

The hygienist and sociologist Louis-René Villermé (1782-1863): a pioneer of occupational medicine

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SUMMARY

Background: *Louis-René Villermé's work and research have ranked him among the most important figures in the history of occupational medicine.* **Objectives:** *The aims of this article were to objectively record the influence and the impact of Villermé's life and work on the establishment of occupational medicine.* **Methods:** *A thorough analysis of scientific and historical literature on the subject was conducted. The authors paid special attention to primary French sources.* **Results:** *Louis-René Villermé was born in Paris in 10 March 1782. Taking advantage of his good fortune and financial prosperity, due to the recognition of his initial work, he progressed efficiently and with decision towards a new way of thinking. He stressed the importance of observation of the social environment, the role of investigations on lack of hygiene, the significance of statistical recording and the study of demographic statistics, and devoted himself to the labour force's health problems. He died in his homestead on 16 November 1863.* **Conclusions:** *Villermé lived an intense life full of activity, social work and travel. His support of the working classes' rights, his opposition to child labour and gender inequality, and his fight for humane conditions in prisons remain diachronic ideals. He provided a reference model for socio-medical research and contributed to the establishment of the new scientific discipline, Occupational Medicine.*

RIASSUNTO

«**L'igienista e sociologo Louis-René Villermé (1782-1863): un pioniere della medicina del lavoro**». **Introduzione:** *Il lavoro e la ricerca di Louis-René Villermé lo promuovono tra le figure più importanti nella storia della medicina del lavoro.* **Obiettivi:** *Gli obiettivi di questo articolo sono quelli di riconoscere l'influenza e l'effetto della vita e dell'opera di Villermé nella nascita della medicina del lavoro.* **Metodi:** *È stata condotta un'analisi approfondita della letteratura scientifica e storica. Gli autori hanno prestato una attenzione particolare alle fonti primarie francesi.* **Risultati:** *Louis-René Villermé è nato a Parigi il 10 marzo 1782. Disponendo di una buona prosperità finanziaria e grazie al riconoscimento del suo lavoro iniziale, è riuscito a proporre con decisione e in modo efficiente un nuovo modo di pensare. Ha sottolineato l'importanza dell'osservazione del contesto sociale, il ruolo delle indagini di igiene, il significato delle rilevazioni statistiche e lo studio delle statistiche demografiche e si è consacrato ai problemi sanitari della forza lavoro. Muore nella sua casa il 16 Novembre 1863.* **Conclusioni:** *Villermé ha vissuto una vita intensa, piena di azioni, di lavoro sociale e di viaggi. La sua difesa dei diritti delle classi popolari, la sua opposizione al lavoro dei minori ed alle differenze di genere, la sua lotta per il miglioramento delle condizioni nelle prigioni restano degli ideali diacronici.*

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INTRODUCTION

Louis-René Villermé (1782-1863) achieved everlasting recognition as one of the pioneers of the incorporation of systematic research, mathematics and statistics, and environmental observation in medical practice.

His use of numerical methods and his sincere interest in workers' health rank him among the founding fathers of sociological and occupational medical research. The legacy of Bernardino Ramazzini (1633-1714) marked the beginning of society's concern with the occupational aspects of health, and Villermé revived the Italian pioneer's analytical approaches to the association of disease with particular occupations (9, 26). His research, along with that of his contemporary, Pierre-Charles-Alexandre Louis (1787-1872), established the use of systematic methods in the study of disease (12) and preceded the eminent female figure Ersilia Majno Bronzini (1859-1933), who shared his interest in occupational health laws, especially regarding child labour (16). By continuing Ramazzini's innovative work and thereby representing an important chapter in the history of occupational medicine and the public health movement (6, 10), Villermé assured himself a prominent place in the history of medicine.

BRIEF BIOGRAPHICAL NOTE

Louis-René Villermé was born in Paris on 10 March 1782 and spent his childhood in the area of Lardy. In 1801 he began his studies in Medicine and only two years later became the assistant of Baron Guillaume Dupuytren (1777-1835), teaching a course on skeletal anatomy (20). After completion of his studies as a military doctor in Napoleon's army, he began travelling abroad, as was the habit of every philosopher: Germany, Portugal, Poland and Spain were among his destinations. In 1814 he was promoted to *Chevalier de l'Ordre de la Réunion* and a year later he quit the army (2). In 1814 he completed his PhD Dissertation in Medicine and four years later he married Morel d'Arleux.

In 1834 he was working for the *Académie des Sciences Morales et Politiques*, recording the variations in mortality among the rich and the poor, using demographic statistics for the first time. In 1837, in a session of the Five Academies, he expressed his revulsion for the drama of child labour in industrial establishments. In 1848 he became a member of the Academy of Public Hygiene (20).

He died at his homestead on 16 November 1863 (20), but his beliefs, his statistical methodology and his remarkable publications that are still extant had a major impact and led to the revival of Occupational Medicine, granting him lasting recognition.

VILLERMÉ'S MEDICAL PRACTICE, SOCIOLOGICAL RESEARCH, STUDIES AND PUBLICATIONS

Between 1815 and 1818, while he was still practicing medicine, Villermé used to spend some time at the *Société d'Emulation*, where he spoke about his latest far reaching research, including studies on fistulas and membranes, erysipelas and potassium cyanide. These studies were highly appreciated and ranked him high among his contemporaries Marie François Xavier Bichat (1771-1802), Philippe Pinel (1745-1826) and even Guillaume Dupuytren (3).

Taking advantage of his good fortune and financial prosperity and with his wife's unconditional support, Villermé was able to progress efficiently and with decision towards a new way of thinking. In 1818 he decided to abandon his practice and started a collaborative work which led to the publication of "*Dictionnaire des Sciences Médicales*", where he stressed to his colleagues the importance of observation of the social environment, the role of the investigation of lack of hygiene, the significance of statistical recording and the study of demographic statistics (8). From that moment on, influenced by the effects of war, he fixed his main aim: to fight against misery and maltreatment of any kind.

On October 6, 1818 he presented to the *Société de Médecine* a report entitled: "*De la famine et ses effets sur la santé dans les lieux qui sont le théâtre de la guerre*" (Famine and its consequences in the areas affected by war) (3). This report, far from any com-

pliant allocution, was a convincing detailed analysis of the situation and data available at that time. He further studied the mortality rates across Paris during 1817-1826, exploring variations in fatality rates in Paris by district, population density and income indicators (22). Results obtained with today's statistical techniques (correlation analysis) support Villermé's claims of a direct link between poverty and a high mortality rate (11). It was inevitable that his sociological views would seriously affect the beliefs of the scientific and political community.

Moreover, he published an article in 1819 in the *Journal Général de Médecine* entitled "Quelques considérations sur la santé des forçats et des galériens" (Some views on convicts' and mine workers' health). This article, Villermé's first attempt to address issues like workers' health, was a keen attempt to create awareness in public opinion and served as a prelude to his provocative book entitled "Des prisons telles qu'elles sont et telles qu'elles devraient être" (Prisons as they are and as they should be). With this publication he inflicted an impressive blow to the excessive brutality, the unnecessary tortures, and the twisted way of thinking both in prisons and at construction sites (15). A lover of statistics, Villermé had collected data for all the types of French prisons, from detention sites to pre-trial detention centers, and went on to compare evidence, systems and architecture between France and England (as described by Thomas Fowell Buxton in his *An Enquiry, Whether Crime and Misery are produced or prevented by our present system of Prison Discipline* in 1818) and the USA (analyzed by Rob I. Turnbull in his *A visit to the Philadelphia Prison* in 1797) (18, 23).

At that point, using his own capabilities and aided by F. Villot, the mathematician Jean Baptiste Joseph Fourier (1768-1830) and the Prefecture's official, Gaspard de Chabrol (1773-1843), Villermé established a department of statistics in the 3rd Prefecture's office, where he collected significant social data from pre-1817 Paris. Having now access to new data, he became one of the first to compare morbidity to mortality rates among Paris hospitals, and associated the results with the patients' occupations (14). Through detailed charts he recorded 130 male and female workers who had been hospi-

talized in those years. In 1824, he presented to the *Académie Nationale de Médecine* his treatise entitled "La mortalité comparative dans la classe indigente et dans la classe aisée" (Comparative mortality in the poor and the wealthy classes) that revived the medical society's interest in his views (14).

In 1832, a cholera outbreak spread rapidly and severely in Paris and the rest of France. Faced with this dreadful disaster, Villermé left everything and dedicated himself completely to the service of those who were suffering. He worked intensely in the *Garde Nationale* and persevered in organizing 48 "Bureaux de Secours" in various districts of Paris. His fame grew rapidly among the citizens, and he was eventually granted the Medal of the City of Paris for his dedication in assisting cholera patients. He then wrote the "Note sur les ravages du cholera morbus dans les maisons" (Note on the ravages of cholera in dwellings), where he described the relationship between the spread of the disease and living conditions (4).

A series of publications followed: "L'organisation des sociétés de prévoyance ou de secours mutuels" (The organization of social security or friendly societies), "Mémoire sur la taille de l'homme en France" (Note on the stature of men in France), "Note sur la mortalité parmi les forçats du bagne" (Note on the mortality among prison convicts), "Sur la durée moyenne des maladies aux différents âges" (On the average duration of diseases at different ages), "De la mortalité dans les divers quartiers de la ville de Paris" (On the mortality in various districts of Paris), and "Mémoire sur la distribution de la population française" (Note on the distribution of the French population), until 1837 (3).

By 1837, Villermé had already perfected his statistical methods and fully developed his social sensibility. He had prepared the grounds for his engagement with the health problems of France's labour force.

THE BIRTH OF OCCUPATIONAL MEDICINE AS A RESULT OF VILLERME'S INFLUENTIAL THEORIES

Villermé completed a major retrospective study between the years 1835-1837, together with

Benoiston de Châteauneuf (1776-1856) on behalf of the Academy of Ethics and Politics, on the working conditions of the French working class. He repeatedly visited the large provincial villages, devoting himself not only to observations, but also to precise ratings and recordings (21). After three years of multiple analyses, in 1840 he published his major work: "*Tableau de l'état physique et moral des ouvriers employés dans les manufactures de coton, de laine et de soie*" (Survey of the physical and moral conditions of workers employed in cotton, wool and silk manufacturing), in which he also reported on the wretched conditions under which children worked from a very young age (5). His work was difficult as he had to obtain information from an extremely sensitive source, the poor. He found that women started work very early in the morning but were paid much lower wages than the men. They were also forced to take work home, regardless of the distance between where they lived and the work place (20). He showed how hand combing of cotton led to pneumonia. Moreover, an important conclusion was that the main problem of workers in the textile industry, apart from the working conditions, was their low income which was insufficient to ensure proper living conditions (1, 13). In the second part of his research he studied the problems of linen workers, and in the third part those of those in silk industry (24). He introduced the phrase "*phtisie ou pneumonie cotonneuse*", for a chest disease, probably some occupational form of a deadly pulmonary tuberculosis (25).

This landmark work acquired more importance because Villermé did not just cite numbers but observed the trends in the growth of the working class, the urban population and the increase in the number of births. He categorized workers according to the industry they worked in, the area of employment and their individual tasks (24). The industrialization of France required a new record of both salaries and work accidents and Villermé produced impressive data, thus giving scientific validity to his observations for the years 1827-1834, which ultimately became the guide for new social reforms. Along with German Edouard Mallet's work "Study of the average height of Genevan conscripts", Villermé was among the first to use data

from large samples of individual conscripts in an attempt to produce evidence-based statistics (19).

Above all, his most important work was his protest against excessive use of child labour in manufacturing. Child labour had been suppressed when a rapid industrial evolution came on. It had been observed that the health of the families that worked in those industries was poor and the children were underweight and pale. Local physicians confirmed Villermé's views on pulmonary consumption. The results of his impressive research led, on 22 March 1841, to the Law restricting child labour, with total prohibition for children under twelve to work (13). A model for this research may have been the pioneering work in 1831 by Charles Turner Thackrah (1795-1833, a renown surgeon from Leeds), "*The effects of arts, trades and professions and of civic states and habits of living on health and longevity*", which had an enormous impact on the introduction of the English Factory Act of 1833. This Act, which preceded the French legislation of 1841, prohibited the employment of children under 9 years of age and provided that children between 9 and 13 years were not to be employed longer than 9 hours a day or 48 hours a week (7). Just as happened in England, in France it took impressive research work of a bright mind to bring about the introduction of such legislation.

Meanwhile, Laurent Cunin-Gridaine (1778-1859), Minister of Commerce, recognized in a public speech the existence of the problem, stressing however that it existed only in certain areas and was not widespread. Even though Gridaine theoretically considered Villermé a prominent member of Parisian society, his statement led Villermé to maintain a low opinion of politicians and start a new campaign. He observed that there was a huge difference in living conditions between employers and employees, with the exception of Lyon. He recorded that low salaries led to wretched living conditions, which, in turn, led to serious health problems, eventually resulting in loss of working hours and failure of the industry. He concluded that the damp, underground workshops, with high temperatures and inadequate aeration, in combination with the workers' light clothing, caused severe respiratory diseases. He observed that the workers

were usually consigned to sheds, in teams of 10-15 people, with little space and no windows, forced to start work at 5:00 am and finish at 9:00 pm. He blamed the modern machinery for being inadequate for the work performed with them and were a risk factor for accidents. He stressed that poverty reduced life expectancy, recording a number of only 3541 poor children who lived to the age of 40. In an attempt to stimulate the public's interest, he condemned the exclusiveness of the upper social classes, recognized illegal births and drew attention to the huge problems posed by alcoholism, ignorance, prostitution and crime. Villermé then proceeded to make a number of proposals aimed at improving this situation. He proposed the establishment of schools, repression of prostitution, a reduction in the number of bars, adequate police patrol, reinforcement of the role of the priests, the control and closure of illegal distilleries, coordinated health care and the distribution of modern conveniences to farming families (20).

Villermé, influenced by the conditions of his times, recognized that his suggestions envisioned a utopian society, however he wrote "*truth is the sole purpose*". The main truth that he upheld, care for the working class, led to the establishment of the discipline of occupational safety and health. The impact his work had led to the introduction of the first law of urbanization and living conditions in 1850 and foresaw the 1898 legislation on work accidents (20).

CONCLUSION

Louis-René Villermé lived an intense life full of activity, social work and travel. His support of the rights of the working classes, his opposition to child labour and gender inequality, and his fight for humane conditions in prisons remain diachronic ideals. He offered a reference model for socio-medical research, as he showed a rare interest in epidemiology and medical statistics which lie at the basis of modern Occupational Medicine and Public Health. By taking these concepts into account and forming a holistic approach and a medical/philosophical point of view, he succeeded in

bringing a fresh spirit to contemporary research. Villermé is still remembered today as an erudite and exceptional French scientist who, exactly in Paris, "*La Ville Lumière*", attempted to light the path to improvement in the lives of vulnerable individuals and social classes, while contributing to the establishment of the new approach to the scientific discipline of Occupational Medicine.

NO POTENTIAL CONFLICT OF INTEREST RELEVANT TO THIS ARTICLE WAS REPORTED

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