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*THE FIRST CENTURY OF "CLINICA DEL LAVORO" IN MILAN*

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# The First Century of the "Clinica del Lavoro" in Milan

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The Clinica del Lavoro was created in Milan at the beginning of the 20th century by Luigi Devoto, who deemed it essential for physicians and health researchers to get involved in the life and health problems of working populations. The main roles of the Clinica del Lavoro were to educate medical students and train physicians; study actual workplaces, examine health and safety hazards and their noxious effects; and create initiatives and services to protect and promote workers' health. Important scientific contributions were made in several fields, including chemical carcinogenesis, effects of mineral and biological fibers, mechanism of action of silica dust, methods for the detection and measurements of toxic substances in both the work environment and workers' biological media. *Key words:* occupational health; history; Milan; Italy; Luigi Devoto; Enrico Vigliani; Clinica del Lavoro.

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The turn of the 19th century in Italy was characterized by extension of life expectancy and better general living conditions, along with an initial improvement of conditions at work, thanks to the struggles of the workers and, partially, to that particular medical branch initiated by Bernardino Ramazzini<sup>1</sup> and later rediscovered in Italy with the name "medicina del lavoro" [occupational medicine]. Among physicians, and in the scientific environment at large, there was a vivid need to couple science and humanity. "Hygiene" which cures the sick body of the city (of the society) comes before "clinic," which cures the sick body of the individual. Comes before, according to the Latin root, is *pre-vents*.<sup>2</sup>

## THE IDEA OF A "CLINICA DEL LAVORO"

It was in that social and cultural context that Luigi Devoto (1864-1936) conceived the idea of the "Clinica del Lavoro."<sup>3</sup> Trained in Genoa and Prague, and then professor at the Medical School of Pavia, he was the

first to offer a university course on "occupational diseases," in which he emphasized the diseases of rice-growing workers (main occupation in the area at that time) and pellagra. In 1901 he founded *Il Lavoro—Journal of Physiology, Clinics and Hygiene of Work*, but his dream—and his plans—were to establish a "home" in which to study and treat work-related health problems.

This far-seeing project, which probably took shape also thanks to Devoto's contacts with members of the trade unions, for whom he held "popular conferences," aroused many criticisms. Some were probably motivated by the fear of having a new institution competing in the scientific and medical education fields. Others criticized the idea of a "home," because, as they said, physicians ought to go to the workplace and protect workers' health right there. But Devoto, as a matter of fact, recommended to his students and physicians exactly what Hector Denis, a Belgian sociologist, had written in 1897: "Physicians, walk out of your clinics, hospitals and laboratories, it is in the workshops that you'll find new and rich study materials, come among those who work!"<sup>4,5</sup> The interpretation, which still survives, of occupational medicine as a discipline that arose merely to repair workers' impairments to assure healthy manpower probably does not pay the right tribute to the actual ideals behind the creation of a medical institution completely devoted to the study and care of workers' health.

## FOUNDATION AND OPENING

Eventually, Luigi Devoto won his battle. In its November 20, 1902, session, the Milan Municipal Council approved (of 64 members, 57 in favor, 7 against) the project for the foundation of a postgraduate school for young physicians covering three major medical fields, obstetrics and gynecology, occupational health, and epidemic-contagious diseases.<sup>5,6</sup> The "Clinica del Lavoro" had the aim, in the words of City Mayor Mussi, of "scientifically studying the causes of occupational illnesses, spreading the clinical knowledge of them among physicians, hosting workers suspected of initial or advanced occupational illnesses for diagnostic and therapeutic purposes, for periodic checks on the health status of industrial workers in general and for those in unhealthy occupations in particular." When asked why the name "Clinica del Lavoro" (Work Clinic) and not, for example, Workers' Clinic, Devoto

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answered: "Because it is work that is sick and has to be treated to prevent diseases of the workers!"<sup>5,7</sup>

In 1906, two international events in Milan aroused new interest and provided support for the idea of the Clinica del Lavoro. One was the inauguration of the Simplon tunnel, then the greatest tunnel in the world, with two parallel tubes of 19,924 m linking Milan to Switzerland and France, which was celebrated worldwide as an astonishing success of human work—thanks also to the rigorous application of innovative injury-prevention and health-protection measures.<sup>8</sup> The second was the Universal Exhibition (World's Fair) in Milan, during which L. Devoto very ably organized the 1st International Congress on Occupational Diseases and, together with M. De Cristoforis, founded the Permanent International Commission on Occupational Health, with the immediate participation of 20 countries.<sup>9</sup>

In 1905 the Italian Parliament converted into law the decision of the Milan Municipal Council, and in 1907 a Royal Decree assigned to the Clinica financial and personnel resources. Further donations came from Milan Province, industry, the unions, and private citizens. In the foundation stone the motto was carved "In aliis vivimus, movemur et sumus" [In others we live, and move, and have our being].

The Clinica del Lavoro was solemnly inaugurated on Sunday, 10 March 1910, with the participation of representatives from numerous foreign countries.<sup>10</sup> One of the main speeches was given by professor Langlois on behalf of the French Ministry of Work:

Aujourd'hui est une date historique, qu'elle marque une époque dans l'évolution incessante de la vie sociale des peuples (. . .) L'Italie, et plus particulièrement l'Administration communale "di Milano" donne ici au monde entier un noble exemple. (. . .) La Clinique des maladies professionnelles est appelée à devenir un centre d'instruction mondial. [Today is a historic date which marks an epoch in the incessant evolution of man's social life (. . .) Italy and, especially, the Municipality "di Milano" here-with gives a noble example to the entire world. (. . .) The clinic of occupational health is called on to become a center for world-wide instruction.

Devoto highlighted the ". . . philosophical and human vision that prepared the destiny of the Clinica." He particularly stressed the following points:

- The birth of the Clinica was exclusively due to Milan's initiative and support, as a concrete and practical manifestation of sympathy with "the workers of every nation" and as an offer to "all those who receive from work in all its aspects, problems or patients, motives for research and care" without looking for any personal benefit.
- The Clinica, a instrument of social and political balance, was born as the nodal point of the interna-

tional network "of wires and waves" bound to work problems.

- The international value of the Clinica was definitively consecrated when the Permanent International Commission for Occupational Health established its headquarters within the Clinica.
- Great moral and civil significance derived from the location of the Clinica del Lavoro next to the obstetrical-gynecological clinic in recognition "of difficult or unfortunate maternity not exclusively due to the anti-physiological work of women, but deriving from the father who has an occupational illness."

The Clinica was designed as place for study and research, for therapy and assistance and, in fact, as an expression of social solidarity. Devoto's insistence on the physician's right-duty to go further than the restricted perimeter of the traditional medical activity and to get involved in issues of social relevance such as those related to work is remarkable.<sup>7</sup>

As Vigliani wrote in 1960,

The inauguration of the Clinica del Lavoro was a sensational event in Italian and international medicine: a discipline, so far neglected, suddenly leaped to the fore of the scientific scene with an institute that, for that period, was the very best that could be imagined. The Milanese were proud of having given to Italy and the world a new proof of scientific and social progress, foreigners demonstrated all their enthusiasm for an accomplishment which, following up Ramazzini's work, confirmed Italy's leadership in Occupational Medicine.<sup>10</sup>

The Clinica del Lavoro's medical and scientific programs included projects on fatigue in its various forms, pulmonary disease due to dust particles, workers' capability and work demands, hyper-susceptibility, the influence of occupational poisons on workers' children, blood in occupational intoxications, the endocrine organs and work.

In addition to scientific and clinical programs, the Clinica promoted special agreements with workers' associations to provide workers with medical and health assistance, health examinations, popular-type illustrated handouts with prevention guidelines against the most common occupational illnesses, guidance on most appropriate dietary rules for workers, and advice for a healthier life.<sup>11</sup>

The Clinica del Lavoro model was later followed by the creation of similar institutions in Moscow in 1923 and in Berlin in 1925, where a decree of 14 May 1925 by the German Minister of Trade and Work made explicit reference to an Institute ". . . analogue to the Milanese Clinic for Occupational Diseases."<sup>12</sup> Regret was expressed in the United States by the secretary of the American Association for Legislation at Work for not having achieved a similar goal: "Some of us had

hoped that industrial America with its wonderful resources, its famed philanthropies and its uncounted thousands of work-diseased men and women, might be first among nations to recognize the need of a special hospital and clinic for industrial diseases. But the honor belongs to Italy. . . ."<sup>13</sup>

## THE FIRST THREE DECADES OF THE CLINICA DEL LAVORO

In a 1913 report on the first years of activity, Devoto further elaborated and specified the nature and scope of "his" institution:

The Clinica investigates and studies known and indefinite causes of ill health related to occupations in order to reduce or do away with them; thus, more than a didactic specialization, it represents a vigilant and intense concentration of thought, research and application on everything that may contribute to the central objective: healthier and more physiological work. . . . From the medical-academic point of view, this clinic almost appears to be a revolutionary institute. It came to life and lives outside the customary schemes, with its specific aim, its content, its radical therapy which, in the end, is prevention.

Research and medical care were flanked by teaching activities conducted, however, according to particular criteria. In brief, it was about a clinical lesson with social intentions.

The clinical lesson held in University in order to attain effects also of medical-social education (. . .), will not only consist of brilliant diagnostic work and an impressive discussion of individual therapy, but will include a logical and detailed analysis of all the professional and social factors... from which sure elements for suggesting individual and social prophylaxis will derive.<sup>7</sup>

During the celebration of the 20th anniversary Devoto remarked

. . . how the name *Medicina del Lavoro* [Occupational Medicine], proposed by the Italians to describe the totality of studies and data regarding work, that great phenomenon of life, which daily flows in from physiology and pathology, toxicology, clinical and forensic medicine and work hygiene, not less than from the social security laws of the State and from the most important state-controlled institutions, is favorably received abroad. Occupational Medicine thus is not particularism, dismemberment or hegemony, but an extremely mobile band of energies and discoveries conveyed towards a single aim: to protect, defend and assist those who work.<sup>14</sup>

The 25th anniversary was celebrated on 24 March 1935, and the official speech was delivered by Nicolò Castellino, professor of occupational medicine in

Naples and Member of the Italian Parliament. The motto of the celebration was *Scientia sibi aedificavit Domum* [Science has built her house].<sup>15</sup>

When the idea became concrete of constructing the Clinica del Lavoro in Milan, the largest Italian industrial center, there was no precedent or model either in theory or in practice. In fact, academic theory with its "misoneism" [hatred of anything new] was hostile because the Faculty of Medicine clinics study well-defined territories (many of whose confines are disputed) of the human body attacked by illness, and the Faculty was thus reluctant to admit the opportunity of a new medical organization outside the normal schemes. . . . All this explains the long delay, deplored also by the political world, in the study of occupational illness; and so almost two centuries passed since Ramazzini's time. . . . The Milan Clinica del Lavoro demonstrates already in the conception of its construction its essential nature as an autonomous environment for research framed within the greatest manifestation of life: Work. The new research institute, in addition to studying sick and healthy or apparently healthy workers, also studies medical-health problems of work in order to transmit to public administrations and industry their conclusions to be applied

He then enumerated a series of examples on how the work of the Clinica del Lavoro had already been effective in producing changes in work conditions. We mention just two of those examples:

The Clinica thoroughly studied the damage night work does to children who work in the main city's theatres; the results were immediately taken into consideration by the municipality and steps were taken in accordance.

In 1920 an enormous strike hit Milan because the industry refused to increase the hourly wage of 1.25 lira an hour. The Clinica offered to the Prefect the data which indicated that these workers wouldn't live more than 60 years, after 35-40 they're sickly, they have few children and these are fragile. The Prefect solved the controversy by increasing the hourly rate to 2.75 lira.<sup>15</sup>

## THE POST-WORLD WAR II PERIOD

Luigi Devoto died in 1936. Director from 1936 to 1941 was Luigi Preti. Then, Enrico C. Vigliani directed the Clinica from 1942 to 1977. After the enforced period of stasis during World War II, due also to the heavy destruction suffered during the air raids of 15 August 1943, the Milan Clinica del Lavoro fervently resumed work. With the reconstruction, a new outpatient department was opened, along with new centers for the study of occupational illnesses, in collaboration with the main welfare and social security agencies. The for-

tieth anniversary of the Clinic, in 1950, was marked by an international congress. The number of participants was high, and the contributions of eminent occupational health physicians from Belgium, France, Germany, Switzerland, Great Britain, Croatia, Serbia, Spain, Portugal, Sweden and the United States underlined the international role of the institution, attributable both to its ancient tradition and to the current fervor in research.<sup>16</sup>

On the occasion of the fiftieth anniversary Vigliani described the Clinica's post-war renovation<sup>10</sup>:

Between 1952 and today [1960], the Milan Clinic has been completely restructured and modernized, with new laboratories, renewed diagnostic services (Rx, in particular), and a new wing was added to the original building bringing the total number of beds for inpatients to 140. Funds were donated by the University, the National Insurance Institute for Work Accidents and Diseases (INAIL), Montecatini Company, the Coal and Steel European Community, the Cassa di Risparmio (Regional Savings Bank), numerous industries and the sacrifice of all the physicians who donated a good part of their proceeds to a common fund destined to cover the needs of scientific research. Latest to be created was a service for industry managers' health control and promotion (curiously, almost following in the footsteps of Ramazzini, who, after *The Diseases of Workers* [*De Morbis Artificum*] wrote *The Health of Princes* [*De Valetudine Principum*]). About fifty physicians and twenty-five students work in the Clinic. Working side by side with them are four psychologists, five chemists, a physicist, two engineers, two PhDs in natural sciences, lab technicians and health workers.<sup>10</sup>

In the post-WWII period, Vigliani continued the Clinica tradition of combining advanced, high-quality research with direct knowledge of the actual work conditions causing workers' diseases. In 1947, thanks to the Marshall Plan and donations by FIAT, an X-ray-equipped truck started visiting dusty workplaces to identify early and not only overt signs of lung disease, pneumoconiosis mainly: in those years they used to perform up to 80,000 chest X-rays/year. Silicosis and asbestosis had been recognized in 1943 as occupational diseases by INAIL (National Insurance Institute for Work Accidents and Diseases), thanks to the work of Vigliani and other Italian occupational physicians. In 1948 the first Italian laboratory of Industrial Hygiene was initiated in the Clinica, with a large capacity for measurements at the workplace and in the general environment, and with an innovative view of analytical methods; from its activities stemmed in 1960 the Italian Association of Industrial Hygiene (AIDII). In 1950 the first European Institution, the European Community of Coal and Steel (CECA), was created in Luxemburg by Germany, France, Luxemburg, Belgium, Italy, and The Netherlands, and it became one of the major

sources for the funding of research in occupational health. In 1963 a further wing (later named "Vigliani Hall") was added to the original building. It was completely dedicated to laboratory research activities and to a new library: pioneer research was conducted in fields such as industrial hygiene, immunology, histology, cytogenetics, and ergonomics. Other main departments included respiratory function, cardiology, dermatology, haematology, audiology, toxicology of metals and organic substances, neurology and psychology.<sup>17</sup>

The journal that Devoto founded in 1901, *Il Lavoro* (from 1925 on, *La Medicina del Lavoro, Med Lav*), grew hand in hand with the Clinica so that the scientific and social development of the latter can be best understood through the journal contents over the years.<sup>18</sup>

The major scientific achievements were summarized by Luigi Devoto in 1930,<sup>14</sup> by Enrico Vigliani in 1992,<sup>17</sup> and recently in 2003.<sup>19</sup> What is most fascinating in re-reading those articles is to observe how research was constantly adapted to the evolution of manufacturing techniques and work organization, and to the changes in the political and social context that affected labor relations and hence the relationship between health and work.

In the early period great attention was devoted to the diseases that affected not only workers but their families as well. This line of research included both vitamin deficiency (e.g., pellagra) and infectious and parasitic diseases (e.g., ancylostomiasis). The physical fatigue of manual workers "who exposed themselves to intense strain" and its possible effects on the heart, blood vessels, and endocrine glands were investigated even through experimental models.<sup>20</sup> This line of research continued later with the study of the relationships between work stress conditions and cardiovascular disease.<sup>21,22</sup>

The effects of exposures to metals and chemicals were first assessed by defining their clinical pictures and later through indicators of abnormal absorption before any effects appeared. Here we should pay homage to the pioneering observation made by Pier Diego Siccardi (who died from ictero-hemorrhagic leptospirosis while studying the diseases occurring among World War I soldiers) that lead poisoning was due "to the clearcut action on blood vessels, and on smooth and striate muscles," an observation that was confirmed 50 years later. A main line of research was neuropsychology,<sup>23,24</sup> with the aim of identifying early toxic changes in the central and peripheral nervous systems and the neurobehavioral effects of extremely low levels of exposure to neurotoxic substances.<sup>25</sup> Major efforts were devoted to the practice of biological monitoring that became more and more sophisticated with the increasing need to assess exposures at extremely low levels.<sup>26,27</sup>

The clinical pictures of many intoxications were described, including phosphorus poisoning (white phosphorus was banned in Italy in 1923); mercury poisoning, the last epidemic of which was described at the



Clinica in the 1950s, whereas the neurobehavioral effects are still subject of study today<sup>28</sup>; carbon disulfide poisoning, the features of which were described in 1956; benzene poisoning: the clinical picture of bone marrow aplasia and leukemia were described in the 1940s, first by Saita<sup>29</sup> and then by Vigliani and Saita.<sup>30</sup> Benzene was banned as a solvent for glues in Italy in 1963, also as a result of these scientific works.

In the 1920s phenomena such as neuritis, muscular and joint pain, and cramp were associated with manual work consisting of limited and circumscribed exercise of a specific neuro-muscular district extending over years. The effect of repetitive movements and biomechanical overload of the upper limbs or cumulative trauma disorders are still topics of extensive study.<sup>31</sup>

For the period from World War II to 1977, the reference figure is Enrico C. Vigliani. More than 1500 articles were published in that period, in both Italian and international journals, covering a wide range of topics from respiratory physiopathology to radiology of silicosis and asbestosis, from cytogenetics to cellular pathology, from immunology to electron microscopy, from chemical and clinical analytic methods to industrial hygiene studies, from ergonomics to epidemiology, from clinical medicine to experimental toxicology, from respiratory function to noise-induced hearing loss.<sup>32</sup> Specific examples of this work are:

- the confirmation of a vascular encephalopathy in carbon disulfide poisoning (Vigliani and Cazzullo) and its pathogenesis via inhibition of the clearing factor in the blood (Pernis);
- the first suggestion by Vigliani and Barsotti in 1948 that benzidine was at least as carcinogenic as beta naphthylamine;
- the identification of the cause of the so-called "foundry fever" or "metal fume fever" due to the liberation of "endogenous pyrogen" by granulocytes that had phagocytized minute particles of the fumes;
- the explanation of the pathogenesis of hemolytic anemia due to arsenical hydrogen;
- the study of many polymers which, by adhering to quartz, delayed the onset of experimental silicosis;
- the suggestion by Pernis and Cavagna that byssinosis was due to the inhalation of bacterial endotoxins contained in cotton dust: This revolutionary hypothesis was later confirmed and is today generally accepted.

In the field of industrial hygiene, a portable mercury pump was invented for the deposition of dust particles at constant velocity on a micropore membrane, and also an Aeolian separator for dust particles and a new version of a personal sampler for toxic gases.

However, the problem to which the Clinica dedicated most time and effort was the pathogenesis of silicosis. Through a long series of clinical and experimen-

tal research, from 1948 to 1982, the pathogenesis of silicosis was defined to be of immune nature. Until then, no explanation had been found for this disease since the Milanese chemist Scarpa in 1870, through the chemical analysis of the lungs of a stone mason, for the first time called "silicosis" the pulmonary fibrosis due to quartz.<sup>33-35</sup>

The last 25 years have seen major transformations in work conditions and organization and, accordingly, new fields of research have become prominent as, for example, epidemiology, ergonomics, and psychosocial sciences, whereas traditional fields such as toxicology have had to renew their methods, skills, and objectives. The 2002 celebration of the founding of the Clinica was the occasion for reporting in a special issue of *La Medicina del Lavoro* the evolution and development of the various fields related to occupational health.<sup>36</sup> Directors in that period were Gerolamo Chiappino (from 1980 to 1985), who extensively worked on respiratory effects of mineral fibers<sup>37,38</sup> and renovated the postgraduate School of Occupational Medicine,<sup>39</sup> and Antonio Grieco (1978-1980 and 1985-2001), who strengthened and expanded the social relevance of the institution and offered major contributions in the fields of ergonomics and occupational and environmental prevention history.<sup>40,41</sup> The "Clinica del Lavoro Luigi Devoto" gave the name to the Department of Occupational and Environmental Health of the University of Milan, which presently includes units in three major teaching hospitals within the city. This Department will be hosting as main organizer the 2006 Congress of the International Commission of Occupational Health, marking the 100th anniversary of the largest scientific and professional organization in occupational health, which was launched in Milan on 13 June 1906.

Whether and how much the Clinica still effectively contributes to the knowledge and prevention of new risks at the workplace can be judged by the reader through the current literature and our participation in international forums. At least one feature of its origin and history has not been lost, we think: to stay in contact with people at work and not just with their diseases.

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