

LETTER TO THE EDITOR

Re: Mesothelioma in Railroad Machinists

Key words: asbestos exposure, mesothelioma, amphiboles, railroad workers, chrysotile

We have read with great interest the report by Dr. Mancuso [1988] on the risk of mesothelioma among railroad workers supposedly exposed only to chrysotile. Dr. Mancuso concludes that chrysotile is far more hazardous as an agent of mesothelioma in man than has previously been believed. Indeed, looking at his own numbers, one finds that mesotheliomas accounted for nearly 10% of deaths in his cohort, an extraordinary figure, and one only previously reported for those heavily exposed to amosite or crocidolite [for example, Selikoff et al., 1979; Jones et al., 1980; and see Table 8.8 in Churg, 1988, for a more complete listing]. Because amphibole in the form of amosite and crocidolite is generally considered to be a much more potent mesothelial carcinogen in man than is chrysotile [Berry, 1986], exposure to these forms of asbestos could greatly affect the mesothelioma incidence in this cohort. The validity of Dr. Mancuso's study thus hinges entirely on the question of whether exposure really was to chrysotile alone.

We believe that the data already in the literature, as well as analytical studies (see below) on lung tissue from railroad workers, do not support the idea that these workers were only exposed to chrysotile. Amphiboles were widely used on the railroads in Europe and South Africa [Webster et al., 1977; Mostert and Meintjes, 1979; Ohlson et al., 1984]; and, although there does not appear to be an American study specifically addressing this issue, there is no doubt that amosite and crocidolite were manufactured and sold for use in steam locomotives in the United States [McDonald et al., 1982]. Moreover, Dr. Mancuso's own previous report on mesothelioma among railroad machinists [Mancuso, 1983] notes that amosite was found in 4 of 6 asbestos samples taken from old locomotives, and the present study appears to be based on the same factory and cohort of workers!

To examine this issue further, we analyzed the asbestos content of the lung in two long-term railroad workers with pleural mesothelioma (Table I).

To our knowledge, these workers did not have any other asbestos exposure. It should be noted that the amosite plus crocidolite values seen in these two individuals are well within the range we have previously found in shipyard workers and insulators with mesothelioma [Churg and Wiggs, 1986]. Obviously, one must draw limited conclusions from two cases, but these data and the literature just cited suggest to us

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Accepted for publication February 16, 1989.

TABLE I. Lung Asbestos Content in 2 Railroad Workers With Pleural Mesothelioma

Case/exposure	Fiber concentration/gm dry lung			
	Amosite	Crocidolite	Chrysotile	Tremolite
Case 1: 1922-1971	1,500,000	600,000	2,200,000	1,800,000
Case 2: 1937-1974	230,000		140,000	580,000
General population (95th percentile values) from Churg and Wiggs [1986]	10,000*		1,100,000	1,200,000

*Amosite plus crocidolite

that amphibole was likely to be present in the cohort studied by Mancuso and probably was largely responsible for the mesotheliomas which were observed.

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