

6: The Role of Industrial Pathogenicity as a Causal and Final Argument for the German Social Insurance System

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This is an attempt to discuss a central issue in the historic experience and future tasks of public health, and especially, occupational health. This central point concerns the responsibilities for work-induced health dangers and the workers' role in this responsibility.

Modern social security not only demands increasing responsibility from each individual citizen for his or her socialization and safety. The modern organization of work and its realization counts on both participation and an acceptance of one's own responsibility. From an historical perspective, this is a continuation and further development of the basic conceptions of work and health protection that were developed by Max Pettenkofer 150 years ago. It is therefore interesting to compare today's tasks with the positions the famous German hygienist took. When Pettenkofer died 100 years ago, however, little evidence of his work was left. The essential elements were barely discernable in work protection, bacteriology, social policy and racial hygiene. Thus his positions will be introduced and discussed in relation to important problems that are relevant today.

Max Pettenkofer and the Scientific Rationale of Work Protection

Pettenkofer stands at the beginning of public health in Germany. He focused on two basic problems of industrial development: firstly, urban development, also known as *Assanierung*, and secondly, industrial pathogenicity, mainly factory hygiene and the worker's insurance. Both problems contributed to the importance public health gained in the young German state (Pettenkofer 1871, 1873).

While *Assanierung* came into force in the cities in the first half of the nineteenth century, industrial hygiene was a neglected part of medical science. Bernardino Ramazzini's work still set the tone and was furthered by various translations, such as the one provided by Johann Christian Gottlieb Ackermann between 1780 and 1783. This work was extended by Benjamin Gottlob Hebenstreit, a physician from Leipzig, by the chapter "On the concern for the safety of means of purchase". Even A. C. L. Haffort's great work of 1844 was still based on Ramazzini.

Public health had difficulties dealing with the area of industrial productivity from the start. This area had gained in social importance and influence due to the heavy-iron industry in the late 1860s and the 1870s. Within factory walls the basic rules of public health were split into technological problem-solving, on the one hand, and individual, pedagogical rules of behavior on the other. An important factor in Prussian Germany was that the unsuccessful civil revolution of 1848 had moved the "medical revolution" of socially engaged physicians, such as Rudolf

Virchow and Salomon Neumann, close to the revolutionary movements (Milles 1991). As a consequence, medical science attempted to repudiate this political closeness and suspicions with scientific methods. Physiological conceptions, as developed by Hermann Helmholtz, were decisive in this development. According to these ideas, the human body has to be understood as being functionally analogous to a machine and therefore had to be examined in a scientific way (Rabinbach 1990).

Max Pettenkofer was born in Donaumoos in 1818 and came to Munich in 1826. In 1837 he started to study pharmacology in order to take over his uncle's position as *Hofapotheker* (pharmacist to the Court). Max Pettenkofer was educated in the era of holistic and romanticist natural science, but, at the same time, used the methodology of the emerging technological natural science. An important physiologist of that time, Johannes Müller, believed in an integrative "life ability", but demanded methodologically precise procedures. So, too, did Justus Liebig, Pettenkofer's famous teacher in Gießen. Pettenkofer himself placed emphasis on chemistry and physiology, and developed experimental hygiene. In 1847 he was awarded a chair in medicinal chemistry and, in 1883, he established hygiene as part of the requirements for a degree in medicine. He is an impressive example of the scientific view that not only included social responsibility, but also sought scientific explanation. Conclusions on public health measures were to be based on objective and analytical findings and were to be made available to the authorities.

Pettenkofer's concept, which was called "conditional hygiene", emphasized the importance of the biographical and the working environment for diseases. This included the belief that the environment was increasingly created by people who therefore had to accept responsibility for it. His scientific methodology, however, aimed at replacing political responsibility with "measurements and figures" and scientific evidence. The problems that were visible coincided with Pettenkofer's strengths: the research on the first maximum allowable concentrations for health-damaging gasses and smoke, for example, or on the pollution of rivers. What he saw as limiting regulations acted as liberating regulations. Health dangers were, to a certain extent, permissible and endurable.

This thinking influenced the early institutionalization of public health in Germany. As a result of a proposal by Max Pettenkofer, in 1867 the hygienic section of the Congress of German Natural Researchers and Physicians was founded in Frankfurt. The *Niederrheinische Verein für öffentliche Gesundheitspflege*, the most important of a string of regional initiatives, was established the same year (Fischer 1933). Prussian authorities were not very pleased about this and blocked the attempts for action because of the high costs. The early demands were often insufficiently explained and were deemed to go too far.

In the opinion of the medical professor Carl Reclam from Leipzig, the main task of health care was to provide legislators with the "missing knowledge of the extent of the natural need in measures, figures and weights". The "urge to influence public life because of the knowledge gained", as can be read in a written addition to the text of the first gathering in Frankfurt on September 15 and 16,

1873, led to the founding of the German Society of Public Health. It aimed to appeal not to the medical profession but mainly to “the civil servants and the elected representatives of large cities [...] on whom, practically, most depends concerning the improvement of the public state of health”. The initiative was mainly taken by the city councils: of the 39 signatories of the “invitation for a pre-discussion on the founding of a traveling meeting on public health” in the early summer of 1873, there were 15 mayors, three senators and seven high-ranking civil servants. The driving force behind it was Berlin’s town council James Hobrecht. On September 15, 1873 the founding meeting took place in Frankfurt. Among the 230 members present, there were 113 physicians (including many medical civil servants), 28 mayors and 15 high-ranking communal civil servants. Thus this public health institute, which was aimed at general (practical) experts and people with positions of responsibility, was inter-disciplinary and generally rooted in politics (Göckenjan 1985).

The main objective of the growing attempts in the early 1870s was the unification of scientific findings with its feasibility. This objective, however, had a political dimension that caused difficulties in the German Empire. Mainly due to the Social Democratic labor movements, work dedicated to the “social question” was immediately regarded suspiciously as an attempt to overthrow the state. In addition, the emphasis on scientific methods and the analytical presentation of findings in figures, professional expertise needed to be developed. These experts were to be educated at the universities and would then work for the authorities, especially in cities. This aim was related especially to the development of the *Reichsgesundheitsamt* (the pre-war German National Health Authority).

During its first meeting in 1873, the German Society for Public Health negotiated the organization of the *Reichsgesundheitsamt*. Max Pettenkofer had been asked to take on the administration of the *Reichsgesundheitsamt*, but he declined, citing his age as well as academic responsibilities. In a thesis that took stock of the development of the *Reichsgesundheitsamt* programmatically, the appointed administrator at the *Reichsgesundheitsamt*, Hermann Struck, put high demands on public health research and its practice.

In his work Struck expressed the conviction that among representatives of medical science more precise methods of research had gained in importance, but that dealing with diseases from case to case with the intention of finding a cure was insufficient. Instead, it was the causes and distribution of the determinants of general health conditions, with implications for continuing changes in people’s social conditions, that demanded close examination and efficient action (Struck 1878, p. 1).

The Health Office was to provide uniform methods as well as an ensured level of knowledge and, therefore, prepare decisions regarding social policy. In addition to the standardization and processing of other research, the main independent instrument was to be medical statistics in a broad sense. People’s relationships to one another, their age, their environment, their geographical distribution, the soil they lived on, the water they drank, their prosperity, their diets, etc. were to be

examined. All this was to be seen in relation to the diseases occurring in their proximity, their life expectancy and their mortality rates, so that the causes could be found which resulted in the diminished strength and health of the population and lead to a shortened life-span (Struck 1878, p. 4).

Assanierung in the Cities and Factory Hygiene

Whereas there were no significant political difficulties regarding water-supply and sewage disposal, industrial hygiene found itself wedged between the profoundly contrasting interests of industrial society (Milles 1994). Not only did Max Pettenkofer set up the gut sewage system and the central water-supply system in Munich; he also started studies into health-damaging factory work. He ensured further treatment of this problem, as, for example, during the fifth meeting of the German Society for Public Hygiene in Nuremberg in 1877. The “practical realization” was discussed in a manner which was mindful of the organized labor movement (*Die Zukunft* 1877/78, p. 88f). The first attempts at trade regulations were listed for further development. They included regulation of child labor; a ban on night labor and labor on Sunday; regulations concerning breaks, minors, women’s labor, the normal workday, required licenses for facilities; inspections dealing with construction and fire-safety, etc. The meeting deemed “a certain supervision of the trade regarding hygiene as necessary”, though it was “to avoid taking on the character of the police”. It recommended:

- local, mixed factory commissions for the supervision and the consultation of the authority
- technical supervision associations
- “the proper organization of the medical service. It is not sufficient that the health insurance funds grant their members medical treatment in cases of disease; the physician has to be familiar with the member’s kind of occupation and the resulting health risk and has to visit the workplace during a certain period of time and the like. Also, he has to be granted a sufficient prophylactic influence”.

The meeting saw the employment of a few high-ranking civil servants as necessary in order to bring about the program’s realization. These civil servants were to possess the appropriate technical-hygienic, medical-hygienic education in addition to the required common knowledge. They were also responsible for the realization of supervision by the state (Milles 1997).

The proximity to the labor movement and the state’s control of factory inspection proved to be the decisive difficulty. Bismarck was against patronizing and burdening industry on which the state’s power had become increasingly dependent. Thus the socialist law was an attempt to suppress all Social-Democratic organizations, whereas the factory inspectors received only advisory tasks.

The Contradictions of the Public Health Conception

Under Pettenkofer's influence, hygiene in Germany concentrated on two tasks which had implications for social policy: on the one hand, the support for technical measures and, on the other hand, pedagogical measures. Hygiene was to aim at the "well-being of the people" in the form of applied physiology. That well-being, however, was increasingly dependent on economic growth. This belief would lead to progress, but also to profound restrictions (Eckart 1998, p. 277ff).

Pettenkofer developed the concept of "framing" from this perspective: since nature possessed the ability to purify itself (*Selbstreinigungskraft*), it was thus necessary to determine the extent of possible health risks in regard to the pollution of rivers and the concentration of hazardous gases. Thus the frame in which economic growth could take place had to be set.

Pettenkofer understood the concept as scientific and as a way of precisely determining protection. Its consequence, in practice, meant a gradual distancing from the political implications of public health.

In industrial hygiene, Pettenkofer's students, such as Max Gruber and Karl Bernhard Lehmann, were less concerned about the attainment and extension of workers' protection than with the legitimization of non-harmful health strains. They explored "efficiency thresholds", and the proposed limits for gases and fumes had been derived mainly as levels for releasing rights. These hygienicists acted mainly as industrial lawyers, as can be seen in the so-called "zero hypothesis", according to which no health risk is assumed as long as no exact cause can be proven. Especially in regard to workers' insurance, their work blocked the opportunity for negotiation of a social agreement on reasonable health risks and on industrial pathogenicity. They were also a hinder for the teamwork between the various insurance branches in Germany, where accident insurance was ascribed a responsibility for prevention which could be largely transferred to the statutory health insurance.

The Tragic Controversy of Cholera

An especially problematic development of the connection between industrial hygiene and public health can be illustrated by another central concern of Max Pettenkofer's work: the fight against cholera. Pettenkofer's stance in this problem was also bound to the hope of economic growth and the entailing improvements regarding the prevention and cure of major health risks. Pettenkofer therefore believed that, for the sake of the development of free civil communication, even cholera and many other diseases had to be risked: "A ban on traffic up to the point where cholera cannot be spread by it would be a much bigger disaster than cholera itself." On the one hand, this understanding was quite modern and corresponds with the meaning we nowadays ascribe to the improved conditions for a healthy life. On the other hand, it subordinates itself too readily to the conditions of capitalistic interests of utilization. This conception contained a social-political dimension which cannot be traced easily during those years. Thus concepts which

appeared to reject social-political dimensions received a higher amount of benevolence from the authorities and representatives of the economy. The triumphant advance of clinics and of bacteriology fall into this period.

It is due to tragic circumstances that, at the end of his life, Pettenkofer suffered his greatest defeat concerning that aspect of his hygiene concept that is the most important for us today: the emphasis on social conditions regarding epidemics. This has been described in great detail by Richard Evans (1987) in his study on Hamburg's cholera epidemic in 1892. Thus, we will mention only some highlights.

Until the 1880s, Pettenkofer was seen as the leading expert on epidemics in Germany. Though he did not deny the existence of cholera germs, he nevertheless stressed other contexts of impact, especially the importance of the "host". After the discovery of the cholera germ by Robert Koch in 1883/84, Pettenkofer watched the triumphant advance of bacteriology with envy, as well as rejection. The cholera epidemic in Hamburg in late 1892 provided clear evidence that assured bacteriology's triumph. This unexpected and grave epidemic that caught everyone by surprise was neglected by Pettenkofer's followers and was tackled successfully only because of Koch's intervention. The boiling of water, which Pettenkofer saw as useless, turned out to be the most effective method of fighting the disease. After the epidemic faded, there was a serious controversy between the two at the *Reichsgesundheitsamt* in September 1892. Koch emerged the victor and determined "the scientific standpoint of today". Pettenkofer consequently drank a cholera culture in front of students on October 10, 1892. The culture had been obtained from the institute founded by Koch's student Georg Gaffky in Hamburg. As a result, Pettenkofer showed some symptoms of the disease, but recovered and saw this as proof of his convictions. Gaffky, however, reported that, out of consideration for the old and honorable man, he had sent Pettenkofer a mild and non-dangerous culture. Thus even this experiment did not receive the recognition that he expected from the authorities, medical science and the general public. After these events and the death of his wife, Pettenkofer became ill, was affected mentally and finally shot himself on January 10, 1901. The event was symbolic in its tragic failure to promulgate scientific arguments for measures regarding social policy and their acceptance.

Developments of Responsibility for Industrial Pathogenicity in Germany

Pettenkofer's achievement lay especially in having provided the analytical foundations of public health measures without neglecting social objectives. He targeted the responsibility of the authorities regarding the political structures, especially that of the cities' health offices and of the authorities of the German Empire. He supported economic growth and the improvement of living conditions. However, the implications of his public health concept for social reform was pushed into the background in the politics of the German Empire, and scientific methods replaced political aims.

The rising labor movement, which was seen as dangerous, contributed in some ways to the increased importance of public health in communities as well as in the central state. At the same time, however, its political treatment was strained by power interests and economics.

During the 1870s special social security systems were developed in Germany which dealt with health dangers related to workers' protection and work insurance. These political constructions came into being under the influence of a grave and long-lasting economic crisis, the threat of strikes by unified Social Democrats and the menacing ideas of the Paris *Commune*. The development of the social insurance system in the 1880s (health insurance in 1882, accident insurance in 1884, pension insurance in 1889) took place in an attempt at social and political integration and the acceleration of national efficiency in the competition with England. Security benefits had to be justified causally with industrial pathogenicity and, at the same time, with the promise of integration and strengthening of performance.

Within this social embedding, a "clinical look" in occupational medicine and a "hygenization" of work and life environment was more supportive of the state than public health care developed politically or medicine's social aspects. Yet, fatally, the distance created by scientific and analytical methods concerning the social, political and moral questions at that time led to a stabilization of the natural sciences and to practical influence as well as success. As Alfons Labisch concluded, "the ethical and political components were sacrificed willingly" (Labisch 1992, p. 122).

Security and Health Today

Today, security and health accentuate the central challenge to social policy, and, thus to the German and "European" welfare state. Because of Europeanization, the objectives are being newly focused.

Health, in other words, physical, mental and social performance capability, became the single valid constant for us humans during the development towards modern industrial societies, and especially in today's post-modern age. This is especially true in a society where the large majority no longer believe in eternal life after death. Against this background, health is seen as the highest good in the public's esteem and is undoubtedly a central value in industrial societies. Health is not only seen as an individual and private, but also as a public and common, good. This double aspect of being a private but also a public, meritocratic good makes up the basic interpretation of public health.

Public health tendentially penetrates all social areas and cannot be reduced to scientific analysis, to treatment provision and, least of all, to medicine. Public health is implicit in all social areas, such as education, work, the family, mobility, nutrition or urban life. Health is therefore penetrated by aspects of power and control, of interests and conflicts. Thus health is subjected to political processes, arrangements and decisions. This also holds true for the area of health and work. The political interspersing of public health in private companies or, in other

words, the realization of public, social responsibility in businesses is the story of health protection.

Models of Social Development

Health protection in the German or European context, as a supplement to the citizen's civic, (economic) and political rights, is part of human rights as formulated for the first time in the UN Declaration on Human Rights of 1948 and in the EU Social Charter of 1961.

Social responsibility aims at inclusion, at social integration, at the participation of all people as members of one social context. Every person, therefore, has to have access to all areas of society's functions, such as the law, education, health care, and the opportunity to start a family as well as economic life (Kaufmann 2000, p. 176).

A new model of work has to integrate central dimensions of industrial and public health. These are:

- Reduction of work's share of life-time
- More variety in and discontinuity of *work biographies*
- Consideration for care work (such as nursing or the upbringing of children in families) as well as community and individual work in addition to paid work
- Equality for men and women (gender democracy)
- The knowledge that ecological, healthy and socially aware activities outside work are connected to corresponding experiences within the work sphere.

However, due to the dynamic changes within the work sphere, the connection between work and everyday life will become more complicated and diverse for many people, and it increasingly demands a more active individual organization of everyday life.

Chances of Politicization in the European Context

Europeanization has provided the concept of "public health" in the area of industrial businesses with an essentially stronger legitimization than previously. This is especially true concerning regulations on work protection, which follow a new model. Instead of an orientation towards technology, authoritarian control, a passive role for the employees and damages understood as accidents and occupational diseases, there is now a shift towards an industrial law where dangers are to be comprehensively understood, tackled early or prevented, and where all involved in business are to act upon the humane arrangement of work and its conditions.

Whereas work protection used to be oriented toward damages and physical, chemical and biological hazards, there is now a normative orientation in the new regulations on work protection. Health, health promotion, maintenance of pro-

ductivity and personal disposition must be compatible with the demands of work. The new regulations strengthened the rights of the employees in a civil and democratic sense. Employees have the right to information on risks and opportunities for health promotion as well as the right to advice on health problems in connection with their work. To a certain extent, the right to participation and to share in businesses has been strengthened. The extension of the principle of public health in the sphere of productivity, including the service sector, is further expressed by the extension of the EU's and thus Germany's regulations concerning work protection for the entire working population.

The new demands on work protection can be summed up as follows:

- An extended understanding of health; not only purely physical damages but also psycho-social aspects are included as well as aspects on health promotion (*holistic work protection*)
- Health policies aimed at prevention are understood as a cross-section task of business policy (*safety management*)
- Work protection is seen as a dynamic challenge. It has to adjust to the progress of technological development and to the newest findings of ergonomics (*adjustment duty*)
- Reduction of the executive deficit, especially concerning smaller businesses, employer's responsibility (*business orientation*)
- Cooperation between skilled safety experts and company medical officers (*principle of cooperation*)
- Active involvement of individual employees in the perception and management of hazards and risks as well as *healthy* behavior; employees are to be respected and accepted not only as objects of considerate protection but also as representatives of interest of their own health (*principle of participation*)
- Uniform and transparent standardization of legal demands and duties (*uniform right to work protection*) (Bücker et al. 1994, p. 43–44).

Not only the public work protection law but also the legal regulations concerning public health insurance and accident insurance in Germany outline new activities aimed at prevention and humane arrangements of work conditions. Paragraph 20, "Prevention & Self-help", of the Social Security Code, Book V may be cited. Accordingly, public health insurance funds have to cooperate with the providers of the statutory accident insurance for the prevention of work-related health dangers. They have to provide services for primary prevention in order to deliver a contribution for the reduction of social inequalities regarding health opportunities. Prevention has been extended in the new accident insurance with §1 and §14. This relates not only to work-related accidents and occupational diseases but also to work-related health danger that may threaten life and health. There must be an investigation into the causes for these dangers and cooperation with public health funds.

Thus a central element of modern labor and health policy is the promotion and the qualified organization of the citizen's participation in- and outside the workplace in the interests affecting them. This further develops a problem seized upon by Max Pettenkofer. Yet, whereas he aimed at *objectifying*, seeking mainly analytical criteria for health protection, the emphasis is nowadays on a broader politicization. Pettenkofer aimed at an official expertocracy (technicians, physicians) and pushed aside a politicization "from below"; today there is an opening towards the affected citizens and employees. To a certain extent, we are able to link up with the old positions of Pettenkofer and to develop them further.

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