

7 for hand (i.e., narrow) weaving, wet, is not accurate since the figure has been raised by dust from a neighbouring dry cloth loom.

Mattress making without any precautions, such as exhaust ventilation, or damping floors, tables and cloth, follows next with a figure of 1.83 (See footnote Table 5). Application of exhaust ventilation, and damping reduces the figure considerably, but it may be that the figures in columns 9 and 10 are too low, since counts for some subsidiary processes, such as buttoning, sewing, and cutting out, are not available.

It will be observed that carding, although essentially a very dusty process, produced a comparative figure of only 1.17. This is due in part to partial enclosure of the working parts of the carding machine, but is mostly the result of the application of local exhaust ventilation. Moreover, the figure does not take into account the extremely dusty operation of stripping.

Relative to the comparative numbers for the other different processes, the figure of 1 for spinning, plaiting and braiding is probably rather too high, owing to contamination by dust from neighbouring and more dusty processes.

Samples of asbestos vary much in chemical constitution and physical properties, and of the three main varieties, chrysotile, crocidolite, and amosite, the latter two, in the opinion of experienced workers, usually give rise to more dust than chrysotile in the textile manufacturing processes. No evidence was found to indicate that any one of the three varieties is more, or less, potent than the others in producing fibrosis, other factors, such as concentration of dust, being equal. A peculiarity of the asbestos fibre is that it first fragments longitudinally, and apparently this process can go on indefinitely, since there is no ultimate fibre comparable to a vegetable fibre such as cotton.

Concentration of Dust and Length of Exposure Necessary to Produce Fibrosis.—From the data so far examined it seems clear that fibrosis of the lungs is a definite occupational risk amongst asbestos workers as a class. Furthermore, it appears that the risk falls most heavily on those longest employed and on those engaged in the more dusty processes.

Some further consideration of these two important factors, length of employment and concentration of dust, is desirable. Obviously, to some extent, they are interdependent, since, assuming that a specific quantity of asbestos dust must be inhaled to produce a generalised fibrosis, the fibrosis will result from exposure for a period of time varying with the concentration of dust in the air breathed.

"Simson" reports the case of an asbestos mill worker in South Africa, exposed for 12 months to a very dusty atmosphere, who died from a rapid tuberculosis; sections of the lungs showed, apart from the changes due to tuberculosis, a moderately marked fibrosis.¹ Burton Wood and Page² report the case of an asbestos spinner, employed 15 months, who died from a generalised tuberculosis, 8 months after ceasing work. In this case a little fibrous tissue was generally to be seen surrounding the asbestos fibres found in the lung tissue, but there was no gross fibrosis. It seems probable, therefore, although further research is very necessary, that not only is a certain minimal quantity of the dust required for the production of a generalised fibrosis, but that inhalation of the dust in high concentration results in the production of a more marked degree of fibrosis in a shorter time, than when the concentration is low.

Investigation of this important matter—concentration of dust and length of exposure necessary to produce fibrosis—from the clinical side is beset with difficulties, one of the most confusing being that the existence of a clinically recognisable diffuse fibrosis is quite compatible with continued work in the industry, and, therefore, the cases of fibrosis discovered in such an investigation as this are in various stages of the disease, with the result that the point at which they first became recognisable clinically cannot be ascertained.

Despite this, some confirmation of the hypothesis that the length of exposure to asbestos dust necessary to produce fibrosis varies inversely with the concentration of the dust in the air, within certain low and high limits, may be obtained.