For those in peril: 3 - not only on the factory floor

Dr D. R. Bowes of the Department of Geology at the University of Glasgow points out that not only workers but the general public could be at risk from asbestos and other mineral dusts in the environment and that more research is needed on this particular topic.

Not the only one at risk

THE discussion by Peter J. Smith of occupational exposure to asbestos (*Nature*, October 18) highlights a major obstacle to a concerted effort by the scientific community in the field of the relationship of mineral and rock dusts to human disease, namely the apparent lack of awareness of the problems by many mineralogists, geochemists and geologists and hence of the neglect of their expertise. Some are involved but, however significant their contributions may be, it has been a relatively small group of the medical profession who has pinpointed the vital role of mineralogy and allied fields as well as demonstrated the health hazards associated with the inhalation of mineral and rock dusts. Much of the recent direction of public attention to the matter stems from an articulate few who see not only the value of scientific research to community health, but also to social and legislative action. They have been supported, particularly in the United States in recent years, by active collaboration with physical scientists, which has not only contributed to medicine but has opened frontiers in the physical sciences. In Britain it is more than 40 years since an industrial survey showed the high prevalence of asbestosis in asbestos factory textile workers, and that came nearly a quarter of a century after Parliament was first notified, in 1906, about fatal pulmonary asbestosis amongst asbestos workers. With such a passage of time, and its implications for human disease and suffering, the focusing of attention of physical scientists on occupational exposure to asbestos, and to the many other mineral and rock dust materials associated with mining, milling and manufacturing industry, is a matter of urgency.

Urgent attention should also be given to potential health hazards concomitant with environmental exposure. The incidence of pleural calcification resulting from environmental exposure in the neighbourhood of an asbestos mine or mill, or of pleural mesothelioma, without occupational exposure, in areas where there is asbestos in the local rocks, serves to illustrate that potential risk is not limited to occupationally exposed miners and industrial workers. The 1971 Report of the National Institute of Occupational Diseases, Johannesburg records that more than a third (of 210) of cases of mesothelioma were considered to be the result of environmental and not occupational exposure to asbestos. This, together with evidence that asbestos greatly multiplies the already considerable lung cancer potential of cigarette smoking, suggests that combined scientific and medical research as a basis for legislative attention, as well as preventitive medicine, could have a significant effect on community health in at least some industrial areas.

The dimensions of any health hazard associated with air pollution caused by dusts, including asbestos, have yet to be defined and it is not proper to equate neighbourhood contamination with general community air pollution. The existence of levels of 10 to 50 $\times 10^{-9}$ g m^{-3} of chrysotile asbestos in the ambient air of places like New York City and the regularity with which asbestos fibrils are found at autopsy in the lungs of residents of New York and London, are probably indicators for other urban areas. The asbestos industry has an important responsibility for controlling the commercial and industrial sources of air pollution, but additional possible contributory factors, resulting from the action of the public at large, must not be passed by. These include dusts from asbestos brake drum linings and the mineralogy of decomposed lining material which could have a general effect as well as a localised one in the confined spaces of motor repair premises; inorganic particles in smoke from tobacco—that from some cigars is known to contain an inorganic fibrogen and that from cigarettes, is suspect in view of the relationship between cigarette smoking and lung cancer; and consumer talc products, which must represent one of the mineral dusts most inhaled and ingested by people of all ages in many households, with talc known to cause pneumoconiosis as the result of occupational exposure and to occur in nature together with some asbestiform minerals.

There are other factors to be considered in the control of environmental exposure to mineral and rock dusts through air pollution, and many other geological and mineralogical aspects to be assessed in the relationship between human health and the inhalation and ingestion of inorganic particles. And those instanced now under joint or separate investigation in the Environmental Science Laboratory, Mount Sinai Hospital, New York, and the Department of Geology, University of Glasgow show not only how in science something that is apparently obvious, with the benefit of hindsight, is not recognised until its possible effect on human welfare is appreciated, but also how in developing fields the availability of equipment that can help meet the new demands is vital. Identification of gaps in existing knowledge as suggested by Peter J. Smith is a useful next step but consideration of environmental exposure to mineral and rock dusts, as well as occupational exposure, is likely to reveal larger gaps than initially anticipated and to suggest that inclusion of matters affecting the health of the public at large will entail interdisciplinary endeavour on a considerable scale. Review and assessment alone will, however, not avert human suffering but could lead to frustration on the part of scientists and cynicism on the part of the general public if the will to accomplish is not matched by adequate provision of the tools needed, even if this means that certain other research topics, with less application to human suffering, are given reduced support.