Centr. eur. J. publ. Hlth 7, 1999, No 2, p. 55–56

PRESENT AND FUTURE CHALENGES TO ENVIRONMENTAL HEALTH IN EUROPE

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The 100th anniversary of the Institute of Hygiene and Epidemiology of the Charles University at the First Faculty of Medicine provides a good opportunity to look back at the impressive improvement of the health status of European populations over the last century. Infant mortality has declined 10-fold and the incidence of several infectious diseases, common in the 19th century, has declined dramatically. The life expectancy is growing. To a large extent, this progress is due to the prevention of disease through effective immunization programmes, improvement in nutrition and the reduction of population exposure to hazardous factors. In search of effective approaches, new public health disciplines have developed over the last century. They are based on natural and medical sciences but include experience and methods of social sciences, statistics or mathematical modelling.

Health promotion and disease prevention requires comprehensive action from all parts of the society. It starts with individuals and individual families, is an important task at the community and national government levels and is also a leading policy of international bodies, such as the World Health Organization. Responsibility for disease prevention goes far beyond the health care sector. Effective preventive programmes must actively involve industry, energy production, transport and housing as the sectors possibly generating health risk, and education or public communication as the sectors enabling health promotion. Public health should link and catalyze the actions of various sectors to achieve maximum health gain.

Environmental health, as a part of public health disciplines, has a particular role in disease prevention and creation of environments supportive for health. Based on the recommendations of the 2nd European Conference on Environment and Health held in Helsinki, in 1994, many European countries are developing their National Environmental Health Action Plans. The plans translate the environmental health assessments into political decisions and technical programmes aiming to reduce environmental health risks.

At the European level, the comprehensive review "Concern for Europe's Tomorrow" prepared by the WHO European Centre for Environment and Health for the Helsinki Conference, has identified several environmental health priority issues requiring the most urgent action in the European Region of WHO. The list, endorsed by the Helsinki Conference Declaration, includes the following problems:

- contamination of food and water,
- ambient and indoor air pollution,
- death and injuries from all forms of accidents, including nuclear emergencies,
- ecology and health,
- urban health,
- occupational health,
- consequences of armed hostilities.

Sometimes, the list of problems most relevant to each individual European country may only partly correspond to the European list. An assessment leading to the formulation of such a national list requires a combination of work of the environment and health monitoring services with special research investigations and with a review of the accumulated knowledge on the effects of environmental factors on health. Over the century of its activity, the Institute of Hygiene and Epidemiology has contributed significantly to the development of the national expertise necessary for these tasks in the Czech Republic.

The WHO European Centre for Environment and Health promotes the national assessments and national action plans through development of methodologies, reference materials and support for capacity building. Among the examples of the relevant, most recent projects and products of the Centre, one can mention:

- *Update of WHO Air Quality Guidelines.* This project has reviewed health effects of more than 30 common air pollutants and set health-based exposure guidelines. For several pollutants, the Guidelines provide estimates of exposure – response relationship enabling calculation of expected health effects of certain pollution levels. The Guidelines constitute an essential input for the development of national air quality standards. Their implementation should contribute to the prevention, or substantial reduction, of adverse health effects of the pollution.
- *„Exposure assessment to indoor air pollutants"* and *„Strategies of ambient air quality monitoring for health impact assessment"*. These monographs discuss the most effective methodologies of exposure assessment to air pollutants and help to identify environments posing the highest risk for health.
- *„Atlas of mortality in Europe – spatial patterns 1980/81 and 1990/91"* presenting areas with different mortality patterns, and highlighting those where the disease prevention may be the most urgently needed.
- *Prague Summer School „Epidemiology in public health"* organized by WHO/ECEH annually since 1994 in collaboration with the 3rd Medical Faculty of the Charles University, London School of Hygiene and Tropical Medicine as well as the Czech National Institute of Public Health. Each year the School provides a 2-week course for approximately 70 postgraduate level students coming to Prague mostly from Central and Eastern Europe.

While the identification of current problems helps to reduce the present risks, the turn of the century calls for the prediction of new challenges for environmental health. The most immediate needs are related to a better understanding and quantification of the effects of present and ubiquitous hazards,

Opening address at colloquium "Primary Prevention and Quality of Life" at the occasion of Centennial of establishment of Institute of Hygiene at the Czech Medical Faculty of Charles University in school year 1897/1898, the present Institute of Hygiene and Epidemiology, First Faculty of Medicine, Charles University of Prague.

such as fine particulate matter. This understanding is needed to devise pollution prevention strategies optimal from the health point of view and, at the same time supporting sustainable development of the society. A more remote threat is the global climate change. The prevention of its potential effects on the future generations needs decisive action now. Recognition of the immediate health benefits linked with the reduction of emission to atmosphere of green-house gases should stimulate fast and comprehensive action preventing the global climate change and the delayed, often indirect, effects on population health. Another example of concern for the future is the potential effect of endocrine disrupting chemicals. Though the present knowledge on the extent of the exposure and their relevance to human health is extremely limited, the potential risk to health should be carefully evaluated.

Evaluation and management of the present environmental health problems, as well as inventive approaches to solve new, emerging issues, call for the active involvement of a wide circle of specialists. The activity of the Institute of Hygiene and Epidemiology of the Charles University in its second century of existence will certainly continue to contribute to the expertise necessary in the Czech Republic and in the entire European region.

Received March 11, 1998

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Five Kingdoms. An Illustrated Guide to the Phyla on Earth

Third Edition

New York, W. H. Freeman and Company, 1997. XX + 520 pages. Format 230 x 232 mm. Soft cover. Price Lstg 25.95. ISBN 0–7167–3027–8

First author is Distinguished University Professor at the University of Massachusetts (Amherst) – she is the author and co-author of numerous monographs: **Handbook of Protoctista** (1990), **Origins of Sex** (1991), **Illustrated Glossary of Protoctista** (1992), **Symbiosis in Cell Evolution** (1993), **The Illustrated Five Kingdoms** (1994). Second author teaches in the biology department at the University of Massachusetts (Boston), she is a professional photographer of natural history. Earlier editions (1982, 1988) have been praised as ...rarest of intelectual treasures... a terse visual index to the living library ...a sampler of life... In addition, translations into Spanish, Japanese and German appeared in print.

As emphasized in the foreword by S. J. Gould (Museum of Comparative Zoology, Harvard University), some investigators dismiss taxonomies and their revisions as mere exercises in abstract ordering. Still, classifications express most fundamental concepts about the objects of our universe, and also record degree and amount of live's diversity and complexity. In the preface, the authors characterize their book as an illustrated guide to the diversity of life on Earth and a comprehensive reference to both microbes and macroscopic organisms – what they look like, where they dwell, how they are related to one another, and how scientists group them. NASA scientists stressed the need of an illustrated guide to the diversity of life on Earth to inform their search for possible extraterrestrial life forms. As further emphasized, concepts of kingdoms and phyla originate in the classification proposals of scientists of the twentieth century R. Whittaker and H. Copeland – built on earlier attempts of Linnaeus, Jussieu, Cuvier, and Haeckel to order the biota. The molecular data have most profoundly affected the view of bacteria and protoctists. The authors anticipate further classification shifts. The volume is composed of 5 chapters which provide insights into actual knowledge of particular kingdoms.

Chapter 1 concentrates on the kingdom **Bacteria** (Prokaryotae, Procaryotae, Monera) which comprises 14 phyla divided in two subkingdoms – **Archaea** (Archaebacteria) and **Eubacteria**. Next chapters are joined in the frame of the superkingdom **Eukarya**.

Chapter 2 presents the kingdom **Protoctista** which comprises 30 phyla of eukaryotic organisms and their immediate descendants: all algae, flagellated water molds, the slime molds and slime nets, the traditional protozoa, and some other aquatic organisms. All proctoctist cells have nuclei and other eukaryotic features. Many photosynthetize (have plastids), most are aerobes (have mitochondria) and most have undulipodia (= flagella) with their kinetosome bases at some stage of their life cycle. The name of protoctists is derived from the Greek *protos* = very first and *ktystys* = creature. In this system there are no one-celled animals; traditional protozoans are placed in the Protoctista kingdom.

Chapter 3 is devoted to the kingdom **Animalia.** Animals conclude 37 phyla beginning with trichoplaxes (Placozoa) and poriferans (sponges) and concluding with cephalochordates and craniates.

Chapter 4 provides insights into the kingdom **Fungi** (= Mycota or Eufungi). As defined here, this kingdom is limited to eukaryotes that form resistant spores and chitinous cell walls and that are immotile at all stages of their life-cycle. Featured are three phyla: Zygomycota, Basidiomycota and Ascomycota.

Concluding **chapter 5** is concerned with members of the plant kingdom **Plantae** as multicellular organisms which have a sexual stage in their life-cycle. Photosynthesis by plants requires enzymes within membrane-bounded plastids. Plants include 12 phyla.

Finally, there is an appendix containing a list of phyla and a tabular overview of genera mentioned in this book. For some genera common (vernacular) English names are given. Still, for most genera no common names are available. Moreover, there is a glossary of biological and ecological terms relating to certain kingdoms or phyla. The introduction to each chapter defines the general features of the entire kingdom, and it is followed by essays, each describing one phylum of that kingdom. At the top of the right-hand page of each phylum essay is a scene with one or more arrows pointing to typical habitats of the members of the phylum: temperate seashore, temperate forests, lakes and rivers, deserts and high mountains, tropical forest, tropical seas, tectonically active anoxic environment and the ocean. Each phylum is characterized by micro- or macrophotographs and corresponding line-drawings of a distinctive species or of an anatomical detail, schematic drawings of life-cycles, dendrograms, cross sections, cutaway views or diagrams. In addition, there are summary-type tables, classification schemes, and more. Each chapter is concluded with a list of references.

This extraordinary volume provides a most comprehensive catalogue or picture book of the world's living diversity of nature's life five great kingdoms using modern taxonomic schemes. It allows readers to sample full range of life forms inhabiting our planet and familiarize themselves with new ideas on molecular systematics.

Jindřich Jíra