

Book reviews

Environmental Health Criteria. I. Mercury. (Pp. 131; 14.00 Sw. fr.). WHO: Geneva. 1976.

This is the first of a series of reports on the evaluation of health hazards in the environment by an international group of experts under the sponsorship of the World Health Organization and the United Nations Environment Programme, set up in 1973. The scope of the environmental health criteria reports is to compile, review and evaluate information on the biological effects of pollutants influencing human health, and to provide a scientific basis for decisions aimed at protection from the adverse consequences of exposure, both in the occupational and general environment. The more precise objectives are to assess information on the relationship between exposure and health, in order to provide guidelines for setting exposure limits; to identify potential pollutants by preparing preliminary reviews on health effects; to identify gaps in knowledge and thus to promote research, and finally and most important, to promote the harmonisation of toxicological and epidemiological methods for the purpose of obtaining research results that are internationally comparable. Each criteria document, as it is styled, contains chapters on chemical and physical properties, analytical methods, sources of pollution, environmental transfer, distribution and transformation, metabolism, and experimental, epidemiological and clinical studies of effects. The evaluation which follows gives the opinion of the task group on relative contributions to the total dose from air, food, water and other exposures, dose-effect and dose-response relationships and guidelines on exposure. In addition the report gives a summary, followed by recommendations for future research.

It is appropriate that the first of these criteria documents should be on mercury. A decade ago the epidemics of poisoning following the discharge of mercury in industrial effluents at Minamata and Niigata shook the world into a realisation that similar pollution was occurring

in many other industrial centres. At that time we knew little about the complex behaviour of mercury in the ecosystem or of the metabolism of highly toxic methyl mercury in man. The study of predominantly fish-eating populations in Japan, Sweden and elsewhere, together with the observations made on the rural population of Iraq who had consumed bread made from wheat seed treated with methyl mercury, has given a fairly good but still incomplete picture of the long-term daily intake of methyl mercury in the diet associated with the earliest effects seen in an adult population. The levels quoted apply only to adults and relate to the probability of an effect in up to 5% of the population. Assumptions, approximations and some fairly sophisticated arithmetic have been used in arriving at estimates of total dose and of total body burden. However, precise assessment of neurological deficit is difficult enough in specialised centres, let alone in field studies. While the assessment of paraesthesiae must, for the present, remain subjective, the report gives no indication of criteria used in the assessment of the presence of ataxia, dysarthria or deafness. The crude nature of the clinical input data has not been stressed and this must be kept in mind when interpreting the evaluation made by the task group.

The toxic properties of elemental mercury differ from those of its inorganic salts, and from the short chain alkyl mercurials which in turn differ from all other organic mercury compounds. The account of the clinical effects of these different categories is incomplete. In particular, renal disorder following immune complex deposition on the basement membrane of the kidney, and in general the role of hypersensitivity in influencing the toxic reactions to mercury, have not been considered.

Occupational exposure to mercury occurs mainly to elemental mercury vapour. Although large numbers of workers have been exposed to mercury vapour for many years we still do not have precise measurements on exposure

levels, their relationship to concentrations in blood and urine and to total body burden. Information is also lacking on the possible effects of exposure to mercury vapour during pregnancy and these gaps in our knowledge are indicated in the report.

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Mercury Contamination: A Human Tragedy. By Patricia A. D'Itri and Frank M. D'Itri. (Pp. 311; £13.45). John Wiley & Sons: New York. 1977.

The Phoenicians in 700 BC traded in cinnabar from the rich deposits still present at Almaden in Spain, and mercury was used in far eastern medicine before the Christian era. Since the industrial revolution the uses of mercury have increased steadily, resulting not only in exposure of workers to this toxic element but in increasing exposure of the general population from discharge of mercury into the environment. It has been estimated that Minamata Bay now harbours over 1 million lb (over 450 000 kg) of mercury, and 58 tonnes lie in the mud and silt of San Francisco Bay, an indestructible load presenting space age man with a colossal problem in pollution control on a world wide scale.

The D'Itris trace the uses to which mercury has been put through the ages and this makes fascinating reading. In the sixteenth century, they recount, syphilitic patients were placed on a chamber pot with the head and body covered in blankets while cinnabar was burned beneath them until, breathing the vapourised mercury, their teeth loosened. No less horrifying is the course of events at Minamata and the Iraqi tragedy of the early 1970s in which grain contaminated with methyl mercury was eaten, resulting in probably the largest epidemic of chemical poisoning the world has yet seen. There is continuing unease over the state of the Canadian Indians who fish the mercury-contaminated waterways of the Ontario reserves. The technical and economic problems posed in removal of mercury from waterways is