



Chapter 1

“The Influence of Employments on Health”

Work and Medical Discourses about Occupational Health

Experiences of modernity—of the “difference posed by the present,” as Partha Chatterjee put it—are often infused with concerns about physical and mental well-being, about the body and the mind’s inability to adapt to the demands of the present as opposed to the past.¹ In the nineteenth century, the health of “modern” men and women became a subject of discussion among a wide range of social actors, from politicians and administrators to medical men, workers, writers, and journalists. If, as many Victorians were keen to point out, theirs was an era of progress and modernization, of sustained mechanization and industrialization, it was also a period of questioning and introspection. As contemporary observers struggled to come to grips with the disruptive consequences of ongoing socioeconomic and technological change, many questioned the ways in which science and the “progress of civilization” affected the fabric of society and influenced the physical and moral well-being of its members.

This chapter examines work as one of the main sites where anxieties about “modern life” were played out in the nineteenth century.² Indeed, as discussed in the introduction, “Work, of all kinds, was central to concerns about the diseases of modern life”; one of the most important outcomes of such anxieties was the gradual crystallization of occupational health as a distinct field of medical inquiry and public health intervention in the

course of the nineteenth century. During this period, the human and environmental costs of ongoing industrialization and urbanization became increasingly visible to the public, mediated as they were by an explosion of print matter that brought cheap newspapers and other periodical publications within the reach of a growing audience of literate men and women. Many of the concerns about deteriorating bodily and mental health expressed through the medium of the popular and specialist press were linked to inadequate working conditions and practices, which often culminated in serious accidents. As Jamie Bronstein has cogently observed, such widely publicized accidents “called into question man’s ability to control and to progress, contravening the spirit of Victorian positivism.”³

The newspaper and periodical press also offered a platform for the dissemination of medical ideas about occupational diseases and was instrumental in raising awareness about the relationship between health and a person’s working environment. Charles Turner Thackrah’s (1795–1833) book, *The Effects of the Principal Arts, Trades and Professions, and of Civic States and Habits of Living on Health and Longevity* (1831), an early example of a burgeoning literature on occupational health, was widely reviewed in popular journals, including *The Literary Gazette*, *Chambers’s Edinburgh Journal*, *The Imperial Magazine*, and *The Penny Magazine of the Society for the Diffusion of Useful Knowledge*.⁴ A pioneer in the field of occupational medicine in Britain, Thackrah pertinently summed up contemporary anxieties associated with work practices:

If we turn our view from man to his works, we see the wilderness converted into towns and cities, roads cut through mountains, bridges carried over rivers and even arms of the sea, ships which traverse the globe, lakes converted into corn fields, forests made into pasture, and barren rocks covered with timber; in a word, we see the face of the world changed by human will and human power. If we look immediately at home, we observe the wonders which science and art have effected. We see large buildings, manufactures of almost every kind, and substances so changed, reformed, and combined, that nature could scarcely know her own productions. We admire the inventions of science, alike in their minuteness and their size, their accuracy, and their extent of operation. . . . These, and works like these, are assuredly wonderful. But while we admire, let us examine. What are the effects of these surprising works—effects, I mean, physical and moral?⁵

Thackrah's question was not new. Enlightenment intellectuals and medical practitioners had also decried the negative effects of "modern life" on health. Jan Golinski has documented how, in the eighteenth century, "aerial pathologies" such as melancholy came to be regarded "to some extent [as] diseases of modern life," with many commentators establishing a connection between the proliferation of such illnesses and their age's growing appetite for "modern luxuries" in the form of tea, coffee, "fashionable clothing," and "indoor entertainment."⁶ Thackrah himself was drawing on important predecessors in his attempt to diagnose the impact of the working environment on the health of various categories of workers, among them occupational groups as diverse as "operatives," merchants, manufacturers, and "professional men." The first clues of these intellectual debts can be gauged from the text itself, in particular the extended second edition of *The Effects of the Principal Arts, Trades and Professions*, published in 1832. In it, Thackrah references extensively the work of the Italian physician Bernardino Ramazzini (1633–1714), author of the first comprehensive treatise on occupational health, *De morbis artificum diatriba*, first published in Latin at Modena in 1700 and usually translated into English as *Diseases of Workers*. In fact, as this chapter discusses, in the nineteenth century Ramazzini already had the reputation of a "father" figure in the emerging field of occupational health, his book being one of the "classics" with which medical authors often engaged.⁷

Taking a cue from nineteenth-century medical authors, this chapter uses Ramazzini's pioneering work—its subsequent reception, transformations, adaptations, or rejections—as a springboard for pondering, from a historical perspective, the changing relationship between work, modernity, and occupational illness in the nineteenth century. If, as suggested above, Thackrah's question about the relationship between health and the environment in which one worked was not new, then what about the answers to that question? In order to contextualize nineteenth-century debates about work and occupational health, but also to understand what was novel about them, the chapter traces the reception of Ramazzini's ideas in a range of eighteenth- and nineteenth-century historical material from Britain, Italy, France, and Germany, in the form of medical treatises, dissertations, essays, lectures, correspondence, and book reviews, many of which were published in the popular and scientific periodicals of the time. The aim is to examine the development of conceptual and nosological frameworks for understanding the etiology, pathogenesis, and

symptomatology of occupational diseases during the nineteenth century, their connection with earlier medical thought and practice, and the ways in which relevant scientific knowledge was produced and disseminated during this period.

Processes of knowledge production about occupational health can be seen to be transnational and dialogical in nature, and translation plays an important role in the production and circulation of scientific knowledge. Translation is understood here not only as the process of rendering a scientific text from a source language into a target language, but also as an intertextual practice that allows knowledge to move across various genres and media of communication. This analysis opens up a broader and more inclusive understanding of the “workplace” in its relation to health in the nineteenth century, one that recognizes that discussions about occupational hazards were linked to a wide range of activities. Although mines, collieries, factories, and railways provided some of the most compelling examples of work-related bodily injury and emerged, in both popular and scientific literature, as conspicuous sites of occupational injury, they were by no means the only risk-prone working environments.⁸ Many nineteenth-century medical commentators recognized this fact, remarking that the great diversity of occupational pursuits that characterized their age had translated into a bewildering number of “distempers,” “maladies,” “disorders,” and “accidents.” Put differently, bodily and mental illness in the nineteenth century was associated with a wide range of occupations across the social spectrum, ranging from mining and chimney sweeping to nursing, operating sewing machines, and even singing and writing, although not all of these conditions engaged the attention of legislators or led them to address specific conditions to the same degree. This comprehensive, encyclopedic approach to occupational health was an important legacy of Ramazzini’s early work in this field, demonstrating not only the extent to which nineteenth-century writers were indebted to the previous corpus of medical knowledge and practice but also the ways in which they departed from it.

Eighteenth-Century Models and Approaches

The notion that work and the environment in which it was conducted had a direct bearing upon the physical and mental well-being of the worker had a long pedigree. In antiquity and the Renaissance, medical thinkers investigated how certain types of work, along with ecological factors

such as climate and water, influenced health and promoted the onset of disease. Mining, a particularly dangerous occupation, also attracted the attention of famous medieval scholars such as Agricola (1494–1555) and Paracelsus (1493–1541); for example, the latter’s posthumous work, *Von der Bergsucht und anderen Bergkrankheiten* (“On the Miners’ Sickness and Other Miners’ Diseases”), was innovative in its discussion of respiratory diseases and its “attempt to relate [them] to the general body of medical knowledge and theory.”⁹ But it was during the Enlightenment, as a number of authors have also pointed out, that many modern notions about public health took shape and crystallized.¹⁰ Ramazzini’s work on various types of occupations and the diseases incident to them is an important example in this respect. Unlike its predecessors, which focused on a single occupational group, Ramazzini’s *De morbis artificum diatriba* was a more ambitious project that attempted to account for a broader range of occupational diseases and categories of workers. The first edition, published in 1700, described no fewer than forty-three types of occupations and was reprinted in 1713 with a “Supplement” that included an additional thirteen. Among those whose health and work conditions were scrutinized were glass-makers, glass-grinders, porters, sailors, and “tradesmen who sit too much.”¹¹

Two main nosological principles can be distilled from the structure of the book. First, diseases were classified according to the type of work to which they pertained, with each chapter dedicated to the discussion of a set of medical conditions associated with a particular occupational group. Second, they were also organized according to etiology, with two main risk factors being identified: exposure to noxious substances and mechanical hazards. Ramazzini’s nosology was informed by a combination of humoral theories of disease and the idea that external factors were also responsible for ill health and death, which had been popular in Italy since the seventeenth century.¹² Strongly influenced by Hippocrates, who posited a link between disease and environment, Ramazzini operated with an understanding of the workplace as an all-encompassing habitat. Occupational illness was thus a function of various factors that converged in the workplace *environment*, such as the repetitive nature of certain work practices, the use of dangerous materials and technologies, and the action upon the body of the atmosphere.

Ramazzini’s concern with nosology, unsurprising in the context of his time, was related to a broader interest in classification that also extended to plants, animals, languages, and human beings. Such interest became

increasingly conspicuous in the eighteenth century.¹³ As Matthias Dörries has pointed out with regard to natural philosophy, for Enlightenment thinkers classification was “one means to achieve clarity and rational order,” an impulse that stemmed from a “concern for completeness” and the desire to map, as comprehensively as possible, future areas of investigation.¹⁴ At the same time, the drive toward classification was also a reaction to the perceived “information overload” in the sixteenth and seventeenth centuries—the nineteenth-century incarnations of this phenomenon have been discussed in the introduction—which resulted in the publication of numerous dictionaries and encyclopedias that aimed to organize this information coherently and systematically.¹⁵ The preoccupation with organization and classification continued in the works of the nineteenth-century medical writers discussed, many of whom had learned to think about the connection between health and occupation within an analytical and methodological framework not dissimilar to the one developed by Ramazzini.

Translation played an important role in this context. Although tracing the number of translations, reprints, and new editions of Ramazzini’s *Diseases of Workers* is beyond the scope of this chapter, there are indications that the book enjoyed a substantial degree of popularity in the eighteenth and nineteenth centuries.¹⁶ According to a list compiled at the beginning of the twentieth century by Franz Koelsch, by the 1850s the work had been published eight times in Latin, four times in Italian, three times in French, four times each in German and English, and once in Dutch.¹⁷ The eighteenth-century doctor Johann Christian Gottlieb Ackermann (1756–1801), who translated Ramazzini’s book into German, also wrote that by 1780 the *Diseases of Workers* had been reprinted nine times as a distinct work and seven times as part of volumes of Ramazzini’s collected medical work.¹⁸

The book’s popularity stemmed partly from Ramazzini’s own reputation as a physician in eighteenth-century Italy and his association with the renowned medical schools at Padua and Modena. A late eighteenth-century Dutch visitor to Padua, W. X. Jansen, described the university there as “formerly one of the most celebrated in Europe” and attributed its fame to the “superior learning” of professors such as Andreas Vesalius, Sanctorius, Bernardino Ramazzini, and Giovanni Battista Morgagni.¹⁹ At the same time, Ramazzini’s holistic approach to the study of occupational health also contributed to the broader appeal of the book, making it relevant to a larger group of medical and scientific men. A

1702 review in *Actorum Eruditorum*, a scientific periodical published in Leipzig in the late seventeenth and early eighteenth centuries, underscored the book's utility for physicians as well as "amateur scientists" (*Amateurs des Sciences*).²⁰ Similarly, Ackermann believed that there was a "general agreement about the value of the work and there is probably no medical doctor who cannot find something useful in it," while the chemist Antoine François de Fourcroy (1755–1809), Ramazzini's French translator, revealed that the book's potential public relevance had provided the incentive for its translation.²¹ The appeal of Ramazzini's work in the eighteenth century was also connected to other imperatives, as Vincent pertinently reminds us: in England, with the expansion of a "market of treatments and remedies," as demonstrated by the case of Dr. Robert James, one of Ramazzini's English translators, and in Germany with the emergence of a "medical police" whose authority, away from the urban centers, relied on a network of *physici* and translators like Ackermann and Julius Heinrich Gottlieb Schlegel.²²

In Ramazzini's work we witness the emergence of a model of investigating occupational diseases that, through subsequent translations into a number of European languages, would prove influential in the development of medical thinking about occupational health. Some of the most important characteristics of this "Ramazzinian mode of investigation," as the British physician Benjamin Ward Richardson (1828–1896) was to refer to it in the nineteenth century, were: the emphasis on the public relevance of studying occupational health; a recognition of the workers' role in the production of medical knowledge about occupational pathologies; a nosology of occupational diseases that recognized two main types of causative agents, namely exposure to noxious substances and mechanic causes; and finally, an understanding of occupational disease that cut across economic lines and gender and included almost every type of work, from menial laborers to surgeons and "learned men."²³

In writing his treatise, Ramazzini relied heavily upon the intellectual heritage of famed predecessors and contemporaries such as Hippocrates, Galen, Avicenna, Agricola, and the German physicians Michael Ettmüller (1644–1683) and Georg Wolfgang Wedel (1645–1721), as well as the English doctor Thomas Willis (1621–1675), founding member of the Royal Society, whose observations on urine and diabetes he referenced extensively.²⁴ The influence of Hippocrates and Galen is particularly notable. The book is laden with references and extensive passages from the former's work, especially his *On Airs, Waters and Places* (fifth/fourth

century B.C.E.), the first known work to posit a connection between disease and environment. For example, Ramazzini uses Hippocrates's famous dictum that "Air is at once the author of life, and of diseases" to discuss the effect of "vitiating air" on the health of miners, wrestlers, and bearers of corpses.²⁵ References to "gross and glutinous humours," and to the effect of various noxious substances, foods, and beverages on the "motion of the humours and spirits," as well as prescriptions regarding the usefulness of emetics, purgatives, bleeding, and exercise in cleansing the body, further demonstrate his intellectual indebtedness to Hippocrates's and Galen's humoral medicine.²⁶

But Ramazzini's ambition was to convince his contemporaries that investigating the occupational diseases of a wide range of workers was a publicly relevant and profitable exercise, not least because each of these groups, from miners to "wise and learned men," performed indispensable functions within society and contributed both to the "profit of princes and merchants" and to the "interest and good of the Republic."²⁷ His perspective on occupational health was very much a mercantilist one: in Michel Delon's words, his aim was to "conserve the living forces of production—those of the workers—in the service of the state," a position that anticipated, in many ways, the nineteenth-century "interconnection of psychological, social, and economic health" discussed in the introduction.²⁸ His concern for the well-being of various sections of society was also informed by Hippocrates's principle of palliative care, which held that physicians "must pursue the knowledge of incurable diseases, with an intention to make them as easy as we can." This led Ramazzini to a more general recognition of the relationship between poverty and disease and helped him to revise the Greek doctor's principles of medical diagnosis by emphasizing the importance of a patient's occupational history in diagnosing illness. As Ramazzini put it: "The divine Hippocrates informs us, that when a physician visits a patient, he ought to inquire into many things, by putting questions to the patient and the bystanders . . . you must ask what uneasiness he is under, what was the cause of it, how many days he has been ill, how his belly is affected and what food he eats. To which I would presume to add one interrogation more: namely, what trade he is of."²⁹

This belief in investigating the occupational background of the workers prompted Ramazzini to "step . . . into the meaner sort of workhouses" and to treat "vulgar, ordinary patients."³⁰ In fact, according to his own account, the inspiration to investigate more closely the medical conditions

affecting working men and women stemmed from an occasional encounter with a man who was cleaning his own privy (“house of office”).³¹ In attending to the poorer and less fortunate strata of society, Ramazzini’s method of investigation was not unlike that of Paracelsus who, a century before him, had written poignantly that “I have not been ashamed to learn from tramps, butchers and barbers.”³²

The importance of workers’ experiences and testimonies in producing early medical knowledge about occupational health and of empirical observation more generally is also confirmed by Ackermann. Originally from Zeulenroda, a small town in present-day Thuringia in Germany, Ackermann wrote that he “had, since boyhood, spent many hours in the company of workers and artisans [*Künstler*]; I grew up among them and was in the habit of visiting their workhouses, observing them at work, engaging in conversations about their work practices, and lending my ear to their complaints.”³³ After having studied at some of the most renowned German universities in Jena, Göttingen, and Halle, Ackermann temporarily returned to his hometown to work as a *physicus*. It was during this time, in 1780, that he published the German translation of *De morbis artificum diatriba*. The experience he had acquired while treating workers and artisans, in particular clothmakers and hosiers, who “represented a good part of the patients of my medical practice [*praxis*],” proved invaluable. By acknowledging the role of worker informers, Ackermann made an important statement about the plurality of expertise and educational models involved in the production of medical knowledge about occupational diseases in the eighteenth century. As he put it: “Among them [workers and artisans] I have a few friends with whom I enjoy regular interaction. They are honest and experienced people, very dedicated to their profession [*Handthierung*]; people who are animated by the spirit of precision [*genausten Ordnung*], who know and conduct their work as scholars, I am tempted to say philosophers [*Weltweise*], would, and from whom I have never parted without delight or instruction. I am indebted to them for [teaching me] a good part of what I have said about the diseases of artisans and workers.”³⁴

This engagement with the workers allowed Ackermann to gain a “multifaceted knowledge” [*mannigfaltige Kenntnis*] of occupational health. Mary Lindemann’s point that the *physici* were not simply provincial agents of an increasingly intrusive state apparatus, but also “members of a community and the creatures of an extended patronage-clientage system,” deserves emphasis here, for it was precisely as a member of such

a local community that Ackermann was able to learn about occupational hazards.³⁵

Thus, although institutionalized education helped to legitimize medical knowledge, it was by no means the only way of acquiring it. Firsthand experiences of working environments and practices were complemented with other methods of study, such as the reading of medical books and periodicals, and conversations with medical authorities, both face-to-face and through correspondence. The latter, in particular, was an important way of obtaining knowledge about diseases that could not be directly observed. The problem of access to medical texts preoccupied eighteenth-century practitioners. For Ackermann, a *physicus* based in a small provincial town, accessing medical books proved to be a particularly frustrating experience, since he lacked the financial means to purchase medical publications, especially “large works which contained many important and complex observations about the diseases of workers and artisans.” His musings on the topic underscore the general image of the *physicus* as an underpaid and overworked “servant of the state” documented by historians of medicine; as Ackermann put it, “In my life, I have never been short of air [to breathe], but I was forced to borrow most of the books [to translate Ramazzini’s work].”³⁶

Such difficulties notwithstanding, eighteenth-century provincial doctors, much like their nineteenth-century successors, were central to processes of knowledge production in the field of occupational health, as de Fourcroy also attests. In his introduction to the French edition of Ramazzini’s book, published in Paris in 1777, de Fourcroy highlighted the role of provincial doctors (*médecins de province*) in collecting information about occupational diseases and advised the Société royale de médecine to encourage its provincial correspondents to “undertake research into the maladies of artisans, and in particular the epidemic constitutions that they attempt to describe.”³⁷ As Thomas Le Roux has pointed out, de Fourcroy’s translation should be seen against the background of an increased medical and public preoccupation with the health of craftsmen in late eighteenth-century Paris, which was connected with a decline in their working conditions and the creation of new institutions such as the Société royale de médecine. Among other things, this institution attempted to use its extensive network of correspondents to collect information about hazardous occupations and to investigate avenues for the prevention of occupational injury and illness. Le Roux contrasts this early interest in occupational health with the period after the French Revolution which,

he claims, despite a short revival from 1815 to 1821, was characterized by the “erasure” of the body of the worker through the denial of work pathologies and the active endorsement of industrialization.³⁸

Scientific translation in the eighteenth century was a complex process that involved much more than the rendering of a text from a source language into a target language. In Ramazzini’s case, the hurdles of translation often began with the title itself, as subsequent editions in English, French, and German demonstrate. The original Latin title contained the word *artificum* (genitive plural form of *artifex*), which referred to people who practiced an art or craft. However, the book itself addressed categories of workers as diverse as unskilled laborers, agriculturalists, skilled artisans, tradesmen, merchants, and even the gentry and professional classes. The word *artificum* was variously translated into English as “tradesmen,” “artificers” and “workers,” into French as *artisans*, and into German as *Künstler und Handwerker*, a situation that further demonstrates the difficulty of finding an umbrella term to incorporate the wide variety of occupations discussed.³⁹ As Vincent reminds us, “there was nothing arbitrary about this ambiguity,” since the Latin word *artificum* as used by Ramazzini covered both the “liberal and the mechanical arts.” It denoted, in essence, “all those who contributed to civil society,” during a time when the logic of medical specialization was largely absent and the “civil sphere” and the “sphere of work” were not yet separated as they would become over the following century.⁴⁰ In this respect, it can be argued that Ramazzini operated with an understanding of occupational illness that was more inclusive and encompassing than the narrower concept employed by many commentators and state officials in the nineteenth century. This comprehensiveness confounded later observers. Some Victorian writers pointed out that the project’s unique, encyclopedic approach was also one of its pitfalls, since it rendered it extremely laborious: it was almost impossible for one physician to obtain firsthand knowledge of all the occupations discussed. This does not mean, however, that interest in Ramazzini’s work disappeared during the nineteenth century, but it does suggest some of the ways in which his vision of occupational health failed to meet the efficiency imperatives of state-led public health agendas that crystallized during that period.

The first identified English translation of Ramazzini’s book, published in 1705, was a relatively straightforward work that included the author’s original preface, the table of contents, and the forty-three chapters on the diseases of various occupations, but the subsequent editions in English,

French, and German were more elaborate works that also featured paratexts such as prefaces and translators' introductions.⁴¹ In the French case, the translation was in addition accompanied by letters of approval from the royal censor, a proof that the publication had received official sanction and that the translator's copyright in his work was recognized. According to Pietro Corsi, the paratext was not a secondary feature of the translation, but a central element in itself, which often helped to enhance the value of the main text, such as by increasing its market value and public appeal.⁴² De Fourcroy's 1777 French edition is a good example of this. Not content to simply translate Ramazzini's treatise, he went on to offer a comprehensive overview of the works on occupational health published in the intervening six decades. For this purpose, he divided authors into three categories: those who had treated the subject occasionally, those who had offered comprehensive accounts of occupational diseases, and those who had discussed only certain occupations. Based on this survey, de Fourcroy dismissed most succeeding writers as mere imitators of Ramazzini's work, who had failed to contribute new knowledge to the field.⁴³ Notably, de Fourcroy lamented the absence of translations of works by English medical authors, a situation that prevented many French physicians unfamiliar with the language from accessing "important information," especially in the field of naval health. According to him, this was an area of occupational health in which eighteenth-century English scholars were particularly prolific, due to the importance of the navy in that country.⁴⁴ J. D. Alsop has pointed out that, in the eighteenth century, the health of the navy attracted growing attention from British medical writers—a stark contrast from the relative lack of interest in naval pathologies during the previous century—and a veritable "trend" was established "whereby naval practice was deemed to provide outstanding surgical expertise."⁴⁵

De Fourcroy was right to point out that Ramazzini's successors were animated by two main concerns: to build on his work by contributing new insights on the relationship between health and the working environment and to "organize" it better. Ramazzini had understood occupational diseases as stemming from the (often combined) action of two categories of factors: chemical and mechanical.⁴⁶ De Fourcroy offered a more elaborate classification of diseases into two main classes, further subdivided into orders and chapters; he also revised to a certain extent the list of occupations discussed, for example by eliminating the "diseases of the Jews." Overall, however, although more elaborate, his model digressed

but little from Ramazzini's original. In essence, the etiological framework remained unchanged and ascribed the causes of diseases to two categories of factors: the vapors or molecules released by various materials employed in processes of work, and violent movements, inactivity, and chronic trauma to certain parts of the body. The same concern with nosology was also visible in Ackermann's translation, which proposed to divide occupations into five classes: menial work, work with dust, sedentary work and work involving bent postures, work with water, and factory work.⁴⁷ Thus, despite these various attempts at reorganization, the eighteenth-century medical writers discussed here offered no radical attempts to change Ramazzini's model of investigating and interpreting occupational diseases.

Modernity and Its Occupational Ills in the Nineteenth Century

In the nineteenth century, preoccupation with occupational pathology acquired new dimensions. The Victorians themselves perceived their age as one of unprecedented socioeconomic, scientific, and technological change that shaped many aspects of everyday life and work.⁴⁸ With regard to the latter domain, these transformations were reflected in the nature and distribution of labor, which was marked by several factors: a growing distinction between "home" and "the workplace"; increased regulation and rationalization of processes of work; the standardization of tasks due to advancing mechanization; the rise of the commuter; and the transition from an agriculture-based economy to an economy that depended primarily on manufacture and the service industry.⁴⁹ Although, as Roderick Floud has pointed out, changes in the nature of work were gradual and piecemeal, with significant differences between the first half of the nineteenth century and the second, the onslaught of "modernization" was dramatic for many of those who experienced it firsthand.⁵⁰ One of the best examples of this process is the fact that speed as a concept that denoted both accelerated movement and the "rate of occurrence of events" emerged as a powerful "leitmotiv of cultural modernity."⁵¹ Its effects on the human body and mind were both "liberating" and oppressive.⁵² If, on the one hand, machines helped to economize effort and time, mediating powerful cultural associations between mechanical speed and progress, on the other hand they also generated myriad anxieties about the social and moral costs of ongoing urbanization and industrialization.⁵³

Workplace accidents, in particular, acted as a catalyst for, and exposed anxieties about, transforming conditions of work. In the popular and scientific imagination of Victorian Britain, the diversification of work and technology was often linked to the multiplication of accidents and diseases, although, as Bronstein pertinently remarks, the lack of adequate statistics makes it difficult to prove beyond doubt that the number of work-related accidents actually increased during the nineteenth century.⁵⁴ Similarly, Bill Luckin has cautioned that arguments that establish a linear causal relationship between the “‘age of the machine’ and the ‘modern accident’ are likely to prove evidentially problematic.” While not denying the novel challenges posed by new technologies of work and transport to human health, Luckin nevertheless argues that the “sheer novelty of new modes of production may have led to an exaggeration of the scale of death and injury attributable to them—in aggregate terms victims of accidents in mills, workshops and factories may have continued to be decisively outnumbered by those who were kicked by animals, mangled by carts or drowned in ponds, streams and rivers.”⁵⁵ According to Luckin, the methodological implications for the study of occupational health in the nineteenth century are important, since this recognition challenges us to avoid reductionist approaches that equate the history of occupational health with the history of accidents.⁵⁶

In the discourses of Victorian Britain, changes in patterns of life and work triggered by advancing industrialization were mirrored by the historical trajectory of diseases themselves. In this respect, modernity was an ambivalent project that was associated with progress, imperial expansion, and scientific advancement, but also generated countless mental, physical, and social ills. Indeed, disease was an index of social and cultural change. Writing in 1885 in *Berrow's Worcester Journal*, one observer remarked that the nineteenth-century version of “modern life” had led to the gradual disappearance of some diseases, while also facilitating the rediscovery or “invention” of others. Ailments such as Bright’s disease (nephritis) and Addison’s disease (hypoadrenalism) could be described as “ancient messengers of death,” but the same could not be said, according to our writer, about heart and eye diseases connected to railway travel or about “writer’s cramp,” an “old” disease whose incidence was allegedly on the rise in the nineteenth century due to the use of steel pens.⁵⁷ Arguments like these were emblematic of nineteenth-century debates about the impact of modernity on physical and mental well-being and often led to prolific discussions about their scientific validity. Not everyone was

convinced, for example, that railway travel was “detrimental to persons of a nervous temperament” or that it caused “paralytic seizures.”⁵⁸ Similarly, while some commentators blamed steel pens for causing writer’s cramp, others extolled their benefits: as early as the 1840s, press reports indicated that the manufacture of pens amounted to an impressive 200 million or the equivalent of 120 tons of steel annually, a development that was believed to benefit not only the ranks of schoolmasters and clerks, but also the legions of “live geese” that had previously provided the “harvest of quills.”⁵⁹

As many observers pointed out, the formidable “progress of knowledge” in the nineteenth century also afforded physicians and other medical practitioners better insights into the etiology and treatment of a wide range of diseases. Tuberculosis, often described as an occupational pathology in nineteenth-century texts—see the case of clerks discussed below—was one such example, with Harold R. White remarking in 1901 that, “It is somewhat curious to observe the progress of knowledge in this subject, and how it now appears to us that the former generations of physicians either hurried their consumptive patients to their graves, or, at least, greatly retarded their progress.”⁶⁰ The well-known physician and sanitarian John Thomas Arlidge (1822–1899) also reflected at the end of the nineteenth century that correct diagnosis of respiratory illnesses had previously been impeded by a variety of factors, with lack of knowledge playing a crucial role: “For a long period physicians have been aware that the inhalation of dust is followed by symptoms greatly resembling those of tubercular phthisis, bronchitis, and asthma, but which are really due to fibrosis of lung tissue. In too many instances little pains have been taken to differentiate between the last-named and either of the former lesions, and very few efforts made to elucidate the minute pathology of dust-produced pulmonary mischief.”⁶¹

As Christopher Hamlin has documented, the first half of the nineteenth century, in particular the public health movements of the 1830s and 1840s, were instrumental in the development of an institutionalized system of public health in Britain.⁶² In fact, the nineteenth century was also a period when many European states began to recognize the “workplace” as a site of more consistent and formalized public health intervention. The passing of several important pieces of workshop and factory legislation in Britain, France, and other European countries ameliorated to a certain extent the working conditions of industrial employees, in particular children and women.⁶³ However, as Barbara Harrison points out

with regard to women, this overwhelming focus on industries, especially on “hazards” that resulted from the operation of machine technologies, also meant that the concept of “work” was understood narrowly, and excluded the sphere of domestic service, in which the majority of women were employed.⁶⁴ In this context, it is all the more important to emphasize the role of the nineteenth-century medical press in highlighting many of the health issues faced by working women—among them conditions such as “housemaid’s knee,” discussed below—which usually escaped the attention of state officials. As Harrison argues, official discourse and action tended to focus on considerations of “safety,” at the expense of the longer-term effects that various types of work had on health and well-being.⁶⁵

Contemporary commentators often expressed dissatisfaction with what they regarded as reluctance on the part of state authorities to engage with such problems, while also being self-critical about the medical profession’s achievements in this regard. In the beginning of the period, for example, John Sinclair complained that a “*hygiène* of artists is still a desideratum in the medical art.”⁶⁶ Arlidge expressed a similar opinion at the end of the century, although he was keen to qualify his statement: “Be it far from me, however, to imply a general and total neglect of symptomatology and pathology of industrial diseases.”⁶⁷ The problem, as Arlidge saw it, was twofold. First, much of the impetus for reform had come from “outside” the industry rather than from within, as his commentary on the relationship between employers, lawmakers, and public opinion revealed: “There is much to be said in commendation of the action taken by masters to improve their factories and the condition of those they employ, but the stimulus to it has come to a large extent from the outside; firstly, by the influence of factory inspection; secondly, by the force of public opinion, the fruit of ever-increasing recognition of sanitary laws; and thirdly, by the pressure of trade competition demanding superior buildings, machinery, and processes to accomplish results more speedily and profitably than aforesaid.”⁶⁸

Additionally, knowledge about occupational health was dynamic and greatly influenced by the changing nature of work and society: Arlidge himself argued that occupational medicine as a field of inquiry and investigation was not immune to social and technological change. For this reason, he believed that it was essential for Britain to produce its own body of knowledge about occupational health that would respond to the idiosyncrasies of its socioeconomic and political circumstances. His nar-

row nationalist vision of occupational health, voiced during a period of heightened imperialist contestations between the European powers, contrasted sharply with de Fourcroy's lament, a century earlier, about the lack of French translations of relevant English medical works. Ironically, it was also at odds with Arlidge's comprehensive knowledge of French and German literature in this field, which would suggest that, despite his discursive insistence on the importance of nationally produced knowledge about occupational health, his own sources of information were much more transnational and eclectic in nature:

Another fact that lessens the value of foreign work on the effects of employments upon health and life, is that several of the most important of their number—for instance, Hirt's comprehensive treatise on diseases of trades—were published many years since. This fact detracts greatly from them as authorities at the present day. For the division of labour is ever going forward and undergoing modifications; new trades arise; and, above all, one process of manufacture succeeds another almost faster than note can be made of it. Our own manufactories and modes of manufacture have also undergone transformations quite as great, and even greater, particularly when large machinery is used. Above all, we are ahead of all other lands in legislation for the benefit of the operative classes, in prescribing the hours of work and of meals, and in enforcing regulations to prevent accidents, and to secure general cleanliness and sanitation.⁶⁹

Nevertheless, knowledge about occupational health and scientific knowledge more generally *were* regarded as an index of a country's degree of "civilization" and "progress," and Arlidge was certainly not alone in underscoring the competitive dimensions of knowledge production in this field. In a book on the *Dangerous Trades*, published in London in 1902, A. M. Anderson, H. M. Principal Lady Inspector of Factories, also highlighted the continuing importance of occupational health to projects of nation- and empire-building by drawing on the words of Sir John Simon, the first Chief Medical Officer, who, in his 1861 Report to the Privy Council, had pointed out that "The canker of industrial diseases gnaws at the very root of our national strength."⁷⁰

Public interest in occupational health was by no means negligible, if we are to judge by the number of references to the topic in the popular

and scientific periodicals of the time. Indeed, nineteenth-century journals were replete with discussions about various aspects of occupational health, ranging from more general pieces on the “influence of occupations on health,” “diseases of the working classes,” or “industrial pathology,” to more specific accounts of a bewildering range of medical conditions and concerns, including less familiar afflictions like writer’s cramp and housemaid’s knee.⁷¹ The latter, nowadays better known as prepatellar bursitis, usually affected domestic servants, the overwhelming majority of whom were women, but was also recorded in other occupational groups such as weavers and coal miners. It was caused by continued pressure on the bursae from prolonged kneeling, often on cold and damp floors, which led to inflammation, a symptom usually described as a “bursal tumour” in the medical literature of the time. Opinion varied as to the best course of treatment, with some surgeons preferring the surgical removal of the cyst, while others advocated the use of counterirritants, plasters, and bandages to reduce inflammation, or the passing of a seton made of thick silk thread through the cyst in order to encourage suppuration.⁷² Noninvasive treatments appeared to have gained more traction by the second half of the nineteenth century, when some writers also took issue with the widespread practice of kneeling among English domestic servants, recommending instead the use of brushes and long-handled mops of the type already employed in Paris and Holland.⁷³

Another occupational group that attracted the attention of medical commentators were clerks, considered particularly prone to diseases of the digestive and circulatory systems on account of their sedentary working practices, as well as to respiratory diseases, the outcome, some argued, of the overcrowded and unventilated conditions in which they often labored. Thus, in his *Report on the Sanitary Condition of the Parish of St. Mary, Islington, for the Year 1864*, which included a section on occupational mortality, medical officer Edward Ballard remarked laconically that “our table tells a sad tale” with regard to commercial clerks. At the age of twenty, they were not expected to live beyond thirty-eight. Ballard explained the situation as follows: “In the case of clerks employed all day, tied down at the desk, to their sedentary life, in close, gas-lighted, unventilated counting-houses and offices; in the case of other young clerks, to intense bodily fatigue, their duties compelling them to be upon their legs about town nearly all day, without regular hours or sufficient time afforded for meals; and in the case of both, to unnatural and murderously late hours of business.”⁷⁴

Consumption was particularly rife among clerks and office workers more generally, an image endorsed not only by the numerous examples of consumptive clerks in Victorian literature, but also by official reports. The Post Office had a bad record in this regard. At the turn of the century, for example, it was estimated that approximately 50 percent of all deaths in the English Postal Service were due to tuberculosis and that among postal staff the mortality rate from this disease was 2.4 per 1,000 living (as opposed to 1.3 per 1,000 living in the general population). The Postal and Telegraph Department in France was confronted with a similar problem: the danger, it was believed, was due to the “large numbers of men working in a limited space where no preventive measures against tuberculosis are adopted.”⁷⁵

Apart from illustrating the wide range of pathologies associated with “modern life” in the nineteenth century, examples like the above also suggest that concerns about occupational health were by no means limited to familiar working environments such as factories and mines.⁷⁶ As Bartrip points out, the discussion of occupational health in the nineteenth century is complicated by class inflections and the fact that it is not always easy to establish “what constitutes occupational illness and how victims of such diseases are to be defined.”⁷⁷ But this is not an insurmountable difficulty, especially if we acknowledge that uncertainty and the search for definitions and principles of organization were and continue to be central to processes of knowledge-making. Much like today, eighteenth- and nineteenth-century medical writers struggled with similar questions about the best ways to investigate and understand occupational diseases and how to organize and standardize knowledge about them.

Despite the narrower approach to occupational health promoted by medical specialization and the hygienist turn of the nineteenth century, as well as the reluctance of the British state to recognize the importance of occupational health as a field of public health investigation and intervention—as noted, among others, by Vincent and Bartrip—examples like the above also suggest that there survived, in the medical and public discourses of the nineteenth century, traces of a medical opinion that conceptualized occupational illness within a broader, more encompassing framework that was not limited only to the “dangerous trades.”⁷⁸ The roots of this “encyclopedic” approach to understanding and studying occupational pathologies went back to Ramazzini’s work, among others, which nineteenth-century writers continued to adopt, adapt, or reject.

Ramazzini's Legacy in the Nineteenth Century

Victorian commentators, among them Arlidge and the well-known statistician and epidemiologist William Farr (1807–1883), acknowledged their intellectual debt to medical predecessors like Ramazzini, pointing out that knowledge-making about occupational diseases was a cumulative process that drew on earlier models of investigation and analysis.⁷⁹ But perhaps one of the most succinct descriptions of Ramazzini's legacy in the Victorian period comes from the physician and sanitarian Benjamin Ward Richardson. In an essay on "National Health" published in *Good Words* in December 1876, Richardson summarized Ramazzini's contribution to the emerging field of "public hygiene" in the following words:

An enlightened Italian physician—and it is wonderful how indebted the world is to the Italian schools of physics—one Ramazzini, commenced a century and a half ago, nay, nearer two centuries ago, to study the effects of the labour of artisans on the health and vital value of the labourer. He specifically studied the kind of labour that is carried on in flax working, and defined the evils of that occupation with a degree of accuracy which has not been surpassed. He was followed by many more in the same line of research, and in the present century, through the further exertions of Thackrah, and other observers, we have arrived at a very clear idea of the influence of industrial labour on health and life. The knowledge that has thus been brought forth has culminated during the present year in the production of a series of statistical facts, collected under the direction of Dr. William Farr, from which the relative values of life in sixty-nine well-defined occupations have been compared by a certain standard of general life, and results have been obtained which are unexampled of their kind. . . . From the same Italian physician . . . there dates largely another advance in this project of preventive medicine. To him we owe an early suggestion for making observations on the relation of weather and season in connection with diseases, and particularly with diseases which take the epidemic or spreading type.⁸⁰

Richardson's evaluation of Ramazzini's work was pertinent. If we examine other relevant publications such as popular and scientific periodicals, medical works, and encyclopedias, we find that in the nineteenth century the Italian physician's name was usually mentioned in connec-

tion with the fields of occupational health, contagious diseases in humans and animals (in particular rinderpest or cattle plague), and medical meteorology.⁸¹ For example, his work was often referenced in discussions of malaria and other tropical diseases, but also in a substantial body of publications that dealt more generally with the “preservation of health” and the question of longevity.⁸² Underlying these discussions was a shared desire to understand the connection between environment and disease (considered an important aspect of investigations into population health between the seventeenth and nineteenth centuries), but also the impact of “habits of living” on health.⁸³

Ramazzini’s enduring reputation as a medical writer is also demonstrated by common references to his ingenuity, experience, and skill as a medical practitioner and author.⁸⁴ One commentator praised his classification of occupational health as being “so complete, that it has been of great service to modern investigators into the same subject.”⁸⁵ There was also a relatively widespread agreement that his work was relevant to the emerging field of public hygiene. In the beginning of the nineteenth century, for example, the Scottish politician and statistician John Sinclair explained that: “I have ranked in the number of the works which have contributed to the improvement of *hygiène*, Ramazzini’s treatises on the diseases of artists. In fact, it is truly in the study of these diseases, that the physician ought to seek for the lessons of experience, as to what is conducive to the preservation of so many useful men, to whom society owes its enjoyments.”⁸⁶

However, admiration for Ramazzini’s work did not prevent his successors from also being critical of it. In an essay on the “Hygiene of Occupation,” Roger S. Tracy, Sanitary Inspector of the Board of Health, New York, argued that Ramazzini’s “intensely pessimistic view of the condition of the artisan” was the direct outcome of his inability to distinguish sufficiently between work conditions and “the influence of the home surroundings and food,” although he went on to admit that such a separation was difficult to effect even for his contemporaries.⁸⁷ For Anderson, what distinguished writers like Ramazzini from the nineteenth-century practice of occupational health was the lack of a “practical preventive treatment.”⁸⁸ Farr, who dedicated much of his career to the development of medical statistics in Britain, credited Ramazzini with having “created a new art, the art of preserving the health of the men who are engaged in the arts of life.”⁸⁹ However, he also criticized his work on two accounts: the “imperfect” knowledge of chemistry characteristic of his time and the

lack of statistical data, which had led not only the Italian physician, but many other previous medical writers, to focus too much on sickness at the expense of mortality. Farr argued that “The only way in which the mortality, and the duration of life, of miners, tailors, farmers, labourers, or any other class of men can be accurately determined, is to determine the ratio of deaths at each age to the living during a certain time.”⁹⁰

In his discussion of Farr’s work, John M. Eyler has shown how by the mid-nineteenth century, the methods of the statistician could coexist with the “miasmatic theories of the sanitary reformers” and how epidemiological research such as that conducted by Farr on cholera made use of “national mortality statistics to weight environmental influences on health, a technique of great influence in the decades before the general acceptance of the germ theory of disease.”⁹¹ With the growing importance of statistics, the “Ramazzinian mode of investigation” of occupational disease continued to change in the nineteenth century, as can be seen in two interrelated trends: the process of data collection, with an emphasis on the role of provincial doctors, and developments in the etiology, pathogenesis, and nosology of occupational diseases, especially the use of statistics and the alleged connection between disease and the morality of the worker in the nineteenth century.

Perhaps the best testimony to the lingering influence of the Ramazzinian model into the nineteenth century comes from a body of work that follows a similar encyclopedic approach to the study of occupational diseases. While it is beyond the scope of this chapter to provide an exhaustive list of such publications, it is worth noting that they ranged from relatively faithful reproductions of previous models of investigating and organizing occupational pathologies to works that aimed to make a novel and more consistent contribution to the field of occupational health. An example of the former type of publication comes from the Parisian doctor and professor of medicine Philibert Patissier, whose 1822 *Traité des maladies des artisans et de celles qui résultent des diverses professions, d’après Ramazzini* bears a striking resemblance to de Fourcroy’s 1777 translation, despite Patissier’s claim that his was a work in which he “attempted to collect all the information available to date about the means of preventing the diseases of artisans.”⁹² In the latter category we find publications such as Thackrah’s already mentioned *The Effects of the Principal Arts, Trades and Professions*, whose first edition focused on the manufactures and trades of Leeds; Hirt’s *Die Krankheiten der Arbeiter* (1871–78); and Arlidge’s own *The Hygiene, Diseases and Mortality of Occupations* (1892),

whose conclusions were based primarily on the examination of the pottery industry in north Staffordshire.

The importance of industrial centers in the development of knowledge about occupational health in Victorian Britain has been discussed in a number of scholarly publications.⁹³ Thackrah and Arlidge were by no means the only provincial doctors to promote the cause of occupational health, although they were and continue to be two of the more familiar names connected with this field of investigation in Victorian Britain.⁹⁴ As A. Meiklejohn points out, a less known figure was John Darwall, himself a physician from a manufacturing town, who in 1821 submitted a thesis in Latin to the University of Edinburgh on the topic of “Diseases of Artisans with Particular Reference to the Inhabitants of Birmingham.” As Darwall explained in the beginning of his dissertation, occupational diseases were a function of progress and the diversification of work and technology: “When the world was still new and the inhabitants few, there was scarcely any form of labour apart from agriculture. It is probable also that diseases, like crafts, were equally few. But later when the population was divided into various trades, although some of these may have led to luxury and a comfortable life, diseases likewise increased to the greatest degree. For either the method of work or the materials used in the work—harmful in themselves—frequently caused illness among the tradesmen.”⁹⁵

In Darwall’s dissertation the pathologies of work were organized according to their causes; as he put it, “Although the trades are so numerous that it is not possible for me to enumerate them all, the causes of ill-health arising from them are fewer.” Thus, despite the bewildering variety of trades and diseases, Darwall argued that the causes of illness were limited and identifiable and could be traced to excessive work, posture, excessive light and noise, variations of temperature, dust, and chemical irritants.⁹⁶ Successive authors like Thackrah and Arlidge followed a similar model of organizing occupational diseases according to “classes of persons” or “classes of occupations” as well as etiology, that is various types of risk factors, among which dust and chemical factors played a prominent role. Arlidge, in particular, produced an extremely elaborate classification of risk factors in mining and manufacture by arranging them into groups, orders, and suborders, a move that enabled him to discuss the effects on health of electricity, abnormal atmospheric pressure, exposure to infection and contagion, prolonged use, strain, pressure, and friction, as well as the effects of noxious vapors or organic

dust. Commenting on the genesis of his classificatory model, he underscored the difficulty of reconciling official classificatory schemes like the one devised by Farr, which focused on categories of occupations, with the “desire to make the health aspects of employment a primary principle in their grouping.” In choosing to prioritize the etiological basis for classification, Arlidge was drawing on the works of such predecessors as B. W. Richardson, Dr. Roger Tracy of New York, and Ludwig Hirt.⁹⁷

The latter’s *Krankheiten der Arbeiter* had divided occupational pathologies into two main categories, “internal” (*inneren Krankheiten*) and “external” (*äusseren Krankheiten*), each subdivided into further groups. For example, under the former category, Hirt discussed conditions that resulted from the inhalation of dust and gases, such as catarrh of the bronchi, acute inflammation of the lungs, and tuberculosis. His elaborate classification of inhaled matter included references to oxides of sulfur, carbonic oxide, carbonic acid, and hydrogen, but also to vapors of iodine and bromine, turpentine, petroleum, and vapors emanating from the boiling of bones. Similarly, the discussion of external diseases dealt with skin diseases and diseases of the muscles, nerves, joints, eyes, and connective tissue as well as diseases caused by posture. The discussion was structured around the pathologies themselves, the occupations and factories in which exposure was likely to occur, and the proposal of prophylactic measures aimed to reduce occupational risks.⁹⁸ Reviewing Hirt’s work, a British writer welcomed this new addition to knowledge, pointing out that “although many physicians have studied these diseases in detail, and have studied them successfully, yet since the time of Ramazzini, at the beginning of the eighteenth century, no one has hitherto attempted to produce a complete treatise on the whole matter.”⁹⁹ In preparing his treatise, Hirt himself made extensive reference to the Italian physician’s work—for example when discussing the health of wool sorters and workers with flax and hemp—drawing not only on Latin editions published in 1703 and 1717 (the latter as part of an *Opera Omnia*), but also on Ackermann’s and Patissier’s versions discussed above.¹⁰⁰

Returning to Darwall, it is important to point out that he also recognized “excess and intemperance” as a significant risk factor in disease etiology, a move that enabled him and subsequent medical authors to question the importance of chemical and mechanical factors in causing occupational illness.¹⁰¹ Indeed, the gradual shift toward a model of investigating occupational disease that placed a much greater emphasis on an individual’s lifestyle and responsibility in disease etiology was already

reflected in the title of Thackrah's book, which did not examine only "the effects of the . . . arts, trades and professions" on health, but also the effects of "civic states and habits of living." While Thackrah still organized his chapters according to occupations or "classes of persons," one crucial difference between his and Ramazzini's text was that the discussion of diseases associated with each of these categories was almost always accompanied by an evaluation of the workers' morality. Unlike in the works of the eighteenth-century authors examined, where such references were relatively rare, morality was now a recognized yardstick for diagnosing occupational illness. For example, Ramazzini's treatise contained a reference to the role of intemperance in promoting disease among runners and couriers, but this was of little consequence to his overall argument that disease was a function of the environment in which people were forced to work and over which they had but little control.¹⁰² To paraphrase Dorothy Porter, that environment was predominantly physical and structural, not necessarily moral.¹⁰³

In Thackrah's text, by contrast, references to intemperance and excess appeared regularly. We learn, for example, that cattle and horse dealers "would be almost exempt from ordinary maladies, were it not for their habit of drinking"; that paviors are "addicted to dram-drinking"; and that the tailor "often seeks the baneful comfort of ale and ardent spirit."¹⁰⁴ In fact, the emphasis on character sometimes led Thackrah to question the connection between environment and disease, as the following passage about chaise-drivers, postilions, and stagecoachmen demonstrates:

The atmospheric vicissitudes to which all drivers are exposed, are thought to produce rheumatism and inflammation of the lungs. I conceive, however, that these diseases would rarely occur to abstemious men. It is intemperance which gives the susceptibility to such maladies; and it is intemperance which produces much greater, the fatal affections which we have just mentioned. I scarcely need add, that the whole class is short-lived. They generally die before they reach the age of 50. Among all the Leeds men, we could find only three individuals who are old, and two of these have the character of great temperance.¹⁰⁵

The preoccupation with diagnosing character and its relation to lifestyle, especially of the lower classes, was a familiar trope in Victorian Britain, as a number of scholars have illuminated.¹⁰⁶ Dorothy Porter, for

example, pointed out that, “The study of health and disease as part of the study of the state of society flourished within English learned societies in the early nineteenth century. This social science, while purporting to be entirely factual, was in reality bound to political and moral philosophies of reform and active philanthropy.”¹⁰⁷ Statistics, which became increasingly recognized as a “science” in the course of the nineteenth century, provided the raw material that assisted the diagnosis of medical and social pathologies.¹⁰⁸ The early importance of statistics for the study of occupational health is demonstrated by Patissier’s 1822 *Traité des maladies des artisans*, which, despite being a replica of de Fourcroy’s 1777 treatise, was different from it in one important respect: the inclusion of gender-specific mortality statistics related to over a hundred types of occupations. The figures were based on data collected from hospitals and only covered a period of one year, although Patissier insisted that the compilation of annual tables should become a regular practice. Statistics, he argued, were important because they allowed doctors to devise measures for the prevention of occupational illness and for the state to act on them with “paternal solicitude” (*la sollicitude paternelle du Gouvernement*). At the same time, he suggested they could also be used by social groups like artisans as a tool to guide their children into choosing an occupation that was best suited to their “physical constitution, their temperament and moral disposition.”¹⁰⁹ Patissier claimed that his discussion of statistics was innovative in the field of occupational health and regarded it as one of his main contributions to this branch of medicine.

Patissier’s evaluation of his own contribution to the field of medical statistics might have been exaggerated, but the influence of the French school on the development of this strand of occupational medicine in Victorian Britain was far from negligible.¹¹⁰ This is demonstrated by the work of Farr, who studied hygiene and medical statistics in Paris under Pierre Charles Alexandre Louis and went on to become the Compiler of Abstracts at the Registrar General’s Office established in 1836 for the purpose of collecting vital statistics about births, marriages, and deaths. Even at the end of the century, there seemed to be a widespread agreement in England that continental science (French and, to a certain extent, German) had done much more to promote the study of occupational health and the use of statistics than its British counterpart. This was often punctuated by arguments about British superiority in other domains of occupational health (such as the legislation of industrial hygiene) and the importance of pursuing national research and statistics. Arlidge was

one of the proponents of this position. A similar example comes from Arthur Newsholme, who wrote, in an article on “Occupation and Mortality” published in 1893 in *The Journal of the Royal Society for the Promotion of Health*, that “French and German hygienists have expended much more labour on the subject [industrial hygiene]; they have published elaborate statistics which are very generally defective or fallacious in one particular or another; and under the different conditions holding good in this country but little use can be made of the data they have collected.”¹¹¹ Indeed, as is noted in the introduction, “the diagnosis of the competitive conditions of modern life [was] itself competitive.”

The discourse surrounding the use of statistics in relation to occupational health was by no means homogenous, as another example from a late nineteenth-century popular periodical demonstrates. In an article reporting on the mortality statistics released decennially by the Registrar-General of Births, Deaths, and Marriages, the anonymous author began in a familiar vein by pointing out that “The tendency of the table is to prove that the nearer the liquor the shorter the life.” However, the contradictions and inconsistencies between observations based on numerical data and observations based on the moral profiling of workers were not lost on the writer, who went on to remark that the high incidence of tuberculosis and respiratory diseases among Cornish tin miners was “almost inexplicable,” since “as a class of men [they] are notoriously well-conducted and temperate.” Furthermore, he pointed out, “The potter dies from his work, and not from alcoholism, as is often said by those who never look at the disease-tables.”¹¹² Although the author did not dismiss lifestyle choices as a potential cause of occupational illness, we notice here a palpable tension between a model of interpretation that placed a greater emphasis on the responsibility of the worker in disease causation and one that was more concerned with the hard “scientific” evidence provided by numerical data.

Nineteenth-century occupational medicine was thus preoccupied not only with sanitary reform, but also with moral and social reform. There were other indications of this gradual transformation, for example in the changing position of the worker as a source of knowledge about occupational disease. While, in some respects, Arlidge continued to subscribe to a vision of medical diagnosis indebted to Ramazzini’s work—as demonstrated, for example, by his observation that “It is as essential to the medical man to acquaint himself with the occupation of a patient, as an important health-factor, as with the hygiene of his home and neighbour-

hood, or with his family history”—in other respects the model had been visibly transformed and reevaluated. Notably, the figure of the worker was absent from the list of people who helped Arlidge to further his knowledge of the subject.¹¹³ Firsthand acquaintance with manufacturing processes and practices remained an essential aspect of the investigative methodology of occupational medicine, as the case of Hirt’s research on occupational hygiene also demonstrates, but it was complemented with the examination of data collected in a more formalized, standardized, and “scientific” form, for example in the course of factory and home inspections.¹¹⁴ Medical writers from this period also acknowledged the role of life assurance societies in facilitating access to statistics.

Like his predecessors, Arlidge was honest about his inability to gain firsthand knowledge of all the categories of occupations examined. In such cases, he relied on the authority of other medical works and correspondence with “medical men practicing in the chief manufacturing towns of the country, who possess the fullest opportunities of supplying me with the information sought.”¹¹⁵ But it was to the leaders of manufacturing and not to the common workers that his gratitude was eventually directed: “I must also not fail to express my best thanks to those many manufacturers who accorded me the privilege of going over their factories, and witnessing the principal processes carried on.”¹¹⁶ In many ways, this was another example of what Le Roux, in his discussion of occupational health in nineteenth-century France, has termed the “erasure” of the body of the worker.¹¹⁷ It was also an illustration of the ways in which processes of work themselves had changed in the course of almost two centuries. In this respect, nineteenth-century medical works on occupational pathologies are not only scientific texts, but also histories of labor and of medicine.

In the twentieth and twenty-first centuries, scholars continue to turn to Ramazzini and use his work to illustrate early medical interest in a variety of topics relevant to the field of occupational health, from headaches and maritime health to the relationship between musculoskeletal disorders and ergonomic factors.¹¹⁸ Focusing on work as one of the main sites where anxieties about modern life were played out in the nineteenth century, we have seen how the model of investigating occupational diseases proposed by the Italian physician was emulated, transformed, or rejected in the works of his successors and how knowledge of occupational pathologies was constituted out of transnational interactions that involved medical authors and texts in a number of European countries

like Italy, France, Germany, and Britain. The discussion of Ramazzini's work should not be read as an example of a linear and unproblematic transmission of his ideas to his successors, but rather as an example of the ways in which they engaged with his medical ideas in a context that was very different from the one in which Ramazzini had originally penned them. Indeed, as Vincent has pointed out, occupational medicine had multiple disciplinary origins, and there were important disjunctures between Ramazzini's project of "political medicine" (*médecine politique*) and the hygienic turn of the nineteenth century, which usually downplayed occupational risks.¹¹⁹

Ramazzini's model of investigating occupational diseases was not only encyclopedic in its approach, but was also based on the understanding that illness was the result of the environment in which workers were forced to conduct their activities. This environment included physical factors such as posture, but also chemical and mechanical materials that affected adversely the bodies and mental well-being of working men and women. In the nineteenth century, medical writers continued to engage with his ideas in ways that both drew on and departed from his take on the nosology and etiology of occupational pathologies. The narrower vision of occupational health, associated with medical specialization and the hygienist turn, coexisted to a certain extent with a more encompassing view of such pathologies that was by no means limited only to the "dangerous trades," as demonstrated among others by the works of Thackrah and Arlidge. During this period, the use of statistics came to complement and legitimize observations by physicians conducted in workshops and factories, providing material for sanitary and social reform. At the same time, the process of evaluating occupational illness also acquired a moral dimension, with occupational diseases being increasingly described as maladies of character, a change that provided a window of opportunity for employers and state authorities to shift the bulk of responsibility for occupational hazards and illness onto the shoulders of the workers themselves.

While debates about the pathologies of modern life were not new in the nineteenth century, the nature and scale of the problems discussed as well as the answers provided had certainly changed. As medical observers and other commentators pointed out, advancing industrialization and urbanization created myriad social problems, while the introduction of new technologies of work led to novel types of accidents and bodily injury. The role of machines, and technology more generally, in fueling debates

about the impact of modernization on the lives of nineteenth-century men and women has been largely absent from this account of occupational health. These areas will be discussed in the next chapter in relation to two technologies that transformed the communication landscape of the period: the telegraph and the telephone. In the nineteenth century, new technologies, in the form of steam, railways, and telegraphs, were often regarded not only as instruments of progress and civilization, but also as symptomatic of the many ills of modernity (see the introduction). For example, the American neurologist George M. Beard, known for his work on neurasthenia, posited a direct link between such modern devices and the considerable increase in nervous illnesses he claimed to witness. Building on the arguments developed here, the next chapter turns to the use of technology in medical practice to document not only the contradictions and ambivalences that characterized projects of modernity in the nineteenth century, but also the manifold opportunities they provided.