Control of the Asbestos Hazard

IN his Rock Carling Memorial Lecture last week on the prevention of cancer Dr. RICHARD DOLL noted that malignant mesothelioma seemed to be associated in some cases with very small exposures to asbestos, and he advocated a system of control by licence of the import and use of what is probably the most dangerous form of asbestos—crocidolite or blue asbestos. These views accord with the change in attitude noticeable lately in official statements on this subject from several sources. Until a few months ago pronouncements were being made that only blue asbestos can produce mesothelioma,[1] that exposure sufficiently gross as to produce clinical asbestosis is required before malignant disease can develop, and that the hazards of contracting either asbestosis or malignant disease from asbestos are confined to those engaged in the mining of the mineral or in the manufacture of goods for which crude asbestos must be processed.[2] Another statement [3] was that dockers had been informed that it was impossible to pack asbestos in airtight containers because the asbestos " would die and would be useless for certain types of manufacture." Now it has been declared unequivocally that " crocidolite is not necessarily the only type of asbestos that may be involved ",[4] and investigations in the U.S.A.[5] [6] support this view. At a coroner's inquest [7] a mesothelioma was presumed to be due to asbestos exposure in a man who did not have asbestosis or even asbestos bodies. British Rail announced [8] that asbestos was no longer used as insulation in railway carriages because of possible danger to men in the workshops where panelling was removed, and glass fibre was used instead. The British Asbestos Industry last month announced [9] measures to protect the health of those working with or handling asbestos; these include proposals that all asbestos fibre shipped to this country shall be packed in dustproof bags, and that all blue asbestos shall in addition be shipped on pallets which can be handled mechanically. Also the industry is " urgently examining afresh the use of blue asbestos for processes and products where there is the slightest risk of the emission of respirable dust, with the intention of limiting its use and rendering the processes and products themselves safe beyond any doubt ". Finally, the long-awaited draft Asbestos Regulations,[10] to supersede those of 1931, have been issued and circulated to " interested parties " for criticism.

These positive acts and proposals are a welcome sign of a more rational approach by the industry and some concerns using asbestos. The Factory Department of the Ministry of Labour has been seeking to improve conditions for a very long time; and much credit for the advance must also go to those medical research-workers who have studied the problem for so long with unremitting care, particularly, in this country, the M.R.C. Pneumoconiosis Research Unit at Penarth, led by Dr. J. C. GILSON and Dr. J. C. WAGNER, and the team from London headed by Dr. MURIEL NEWHOUSE. But the time for complacency has not yet arrived. The Draft Regulations as they stand contain provisions which, on the one hand, may be too stringent to be practical in industry, and which, on the other, may be objectionable to the community outside the factory. An example of the first shortcoming is the requirement that equipment be installed which " produces an exhaust draught which prevents the escape into the air of any workplace of dust consisting of or containing asbestos ". Such an outcome would be ideal, but is it really possible? Legislation which cannot be enforced tends to be neglected. Might it not be more realistic to specify a maximum allowable concentration, which would allow some action to be taken if an infringement occurred? The second difficulty is exemplified by the clause which requires any premises to be used in the future to have " installed in it a fixed vacuum cleaning equipment which has ducts . . . (and) is so designed that no dust consisting of or containing asbestos can escape or be discharged from it into the air of any workplace ". It is possible to envisage a situation where such dust might be discharged to atmosphere through a vent leading outside the premises covered by the Factories Act. What protection would dwellers in the neighbourhood then have? To meet this situation, could not some more specific clause be provided than the one appearing under the heading " storage and distribution " which reads: " No loose asbestos or asbestos waste shall be received into, distributed within or despatched from a factory except in suitable closed containers which prevent the escape of dust therefrom " ? Discussion will doubtless produce a better Draft, but it will probably be a long time before the Regulations pass into law. The Carcinogenic Substances Regulations, the first Draft of which was circulated in August, 1964, have not yet come into force.

Furthermore, measures under the Factories Act cannot protect users who do not themselves come under that Act. It seems quite plausible that inhalation of dust from such activities as sawing or sanding material containing asbestos may present a small hazard outside as well as inside industrial situations. It seems not unreasonable, therefore, to insist that materials containing asbestos should be clearly marked to show this, so that adequate precautions can be taken by the users. For instance, amateur handymen sawing materials containing asbestos could easily wear a makeshift mask, and either work out of doors or in a well-ventilated room.

On the other hand, there is a danger that workers' representatives may overrate the dangers of dealing with asbestos under good conditions. It would be ludicrous to outlaw this valuable and often irreplaceable material

1. *Nature, Lond.* 1967, **213**, 855.
2. Lawrence-Smith, A. M. Occupational Health Circular no. M. 1/966. Medical Department, Port of London Authority, 1966.
3. Lewis, W. D. *Times*, Nov. 13, 1966, p. 12.
4. Gilson, J. C., Wagner, J. C. *Nature, Lond.* 1967, **213**, 1170.
5. Selikoff, I. J., Churg, J., Hammond, E. C. *New Engl. J. Med.* 1965, **272**, 560.
6. O'Donnell, W. M., Mann, R. H., Grosh, J. L. *Cancer, N.Y* 1966, **19**, 1143.
7. See *Lancet*, May 13, 1967, p. 1054.
8. *Times*, April 11, 1967.
9. Asbestos Information Committee. Press release, May 19, 1967.
10. Draft Statutory Instruments. Factories: The Asbestos Regulations Ministry of Labour.

in all circumstances. Situations arise where the use of asbestos can save more lives than it can possibly endanger. Perhaps a reasonable perspective can be generated by a free and frank discussion of risks between management and labour, replacing some of the evasions of the past. Workers in general are willing to take a calculated risk for the benefit of the community if they feel they have had it frankly explained to them and if they have confidence that all reasonable practical measures are being taken to protect them.

Annotations

MAN-POWER IN THE HOSPITAL SERVICES

MANAGEMENT techniques developed by industry for industry should, it is often urged, be adopted more widely in the health services. The analogy is far from complete, however, and nowhere more significantly than in the demand for, and supply of, man-power. In business, once sales have been predicted, the needs for men, machines, and materials more or less fall into place: in the health services the nearest equivalent to sales—demand for care—has not behaved as expected (as Dr. Robert Kemp shows on p. 1316). True, industry needs its quota of trained specialists, but on the whole its demands for education and formal preparation are much less exacting than those of the hospital service, and re-training plays an important role.

Platform speakers at the annual conference of the Institute of Hospital Administrators, in London last week, indicated that the nature of the man-power problem varied from point to point in the hospital service. The Minister of Health, referring to the National Board for Prices and Incomes report on pay and conditions of manual workers in public services, talked of overmanning; Prof. A. L. d'Abreu felt certain that " we are about to face an inevitable shortage of medical manpower "; while Mr. W. R. B. Robinson, from the Ministry of Labour, observed that recruitment to the medical and dental services was at a rate close to that implicit in the (now ill-fated) National Plan. Professor d'Abreu did not hold out much hope when he re-remphasised that the output of our medical schools would not increase for some time and that countries such as India might adopt a less permissive attitude to those of their graduates who stay on in the U.K. and underpin its hospital service. Nor was there much comfort in his sinister hint that " . . . non-medical disciplines are naturally worried by the thought that . . . medicine seems to be having an unfair share of the academic cake."

If these warnings are to be heeded, the only short-term cure is to make better use of what is available. But to what extent are implications of inefficiency true of the health services, remembering that criticisms of this type may be evoked simply because the means for necessary expansion are missing? No-one knows, nor does there yet seem to be a nationally coordinated effort to find out. Measuring the gaps and overlaps, and experimenting (in New Towns, for example) to find the means to avoid them, is one of the most urgent tasks facing administrators. But no start can be made without adequate statistical information, for this is a major management tool, and the sense of the conference was that this information is not systematically collected, at least as far as hospital man-power is concerned.

A PENICILLIN AGAINST PSEUDOMONAS?

THE bacterial infections which afflict man today might be divided into " wild " and " domestic ". The former are those from which the classical ideas of bacteriology were drawn: a virulent parasite plus a susceptible host equals disease. These diseases such as tuberculosis or gonorrhœa respond to modern treatment far better than could have been imagined in 1930, and they take up only a small part of the time of the working bacteriologist. Today it is the domestic infections which occupy him. These are not " new " in the sense that they are caused by newly discovered organisms, but their prevalence and their interest have increased from a variety of causes. They are not specific infections (in which each organism causes its own assembly of symptoms) and they are often associated with a mixture of bacterial species. Many of the organisms are of endogenous origin; and host immunity seems to play a small part. They are not " caused " by antibiotics, but their occurrence is linked with the use of these drugs. The extermination of an organism by an antibiotic in vivo seldom results in sterility, but more usually in invasion by an organism resistant to the antibiotic. A change of antibiotic to deal with this secondary infection may result in a return of the first organism or the establishment of a third. Whether healing results will depend on the invasiveness of the organisms and the general and local resistance of the body. Antibacterial measures alone are no guarantee of cure. It is generally true of domestic infections that the organisms which cause them are either naturally resistant to many of the more commonly used antibiotics or have acquired resistance. Nowadays the published warnings of acquired resistance usually follow the launching of any new antibiotic by only a few months. Another characteristic of domestic infections is that they are common in hospitals. It is not only the varicose ulcer which is infected but the clean surgical wound, and the carrier-rate among the hospital staff of these strains resistant to many antibiotics is almost always far above that found in the population at large. A partial explanation of the high incidence of these infections in hospitals is the age and conditions of the inmates. The susceptibility of the old to infection with the " hospital staphylococci " has often been noticed. Equally liable to infection are those with debilitating diseases such as leukæmia or those under treatment with steroids. Not only have the doctor's drugs changed—without doubt for the better—but so have his patients.

Some of the difficulties in handling these domestic infections are illustrated in a paper on p. 1289 by Dr. Brumfitt and his colleagues. Few organisms give so much trouble in the wards as *Proteus* spp. and *Pseudomonas aeruginosa* (*pyocyanea*). Both are responsible for intractable urinary infection and, while neither is usually thought of as a virulent organism, the second has been the cause of disasters in premature infants, after ophthalmic operations, and when introduced into the central nervous system. Either may be found in superficial infections or in the urinary tract by itself or in conjunction with such organisms as a staphylococcus or *Streptococcus fæcalis*. Because of the exuberant growth of the gram-negative