Book reviews


The Advisory Committee set up by the Secretary of State for Employment started its deliberations in 1976. Its terms of reference were wide: to review the risk to health of people exposed to asbestos at work, and also the risk to the general public exposed to asbestos used at work, or from consumer products or asbestos waste. The committee was required to make recommendations as to whether any further protection was required.

The committee, chaired by Mr. W. Simpson, consisted of 15 members drawn from employer and employee interests, local authorities, and consumer groups; and medical and scientific members. Five separate working groups reported to the main committee. The medical, environmental monitoring, and legal and administrative groups were all chaired by members of the Health and Safety Executive. The fourth group was entitled "Production and use of asbestos products" and later a fifth group was set up entitled "Substitutes and substitution." The members of these last two groups had special interests in the building trade, insulation, and demolition, and also brakes and gaskets in the automobile industry.

The first volume contains the main text of the report setting out the principal facts and arguments on which the conclusions are based, and the proposals on legal and administrative controls, both for the workplace and for the general public. The 41 recommendations are summarised at the end of the volume, where the recommendations of the earlier reports on "Work on thermal insulation and sprayed coatings" and "Measurement and monitoring of asbestos" in air are also given. The second volume contains the papers commissioned by the Advisory Committee—that is, "The ill effects of asbestos on health" by Acheson and Gardner, and "Asbestos control limits" by Steel. Volume 2 also contains an account of the current asbestos controls in other countries and the results of an exploratory survey into the feasibility of substitution by other materials. Thus although the material from the papers by Acheson and Gardner and by Steel are largely assimilated into the main body of the report, volume 2 also contains much that rewards careful reading.

The chapter on asbestos in the workplace gives very succinct information. Crocidolite has not been imported into Britain since 1970. In 1976 41 000 fewer metric tons of chrysotile asbestos were imported than in 1973, the largest drop recorded. Whether this was due to economic factors, the difficulty of handling a material under such tight restrictions, or the increase in use of alternative materials is not speculated on. Particularly interesting is the figure showing the distribution of dust-exposure levels in different branches of the manufacturing industry. The curves are based on personal samples taken by the Factory Inspectorate over a six-year period. In the asbestos cement industry 98.5% of the samples showed a concentration below 2 f/ml and 95% below 1 f/ml, whereas for insulation board 88.6% were below 2 f/ml and 72.5% below 1 f/ml. However, maximum concentrations of 10-2 f/ml for friction materials and 13-7 f/ml for insulation board were noted. Conditions are not so happy in the section of the asbestos industry concerned with removal, stripping, and demolition including shipbreaking. Conditions vary from job to job and day to day, dust control is difficult and expensive, and collection of waste often presents serious problems. Moreover, whereas the processing of raw asbestos is controlled by three or four companies in Britain, several hundred firms with workforces varying in size from more than 200 to one or two employees are concerned here.

There are still considerable uncertainties about the total number of asbestos workers. The Committee estimates that about 25 000 workers may be exposed at any one time, but very much more than this will have been exposed at some period during their working life.

When considering asbestos and the general public the report emphasises the difficulties of sampling extremely low concentrations of asbestos in air, but this has been achieved, and levels around factories varying between 0-1 f/ml and 2.5 f/g m3 have been recorded. In buildings, however, there are insufficient data to draw conclusions about asbestos dust levels. Since 1969 disposal of asbestos waste has been largely controlled by codes of practice and legislation. The Factory Inspectorate is active and has sampled at 61 disposal sites. The vast majority of samples were within the hygiene standards. While considerable resources have been used both to protect the public and to ascertain the degree of exposure experienced, the report can hardly go further than the Zielhuis report (1) which stated that there is no established evidence that true ambient exposure carries a definite risk but that there are too many uncertainties to deny the existence of such a risk.

Chapter 3 of the first volume is devoted to the medical effects of asbestos exposure. It opens with a statement on the biophysics of asbestos, recapitulating the experimental evidence that carcinogenicity of fibres is related to the proportion of fibres per unit mass with diameters of between 0.5 and 2.5 f/m and lengths of 10-80 f/m. Fibre diameter is the key to the number of fibres inhaled. For a given mass of airborne amphibole, the number of fibres available for inhalation is greater for crocidolite than for amosite. Chrysotile has a greater tendency to divide into fibrils than the amphiboles, and its aerodynamics depend to a certain extent on the amount of milling or grinding, but it may become as respirable as the amphiboles.

 Among workers exposed to asbestos lung cancer is the most frequent of the asbestos-related diseases, but cigarette smoking is heavily implicated. Asbestosis rates second as a cause of death. The number of deaths due to mesothelial tumours continues to rise, and reached 292 in the UK in 1976. After consideration of the available epidemiological data the report accepts that there is an increased risk of gastrointestinal tumours. It considers that there is clear evidence that
in relation to mesothelial tumours crocidolite has been more dangerous than chrysotile or anthophylite. Asbestos has an intermediate position. The epidemiological evidence for this later conclusion is based on a study of a factory using amosite by Seidman et al, and on the presence of amosite fibres in a high proportion of the lungs of patients dying of mesothelial tumours in North America.

When turning to the question of dose-response relations, the report reiterates the difficulties experienced in assessing various studies due to differences in measurement techniques, and recent improvement in counting techniques with the membrane filter due to use of the reticule eyepiece, which has led to 2-4 times higher counts on equivalent samples than in the 1950s and 1960s. Considerable reliance has been placed on the second study of asbestosis from Rochdale. Berry shows that an annual incidence of 0-5% of certified asbestosis has occurred after a cumulative dose of less than 100 fibre year/ml—that is, under the current standard of 2f/ml. The committee found no evidence of a threshold for lung cancer or mesothelial tumours, but accepts that the risk is proportional to cumulative dose. When turning to the public health risk, the same criteria have been adopted and all available measurements of asbestos in air in cities, buildings, and the vicinity of dumps considered. The committee concludes that the presence of chrysotile containing small quantities of amphibole is unlikely to have produced any material increase in the risk of lung cancer, or any appreciable number of cases of mesothelioma, a statement which seems to reflect the uncertainties noted earlier. It also concludes that more data are required about school buildings and dumps where children may play.

Before turning to the proposals for administrative and legal controls in section 4, the committee summarises the evidence relating to the medical effects of exposure to each type of asbestos.

The major proposals relating to the permitted levels of asbestos in air are now well known, but other concepts, explained at some length in section 4, are less familiar. The views of the committee on prohibition are that the control of any useful but hazardous material is preferable to the ultimate sanction of prohibition. Prohibitions are limited to the application of asbestos in the manufacture of pipes, and it is a means of spraying, the import of raw crocidolite, and manufactured goods containing crocidolite. There has been a voluntary ban on the import of crocidolite since 1970. Enforcement difficulties are envisaged in implementing the ban on manufactured goods, but it is considered that a labelling scheme might be effective.

The question of substitution is also fully discussed. There is a recommendation that anyone who produces specifications for, or carries on a process using, asbestos considers its substitution by other materials, so far as it is reasonably practical. The committee recognised that man-made mineral fibres are less harmful to man than asbestos, but were apprehensive that these fibres might be used in such dimensions as came within the carcinogenic range. There is also a recommendation that the Health and Safety Executive takes into account the social costs of obtaining, using, and disposing of asbestos, as well as costs and benefits more easily defined. It is not too clear what is meant by "the social costs." Where substitution or prohibition is inappropriate, recommendation 9 requires that a single control limit for each type of asbestos should be applied to all processes and products containing it, and that this set of limits should have legal backing. The recommended control limit for chrysotile asbestos is 1f/ml, for amosite asbestos, 0-5f/ml, and for crocidolite, 0-2f/ml. There is very detailed argument supporting recommendation 9. Recommendation 10 requires legislation to be drawn up so as to make it clear that there is an overriding obligation to reduce exposure to asbestos dust to the minimum that is reasonably practical. The subsequent recommendations deal with monitoring in the workplace, exhaust ventilation, and protective equipment and are not controversial.

The recommendations as to medical supervision are of interest. The Advisory Committee believes that the aims of medical supervision should be, firstly, to protect individual workers and, secondly, to collect data that may be used in epidemiological study to assess the effectiveness of control measures. Apart from the opportunity to warn asbestos workers against smoking, the committee is pessimistic about the value of medical supervision to the individual, but finds reasons for its continuation. At present two organisations, EMAS and the pneumoconiosis medical panels, are responsible for collecting epidemiological data. The committee would like to see them replaced by a single body, EMAS. The responsibility for medical supervision and the cost would still remain with the employer, and medical examinations need not be carried out by EMAS, but apparently the responsibility for record maintenance would remain with this body. This scheme would have clear advantages in dealing with the mass of firms of various sizes in removal, stripping, and demolition, where the workers are often at risk and there is poor medical cover, but larger companies would probably prefer to continue with their present medical systems in co-operation with EMAS. The committee has information about restrictions on asbestos in 14 other industrial nations, but comparisons are difficult due to differences in measuring techniques. Sweden appears to have gone further in restricting its use, but the use of crocidolite is also banned in Denmark and Ireland. No other country has specific regulations relating to amosite asbestos. The estimated cost to the manufacturing industry of complying with the proposed control limits is given. It would cost the asbestos cement industry, where levels are generally at 1f/ml or below, half a million pounds capital expenditure, and £300 000 a year, with a rise in cost of the product by 1%. but the textile, mill board, and paper factories would need to spend £10 million in capital expenditure, with a rise in cost of product of 17% if indeed the operation were feasible. About 5:5 thousand jobs might be lost.

Three months were allowed for comment on this report, and the new control limits should be operative by 1 December 1980. It seems probable that with the problems industry faces, perhaps particularly the restrictions on the amosite industry, more time will be needed. The report itself is well-presented, comprehensive, and thoughtful, and repays careful reading.

M L NEWHOUSE

References