United States Department of Energy (DOE data) and the records of A-bomb survivors that are the mainstay of radiation safety regulations in this country and elsewhere (A-bomb data). Also, analyses of the Hanford data were done for one variable in a relative risk model—that is, the one which measures the effect that the age when exposed has on the subsequent cancer risk, which should have a constant value whatever the source of the radiation—there is incompatibility not only between A-bomb data and DOE data but also between Hanford and Oak Ridge data and between Hanford data for different exposure periods.

What is missing is that generating O’Donnell is not the number of times that Hanford data have been analysed (which is far fewer than the number of analyses on the A-bomb data) but the number of independent variables in the Kneale and Stewart relative risk model. Correct assessment of these variables is essential for future tests of important hypotheses, such as whether young people are more or less sensitive to cancer effects of radiation than old people, and whether A-bomb survivors apart from their radiation dose are or are not representative human beings. So it is clearly important not to stint on the resources for recognising false elements in DOE and A-bomb data.

Finally, we have a special reason for making this point, as we hope shortly to publish a paper which shows that the A-bomb survivor who most closely resembled the survivors—that is, the survivors who had multiple acute injuries, such as burns, purura and epilation—differ in several important respects from the much larger number of survivors who had no such injuries.

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Mesothelioma in a community in the north of England

Editor—Muir, who wrote a brief essay on the subject of bias in the field of occupational health in the final issue of the British Journal of Industrial Medicine, will find this paper useful for teaching purposes. He might take issue with the authors on the literary style and presentation of historical facts, and on their analysis of data. We are informed that this community was working in 1939 to produce gas mask filters. Reference to Defence of the Realm powers for initiating asbestos work might be misunderstood by the reader as a plea in mitigation for the heavy harvest of disease resulting from post-war exposures. The introduction cites Bertram Mann as making some reference to problems resulting from asbestos exposure. He and A.M. Kneale Mill was consulting that time to rout out the text of his 1978 Royal College of Physicians Milroy lecture, will find that this chest physician had a lot to say about the amount of disease that he came across in this small part of his catchment area.

The discussion section states that: “In common with many asbestos factories, working conditions in respect of asbestos dust were poor, especially in the early years of its operation.” This might be misread to imply that conditions in its latter days were acceptable. Sir Alan Marre’s (The Ombudsman) report in 1976 of his inquiry into Acre Mill, although concerned solely with the quality of maladministration, did find that the factory was a cause for concern. The authors’ statement that; “The factory closed in 1970 and has since been demolished.” is occupationally incorrect for several more years, in a not entirely decontaminated state.

In the discussion section we are informed that between 1000 and 3000 people worked at the factory, although the material and methods section is not explicit on this point. One may assume that the authors did not have access to the nominal roll of employees. Otherwise they would surely have used the Registrar General’s facilities for tracing and flagging the total population. No researcher should be faulted when making the best of limited data, provided the necessary caveats are presented prominently.

In their calculations, the authors gave an average incidence of tumour in Calderdale over the period 1966-94 as “12.5/5 million persons/year.” This result from the dilution by the overwhelming non-exposed population. When the factory population is studied separately, the rate works out not surprisingly as between 524 and 786 cases of mesothelioma per million person-years depending on which extreme estimate of factory population is taken. For the non-exposed, the rate works out as 3.2 million person years, which is a higher rate than one would like to see.

The authors state that there were no neighbourhood cases of asbestos related disease. Yet of the 17 cases of malignant mesothelioma reported in the population exposed to asbestos, eight had had excessive amounts of amphibole in their lung tissues.

We are not informed of how this might have been acquired. It is possible that despite the Pennine geography and meteorology exposure conditions, some came to be healthier with respect to malignant mesothelioma than in the “dust bowls” of Barking and North Western Cape province.

Apropos of fibre counts in the lungs (which commonly means the parenchyma, rarely the pleura, and even more rarely the bronchus), toxicologists look at the science of xenobiotic disease differentially from pathologists, mineralogists, statisticians, and physicians. Physicians looking at disease in the pleura or peritoneum are content to relate it to the amount and type of fibre in the lung parenchyma rather than the type and quantity of material to the critical tissues. (Yet it is chrysotile rather than the amphiboles that is more often reported by pathologists to be found juxtapleurally.) Again, although physicians are content to attribute the fatalising of chrysotile fibre because of its rate of clearance from the body, toxicology requires a better understanding of the toxicokinetics and mode of action of amphiboles that has preoccupied many researchers in both fields. It has not been conducted on the various asbestos species to relate their carcinogenic effects, dose for dose, fibre for fibre when equal dimensions are involved. Many crude studies have in fact shown that they can share similar carcinogenic power. The courts are led to think that one can differentiate between the tumour caused by asbestos and the tumour not so caused, on an estimation of parenchymal fibre content. This is despite the wide confidence limits that need to be placed around an estimate involving uncertainties in sampling and in counting. And despite the overlap in the distribution curves for lung fibre content between people with a history of asbestos exposure and those with no ascertainable exposure.

As for the authors’ more sanguine attitude to chrysotile, the reader would be well advised to await the forthcoming report on chrysotile in the Environmental Health Criteria series published as part of the International Programme on Chemical Safety. This has had a stormy passage but it is due out soon.

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Authors’ reply—Greenberg’s repeated concern that parts of our article might be misread is touching but likely to underestimate the preoccupations of your readers, and it is more difficult to imagine how the factual statement that Acre Mill was “commandeered by the Home Office in 1939” could be construed as a “plea in mitigation for the heavy harvest of asbestos disease”. Likewise his concern that our observations about working conditions might be misread to “imply that conditions in the latter days were acceptable”. We wrote this article not with the intention of apportioning blame but to set the medical scientific record straight about the number of cases of mesothelioma found in Calderdale. Even after rereading the article we do not recognise any suggestion that the working conditions at Acre Mill were any better or worse than any other asbestos factory working at that time. Perhaps David Muir might find this letter by Greenberg an interesting example of bias for teaching purposes.

Two of the authors (ATE and DW) worked alongside Bertram Mann for many years and his paper is well known to us. Despite his claims (in writing or in writing) about asbestos related disease arising from asbestos pollution from the factory a detailed analysis of tissue proven mesothelioma failed to detect any such case in a person living within two to four square miles of the factory who had not been employed at Acre Mill. Furthermore ATE performed most of the postmortem examinations in the district from 1960 to 1994 and has examined the reports of those not performed personally and he is not aware of any case of asbestos related disease occurring as a result of atmospheric pollution from the factory. This is despite a high level of asbestos related disease among the medical profession and in the community whereby suspected cases were readily referred to the local coroner.

We had very good access not only to senior ex-management of the mill but to many other ex-employees who are still alive and who had worked during wartime and later periods leading up to the 1939-45 period. It is difficult to imagine how the exposure, DW carried out personal interviews with many to gather information about the type of asbestos used and the working conditions. Several of DW’s fellow ex-workers had worked at Acre Mill from the 1940s to...
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Morris Greenberg

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