The recovered worker: occupational medicine, orthopedics, and the impact of medical technology on the social image of persons with disabilities (Spain, 1922-36) *

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The article explores how the development of medical technologies helps to change our social perception of people with disabilities. It analyzes the case of a program meant to attenuate the problems caused by work accidents, introduced at Madrid's Instituto de Reeducación Profesional de Inválidos del Trabajo in the 1920s. The specific focus is on the program's initiative in the arena of Traumatology and Orthopedics, aimed at the rehabilitation of disabled workers. The text underscores how these efforts helped to strengthen an "individual model" of disability and to shape the image conveyed to society about what could be expected of a person with certain physical disabilities.

KEYWORDS: disabilities; occupational health; occupational medicine; traumatology and orthopedics; Spain.

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From the end of the 19th century on, there was growing concern regarding problems arising from occupational accidents, which led to the development of important legislation during the first three decades of the 20th century. (Soto Carmona, 1985).

The 1922 *Ley de accidentes del trabajo* (Occupational Accidents Act) was a milestone in this legislation and it aimed to overcome some of the shortfalls of its predecessor of 1900. The 1922 Act included the setting-up of 'a special service to re-educate occupational accident victims', which would 'give victims sufficient professional ability to be able to earn a living' (Instituto, 1932, p. 51). In order to comply with the former law, a Decree of March 4th 1922 led to the establishment of the *Instituto de Reeducación Profesional de Inválidos del Trabajo* (Instituto, 1932, p. 52).

The opening of this centre took place in the framework of occupational accidents legislative development, which, concentrated on helping occupational invalidity (Martínez-Pérez, Porras, 2003), and largely resulted from the loss of manpower and the effect of accidents on productivity (Soto Carmona, 1985, pp. 91, 93). However, as I have highlighted elsewhere, the *Instituto de Reeducación de Inválidos del Trabajo* (IRPIT, from now on), and the measures taken to attempt to solve the problem of people disabled by occupational accidents, can be considered part of a wider programme; that is, Spain's adjustment to the new conditions arising from the political, economic and social situation of the time. Thus, when defining the factors that led to a situation favourable to the setting-up of a centre of this kind, the following issues must be taken into account: the maintaining of social order, economic growth, industry's adaptation to the new conditions of production, the balance of power between employers and workers, the need to continue fostering social protection policies above and beyond the old system of charity, and the increasing value given to science's ability to solve problems of the State (Martínez-Pérez, in press).

This last point is particularly important when considering the action which, in order to fulfil its objectives, was taken at the IRPIT. We must firstly bear in mind that, as we shall see later, the measures were designed largely on the doctrinal basis of the so-called Organización Científica del Trabajo (Scientific Management of Labour, OCT, from now on).

The origins of the OCT date back to the end of the 19th century, which was when Man was first studied as a 'psycho-physiological motor', and questions such as fatigue began to be researched in laboratories. The results led to the possibility of developing a 'science of work'. The work of economists helped develop this line of study, and this in turn led to the idea of the viability of a 'business science'. Nevertheless, as it is well known, it was the work of North American engineer Frederick Winslow Taylor (1856-1915) that gave

it a considerable boost. Taylor´s studies and articles on increasing industrial productivity, via the appropriate assignment of tasks and the development of machines, helped him to lay the foundations of a new discipline. The whole world began to discuss his system once his work *The principles of scientific management* was published in 1911 (Mallart, 1942, pp. 9-16; Rabinbach, 1992).

Initially, Taylor´s term and the whole American school of *Scientific Management* was translated as 'Organización Científica del Trabajo' in neo-Latin languages. However, its proponents tried to make it more far-reaching. In 1927, the *Institute International d'Organisation Scientifique du Travail* in Geneva referred to the OCT as 'the science of the relationship between the various factors of production, and especially between Man and his tools', and it pointed out that 'its aim is to obtain optimum yield by means of a rational use of these factors'. Thus, it highlighted the efforts of its champions to widen its scope, taking it, as a later commentator stated, to the realm of economics (Mallart, 1942, pp. 48-49). In Spain, in fact, after the gradual introduction of Taylorism during the 1920s (Tomás; Estivill, 1979, pp. 27-32), this way of understanding OCT was to take off in the 1920s. In effect, according to César de Madariaga, the engineer who was the first director of the 'technical section' of the IRPIT (Bachiller Baeza, 1985, p. 12), and one of the staunchest defenders of the benefits of this discipline, OCT was 'the disposition of the various factors of production, in accordance with the rigorously scientific methods, that led to optimum yield' (Cfr. Palacios, 1928-1929, p. 58). So, Madariaga highlighted two aspects of OCT which made it highly attractive to a society that, as Spain was at that time, trying to modernise and change with the times: its ability to improve industrial activity and economic growth, and its nature as a 'scientific' discipline.

The fact that Science was more able to win over society and the Spanish political authorities as to how it could benefit the country also meant that doctors' calls for the setting-up of a centre such as the IRPIT were more easily met. Although the Occupational Accidents Act of 1900 was a law designed to lead to the establishment of a new speciality in Medicine –one which aimed to deal with accidents victims and the forensic evaluation of the injury (San Martín, 1903, p. 5)-, in fact very little progress was made in the first two decades of the 20th century. This did not come about until the 1922 Act, which led to the founding of IRPIT, the centre in which Occupational Medicine was to develop and become a speciality (Rodríguez Ocaña, 1993, p. 426; Bachiller Baeza, 1985, p. 9-39). The setting-up of this centre met the demands of some doctors, such as Antonio Oller (1887-1937) -the first director of the 'medical section' of IRPIT (Bachiller Baeza, 1984, p. 14) (Figure 1)-, which demands they had been making for years in the sense that they

called for the 're-education of the mutilated' (Oller, 1918, p. 380). In this area Medicine was considered an essential ally (Martínez-Pérez, Porras, 2003). As Oller indicated, it was important to be more than aware that

> 'a rigid joint, seemingly unable to move, a nervous complaint, a missing organ etc., etc., can over time, with determination and, especially, with appropriate re-education, undergo such considerable change that it turns a useless man into a able worker.
>
> Before 1914, some nations were concerned with this question and had founded real centres of re-education (…) They could not be easier to operate. Imagine a serious injury to the right hand, for which amputation is necessary; first an amputation is started (always whenever possible) that can be adapted to a good prosthesis. Once the wound heals the worker is sent to a workshop where he is taught to use his left hand; then he is given a provisional prosthesis while a definitive one that he can use in his work is made' (Oller, 1918, p. 380)

So, doctors, together with Orthopaedics, became essential in enabling those workers with some kind of physical or functional disability caused by an occupational accident to return to work. Their knowledge and skill was now moreover particularly important in order to fulfil the social task of transforming a 'useless man' into an 'able worker'.

> 'After 1914, and as a result of the war, the number of mutilated men rose so considerably that all governments of those nations at war were forced to pay very great attention to the problem of re-education. In France, for example, several centres were set up to this end and the prostheses, particularly artificial arms and hands, designed for specific jobs were highly perfected.
>
> In our opinion we believe the time has come for the Instituto de Reformas Sociales [-in Spain the institution in charge of developing labour-related legislation, ensuring its implementation, organising inspections and fostering social and governmental action to improve the well-being of the working classes-] to be in charge of this matter. I think that the crux of the matter lies in making employers pay for the prostheses needed, as current law stipulates, and as regards the rest, with a little determination, a number of workers who are today useless, will shortly be able to earn a living' (Oller, 1918, p. 380)

Now is not time to discuss whether the war actually helped the advance of Orthopaedics to such an extent as Oller propounded. In fact, whether or not it contributed to the development of this speciality, to which it has often been attributed in medical historiography, has been questioned recently (Cooter, 1993, p. 65).

What we are interested in is highlighting how the Spanish surgeons who cultivated the discipline used this argument to try to encourage the re-education of the disabled in their country. However, Spain was one of the countries that did not send troops to the Great War. It did not have, as France did, (Porras, 2004), a large number of mutilated ex-soldiers, which meant that the governments had to set up institutions to re-educate the invalids. Therefore, doctors had to find another group of people with disabilities for whom they could justify the need for establishing this kind of centre, and they turned to victims of a different kind of battle field, that is the workplace (Martínez-Pérez, Porras, 2003).

Thus, IRPIT was not only the result of a growing awareness of a humanitarian kind towards occupational accident victims; even contemporaries were aware of the need. According to Joaquín Decref, who was appointed by the Real Academia de Medicina as one of the members of the Employment Board in charge of its founding, the reasons for setting it up were: to avoid charity, reduce the financial burden of the disabled on public wealth, shorten the periods of invalidity, increase the chances of returning to work, fight the 'immorality' of insurance companies, and enable the invalids to work again (Decref, 1924). IRPIT, therefore, was set up for the purpose of improving conditions for those affected by a disability, but also to help solve the economic and labour-related problems that the high rates of occupational accidents brought to employers and the State. It is not surprising therefore that IRPIT incorporated activities of disciplines related to OCT in its organisation. Similarly, its founding was also a result of surgeons'

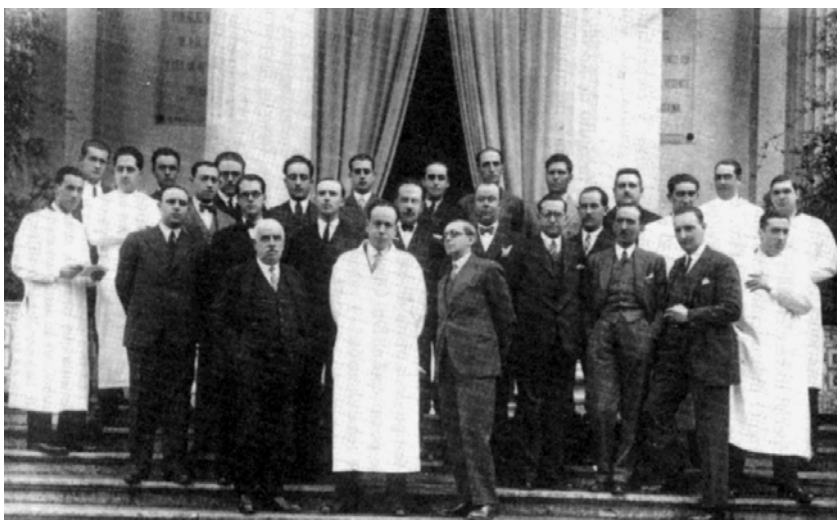

Fig. 1– Dr. Antonio Oller (1887-1937) – middle of the front row, in a white coat – together with others doctors from the Institute and students of a course of Occupational Medicine.

interest in creating a suitable place to develop Occupational Medicine and, as part of it, Orthopaedics.

IRPIT was able, at least for several years, to fulfil the objectives for which it was founded. This was largely due to the ambitious programme which was set up, in which Medicine played a key role, not only to re-educate occupational invalids, but also to deal with the more general problem of occupational accidents. Thus, by studying the medical technology deployed in the centre we can explore the way in which they were able to bring about changes regarding the way in which society perceived the disabled, which is the main aim of this work. As a result, I have selected a specific area: that related to Orthopaedics.

It is worth pointing out that I shall use the term 'medical technology' in the way the meaning of this concept has evolved since the last decade of the last century. As opposed to the simple reference to the 'machines', it has moved on to include all that is designed to understand, prevent, diagnose, and treat an illness and physical and bodily disorders (Brown; Webster, 2004, p. 4). As Menéndez and Medina have shown, this concept has gradually evolved, moving 'from the instruments, practices, processes, knowledge and meaning related to their use, to the organisational changes necessary for their implantation' (Menéndez; Medina, 2004, p. 16).

In order to illustrate the results, I shall firstly describe the programme developed at IRPIT to meet its objectives; and the role that 'medical technology' played in it, especially that related to Orthopaedics. Then I shall discuss the specific content of this technology. Lastly, I shall attempt to highlight the consequences of all this for those affected and for the evolution of Orthopaedics in Spain. Thus, I shall attempt to draw attention to the role it played when promoting the consolidation of a disability model in Spain, which has recently been denominated 'medical' or 'individual' and which has been compared with what was called the 'social' model.

PROGRAMME TO RE-EDUCATE THE DISABLED

The Royal Decree of 4th March 1922 which created IRPIT stipulated that its functions were to carry out the following: the functional re-adaptation of those workers who were occupational accident victims; the professional re-education of the same; to exercise 'social tutelage', that is, once re-educated, to ensure their reinsertion into society and, especially, in the workplace. The Institute was divided into three sections: 'medical' headed by Antonio Oller, 'technical' with César de Madariaga in charge; and

'administrative', led by Manuel García de los Ríos (Palacios, 1990, pp. 9-10). The founding Decree stipulated that, in order to fulfil its aims, the Institute had to have: a 'functional re-adaptation clinic' equipped with the 'therapeutic and surgical elements' needed to carry out its task, as well as 'an orthopaedic and prosthesis service' attached; a series of workshops for the professional re-education of the disabled workers; and 'all the means within their reach' to deal with and facilitate the placement of the re-educated workers (Instituto, 1932, p. 52).

Although the centre was inaugurated in 1924, it was not until the following year that the installations were completed. At that time there were already two medical rooms, one for restorative and orthopaedics and another for 'eye disease'; a radiography and radioscopy room; an area for 'applying plaster casts'; a surgical procedure room; a physiotherapy service; professional guidance and cultural and social service; areas for 'general education courses for the disabled' and 'professional training (re-education) for the disabled'; workshops for teaching general mechanics, electricity, carpentry, cabinet-making, cobbling, saddlery, woodwork, leather repoussé, drawing for industrial skills, office skills, office administration and industrial administration; a specialised library; a reading room; a film library; and a publication and publicity section. So by 1925 IRPIT was 'fully up and running' (Instituto, 1932, p. 53-5).

The various stages of re-education through which those workers admitted to the centre went, were related to the administrative division. After being admitted, the workers had a medical examination and then were given all the surgical, medical and physio-therapeutical treatment necessary. This was done in the operating theatres, laboratories and mechano-therapy, electro-therapy and massage rooms at the Institute itself. After each stage, or simultaneously with the previous stage, the patient moved on to the technical section, where the decision was taken as to what trade the worker could do, and then they attempted to convince him of the need to retrain, teach him his new trade and find him work. Finally the patient was monitored by the administrative section, which had the tutelage of the re-educated workers in order to achieve the best possible social re-insertion and to maintain contact between the institute and worker (Oller, 1923, p. 188-91; Oller, 1924a, p. 135-7).

I would now like to highlight two important aspects of this system of re-education of the disabled: the high degree of medicalisation, and the influence of OCT. If the first played its role in the initial stage, when the worker with some kind of physical or functional disability underwent medical treatment to achieve as great a recovery as possible and so enable him to learn a trade

appropriate to his new physical situation, then the second mainly influenced activities in the 'technical section'. In fact in OCT there were four main ways of achieving greater productivity from the 'human motor': that is, the perfection of the tools; the skill and correct use of the same; the selection of the workers; and their instruction. The result was that OCT promoted professional training and selection programmes (Medina, Rodríguez Ocaña, 1992, p. 460-2), and it was IRPIT which became one of the main champions of these disciplines in Spain (Mallart, 1974, p. 943-45).

As part of the programme that IRPIT established to re-educate the disabled, the medical technology was employed particularly, as we have mentioned, in the first stage. It is possible to differentiate between the technology used for diagnosis and that more specifically aimed at re-education. The first type can be divided into two groups: the clinical and the forensic. They both shared technical instruments and apparatus such as the radioscope, although they pursued different ends. The area related to clinical diagnosis aimed to determine the treatment necessary for the patients with morphological and functional deficiencies. According to a published compilation of cases there was a wide variety of clinical problems. Many were direct results of the accident, but others were morbid processes brought on or aggravated by the accident. Some of the main pathologies included: osteo-articular tuberculosis, tumors, syphilis, the results of accidents involving electricity, lumbago, hernias, fractures, traumatic lung complaints; pleural and traumatic cardiovascular complaints; digestive problems resulting from accidents; cranial and medulla traumas and those affecting the peripheral nerves; sight and hearing problems. (Oller *et al*., 1929). It is clear that Surgery, and particularly Orthopaedics, were the disciplines most in demand when diagnosing this great variety of afflictions.

Consequently, it was a fairly similar situation for forensic diagnosis. This was a highly delicate and important matter as the workers´ future depended on it, as the compensation they would receive depended on the extent on their disability. As a result it was maintained that the forensic diagnosis should also deal with a series of matters that might be taken to court, for example, whether the relationship between the accident and the injury was concordant; establishing the state of the patient prior to the accident; so as to establish whether or not the affliction was caused by the accident; and whether the pathology actually existed or was being faked by the worker (Oller, 1929a; Oller, Germain, 1929; Melián, Oller, 1929b).

The very medical technology of Orthopaedics was also crucial when starting treatment to recover the lost morphological and/or functional capacities. Moreover, by having to try to help the worker

adapt to his new physical condition, this discipline frequently overlapped, as we shall see later, with the re-education stage set up by IRPIT, which was responsible for professional retraining.

ORTHOPAEDICS AT IRPIT

The medical technology that, in relation to Orthopaedics, was employed at IRPIT was logically determined by the very aim of the centre. Other determining factors were the type of pathology that affected the occupational accident victims that went to the Institute, and the best type of treatment with a view to professional re-education. In order to explain and to highlight their importance related to the aim of this work, I shall go on to analyse the main aspects of the approach regarding the following: the handling of fractures; restorative surgery and reparative surgery or functional adaptation including the fitting of prostheses. I shall dedicate a final section to briefly explaining the Institute´s impact on the professional organisation of Medicine.

Fractures

Antonio Oller stated that 'the study of fractures, and particularly closed fractures of the extremities', were 'exceedingly important to the doctor of occupational accidents' (Oller, 1929b, p. 83). The most common kinds of fractures dealt with at the Institute were of the arm and forearm. Oller attributed this

> 'to the fact that the disability of the hand as a result of this type of fracture was more worrying and serious for the worker than one in a lower limb. In effect any fracture to the surgical neck of the humerus, any supracondylar_fracture, to say nothing of the lower extremity of the radius, left a stiffness in the elbow, wrist and fingers joints, which affected the functioning of the hand, which was alarming and led to a desire to improve' (Oller, 1929b, p. 84)

Thus, while highlighting the importance of this kind of fracture, Oller also drew attention to an aspect which I shall deal with later because it was crucial to the functioning of IRPIT: the fact that accident victims did not always feel impelled to follow the re-education treatment. Only when they thought that the injury would seriously impede their daily living would they go to the Institute.

It is worth pointing out, as it illustrates the Institute members' interest in contributing to technological innovation, that as a result of the work regarding fractures to the upper limbs new innovative devices which improved treatment were used at the Institute. Thus,

the Institute played an important role in the development of Orthopaedics in Spain as various apparatus were actually built in the Institute's workshops. (Figures 2 to 4).

When studying Oller´s approach towards fractures of the extremities, especially those of the upper limbs, there is one point worth noting and that is the relationship he established with forensic diagnosis. If 'preference' was given to this type of pathology it was because the forensic evaluation for compensation was particularly delicate and important. As a result, in his explanation, Oller 'specified the disabilities left by various types of fractures' and gave 'some convenient ideas in forensic diagnosis for the doctor' (Oller, 1929b, p. 83-4).

Thus, the medical technology developed by IRPIT for Orthopaedics aspired to being of a clearly normative nature. As it was pointed out more explicitly years later, the work at the centre attempted to ensure that the most of the scientific work carried out complied with Article 16 of the founding Decree. Consultations regarding accidents would have 'provided valuable material for the drawing up of norms which could be used in disciplines as interesting as (…) restorative surgery and orthopaedics'. With this they wanted to help solve 'various problems of application, for which the Institute had various elements which were difficult to find elsewhere, and which were of great scientific and social interest'

Fig. 2 – A mechanical device built at the Institute for treating humeral diaphysis fractures.

Fig. 3 – A prosthesis built at the Institute which improved the ability of a patient with a hand amputation to typewrite.

Fig. 4 – Another kind of "work" prosthesis which was partly designed at the Institute following the suggestions of the affected worker who appears in the picture. It could be used for all kinds of tasks due to a support to which various pieces could be attached.

(Instituto, 1932, p. 75-6). Undoubtedly, some of these problems were those related to the difficult task of evaluating injuries, which were a source of conflict among workers, employers and insurance companies.

As a result, the medical technology that we are looking at became part of, as I have pointed out elsewhere, a project that went far beyond mere re-education of invalids. IRPIT´s activities were socially recognised for the staff that undertook scientific work and treatment, as they were presented as being much more than potentially capable of improving labour relations, of placating the conflictive world of work and, therefore, improving the nation's economy (Martínez-Pérez, 1994;1997, 1998, 2001). As we shall see later, by studying the medical technology developed in restorative surgery, we can see how they sought social recognition for their proposals and social approval for the way in which IRPIT achieved its ends.

Restorative surgery

Restorative surgery and that related to re-adaptation played a key role in the way the traumas of workers admitted for re-education at the Institute were dealt with. Oller explained the difference between the two types of surgery in *El Siglo Médico*, one of the most popular Spanish medical publications of the time, where he established that restorative surgery should be understood as that which

> 'returns the function lost, re-establishing the anatomy as well as possible; that is to say, that which reconstructs the injured organs and tissues so they can function normally again. We give, therefore, the word restore its real meaning, as according to the dictionaries it is equivalent to repair, renew or return something to its former state, derived from the Latin *re* and *staurare*, a symmetrical form of *statuere*, to establish' (Oller, 1929c, p. 78)

Although he admitted that one example of this type of surgery is any kind of arthroplasty, this is, plastic surgery that focuses on the formation of joints to help anchylosis, Oller preferred to 'inform of' a case which he considered 'more original'. The case involved a worker who was admitted to the Institute because an earlier wound had produced a retractile scar which bent all the joints of the little finger of his left hand greatly affecting mobility. Due to the difficulties he had in carrying out his work 'the worker and employer agreed' that amputation was necessary. Oller, however, planned and carried out a procedure which he described as having 'splendid' results (Oller, 1929c, p. 78-80). To explain the case he used a series of pictures which I shall show (Figure 5).

So Oller showed that the medical technology used at IRPIT was highly effective. The publication not only attempted to explain an effective surgical procedure and how to carry it out, but also to show society the degree and extent of knowledge, technology and practice used at the Institute. He thus wished to illustrate, that where workers and employers saw drastic measures as the only solution, surgery could come to their aid and avoid mutilation, returning the patient to the condition he was in prior to the accident.

Oller presented reparative surgery in a similar way. He linked it with the idea of re-adaptation. He believed this term had a wider meaning than the one the French had given it. While the French referred to it as the 'accommodation of a mutilated person to their previous trade', he believed that

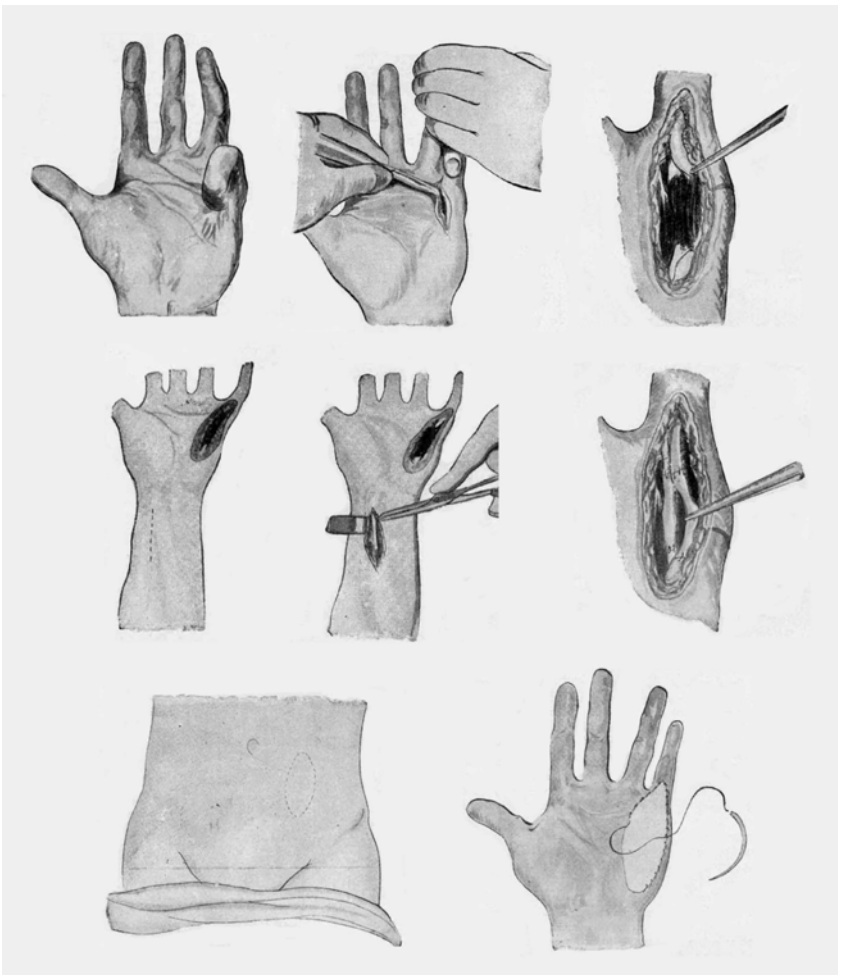

Fig. 5 – An example of restorative surgery which was implemented at the Institute.

> 're-adaptation or rather adaptation has a wider meaning, since we understand that all the surgical means, doctors, physiotherapists, orthopaedists etc. are needed to return as far as possible the lost function. Any kind of adaptation nearly always involves reconstructive surgery, which is not completely restorative, for example, cineplasties, fitting an artificial leg so the patient can walk, etc., etc. All this is clearly so the person can work, so he can earn a living, but without taking into account at all whether it is by a new or his old trade' (Oller, 1929c, p. 78)

Again Oller illustrated the 'restorative or functional adaptation' surgical procedures with examples from his experience at IRPIT. There was one case of a worker that, due to an electric shock, burnt both hands so badly that his little and second fingers of his right hand had to be amputated. Although the insurance company agreed to grant total invalidity, it believed it was possible to improve his condition as, in spite of compensation, the man 'could barely cope with the tasks of everyday living'. The procedure carried out by Oller, meant, as he himself said, that 'the worker [left] the Institute transformed. He had not recovered his fingers, nor regained normal functioning, but he could use his hands even for working. In a word: we had managed to re-adapt him functionally speaking' (Oller, 1929c, p. 80-1). To illustrate this and to convince his audience he showed pictures of the worker before and after the operation (Figure 6A and 6B).

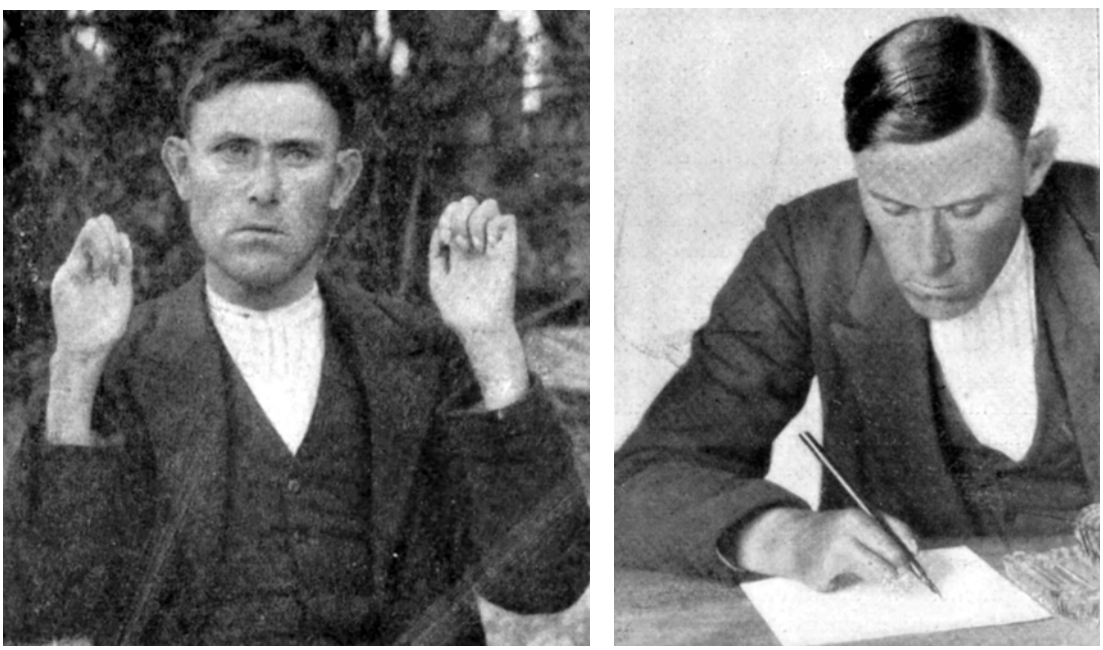

Fig. 6 – An example of reparative surgery. A) The state of the worker's hands on arrival at the Institute. B) After the operation.

Oller´s publication illustrates how IRPIT attempted to highlight the social significance of the medical technology used there. When explaining his achievements, Oller not only showed the importance of this 'transformation', resulting from surgical techniques for accident victims. Through restorative and reparative surgery, he also managed to change its status in relation to the labour market. In cases in which a person was thought to be limited or even 'useless', as the label was used mainly referring to his ability to work, IRPIT managed to provide the nation with a productive worker.

So, a particularly important aspect of restorative surgery, that related to amputations and fitting orthopaedic prostheses, greatly helped to highlight IRPIT's ability in this respect. Oller drew attention to the fact that,

> 'as far as a lower extremity is concerned, we can say, even when they accuse us of exaggerating, that a person with an amputation is not really a permanent invalid. In recent years prosthesis-making has reached such a degree of perfection that most people with amputations below the knee can go about their daily business and work as well and in the same way as prior to the accident'
> (Oller, 1929d, p. 361)

To illustrate it, he referred to the case of a worker re-educated at the Institute who had been placed in a workshop. He was asked to participate in a film the centre was making to publicise its work, but he refused alleging that 'none of his co-workers knew he had an artificial leg and he was afraid of losing his job if they found out' (Oller, 1929d, p. 361). Prosthesis-fitting was thus an effective way of transforming disabled workers, and therefore, their social image. As a result, it was to become an important part of the medical technology promoted by IRPIT to fight the prejudice that, as the case given by Oller illustrates, existed in Spanish society regarding the ability of the re-educated 'invalids' to work.

Thus, it was necessary to tackle one matter first, due to the consequences it had for the fitting of the prosthesis, and this was related to the problem of amputation and the resulting stump. The Institute advised on the best point for amputation, on the procedure involved, and on post-operative treatment. Work on the stump was particularly important when an upper limb was involved, as apparently the prostheses for upper limbs were not as good as those for lower limbs as far as the worker's ability to work was concerned. As a result IRPIT tried to re-educate those with upper limb amputations by concentrating on the stump. One example of this reality was the fact that, in treating a hand amputation, they would have chosen the so-called Krukenberg operation, or cubital

radius pincer, which Oller claimed to have helped perfect. It consisted in making two thick fingers from the cubital and the radius which could be moved by the pronator and supinator (Figure 7). So they were able to build an 'auxiliary element of great value' which, particularly in cases of dual amputations, would be 'better than any kind of prosthesis' (Oller, 1929d, p. 362-74, 383-4).

Fig. 7 – A patient with his right hand amputated, operated on by Oller, showing the so-called Krukenberg's pincer.

Nevertheless IRPIT did a lot of work involving prostheses. Not only did it research the suitability of one kind of model or another, but also in its workshops the workers themselves in process of re-education were to build some of the prostheses that were later to be fitted with. In fact, given that it was believed that of the two types of prostheses used in Orthopaedics –one for 'leisure' and the other for 'work'- it was the work type that was considered to be the only 'acceptable' one from the workers' point of view, they were consulted when it came to designing the devices (Figure 4). As a result of this experience surgeons felt legitimised to advise on 'the general norms for building' the apparatus (Oller, 1929d, p. 374-382, 385-386).

In spite of the obvious limitations of prostheses, particularly those for upper limbs, in helping to restore the functional capacity of workers with amputations they were beneficial. It was necessary to continue improving the models making them more effective so that those using them could work. Moreover, a positive image of those with artificial limbs could be transmitted, not only as people able to work again, but also as people whose physical disability could go unnoticed. Some images of the workshops that were published, showing workers being re-educated for a new trade, in fact indicated that, not only was the re-education effective and that those receiving it could return to work in jobs suited to their new physical condition, but that also they were able to do so without their functional or morphological deficiency being noticed by their 'normal' co-workers (Figure 8).

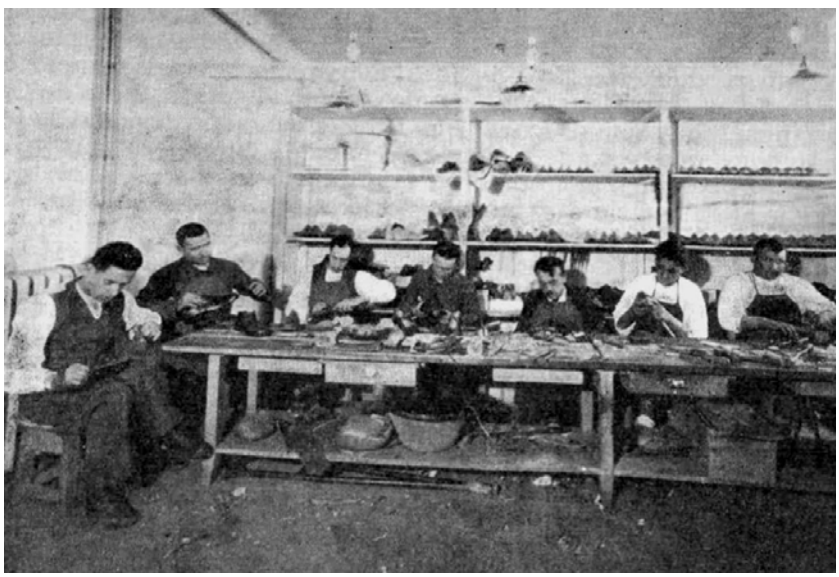

Fig. 8 – Shoemaking facilities at the Institute.

The impact on professions

The medical technology employed in IRPIT which I have just mentioned was to leave its mark on the organisation of Medicine. Apart from acting as a catalyst for the development of Occupational Medicine as a speciality in Spain (Bachiller Baeza, 1984, 1985; Menéndez-Navarro, Rodríguez Ocaña, 2003), it played an important role in the development of Orthopaedics. In 1929, there were already indications that Surgery would be the area within which 'most of doctrinal body of the study of occupational accidents' would take place, with Orthopaedics being the speciality with the most to say as 'occupational accidents make up most of the cases of traumata' (Goyanes, 1929, XIV-XV). It is not surprising that Oller, in the book he published years later entitled *Medicina del trabajo (Occupational Medicine)*, where he attempted to systemise every aspect of this speciality, dedicated more than 40% of its contents to Orthopaedics (Oller, 1934).

Thus, backed by the strategic interest that Occupational Medicine had earned for itself due to its ability to help palliate the problem of occupational accidents, Orthopaedics found a way to become institutionalised. The treatment, research, training and educational work based on this discipline carried out at IRPIT helped to consolidate Orthopaedics as a speciality and to facilitate the setting up of a group of professionals dedicated to cultivating it. So, people with disabilities increasingly became the centre of attention of two emerging medical specialities that were being developed as professional fields related to 'invalidity'. The objective was to find ways to make the 'disabled' 'useful' citizens, which basically meant transforming them into able-bodied workers, able to lead a 'normal' life. As we shall see later, this involved promoting the 'individual' model of disability in Spain, which has been the main way this phenomena has been seen throughout the 20th century, both by professionals and politicians and lay people.

IRPIT AND THE CHANGE IN THE SOCIAL PERCEPTION OF THE DISABLED

It is not easy to exactly calculate to what extent the programme designed at IRPIT, and specifically the medical technology employed there, helped to shape the social perception of people with physical or functional disabilities. The opinion at the centre itself was that it had 'enormously'helped to 'change opinions as regards the abilities of the disabled in Spain and in guiding public opinion towards a new way of perceiving the problem of invalidity and bringing about a solution via prevention and social assistance, instead of abandoning it to denigrating charity' (Instituto, 1932, p. 85). The

Institute also pointed out, which would make this affirmation seem credible, that in the 1920s 'it had completely succeeded', and that, it had been a key factor in 'freeing' the disabled of the label 'idle parasites' and in being considered 'useful citizens' (Bastos, 1935, p. 210). In effect, if one takes into account that IRPIT was believed responsible for the fact that 'professional re-education' was at that time in Spain equivalent to the word 're-education' (Bastos, 1935, p. 212), then it seems feasible to see that the centre, and its activities, must have played a certain role in the transforming the stereotype of the disabled.

Nevertheless, the extent of this change must have been limited. As mentioned earlier, the Institute itself was quite aware of the prejudice that existed regarding the capacity of re-educated workers, which made it difficult for them to find work. In fact, the Department of Professional Guidance in 1926 was already responsible for, with 'the collaboration of everyone at the Institute' who could help, the 'difficult task of finding work for the ex-invalids'. Three years later the problem still remained, and it indicated that the re-educated were beginning to 'accumulate' in the centre's workshops as it was difficult 'without a job, [to be] asked to leave the Institute' (Instituto, 1932, p. 61, 69).

From that moment onwards, as we have seen elsewhere, (Martínez-Pérez; Porras, 2003), the historical circumstances made it even more complicated for the disabled in the programme to find work. The economic crisis of 1929 was to leave its mark on unemployment rates and, as it was to be expected in view of what we have mentioned earlier, it became even more difficult to help the workers find jobs. Due to the oversupply of labour employers tended to chose workers without any disability, which must have led to a growing lack of incentive among the occupational accident victims to continue with the programme at IRPIT. Therefore, the 1932 *Ley de accidentes del trabajo* was effectively a coup de grace as it established a system of life annuities for workers who suffered occupational accidents so guaranteeing them maintenance. This law meant that the centre had to be transformed.

In effect, as stated in a session at the Real Academia de Medicina, 'all the work at the Institute was pointless if those leaving it (…) could not find work for their new abilities' (Bastos, 1935, p. 212). So after a brief stage when it was called the Instituto de Reeducación Profesional (1930-33), it became the Instituto Nacional de Reeducación, a name which would last up until 1986 (Palacios, 1990, p. 16-18). These changes illustrate how the authorities openly expressed their belief as to the inability of the centre to fulfil its objective of reinserting 'work invalids' in the labour market, but also that it tried to take advantage of the experience of the centre in tackling the problem of disability. As one of the surgeons at the Institute said,

> 'the State, which could not let such a distinguished institution fall into disuse *discovered* a new type of invalid and placed that building at their disposal. These invalids are the victims of illness, congenital defects and accidents which do not occur in the workplace or in war, they are: the disabled, maimed, paralysed, crippled, those deformed by illness or organic anomalies' (Bastos, 1935, p. 214)

Instead of resulting in less medicalisation in the programme to tackle the problem of the disabled, the transformation of the centre increased it. According to the new doctors in charge at the centre, because 'what the invalids nearly always wanted was to be cured', the 'tradition at the centre in the pedagogical sense of the word re-education' had 'almost completely disappeared' (Bastos, 1935, p. 219). So a new stage called the 'medico-rehabilitative' phase started at the Institute, and this followed the one called the 'Medical' stage (Palacios, 1990, p. 19). The medical technology developed at IRPIT, and particularly that related to Surgery and Orthopaedics, was to become a key factor in tackling the problem of the disabled. If we also take into account the fact that this very medical technology was also to play an equally important role at the Clínica del Trabajo, founded in 1933 for the functional re-adaptation of occupational accident victims and of which Antonio Oller was the director (Bachiller Baeza, 1985, p. 163), it is possible to state that the clear move towards the study and intervention of the 'human factor', which IRPIT established in its beginnings as the main way to solve the problem of occupational accidents and the anatomical and functional disabilities of the victims, was reinforced as of 1933.

As a result, the Institute's work can be seen as an important boost in Spain to construct a specific social identity of people with this kind of disability. I refer to that related to what, after the 1970s, became known as, at the insistence of the champions of the rights of the disabled, the 'medical model' or 'individual model' of disability. The main feature of this model is that it focuses on the corporal 'abnormality', and on the way in which this is responsible for some degree of functional limitation or disability. This functional 'inability' in the model is used as the basis for a wider classification of the individuals as 'invalids'. Thus, once their social condition with respect to other people has been established, the 'disability' becomes a differentiating feature. This model therefore is the basis of a view of disability which sees disability as a 'personal tragedy', in which the individual is seen as a victim, and as someone that needs care and attention, and therefore, dependent on others. That is the view that has been the core of social welfare policies designed to help people cope with their 'disabilities' (Barnes, Mercer, Shakespeare, 2002, p. 20-7).

This model must then have been a hindrance to the approach to the problem of disability known as the 'social model'. The latter does not deny the importance of the disability in the lives of those affected, but, unlike the 'medical model', it focuses on the numerous obstacles –economic, social, cultural etc. – that have grown up around it. From this point of view, it is believed therefore that the 'disability' is not (Oller, 1934).a result of 'individual defects', but that it is 'socially created'. The explanations of its changing nature are found then in 'the organisation and structure of society'. Therefore, more than identifying disability as an individual limitation, the social model believes society to be the real problem, and so envisages political and cultural changes as essential to finding solutions (Barnes, Oliver, Barton, 2002, p. 5). It can be said then that the status acquired by the medical technology related to tackling the problem of disabilities that we have studied here was not conducive to the development of other ways of dealing with the problem of disability highlighted in the 'social' model. I refer, for example, to measures on aspects such as family circumstances, architectural barriers or transport, so making it possible to develop a more suitable social environment for the disabled.

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