The Medical Rehabilitation of the Disabled

by

H. A. de Boer

International Labour Office

The policies for the rehabilitation of disabled veterans that have been developed by various Governments can well be turned to account for the benefit of the civilian population, and in fact steps are already being taken in this direction.[1] *Whereas after the First World War massive unemployment among the able-bodied destroyed the prospects of employment for the handicapped, now full employment is recognised as a general objective, and there is therefore hope that the handicapped will fill a useful place in production. The productive employment of the disabled is indeed an economic necessity, for their number is so great as to make the cost of their pensions an excessive charge if they do not contribute to the wealth of their country. The International Labour Office, which is concerned to promote rehabilitation policies for disabled workers in all countries, has already published a preliminary report on their training and employment*[2] *and is now taking up the study of the medical aspects of rehabilitation, which are briefly surveyed in the following pages.*

IN every country, a substantial proportion of the population is afflicted with physical or mental impairments, congenital or due to accident or disease, and severe enough to reduce earning capa-

[1] For example, in Great Britain, under the Disabled Persons (Employment) Act, 1944 (cf. *International Labour Review*, Vol. XLIX, No. 3, Mar. 1944, p. 373, and Vol. L, No. 1, July 1944, p. 98); in New Zealand, by the Rehabilitation Board (*idem*, Vol. LI, No. 4, Apr. 1945, p. 505); and in the United States, under the national vocational rehabilitation programme (*idem*, Vol. XLVIII, No. 5, Nov. 1943, p. 648, and Vol. LII, No. 1, July 1945, p. 67).

[2] *The Training and Employment of Disabled Persons. A Preliminary Report.* I.L.O. Studies and Reports, Series E (The Disabled), No. 7 (Montreal, 1945).

city. In the United States, for example, it is estimated that, in 1939, there were 27 persons per thousand of the general population who had been totally disabled for a year or more, and that of these 27, about 10 would, if capable of work, normally be occupied. To the peacetime load of handicapped people must now be added, in the late belligerent countries, the host of permanently injured veterans and civilians. The loss in terms of personal frustration is not measurable, but the mere economic loss is large enough to warrant much greater attention from society than it has been wont to receive.

A welcome result of the war has been that certain Governments. in search of manpower, have addressed themselves in earnest to the problems of the rehabilitation of the disabled, civilians as well as veterans. The necessity of restoring the wounded soldier to service as fully and quickly as possible successfully stimulated improvements in medical and surgical treatment and after-care in the military hospitals. The equal necessity of utilising all labour that could be made available led to the employment, with satisfactory results, of large numbers of handicapped persons who in peacetime would have remained unproductive. These gains in knowledge and organisation should not be dissipated, as they largely were after the First World War, but should be retained as the permanent bases of a broad and progressive rehabilitation policy for the civilian population.

The intensive development of rehabilitation has been largely confined to the English-speaking world and the U.S.S.R. In other countries, particularly those of continental Europe which, occupied as they were by the Germans, were deprived of the power to participate in this movement, technique and institutions remain much as they were in 1939. Such countries should be enabled to share in, and catch up with, the new development.

The purpose of a rehabilitation programme is to ensure that persons born with an infirmity, or who have suffered an injury or contracted a disease which will result in permanent physical impairment, will be made fit as far as possible and placed in gainful employment. Since failure to apply the most efficacious methods of treatment is likely to prejudice the success of rehabilitation, the powers to be exercised under the programme should include that of encouraging, if not of enforcing, the application of such methods, at least in those kinds of cases in which error is commonest or most disastrous. But it may be assumed that the services directly administered by the organs of the rehabilitation programme will begin to operate only when the acute symptoms of illness subside. For practical purposes, the process of the rehabilitation of the disabled can be divided into two stages: medical (or physical) rehabilitation and vocational rehabilitation. In the first stage, the terminal phase of medical care and the period of convalescence are utilised in order to achieve the maximum degree of restoration of working capacity, while the second stage comprises vocational guidance, training, and placement. The present article is intended as a preface to the subject of medical rehabilitation, with special reference to cases of traumatic injury.

Therapy of the Person as a Whole

The emergence of new specialities, such as plastic surgery, neuro-surgery, fracture treatment, and spinal injury treatment — to mention only some departments of particular interest in the present context — has made new or greater skills available to the patient. But the increasing specialisation of medicine and surgery must not be allowed to obscure the importance of treating the patient's personality. It is now recognised in enlightened rehabilitation practice that injury to a part of the body affects the whole body, and still more the mind of the patient. Treatment, therefore, must not be confined to the damaged part, but must be directed to maintaining the fitness of the rest of the body and to infusing the patient with courage, and even the specialist must attend to this aspect.

As soon as his life is out of danger, the victim of a severe trauma begins to be anxious about his future. He is prone to feel that his active life is finished and that society has no more use for him. This feeling is a serious threat to the restoration of working capacity. It must be impressed on the patient that, with his co-operation, he can be enabled to overcome any impairment that may remain; that nature has provided him with an unsuspected reserve of resources to this end; and that, if he has lost a limb, an efficient prosthesis is at his disposal. Emphasis must be laid, not on what the patient has lost, but on what he retains, and on the new strength he will win in the overcoming of his handicap.

It will not be enough, however, to envelop the patient in an atmosphere conducive to self-confidence. Recourse must be had also to the positive aids of physiotherapy and occupational therapy.

Physiotherapy

The various procedures of physiotherapy are to be used, on the one hand, to maintain, as far as possible, general physical fitness, and, on the other hand, to restore or retrain the impaired part or function.

During a lengthy period of rest necessary for the healing of an injury which perhaps affects only a small part of the body, the idleness of the remainder of the body will cause a weakening of its muscular and other capacities unless it too is suitably cared for. Today, it is inadmissible that a patient should, when the treatment of his injury is finished, find himself with wasted muscles that will take a long time to recover. Graduated gymnastic exercises of a general character are performed in the ward under the direction of a trained physiotherapist. The doctor decides for each patient, according to the progress of his healing, what part of these exercises he may do. It may be noted that certain exercises can be used with advantage even in cases of acute illness: for example, breathing exercises may be prescribed as a preparation for surgical treatment under general narcosis.

Besides these general exercises, special exercises are prescribed in order to strengthen an injured limb or restore its function. Such special exercises begin, as soon as healing is advanced enough, while the patient is still confined to bed in the ward and, it may be, long before he can visit the hospital's department of physiotherapy.

For amputees, it is necessary to take early steps to ensure that perfect limb-fitting which is required for successful rehabilitation. By means of bandages and exercises, the stump is prepared to receive the artificial limb and the time within which the permanent prosthesis can be fitted is shortened; and, in case of amputation of the leg, the stump is made capable of bearing the weight of the body. Moreover, in order to facilitate proper use of the prosthesis, a correct posture of the stump is obtained, the movement of joints is restored, and the muscles are strengthened.

The loss of one or both lower limbs or the paralysis of the lower half of the body requires the patient to learn quite new ways of maintaining his equilibrium. For paraplegics, as also for amputees, it is important, therefore, to develop control of the balance of the trunk. By special exercises, the muscles of the abdomen and back are made stronger, and the patient's power to control these muscles is increased. If the patient has to use a wheel-chair, the development of arm and shoulder muscles is essential, since they have become the organs of locomotion.

Occupational Therapy

Exercises, directed as they are to the restoration and development of the body, can fill only a portion of the day, and do not suffice to divert the invalid. Boredom must be prevented, since, unless the patient is kept interested, the treatment will not succeed.

Occupational therapy is the solution of this difficulty, for not only does it afford the patient the interest and satisfaction of making a concrete product, but it can also be a form of physiotherapy, since the work may be so selected as to involve the manipulations necessary to loosen stiff joints or acquire new dexterity.

Even the bed-patient has a fair choice of occupations open to him, such as weaving, knotting, and leather work, which involve only light apparatus or none; while men as well as women enjoy knitting and embroidery. Evidently, injured hands and fingers can be exercised with much greater assiduity by such work than by the empty movements of gymnastics: they are trained incidentally and with the attention absorbed in the work.

As a better alternative, in some cases, to crafts of the kind just mentioned, or as a sequel to them, work of a more realistic character can sometimes be provided by arrangement with factories that are willing to co-operate. A factory may supply a hospital with a quantity of small objects that can be worked up or finished by some simple process. For example, during the war, at a hospital for men of the British Royal Air Force, a most satisfying occupation was afforded in the form of assembling the parts of aircraft instruments.

Of course, the doctor has to decide what kind of work each patient should properly do. As the patient's condition improves, he is allowed to do more complicated work. When he can leave his bed he may proceed to the special department for occupational therapy, where a wider range of work is available to him. The work may involve increasing muscular effort, and in the later stages quite heavy jobs, such as sawing wood, can often be done: its remedial effect now becomes as great as its effect as a mental diversion.

In some hospitals, it is possible to distribute the patients in a gradation of classes, membership of a higher class carrying with it more privilege, so that there is a positive incentive to increase one's capacity and so to graduate. The members of the class also develop a healthy team-spirit.

But physiotherapy and occupational therapy together should not employ the whole of the patient's time: even the unintelligent ones like to read. Modern therapy does not neglect this opportunity: it is the duty of the hospital to furnish patients with interesting reading matter; its librarian should help them in the choice of books, since often they can express no preference. It is indeed desirable that a large hospital should have a trained librarian on its staff, who should not only guide the patients' reading, but also discuss with them what they have read.

Care during Convalescence

A person who has so far recovered from a severe injury as to be able to leave hospital is rarely fit to resume work at once, and a period of convalescence must intervene. In the past, it was usual to leave the discharged person to his own devices, with the result that, lacking direction and faculties, he discontinued his exercises and training, and suffered a physical and mental relapse. Nor is it sufficient to provide massage or other forms of physiotherapy at out-patient departments, since the treatments are intermittent, and there is no favourable background to fill the spaces between.

Special institutes are required in order to furnish systematic care during convalescence, care which will continue the physiotherapy and occupational therapy begun in hospital until the patient is fit to return to full-time work. Whether the institute is designed for out-patients or, which is better, for in-patients, it must offer a full programme for each and every day.

Games and gymnastics will enter largely into the programme. There must, accordingly, be a gymnasium, having not only the usual requisites for Swedish gymnastics, but also special apparatus for remedial exercises: appliances for exercising the shoulder, back and legs, weight-lifting pulleys for developing muscular strength, and so on. The exercises can be given in small classes for persons having the same needs, and should be directed by a trained physiotherapist; working in small groups promotes friendly rivalry among the members.

The institute should furnish the various forms of electric, heat, and light treatments, on the doctor's prescription. Facilities for bathing, and, if possible, swimming also, should be provided. In swimming, stiff members are loosened, and, with the water supporting the weight of the body, special exercises become possible.

It should be noted that though the institute must be fully equipped, much of the apparatus can be made very cheaply by a carpenter or mechanic. More important than material equipment for the success of the institute's work is that it should be staffed by persons who bring expert knowledge, enthusiastic interest, and tactful encouragement to the service of their clients.

The responsibility of the institute does not always end when the patient is able to resume work. For, though in most cases he should be ready for full-time employment at his former job, there are some cases in which graduation from easy to normal work is indicated, and with which, therefore, contact must be maintained for the purpose of medical supervision.

Industrial undertakings can co-operate very effectively in the rehabilitation of their disabled workers by taking pains to adapt

to the capacity of the individual the kind of work offered and the conditions under which it is performed. Very large plants may even maintain special workshops for this purpose.

What is performed here is not the old-fashioned "light work", which so spared the injured function that the latter was not strengthened by use. On the contrary, the function is gradually re-educated through the operation of machines fitted with adjustable devices designed to exercise it. Meanwhile, the worker is productively employed, and his earnings supplement any compensation to which he is entitled. The workshop is supervised by the medical officer of the plant. One which accommodates a score of workers will suffice for a plant employing several thousand people.

Rehabilitation of Amputees

Special consideration should be given to the requirements of amputees in all phases of rehabilitation. Here the maintenance of morale calls for particular efforts on the part of all persons with whom the patient comes in contact. He must be persuaded that, equipped with a proper artificial limb, he can compete in most kinds of work on level terms with the able-bodied. But these reassurances must be verified by subsequent experience. In order that the employer may be ready to engage an amputee for some suitable but normal work, and not class him with apprentices, the infirm or the feeble-minded, the ingrained prejudice against the maimed that he shares with the general public has to be dissipated, partly by propaganda, partly by satisfactory trial. Nothing, therefore, must be neglected in the preparation of the amputee to perform his job efficiently.

It is obvious that a principal condition for the successful rehabilitation of an amputee is that he should be furnished with a strong, light, and well-fitting prosthesis. Already, at the time of amputation, the surgeon must have decided about the type of prosthesis to be worn, and present-day opinion seems inclined to make the choice of site depend rather on the suitability of the stump to receive the best prosthesis than on the consideration that as little as possible should be amputated. Excellent appliances are now being made, and current research promises to improve upon them. The use of plastic materials reduces the weight of the appliance, and better design of the artificial wrist, knee-joint, and ankle-joint afford the wearer more effective control of his prosthesis. Artificial legs, particularly, come close to fulfilling the functions of the natural limb. But with the hand, the problem is more difficult. The natural hand has such a wide range of movements, and is capable of so delicate an adjustment, that no artificial product could

ever replace it, and any that purports to do so will be too heavy or too fragile. Nevertheless, it is possible to supply an artificial wrist that serves as a socket for a variety of tools, each of which corresponds to some function of the hand. Every prosthesis must be very carefully modelled to suit the amputee. The success of the rehabilitation depends, more than may be supposed, on the skill of the limb-fitter and his conscientious attention to the comfort of his client.

The amputee cannot be left to himself to find out how to wear and use his prosthesis: he has to be systematically taught. The teaching is a duty of the physiotherapy department. The man who has lost a leg has to be taught to walk so well that the public does not notice any disability. His training should be carried so far that he can take up various sports again, and is able to remain standing for hours at a time.

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A complete rehabilitation programme will enable even the severely disabled worker to resume his status as a self-supporting person in industry, in which he will in most cases be doing his old work. This is an economic and a moral achievement alike, wiping out in both respects a loss to society and to the individual.

It is important that the success of the programme should not be spoilt by an unwise policy in the field of cash benefits. It would be most unfortunate if the worker who has a permanent physical impairment should find that every improvement in his earning capacity or earnings is accompanied by a corresponding decrease in his pension. Admittedly, it is difficult to devise a rational basis for computing pensions other than the basis of earning capacity or earnings, but in several countries, and most recently in the United Kingdom, the bull has been taken by the horns, and scales of compensation have been adopted which, essentially arbitrary in character, find their pragmatic justification in that they prevent the pensioner from being penalised for his exertions.

The services which a rehabilitation programme renders, and to which the disabled person has to respond with appropriate effort, should be obtainable as of right and not as of grace. Any condition that induces or maintains a sense of inferiority is to be avoided. The disabled person, rightly treated, will not look for charity, but only for an opportunity to overcome his misfortune. Rehabilitated, he will be an asset to the production of his country. But the main thing is, he will be happy.