

It is well known, for example, that highly effective techniques have been developed to control the acute diseases that used to be caused by water pollution. Microbial pathogens can be held in check by chlorination; organic matter content can be minimized by dilution, oxygenation, and other chemical techniques; and of course water can be made limpid by filtration. But there is no practical technique for removing inorganic materials, as well as some synthetic organic substances, that tend to accumulate in water supplies as a result of industrial and domestic operation. Even though clear and free of pathogens, many sources of potable water are now becoming increasingly contaminated with a variety of chemicals that probably exert delayed toxic effects. In this regard, it is worth keeping in mind the recent reports suggesting that the incidence of certain forms of cancer and vascular diseases is correlated with differences in geological formation and in the mineral content of water supplies. While these reports are still preliminary and sub judice they point to a new kind of threat, which though ill defined, bids fair to become of increasing importance in the future.

In my opinion, the medical problems posed by environmental pollution will require a kind of scientific research which is greatly neglected at the present time, and for which adequate facilities do not exist either in medical schools or in research institutes.

For example, it will be necessary to maintain and study various kinds of experimental animals under a wide range of conditions for prolonged periods of time, and indeed for several generations. To be successful such studies will have to be carried out with animals of known genetic structures and experiential pasts. Equipment will be needed to record, retrieve, and analyze the complex data to be derived from the study of large populations and multifactorial systems.

The mere listing of these facilities points to the need for new types of institutions with a special organization of highly integrated personnel. What is required is nothing less than a bold imaginative departure to create a new science of environmental biomedicine.

Unfortunately it will always remain impossible to predict from laboratory experiments all the threats to health that can arise from technological innovations. Unforeseeable accidents will happen, as was the case with exposure to ionizing radiations or with chain cigarette smoking, or with the use of thalidomide during the first 3 months of pregnancy. Since it is impossible to test all the effects of all technological innovations, some of them will inevitably have pathological consequences.

We must abandon, in fact, the utopian hope that regulations can protect us completely from all health dangers in the modern world. For this reason, the science of environmental biomedicine should be complemented by a prospective kind of epidemiology, designed to detect as early as possible early manifestations of abnormality in the population at large so as to guide efforts to trace such abnormalities to technological and social changes. Seen in this light, prospective epidemiology would constitute a kind of protective social organ, as assential to disease control as are the safety regulations designed to protect the public against known dangers.