

### **What is silicosis?**

Silicosis is a chronic disease due to the inhalation of crystalline silica dust. When inhaled over a long period of time, particles of silica create nodules within the lungs, which progressively led to their scarification. At the end the patient cannot breathe and needs a bottle of oxygen to move only a few steps. The disease is not curable and often leads to death.

### **When was silicosis discovered?**

Descriptions of silicosis symptoms can be found in the literature since the time of ancient Egypt. Japanese miners from the early modern era had a word, *yoroike*, to designate it. But the word silicosis was only coined in 1871 by the Italian physician Achile Visconti. This was a quite unfortunate timing. Tuberculosis, whose bacillus was discovered a decade later in Germany, became a dreadful competitor: employers' medical experts used TB to negate the very existence of silicosis, or attribute it to a side effect of this "private" lung disease, in order to counter workers' demands for financial compensation.

### **Who are the victims of silicosis?**

Silica being the main mineral component of the earth crust, its dust is produced by most industrial activities. Until the 19<sup>th</sup> century, its victims were primarily skilled workers such as stonecutters or glassworkers – what remains true in many developing countries. Then, with the growing need for coal energy, the digging of deeper and deeper pits, the use of explosives and of powerful drilling machines (nicknamed "the widow makers"), the workers in the extraction industry, and particularly coal miners, progressively became the most numerous and visible victims of the disease. This picture still sticks to the disease, and has even gained more relevance in emerging countries. This plays a role in hiding the prevalence of silicosis among workers of other industries.

### **Why is silicosis historically important?**

Silicosis is probably the most lethal occupational disease in the history. Its pathogenic effect share many similarities with asbestos, and the two diseases, asbestosis and silicosis, have for a long time be treated in the same medicolegal categories (see illustration below). Because of the number of victims involved, silicosis was nicknamed "the king of occupational diseases" when industrialized countries created this medicolegal category in the beginning of the 20<sup>th</sup> century. It symbolized a new focus in medical concern, from poisoning diseases (saturnism) to dust ones.

### **Why can silicosis be considered as a "negotiated disease"?**

Silicosis symptoms (nosology) and causes (etiology) were officially defined in 1930 in an international conference in Johannesburg, by physicians who had to conciliate the economic interests of the industry and the demands of workers' unions. The result was a literally "negotiated", "bargained" disease, where some pathogenic effects of silica entered the concerns of medical knowledge, and others were deliberately set aside.

### **Why are the history of silicosis and current medical research on silica hazards directly related?**

The 1930 compromise (silica hazards = silicosis) remained stable until the end of the 20<sup>th</sup> century, when new tools of medical detection such as scanners appeared. 9/11 played a major role in questioning medical research. Manhattan rescuers have been suffering from an "epidemy" of sarcoid-like disease, probably associated with the instant but massive inhalation of silica and other inorganic dust particles. Since then, physicians have been more and more willing to open the black box sealed several decades before. They question the possible association between exposure to silica and the triggering or aggravation of a range of chronic autoimmune systemic inflammatory diseases such as sarcoidosis, systemic lupus, rheumatoid arthritis, systemic scleroderma, uveitis, or spondyloarthritis. One of the major originalities of the book is to have been informed by research both in medicine and in history. It thus draws a direct and original connection between those two disciplines, and feeds further epidemiological research on silica hazards.