

## OCCUPATIONAL HEALTH IN YUGOSLAVIA

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### ABSTRACT

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A short historic review of the development of occupational health in Yugoslavia is given. Transformations which occurred after the 2nd World War, with social and economic changes and fast industrial development, together with accompanying effects of industrialization are summarized. The most important achievements in the field of occupational medicine since the war are given chronologically. Present organization of occupational medicine is also shown.

In addition, a short survey of occupational pathology in Yugoslavia is given, and data on accidents at work, and rate of sick leaves (absenteeism due to illness) are listed. A part of the review summarizes the subjects occupational medicine deals with, and in the end, present orientation and future tasks of occupational medicine are critically evaluated.

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The industrial revolution in this part of Europe began late, and consequently in the territories of the present state of Yugoslavia occupational medicine is relatively new. The first publications dealing with occupational exposures and injuries date from the middle of the 19th century. However, as early as 1776, J. B. Lalangue, a physician in Varaždin (Croatia), published a book dealing with living and working conditions and diseases of landless peasants<sup>2</sup>. This work deserves attention because it is a rare review in the history of occupational medicine of health problems of peasant – farmers. Moreover, it was the first medical book written in the Croatian language.

There are documents about mercury poisoning in our country which date even earlier, and concern the mercury mine in Idrija. In the first years of exploitation of this mine cinnabar was accompanied by a lot of native mercury. Since the work was carried out without any protective measures, the workers' health was greatly affected. Paracelsus wrote about it in one of his articles as early as 1527. The mining and recovery of mercury in the Idrija mine was described by Bauer. Mattioli, physician and botanist from Sienna, reported chronic mercury poisoning which appeared in Idrija miners in the form of gingivitis, loss of teeth, and tremor. At the end of the 17th century Johann Weikhard Valvasor wrote about disabled miners from Idrija who wandered around the country begging. They possessed a certificate of destroyed health and disability issued by the authorities entitling them to beg freely. The mine was modernized in 1736, and

the working conditions were improved<sup>1</sup>. At present the mine is closed because of high production costs and very low prices of mercury on the world market.

Following Lalangue's book from 1776 next publications dealing with occupational health appeared almost 80 years later. The topics discussed and years of pertinent publications were as follows<sup>1</sup>:

- Hygiene of seamen (1885: A. Giacčić, 1872: M. Nikolić, and 1896: J. Gjivanović),
- Social insurance of the poor and workers and diseases among farmers (1862 and 1882: K. Pejičić),
- Lead poisoning (1886: D. Reich, and 1888: L.K. Lazarević),
- Mercury poisoning (1825: A. Mraović, and 1895: S. Pops),
- Phosphorus poisoning (1895: L.K. Lazarević, 1899: G. Janaček, and 1914: A. Culek),
- Health conditions of craftsmen and workers (1904: F. Gudrum),
- Working conditions in industrial plants in Serbia (1914: K.D. Nikolić),
- Occupational diseases, accidents at work and tuberculosis in workers (1912 and 1935: Ž. Hahn),
- Pathology of work (in a book: Social medicine, 1925: A. Štampar),
- Conditions in Yugoslav mines (1925: V. Bogić),
- Lung silicosis (1939: M. Sekulić and R. Milošević),
- Hygiene of work and occupational diseases of miners (1939: B. Kesić),
- Pneumoconioses (1940: A. Radosavljević).

After the 2nd World War essential transformations of social and economic nature took place. Especially important was the rapid growth of industry which gave a new stimulus to occupational health development. However, the building of industrial plants and introduction of new technologies aroused many occupational health risks previously unknown in our conditions. For example, the increase in production in the mining industry following the mechanisation of mining was connected with a sharp increase in the rate of pneumoconioses several years later. At the same time, thousands of farmers left the land and the villages for industrial jobs. The proportion of agricultural population decreased from 75% in 1945 to 31% in 1977<sup>3</sup>. New industrial workers had not only to learn new tasks, but also to adjust to changed rhythms of work and to new surroundings both in the factories and in urban homes. This was reflected in an increase in the rate of accidents at work and also in the occurrence of many psychoneurotic disturbances.

Socio-economic changes were accompanied by efforts to improve social and health care of the population, especially of workers. Social insurance, both health and disability insurance, started before the war, was extended and improved as rapidly as conditions allowed. As an example, in pre-war Yugoslavia only five diseases were accepted as occupational, while today there are 52 diseases which health and disability insurance recognizes as occupational.

Workers' health protection was characterized first by an attempt to provide workers with essential medical care only. However, it was soon recognized that organized preventive activities directed to specific occupational health problems were needed. In these efforts a significant role was given to organized scientific research in the field of occupational health, which dates back to 1947 and 1948, when the Institute for the Physiology of Work of the Serbian Academy of Sciences in Belgrade and the Institute of Industrial Hygiene of the Yugoslav Academy of Sciences and Arts in Zagreb were established as well as to the introduction of the subject of occupational health in the curriculum of graduate and postgraduate studies of medical students. As early as 1950 postgraduate courses in industrial hygiene were organized at the School of Public Health in Zagreb. In 1950 a Yugoslav periodical entitled "Archives of Industrial Hygiene" was first published. In 1956 its name was changed to "Archives of Industrial Hygiene and Toxicology". The Yugoslav Association of Occupational Health was founded in 1963 when the First Yugoslav Congress on Occupational Health also took place. The Congress was preceded by three scientific meetings on industrial hygiene with international participation organized by the Institute of Industrial Hygiene (now the Institute for Medical Research and Occupational Health) in Zagreb in 1950, 1953 and 1958.

With social and economic advancement, a network of occupational health institutions developed. Occupational health units were established in almost all larger factories. Occupational health departments were organized in the public health institutes at republic, district and town levels. In addition, the Institute for Occupational Health and Radiological Protection in Belgrade (in 1959), the Institute for Occupational Health, Traffic and Sport Medicine in Ljubljana and several institutes for safety at work in Ljubljana, Zagreb and Niš were also founded. According to data from the end of 1975, there were 1 151 occupational health units in factories and occupational health clinics in Yugoslavia, with 1644 employed physicians. The ratio of physicians to workers was about one to 3 000<sup>4</sup>. There are now almost 800 occupational health specialists, and this makes a ratio of one specialist to 6 400 employees. Although the occupational health programme is an integral part of the national health service, there are many variations in the manner of organization. Local needs and views, as well as differences among the republics and the districts, are reflected in the practices of occupational health units. These practices range from rather strictly limited occupational health services to some instances of complete care of the workers and their families.

At present workers' morbidity in Yugoslavia probably corresponds to that which can be expected in other countries with similar industrial structure and development. Among occupational diseases the most frequent are skin diseases, about 40%, about 15% are industrial poisonings and about 10% occupational hearing damages. Approximately 25–30% are pneumoconioses and other occupational lung diseases. Pneumoconioses are still a current problem especially in the mines in the eastern part of the country. Among pneumoconioses the most prevalent are silicosis and coal workers pneumoconiosis (60–70%). Ten to

fifteen per cent of the total number of pneumoconioses relates to silicotuberculosis. About 5% of pneumoconioses relates to asbestosis, and the rest to other pneumoconioses.

The annual rate of registered occupational diseases is about 1/1000 employees and they participate with about 0.5% as causes of sick leaves. The annual rate of accidents at work is 50–60/1000 employees. The average daily sick-absence rate in Yugoslavia is about 4–4.2%<sup>5</sup>. However, it differs significantly not only between certain branches of industry but also between the republics. The highest rate of absences is found in industries where the working conditions are most difficult but also in the most developed parts of the country. About 86% of the absences are due to illness, 9% to accidents (occupational and nonoccupational) and about 5% are due to the care of a member of the family. Among diseases which cause sick absences the most frequent are those of the respiratory system, digestive system, locomotor apparatus, and cardiovascular system. This nonoccupational morbidity of Yugoslav workers is similar to the morbidity of workers in developed countries. Improved medical care, better living and working conditions as well as better nutrition have a significant influence on the morbidity pattern. The role of different chronic degenerative diseases in this pattern has become more important while many "classical" diseases from the near past have greatly lost in significance. Among these are tuberculosis, bacterial infections of digestive organs and some diseases caused by malnutrition. However, this does not mean that all these diseases have been completely eradicated.

The directions of industrial development, occupational pathology, and the causes of absences and disability influence scientific research in the field of occupational health in our country. Thus, industrial toxicology in Yugoslavia deals with various aspects of intoxications by heavy metals (lead, mercury, manganese, and cadmium). The studies concern the lead effect on the kidneys, peripheral lead neuropathy, relationship between the levels of lead, mercury, and manganese exposure and demonstrable biological effects, as well as physical and chemical investigations of interaction of metal ions and of absorption, metabolism, and elimination of heavy metals in various conditions. The toxicology of carbon disulphide is also widely investigated. Much attention is paid to the toxicology and mechanism of action of some pesticides, especially anticholinesterases, as well as to the current problems of exposure to organic solvents, plastics, etc. In the field of occupational lung diseases clinical, epidemiological and partly experimental investigations of various pneumoconioses are carried out. Attention is also paid to other occupational lung diseases, such as byssinosis, as well as to the role of occupational exposure to various dusts in the development of chronic nonspecific lung disease (coal dust, cement dust, organic dusts). Some studies also pertain to occupational hearing damages in some industries, damages caused by vibrations, especially in forestry where motor saws are used, and decompression illness. At the same time basic investigations of the kinetics of some enzymes, physiology of mineral metabolism and cellular biology are carried out. In connection with increasing

rates of degenerative diseases in workers' morbidity, methods of systematic health check-ups applicable in industry have been developed, and the relationship between work and living conditions and the occurrence of some chronic lung diseases, diseases of the locomotor system, psychoneuroses and coronary heart disease have been studied. Psychophysiological factors, nutrition etc., connected with absenteeism and work injuries have also been investigated.

The evaluation of the present situation in our occupational health service shows that the guiding philosophy, organizational structure and resources can be given a relatively high score. But the health services programme reflects a curative emphasis rather than a preventive one. It is mainly with respect to this element that we can discern a need for improvement. In the future both the prevention of occupational diseases and the control of chronic diseases of widespread occurrence deserve more attention. The factory occupational health units should give greater emphasis to pathology directly associated with specific work exposures and to the development of protective measures based on such knowledge. The workers' health unit can also organize surveys for the early discovery of chronic diseases and for the recognition of risk factors, and can conduct educational programmes to correct unhealthful habits and living conditions. To achieve these goals a continuation and further development of specific systems of education of occupational health workers and properly directed scientific research are of special importance. In a working environment in which workers have strong management roles, the necessary conditions to achieve these objectives exist, and they can be used better in the future for fulfilling the workers' need for health protection.

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