainly to be found in the whole-time staff of medical men, nurses, and orderlies that carried out the treatment. A continuity of policy could thus be practised, a standardization of the principles of treatment obtained, and the end-results observed by the keen and devoted team of workers who had cared for these cases. In other words, the cases were concentrated: the men anxious to treat them got them to look after. They had time to do so, and saw the final result.

The application of the knowledge to be gained from these experiences to civil practice is worthy of our careful consideration. To begin with, we start with this advantage, that most of our cases are much easier to treat, being simple fractures with unbroken skin. At a moderate cost a complete outfit can be obtained for treating a case of fractured femur. The simplest and best bed frame, in my experience, is the Morison R.I.E. bed-frame. Its invention is the outcome of the application of the wide knowledge of Sir Harold Stiles's late resident, Dr. Abbott, now of Ann Arbor in America, by Mr. Morison, engineer to the Royal Infirmary, Edinburgh.

The complete outfit should include a knee flexion piece for attachment to the Thomas splint and pressure pads for correcting local lateral displacement. A pair of Pearson's callipers and a pot of Sinclair's glue will complete our essential equipment, but a bent Thomas splint and a Sinclair's skate will be found most useful for treating fractures of the leg, whether simple or compound.

Even when all these were available, I have seen in a military hospital, and, more recently, in civil practice, a lamentable failure attend the treatment of a simple, straightforward case. Let us be frank and discuss the reason. Is it not to be found mainly in a disinclination or a lack of sufficient time to treat these cases on the part of the surgeon in attendance? Is it not true that in most hospitals the recently appointed house-surgeon, or even the surgeon in charge, estimates the luck of the waiting day, on the following morning, by the number of cases of fracture that have not been admitted? He much prefers that vacant beds should be available for the admission of cases requiring operative treatment where the problem to be dealt with is rapidly solved in the operating theatre, and little further is required but hasty observation of his patient's progress.

In so many hospitals the visiting staff have not time to devote to the proper care and treatment of fractures, and in nearly all hospitals the tenure of office of the house-surgeon is so brief that his period of service has almost expired before he really understands how to deal with such cases, and he relinquishes his appointment in favour of one who in his turn has to be trained.

I do not suggest that great skill or dexterity or prolonged study is necessary to treat cases of fracture. All that is required is a devotion to this branch of surgery by one who has the time and enthusiasm to carry out carefully daily observations on the progress of his patients and note the faults at their inception, when they are usually easily corrected. The fundamental principles underlying this practice are few, simple, and easily understood.

In military surgery, when the patient was discharged from the general hospital he was transferred to a convalescent dépôt. On the whole he had a very good time there. He had ample opportunity for rest and relaxation, and its environment was usually such as to encourage him to be out and about, and games suitable for his crippled state were usually provided. From this hospital he was transferred to the command dépôt, and on the day of his admission graded in his suitable class. If seriously crippled

he would be put in the fourth class and looked after by a medical officer. The officer in charge of the dépôt was a combatant, but no patient could be transferred from his class to a higher one without the approval of the medical staff. Ultimately, as he gradually improved, he would reach the first class, where he was capable of carrying out regular exercises, usually in the form of specially designed games, and also certain duties, such as mounting guard and light fatigues. Before he returned again to his regiment he was boarded, and the final result of his treatment was not judged by what he who originally operated on him thought, but by the cold light of the end-result obtained. The question then was, Can he wear his equipment? Can he march five miles with his pack? Can he do the full and arduous duties of a soldier of the line? And if so he was considered a Class A man.

The lessons we learn from this are of course extremely difficult to apply to civil practice in our democratic community, but I am sure that there is here a great field for improvement in our surgical work. Rigid and compulsory training or exercises are sought for by no civil surgeon that I know of, but the harmful effects of their absence are seen in almost every compensation case following injury. A very great deal, I am sure, can be obtained voluntarily, and if the facilities existed and their benefits were demonstrated in the case of a few the great majority would soon seek to participate in them.

ECONOMIC ASPECT OF FRACTURES.

The economic importance of the treatment of fractures is realized by us all. The injury is usually met with when the patient is at the height of his wage-earning capacity and has the responsibility of a household and family dependent on him.

The issue of the *BRITISH MEDICAL JOURNAL* of November 30th, 1912, contains the report of the British Medical Association Committee on the treatment of simple fractures:

In Table VII, which deals with all fractures occurring in patients over 15 years of age, those treated by non-operative measures were 1,324; their average duration of incapacity was 27.6 weeks. The number of cases in which the incapacity was permanent was 121, or 9.02 per cent. There were 179 cases of fracture of the shaft of the femur, the average incapacitation being 33.6 weeks, and the number of cases in which incapacity was permanent was 21, or 11.7 per cent.; 673 were fractures of the shaft of the tibia and fibula, the average number of weeks of incapacity being 26.7; 41 of these were permanently incapacitated, that is, 8.1 per cent.

Recently I discussed with a large employer of labour the question of hospital organization and the economic importance of the treatment of fractures in the industrial world, and he was kind enough to give me access to information bearing on the financial side of this question.

I have been provided with a consecutive series of 22 cases of workmen who in the year 1917-18 suffered fractures of the bones of their lower extremities in the course of their work. Of these, 7 were fractures of the thigh, 14 fractures of the leg, and 1 was a fracture of the thigh and leg. To these £2,932 11s. 5d. was paid in compensation, and out of the 22 fractures, 14 exceeded a period in which their recovery might be fairly anticipated. It is estimated that the extra compensation paid by the employer in consequence was £1,558. It is also estimated that the financial loss to these 14 men amounted, even after crediting them with their compensation, to £3,663, the total loss being thus £5,221, a sum which appears even more impressive when capitalized as an annual charge at 6 per cent., when it amounts to £87,000.

I do not say these figures are accurate and beyond dispute. No statistics are. The important feature of them, however, is that they are considered so by the person who has provided me with them. According to the information possessed, he and his fellow masters of a great industry believe, apart from humanitarian grounds, that there is value to be obtained by themselves, their employees, and the State from good surgery. Their deliberate conclusion is that, when calculated on the 1918 basis—which, of course, is much lower than now holds good—a sum up to £5,221 may economically be expended in one year in improving the treatment of 14 cases of fracture.

We all realize that there is very considerable scope for improvement in our treatment of fractures. Most of us will acknowledge that if we are given paper and a pencil and the pocket of the British taxpayer, that so many in the present day seem to imagine is bottomless, to finance

our schemes, we could produce in half an hour an excellent plan on paper wherein there was created something similar to a field ambulance at every coal-face and a casualty clearing station at every pithead. But, fortunately, we will not be called upon to do this, and something more economical and more efficient, at least as the Briton works, will have to be produced.

THE PART OF THE GENERAL PRACTITIONER.

I think it is of vital importance, when any scheme of medical reform is being discussed and thought out, that the cardinal underlying fact should always be borne in mind that it must be based on the general practitioner of medicine, who has the care of the health of the industrial army. All such schemes should be so thought out that, when completed, they come to the general practitioner, not to take from him the cases he is at present treating successfully and economically, but preferably he should be approached and asked what he requires to do that work more efficiently, more rapidly, and more successfully. The care of the recent accident and the arrangement for its transport must always be his sphere of duty. The equipment necessary to carry that out can, however, be centralized for him and distributed as he advises.

The serious case of fracture will always require prolonged institutional treatment, and the question is who is best able to carry that out. In the issue of the *BRITISH MEDICAL JOURNAL* of November 20th, 1920, you will read a most interesting article by Sir Robert Jones on orthopaedic surgery in relation to hospital training. He advocates that all fractures, whether recent or old-standing, ununited or malunited, shall be given over to the care of a special orthopaedic surgeon, who shall have a fully equipped department to deal with them.

In certain teaching hospitals I think this is a sound proposal, for these departments would set a standard for all and provide the necessary post-graduate training school for a wide area. For the provincial smaller hospital, however, this scheme appears to me not to be possible; but I consider that it would be an experiment well worthy of being tried to hand over all cases of fractures admitted to such an institution to the care of a member of the staff especially appointed for the purpose. The ideal man for such a post would be a local general practitioner, not too busy, and with an instinctive love for hospital practice. If I had to select him I would choose one whose inclinations were not for work in the operating theatre. I would almost go the length of prohibiting him from doing general surgical operative work. He will find the care of these cases a fascinating study. They will require a daily visit and frequently a call again in the evening. To assist him he will require a whole-time nurse trained in the simple elements of massage. It is absurd and unsatisfactory to expect him to do this work gratuitously or on a charitable basis, and he, of course, would receive payment for his services. The source of this revenue I cannot do more than suggest, but it seems to me that, in the light of the figures I have already given, if the case for efficiency in the treatment of such cases is laid before the master and men concerned, they would not hesitate to meet such an expenditure. The financial saving, if nothing more, it would effect would be immense. Certainly it would well justify at least a five years' trial.

The problem of the fracture case that is discharged from hospital and continues to drag on, showing little improvement, is one of great difficulty, but a suggestion as regards its solution is contained in the *BRITISH MEDICAL JOURNAL* of September 18th, 1920, in an article by Dr. T. Lister Llewellyn on a physical therapeutic centre, and I am sure it should not be difficult to discover. Such a scheme is voluntary in its features and British in most of its characteristics, and consequently offers, in my opinion, the greatest prospects of success.

ON February 8th the 346th anniversary of Leyden University was celebrated by an address delivered by the rector magnificus, Professor R. van Calcar, on the development and significance of modern bacteriology.

AT a recent meeting of the Vienna Urological Society, the president, Dr. Zuckerkandl, delivered a eulogium on the late Professor Guyon of Paris, all the members standing up in token of respect.