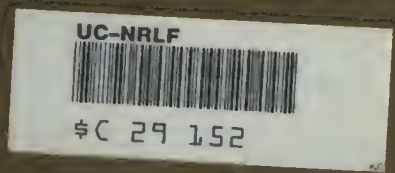


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Military Hospitals Commission Canada

Hon. J. A. Lougheed, P.C., K.C.,
President.

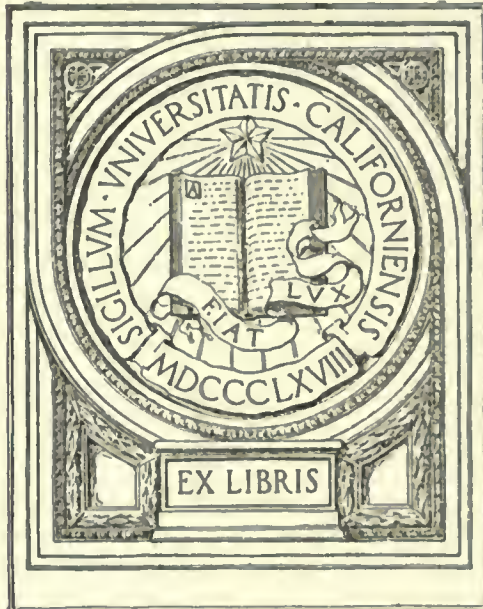
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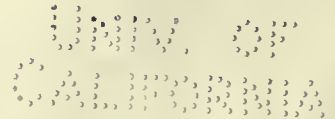
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Military Hospitals Commission Canada

Hon. J. A. Lougheed, P.C., K.C.,
President.

SPECIAL BULLETIN

APRIL, 1916.



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THE MILITARY HOSPITALS COMMISSION OF CANADA

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Detached for service with Military Hospitals Commission

22 VITTORIA STREET,
OTTAWA, CANADA

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MILITARY HOSPITALS COMMISSION
SPECIAL BULLETIN

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INTRODUCTION.

Mr. W. M. Dobell, our fellow member, was good enough to devote a considerable amount of time last winter to visiting the places in England and France where the most important work of the kind with which the Commission is charged is being carried on. His report has already been placed in the hands of the Commission, but so widespread has proved to be the interest in it, as well as in the matters with which it deals, that it is now being printed, with the intention of making a wider circle familiar with the information it contains, and the conclusions Mr. Dobell has drawn from his experience.

In addition, free, and in certain cases, condensed translations of various documents, mostly collected in the course of Mr. Dobell's investigations, are herein included. The most noteworthy is that concerning the work of the Anglo-Belgian hospital at Rouen, which will prove of interest to those who have professional dealings with our invalided, and to all readers describes a striking achievement in the face of excessive difficulties. Another document of interest is the statement by Dr. Amar, who has been the pioneer in Europe in the scientific examination of the wounded. The purpose of this examination is to so effectively ascertain the capabilities of each invalid, that errors in the choice of a career may be reduced to a minimum, and to give data for scientific adjustment of effort and tools so as to produce the highest output with the least fatigue. Attention is called to the series of photographs illustrating the recording apparatus by which Dr. Amar obtains his data, as well as photographs showing divers ways in which the seriously maimed are able to exercise newly acquired aptitudes.

NOTE.—These photographs we owe to a report by Lieutenant-Colonel Mignault, O.C., 4th Stationary Hospital, which came into our hands when this bulletin was in an advanced stage of preparation for the press.

Another document, dealing with the German treatment of the crippled we have incorporated on the principle *Fas est ab hoste doceri!* We give the substance of an article published no longer ago than last January, by Dr. Bourillon, head of one of the most important of the French hospitals.

Our publication, Sessional Paper 35A, 1915, contains another article by him.

The free nations who are now at war have to deal with the same problems. It is evident from Mr. Dobell's report and the writings of French and Belgians dealing with the same matters, that in countries, every adult of which has served two or three years in the army, where from their youth it is habitual to obey regulations, where a thorough education is common to all classes, they have the same difficulties which we have in Canada. It appears also between the lines of French writers, that even in a country where perfection in administrative detail is a passion, there is great confusion, and the care of the maimed is divided among various Departments of State and semi-private agencies. There is thus in France, and perhaps to a greater extent in England, overlapping and consequent waste, both of effort and expenditure.

To some extent the difficulties with which we have to deal in Canada are the same as those in European countries. The wounded man returns to Canada with only part of his treatment completed. He is eager for the sight of his home, the prospect of which has often sustained him in irksome hours, he is eager to meet his kinsfolk and friends, conscious that he has deserved well of his country, but he is weakened by wounds or disease, his initiative slackened by enforced idleness, his fibre softened by experiences which are enervating so that only in exceptional cases can he have the outlook and the self-dependence of a man in normal health and vigour, and thus he looks forward to an uncertain future with grave anxiety, springing from these bodily and mental disabilities.

While our Canadians suffer in some cases from the same drawbacks as those noted by Dr. Bourillon, namely, alcohol, indiscipline, lack of initiative and pernicious counsellings and associations, such observation of our returned wounded as I have been able to make, leads me to believe that the proportion of our men who yield to these detrimental influences is much smaller than among those with whom Dr. Bourillon has been working. In all writings which deal with the invalided, there is a universal testimony supporting the conclusions at which Mr. Dobell arrives in regard to the necessity for discipline in our homes, for occupation of the men in such measure that it will assist in cure, prevent the formation of bad habits, and train them for a successful life.

Quite as serious a modification of the treatment of our soldiers has become necessary in Canada, as any that is still in process among the French. On the formation of our Military Hospitals Commission, under the conception that what was required were convalescent homes wherein returned men would pass a short time in rest and refreshment, scores of houses were offered to the Commission, by the people of Canada, and hundreds of workers placed their services gratuitously at the disposal of the Commission. Few, if any, foresaw the length of time in which it was necessary for men to remain under treatment, even after their return to Canada. There are many men in our homes to-day, still unfitted to resume civil life, whose wounds were received in the great battles of a year ago. The supply of comforts which in many cases were luxurious, the relaxation of discipline, the treating of men as one treats a civilian patient in the interval between illness and the resuming of ordinary occupation, which might do no harm if the experience was to be counted in days, are most seriously detrimental to the best interests of the men when extended over the prolonged periods which have been found unavoidable. The first conception of the homes was that they were places of relaxation; the right one which experience has taught us to realize, is that they are places of rehabilitation. In other words, we are changing as rapidly as may be, our convalescent homes into hospitals where, in the interests of the men, their time will be fully occupied, their physical restoration made as perfect as possible, and, from the beginning, the bad effects of idleness obviated by employment.

Training schools are being started in all our places as rapidly as possible; therapeutic apparatus is being supplied. As an illustration of what has been done in this way, photographs are given herewith of our installation at the Central Military Convalescent Hospital at Toronto, and it is the intention of our Commission that all our hospitals shall be equally well equipped; while steps are now being taken to have the physical restoration of the invalided exclusively in the charge of medical men with no other military claims on their time.

It has been found that the large amounts of money paid to the soldiers in the homes was not conducive to their well-being. Through the kindness of the Canadian Bankers' Association it has

been arranged that beyond pocket money, the pay of the men with no dependents will be placed on interest and transferred free of cost to the place where they are to take up their residence, as soon as they are discharged from the hospitals of the Commission.

One important matter, that of pensions, which has held back our work, is on the point of being settled. It has been found that men took little interest in plans for their return to civilian life while the basis of their pensions was unsettled. The principle recommended to the Committee of the Commons by this Commission, viz., that earning-power subsequently acquired by a pensioner should not lessen his pension, has been accepted, and is, we believe, to be incorporated in the Pensions Regulations. The settlement of this principle will allay the anxiety of the men, previously referred to, and make more effective the facilities for their training which the Commission is providing.

The Commission has been greatly assisted in its work by many agencies. Previous bulletins have indicated the help given to the Commission by the provinces and cities. The medical profession has been most generous in offering its time and skill. Philanthropic societies and individuals have assisted in the furnishing, the maintenance and the working of our Convalescent Homes. So that these benefactions, extending from the complete installation and maintenance of a home of forty-five beds since May, 1915, to the giving of hours of service, has greatly facilitated the work of the Commission, lessened public expenditure, and added to the well-being of our invalided. A typical case of a returned soldier may illustrate the agencies which, beyond the official services of the Militia Department, care for his well-being.

When he lands in Canada he is met by a representative of the *Military Hospitals Commission* and the *Canadian Patriotic Fund*. While at the port of landing he is maintained in an establishment beautified by donations. When he leaves for his home, the Military Hospitals Commission representative wires to the local committee advising the train on which the man will arrive. If the journey is so long that a break or breaks are necessary, say at Montreal and Winnipeg, on the road to the Western provinces, at each of such places, the local committees meet the man and see to his rest and refreshment until he resumes his journey. On his arrival at his

home town he is met and welcomed (the supply of automobiles rarely is inadequate). The notifications to the various parties charging themselves with these services, often performed at inconvenient hours, are sent out by the Military Hospitals Commission.

Provincial and local committees find the man employment; so far, without the slightest difficulty. The invalided who requires further treatment, goes to a Military Hospital Commission Convalescent Hospital. The State supplies any artificial limbs required and special attention is given to make them most efficient. When his treatment is complete, he is, like the man who goes directly home, taken charge of by the Provincial Employment Commission, after receiving such training as will fit him for civil life.

The aim of the Commission is to do its best for the physical and economic well-being of the man, and to bring to bear on him such influences that he may perform for his country a service not less important than those of the firing line, namely, that, instead of being an idle ward of the State, he becomes a shining example to the young, of self-dependence, of courage and perseverance in overcoming disabilities.

J. S. McLENNAN.

Ottawa, April, 1916.

1. REPORT ON EUROPEAN WORK

BY W. M. DOBELL, ESQ.

Member of the Commission.

An account of the work being undertaken in Great Britain, France and Belgium for the care of wounded soldiers, being the results of a personal investigation made in Europe by Mr. Dobell, at the request of the Commission.

ORGANIZATION OF THE TRAINING OF THE DISABLED IN THE WAR

REPORT OF Mr. W. M. DOBELL.

Commissioner, M.H.C.

ARTIFICIAL LIMBS.

FRANCE.

The supply of artificial limbs, etc., to the wounded French soldiers is a little complicated and difficult to explain. It is estimated that they now have 50,000 men in France suffering from amputations, and it is therefore evident that it will take some time to supply them all with the necessary limbs. Apparently at first, the French Government did not intend to supply those limbs, but they are now undertaking to do so and also to keep them in repair and provide new ones when they are required. This applies to eyes also. In order to do this, the Government requisitioned the entire output of all the artificial limb-makers in France, and prohibited the supply of limbs to anybody without Government permission. In order to supply the wants as quickly as possible, they started by giving very rough and elementary sort of limbs, that is to say, they supplied the old fashioned wooden "pilon," which we would call a "peg" leg, the intention being to replace this with a better leg later on. I discussed the matter with Major Plisson of the War Department, and he gave me information regarding costs, etc.

The fact that a good many of the men were not satisfied with what they were given, induced the Fédération Nationale des Mutilés de la Guerre to get special permission from the War Department to supply limbs of a better quality, care being taken to see that the same men did not get supplied both by the Federation and by the Government. The Federation's plan is to pay half the cost of the limb, provided that the man himself or some of his friends can pay the other half, except in the case of a man who has lost either both legs or both arms, or of men who are willing to take vocational training, in which cases the Federation pays the entire cost and the Government undertakes to keep these limbs in repair, and to renew them when necessary. The price runs from 400 to 600 francs for legs and from 300 to 500 francs for arms.

This arrangement enables the Government to avoid the first cost of a lot of limbs and also pleases the artificial limb-makers who could make very little profit out of the rough articles being provided by the Government.

ENGLAND.

ROEHAMPTON.

The principle adopted by the British Government has been to contract with several makers, of whom the principal ones are Americans, at prices varying from £10 to £16 for arms and £15 to £25 for legs. The men are all sent to the Queen Mary's Auxiliary Hospital at Roehampton where they are kept for from six to ten weeks to get their limbs fitted. There are now four hundred men in the hospital and two thousand five hundred more on the waiting list. They are turning out about seventy limbs a week so that it is easy to see that there is going to be a long wait for some of the men. The two principal American makers of legs are the Rowley Company and the Hanger Company, while the Carnes arm is supposed to be the best that is made, but it seems to me very complicated.

In order to facilitate the supply of limbs to Canadians, General Jones is endeavouring to establish a branch factory in connection with the Granville Hospital at Ramsgate, but this would probably be only for men who want to take their discharge in England, or who, for some reason, require to be supplied promptly. I still think that for the general Canadian supply, it would be far better to establish a central depot in Canada.

I find a great disinclination on the part of all the makers to have anything to do with arms; they are all ready to make legs but apparently an arm is never as satisfactory as a leg and very seldom brings them any credit.

I merely mention this as a guide in case any contracts were being made, as you would probably find that the arms would be proportionately dearer than the legs.

ARTIFICIAL EYES.

These are now being supplied very promptly, and of excellent quality at a price of seven shillings and sixpence by a man named Muller, who is a naturalized German. It is very necessary that the artificial eye should be fitted as soon as possible as the socket very quickly contracts and it is then more difficult to match the remaining eye.

EDUCATIONAL ESTABLISHMENTS.

FRANCE.

There have been roughly about 50 re-educational establishments organized in France, all of them receiving more or less Government assistance, and being at the same time subsidized either by Municipalities or Districts and also helped by private subscriptions. It will readily be seen that this plan is more or less disconnected and unsystematic but I think that in the near future the whole supervision of this work will be co-ordinated by the French Government under a Department which should do away with a great many of the difficulties

under which they now labour. It was impossible for me to visit anything like all these establishments, nor was there any object in doing so, but I think those that I saw were fairly typical.

The Hospital at St. Maurice presided over by Dr. Bourillon has accommodation for about 700 patients. In connection with this, is the Vacassy Institute which was founded many years ago for the re-education and maintenance of maimed men. There is accommodation available for about 150 patients and a good many trades are successfully taught, the principal ones being boot-making, tailoring, basketmaking, printing, bookbinding, tinsmithing, plumbing, motor machinery, harnessmaking, etc. The instruction in these different trades is largely provided by the different Guilds of the City of Paris which send voluntary instructors to teach the patients. The men are all under military discipline as inmates of a military hospital, but it is entirely voluntary with them whether they take up re-education work or not. Dr. Bourillon advised me that he had interviewed 2,000 men in order to get 350 students, and that his chief enemies were alcoholism and a certain ingrained idea that, as the men had been wounded in defence of the State, the State should support them for the rest of their lives. This institution is supported by the Government except the Vacassy Institute which was endowed by the original founder. I attach copy of Dr. Bourillon's report which I think it would be well to have translated.

Dr. Bourillon estimates that the cost of keeping and instructing the men is about $4\frac{1}{2}$ francs per day, and in addition to this the men are paid 50 centimes per day as well as their proportion of the profit of the goods sold. Dr. Bourillon has had many years' experience on work of this kind, and is most strongly of opinion that strict discipline and constant work are the two most essential requisites in dealing with invalided men.

Fédération Nationale des Mutilés de la Guerre, 63 Champs Elysées, Paris.—This institution has already been referred to in my paragraph regarding artificial limbs. They also do a great deal of work in connection with the re-education of men, and work on two different principles. Some of the men live in their own homes and come to the Federation workshops every day. These men are supplied with their dinner and are also paid four francs per day.

There are also workshops with dormitories in connection for men to live in. These men are all found in every way and get a proportion of the profits of the work produced from the time they start. That is to say, it is not necessary for a man to be efficient in order to get a certain small wage, but as soon as he begins to work he immediately gets some proportion of the earnings from the entire establishment. The Superintendent informed me that the percentage of men willing to learn trades is practically the same as that given by Dr. Bourillon. They interviewed 3,000 men in order to get 500 so that in each case the percentage works out to about 17 per cent.

I may mention that the officials of the Federation strongly favour the men living in, as they find they pay better attention to their work and are not so subject to alcoholism and other forms of dissipation. The Federation has the advantage of the assistance of two very distinguished gentlemen in Paris—M. Frédéric Masson and M. Maurice Barres.

Lyons.—Before leaving Paris I had received a letter from Monsieur Herriot, the Mayor of Lyons, and also the head of the school for the wounded in that city. I had an interview with Mr. Azer Basèque who, it will be remembered, wrote to the Commission some months ago. The schools in Lyons were the first move made in the direction of the re-education of wounded men, and, owing to this fact and also M. Herriot's influence, they work in connection with the War Department and not with the Department of the Interior from which all the other schools and institutions derive their grants.

There are two establishments—one at the Rue Rachais and the other at Tourville which is some little way out of the town. They accommodate respectively about 140 patients and almost all the ordinary trades are taught. The book-keeping, shorthand, and typewriting classes are most successful, and of the graduating class of thirty-eight in December, all were provided with good situations before they left. The establishment at Tourville is an old Chateau standing in the middle of a large farm and here the men are taught fruit-growing and gardening of all descriptions, besides poultry and rabbit raising. They are also establishing work shops and machine shops which will practically fit the men for almost any trade. Both these establishments are lent by the city of Lyons, Tourville having been bought by the town a short time before war broke out with the intention of forming an establishment for supplying pure milk to the poor people of the city. The government allowance, through the War Department, is 3.50 francs per head per day, out of which the management pay 1.25 francs per day to the men. The average cost is about 5 francs per day, and the deficit is made up by private subscriptions. I am advised that there is no difficulty whatever in finding employment for the men as soon as they have become reasonably efficient, and the number of men wishing to come to the establishment is constantly increasing.

I find in operation here a system of Accident Insurance which I do not think is in force anywhere else. They insure all their men, which costs them about 10 francs per head per annum; they carry a blanket policy covering a maximum number.

I had a very interesting conversation with M. Herriot and he explained to me that the chief reason why so few men were willing to undertake training at first, was the general idea that if a man learnt a trade and became self-supporting, the Government would either reduce or entirely stop his pension. This became so serious that the French Government made an official statement to the effect that no man's pension would be interfered with by his subsequent

earning capacity, but that it would in all cases be based on the percentage of his physical disability estimated on the basis of earnings in the open labour market.

I shall have occasion to refer to this matter again, as I consider that the point is most important—I have already mentioned that there are now 50,000 men in France suffering from amputations and disabling wounds, so that the question of these men being self-supporting and therefore self-respecting members of the community, instead of simply drawing their pensions and living on the State immediately becomes one of immense importance.

Laboratoire des Recherches sur le Travail Professionnel, 62, Bd. St. Germain. Dr. Jules Amar (Directeur).—This is a Government establishment for the scientific examination of wounded men, particularly to establish the percentage of their disability in the labour market. I attach a report from Dr. Amar (see p. 31) and also a copy of a pamphlet by Messrs. Bouchard and Chaveau on this subject which is highly scientific and technical, but shows how thoroughly the matter is being gone into in France.¹ Dr. Amar was most kind in showing me all his instruments and the results obtained are most striking. I also enclose one of his vocational training forms which may be of use in suggesting a basis for drawing up something of this kind for our own men.

The only other form of this kind that I have been able to find is that used by the Belgian establishment at Vernon, which is practically the same, a copy of which I also enclose.

With reference to the percentage of men who are willing to take vocational training, it is well to remember that in addition to these—who amount to about 17 per cent—there are probably about 25 per cent who are enabled to get employment without any training, either by returning to their old occupations, or by taking positions as concierge, garde-chasse, watchman, elevator man, etc. This therefore leaves 50 per cent to 55 per cent of injured men who are apparently not trying to do anything. This percentage will, I feel sure, be reduced as the men become more assured that their pensions will not be reduced in proportion to their earning capacity.

As will be seen from Dr. Amar's report, he estimates that 80 per cent of men apparently incapacitated, can be made competent workmen and very few come under the heading of "totally incapacitated."

¹ Messrs. Bouchard and Chaveau's pamphlet has not been reprinted, but among the illustrations will be found photographs of Dr. Amar's apparatus, and others showing what can be accomplished by the maimed when fitted with proper appliances.

BELGIUM.

L'Institut Militaire Belge de Re-Education Professionnelle, Port Villez, Vernon. (Technical Director, Major F. Haccourt; Medical Director, Dr. Dam.)—This is by far the most interesting establishment I have seen. The institution is not only self-supporting but, since its opening in August last, it has paid back to the Belgian Government the entire capital cost of installation. There is at present accommodation for 800 men and this is being increased to 1,200. The cost per day to the Belgian Government is as follows:—

	Francs.
Food and clothing..	1·54
Pay..	0·43
Light and heat..	·08
	<hr/>
	2·05 per day per man

It must be understood that these men are still mobilized and are therefore subject to military discipline and receive the pay of a Belgian soldier, namely, 43 centimes per day. The fact that the entire male population of Belgium is mobilized enables Major Haccourt to requisition the services of the very best craftsmen in the different trades as professors, and these men perform very valuable work for their ordinary pay as soldiers. Forty-three different trades are taught, covering almost every imaginable occupation. There is a large farm in connection with the establishment on which horses wounded in the war are cared for and made useful. The workshops provide for instruction in book-keeping, shorthand, typewriting, telegraphy, moulding in clay, wood-carving, drawing and designing of all descriptions, wall paper designing and painting, the manufacture of motor vehicles and electrical machinery of all descriptions, tinsmithing and plumbing, tailoring, boot-making, basket-making, poultry farming, rabbit farming, to which fur curing, dyeing and trimming are added.

The land provided for this establishment was for the most part originally covered with forest, and the first move was the erection of a saw-mill. The forest was thinned out on scientific principles and the timber converted either into lumber required for the buildings or such as would be saleable on the open market. Large quantities of pickets and stakes of all descriptions which were required by the Belgian army were manufactured, and also large wickerwork shields which were used for laying on swampy ground under gun carriages so as to prevent them from sinking; in fact everything was made use of.

The buildings originally cost 450,000 francs and this amount was repaid to the Belgian Government out of the profits on the lumber, stumpage being paid on the standing timber. The equipment and plant for the workshops cost 300,000 francs and this amount has been repaid out of the profits of the different workshops. Up to date, most of the work has been done for the Belgian War Office and the above handsome profit has been realized, besides enabling the

Government to get their supplies very much more cheaply than they were doing from other sources. For instance, fuse boxes which were being made in the United States and costing them 30 francs apiece laid down, are now being delivered at 10 francs apiece, leaving a profit of $2\frac{1}{2}$ francs, or 25 per cent, to the Vernon establishment. In addition, they are making all their tools of every description as well as a large number for the Belgian army. All the printing and photography is done on the premises besides a great deal of Government printing work. The men are paid, in addition to their army pay, from 5 to 20 centimes per hour according to the work they do, and the surplus profits are now being funded for the benefit of the men.

When a man is considered efficient in his trade and able to earn his own living he is permitted to take his discharge on the following conditions:—

(1) He must first take three months furlough, (2) he must satisfy the officials that he has secured employment at a satisfactory rate, or that he is going to start business for himself on such lines as they feel will enable him to make a living, in which case he is given a complete outfit for his trade, together with sufficient stock of raw material to start with. A man who has taken his discharge is at liberty to return at any time and has to report from time to time so as to enable the Direction to feel satisfied that he is earning a decent livelihood and is not in want.

This institution is operated in connection with the Anglo-Belgian Hospital at Rouen, so that men are only sent to Vernon when they are considered to have finished with actual hospital treatment. On arrival at Vernon they are put through a highly scientific test (see Dr. Amar's report) in order to establish their physical capacity, and no man is allowed to attempt to learn a trade which will be too arduous for him or at which he is not likely to become efficient. The underlying principle of the whole establishment is, constant work and no idleness. There is a small hospital in connection where men who become ill or are temporarily suffering from their old wounds are accommodated, and, unless they are absolutely helpless, they are required to do some sort of work in bed; the hospital orderlies being men who have passed examination as instructors in such work as net-making and light basket work.

Major Haccourt before the war was a general contractor in Brussels, and his intimate knowledge of all trades is most remarkable. I could see no waste of any kind and all the by-products are made use of. For instance, the interior partitions in all the workshops are made of material produced on the premises composed of one-third iron filings, one-third sawdust, one-third common plaster. Light forms are laid on a large wooden platform and the material is poured into these forms about 2 inches thick. It is left for about an hour and then open piled for about a week to dry. When being set up it is joined with a thin coat of common plaster between the pieces and makes most excellent partitions, being practically sound proof.

The very best orthopædic and therapeutic treatment is available on the premises as well as a gymnasium and instructors in fencing, boxing, sword exercises and physical development, great care being taken to avoid the over-development of the uninjured limbs, which would increase the proportion of disability of the other members. Artificial limbs are manufactured and fitted on the premises, this work also being done by the men themselves.

In estimating the success of this institution there are several points which must not be overlooked as they would not apply to any other country:—

First.—The men are all under absolute military discipline and are sent to Vernon, without any option, as soon as they come out of the hospital.

Second.—Very few of them have any homes to go to and they are therefore all the more willing to stay where they are.

Third.—The pay of the Belgian soldier is so small that the overhead charge to the Government is not onerous.

Fourth.—The services of the very best professors in the different trades are obtained at a minimum cost and practically without trouble, as the men are simply ordered to do the work and no regimental officer in the Belgian army can refuse to allow any officer or man in his unit to proceed to Vernon whenever he is requisitioned.

Fifth.—The requirements of the Belgian War Office provide an immediate outlet for practically everything that can be produced. This is now changing to some extent as more of some articles are being turned out than the Government can use, but Major Haecourt does not anticipate any difficulty in disposing of the surplus in the open market.

Sixth.—The population of Belgium was the most highly trained community in Europe, the great majority of the men having a thorough knowledge of some trade or other and very few being illiterate.

ENGLAND.

From what I have seen, I am of opinion that Great Britain is, so far, behind both France and Belgium, though I believe considerable attention is now being paid to the question. One of the principal difficulties arises from the fact that the question of Pensions is not clearly understood by the men. I enclose copy of the last leaflet issued by the British War Office on this subject, from which it will be seen that the actual pension guaranteed by the Government is ten shillings and sixpence per week, but men are granted provisional pensions up to 25 shillings per week, and, should they prove to be incapable of earning sufficient in addition to their pension, to make up the 25 shillings, they may be granted the difference permanently. The men somewhat naturally consider that they ought to get the 25 shillings, and I think that, if they cannot be shown to be earning anything this amount will be confirmed to them; the sum

over and above 10 shillings and sixpence is looked upon by the Government as subsistence allowance and is automatically reduced as the man is able to provide for himself.

I had personal experience of a case a few days ago. A man who had lost one leg had been granted a provisional pension of 25 shillings per week. He set to work and learnt basket-making and he is now in receipt of, I think, about 30 shillings in addition to his pension. He had just been notified that in future his pension would be 10 shillings and sixpence per week. He naturally feels that if he had refused to do anything—as many of his friends had—he could still be drawing the 25 shillings. The principle is a bad one and until something is done to correct it, there will be a very small number of men who are willing to take training.

I have discussed this matter with a prominent gentleman in London, and he is of opinion that it is just as well that the men should not start working too soon, but that they should be encouraged to take it easy until their health is as much recovered as it ever will be. There is no doubt that the shock to the system is very often not fully realized until a man begins to try to work, but the percentage of cases who suffer from starting too soon, is, in my opinion, very much smaller than that of those whose working capacity has permanently deteriorated through the enervating influence of a long period of idleness. It is perfectly true that our experience of these cases has not been long enough to enable us to speak with absolute certainty, but both the French and Belgian authorities feel strongly that the period of inaction should be as short as possible, commensurate with the man's physical well-being. This emphasizes the advantage of the scientific physical examination as practised in France, which prevents a man being permitted to try to do more than he is really able to perform.

Roehampton.—In connection with the Queen Mary's Auxiliary Hospital, there are some workshops provided for teaching the men trades while they are waiting for their limbs to be fitted. The book-keeping and shorthand classes are fairly well attended. I think the figure was 17 men out of 400. The only other class which is at all popular is the Motor Car Department which teaches how to take down and set up the engine and also how to drive a car. There seems to be a very great desire on the part of these wounded men to become chaffeurs, which, in my view, is a great mistake. To begin with they will probably not be given licenses, and, what is more important, I think there will be more competition in this trade than in almost any other, especially as it is already being invaded by women who will probably work for lower wages.

No scientific examination is made of the men and they are allowed to take up practically any trade that they fancy; few of them do anything, most of them being absolutely determined to learn nothing until they have had their full pension allotted. It will be readily seen that this induces idleness, as the longer a man lives without doing work, the less inclined he is to tackle it again.

The Employment Bureau in connection with this establishment is doing good work. Up to the 29th January the results obtained were as follows:—

Men placed by the Bureau	244
Men returned or returning to their old employment	314
Men accredited to local authorities or organizations, i.e., men who will only work close to their own homes and have therefore to be handed over to the organization of the locality to which they belong	161
Men about whom correspondence is still being carried on	61

The position of the labour market in England at present is such that these men can easily obtain work at 30 shillings to 35 shillings per week. The consequence is that they frequently accept the situations, then either never turn up at all, or only stay for a day or two. I heard of one large manufacturer in Birmingham who proposed to put up an additional workshop for the employment of sixty men. His intention was to build special machines to be run by unaimed men and especially adapted for their requirements, i.e., there would be a certain number for men short of a right hand and others for men short of a left hand, and so on. This gentleman advertised, offering good wages, and finally succeeded in engaging eleven men, but on the appointed day not one of them turned up. He has abandoned his scheme and the workshop is not being built. From inquiries made, most of those men failed to appear owing to their fear of losing their full pensions, while some of them were probably suffering from innate laziness. This condition will probably be bettered when the wounded men from the new army are available. So far the men have practically all come from the old professional soldier class and many of them are most difficult to employ in any ordinary trade.

Soldiers' and Sailors' Help Society. (Major Tudor Craig.)—This institution is run entirely by voluntary subscriptions without any Government aid and is doing most excellent work. They now employ about 500 men and expect this will be increased up to about 2,500. Their wages at present amount to about £10,000 per annum and they pay the men one pound per week to start with, which is increased to as high as three pounds per week as they become more efficient. The central establishment is in London and branches either have been or are being opened in Edinburgh, Aberdeen, Newcastle, Bedford, Birmingham, Cardiff, Dublin and Belfast. Only such trades are taught as will immediately bring in returns, the principal ones being carpentering, toy-making and basket-making. They have ample orders ahead and turn out most excellent goods. Major Craig has been operating this establishment for the last 10 years, and his experience of the men is curiously confirmatory of the figures which I got in France. He estimates about 20 per cent of good men, 40 per cent indifferent, who will work for spells but not steadily, and 40 per cent hopelessly lazy. The daughters and sisters of the men are employed in the factories and they find that this has a very good effect. Major Craig is now organizing a workshop for Lord Astor at the Cliveden Hospital, where it is

the intention to have accommodation for about twenty-five men who will work about four hours a day; if more accommodation is required, there will be two shifts. The work will be taken at fair prices by the Soldiers' and Sailors' Help Society. The men will be paid threepence per hour and of course the work will be entirely voluntary.

I introduced Major Craig to Captain Russell, of the Granville Special Canadian Hospital at Ramsgate where workshops are provided in the Chatham School House which has been taken over by the hospital. The object of this is entirely therapeutic, the aim being to combat the mental condition of the men, many of whom believe that they are far worse than they really are. Major Craig has offered to arrange to take any saleable work that may be produced and dispose of it with his own goods, which will be of great assistance to this hospital.

East Grinstead.—An endeavour was made by a gentleman at this place to establish a sort of agricultural school on his own property. About fifteen men were given cottages on the estate and a large house was fitted up as workshops; the men did a certain amount of farm work every day and were taught other trades as well; they were of course paid for the work that they did. At the end of six months, the scheme had to be abandoned owing to the bad behaviour of the men and the impossibility of making them stick to their work or obey any discipline.

In addition to the institutions which I have referred to above, there are a number both in France and England which are working for the assistance and benefit of the wounded soldiers and sailors.

In France I may mention the following:—

L'Union des Veuves de la Guerre.—This institution is looked after by M. Frédéric Masson and the Comtesse de Ribes. They concern themselves especially with the widows of men who have been killed at the front, and they are, I believe, endeavouring to arrange with Messrs. Morgan and Co., of Montreal, to sell some of the artistic work which they produce.

L'Association pour l'Assistance aux Mutilés Pauvres.—M. Bourlon des Sarty is at the head of this institution. Their system is to advance sums up to 500 francs to wounded men in order to enable them to start business again. It did not seem to me a very businesslike undertaking as they had no security whatever. No doubt, however, they make personal inquiries regarding the men before giving them anything, and they seem to be satisfied with the result of their work.

La Société de la Croix Verte.—This Society has as its object the finding of employment for wounded men, and owing to the condition of the labour market they have been very successful.

In England are the following:—

The British and Canadian Red Cross Association, which has been doing a great deal of work.

The Soldiers' and Sailors' Families Association, which concerns itself entirely with the wives and families of the men actually serving.

Maple Leaf Club, presided over by Lady Drummoud, which provides board and lodging at a very low rate for Colonials on furlough in London.

The Canadian Contingents Association which is most efficiently managed by Mr. Colner.

The Military Hospitals and Convalescent Hospitals are as follows:—

Shorncliffe Military Hospitals and Auxiliaries.	capacity about	2,000
Moore Barracks.	"	800
Duchess of Connaught, Cliveden.	"	900
Westcliff Eye and Ear Hospital.	"	200
Granville Special, Ramsgate.	"	650
Convalescent Homes, Bromley.	"	100
Bear Wood Park, Wokingham.	"	400
Hillingdon House, Uxbridge.	"	137
Kings Canadian Hospital, Bushey Park.	"	60
Monks Horton, Westenhanger.	"	674
Woodcote Park, Epsom.	"	528
Huxton. (In course of organization).	"	300

These figures cannot be taken as permanent as new units are constantly being added. The Orpington Hospital given by the Ontario Government is now being taken over. It contains 1,000 beds.

EMBARKATION.

I was able to see the embarkation of the party by the *Missanabie* (Liverpool, 16th February). Captain Sparling, Embarkation Officer, took the utmost trouble to see that the men were all comfortably settled in their cabins, without overcrowding, those wishing to be together being so placed. Everyone appeared to be thoroughly satisfied and the accommodation was excellent.

AFTER-THE-WAR COMMITTEE.

I had several interviews with Sir Rider Haggard, Sir Harry Wilson, Secretary of the Royal Colonial Institute, Mr. G. McLaren Brown and Mr. E. T. Scammell, on this subject. Sir Rider Haggard has been appointed by the Colonial Institute as an Honorary Commissioner to go round the different Dominions and find out what the Governments will be willing to do in order to assist the immigration of ex-British soldiers. He has had an interview with Sir George Perley and a letter has been written to the Government in Ottawa explaining the object of his investigations. It is to be regretted that some misunderstanding appears to have arisen with Mr. Obed Smith, the Dominion Emigration Commissioner, as to Sir Rider Haggard's functions, but I trust that any misunderstanding which may exist will have been cleared away, before he arrives in Canada.

This will probably not be before August, as he is going to South Africa, Australia and New Zealand first, his reason being that his health prevents him from facing our climate at this season of the year.

TREATMENT OF THE BLIND.

I paid a visit to the Institute of Les Amis des Soldats Aveugles at the invitation of Mr. Vallery Radot, the President. This is situated on the outskirts of Paris and accommodates about 150 patients. Everything is extremely

plain and simple, the buildings being simply whitewashed and the food and accommodation being of the plainest character. The men are all in uniform though some of them have been discharged and have been awarded their pensions.

A government allowance of two and a half francs per day per man is made, and though the President told me that they really do not know what the cost of running the place is, from what I have seen of the other institutions, I imagine that it would be about four and a half to five francs, the deficit being made up by private subscriptions. They could not tell me how many blind soldiers they have in France, but I imagine that there are 300 or 400, as a number of institutions have been opened in different parts of the country. The men are all taught trades and it is a remarkable fact that the blind men are, without exception, anxious to learn, and are therefore unlike those wounded in other ways.

The principal trades are basket-making, boot-making, brush-making, netting, harness-making and bookbinding. The men take, on an average, about six months to become fairly efficient and a good many have already been placed as workmen in factories, or have been established in small shops of their own. The institution runs its own printing establishment for Braille literature, and I saw a system there which I have not come across anywhere else; namely, printing by means of type which has the Braille letter at one end and the Roman at the other, so that the type can be set and the book printed in Braille by anybody without any knowledge of Braille. The great difficulty in getting Braille literature has been that it was necessary for those doing the printing to be able to read Braille letters. I attach herewith a pamphlet on this subject and I think the matter is worth some attention. The complete cost of a press with the necessary type is about three thousand francs. The men are paid their estimated proportion of the work disposed of after deducting first cost. This gives them all a slight incentive to work and some of them are acquiring quite a small capital in that way.

After my return to England, I visited the St. Dustan's Hostel for Blinded Soldiers and Sailors, Regent's Park, London, on the invitation of Mr. C. Arthur Pearson. There are about 140 patients and everything possible is done to make these men comfortable and offer them every opportunity for learning. The house and grounds, which are admirably suited to the purpose, have been lent free, and numerous additional dormitories and workshops have been built by private subscription. Mr. Pearson had no very clear idea as to how much it costs per capita as he said that they had so many donations both in money and kind, that it was impossible to give any accurate figures. His idea, however, was about 30 shillings per head per week, and this included the expense of sending men away to visit their families and, in some cases, of bringing relatives to see the men and paying their board while they were in the

neighbourhood. Very largely the same trades are taught as in France and the men are paid twopence in the shilling on the gross price realized for the work produced. That is to say, no deduction is made for first cost. A great deal of the work and teaching is voluntary, and it is quite evident that there is money forthcoming for any possible requirements. The conditions are very much more luxurious than they are in France and the men have all kinds of amusements such as concerts, dances, recitations, etc. Mr. Pearson gives a great deal of his own time, and has a very efficient staff working under him. The men, practically without exception, are most anxious to learn, and the only trouble that he has had has been with one or two hopeless drunkards whom he has had to dismiss.

CONCLUSIONS.

After carefully considering everything I have seen, I have arrived at the following conclusions:—

1. *Convalescent Homes.*—There is an absolute unanimity of opinion that the influence of convalescent homes is bad; the life in these institutions is conducive to lax discipline and idleness; men are shown a different standard of living from what they have been accustomed to, and one which they will probably not be able to maintain. This naturally produces unrest and dissatisfaction. The aim should be to keep men in military hospitals under military discipline until they have thoroughly recovered from their wounds, and then either return them to their homes, or when required, induce them to take vocational training with a view to making them capable of supplementing their pensions.

2. *Pensions.*—I think it most essential that all pensions should be allotted on the basis of physical disability in the untrained labour market and without any consideration as to what a man was earning before or what he may be able to earn in the future by his own initiative and hard work. Both France and Belgium realize that a self-supporting citizen, even though he is maimed, is an asset to the State, whereas a man living on an allowance of so much a week is entirely non-productive and only an incubus.

3. Most careful examination should be made of all men, and their capacity, in their maimed condition, increased to the highest possible point, either with, or without the assistance of artificial limbs, according to the individual conditions. In many of the workshops that I have visited, men only wore their limbs when going to and from the workshops. Many cases can be materially assisted by artificial appliances, but it is not advisable to make the men dependent upon these any more than is absolutely necessary. The supplying of complicated artificial limbs is not desirable. Dr. Bourillon's experience confirms this and he is in favour of having them as strong and simple as possible. Having worn an artificial arm for many years myself, I entirely agree with this opinion.

4. *Vocational Training*.—The system of training for allied trades should be carried out as much as possible. By this, I mean taking advantage of any previous knowledge that the men may have, *i.e.*, a man who has been a stonemason or a house carpenter and has lost an arm or a leg, has a considerable asset in his knowledge of the materials and their different uses. By teaching such a man to be an architect's draughtsman, and giving him sufficient education to be able to make building estimates, he is immediately placed in the position of being a valuable man to any builder or contractor, or even, if he has a little capital behind him, of becoming a master builder himself. I merely quote this as an example. This system is very closely followed out by the French and Belgians.

The question of accident insurance in connection with employers' liability has to be considered. A maimed man cannot be insured at the same rate as a sound one and is therefore at a disadvantage in the labour market.

5. *Pay of men*.—In order to induce the men to take vocational training, it is necessary to offer them some immediate inducement. In other words, a premium must be put upon work and not upon idleness. If a man has been allotted a pension and can then be taught a trade which will enable him to earn, in addition to this pension, as much or more than he ever earned before, he will certainly be a more satisfied and self-respecting citizen than one who feels that if he does learn to be self-supporting, his pension will be proportionately reduced.

6. *Government positions*.—The French Government has announced that all government and government-controlled employment will be offered first to wounded men. This system should be strictly adhered to, and undoubtedly many positions can be found which will enable men, who have been trained, to earn more money than they ever earned before.

7. *Totally disabled men*.—Fortunately this class is a very small one and probably the number returning to Canada will not be great. The French Government either returns such cases to their homes, or if a man has nowhere to go to, he is put into the Hotel des Invalides in Paris which, of course, has long been in operation.

I should think that there are sufficient institutions in the different towns in Canada to take care of such cases without establishing any actual Soldiers' Homes, as there will undoubtedly be a tendency on the part of some who can do a certain amount of work, to become inmates of them, rather than exert themselves.

SUGGESTIONS.

The question as to how the experience of France, Belgium and the Mother Country may best be adapted to the requirements of Canada, is one demanding most careful consideration. Two outstanding necessities have been impressed upon me, *viz.*, a clear understanding as to pensions and the reduction of Convalescent Homes to a minimum.

I beg to make the following suggestions for the consideration of the Commission:—

1. That in view of the fact that there are not sufficient Military hospitals in Canada to accommodate all the invalided men who require hospital treatment, certain of the Convalescent Homes, most conveniently situated, should be continued as military hospitals to be operated by a staff who will require and maintain regular military hospital discipline.

2. That, as soon as the men are in a fit physical condition to leave the hospital, they should either be discharged and allowed to return to their own homes, or, when considered necessary, be given vocational training to enable them to work at some trade or occupation.

Some arrangement should be arrived at to relieve them, during the period of their apprenticeship, of anxiety regarding their wives and families. This might be done by granting the man his pension from the date of his discharge from the hospital and, as long as he is undergoing educational training, his wife and family might continue to receive their separation allowances which, in addition to the pension, would be sufficient for them to live upon. This, of course, presupposes that men taking this training would be "all found" and would therefore be at no expense to themselves. Should it be found that any man was not doing his best to learn, or behaving badly in other ways, he could at once be dismissed from the training school and the allowance to his wife and family immediately stopped.

3. That the facilities offered by the Macdonald College at St. Anne de Bellevue, the Guelph Agricultural College and the Agricultural Schools now in operation in the Western Provinces should be made use of for the training of the men.

From what I have seen I do not think that the scheme of establishing permanent workshops for vocational re-education in Hospitals or Convalescent Homes would be, in general, a satisfactory one, though classes in ordinary school subjects and in elementary vocational training might profitably be established for their educational, therapeutic and recreative value, as this would not entail the installation of any expensive plant.

4. That a central depot be established for the making, fitting and supplying of artificial limbs. In connection with this, there should be a scientific laboratory on the lines of the French and Belgian system for establishing the physical capacity of the men. It must not be forgotten that the loss of a limb not only maims a man but, in most cases, reduces his total physical ability. The first step in this connection would be the transfer of the supply of the artificial limbs from the Militia Department to this Commission and the establishment of a central depot, either in Montreal or Toronto, where the best orthopedic advice is available and where vocational training could be given to the men while waiting for their limbs. These should, in my opinion, be supplied, under contract, by some responsible firm who will agree to establish their workshops in connection with the depot and guarantee the satisfactory fit and wear of the limbs for a reasonable period.

W. M. DOBELL.

2. ORGANIZATION OF THE TRAINING OF THE DISABLED

BY PROF. JULES AMAR.

*Directeur, Laboratoire des Recherches sur le Travail Professionel,
Paris.*

An account of Dr. Amar's system of testing the psychological and physical values of mutilated men, before their re-education is undertaken.

ORGANIZATION OF THE TRAINING OF THE DISABLED.

BY PROF. JULES AMAR.

Directeur, Laboratoire des Recherches sur le Travail Professionnel, Paris.

The organization of the vocational re-education of those soldiers who have been maimed by wounds received in the war implies the examination of many questions:—

1. DIRECTION TOWARDS VOCATIONAL TRAINING.

At the outset one realizes that the future of the wounded depends upon the directing of his activities towards some particular trade. The greatest care must therefore be taken in determining the best occupation for each individual, the director being guided, not only by the man's previous experience but by his tastes, and by his physical and psychological capacities. His general psychic condition will determine the diminution of his former personal value which is the result, often unsuspected, of the wound. Very exact information on this initial condition of the invalided, and his probable degree of improvement, is due alike to him and his employer. An example will make clear our way of looking at it. Let us imagine a wounded man who, previous to the war, exercised the trade of machine erector. A third of his right arm is now amputated, and he was a right-handed man. How shall we proceed with him? The physical and psychic examinations show us that he is in good health, gifted with average intelligence, and fairly well educated. An experimental analysis, conducted according to the technics of the physical laboratory reveal a perfect state of mobility of the stump and the possibility of fitting to him that artificial limb which will best suit his vocational requirements. Under these conditions the man might and should be directed towards the trade of a machinist. Re-education will develop motive powers in the left arm, and the artificial right limb will more often fulfil the rôle of supporter; that is, will prove a static force rather than a directing power, and, if it be properly fitted, one has the right to expect from the individual a rapidity and precision of movement which will be sufficient for all practical purposes.

Let us imagine, on the other hand, an individual possessed only of moderate intelligence and clumsy in other respects. We should direct him towards the trade, for example, of basket-making.

It is difficult to lay down general rules in this respect. Direction towards suitable vocations is a question of classification, and necessitates a strictly scientific examination of the individual. Re-education in allied occupations must be sought for. No workman capable of re-education in one or another branch of his former occupation should be diverted, and any deficiency of his diminished physical force should be supplemented by superior instruction and appropriate arrangements in the workshop. Many who have amputated arms can be trained for carpentry and wood-turning.

But in our opinion there is a class of disabled men which is a highly important one, inasmuch that if possible they must take up their former occupation; viz., the agricultural workman. A certain proportion, unable to return to work in the fields, will be of service in horticulture, vine-growing, and bee-keeping. This last occupation is deserving of an interest which hitherto we have not bestowed upon it.

Let us add in the choice of an occupation one must be guided only by facts, obtained from observation, which every one can verify. Also we must endeavour to overcome tendencies towards indolence, I should say the tendency to the "do-nothing condition" (*fonctionnarisme de farniente*). The disabled man must be made to understand, and he will easily grasp the fact, that work alone is the regenerator and sole fortifier of his body and his mind; it alone furnishes material sources for a livelihood, and those moral resources which, in him especially, excite our admiration. A too prolonged stay in hospitals and convalescent homes is the true cause of idleness, which is moreover accentuated by the atrophied condition of the stumps there condemned to inaction. The re-education of the joints and the muscles, followed by exercises in his trade, so harmonized as to assure for the individual the maximum of his output, must begin in the convalescent home before medical treatment is finished. I have constantly done it in my experience; I have contributed towards organizing according to my principles, the Military Professional School for Mutilated Belgians at Port Villez, at Vernon (Eure); and the Italian institutions have asked me, in view of this same result, for more complete information. In the Anglo-Belgian Hospital, Roi Albert 1^{er}, at Rouen, centres of manual labour and workshops have been established, of which our Allies' Governments are recognized customers. I am urging that the French State shall proceed likewise, so that she will have her workshops and will make it a duty to co-ordinate institutions established by private initiative. If it had been understood in time, to-day the victims of the war would have been usefully employed in making munitions of war.

2. WORK AND RELIEF.

But, it is asked, what is the proportion of the mutilated who are capable of recovering their working and social value by a re-education conducted on

these lines? How many are capable of being re-educated, and how many doomed to be assisted? By consulting former experience, and on the faith of the soundest proof, 80 per cent of the maimed are capable of vocational re-education. They may be divided as follows: 45 per cent totally, that is to say that they may succeed in earning normal salaries, on condition that 10 per cent among them, or thereabouts, specialize. The direction in which they specialize should always be, as has already been said, within the limits of their former trade. Twenty per cent may not arrive at a full working capacity, as their re-education is partial, but still it gives an appreciable output. The directing of men of this class towards their proper profession involves a series of scientific observations, for the purpose of providing employers with exact knowledge as to the value of each man's output and capacity. Finally, 15 per cent will have to practise subordinate trades (*petits métiers*), in which production is small, their re-education being entirely fragmentary. Whereas the 65 per cent representing the first two classes may be put into ordinary workshops or establish themselves as "workmen in their own rooms," the last 15 per cent must work in workshops organized for this purpose, where in any case they can earn a bare livelihood. The majority of the 20 per cent not capable of being re-educated are dependent upon Relief Institutions for work; nevertheless, a very small minority attain sufficient productivity to be useful in the workshops.

In a general manner, it appears to be unreasonable, according to these totals, not to seek to re-educate almost all the mutilated. It is a question of science and of method; it demands the organization of Training Schools, of which we are about to speak. It unites medical and technical knowledge, to the end that artificial limbs will be adapted to satisfy physical and vocational capabilities. The proportion dependent upon relief is then reduced; and one must endeavour, without ceasing, to diminish it. I wish that the term "relief" were in reality, as in its definition, a synonym for collaboration or for union. One does not *give* relief, that is to say charity, to the glorious victims of the present war; one *owes* them work in the noble acceptance of the word.

Resuming this classification we shall have:—

Maimed or Mutilated.	{	Re-educable 80 per cent.	{	Total: 45 per cent with some spec- ializing.	} Professional schools.
				Partial: 20 per cent.	
		Non-Re-educable, 20 per cent.		Fragmentary: 15 per cent. Relief institutions. Partly in special workshops.	

3. ORGANIZATION OF A TRAINING SCHOOL.

From the preceding explanations, it is easy to deduce the object and the organization of the training schools of vocational re-education. It is proposed to supplement the diminished physical capacity of the disabled man with a greater knowledge of his trade, superior technical instruction or better vocational adjustment; in general to develop his intellectual qualifications by draw-

ing out more of his attention, his goodwill and his self-respect, qualities less acute in the disabled. By this means, the level of technical knowledge will be raised among a considerable number of the workmen whose activities and thoughts will be trained to this end. And in order to realize this aim, an indispensable prosthesis is made, the dynamical prosthesis, not the kind which *replaces* the member or part of an absent member, but that which *re-establishes* or repairs the *functions*. Anatomy is nothing without physiology. The problem of the choice and the adaptation of the prosthetic apparatus is fundamental; its solution depends on mechanical and physical experimentations.

We must also provide a small laboratory to be attached to the training school for the purpose of researches in orthopaedy, in prosthesis, in order to determine the physical and psychical qualifications of the men and to make up their forms, a copy of which is attached hereto. It is in the laboratory that according to my scheme of graphic registration, the analysis of the workmen's movements is made, in relation to their regularity, direction, speed, and according to the force they expend. The measure of the man's physical incapacity, maladroitness and disability, is deduced from impressions which have been gathered together in this manner, and which indicate the method of training. Furnished with his card of qualifications, the disabled man passes to the workshop where experts instruct him in theory and practice.

As well as instruction for the "intellectuals" (bookkeeping, stenography and typewriting, industrial drawing, writing), there will be workshops suited to divers mutilations and deformities; for mechanics, limb-makers, and so forth, as well as land where the simpler agricultural operations can be taught in a short time. There must be competent persons at the head of these offices, schools and laboratories; persons who possess experimental ability in mechanics and general physiology. I should advise the employment of doctors who have specialized, and engineers from factories, who, when necessary, could call in other collaborators.

Such an organization will facilitate the directing of the disabled man towards such trades as will permit his output to be at the maximum, by having due regard to his anatomical and physical capacities. There will then be no reason to fear those rough-and-ready methods, often ruinous to health.

But the mere fact of producing, or of doing useful work pre-supposes a salary which will be regulated by this production and concurrent with improvement in quantity and quality. The salary of the apprentice will serve to remunerate his efforts as much for the work he has done as for the good will of which he has given proof during the course of his training. From the outset he must have a very clear idea that what he is doing will assure him the means of livelihood. The moral effect of this is evident.

As for its application, the disabled man must be taken as soon as possible from the Convalescent Home where a period of idleness deprives him both of

Dr. AMAR'S APPARATUS



Dynamometer

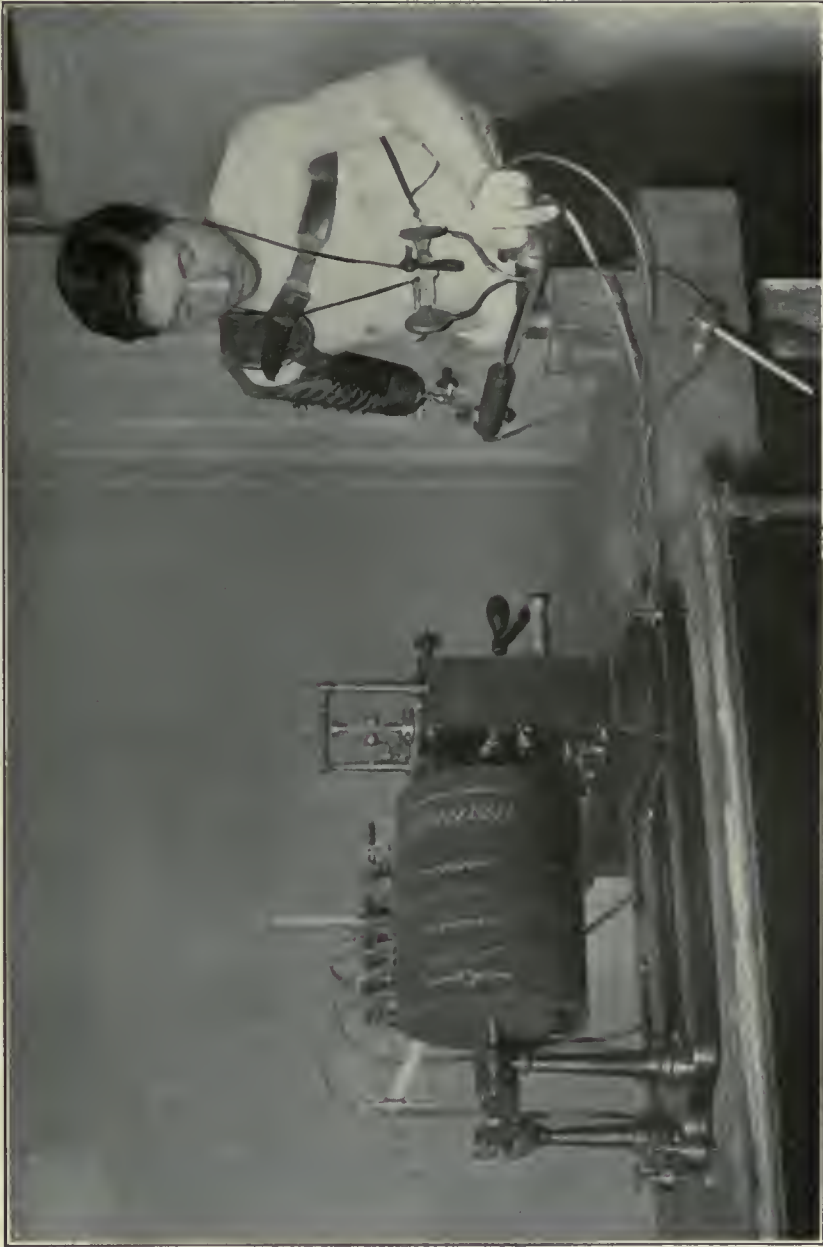
Dr. AMAR'S APPARATUS



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Dr. AMAR'S APPARATUS



The File Test

Dr. AMAR'S APPARATUS



The Plane Test

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Dr. AMAR'S APPARATUS



Percussive Test

Dr. AMAR'S APPARATUS



Chirography

muscular power and the will to act. The doctor at the head of the institution will then have the power to propose him immediately for half-pay, and will turn him into the schools with the stipulated allowance of 1.70 francs a day. The discharge papers will be made up later, without that indefinite delay so unfortunate from every aspect.

One franc will be kept out of the allowance of 1.70 for his maintenance at the school; the remainder will be added to his salary, which is regulated according to an ascending scale; exceptional merit being rewarded by a donation.

I have had, for my part, a certain number of amputated soldiers who, earning nothing, have been a charge to their families, who had to maintain them in order to allow of their following a course of methodical re-education in my laboratory. They are to-day placed with small employers, who are happy to employ them and to give them the means to earn their livelihood. The question of pay during this period of waiting should not be permitted to interfere with their regular allowance, as this might paralyse all waking activity. At the same time it is necessary to hasten the manufacture of the artificial limbs and ensure their immediate delivery. Great inconvenience is caused by delay in delivery; it is also necessary that these limbs should prove practical as well as receive immediately any necessary repairs.

We might cite as an example the school at Lyons, where the difficulty of discharge has been avoided; also the Provincial School of Hainault at Charleroi, where training and wage-earnings are skilfully combined. It is an unquestionable fact that the production of these workshops has not been very great, but if the State gives its own orders to them it should regain a part of the expenses and should set in progress an organization which is of great social power.

4. ORGANIZATION OF RELIEF WORKSHOPS.

I have said very little about this, it being my desire that only a very small minority of the disabled should be charitably assisted. The Relief Workshops will execute orders for easily manufactured articles of regular and remunerative sale, such as stamping, small ironmongery, plaiting, working with alfa, cardboard work, light cooperage, the making of toys, bodies of dolls; all trades for the greater part of which we were dependent upon Germany. Only the very seriously wounded who cannot be re-educated and are not capable of recovery even to a very small extent, in their capacity as workmen, will be admitted to these workshops. And everything will be done to give them the idea that they are earning the fruits of their labours.

The departmental workshops of La Seine (Fondation Marsoullan), and those which are being formed at Rue de la Durance (Paris), appear to answer to the definition which we have given them of Relief Workshops.

GENERAL CONCLUSIONS.

The conclusions deduced from the facts which have been stated above are easily divined; namely, that all, or nearly all of our disabled soldiers must be vocationally re-educated with the co-operation of competent departments. These are the Departments of Trade and Commerce, which must absolutely participate with the medical staff in launching this enterprise which, in the future, will be an industrial movement of the highest importance.

The necessity for having scientific prosthesis, which will determine and guide the work of the limb-makers, unify the types of apparatus and their prices (cutting out the old types which are absolutely irrational); a physical examination of the disabled and of the state of their stumps; the pay and its financial importance, all these different questions show the extent of the duties which the "Under-Secretary of the Medical Staff" will be called upon to fulfil.

Technical teaching, training, and all the legislation which it embodies; the pensions, enforced idleness, the formidable question of the workmen's liability to accident (on which I do not wish to enlarge here, and which concerns the very delicate workmen), these are some of the daily duties of the Departments of Trade and Commerce.

To establish the co-ordination of the different branches of all these departments, to act at once and not to talk, seem to me within the powers of a prudent Government.

I have received requests for information from several industries, and from some associations who offer to find places for disabled men, and their co-operation is assured for any man whom we furnish with a suitable artificial limb, and with a statement of his qualifications. It would be advisable to enter into arrangements in this respect with the Chambers of Commerce and to obtain employment for men with the smaller business houses in the provinces; these last are at the moment the only ones capable of receiving apprentices. The only bar to this is the fear of the legal side of the 'Employer's Liability Act.'

Such are, modestly summed up, the ideas which govern my method of re-education of the disabled and the choice of artificial limbs. We must endeavour to carry it out quickly and thoroughly, scientifically, and with our whole hearts. When hopes of mutual co-operation have been awakened it is a sacred duty to hasten their realization.

PROF. JULES AMAR,

*Director of the Laboratory for Research
in Vocational Re-education.*

62 Bd., ST. GERMAIN,
PARIS.

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Dr. AMAR'S RESULTS



Carpentry.

Dr. AMAR'S RESULTS



Carpentry.

Dr. AMAR'S RESULTS



Carpentry.

Dr. AMAR'S RESULTS



The Violin

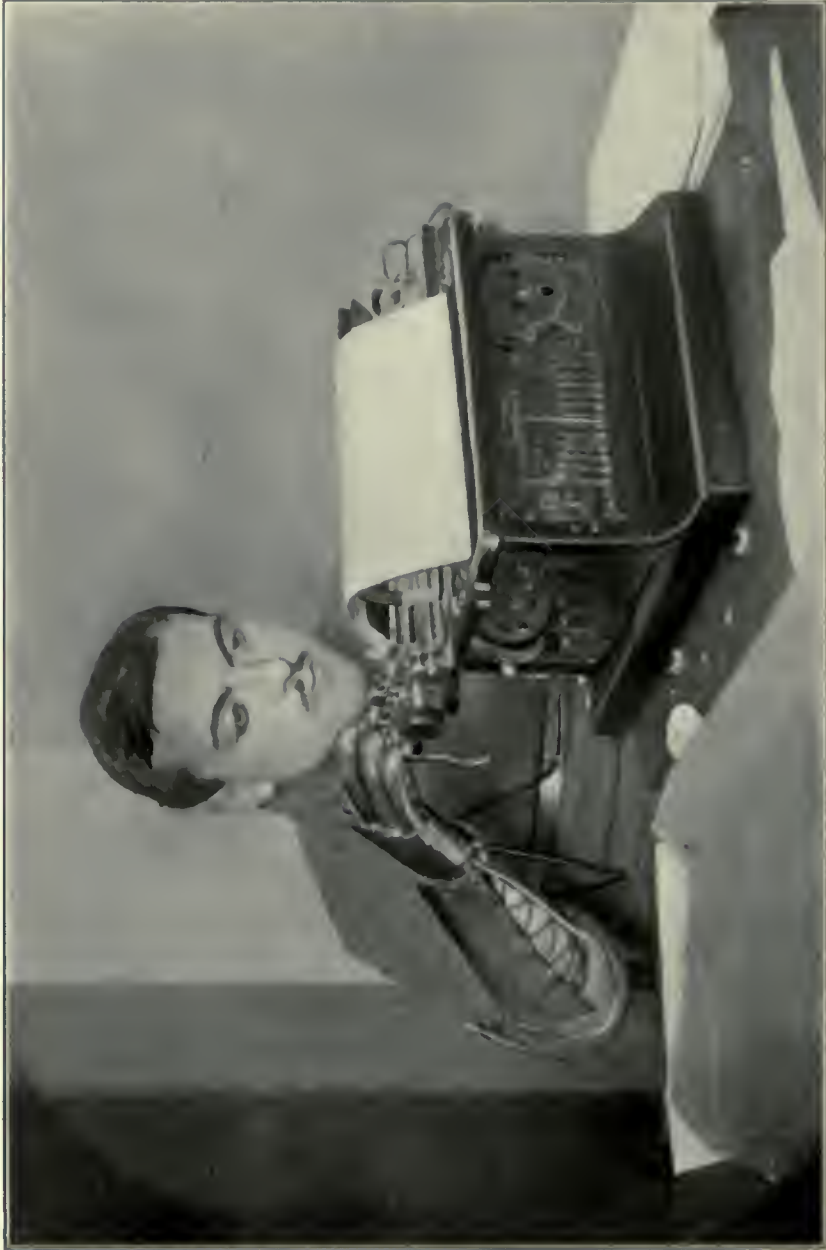
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Dr. AMAR'S RESULTS



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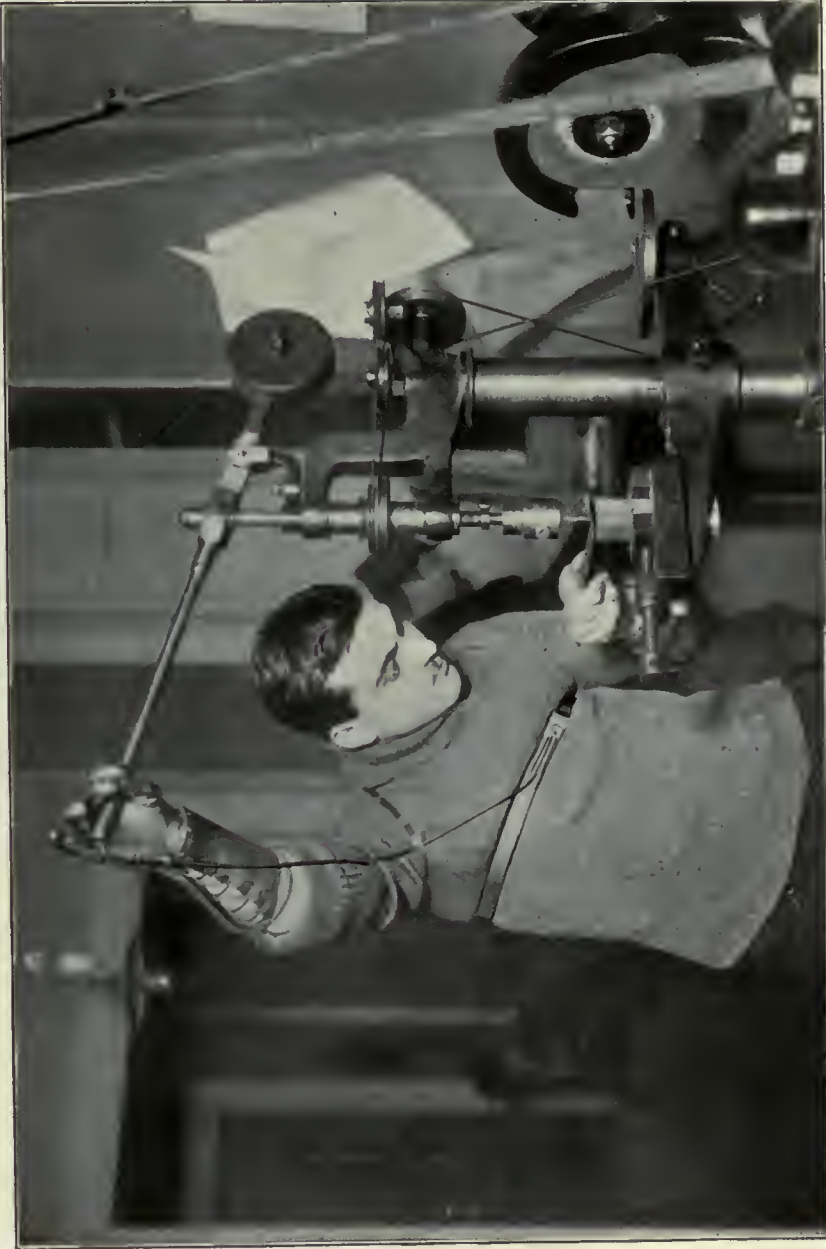
Dr. AMAR'S RESULTS



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Dr. AMAR'S RESULTS



Drilling

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ANNOUNCED

3. THE ANGLO-BELGIAN HOSPITAL AT ROUEN

BY DR. ARMAND DELTENRE.

*Director, Belgian Army Medical Service (Service de Santé),
Rouen.*

A lecture outlining the origin, organization and working of the Therapeutic and Orthopædic Institute at Rouen, with some account of the special appliances for mechanotherapeutic treatment in use in that Institution.

LECTURE GIVEN BY DR. ARMAND DELTENRE.

Director Army Medical Service (Service de Santé), Rouen.

L'HÔPITAL ANGLO-BELGE, ROUEN, THERAPEUTIC AND ORTHOPÆDIC.

LADIES AND GENTLEMEN,—I intend to outline in this lecture, the *origin, organization and working* of the Therapeutic and Orthopædic Institute at Rouen.

Towards the middle of November, 1914, we were obliged by force of circumstances to found a home for convalescents in the various rooms placed at our disposal in one of the barracks in the city of Rouen. It was for the purpose of collecting all the Belgian soldiers who had been discharged from the hospitals and convalescent homes at Rouen, the seat of the Headquarters Staff of Inspection for the Belgian Army, in order that a decision might be made in each case. They were for the most part soldiers whose health was far from being restored. They were the wounded who could not return to active service owing to joint, bone, and nerve affections.

Should these unfortunate men remain forever physical wrecks? Should they be compelled to await the end of the war to be treated?

After a careful examination, one could place these wounded in *two classes*, requiring the use of either of two distinct organizations.

There were many whose condition demanded operations to be followed by treatments for the purpose of warding off the ill-effects of their wounds; partial or total ankylosis, effects of scars, muscular wasting, injuries to the tendons and nerves, slow or faulty knitting of the bones.....

For the Convalescents of the first category, it seems to us that a physio-therapeutic treatment, well administered, could restore to them, all, or part of their working capacity and allow many of them to regain their places in the ranks, while treatment could reduce to the minimum the disability (impotence) of others.

In the case of those of the second category, suffering with incurable functional disability, total or partial, it seems to us that here also something should be done without delay, in order that they might be made use of in branches of the auxiliary service of the army, or started again in their trades, in order to increase their social value in the future.

There is no doubt whatever that the pensions or indemnities which they will receive after the war, will be insufficient to support them for life, and that, if care is not taken, they will fall into complete idleness and become a charge on public charity. Besides, it is necessary to return to the

nation a large number of men fitted to assist in restoring the economic situation. Now, the experience acquired by those who have made a specialty of vocational re-education of cripples, confirms the assertion that 80 per cent of the injured, even those seriously wounded, can regain a total or partial working value; that of this 80 per cent 45 per cent of such individuals can even earn their livelihood after re-education in their former trade, or in a trade suitable to their mental or physical capabilities, and that the remaining 35 per cent can only regain a small portion of their original working capacity.

The question of the medical and social treatment of our wounded heroes then presents itself in all its magnitude and demands a solution as soon as possible, and in this connection we take into account such factors as time, locality and the resources at our disposal.

The duty which falls upon the army medical service and upon the State, consists, partly, in the founding of a hospital in which will be concentrated all the physiotherapeutic and orthopædic treatments in order that there may be ensured to those who are slightly wounded as complete a restoration of the functions as possible. On the other hand, it consists in the founding of a school for vocational re-education, and a bureau of assistance for the war victims who have become helpless, after we have vainly exhausted all therapeutic methods calculated to restore to the maximum their injured functions.

Should these two organizations, the one medical, the other social, be united or separated?

It is quite difficult to determine the exact moment when improvement by therapeutic means is no longer possible. Besides, it is a fact, frequently proved, that vocational re-education will often favourably modify functional incapacity in certain of the maimed where medical care alone has failed. In the majority of cases, re-education is of great assistance to medical treatment and helps to hasten recovery.

It seems then logical to join together in the same place, under common direction, the Therapeutic Institute and the School for Re-education. The union of these two institutions, the one completing the other, would produce an ideal organization, which I found impossible to realize at Rouen at the time, already distant, when we were beginning to concern ourselves with the invalided.

Being an army surgeon, and desiring to treat the most imperative cases, I undertook the physiotherapeutic and orthopædic treatments, leaving to others, who quickly took it up, the solving of the social problem. In fine, about the middle of December, 1914, we founded the home for discharged soldiers at Havre, which gradually merged into a school for vocational re-education and later, toward the beginning of August, the Military Institute of Vocational Re-education was established at Vernon (this latter being the work of the Minister of War), for the regeneration, physically, intellectually, and morally, of our

wounded. M. de Paeuw, Chief of the Civil Staff, who devoted the greater part of his time to the realization of the plan as conceived by his Minister, will, I hope, explain to you the nature of this institution which has been admired so greatly by visitors.

The project which I carried out at Rouen was only accomplished through the splendid assistance of the Minister of War, the unceasing effort of the Director of the Medical Service, the concurrence of the leading medical men and, finally, by the generous and disinterested intervention of the Anglo-French Committee of the Red Cross, who placed at the disposal of our convalescents, a hospital, presided over by English nurses, whose zeal and devotion were greatly appreciated by us.

This hospital, situated on the site of the Vocational School at Rouen, was established December 23, 1914, in the presence of the Minister of War. It was called L'Hôpital Anglo-Belge, Roi Albert 1er. At first there were from fifty to sixty beds, but the hospital had a much larger capacity, and will eventually be able to accommodate all the wounded convalescent soldiers discharged from the convalescent homes of the Third Territorial Region, with maladies amenable to the treatments provided.

Three months after our installation at Rouen, 350 beds were in use in our hospital, and, on account of the large number of convalescents, discharged from some fifteen Belgian convalescent homes in France, from the central hospital at Rennes, from the hospital in England and those from the front who had to take the physiotherapeutic treatment, we were compelled to open up two annexes, one of 275 beds at Orval, the other of 325 beds at Saint-Aubin lez Elboeuf.

We had tried to introduce, little by little, into the Hôpital Anglo-Belge and its annexes, all the methods known to science which might help restore to the maimed war victims their former capacity for work, or to reduce to a minimum their functional incapacity.

Our physiotherapeutic installations consisted of Mechanotherapy, Thermotherapy, Radiology, and Electrotherapy, Medical Gymnastics and Pedagogic Gymnastics.

The Orthopædic service comprised: Intervention, surgical treatment, the operations of orthopædic surgery and the supplying of artificial limbs (Prothèse).

PHYSIOTHERAPEUTIC INSTALLATIONS.

1. *Mechanotherapy*.—At first, for the Mechanotherapeutic treatment I had to resort to a clinic at Rouen, where we could make use of two instruments; one active, the other passive, for different parts of the bodies,

Neither in Rouen nor in Paris could I find a manufacturer who could supply me with the necessary apparatus. It was then, that, seeing the difficulties facing us, the medical officer of the Waffelaert Regiment, attached to the hospital at Rouen, conceived the ingenious idea of having the instruments

manufactured by the wounded themselves, and to use for that purpose the workshop belonging to the vocational school where our hospital was located. Thus, little by little, the apparatus was constructed, so that we have at Rouen and at Vernon, ninety mechanotherapeutic instruments made in our own workshops, easily detachable and transferable so that they will be useful when we return to Belgium. Their number and construction will allow treatment of several patients at the same time.

In the construction of the mechanotherapeutic apparatus for the Anglo-Belge hospital we followed the principles of the Zander and of the Swedish gymnasium; to isolate the muscles which one wished to function so that all assistance from other muscles or joints would be prevented from acting, and the particular organ alone made to do the work.

There are, altogether, three kinds of mechanotherapeutic appliances:—

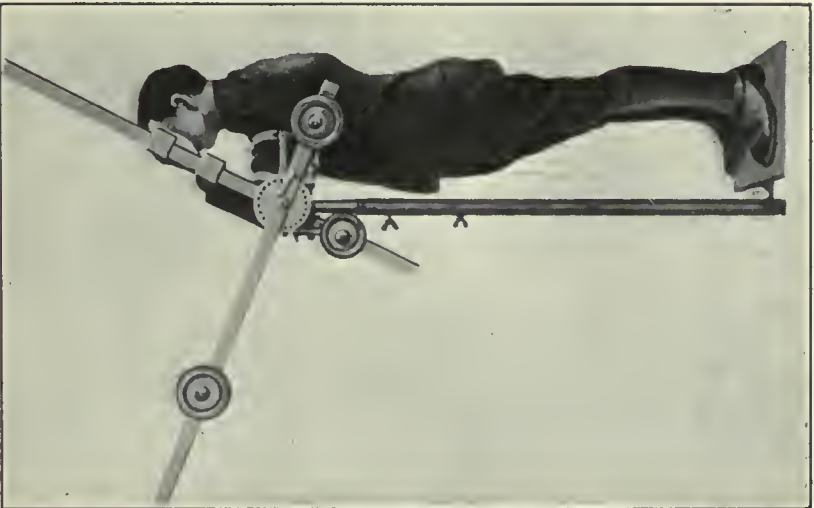
1. Those which can be made to work only by the muscles of the patient.
2. Those which can be worked by motors.
3. The orthopædic apparatus, active or passive.

The several forms of passive apparatus, moved by motors, are very expensive and require very high-power motors. They are used for massage and give the patient very little work when using them himself.

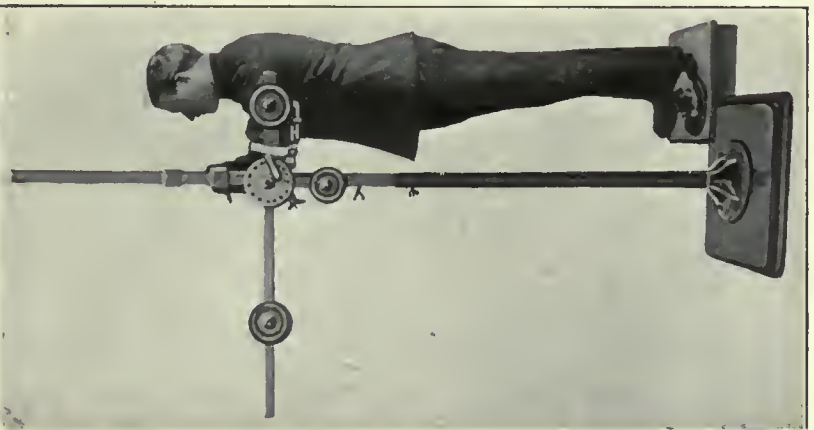
Orthopædic apparatus is useless to us.

We have confined ourselves to the construction of the active apparatus, because it alone encourages muscular activity, and our designers have attempted by means of pulleys and levers to obtain in the one apparatus, not only active but also passive movements.

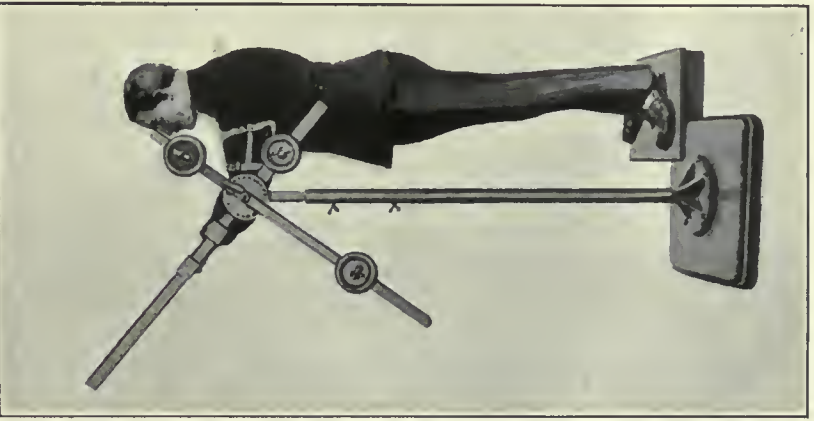
In the Zander type, a different apparatus is required for each movement: one for the bending of the elbow, another for the extending of the elbow. In the apparatus that we have constructed after the model of Rossel-Schwartz, one apparatus is sufficient to produce both these movements, simply by altering the levers and weights. An example will show the mechanism and the functions of our apparatus. For the treatment of stiffness of the elbow, the proximal segment of the arm is in repose and the segment of the forearm is moved, therefore the axis of the apparatus has to coincide with the axis of the articulation of the elbow. In the swinging movement (fig. 11) the lever, with its weight at its lowest point, is placed vertically and swings like a pendulum, provoking the passive movement of the joint. The muscles scarcely come into play. It is entirely through these swinging movements that all mechanotherapeutic treatment begins. The active movements of the elbow are intended to work on the flexor or the extensor muscles of the forearm (figs. 1, 2, 3). By bending the elbow, the lever is placed in such a way that the weight is raised during the bending, reaching the horizontal line at the same time as the muscle reaches the highest point (fig. 3); that is to say, at the moment when the direction of



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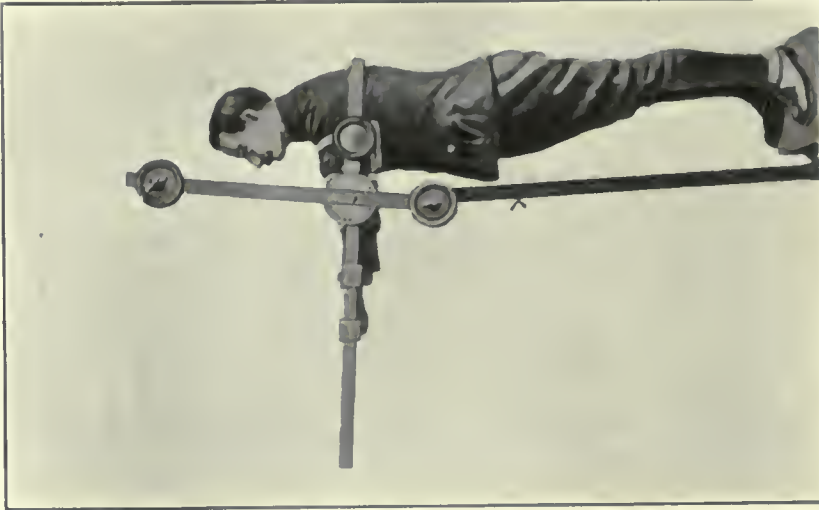


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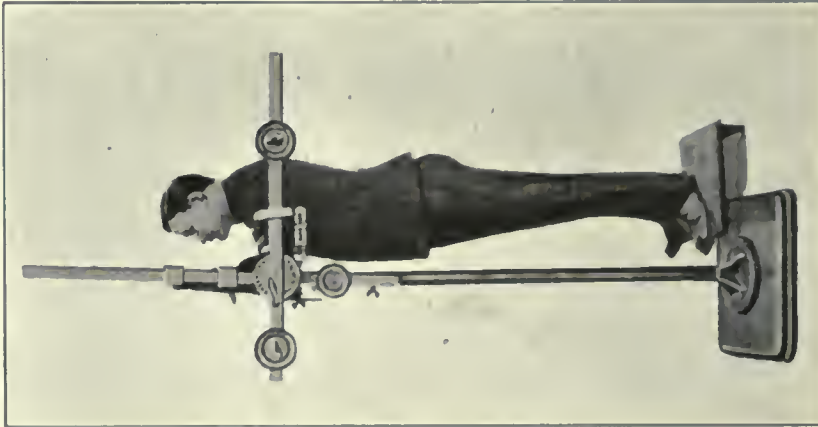


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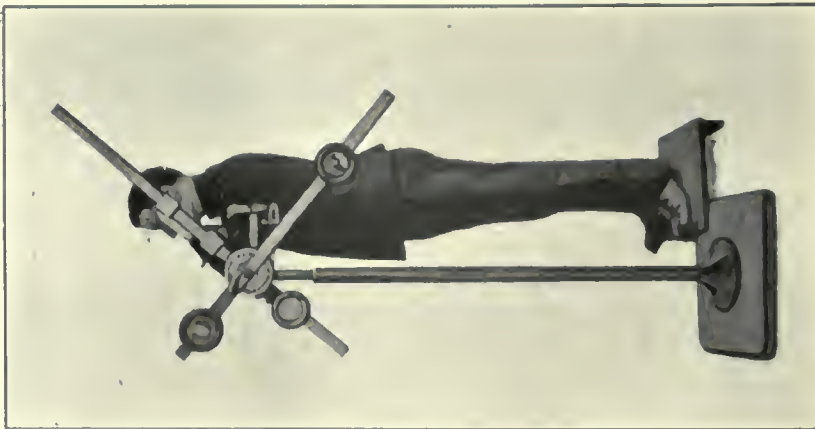
ANGLO-BELGIAN HOSPITAL—Mechanotherapy—Exercises for Bending Elbow.



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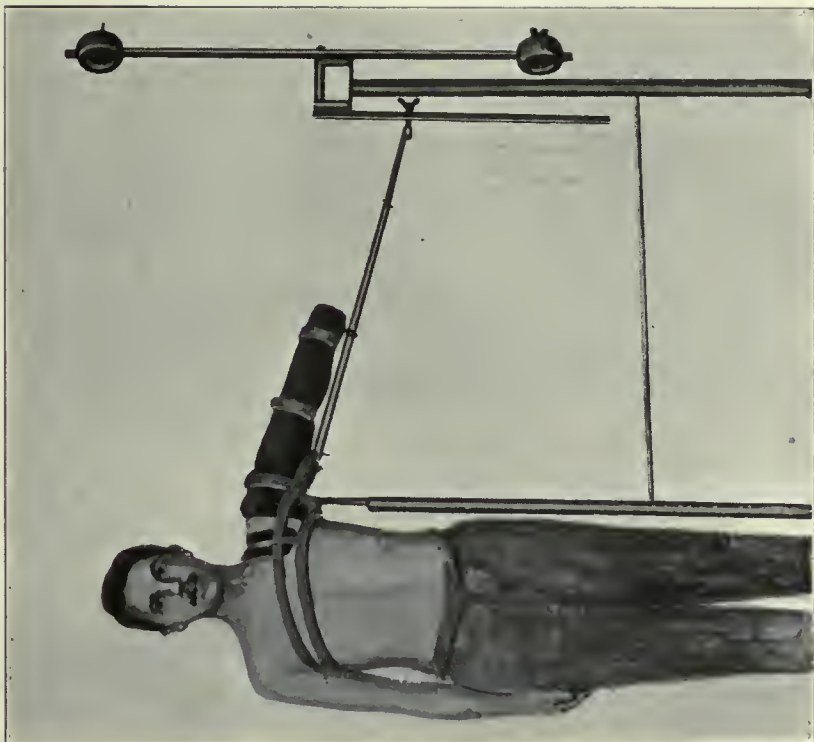
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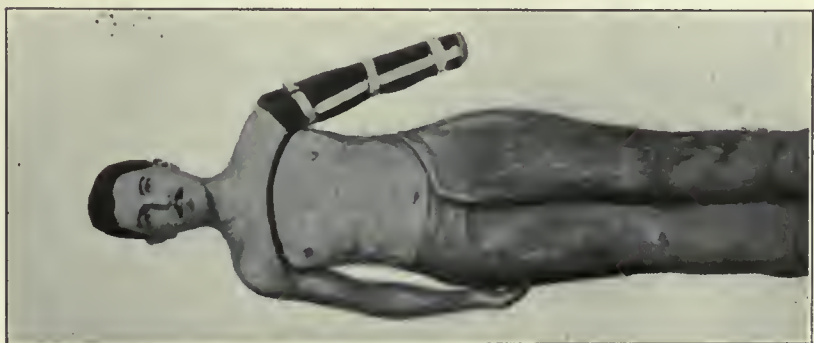
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ANGLO-BELGIAN HOSPITAL—Mechanotherapy—Exercise for Extending Elbow.

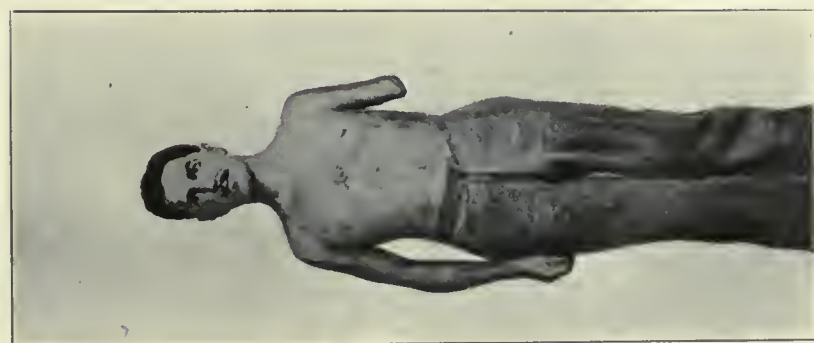
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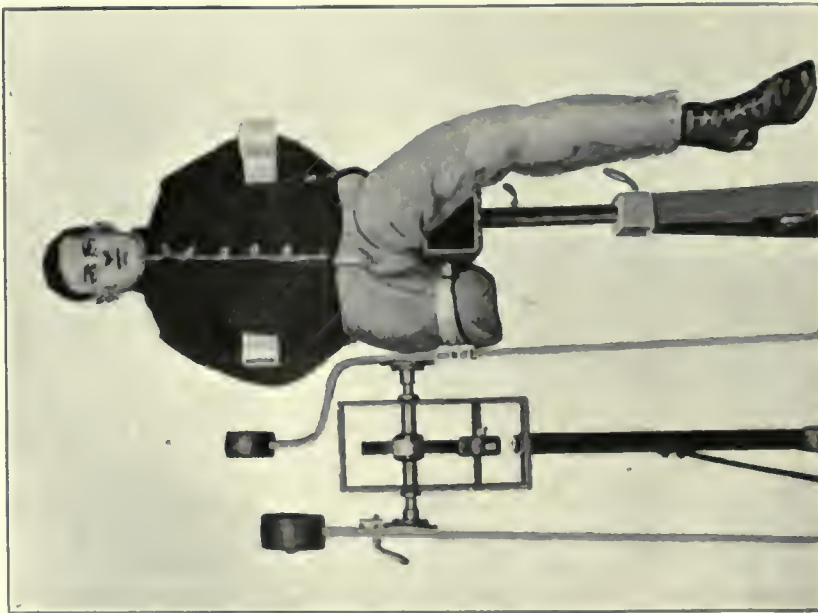


7.

ANGLO-BELGIAN HOSPITAL.—Mechanotherapeutics for amputated.



11. For passive swinging motion



10. Apparatus for amputated
ANGLO-BELGIAN HOSPITAL—Mechanotherapy.

the muscle is perpendicular to the bone. When the forearm returns to its position, it produces a dynamic contraction of the biceps which opposes the shock of resistance. For the active extension of the elbow the same principles are applied and the lever would be placed as in figs. 4, 5, 6. The details of construction of this apparatus allow us to regulate most minutely the muscular effort and to calculate the progress achieved.

Various instruments and apparatus for measuring indicate for us the results obtained.

The construction of artificial limbs in our hospital brought to us a great number of the amputated, whose joints near the lost member were very frequently the seats of stiffness and of inflammation. It is desirable for the best use of an artificial limb that the joints which are the seat of the principal effort should be made as mobile and as healthy as possible and should be moved by a strong group of muscles. It is this consideration which has caused us to make for the amputated an ingenious apparatus which allows them to profit by the Mechanotherapeutic treatment: namely, hollow cylinders in the form of sheaths lined with a layer of gutta-percha joined to the contour of the stump and prolonging the amputated limb.

Owing to this arrangement, those who have lost an arm or a forearm are able to utilize the joints of the shoulder and elbow. Those who have lost a thigh or a leg are able to move the hip and knee joints so that the day their artificial limb is supplied it adapts itself to the stump in a healthy and flexible manner and they are able to move the artificial limb (see figs. 7, 8, 9, 10).

Fig. 12 gives a complete view of the Mechanotherapy treatment at Rouen.

2. *Thermotherapy*.—The Thermo-therapeutic service is composed of baths of hot air, baths of hot water, and local douches of hot air, all of which are accessories to Medical Gymnastics. Convalescents who have articular affections, wounds that will not heal, chronic suppuration, inflammatory tumours and other painful injuries, are treated by hot air. For this, boxes of oak, lined with asbestos, with double electric current, have been constructed in the hospital. They are attached to the ordinary electric current and give temperatures from 120 to 140 degrees (C.). Five boxes for the lower limbs, five for the shoulder, four for the elbow and wrist, made so as to be used by several patients at once, are in use at the hospital at Rouen.

When hot-air treatment is hard to bear, as in some cases of neuritis and arthritis, thermotherapy is applied by hot running water. A large reservoir kept at an even temperature by a gas jet, feeds four baths, in which the affected limbs under treatment are placed. The current is kept up automatically and provides a massage of hot water. In the warmer season we use heliotherapy for the wounds by placing them in the open air for an hour or two every day. We have not found sunshine indispensable.

3. *Radiology and Electricity.*—*The Radio installation* of the Anglo-Belge Hospital is furnished with all the accessories and aids for all necessary examination in the different services of the hospital. This plant is used daily in examination, for the purpose of discovering foreign matter and bone injuries, for determining the cause of persistent ulcers, and also for determining what treatment should be given. One cannot exaggerate the value of these examinations. Often they have led us to surgical intervention, and to extractions of foreign matter which have overcome suppuration. They have also often enabled us to make the treatment more efficacious and facilitate the cures. On the other hand, not infrequently the radio examinations have caused us to discontinue treatment which was doing no good, and enabled us to send certain cases to the schools of re-education at once.

The high-power apparatus, constructed at little cost in our work-shop, feeds the radio apparatus. In certain cases of nervous depression or malnutrition, the high frequency currents have given brilliant results. Many cases of painful neuritis have been modified, but their use is particularly shown in the treatment of weakened scars. Large scars are very numerous in military surgery and treatment by high frequency currents seems to be peculiarly efficacious in their treatment. The fatal infection of a great number of wounds causes us to make sutures rarely and to wait for healing by granulation. In almost all of the cases of this treatment under observation, the daily exudation of the granulated surfaces stimulates in a striking way the formation of new skin and diminishes in a remarkable way the duration of healing.

A small apparatus for radiant heat, constructed in our workshop and fed by the condensers of the high-power apparatus, has been used in several cases of inflammation. We find that it produces subjective as well as objective results of a satisfactory kind.

The galvanic appliances comprise fifteen stations, and are principally employed for treatment in hydro-electric baths.

Each day, from 200 to 250 wounded soldiers undergo one form or other of electrical treatment. They can be grouped in several categories, and the results obtained are according to the nature and gravity of their injuries.

In the case of functional disability in a limb, because of an inflammatory muscular atrophy from inflammation, etc., without any nervous injury, induced currents have given excellent results. In six cases of paralysis or similar affection of the upper limbs caused by wearing ill-fitting crutches, we have obtained a rapid improvement, and in every case a complete cure. In the cases of two soldiers suffering from psychopathic paralysis, the use of high-power and induced currents has completed a cure. In three other cases we have obtained a partial amelioration.

One hundred and fifty wounded have been taken care of up to this time for paralysis due to nervous injuries received at the front. In aid of them

operations have been performed in the hope of re-establishing nervous transmission. Four of these cases have been completely successful. We have, however, not been entirely successful in cases which came to us without any previous treatment. We think that we have succeeded in avoiding atrophy arising from the separation of the muscular fibre from its centre of nutrition, and its vitality is preserved while we are awaiting the junction with its nerve. We have also operated in cases where the wound had existed for some time, and undertaken this treatment immediately after the operation.

After these months of treatment, of using Electrotherapy in our institution, we have concluded that it is necessary before electric treatment to carry out a minute electro-diagnosis which will give an exact account of the nature of the paralysis and of its origin; whether it is muscular or nervous and whether it is central or peripheral. By basing our procedure on the results of this examination, it is possible to begin a treatment adequate to the injury. It is completely useless and even dangerous to submit to an induced current a muscle which will not react to this current or, a muscle which, contracting under the influence of the current, presents only a degenerate reaction.

On the other hand, as the induced current constitutes the best method of excitation of muscular fibre, it is important to repeat the electro diagnosis in order to use the current as much as possible. That is to say, as soon as an electric examination sufficiently induces an improvement in these muscular reactions.

4. *Medical Gymnastics.*—The employment of the different physiotherapeutic agents above mentioned would not have been as efficient or effectual without the co-operation of medical gymnastics (massage, kinesipathy, muscular re-education).

The principal advantage resulting from Medical Gymnastic treatment as compared with other methods of physiotherapy in treating wounds lies in its effect upon that most important function, the mobility.

Hot-air baths and sun baths, for example, will aid in healing the wounds but will not cure the stiffening of the limbs and muscular atrophy, whilst medical gymnastics will accomplish these results. Even Electrotherapy would not have sufficient effect, or at any rate not as thorough an effect, without the movement and limbering up resulting from medical gymnastics. The motor system, joints and muscles can regain their normal state only by movement and this movement can only be obtained through certain well defined conditions; passive movements, dynamic contractions. Now, all of these movements, sometimes very delicate and very exact, are difficult to obtain by the Mechanotherapeutic treatment alone, at least in practice, because the presence of a doctor is necessary to operate each instrument.

Medical Gymnastics requires a profound knowledge of anatomy, especially when it is desired to restore their movement and other functions to each joint,

to each individual muscle and to each nerve supplying such or such a muscular tract.

One may know all about the technique of Medical Gymnastics but not be in a position to apply one's knowledge effectually; often the treatment of the same disease will differ in two different individuals. It is necessary to have a knowledge of the primary positions and of all their peculiar qualities.

Scandinavian doctors, having a thorough knowledge of Medical Gymnastics (the essential principles having been clearly explained by Dr. Ling, a Swede), are continually applying it, not only to all of their wounded but to sick people as well, since many medical diseases are susceptible to this kind of treatment.

They apply it themselves or have it given by "Medical Gymnasts", special graduates of the Central Royal Institute of Stockholm. All of these scientific manipulations have displaced the mechanical apparatus, the use of the latter being limited to the treatment of certain deformities of long standing to save the work of the "Medical Gymnasts."

Our Meehanotherapeutic instruments have been of great service to us, particularly during the first few months in which they were used in the Anglo-Belge Hospital. At that time, all the wounded consigned to our care were victims of the battles which occurred from August to November, 1914. Their wounds had been healed over for some time, the joints having become seriously stiffened and their muscles greatly contracted. Meehanotherapy allowed us to carry on the treatment of several wounded soldiers at the same time without any inconvenience. But this cannot take the place of Medical Gymnastics, especially in the beginning of certain treatments, because it requires too great an expenditure of muscular strength and its motions are too violent. The apparatus lacks the skill, the tactile sensitiveness, the moral force of suggestion and the many and delicate manipulations which are grouped under the general heading of massage, understood in its true scientific meaning.

It is extremely important to recognize the defects of Meehanotherapy in the treatment of certain kinds of fractures insufficiently knit, of wounds in the process of healing, of former channels of infection, or when pain evokes muscular resistance in the patient.

For some time past, the wounded soldiers of certain large hospitals at the front were being sent us immediately after being operated upon. Thus they were able to benefit at once from medical gymnastics, which treatment aims not only to treat the muscles, and the joints and nerves, but also strives to avoid vicious healings, so frequent and so serious, and devotes itself assiduously to the restoration of the general and special motor functions. This gymnastic treatment is an especially delicate branch of the profession. It is very efficient, but may become dangerous if it is placed in unskilled hands or directed by a mind ignorant of its danger signals.

It is for this reason that we have asked and obtained the authorization to utilize in the Anglo-Belge Hospital at Rouen, three ladies, medical gymnasts, graduates of the Institute of Stockholm, who with three of our military assistants are scarcely equal to their daily tasks, for 175 convalescents are daily taking this treatment.

We believe that this service, scientifically organized with all its plant and its apparatus, is a novelty in this country.

Those cases which are treated most frequently by Medical Gymnasts are wounds, simple and compound fractures, certain excisions, ankylosis, paralysis, motor or nervous troubles arising from wounds of the head and spinal cord, and stumps from amputation. In the simple and compound fractures, and in certain excisions of the bones, the practical utility of Medical Gymnastics is shown by the fact that there is no paralysis when the knitting of the bone and the healing of the wounds are complete; that is to say, that although muscular force is diminished there is no longer any ankylosis, and one does not see patients who are cured of their wounds but are from the point of view of function, still cripples.

In the treatment of wounds, Medical Gymnastics is very useful:—

1. In preventing the formation of the scar interfering with the function of the limb, as well as in avoiding the stiffness in the joint of the wounded member.

2. In maintaining the muscular system of the region.

3. In preventing the imprisonment of a nerve in the scar. In the case where this has been freed by surgical intervention it is necessary that Medical Gymnastics be applied with the shortest possible delay.

For motor re-education, that is to say for the re-education of the muscles and of the segments to their normal action, Medical Gymnastics adapts itself perfectly to the needs and to the capacity of the individual. Day by day it can be modified and adapted to all phases of re-education. The moral and psychical influences springing from the suggestion, created by the movement, are themselves a great influence in these cases. Medical Gymnastics can, in effect, frequently restore to the patient confidence in himself and his forces.

Independently of Medical Gymnastics the Pedagogic Gymnastic treatment is applied daily to all the wounded who are in a state to take it up. It is a wonderful way to distract them and to refresh them in their development, and we have added to it various kinds of sport. Moreover, certain of the wounded are employed in the workshops of the hospital, where they collaborate in the manufacturing of Mechanotherapeutic instruments and artificial limbs and of other things useful to the army. All these practices, while they are auxiliary to medical treatment, are of the first importance in avoiding lack of discipline and enforcing obedience, for they assist in absorbing, in a useful way, the excess of the men's energy.

THE ORTHOPÆDIC SERVICE.

We have added a service of Orthopædics to that of Physiotherapy for the treatment of deformities and of mutilations of the wounded. Part of this ground has been gone over, and I shall confine myself to remarks about surgical methods, orthopædic methods and the supplying of artificial limbs.

1. *Surgical Orthopædic Interventions.*—Up to the present we have had recourse to Orthopædic intervention only in the case of soldiers who received their wounds in the first battles of the war. A prompt intervention has been practised only in those cases where it is desirable when one is searching for a nerve or a severed tendon, but we look forward in the near future to carrying this kind of work further, and are studying at this moment the desirability of a more extensive use of orthopædic intervention permitting soldiers with this kind of wound to obtain benefits.

2. *Artificial Members.* The prosthetic part of our work has been much more developed because, although it may not always be urgently necessary to interfere in a surgical way, it is better to correct any pathological tendencies of the limbs which might become fixed in spite of the the aid of Physiotherapy. It is for this reason that we have never hesitated to make for some of the wounded certain indispensable orthopædic apparatus such as, for example, gaiters of moulded leather, orthopædic boots, etc.

The wounded, furnished with such apparatus, continue their treatment, but the prosthetic part which has been most seriously carried on in our workshops is the making of artificial limbs. Soldiers with amputated limbs can only benefit in the largest measure by being transferred as rapidly as possible from the Physiotherapeutic to the Orthopædic Institute, after the amputation has taken place.

The judicious application of this rule is the best way of avoiding wasting of the muscles of the stump, and stiffness near the joint, as well as secondary accidents due to the prolonged wearing of crutches.

It permits, consequently, the most rapid re-establishment of the function of the stump and of its articulations which, profoundly disturbed in their morphology, should be readapted in their new physiological rôle, so as to place these organs in the best condition for the satisfactory fitting of an artificial limb.

We fill up the time which the making of an artificial limb takes in submitting the trunk to the following treatments. I shall confine myself to naming them rapidly:—

1. Mechanotherapy of the stump and its nearest joint.
2. Local baths, air and water to hasten the reabsorption of exudations and to diminish pain.
3. Alcoholic rubbing which strengthens the tissues, stimulates the circulation and diminishes sensibility to cold.

4. The application of an elastic bandage, the turns starting from the root of the stump, thus bringing down the tissues and lightly compressing them. This bandage has the effect of lengthening the stump and tends to separate the tissues in the scar from the bone.

When the stump is not adaptable to an artificial member it is modified by an orthopædic operation. We justify the undertaking of these operations by considerations of an anatomico-pathological order.

At the moment, we will state briefly that the stumps left by the amputation are frequently the seat of remnants of inflammatory reactions, traumatic and surgical, which may affect all the tissues.

It is a subject which we propose to take up shortly, but in the meantime I may say that the bone in the first place may degenerate at its end through a lack of nutrition. The muscles of the stump are always shrunken. They have been cut part of their length. This anatomical disturbance has modified the conditions of their function and they require a new physiological adaptability. Their new motor rôle which they are to fulfil will be acquired by a prolonged and progressive work of physical re-education.

The skin of the stump is tender and sensitive to touch and to cold, and is subject to pus.

The state of the scar is of first importance. Its appearance differs essentially, according to whether it is the result of a primary or secondary operation. If the amputation is primary and on account of the danger of serious infection which necessitated a prompt operation, the scar is circular. If the healing has been long, the scar has a large surface, and it is even, smooth and weak. The tissue (pellicule) which covers it is inelastic and so thin that it bleeds easily. Its base is formed of thick fibrous tissue, the difficulty of nutrition of which produces a tendency to ulceration in certain wounds. Invariably there is an adherence to the end of the bone, and it often happens that this end projects beyond the muscles. It is then necessary to resect the end so as to obtain a proper protecting cushion. Again, it is often necessary to excise the ulcer and its fibrous base when they are slow to heal. The secondary operation is often in two folds and the scar which then results is linear and flexible and the fat and muscular tissues form a proper stump.

This treatment of the stump is of importance. Preparatory to wearing the limb it cures any inflammatory process, and the stump is thus fortified and is less subject to changes in volume. When the stump is enclosed in an apparatus it is less stretched and less subject to wounds and, in short, better fitted for all the necessary work it will have to do. Thanks to the generosity of Mme. Haemers, wife of the Consul for Belgium at Rouen, founder of the Home for Wounded Belgians, we have been able to give better artificial limbs to those who have had their limbs amputated.

Our first steps were laborious. We had no special workmen. One of the doctors attached to the hospital who had been interested in Prosthesis, took the direction of the workshop and was assisted by two foremen of special value. To these were added mechanics, fitters, cabinetmakers, who learned the modelling of wood, bootmakers who were initiated in the moulding of leather, chosen among unskilled soldiers and among our wounded. To each one of them it was necessary to give the first ideas of work of this kind.

Prosthesis differs essentially according as it is concerned with a leg or an arm.

Prosthesis of the lower limb is absolutely essential to the taking up again of an ordinary life and work. All the artificial limbs which we have delivered up to this time to those who have lost a leg or thigh are excellent limbs with practicable joints.

It is not the ordinary model known under the name of Beaufort, which can be made at low cost and in a short time. We have experimented with this model, which presents the inconvenience of not being very practicable and is very heavy, unwieldy and stiff. The patients who experimented with it used it but little.

The apparatus of moulded leather is most successful. It is obtained by modelling a hide of about 3 mm. thick, on a form. The wooden form is modelled after the exact dimensions of the sound leg. The leather thus moulded should follow as exactly as possible the external form of the lost limb, while its interior should touch all the contours of the stump. To make certain that close contact is made between the soft parts and the leather the sheath is split on its front base and furnished with laces, so that the owner can tighten and loosen it at will. If the stump is conical in shape, this method of attachment is unsatisfactory.

This type has the advantage over the Beaufort model of possessing three articulations. Their movement is simple and obtained by means of springs. We were not satisfied with making this type because, although it possesses certain good qualities, it has many defects. It is very heavy ($3\frac{1}{2}$ kilos), wears quickly, and also gets out of shape in a short time, as the leather stretches and even breaks and requires frequent and expensive repairing. It is necessary then, to find a type of apparatus combining unity, lightness, and solidity, with ease and elegance in the walk. Thanks to the intelligent initiative of our chief modeller, we arrived by steps at two well-known and non-patented models; the model Frees-Clarek and the Hanger model of the American wooden limb.

The casing is made of wood, covered with a manufactured material not unlike the skin of animals, but that does not shrink; the thigh covering is manufactured from a block of wood that has been hollowed out. This cavity receives the stump and is formed in such a way that it fits closely to the whole surface of the soft parts; the stump being so suspended that its lower extremity does

not touch the bottom. In order to strengthen the thin wooden casing it should be encased in a soft, moist calf skin, which having been applied when warm has the peculiar property of contracting. It prevents the wood from cracking and adds considerably to the strength of the limb. The American artificial limb, whatever the kind, has the advantage over the moulded leather limb in avoidance of any warping and in better adapting itself to the form of the stump, which varies with each individual, but close contact is only perfect to the extent that the stump does not change in form. This limb can therefore not be adapted in the case of a recently amputated member, but it is suitable to any stump which has been treated by Physiotherapeutic methods and which has been formed by wearing a provisional apparatus such as the wooden leg.

In our workshops we make it a rule that the patient be present during the hollowing out of the wood. The piece of wood is first shaped and hollowed by the side of the patient, and often tried on. As fast as the modeller cuts away the shavings one sees the stump going in farther and the gradual outlining of the interior and exterior shape.

In the artificial limb of moulded leather, the metallic mountings which support the frame, are, so to speak, independent.

In the Frees-Clarck model, thanks to a system of springs, which join the thigh piece to the foot by passing through the hollow of the limb, a correlation between the movement of the knee and foot is obtained. When the patient places his foot upon the ground the knee bends; when he lifts it from the ground the limb stretches itself out from the thigh. The system is rather complicated and liable to frequent deteriorations, requiring repairs much too delicate for the patient himself to undertake.

In the Hanger model, the movement of the foot and knee are not connected. The movements of bending and extending the knee are performed about a transverse axis by means of the tightening and relaxing of an india-rubber band. In front of that axis, and on a level with the ankle, there is placed a small india-rubber pad. Behind the axis and on a level with the heel, is an india-rubber cylinder.

During the bending of the foot under the weight of the body, the anterior rubber plate is passed down. When the foot is raised from the ground it comes back of itself on account of the elasticity of the pad, and cannot go beyond the normal on account of the presence of the posterior india-rubber cylinder. In extending the foot from the limb, a reverse movement is produced. This joint bends easily and the replacing of the india rubber plate and cylinder can easily be accomplished by the patient himself.

In both models, the foot is divided on a level with the metatarso-phalangeic joint, into two segments cut on a slant, to allow bending, and these are joined to the sole of the foot by a leather thong. Two little cylinders of india-rubber hold the two segments together in such a way as to allow the bending of the

front part of the foot when raising it from the ground and the return to its normal position when the pressure ceases.

The artificial limbs of wood which we are manufacturing in our workshops can rival the most perfect productions procurable in America. They constitute a light, inflexible, unbreakable sheath, supporting securely the edges of the stump and reproducing on the outside the shape and curves of the absent member. They allow patients to walk normally and to enjoy a variety of exercises. We are recommending that the Government adopt this model for our patients who have lost their lower limbs. If our recommendation is accepted, I can at once take measures by increasing the number of our labourers, and by perfecting our plant, to make thirty American artificial legs a month. By improving our workshops we not only aim to alleviate present miseries but to create a Belgian industry in order to be independent of foreign supply.

Though we have been able to establish a system of manufacturing our lower limbs as perfect as that of the American, it has not been the case with artificial arms.

In the case of loss of the shoulder joint, no artificial limb made up to the present time can be utilized for work; they are only for show.

For patients with amputations below the elbow, also for patients with amputations above the elbow who retain a stump of 3 or 4 finger-breadths in length, there is manufactured in America a perfectly finished type of artificial arm, called the Carnes arm, made of vulcanized linen and fibre. The movements of the fingers are performed by the aid of a patented mechanism placed in the hollow of the hand to which are attached straps. The movements of the wrist and elbow are obtained in the same way. Action is regulated by the movements of spreading the arm, and by the raising and lowering of the shoulder. We are scarcely equipped with enough tools for the manufacturing of these American automatic artificial arms (the plant alone costs 250,000 francs).

At present we have contented ourselves with giving to our patients who have lost their arms, artificial limbs of moulded leather and a workingman's arm.

The artificial arm of moulded leather is the model generally used. It allows non-automatic movements of bending and extending, of supination and pronation. The rigid hand, with jointed thumb, can hold such objects as are necessary for daily use. It can be removed and replaced by the hook and ring. The ring is for the purpose of taking hold of a tool (a shovel or a pickaxe). The hook, firmly fixed, holds the objects and helps to carry heavy objects.

The working arm which we manufacture is fashioned after the old-fashioned Gripouillau model. Thanks to a universal joint, certain common and simple working movements can be performed, such as planing and filing.

Gripouillau's method of attaching the artificial arm to the shoulder allows the complete turning of the limb.

Our workshops of Mechanotherapy and of Electrotherapy, as well as our workshops for artificial limbs, lend to our institute a distinctive character. Until now, no Physiotherapeutic institution had conceived or realized the idea of having the wounded themselves manufacture the apparatus for their treatment, as well as the artificial limbs.

We have now reviewed the different therapeutic methods used in the Anglo-Belge Hospital and its annexes, in the treatment of mutilated soldiers.

The separation of our methods of physiotherapeutic treatments into three establishments carries with it elements of ineffectiveness and inferiority. Unity of direction, so necessary to the proper working of each service, is difficult to realize. Moreover, it is not possible to pretend to be able to give each of these establishments a staff adequate and, above all, sufficiently skilled to apply judiciously methods of treatment so delicate and varied which are in reality the exclusive region of specialists.

With this situation I proposed to the Inspector-General of the Army Medical Service, to centralize all our efforts in establishing in the neighbourhood of Rouen, a great institute where there will be reunited the different services scattered in the annexes.

This proposition has been accepted, and there is being erected at the present moment the buildings I have recommended.

The reunion in a single establishment of all the services of physiotherapy will not only allow me to be certain of unity of direction, but it will result in utilizing my medical staff in a more rational and efficient manner. At the head of each department I shall place one or two medical men who are absolutely competent. These will serve as guides to less-experienced colleagues, who, left to themselves, could not always make the best use of the apparatus.

The results which we have obtained up to the present are very satisfactory.

Since the inauguration of our institute, up to October 31, 1915, twenty-nine hundred (2,900) convalescents have been admitted and treated, 1,170 (40 per cent) cured and allowed to rejoin their divisions, 670 (23 per cent) have been sent on to the Institute of Re-education at Vernon, 180 (6.20 per cent) to the Depot at Havre, and 880, the remainder, are undergoing treatment on the 1st of November. In order that the physiotherapeutic and orthopaedic treatments should be truly efficacious, they should be undertaken at the very beginning, before the setting up of stiffness, of wrong attitudes, of wastings, or of permanent atrophy or retractions.

Too often convalescents reach us in a hopeless condition.

It is absolutely necessary that the chief surgeons at the front should send their men to us as soon as possible, without sending them through intermediary hospitals.

All those wounded who can be benefitted by the many resources of physiotherapy should be sent to us before the complete healing of their wounds, so that complications of a septic nature may no longer be feared.

There is a close connection between the work of medical gymnasts and that of the dressing stations. All of the soldiers who have unhealed wounds and who are sent to medical gymnasts, receive in the dressing room a temporary dressing which will not prevent the moving of the sections under care.

Our institute should be considered, in a word, as the intermediary between the surgical establishment at the front and the schools at Port Villez. All the seriously wounded, who are required to follow a special treatment should be sent to our institute without delay. After having exhausted all the methods of science at their disposal there, those who are hopeless should be sent on to the Depot for wounded at Havre or to the Military Institute for vocational re-education at Port-Villez (Vernon). There, instead of relapsing into a depressing state of idleness, they ennoble themselves by work and study. After having accomplished their brave duties on the field of battle, our splendid wounded heroes are prepared for a new conflict, that of production, so that they can help immediately in the rebuilding of our national edifice for the approaching liberation of our Fatherland.

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ANGLO-BELGIAN HOSPITAL
12. Mechanotherapeutics



MILITARY HOSPITALS COMMISSION
Central Convalescent Hospital, Toronto—Mechanotherapeutics



MILITARY HOSPITALS COMMISSION
Central Convalescent Hospital, Toronto



MILITARY HOSPITALS COMMISSION
Central Convalescent Hospital, Toronto

4. VOCATIONAL RE-EDUCATION

BY DR. BOURILLON.

Directeur de l'Institut National Professionnel des Invalides de la Guerre, St. Maurice (Seine).

An abridged translation of an article in "La Revue Philanthropique" for January, 1916, giving an account of the methods adopted in the training of disabled soldiers at the Vacassy Institute for the re-education and maintenance of maimed men, which is associated with the Hospital of St. Maurice, near Paris.

DR. BOURILLON ON THE VOCATIONAL RE-EDUCATION OF DISABLED SOLDIERS.

In the "Revue Philanthropique" of January, 1916, Dr. Bourillon, head of one of the most important French hospitals referred to by Mr. Dobell, that at Saint Maurice, deals with the question of Vocational Re-education. The following is a condensation of his pamphlet. We publish it here, not so much for such special information as is contained in the lecture given by Dr. Deltenre, as for his sound point of view and the valuable suggestions which he makes. He begins by pointing out the fact that public attention naturally fixes itself on those victims of the war who have suffered the loss of limbs, or other mutilations. But, he goes on to say that there are other injuries not so arresting, but equally grave, such as paralysis, joint stiffness, the severing of tendons and nerves, which have an equally important influence on the well-being of the individual, in his relation to society. As an example he gives the case of the book-keeper who, having lost a leg in the war, could earn his living in the same way as before, while a pianist who had lost a single finger could not carry on his former profession. "*From the point of view of the future of the invalided, it is the relation between his disability and his occupation which is the essential factor.*" The duty of the nation is to make every effort to assure an honourable existence to those of the invalided who are not in a position to provide for the proper maintenance of themselves and their families. Pensions, even if given on a greater scale than that at present in force, will not accomplish this. Neither would the establishment of Soldiers' Homes be now suggested by any enlightened person.

After a rapid review of various alternatives, he sums up: "The problem which faces us can only be solved by the work of the invalided, and that work must be methodically organized. It is a duty of humanity and of gratitude which France must fulfil; it is also an absolute necessity on its economic and moral side."

Dr. Bourillon points out, as does Dr. Deltenre, that the working force of the nation, decimated by the war, must be restored as far as possible by making as many as can be of the invalided economically productive to their fullest capacity. Again, from the social point of view, it would mean that grave difficulties would confront us if these splendid victims of the war were to be exposed to the temptations and dangers of a prolonged period of idleness, unworthy of them. It is our duty to make them understand that if society owes them a debt, they in their turn, must offer to their Motherland after their

heroism and their sufferings, that which remains of their strength, and as far as lies in their power, the ability and the will to co-operate in the economic rebuilding of their country.

In order to attain this end, there must first be a preparation for the moral attitude of the invalid. This is necessitated by his particular state of mind, which is somewhat prejudiced, and it seems necessary for us to dwell for a moment on the causes and consequences of this condition.

All are not immediately willing to take up some work; far from it, and this is a tendency, the consequences of which are to be feared as much for themselves as for the State. It is all the more necessary to fight it, as evil counselors, profiting by the disarray in which the souls of these peasants and workmen are plunged, have begun their disastrous work. To the question which so many of the invalids are putting, "What is to become of me?" they reply: "Make your claims heard! The State owes you everything, was it not in her service you were wounded?" Even now there is talk of forming a syndicate of the disabled which will be a hotbed of revolutionary movements.

These same agitators are also trying to persuade the disabled soldier that if he learns to exercise a new calling, it will have the effect of reducing his pension, and almost daily we are obliged to assure them to the contrary, for this statement has no foundation whatever. The pension remains absolutely the same whatever may be the amount of the salary earned, even if the salary be higher than that earned by the disabled soldier before the war. These sinister suggestions, these counsels to live a life of idleness and revolt are all the more dangerous as they fall on favourable ground. Our young wounded soldiers, weakened by violent and prolonged sufferings, dangerous operations and nervous shocks, have had their equilibrium rudely shaken and disturbed. Such shocks to their physical organization are bound to re-act on their mental and moral condition.

Add to this their isolation, their natural preoccupation in their own fate and that of those dear to them, and it will explain the kind of inertia, the decay of will power, and the apparent indifference to the future which gives the impression that the majority of them are incapable of ever again realizing the joy of work.

We must here ask ourselves if society, by a lack of organization and by an absolute disregard of the needs and aspirations of these men, is not somewhat to blame for this lamentable state of affairs. Let us have the courage to recognize our faults and do our utmost to correct their effects.

There are many who, realizing the present state of affairs, endeavour with the greatest devotion, to amuse and occupy the sick soldier. They have taken games, they have initiated the invalid into the making of small articles. These pastimes, while seemingly healthy and beneficial, have had grievous results, for true it is, that the best seed when sown in poor soil brings forth but a

wretched harvest. The passion for gambling has been developed among the ignorant, for naturally they play for money, despite the severest regulations to the contrary. Their small labours, which might be such a pleasant way of preparing the mutilated for more serious occupations, have on the contrary often been the means of turning them aside from their pursuit of a real vocation. Having discovered that the small objects which they have manufactured and have sold for a price far and away above their true value have brought them money, they have continued to live in this way expecting always to be kept on half-pay.

What was intended as an encouragement towards training has become a premium on idleness.

The public in its blind enthusiasm, has committed unpardonable faults towards our brave men. Many people have found no other way of showing their admiration than by keeping them supplied with liquor, the heart-breaking consequences of which it is easy to understand. With the best possible intentions, many well-meaning persons, by their mistaken generosity, have helped to inculcate habits of the worst kind in persons whose lives have previously been simple and upright.

The peculiar mental condition of the disabled renders him a prey to a number of evils, and a large part of the responsibility rests on the shoulders of the public. But we must be indulgent towards the weakness of our heroic defenders, and have confidence in them. When healthy red blood once more flows through their veins, when they have escaped from harmful influence, and once more find themselves amidst familiar surroundings, in the bosom of their families (which seems to be the main desire of the majority) and finally, when they find themselves facing the reality of things, they will understand the necessity of completing by work the resources that their pensions will assure to them and then these brave soldiers will become peaceful and industrious workmen. Proof of this is already in our possession, for it is chiefly from amongst those who have been placed on half-pay and returned to their families, that the ranks of the labourer and apprentice are recruited. Nevertheless we must institute an active propaganda in order to enlighten the minds and sustain the weakened wills of the convalescent, so that when cured of their wounds, they may again take up real life. Every delay in carrying out this suggestion increases the chances of seeing them overcome by the evils of indolence.

We shall not be able to convince all the disabled of the necessity of work, and we shall doubtless see, in the course of time, that all too many of our unfortunate cripples are destined by their own fault to a life of idleness, to poverty and its miserable consequences. We must be careful, however, that this latter class shall not be able to reproach us with having abandoned them at the moment when our advice and protection would have been indispensable had they realized it.

Let me add that all propaganda must be accompanied by sound proposals and a speedy réalisation of them, for, after having recommended work to these good citizens, we must not let it rest at that, but, when they demand it, find positions for them; otherwise the results may be extremely disastrous.

The invalid must not be practically *thrust* into the workshop, before an examination is made as to whether his physical condition will allow of his following the proposed trade. In fact, there are very few wounded who should enter the workshop before being subjected to a functional readaptation, which is destined to bring their productive capabilities to the maximum. As in the case of the mind, so with the body, it must be prepared beforehand for the work.

For example, a stump, incapable of supporting a prosthetic apparatus must be reoperated upon; a damaged tendon or nerve may necessitate a delicate suture in order to reunite the severed ends; a disabling scar must be removed, a splinter taken away, etc. This is the work of the repairing surgeon, and of the orthopædist, who, thanks to our skilful operators, are daily achieving veritable miracles.

In the medical world, physiotherapy by massage, electricity, medical gymnastics, mechanotherapy, baths, douches, etc., intervene with no less efficacy in the healing or in the amelioration of paralysis (so common), ankylosis, muscular atrophy, or other consequences of wounds received in the war, by which the functions of members to all appearances sound and healthy are so greatly altered. This readaptation is of considerable importance, as much from the moral point of view as from the economic for by increasing through active and intelligent therapeutics each invalid's capacity for work, we find a very notable diminution (1) in the effort which they must make to learn and exercise a trade, and (2) in the amount of pension with which the state is charged. In the words of one of our greatest surgeons, "millions and millions will thus be saved in our future budgets."

It is for this purpose that our Army Medical Corps has established centres of functional readaptation, and one cannot congratulate them enough on this very excellent enterprise. There is every reason to believe that this same corps will speedily accomplish an increased manufacture of prosthetic apparatus with which we should like to see all our mutilated soldiers provided.

It is to be greatly regretted that public opinion and the invalids themselves, have been influenced perniciously in regard to these artificial limbs, by the press and by the clever advertisements of French and American manufacturers. If credit can be given to many of these statements, nothing is simpler than the replacing of an absent member by an artificial one, and many claim to have seen a man amputated from the thigh, thanks to a leg (manufactured by X.) run, dance, and ride with ease. No one dreams that the appearance is deceptive, and that that which may be true for an amputation below the knee is not so for an amputation of the thigh, and that though an apparatus applied to

the forearm may permit of many movements, these would be impossible if the arm were amputated near the shoulder. Unfortunately, faced with this interested publicity, our mutilated have believed in a miracle, and they have awaited with impatience the ideal apparatus, which will fully restore their activity and dexterity. They have poured contempt on the simple apparatus that the State, affected itself with this popular movement, timidly offers them. A number have received these famous jointed artificial limbs with outcries of joy for the first few days, only to be succeeded by bitter disillusionment, and many throw envious glances at their comrades who are provided with the simple appliances. We are not surprised at these happenings, for we have seen many amputated civilians consecrate their first earnings to the difficult acquisition of these brilliantly advertised jointed artificial limbs, which they have afterwards relegated to the bottom of their cupboards, having once more learned that all that glitters is not gold.

We have come across men who have been amputated from the shoulder, who wept because whilst arrayed in beautiful complicated artificial limbs, with a wealth of hinges, springs, and hooks, these same limbs hung lifeless by their sides, "Never," said one of them, "have I been so painfully conscious of my disability till I tried this arm." Needless to relate, he never wore it again.

Some of our invalids have experienced a bitter disillusion since their début into a new life, and this could have been avoided by inspiring them with the hope, which is in fact the truth, that for the moment, the only solution which is speedy, practical and economical, consists in providing them with the simplest and lightest apparatus, but later when their stumps have taken a definite form, which is only after an interval of some months, and when their own experience shows them in what particular way the first apparatus is at fault, we may correct these defects, and provide them with appliances more adaptable to their needs.

Let us recall the surprise of people who, on visiting the schools of the disabled, expecting to see them perform marvels of skill by means of prosthetic apparatus, were astonished that the reality was so far removed from their expectations. Experience gained in the Scandinavian workshops, and elsewhere, prove that little is to be expected from these complicated machines.

I do not wish to say that one should discourage research nor despise simple apparatus which, when well made and properly adjusted, will render great service to particular cases, but one must not expect impossibilities from them. We recognize that such appliances exist, and we hope to discover for all the badly amputated, such as those who have lost both hands or arms, suitable apparatus to enable them to perform the simple actions demanded by life, and even the exercise of some trade which is remunerative.

Special apparatus are desirable above all for those invalids who by their use will be enabled to resume their former occupations.

The essential aim should rather be to enable the majority of the mutilated to attain to as high a productivity as possible. This will be the more easily achieved in the great majority of cases, by utilizing in a trade rationally chosen, the intellectual faculties and the remaining members of the mutilated man, rather than by trying, at any cost, to force the infirm member to play a rôle which, while making the disabled man a subject of curiosity, will itself be of indifferent value.

For example, one cannot help thinking, when contemplating a carpenter, who is laboriously planing with an artificial arm, that it would have been wiser to have found him a profession which would profit by his intelligence and by the arms and legs remaining to him, and have made him either head of a timber yard, by developing his instruction, and giving him some notions of drawing; or a postman, a bookkeeper, a caretaker in an office, etc. One would have less occasion then to fear that, discouraged by the insufficiency of his wage, and the trouble he experiences in the exercise of his trade, he might abandon it and find himself without hope in life.

We have only spoken up to now of prosthetic apparatus, that is to say of those articles which are destined to supply substitutes for absent members, but another class of orthopædic apparatus exists, namely, that which is applied to crippled members. The recent labours of our surgeons have proved that there is much to hope for from this science. Its rapid development seems inevitable in face of the innumerable cases of paralysis, and of ankylosis, and contractions, the sad consequences of which such appliance will diminish.

Never was the time more propitious for the activity and ingenuity of the surgeons and constructors, but we are persuaded that the amputated themselves, or those who employ them, urged at every turn by necessity, are in a better position to discover what one might call the "sleight of hand," those tricks or devices which will help them to practise their trade.

The handicaps under which the invalids labour on their entry into a workshop, may be usefully overcome by change in their tools and the machines and in the position usually taken by the workman, etc.

Before finishing the consideration of the question of prosthesis, let me direct your attention to the great drawback to apparatus with hinges and springs; namely, their fragility. A few weeks after the amputated man is provided with such an appliance it is in need of repair. It is evidently not wear and tear which has rendered it useless, but its fragile mechanism. What will happen when certain invalided soldiers who have returned to their distant village are obliged constantly to send to the centres of manufacture, for repair, that apparatus which is indispensable to them for earning their living? Must they wait during the customary administrative slowness for weeks, and per-

haps months, until this apparatus is returned to them with the prospect of seeing themselves a little later on again deprived of it. Who is to feed them, their families, during this interval of waiting? From the point of view of their work we must see that they are provided with apparatus strong and serviceable, even if crude, if we can use this word without giving the impression of an article lacking in careful manufacture. Their simplicity will place these appliances beyond the need of repeated repairs, and will allow of their adjustment by the carpenters, saddlers, and blacksmiths of the village. May we be permitted at this juncture to suggest a plan that, with certain reservations, seems to simplify so engrossing a question for the future as that of the repair of the apparatus furnished by the State. If the latter (and I believe, force of circumstances and acquired experience will necessitate it), furnishes in general, as we suggest, only simple apparatus capable of being for the most part repaired by local workmen, then why not leave the invalided to have these repairs executed himself, in consideration of an annual sum being allowed him for the purpose? Both the State and the invalids would gain by this procedure; the former in point of view of expense, the latter in point of view of rapidity of execution.

CHAPTER 2.

Let us return to our invalids. We find them ready to work, rendered capable of doing so by the application of the soundest therapeutic methods of re-education, and the most practical prosthesis. What is now to become of them?

Many, fortunately, dream of resuming their old occupations, and are anxious as to the manner in which that particular kind of work and their existence may be adapted to their physical condition, thus proving that they are filled with good intentions and an ingenuity which augurs well for the future. There are, above all, peasants who evince the most ardent desire to return to the former scenes of their labours, and what is very interesting and worthy of being encouraged, many of the invalided who were formerly workmen in towns, manifest the same keen desire for the country, as in their distress they appreciate more the sweetness and the economic advantage of a rural life.

A certain number, and unfortunately it is the greater number, regard the State first as their Providence, and look to it to supplement, by conferring upon them subordinate positions exempt from worry and hard work, the livelihood which their pension is insufficient to assure them: but they are for the most part cruelly disillusioned. Others hope to obtain the same result, by means of one of those trades, such as peddling, which are often nothing more nor less than disguised begging.

Finally, there are many who, without other resources but the small temporary allowances granted by the Minister of War, seek to earn money at

once, and this is perfectly natural on their part, especially if they are inhabitants of the invaded country, whose situation is sometimes so tragic. The finding of some situation for them is relatively easy, as so many people are interested, but it is not without its dangers.

It is not sufficient merely to inform a man of a vacancy, it must at the same time be known if his physical, intellectual and moral powers are adapted to the position he is offered, in order that he may not be exposed to the risk of a speedy dismissal. Those desiring to take up the work of placing men in suitable and permanent positions must above all remember that all remunerative work which can be performed by the first-comer, is very often precarious, unstable, and offers scarcely any security for the person engaged in it, and he may be dismissed with the same indifference as he was engaged. It seems that the institutions which are being established on all sides with the purpose of becoming bureaux of employment, which will act as intermediaries between employers and employees, leave the business of coming to an understanding to their clients on both sides. This understanding is easily reached at the present time, for often the necessity of both parties obliges them to make every concession demanded. The engagement is made in a hurry and, as has previously been said, often has unfortunate results. What will happen in some months, or some years, when the war being ended, things will gradually have become normal? Is it not to be feared that employers will become more difficult to please, and that lack of skill, and functional disability of the employee will appear intolerable to them? What will become of the invalided if a strike in the factory leads to its being closed, or, if the owner whose property he cared for, dies? What will become of him, ignorant of all those trades which would allow of his easily procuring a position?

In such circumstances, a workman without a profession, but of sound health, may become an excavator, an unskilled labourer, working casually from day to day; but the other, deprived of his arm or his leg, what will become of him, more especially should he be at the workman's critical age, when his hair is beginning to whiten? Let us beware of forcing the invalided into any position, however enticing it may at first appear, unless it guarantees a permanency, for it would mean exposing them more or less to the risk of speedy poverty, and only prepare trouble and revolt for the future.

The only way of avoiding this danger is by giving to the invalid from now on, a real trade, one, of course, which will be most adaptable to his aptitude.

Let us consider how this result can be attained with the huge number of invalided who are not capable of resuming their former occupations. The undertaking is a vast one, most arduous and complex, and on every hand we must consecrate all our zeal to it.

Private persons and organized associations have alike given proof of their marvellous devotion in dealing with the question of housing and caring for our

valiant defenders. We may still expect from them both the moral and financial support which will make of our invalided honest workmen and firm supporters of French industry and agriculture. A magnificent start has already been made and it remains only to encourage and to regulate it, so as to co-ordinate and concentrate our efforts towards a single goal.

On the State first falls the duty of largely participating in the vocational instruction of her wounded sons. Shall she be herself their own educator, or rather should it rest with her to encourage and support enterprises having this end in view? We believe that in both cases she should intervene: we cannot deceive ourselves into believing that unaided she will be able to support the considerable and inevitable expense of a work of this importance. Can she refuse any proffered aid when it concerns the reconstructing of an essential element in the economic and moral power of France?

CHAPTER 3.

It would be rash to draw up a limited list of the trades which can be taught to the mutilated, for often an ingenuity and unsuspected skill allows of their doing work which at first sight seemed to be impossible.

The crippled whose upper limbs have been injured are, with the blind, the victims most to be pitied.

The unfortunate one-armed men feel their misfortune deeply, and there is not one of them who will not welcome, with gratitude and eagerness, the offers which are made to him to enable him to forsake that inaction to which many believe themselves irretrievably doomed. What can be done for them? We have shown that the greater number of the invalided prefer subordinate positions in public or private businesses, and it is not easy to dissuade them. But in the case of those deprived of hands and arms, this desire is justified and is explained by the difficulty or impossibility of their practising the greater number of the manual arts. By completing their primary education, which has been often little developed and is sometimes altogether negligible, the greater number of these subordinate posts will be accessible to them. It is touching when an unfortunate man, deprived of an arm, confesses, with downcast eyes, that he knows neither how to read nor to write, and it is an impressive sight to see these brave men, wearing on their breasts the glorious insignia of their bravery, spelling out like little children, with an air at once confused and stubborn, the letters of the alphabet. Their place is not in the vocational schools, but in the primary schools, and it is necessary that a huge organization, placed under the authority of the Minister of Public Instruction should remedy this sad state of affairs. Why not establish primary courses in all the convalescent homes, which will gather together all the illiterate of the establishment for a few hours each day? Some local man, a teacher, taken by preference from the ranks of the

wounded (there are more than 350 in the Primary Corps of the Seine), a few school supplies, and you have the means of dragging these unhappy one-armed men from the abysses of ignorance. Provided with sufficient elementary education, the invalided with one arm may easily be placed, either in public offices, in which, it is only too evident, posts which they are capable of filling must be reserved for them, or in private concerns as clerks, or as door-keepers, messengers, etc.

A particularly interesting profession, although at first sight it does not seem a very suitable one for them, is that of industrial drawing. An experiment, carried on for several months, has proved that in a relatively short time, many one-armed men may become excellent designers for machines, furniture, architecture, plans, etc. A very great number of industries, such as that of furniture-makers, toy-makers, carriage-builders, glass-making, optics, photography, etc., remain open to them on account of the division of labour. Provided, on the one hand with prosthetic apparatus both simple and practical and aided by a clever modification of tools, and given on the other hand plenty of goodwill on the part of the employers and employees, we may rest assured that not one of our one-armed soldiers will fall into poverty.

The same conclusion may be applied to invalids who have their lower limbs amputated; but for them the problem is extremely simplified, for few manual trades are absolutely closed to them. Despite this fact, the greater number of them wish for office work, and it is not easy to make men who formerly were mechanics, understand that in aspiring to apparently higher levels, they risk falling into the pitiable category of the unclassified. Naturally one should encourage, even inspire the sentiment, which very fortunately has spread among the invalided, that they must profit by any opportunities of re-education which may lead to a position somewhat higher in the social scale than the one they have been forced to abandon. But the advantages and beauty of manual labour must also be pointed out to them with patience and clearness, and they must be persuaded that there is no degradation in passing from one trade to another, if the latter will procure them a sufficient and independent livelihood. The choice of a trade is always very perplexing to the invalided and this is the moment to intervene with explanations and directions and guidance. Before making the decision, they should be examined and carefully questioned, the examiner bearing in mind the importance of it, since upon this examination and the decision which will be its outcome, the entire future happiness of their existence may depend. First of all there will be the visit of the doctor, who will examine minutely and carefully the disability of the patient, its causes and consequences, both immediate and remote, from the point of view of work. Then the general physical condition (respiration, circulation, nervous system, organs of the senses, etc.), in their relation to the professions which at first sight may be regarded as accessible for the candidate.

Then will follow an investigation as to his former trade, (for any advice as to his future should take into account and profit as far as possible by the skill and knowledge he has already acquired), as well as his tastes, his aspirations and his former personal surroundings, from which it is usually best not to uproot him. The amount of his education and his intelligence is also taken into account. In a word, nothing must be neglected in order that his physical, social, intellectual and moral experiences, even in their smallest details, will afford light and aid to his advisers.

Candidates must be inspired with confidence by being addressed with simplicity and cordiality. Many are distrustful or intimidated, and for that reason it is difficult to penetrate their thoughts. There are some who, seeking to profit by the immediate advantages offered by the training institutions, secretly resolve to break away at the first opportunity. The latter are sufficiently numerous to make it necessary for one to be continually alive to attempts of this kind.

The examination over, the examiner passes in review the professions which may suit the candidate. Keeping in view his aspirations, his attention is drawn first to the advantages and physical and moral security of those trades which can be practised at home or out of the workshop, especially those to which he can as easily be adapted, notwithstanding his disability, so that his output may be at the maximum. Inquiry must be made into the special trades of that part of the country where his home is situated, trades connected with the nature of the country (mountainous, flat, on the sea-coast, mining, etc.), or the important industries (clock-making, shoe-making, basket-weaving, toy-making, etc.). It will therefore be well to direct them towards those schools or organizations in those districts which will most naturally provide for the local needs.

Those trades which are least crowded will be the best to encourage them to follow, so as to come to the assistance of those needing workers, and also to permit of the re-trained man being easily placed.

The candidate nearly always asks how long the training will last in the trade he is advised to follow. He must be answered as exactly as is possible whilst bearing in mind the nature of the profession, his intelligence, his health, his manual skill, his zest for work, and other conditions peculiar to each individual.

He must also be reminded that his training may keep him in the Training School for a considerable period while carrying out the idea which directs its organization. Several systems may be considered but the following is the one which may be regarded as preferable. As soon as an apprentice, provided with a pension representing, for example, 2 francs a day, is by means of strict training, capable of earning in addition 4 or 5 francs, he will be able to support himself. At this point, he is in a position to leave the school and take a situation with an employer. But as his vocational education would not be complete, his

employer must be informed that whilst making use of the ideas acquired by the apprentice in order that he may earn a salary, he must undertake to allow him to complete the course of studies which will make a thorough workman of him. This method, whilst limiting to the minimum the time of the training in the school, will permit a greater number of the invalided to benefit from the instruction. The rapidity with which the mutilated have progressed in their instruction, both in manual trades and in courses of French, drawing, etc., has provoked the admiration of visitors and is the joy of the heads of the workshops. They bring to their studies a good will, an attention, and a skill in overcoming the difficulties that proceed from their infirmities which should encourage and reassure us as to their future. One can not compare the progress these men make with that of ordinary young pupils, and it is rare that in the common trades of saddlery, shoemaking, tailoring, tinsmithing, etc., they are not ready, although not yet perfect workmen, to earn their living at the end of six months. This period is even shorter for several other specialized trades.

The candidate's decision is often prompt, above all if he is promised the rapid training which the greater number of them desire. However, he would be wise to consider it carefully and, if he can, remain with his family. It would also be advantageous for him to visit various workshops, in order that he may for himself take account of the trades which are taught.

CHAPTER 4.

In looking ahead, certain questions must be touched upon here, although they have no direct bearing on vocational re-education:—

(1) Conflicts between the sound and healthy workmen and the disabled. We can avoid this difficulty by directing the disabled towards trades in which they themselves can become small employers.

(2) Conflicts between the disabled and women.

(3) The question of accident liabilities, etc., interests the invalided as much during the period of re-education as when they enter employment. They are less able to guard against accidents than men in full possession of their limbs and faculties.

We cannot close without dwelling for a moment on a point of such great importance that unless a remedy is soon sought for it will ruin all the efforts that are being made to place the invalid in that honourable position he has the right to expect in the coming future.

It is well known with what ease civilians who are disabled acquire the habit of intemperance, hence a physical decline follows on the heels of a moral decline. This same danger, which is most to be feared of them all, threatens our invalids. No precaution, no preventative measure must be neglected in order to arrest this evil.

Patient teaching must be brought to bear on each one who is inclined to drink, but one must not hesitate to inflict severe penalties on those who give rise to repeated scandals. Toleration would only appear a weakness and would prove a grievous example.

Reading-rooms with newspapers, games, amusements, meetings, lectures, etc., should be open to them to entice them away in their leisure hours from the wineshops and unwholesome pursuits. But these isolated endeavours, whatever value they may have, will not suffice unless energetic and universal measures are undertaken to complete the work.

Dr. Bourillon goes on to state that the war has let loose this scourge, but that revolting scenes have been the result of provoking a too violent anti-alcohol attitude in the mind of the public.

He closes with these words:—

• “We have seen our glorious wounded return gasping from the scenes of battle. The soul of our nation bursts forth ardent and unchangeable from these bloody rags. Physical and moral suffering may for a time have the effect of producing in them that crisis of despair which we have spoken about with such sorrow, but their soul will awaken in them and once more they will be ready for noble and fruitful labour. Let us aid them devotedly to resume their task. Let us spare neither our counsels nor our trouble. And if at times we feel our strength weaken, let us think of those who have suffered for their country—of those who have died for her. Our task will appear to us easy and we shall prepare for the radiant future of victorious France.”

5. PROVISION FOR WAR CRIPPLES IN GERMANY

BY DR. DOUGLAS C. MCMURTRIE.

Editor, " American Journal of Care for Cripples."

A report of an article in the " Medical Record " of July 31, 1915.
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PROVISION FOR WAR CRIPPLES IN GERMANY.

(By DOUGLAS C. McMURTRIE, *New York, Editor, American Journal of Care for Cripples.*)

Coincident with the outbreak of the European war there was inaugurated in Germany an extensive system to provide, surgically and economically, for wounded soldiers crippled in action. During the past decade there had been built up a national organization dealing with the care of eripples—mostly children—in time of peace, and the first reliance was placed on the adaptation of existing agencies to meet the needs of adults in time of war.

Hostilities were declared on August 1, 1914, and on the 13th of the same month the Empress addressed to the president of the German Association for the Care of Cripples (*Deutsche Vereinigung für Krüppelfürsorge*) the following communication:—

“ Her Majesty, the Empress and Queen, expresses the wish that the activity of the German organizations for the care of eripples should not be hampered by the events of the war, but that they should, on the contrary, contribute their share toward the alleviation of present hardships. We should strive to prevent diminution in the scope of work by institutions for eripple-care, and must aid them to extend that work in certain directions. For instance, needy children, who are not at present being cared for, should be received into the institutions in order to relieve their mothers of undue burden.

“ It also seems desirable that these institutions should undertake the orthopædic care of the wounded, as their entire equipment fits them for such work. Their facilities could also be utilized to restore the wounded to their former industrial or professional status. . . .”

The association immediately issued to its members a questionnaire calling for statements as to the number of beds available for the war eripples, and details regarding the equipment and facilities of each institution. In an accompanying communication it was pointed out that each institution would have to meet the situation individually—some would have to crowd their children and discontinue classes, others might find an unoccupied building or barracks which could be used as an annex, still others might place some of their children in the care of neighbours or friends to make more room for soldiers; while, finally, in some cases benevolent friends might enable an institution to erect a special building which would remain useful after the close of the war.

The questionnaires were filled out and copies sent to the military and civil authorities.

The practical organization of measures for the care of war cripples fell to Dr. Konrad Biesalski, secretary of the German Association for the Care of Cripples. In order to establish the methods and principles of the work, Dr. Biesalski made a round of visits to the various institutions throughout the empire, a series of meetings being held at the different places visited. As a result, the following plan was evolved:—

The scope of the work falls within two categories, [a] medical care (orthopædic and surgical treatment) and [b] social care (teaching of trades and securing employment).

As regards medical care, in order that the war-invalid may be enabled to resume work, the curative resources of surgical and mechanical orthopædies must be called upon, so that the maximum of physical recuperation may be achieved. Whenever possible, all fresh transports of wounded soldiers should first be concentrated in a large hospital which should serve as a central bureau for neighbouring hospitals. Thence—granting adequate means of transportation—the soldiers, classified according to character of wounds or disabilities, should be transferred to other hospitals, particularly for treatment by specialists.

Experience has shown that a great variety of motor disorders and much subsequent treatment can be prevented if, during the healing of the wounds, the limbs are made to assume natural and reasonable attitudes, and simple exercises are prescribed. Another important prophylactic measure is the high development of bandage-technique for purposes of transportation. The cases in the central hospital which will profit from treatment of an orthopædic character should be classified by an expert, and sent to suitable institutions.

When the orthopædic surgeon and specialist in the care of cripples from any district has been called to the front, his release and return must be obtained by the national association. This has been done in many instances. It cannot be questioned that the work of an orthopædic specialist at his civil post is of more value than his services in the field.

The cases for particular consideration are those of wounds which lead to serious motor obstructions through paralysis, the tearing of ligaments, stiffening of joints, and amputations. The best place for such patients is the institution for cripples which has at hand facilities to cope with the medical as well as with the social requirements of each case.

It was the unanimous opinion that these special institutions where soldiers would have to stay for extended periods should be preferably outside of large cities, in which latter it is practically impossible to preserve discipline. It was decided that in any case there should be an officer detailed as military director. It is imperative that the soldiers should not be sent to their families, as at home

they would naturally neglect all physical exercise and, before long, become apathetic and useless. The military authorities must keep the men in an atmosphere of discipline for their own good. Towards the end of the treatment, the soldier may be given a leave of absence to return home for one or two weeks, but he remains a soldier, and as such must return to the hospital in order to be assigned to the work which has meanwhile been secured for him.

From this point on, there comes into prominence the second important feature of the work—social care. The cardinal requirement to success in this field is the education of the public to the idea that the cripple is not condemned to perpetual idleness, but that even a badly crippled individual may be taught to work and earn his living. This can best be accomplished by:—

(a) Continuous propaganda in the daily and technical press, to which end the efforts of writers should be directed in order that the question may be clarified from all possible viewpoints.

(b) Through lectures and visits to institutions for cripples. For illustrated lectures the lantern slides of the German Association for the Care of Cripples are available.

(c) Through advice to and persuasion of the wounded in hospitals, who, immediately upon their reception, should be made to understand that they will be enabled to continue their former occupations. Hospitals can be advised in this connection by the military authorities, and instructive literature can be supplied, as many hospitals are not acquainted with the technique or care of cripples. Medical organizations and the Red Cross can also be instrumental in this work of enlightenment.

(d) By an exhibit demonstrating the principles involved. Also by the preparation of an illustrated pamphlet for broadcast distribution. The workmen's organizations and insurance societies have stated that with the assistance of an illustrated essay of this kind their success would be assured, and they have undertaken to explain its contents to representatives of labour and to distribute it to employers and employees.

Public spirited employers will be glad to offer their former positions to old employees when they will return to them as cripples from the war. There will also doubtless be a deficit in the labour market after the cessation of hostilities. The largest employer, however, is the state itself, which must set a good example and provide work for those who have become cripples in its service. The railroads have long since adopted the practice of retaining the services of those injured in their employ, and the military organization has done the same. If each branch of the state machinery provides only for its own war-victims, thousands will be taken care of. The state can, however, go further and, when placing orders with civil concerns impose the condition that a proportion of the labourers employed be war cripples. But all must first be taught that the cripple is able successfully to pursue an occupation.

The cardinal principle remains that the cripple must return to his old place, employment, and occupation, and thus be naturally assimilated by the community. Under no circumstances should the cripples be gathered in large colonies. The attempt has already been made to segregate them in colonies of from forty to fifty families, located near small cities, and provided with workshops. But this plan has been universally condemned as the colonies bear the stamp of the unusual. Occasionally it may prove advisable to place an individual cripple in an already existing colony, but in no case should this be done on a large scale. As soon as the conviction becomes general that the cripple can do work, the labourer, himself enlightened, will find no difficulty in resuming his former occupation. Employers will willingly allow for a period of partial incompetence pending adjustment to the new conditions of work.

It is important that the cripple continue in the same or in a closely related occupation, where his former experience will stand him in good stead. When it becomes imperative that the occupation be changed, the wisest course will be to find in the cripple's home town a teacher (manual labourer, shop manager, restaurant keeper, etc.) who would accept the invalid as an apprentice, possibly for a compensation to be paid by the military authorities or from private sources. •

The establishment of separate workshops is inadvisable, according to the unanimous opinion of all counsellors; the method is expensive, open to the danger of "crowd suggestion," and would be hampered by lack of experience in the difficult art of teaching cripples—even more difficult with adults than with children. Furthermore, the 54 German institutions for cripples comprise 221 shops for industrial training, in which 51 male occupations are now being taught. In case of necessity these could be enlarged, and the required experience would there be available.

As to the method by which the appropriate work and position for the individual shall be ascertained, the cripple should first be transported to his home town, not to his family, but to an orthopaedic institution in the district. By gradual exchange each institution will thus have an increasing number of cripples from its own locality. While the treatment is still progressing the organization for cripple-care connected with the hospital will find employment, in accordance with the wishes and capacities of the individual. This function should be the duty of a small committee consisting of an orthopaedic specialist, a representative of the social care for cripples (minister, teacher, etc.), and a representative of the local labour organization.

In case the attempt to find employment through the city or district labour bureau fails, the next higher labour bureau will be advised, since the larger the section controlled by the bureau the greater is the chance for securing suitable employment.

There is in Germany to-day a network of labour bureaux distributed according to provinces and states and controlled from a central office. Wherever there are gaps the district administration will have to step in. Separate departments for partially incapacitated labourers exist in a few of these labour bureaux. Such departments will now be necessary and may perhaps become permanent. The establishment of special labour bureaux apart from the existing system is not advisable.

When the individual has secured employment, the institution with which he was connected should keep track of him, so as to be in a position to assist him further if necessary.

As previously explained, these principles were developed by the German Association and by Dr. Biesalski as a basis for the work. These methods are now being worked out by the individual organizations.

Beginning the middle of last December, there was held in the Reichstag, Berlin, a general exhibit dealing with the care of the wounded—the *Ausstellung für Verwundeten und Krankenfürsorge*—in which there was an important section dealing with provision for war cripples. There was exhibited orthopædic apparatus, and articles and pictures showing what badly crippled individuals can do. This exhibit was later sent to other cities. In connection with it there was held in Berlin on January 13, 1915, a great meeting to discuss “*Kriegschrüppelfürsorge*.” Dr. Biesalski spoke on the principles of the work. Professor Schweining described the arrangements perfected by the army authorities. “The military authorities not only seek to heal but also aim to apply measures to avoid the unfavourable results of wounds; arrangements for this had already been provided in time of peace. In part special sections for orthopædic work were established or contracts were concluded with private institutions. A large number of orthopædist have been secured as consultants for numerous hospitals. For instance, in connection with the *Garde-Korps*, 24 medico-mechanical institutions are at the service of the military authorities. Also, arrangements have been completed with 107 health resorts for the after-treatment of the wounded and sick. Artificial limbs and apparatus are procured and renewed by the military authorities. Special institutions have been established for the one-armed and the blind, and others will follow. Advisors with reference to trades are attached to the hospitals for those who no longer can follow their previous trades or think they cannot. Finally, he spoke of the special pensions, as the field allowance and the increase of pay for mutilation will remain as permanent compensation for those crippled in the war.” Kirchner, the ministerial director, also spoke of the general co-operation requisite for success along this line.

An illustrated handbook dealing with the methods and principles of care for war cripples has been issued and is being distributed in large quantities.

This booklet contains a directory listing 138 institutions or organizations concerned in work for cripples throughout the country.

It was estimated by Biesalski that the first few months of the war yielded 40,000 wounded whose motor affections were of so serious a character as to warrant their designation as war cripples. With the continuance of the war, and in view of the fact that with each man are involved several members of his family, it is conservative to say that the interests of hundreds of thousands are at stake in the work.

Organizations and individuals have entered enthusiastically on their tasks. The Kriegskrüppelfürsorge has now reached such proportions that Dr. Biesalski, having given the movement its impetus, has turned over its further organization to the military authorities. In this way the permanence of the work and its uniformity throughout Germany is secured.

It is interesting to note that in the first 800 wounded soldiers under Dr. Biesalski's care, it was found that with but few exceptions—less than 4 per cent—all could continue their former employments.

The care of war cripples is being worked out in various cities. The plan in Frieberg has been described by Dr. Burkhardt. A central organization has been established under the authority of Dr. Rosin. There are three sections. The first, the economic section, is composed of experts on various trades and on labour conditions. On this committee have been appointed two professors of social science, and a practical jurist. Their duty is to advise the individual as to the choice of a suitable employment. The second, the educational section, is composed of the presidents of the trades, commerce, and agricultural schools. They are empowered to appoint to teaching positions. The third, the clerical section, is under a competent director.

The practical results of this system are shown in the following cases:

(a) Paperhanger, 24 years. Amputation of left leg. Has good artistic ability and has been placed in trade school, where he is being trained as a decorative artist. His former employer has agreed to re-engage him.

(b) Baker. Left foot crushed. Is being instructed in bookkeeping and commercial arithmetic. Will enter grain-dealing trade and manage bakery of a deceased relative.

(c) Farmer, 23 years. Loss of right arm. Is being trained in agricultural science and in writing with his left hand. Will take charge of the business end of the agricultural interests of his brother's farm.

The work is slow, and final results will not be forthcoming for a considerable time. But the manner in which the problem is being met is unquestionably sound.

6. PSYCHIATRIC TREATMENT

BY DR. C. K. CLARKE.

Dean of the Medical School, University of Toronto.

A memorandum, prepared for the Commission, on the treatment of mental and nervous disorders by modern methods, with suggestions as to the facilities which might be provided in Canada for returned soldiers suffering from such maladies.

PSYCHIATRIC TREATMENT.

By DR. C. K. CLARKE, Toronto.

The question of caring for returned soldiers who are suffering from mental and nervous trouble, has engaged our attention in a marked way since the actions of last year. New conditions have arisen since the use of high explosives and the mental strain during action seems to be of the most severe character, with the result that we encounter numerous cases of mental stress requiring special treatment.

These cases are to be found in convalescent homes, general hospitals, private houses and asylums. As far as convalescent homes are concerned, they are unsuitable in every sense of the word—patients do badly and conditions are not favourable for their recovery. In general hospitals equipment is not suitable to provide proper care and attention and the same remark applies to private houses. Cases of marked mental trouble, although curable in the majority of instances, will have to be sent to asylums under present conditions. This is a tragedy and most unkind because the moment they reach hospitals for the insane (which in Canada are not equipped in the most modern way) they become, in all probability, one of a herd rather than individuals to whom special treatment must be given. This is in no sense a reflection on the institutions, but is the outcome of conditions which are very impossible at the present time. It is wrong to let these men bear the stigma of being certified inmates of a hospital for the insane.

Modern methods demand that recent cases of mental disease should receive just the same attention that cases in a general hospital secure. What should be done is to acquire a house of suitable structure that will give accommodation for, say, fifty patients and necessary staff—or the necessary staff might be housed in a separate building—which would be a better arrangement as it would enable nurses to get proper rest—a most important thing. This hospital should be equipped with the most modern scientific, hydro-therapeutic, and electric apparatus demanded in the care of such patients. These buildings should have a suitable amount of ground about them so that out-of-doors treatment might be provided, and the hospital itself should not be too great a distance from some large public hospital where necessary apparatus and laboratories are to be found, to carry on the scientific investigations which are absolutely necessary under the conditions referred to.

Those who have the supervision of patients who are to be treated in this psychopathic institution should have long experience in the care of mental cases, and among the medical profession there would be no difficulty in finding men who would be glad to "do their bit" gratuitously.

Nurses, too, should be specially qualified and should be women of the highest type, as on the sensible nursing of psychiatric patients the outcome largely depends.

To my mind it is only fair and just that the provisions asked for should be made, as these men who suffer from mental and nervous troubles ought to be pitied and assisted just as much as those who have had physical disability. Outside of that the fact that the greater proportion of these patients could be restored to health should be, from the dollars and cents standpoint, an argument strongly in favour of the contention made.

Fifty beds should meet all of the requirements and the equipment will not cost an extravagant amount of money, if sensibly done. If necessary, a very complete estimate of the outfit can be supplied at very short notice. The estimate of fifty beds is made on the basis that this number will meet the requirements of the Canadian Army as at present constituted, and is based on actual figures easily obtainable.

C. K. CLARKE.

NOTE.—The Commission has already given the matter of which Dr. Clarke writes its careful consideration and has made arrangements to provide a properly-equipped institution for sufferers of this type.

7. TREATMENT OF CANADIAN WOUNDED IN ENGLAND

BY SURGEON-GENERAL JONES, C.M.G.,

Director of Medical Services.

While the final proofs of this Bulletin were being corrected, the following letter was received from Surgeon-General Jones, Director of the Canadian Medical Service in England. It is in reply to inquiries made on behalf of the Commission as to the therapeutic treatment of the Canadian wounded while in England. It will be noted with satisfaction that the system employed by our Medical Staff in England is the same as that established in those hospitals which have been reported on most favourably.

Surgeon-General Jones advises the fitting of artificial limbs in England. The Commission was led to decide on an establishment in Canada for artificial limbs largely because the Roehampton establishment was overcrowded. At the last report, over 2,000 were waiting for attention there. Both Roehampton and Toronto can be used to advantage.

DIRECTOR OF MEDICAL SERVICES,
CANADIAN CONTINGENTS,
CECIL CHAMBERS,
86 STRAND,
LONDON, W.C.,
March 27, 1916.

To J. S. McLENNAN, Esq.,
Commissioner,
Military Hospitals Commission,
22 Vittoria Street, Ottawa.

DEAR MR. McLENNAN,—I beg to acknowledge the receipt of your communication of the 22nd February, which has just come to hand.

The question of the re-education and training of the invalid has received very careful consideration from the Canadian Medical Authorities both in England and in France. A report by Lieutenant-Colonel Mignault has already been forwarded for the information of the Hospitals Commission, and at the present time, Major John Todd, Canadian Army Medical Corps, is in France and is going very thoroughly into this question. When I left him in Paris, he expected to be through and able to submit his report in about a fortnight's time. Knowing Major Todd, I am satisfied that the report will be very thorough, and he will leave no stone unturned to probe the very bottom of things.

In England, in the Canadian hospitals, more particularly, the Granville Canadian Special Hospital, the education of the man is begun very early. At the Granville Canadian Special Hospital, the patient is carefully examined by a Board of Specialists, who decide what form of treatment he is to receive. This may be: 1st, Medical; 2nd, Surgical.

If it is the first class, the treatment consists of electrical treatment in all its forms, also Hydrotherapeutical treatment, including Turkish Baths, Steam Vapour Baths, Eau Courante, Needle Baths, Scotch Douche, etc., and also Heat treatment, including Radiant Heat, Radiant Light, and Blue Arc Light.

These treatments are given, as a rule, every second day, alternating with massage, either general or local.

If Surgical, many of the cases undergo a preliminary treatment along one of the above lines, which may or may not be followed by operative procedures.

A staff of Masseurs and Masseuses is employed. The patients are definitely allotted to one of these Masseurs or Masseuses, who treats the case throughout, under definite instructions from the Officer in Charge of the combined treatment Department.

Now, as regards education. The patients are re-examined by the Specialist Board at regular intervals. This Board decides either:—

- 1st.—To change the form of treatment.
- 2nd.—To change from treatment to education.
- 3rd.—To discharge from hospital with certain recommendations.

If changed from treatment to education, the patient is moved to separate quarters, and placed under a definite routine of instruction:—

- 1st—For individual muscle training.
- 2nd—For joint training.
- 3rd—For individual groups of muscles.
- 4th—For general systematic exercises.
 - (a) Gymnasium.
 - (b) Swedish.

The patient is transferred from one group to another as is thought necessary or advisable.

In addition to the above, special Mechanical Exercisers are used, both Active and Passive.

As soon as the patient graduates into the Light Duty Class, he is encouraged to perform work suitable to his disability. This may be:—

- 1st—Hospital fatigue duties.
- 2nd—Arts and Crafts.
 - (a) Carpentry.
 - (b) Machine Shop.
 - (c) Printing.
 - (d) Boots and Saddlery.
 - (e) Splint making.
 - (f) Electrical repairs.
- 3rd—Daily regular marches under Military discipline.
- 4th—Athletic sports, especially outdoor games.

In addition to this the neurasthenic patients are given employment as early as possible in the shape of embroidery, insertion, needlework, etc.

I would not advise the Hospitals Commission undertaking this work in England, as it is being carried out by the Canadian Army Medical Corps in conjunction with the existing local Societies, as outlined in Mr. Dobell's report.

The Blind: As the number of blind Canadian soldiers has not been very large up to the present, and the calculated proportion would not amount to a very large number, I consider it advisable that as much use should be made of St. Dunstan's Home as possible, and therefore arrangements have been made for all blind Canadian soldiers to go there. There is no reason, therefore, why arrangements could not be made in Canada for the subsequent education of blind soldiers. I would refer more particularly to the school for the blind at Halifax, under Sir Frederiek Fraser.

The same would apply to deaf and dumb, of which there will be a few cases.

Tubercular patients: It was long ago laid down in the Canadian Permanent Forces that all tubercular soldiers should be sent to a Sanatorium for six months in order that they may learn how to look after themselves, and not be a menace to the community. This procedure has been carried out in England, and all cases are sent to a Sanatorium in England, unless the circumstances warrant the man being sent back to Canada, in which case the same procedure will be adopted. At the end of six months, each case will be considered on its own merits, as to whether it is desirable to have further treatment, or to have the man discharged and sent to his own home.

With reference to the suggestion about patients being sent for treatment to the baths at Bath, this has been carried out, but we have made arrangements, through the generosity of the Canadian Red Cross Society, for opening a Hospital at Buxton. This we expect to have open very soon, and it will accommodate 300 patients. It will be used for rheumatic cases.

Artificial limbs: My opinion is that the Canadian soldiers should have the best limb obtainable. Arrangements have now been made that all amputated cases will go to the Granville Canadian Special Hospital. The firms concerned at Roehampton will send a representative to this Hospital to take the necessary measurements. When the leg is ready for fitting, the man will be transferred to the King's Canadian Red Cross Convalescent Hospital, Bushey Park, and will attend at Roehampton, which is near by, as an outpatient. When the limb is thoroughly well fitted and the man can move about, he will then be returned to the Granville Special Hospital at Ramsgate, so that we may be certain that our Specialists are satisfied with the limb.

I am also strongly of the opinion that the men should receive their limbs in England before returning to Canada, unless a man particularly wishes to return to Canada without a limb, and in that case, he should sign a definite statement that he was offered a limb in England, but preferred to have it fitted in Canada.

Yours very truly,

G. C. JONES, *Surgeon-General.*
Director of Medical Services,
Canadian Contingents.

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