

Plenary Presentation

(Ed. The following address was transcribed from a video recording.)

Dr. Richard Lemen:

"Thank you very much. It's a pleasure to be here and I'm sorry I'm late, but I got misdirected and went to the wrong place. It's really a pleasure to be here and to talk to you today about the challenges for the next century – and to talk a little bit about the past as well as the present and the future. I am here on behalf also of the Society for Occupational and Environmental Health. I saw Dr. Selikoff's picture when I came in and it's very appropriate as he was the founder of that society in the United States. So I feel very honoured to be President of that Society that he founded some twenty odd years ago.

Let me start out by giving you a few facts. These facts relate to the United States but they do have implications worldwide. In the United States alone over the last twenty years, there have been over two hundred and twenty thousand deaths due to asbestos-related diseases. We project that there will be another two hundred and ninety-one thousand deaths over the next thirty years due to asbestos. Even at the current OSHA standard of 0.1 fibres per cc an additional 59,000 death will occur. So at the lowest standard that the United States has, we are still seeing an excess of between 2 and 5 per thousand excess deaths from asbestos-related diseases. If that's true in the United States where we have such a low standard what are the ramifications worldwide? We're really talking of millions and millions of people who are going to continue to die from asbestos exposures that they received twenty, thirty, forty years ago. And we project in our country alone that it's going to go well into the next century. So what is happening where countries are being targeted for asbestos, the developing countries. Are they being targeted by the asbestos industry any differently than the tobacco industry targeted them. And what are we going to see when we combine the synergism of asbestos and tobacco. So how do we prevent the asbestos-related deaths. Clearly the approach of using engineering controls and personal protective equipment in order to achieve occupational exposure standards has not worked – nor will it ever work. The only way to eliminate disease and death from exposure to asbestos, in my opinion, is to eliminate the use of asbestos. That's why I, as a member of the Collegium Ramazini, and other organizations, support a total ban on the use of asbestos – not a limited ban but a total ban on all products containing asbestos.

Asbestos has been responsible for a massive epidemic of disease and death since its commercial exploitation primarily beginning at the turn of the (20th) century. As we enter this new millennium, do we continue to promote the myth that only the amphibole types of asbestos were responsible for the disease and death associated with asbestos usage?

Asbestos, a natural mineral fibre, has been used for a variety of purposes with disastrous consequences to human health. The fact that many countries, including the European Union, have banned asbestos leads us to recognize that these countries, at least, feel that there is no safe way to use asbestos. Unfortunately, in the United States our country has not seen the same light as has been seen by these other, much more progressive, countries. Further substantiation that asbestos cannot be used safely comes from the International Program on Chemical Safety (IPCS) in their latest environmental criteria document. In that document they concluded that exposure to

asbestos poses increased risk for asbestosis, lung cancer and mesothelioma in a dose dependent manner. No threshold has been identified for carcinogenic risk. It further warns that some asbestos-containing products pose particular concern and chrysotile use in these circumstances is not recommended.

Construction materials are of particular concern for several reasons. The construction industry workforce is large and measures to control asbestos are difficult to institute. In-place building materials may also pose risk to those carrying out alterations, maintenance or demolition. The minerals in place have the potential to deteriorate and to continue to create exposure problems. The conclusions of the IPCS are very consistent with an evaluation that I did along with my colleagues Drs. Stayner and Dankovic about the amphibole hypothesis. We're at a point in this history of the usage of asbestos where chrysotile is the main form – in the United States it makes up about 98% of the total consumption of asbestos. While it is true that asbestos consumption has declined in the United States and Europe, sales to other areas such as South-East Asia, South America and Eastern Europe have increased based on its use in construction materials, the very materials that the IPCS and the WHO warned should not be used. Our view that the lung burden, epidemiologic, toxicologic and mechanistic studies which provide the basis for the amphibole hypothesis lead us to conclude that chrysotile asbestos exposure carries an increased risk of lung cancer, asbestosis as well as mesothelioma. And that the hypothesis that these observations may be attributable to trace amounts of tremolite contamination may seem to be primarily of academic interest, because chrysotile exposures in workers and the public are also contaminated with tremolite.

The primary evidence for the amphibole hypothesis comes from pathologic studies in which lung burdens were measured. However, interpretation of these studies is hampered by the fact that chrysotile lung burdens are a poor reflection of the integrated exposures and the fact that chrysotile exposure is highly correlated with lung burdens of the amphiboles such as tremolite. In addition, the pattern of asbestos fibre deposition and deposit in the lung does not appear to be consistent with the pattern of deposition in the target tissue, i.e. the pleura. Dr. Sazuki at Mount Sinai has reviewed and published on 92 consecutive autopsies of mesotheliomas and he found that even while only 28.3% of the asbestos fibre type in the lung was chrysotile, chrysotile was the major fibre type identified in the mesothelial tissue. These findings further suggest then that lung burden analysis for determining fibre type in mesothelioma etiology may not be appropriate and that determining predominant fibre type in the mesothelial tissue is probably the more rational determinant.

Therefore, with the knowledge we have at hand is it not our moral and ethical responsibility as scientists to use such knowledge through a call for a ban on the usage of asbestos in order to prevent a prolonging of the epidemic that could have been prevented, that should have been prevented, and that has already taken a disastrous toll. Many countries such as those now importing asbestos are in the very early stages of receiving new technology, as we heard this morning, including construction materials made of asbestos. Many of these countries are still trying to improve their basic public health infrastructures by improving sanitation, reducing infant mortality, improving health care and delivery. For these countries the introduction of new technologies such as asbestos-containing construction products can represent a very critical and oftentimes overwhelming adjustment. Therefore, in conclusion, we not

only have observed, but we can say with sound scientific evidence that we have known the dangers of asbestos for many, many years. Along with that knowledge we have also known for many, many years some methods to prevent the adverse health effects from exposure to asbestos. We know that these methods do not assure that all will be protected from the awful effects of exposure to asbestos. They simply do not work. As participants of this conference, armed with the knowledge that we will gain from this conference we must now take this knowledge as we have learned it here, along with the knowledge that we have known for many, many years and promote primary prevention by halting the use of asbestos. I might add that this will not immediately stop the growing tragedy of the epidemic of asbestos diseases. That's not going to disappear if we ban asbestos today for another thirty, forty, fifty years; but the first step is to take that step to ban.

As I said, even at the low standard in the United States of 0.1 fibres/cc we anticipate that we will have at least 59,000 more deaths of exposed workers, even at that small concentration. I'll conclude by quoting the very eminent British health statistician Sir Bradford Hill who said in 1965 (and I might add that this still applies today), and I quote, 'All scientific work is incomplete whether it be observational or experimental. All scientific work is liable to be upset or modified by advancing knowledge. That does not confer on us a freedom to ignore the knowledge that we already have or to postpone action that it appears to demand at a given time.' Sir Bradford Hill said this in 1965 and it is still, as I said, very appropriate today. We have done the research on asbestos. We already know the only way to control disease associated with asbestos is to ban asbestos, not to use it in the future and as Sir Bradford Hill says not to ignore the knowledge that we already have or to postpone action that it appears to demand at a given time. The only solution, I think, is a total ban on asbestos. And the time is now and the action that we must take is clear. I abbreviated my presentation because of the limited amount of time, but I do have a handout that is 46 pages that any of you can pick up here and it will give you a lot more detail. I apologise that I couldn't take more time but I would like to thank you for the opportunity to speak."