RECONSTRUCTING CRIPPLED SOLDIERS OF FRANCE.

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The medical and surgical treatment given to a wounded man in a military hospital is only the first step in the process of reconstruction. After his wound is healed and he has received the necessary functional treatment for his injuries or has been fitted with an artificial limb, he may still be unable to take his place in the social and industrial life of the country. His shattered body has no longer the strength required in the only kind of work he knows how to do; the loss of his leg prevents him from standing all day at his old job; he cannot manage his old tools with only one hand. Idleness and dependence seem the only prospect. A pension does not give him what he most needs, for though providing the bare necessities of life, it certainly does not give the selfrespect and happiness which come from useful activity. A disabled soldier has not been reconstructed until he has been made into a capable, self-supporting worker.

It was in France that the need of social reconstruction for the war cripple was first apparent and the means for accomplishing it first devised. An account of French reconstructive methods may therefore have some value at this time when the problem is beginning to crystallize in our country. They were the first to discover an answer to what they call the “problem of the mutilés” in trade training, or—to use the rather clumsy Latin expression which has been as widely adopted as the principle—in “vocational reeducation,” which in plain words is training which will enable a man to earn a decent
living in spite of his wounds in trades suited to reduced physical capacities.

Serious vocational training for the disabled French soldier was first proposed by M. Edouard Herriot, Mayor of Lyon and Senator from the Department of the Rhône, in his article in the Paris Journal, of November 23, 1914. Three weeks after broaching the subject, he opened in Lyon, in an ancient building formerly belonging to one of the expelled religious orders, a municipal trade school for disabled soldiers. Although it then had only three pupils, it grew rapidly, and by May of 1915 M. Herriot found himself obliged by press of numbers to organize a second school. The first, known now as the Ecole Joffre, and the second, called the Ecole de Tourvielle, have served as inspiration and
model to most of those since formed throughout the length and breadth of France.

In city after city of the provinces—Bourges, Montpellier, Saint-Étienne, Toulouse, Marseille, and others—associations formed for aiding the mutilés recognized the worth of M. Herriot's idea. Early in 1915, there was formed in Paris under the leadership of Maurice Barrès, a deputy and distinguished man of letters, the great Fédération nationale d'assistance aux mutilés, which in a few months by means of M. Barrès' stirring appeals in the Echo de Paris collected more than 2,000,000 francs for the purpose of rehabilitating the mutilés through work. The federation has established two schools of re-education in Paris, and gives financial support to others organized by private persons and trade unions. In May, 1915, the national government opened a splendidly equipped trade school for disabled soldiers in a former home for industrial cripples at Saint-Maurice, just outside of Paris; a little later the City of Paris commandeered a common school building and transformed it into a school for the maimed of the Department of the Seine. The Minister of Commerce organized special courses for mutilés in existing trade schools; the Minister of Agriculture did the same in the agricultural schools scattered through the provinces. Departments, municipalities, boards of technical instruction, employers' associations, trade unions, and private philanthropists, both French and foreign, joined in the movement, until at the present time there are more than one hundred reeducational institutions in France.

Many schools made possible originally by private subscriptions have since been attached to a public administrative body—a departmental or municipal government, chamber of commerce, hospital, or the like. The expenses of such institutions are borne in part by the public body—which may still ask for private subscriptions—and in part by the national government. In order to obtain a subvention from
the government, schools must submit their program and budget for ministerial approval. Schools entirely under private control may also apply for a subvention from the government, which, if it is granted, will be in proportion to the number of their pupils and to the social and economic value of their work.

After the reeducation movement had been under way for more than a year, and a large number of schools had sprung up to realize its aims, the government recognized the need of some central bureau which should coordinate all public and private activities for the best interests of the mutilés. Accordingly, an interministerial decree of March, 1916, signed by the Ministers of War, the Interior, and Labor, created a “National Office for Disabled and Discharged Soldiers.” This office has done some excellent work in registering discharged soldiers and in investigating industries with a view to discovering all possible occupations suitable for disabled men. It also directs the efforts of the local committees which in each department are responsible for rehabilitating the men from their region. These committees are composed of representatives of the ministries of war and labor, of the departments of agriculture and technical instruction, of the medical service, of employers’ associations, trade unions, and rural credit banks. Their duties are to see that every wounded soldier from the department receives the aid he needs; to which end they must keep in close touch with the men in hospitals, with the reeducation schools, and with the local employment bureaus.

The National Office has become a useful bureau of information on all matters connected with the reconstruction of disabled men, but it has had scarcely more than an advisory control over reeducational institutions. It has, however, examined the kind and amount of work they are doing and made recommendations to the government regarding subventions to be granted, and possible improve-
ments which might be effected in the reeducational facilities of certain parts of the country. According to the program which it has drawn up, there should be in every part of France a “centre of readaptation,” to which should be sent wounded men, native to that region, as soon as they are cured from the purely surgical standpoint. Each complete centre of readaptation should include (a) a hospital of physiotherapy, where the invalid receives “functional reeducation,” or the treatment which will give him back the greatest possible use of his muscles; (b) an “apparatus centre,” where artificial limbs and other appliances are manufactured and distributed; and (c) a centre of vocational reeducation.

At the present time there are in France twenty centres of physiotherapy to which reeducational schools have been annexed, but in only eleven of these are artificial limbs made and fitted. Model centres comprising the three activities are at Saint-Maurice, outside of Paris, Bordeaux, Lyon, and Montpellier.

The physiotherapeutic hospitals receive from the general hospitals for further treatment those men who have suffered so-called functional injuries. In order to reduce these functional injuries, they employ baths, massage, heat, electricity, radium, mechanism, and other curative methods included in the general term, physiotherapy. The apparatus centres receive the amputation cases, subject them to a thorough examination, and order and fit the needed appliances.

All appliances are furnished free of charge by the government, which is also responsible for their care and replacement during a man’s lifetime. The man who has lost a leg receives as a temporary appliance a simple peg leg, and as a permanent one an articulated leg; both of which he can take with him on his discharge. The articulated legs furnished were at first of leather braced with steel uprights, but they were disliked by the mutilés, be-
cause of their weight, and now legs of the American type of hollowed wood are being more extensively manufactured and distributed. The man who has lost an arm receives a working arm of the type best suited to his needs, and in addition a show arm

![Image](image_url)

Fig. 2.—Mechanical prosthesis for bench work in the metal trades.

and hand of wood. Different models for working arms have been invented at the different apparatus centres. Some are of the type called "universal pincers"; others are special devices for special
trades; and others are improved models of the old fashioned ring and hook. No appliance can be given out at a government centre until it has secured the stamp of approval of the Orthopedic Commission appointed by the Minister of War.

Shops in which the government manufacture these appliances are manned in some cases by mobilized experts, and in others by disabled men learning the trade. If their product is insufficient for the demand, the government is empowered to requisition the output of private manufacturers and to insist on rigid standards of design, material, and workmanship.

After the foregoing brief survey of the machinery which France has created for the reconstruction of her soldiers, it may be interesting to consider what answers can be found in French experience to certain questions which are bound to arise in any discussion of trade training for war cripples.

First, when should reeducation begin? On this subject, Doctor Carle, the first physician in chief of the schools of Lyon, makes some very definite statements. Pupils should be accepted by a school, he says, only when their wounds are completely cured, which means when they have either received their discharge from the army or, having been recommended for discharge, are awaiting final action by the pension board. It is important, he believes, that training once begun should be continued without interruption. There should therefore be no danger that the exertions of work will start up inflammations requiring further medical treatment, or encounter functional incapacities which might better be cured by physiotherapeutic methods. Serious apprenticeship to a trade does not, he says, permit a man to take regular functional treatment at the same time. Doctor Carle was, of course, anxious for the success of his schools and for that reason was particular to accept only pupils who could be expected to apply themselves earnestly to their work and to finish their course successfully.
Fig. 3 — French soldiers being trained to solder the tops on tin sardine cans.
The same conditions of admission were originally laid down by many other schools. Doctor Jeanbrau, the first head of the large vocational school at Montpellier, writes: "If we should accept as pupils men still in hospitals, they would lose a part of their mornings in dressings, massage, and electrical treatment. In an institution where regular and methodical work constitutes the essential factor of success, these invalids would be a perpetual source of disorder."

On the other hand two very successful schools organized by the Union des colonies étrangères have from the beginning drawn their pupils entirely from military hospitals; one from the hospital of physiotherapy installed by the French Medical Service in the Grand Palais at Paris, and the other from a depot for amputation cases at Maison-Blanche, Neuilly-sur-Marne. The directors of these schools consider that the fact that the men are still under military discipline contributes to the efficiency of the instruction. They have found, however, that many men fail to finish their training, as they leave both hospital and school when their cure is complete. The schools at Saint-Maurice and Bordeaux, and others now annexed to hospitals of physiotherapy or apparatus centres, receive as pupils both patients in the hospital and discharged soldiers. They, too, have experienced the difficulty of persuading the pupils to continue their course after their discharge from hospital.

The trend of opinion in France has been more and more toward beginning vocational training as early as possible in the convalescent period. Some authorities have been led to this opinion by their belief in the curative power of useful work; others through their desire to induce a greater proportion of disabled to take up reeducation. While a man is still in the hospital, it is relatively easy to influence him to take up some form of training, but once he has returned to his family it is hard to place before him the arguments which might turn him to it
and to counteract the demoralizing effects of idleness. In a report by Dr. Gourdon of the Bordeaux vocational school for war cripples, it is stated that when the school was first started and received only discharged soldiers, 80 per cent. of the men to whom it offered an opportunity for training refused to avail themselves of it; whereas after the school was attached to the centres of physiotherapy and prosthetic apparatus in the city, the number of refusals was in two months reduced to 6 per cent. and at the present time is zero. To the same effect, M. Chancrin, writing of the agricultural school at Grignon, reports that it was able to do really valuable service only after a centre of physiotherapy was installed in the vicinity. The government’s policy since June, 1916, has been to make it possible for every man to start his training while he is being treated for functional disabilities or fitted for an artificial limb.

How should the work be carried on? In schools where pupils are lodged and boarded, in day schools.
or by placing men as apprentices in private shops? In France the boarding school system, or the Internat, is generally considered to give the best results, and has been adopted in all the larger schools. The expense is not greater than for the day school, inasmuch as maintenance during the period of training must in any case be provided, and the psychological influences are much better. Disabled soldiers needing retraining are in the majority of cases deeply discouraged men, who readily fall a victim to the bad influences of the town. Even when pupils at a day school are housed by some aid society, in a special boarding house, they can not be kept under the same surveillance as at a boarding school. Their attendance at classes is likely to become irregular or to dwindle to nothing before their course is finished. Men who live with their families in the same town as the school, however, often make excellent records as day scholars.

When men are placed as apprentices with private employers, they encounter the same temptations in their living conditions as the pupils at a day school and are even less subject to good influence. Furthermore, they may not receive good instruction. It takes the exceptional employer or foreman so to arrange an apprentice’s work that he will learn all the steps in a trade in a reasonable length of time. Too often an apprentice is considered simply as another hand, cheap labor, to be used for all he is worth.

In schools where the Internat arrangement is followed, men who are still in hospital, or who have been discharged from the army and are drawing their pension, receive instruction, board, lodging, and usually clothing free of charge, nor is any deduction made from their pension. Almost all the schools also pay wages, varying from fifty centimes a day at the beginning to four or five francs a day. Often the proceeds, or, at least, the estimated value of the men’s labor in a shop, are divided among them at
the end of each month in proportion to their productive capacity, after a certain percentage has been deducted as the pupils' contribution to the running expenses of the shop. Or a part of their earnings may be kept back until they leave the school, when it is given to them as a lump sum to buy their tools or other necessary equipment. Pupils at day schools or those placed with private employers usually receive three francs fifty or four francs a day for their support from some one of the numerous aid societies for the mutilés. The cost per pupil per day in a boarding school is about five francs.

The third question—what trades should be taught?—has in France been largely decided by the
fact that from sixty-five to seventy-five per cent. of the mutilés are from the villages and farms of the provinces. The importance of returning these men to their homes and of resisting rather than of encouraging the movement cityward has led most of the schools to teach the simple village trades of shoemaking, tailoring, carpentering, saddlery, and tin-smithing. Of these shoemaking is the most popular with the peasants; the shoemaking classes everywhere are so large that one wonders how the countryside will ever use so many cobbler. With a mastery of one of these trades, men who are convinced that their maimed or crippled condition will prevent them from wresting a livelihood from the land can still be independent in their native village. They can set up their shop in their own house and use their spare time to raise a few vegetables or to cultivate a few grapes.

There are, however, many disabled poilus, both town and country bred, who believe that they are cut off from all manual work and who desire only to obtain an office position. They ask, therefore, for training which will fit them to become clerks, bookkeepers, stenographers, and typists. In every school directors have to use their influence to prevent too large a proportion of their applicants from attempting to enter this already overcrowded field. Men capable of other things should, it is believed, be replaced in industry, while clerical work should be reserved for those who would otherwise become dependent.

In all well planned reeducational work, before any trade is offered as an occupation for disabled men, there should be an investigation of the state of the industry. Not only should a trade be examined in respect to its suitability for men with reduced physical capacities, but as to the number of skilled workmen it can absorb, the standard of wages, the conditions of work, whether the work is seasonal or not, and whether the demand for labor will continue after the war. Trades which
demand a long apprenticeship have been found to be unpopular with the men, who naturally wish to return to their homes as soon as possible. In fact, owing to the dearth of pupils, classes in tailoring—one of the trades which it takes a comparatively long time to learn—have in some French schools been discontinued, although there is a demand for workmen in the trade to replace the Germans and Austrians formerly employed.

Some French schools find it difficult to retain their pupils more than six or eight months, and therefore make that the average length of course; others seem able to arouse such a spirit of ambition and perseverance among the men that they can easily induce their pupils to finish much longer courses. At the Ecole de Tourvielle the courses in shoemaking, fur work and horticulture last a year; those in tailoring, cabinetmaking, and the manufacture of artificial limbs, eighteen months. The aim of this school is to turn out thoroughly competent workmen who can compete with sound men on equal terms without claiming any indulgence from employers. At the government school at Saint-Maurice, where the apprenticeship is shorter, the aim is rather to make men capable of earning a living in a shop where they can complete their knowledge through practice, and so later aspire to higher pay. When men can be induced to finish the longer course, the more thorough training will certainly give them better assurances for the future.

In many of the larger schools a wide variety of trades is offered in order that every man who is obliged to take up a new occupation may find some work that suits his taste. For instance, in the school established by the municipality of Paris and the Department of the Seine there are courses in tailoring, shoemaking, carpentering, varnishing, typesetting, typefounding, binding, lithography, photogravure, moulding and stucco work, clockmaking, fur work, the manufacture of orthopedic appliances, industrial design (including designs for furniture,
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ironwork, architecture, and landscape gardening), bookkeeping, stenography and typewriting, English, and general schooling. At Bordeaux there are taught carpentry and cabinetmaking, lathe and bandsaw work, cooperage, locksmithing, metal work and mechanics, basketry, brushmaking, binding, pottery, shoe and sabotmaking, saddlery, engraving, lithography, gardening, and the commercial courses.

On the other hand, schools situated in regions where there is a predominant local industry often specialize in the training which will meet the labor demands of the vicinity. At Oyonnax men are taught the different branches of the celluloid industry, so that they can go into the numerous factories making celluloid articles. In the national school of clockmaking at Cluses, near the Swiss border, large numbers of mutilés are becoming skilled clock and watchmakers.

It often happens that men who apply for training have no idea of what they want to do, and that the school must practically make the decision for them. In order to direct them wisely, French reeducation experts have worked out certain principles, which are valid, they believe, in the majority of cases. In the first place, any advice given a wounded man about the choice of a trade should be based on a careful examination of his physical and mental capacities. There should be considered not only the nature of his disability, but also his general health, his native intelligence, and his schooling. He should then be directed to some kind of work within his capacity, something in which his efficiency will not be seriously reduced by his handicap. This work should be if possible connected with his former trade, so that he can reap some advantage from his previous knowledge and experience. Even if the process is quite different, he can learn more easily if he is familiar with the materials or has handled similar tools. One French doctor has said that only a bartender or a saloonkeeper may be ruthlessly plucked from his former occupation. A mason or
a plasterer, no longer able to mount ladders or scaffolding, should be placed in a position as foreman or estimator, where he can utilize his former knowledge of the trade. He can be fitted for such a position by some theoretical instruction and practice in figuring. A machinist can make some use of his former experience by learning draughting for machinery; a carpenter can become a cabinetmaker; a painter can change from building work to carriage or automobile body work.

French authorities do not believe that one can lay down any hard and fast rules as to what disabilities are compatible with the different trades. They have found that too much depends on the individual's determination and perseverance and on his natural ingenuity in adapting himself to his disability to make such a classification possible. In general, men who have lost one leg can take up almost any work which does not require continued standing, and for men who have lost both legs there are countless seated positions open. What men can do who have lost an arm depends largely on the length of the stump. Dr. Amar, one of the foremost authorities in France on rehabilitating injured men, says that the loss of a hand rarely necessitates a change of occupation, nor does the loss of the forearm if the stump measures four centimetres from the bend of the elbow. In his experience, stonemasons, bookbinders, mechanics, tailors, and printers, who have had one arm amputated below the elbow, have been able to take up their work again after a short course of reeducation. He also maintains that, given the right kind of reeducation and the proper prosthetic appliances, a man with a very short stump can be restored to considerable mechanical efficiency.

Dr. Bourrillon, who is head of the government school of Saint-Maurice, does not believe that a one armed man can become efficient enough in a manual trade to compete with normal workmen, and he is in favor, therefore, of training their intellectual capacities. The manchots at Saint-Maurice
are consequently to be found largely in the book-keeping and stenography classes and in the section

for industrial design. With the aid of a draughting machine made in the United States, a number of
one armed men trained at Saint-Maurice have become efficient draughtsmen.

In the schools at Lyon, also, the majority of the one armed men are being trained for office positions, though there are a considerable number, barred from such work by a lack of schooling or intelligence, who are learning a trade in the bindery and the toy and paper box shops. At Montpellier one armed men are encouraged to enter the manual trades in preference to turning to office work. At this school, men with their right or left forearm amputated have been taught to do wood and metal lathe work or become tool setters, and men with ankylosed and paralyzed arms have learned tailoring and shoemaking. In the workshops for orthopedic appliances at Bordeaux, a man who has lost his arm below the elbow earns a normal wage as a filer; another whose arm has been disarticulated at the shoulder is running a band saw in the toy shop; and men with various kinds of arm amputations are learning the potter's trade.

Nowhere in France is the loss of a limb considered to be a bar to agricultural labor. Experiments have proved that men with one arm or one leg amputated, when fitted with a suitable working appliance, can do most of the ordinary work of a farm with fair speed and efficiency. Reeducation for agriculture of a man brought up on a farm often consists simply in demonstrating to him what a maimed man can do, and then giving him a few weeks' practice with his appliance. If he can once be persuaded to try to fit himself to his old life, the outdoor work and the familiar tasks soon restore his courage and cheerfulness, and it is then a simple matter for him to learn how to manage his artificial limb so as to do a good day's work.

A number of ingenious devices enabling men with amputations to do agricultural work are in use in France. Men with a leg amputation, who would be hindered by their wooden leg sinking into soft earth or plowed ground, find it convenient to use
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a leg turned with an enlarged end like an elephant's foot or to have a sabot which they can attach to the end of their peg. Men who have lost an arm need an appliance which will hold the handle of a farm tool and permit it to be turned freely in different planes and directions under the guidance of the other hand. They are obtaining good results from the Jullien tool holder, invented by a manufacturing orthopedist of Lyon, from a hook fastened to an oscillating ring, and from a simple arrangement of straps devised by two French doctors from photographs of an appliance used at Vienna. An excellent series of "hands" for different kinds of agricultural work have been invented by Dr. Boureau, of Tours. Among these are a hand for digging, a hand for cultivating the vine, one for driving animals, and one for managing the levers of agricultural machinery.

Agricultural reeducation is mainly carried on in the agricultural schools which existed before the war. These schools have found that after a short course of training, a maimed peasant can dig, hoe, reap, and follow a plow well enough to earn a living as a farm worker, but they try to persuade men to enter upon the longer courses which will open up to them better prospects. By taking courses in scientific farming—rotation of crops, stock feeding, dry fertilizing, farm bookkeeping, etc.—men can fit themselves to be farm managers or to hold other executive positions. Or by specializing in some one branch of agriculture—truck gardening, poultry raising, fruit culture, or butter and cheesemaking—they can fit themselves for the kind of work in which they will not feel their injury as a handicap. Some agricultural schools teach in addition to the regular agricultural work basketmaking, carpentering, and cooperage, these being trades with which a farm worker can eke out his pay and pension during the winter.

Rural mechanics, or the use and repair of farm machinery, are taught in a number of schools, and
it is probable that even greater emphasis will be laid on this work in the future. Even before the war the Minister of Agriculture was concerned about the growing shortage of labor and was taking steps to introduce machinery which would to an extent make up for the lack of men. In the present situation, when the war has made the lack of farm workers a great national peril, every effort is being made to rouse the French peasant from his old fashioned agricultural methods and to induce him to use modern machinery. A great many tractors are being imported from America, and it is necessary to teach men to run and repair them. This seems to be a good field for mutilés, as men who have lost a leg can do the work without inconvenience, and men who have lost a forearm can drive the machines provided their upper arm is strong enough to move the levers.

Disabled men who have taken a course of training are easily placed by the school in good positions. In fact the reports of the schools usually show that they have a great many more demands from employers than they can fill. But the overwhelming proportion of discharged soldiers who have not formed any connection with reeducational centres, unless they can go back to their old positions, are obliged to apply for work through private and public employment agencies. In order to facilitate the replacing in industry of men discharged from the army, the Minister of War established a central Placement Bureau in Paris with branches in each of the twenty-one military régions of France. This placement service has since been merged with the “National Office for Disabled and Discharged Soldiers.” The Minister of Labor, in a circular letter addressed to the prefects of departments, instructed them not to organize special placement bureaus for the mutilés, but to utilize and expand the existing departmental and municipal agencies. He objected to treating disabled soldiers as a special class of labor on the ground that that would mean treating
them as an inferior class. The result of such a division would be, he feared, the concentration of disabled men in a small number of industries, their exploitation by employers, and difficulties with normal workmen.

In the early days of the war, before the official employment agencies were well organized, many disabled soldiers were placed in positions by the Fédération nationale d'assistance aux mutilés and by the Société d'aide immédiate, but it is believed that in the future most of this work will be handled by the government.

All the agencies engaged in the work make an effort to return men to their home districts, and when possible to their old trades. When they encounter cases impossible to place without retraining, they urge these men to enter a trade school. In the matter of wages there has been generally accepted the principle of equal pay for equal work.

A tendency on the part of employers to discriminate against disabled soldiers on account of the resulting increased cost of workmen's compensation has been overcome by a law passed November 25, 1916. This law provides that the additional compensation cost shall be met by a tax on industrial concerns and insurance companies. Since this tax is levied on all concerns regardless of whether they employ disabled men or not, there is no longer any reason for an employer to discriminate against war cripples on the ground of the greater insurance risk.

The United States Government has recognized its responsibility for the complete rehabilitation of the soldier and is making plans to provide trade training and employment opportunities for every man of the American military and naval forces who needs such help. The Surgeon General's office intends to start the instruction in the large base hospitals, but the more specialized technical training necessary to turn out skilled workmen will be carried on as far as possible with the cooperation of existing educational institutions. It is probable that special classes
for disabled soldiers will be organized under government control in many of the trade schools now in operation throughout the country.

The Red Cross Institute for Crippled and Disabled Men, established in New York through the generosity of Mr. Jeremiah Milbank, is making extensive studies in the subject of the disabled soldier's reconstruction for civil life. It has followed with interest everything that is being done in this field in France, and although it does not believe that all the theories and practice of the French schools can be applied to conditions in America, it is finding much inspiration in the achievements of our ally.

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