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CANADIAN
ASBESTOS
INFORMATION
CENTRE

CONTENTS

PROLOGUE.....	1
MESSAGE FROM THE GOVERNMENT OF CANADA.....	2
MESSAGE FROM THE GOVERNMENT OF QUEBEC.....	3
MESSAGE FROM THE COMMISSION OF THE EUROPEAN COMMUNITIES.....	4
COMMITTEES AND SECRETARIAT.....	5
ACKNOWLEDGEMENTS.....	6
OPENING REMARKS..... J. Dunnigan	7
INTRODUCTORY PRESENTATION..... G. Atherley	9
SESSION I	
ASBESTOS: THE MEDICAL DATA.....	16
Asbestos-related disease: an overview I. Selikoff.....	17
Epidemiological evidence: exposure-response, fibre type and industrial process J.C. McDonald.....	29
Scientific issues as yet unresolved H. Weill.....	49
The meaning of a «threshold», considerations applying to carcinogens in general J. Higginson.....	61
Carcinogenic aspects of asbestos D.F.K. Schmaehl.....	68
PANEL I	
IS THERE A PRACTICABLE NO-EFFECT LEVEL FOR ASBESTOS?.....	73

SESSION II

ASBESTOS: PROTECTION IN THE WORKPLACE..... 96

Problems and progress in engineering of workplace environment
control in primary and secondary industries; work practices,
packaging, wastes disposal, etc.
W.B. Reitze..... 99

Monitoring the workplace: problems and progress. State-of-
the-art (automatic counting methods) and international ef-
forts for standardization of methods
K. Robock.....104

Asbestos disease with maintenance and repair
R. Lillis.....117

Estimates of occupational mortality from past and projected
exposure to asbestos
W.J. Nicholson.....136

Problems of medical surveillance
C. Cooper.....150

SESSION III

RIGHTS AND RESPONSIBILITIES: PERSPECTIVES FROM SCIENCE, INDUSTRY, LABOUR AND GOVERNMENT.....156

Scientific viewpoint
J. Peto.....157

Industry's viewpoint
E. Van der rest.....164

Labour's viewpoint
A. Mazzochi.....170

Government's viewpoint (U.S. Department of labor's viewpoint
on asbestos regulation)
J.F. Martonik.....175

PANEL 2

ARE WORKERS EXPOSED TO EXCESSIVE RISK?.....180

SESSION IV	
ASBESTOS AND SUBSTITUTES.....	205
Evolution in the uses of asbestos	
W. Penney.....	206
The feasibility of substitution (The potential for the substitution of asbestos in industrial applications)	
A.M. Pye.....	216
Socio-economic impact of asbestos use (cost-benefit analysis) with special reference to developing countries	
N. Venkataraman.....	224
Socio-economic impact of asbestos use (cost-benefit analysis) with special reference to developing countries	
C. Ushewokunze.....	231
Substitution - a trade union view	
C. Levinson.....	236
Health hazards of substitutes	
J.C. Wagner.....	244
PANEL 3	
SHOULD ASBESTOS BE REPLACED?.....	267
SESSION V	
RISKS ASSOCIATED WITH NON-OCCUPATIONAL EXPOSURE.....	287
Levels of exposure of the general population from natural sources	
M. Ross.....	288
Levels of exposure of the general population from industrial activities (demolition and wastes) and buildings	
R.W. Lanting.....	295
Levels of exposure of the general population from consumer products	
P.W. Preuss.....	306

Levels of exposure of the general population from consumer products (Environmental pollution by weathering of asbestos-cement sheets)	
W. Felbermayer.....	319
Health effects on the general population	
S. Dobbertin.....	323
Health effects on the general population (Cancer caused by asbestos air pollution in the United States)	
P.E. Enterline.....	328
Health effects on the general population (Mortality in the general population in asbestos mining areas)	
J. Siemiatycki.....	337
Family contact exposure	
H.A. Anderson.....	349

PANEL 4

IS THE GENERAL POPULATION AT RISK FROM CANCER DUE TO ASBESTOS EXPOSURE?.....	363
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SESSION VI

THE DIRECTION OF RESEARCH: PRESENT AND FUTURE.....	384
Physico-chemical modification of asbestos in end-use products	
A. Deruyttere.....	386
Modification of asbestos fibres: biological considerations	
J. Dunnigan.....	390
Surface characteristics and biological properties of minerals	
A.M. Langer.....	395
Prospects for new methods of analysis and measurement of fibres in environmental samples	
E.J. Chatfield.....	401
Critical appraisal of current possibilities of in vitro and in vivo assessment of biological effects of fibrous materials	
J. Bignon.....	419

PANEL 5	
QUESTIONS AND COMMENTS FROM THE FLOOR.....	427
SESSION VI (cont'd)	
THE DIRECTION OF RESEARCH: PRESENT AND FUTURE.....	441
Immunological status and host resistance to asbestos related disease	
E. Kagan.....	442
Tissue burden studies	
F.D. Pooley.....	449
Epidemiologic significance of asbestos fibres in lung tissue	
A.A. McDonald.....	455
Study of occupational groups and epidemiological data in France	
E. Fournier.....	464
PANEL 6	
QUESTIONS AND COMMENTS FROM THE FLOOR.....	470
SESSION VII	
LEGISLATIVE PERSPECTIVES.....	482
A view of the U.S.A. approach to environmental regulations - special reference to asbestos	
A. Gorsuch.....	483
Harmonisation of EC Legislation	
W.J. Hunter.....	488
What should be the rationale for regulations on asbestos?	
W.J. Simpson.....	492
Industry's viewpoint	
J. Dupéré.....	501
Labour's viewpoint (Legislation to protect people against asbestos)	
F.E. Mirer.....	506

PANEL 7

TO WHAT EXTENT ARE REGULATIONS AND LEGISLATIONS IN ACCORD
WITH THE PRESENT SCIENTIFIC KNOWLEDGE?

WHAT SHOULD BE THE PATTERN FOR FUTURE LEGISLATION AND
REGULATIONS?..... 512

CLOSING REMARKS..... 538
J. Dunnigan

SESSION I

ASBESTOS-RELATED DISEASE: AN OVERVIEW

SELIKOFF, Irving (United States)

This symposium is likely to be a landmark in the history of asbestos use and asbestos disease. In this respect, this conference resembles the meeting of the New York Academy of Sciences in 1964 which also, in a sense, was a landmark. That meeting however was very naive. It considered that what had to be done was to clarify and identify the scientific problems that were beginning to appear with regard to disease due to asbestos inhalation. Its focus was perhaps best characterized by its title: "The Biological Effects of Asbestos". I say "naive" because we thought at the time that what was needed was good science of the sort that Dr. Atherley has defined for us, and that this necessary step would be adequate. We were wrong. And therefore the task of this meeting is far more complex. It is still science-based - you will hear much science, much debate - but beyond this it will require the identification and resolution of industrial, economic, social, political and ethical questions. We have in many ways reached a decision point. There are several roads open to us. Which is taken will in large part be determined by the decisions of this meeting.

We came into the 1964 meeting with a good deal of background scientific information on a range of diseases. Asbestosis had been identified as a major problem in the 1920's, 1930's, 1940's, and from that point we had begun to realize that many other cases would be seen that did not have such extensive disease, that asbestosis could occur at much lower levels.

In the 30's and 40's and 50's, we had begun to learn that something else unusual was being seen - that unlike other dust, such as coal, aluminum, silicose and silica, the pleura, or lining of the chest, was often affected by asbestos. In some cases, pleural plaques were discreet, limited - not causing difficulties or problems - but evidence that the tissue was responding to inhalation of asbestos. Sometimes, the pleura was very heavily, very extensively involved and, at death, the lung was completely enclosed. And in such cases, it can completely disable the individual and, not infrequently, lead to death. We learned that during the 40's and 50's.

Beginning in the 30's, another set of lessons began to appear. In 1935, Kenneth Lynch, of the Medical University of South Carolina, reported a case of a man who had a cancer of the lung and also asbestosis. And he raised the question for the first time whether there was an association between the two.

Other reports began to appear and in the 40's additional questions were placed before us, when in another individual exposed to asbestos the pleura was found to be malignant. The pleura of course, in our lingo, is called the mesothelial lining of the chest and so the tumour was called mesothelioma.

The case seen then was very much like what has been seen since; that is a diffuse neoplasm totally covering the lung and in most cases beyond the skills of the surgeons and the chemotherapists and the radio-therapists.

In the 1950's the lining of the abdomen was also found, in some people who had been exposed to asbestos, to become malignant - which means a peritoneal mesothelioma.

So that by the time of the New York meeting, we had much information and much more was produced at that time. Moreover, we thought we had identified the remaining questions. And since 1964 many of these have been answered and much useful information has been obtained, in many cases incidentally, by scientists who are here at this meeting.

This information now provides a relatively strong scientific background for our thinking. The first question you will remember was: what is the risk? We knew that some things could occur, but how often did they occur? What was the range of the diseases?

Since then, we have determined in large part the answer to these questions.

To illustrate the extent of our knowledge, I would refer to a group of pipe coverers, or as they are called in Great Britain, pipe ladders.

On January 1st, 1943, there were 632 men in this little union of insulation workers in the New York-New Jersey metropolitan area. I will give you almost the full lifetime experience of this group, - from January 1st, 1943 to January 1st, 1982. These data were

Selikoff - I

completed about a week ago by my colleagues at the American Cancer Society. By the beginning of this year, instead of 352 deaths that were expected among these 632 men, 532 occurred. Of the excess, there were, as expected, 46 deaths of asbestosis - or scarred lungs. But the rest of the excess was due to cancer; instead of 64 deaths of cancer that were anticipated, 238 occurred. 45% of all deaths in this group of asbestos insulation workers were due to cancer. Pride of place was cancer of the lung. Instead of 16 deaths that were anticipated, had their experience been the same as all other U.S. white males, there were 105. 20% - one of every five deaths - was due to cancer of the lung. Instead of one expected death of mesothelioma out of 10,000, there were 50 deaths of mesothelioma. 9% of all deaths in this group of men were due to this disease, which otherwise almost never occurs - being a very rare disease in the general population. And there was a modest increase - two or three times as many as expected - of cancer of the gastrointestinal tract (esophagus, stomach, colon, rectum, etc), cancer of the mouth and larynx and a few other places.

That is the lifetime experience of a small group of men who began to be followed in 1943, at a time when they went to work assuming that someone was looking after things. And there was no someone.

To see whether this limited experience held in general, my colleague Dr. Hammond and I have examined the experience of the entire little Union of Insulation Workers - it is one of the smallest unions in the A.F.L.-C.I.O. On January 1st, 1967, there were 17,800 men in this small union. In the next ten years, 2,271 died. 1,659 had been expected to die had their experience been the same as everyone else's. Why the excess deaths? Well, some were due to asbestosis (168). But most of the excess deaths were due to cancer. Instead of 320 that had been anticipated, 995 occurred.

Instead of 106 deaths of cancer of the lung, there were 486. Instead of no deaths of mesothelioma, there were 175. There was limited excess of cancer of the gastrointestinal tract, the oro-pharynx and buccal cavity, the larynx and the kidney. The other than cancer of the lung and mesothelioma had not been very great.

(SLIDE SHOWING CANCER OF THE LARYNX)

Here, for example, is a recent case of cancer of the larynx. Most of these can be cured and they do not appear on the mortality roles that we maintain.

Selikoff - I

The problem then has become clear: asbestosis, on which our attention had been focused during the 1930's, 40's and 50's, was no longer the major cause of death. Of the excess deaths, 168 were due to asbestosis. 675 were due to cancer. Therefore, cancer has replaced asbestosis as the major cause of death and disability among groups employed with exposure to asbestos.

Incidentally, we did not find that cancer occurs everywhere among people exposed to asbestos. We did not find an increase in leukemia, lymphoma, cancer of the testes, cancer of the bladder, cancer of the liver, etc. Some tissues respond to asbestos with cancer, and others do not.

So we then knew, in these last 18 years, the spectrum of disease that could occur with asbestos exposure.

The second problem with which we were left after 1964 was: which people are at risk? - in our lingo, the population at risk. For a long time, we had been talking about asbestos workers. We've learned since that the problem is not asbestos workers, but rather asbestos-exposed workers.

(SLIDE SHOWING AN INSULATION WORKER)

Here, for example, is an insulation worker mixing asbestos-cement. He is on good behaviour because I am around, so he is wearing his mask. But nobody told the steam fitter or the electrician nearby.

(SLIDE SHOWING WORKER SPRAYING ASBESTOS)

Here, we see the spraying of asbestos. And as you can see, when we began to do this some 25 years ago, to fire-proof steel, it was a very effective process, and they did it very well - as you can see, much of it actually got onto the beam. This was the spraying of the World Trade Center during its construction. The bar joists, as you can see, are being well-covered, but this is what the iron worker, the mason, the electrician got.

The next lesson in this regard again came after 1964, when Peter Harries, a very capable young physician at the Royal Navy Dockyard at Davenport, reported five mesotheliomas in that shipyard. Now, by 1968 when he reported this, five more mesotheliomas created no great stir. What was, however, of much consequence was that not one was an asbestos worker - a boiler-maker, a fitter, a labourer, a shipwright, a welder. And by 1973, there were 55 mesotheliomas in that yard, only two in asbestos workers, 53 in fitters, boiler-makers, shipwrights, welders, caulkers, rivetters, etc. And obviously the inside of a ship would tell you immediately why.

So we learned a bitter lesson that is with us today, and with you today in your deliberations. And that is that the problem is not necessarily limited to asbestos workers, but rather to the use of asbestos products. For example, after World War II in the United States, we no longer put up plaster walls, but used taping compounds containing 10 to 12% asbestos, for our wide construction industry. The problem then was no longer asbestos workers, but rather asbestos-exposed workers.

And for you in Canada, you may regard this in large part as a major problem of mining, but for the rest of the world the problem is product use. And your deliberations here will have to take this into account.

Our next lesson concerning who is at risk came from South Africa in the brilliant work of J.C. Wagner - who is with us today - when, in 1960, he reported 47 cases of mesothelioma, startling everyone. He was very perceptive, and he went and visited the next of kin among these people. And in 45 of the 47 he found that there had been opportunity, decades before, for asbestos contact, often not in occupational circumstances, but as a result of environmental exposure.

With this knowledge, Dr. Newhouse - who is also with us today - brought forth another startling lesson that we all took to heart. She reviewed the cases of mesothelioma in the files of a London Hospital. It was noted that of the 76 cases, when she spoke to the next of kin, 31 had worked with asbestos. Well, by 1965 that was no surprise: if you worked with asbestos, there was a good chance of mesothelioma being present. But of greater consequence, from a public health point of view perhaps, was the fact that of the 45 who had not worked with asbestos, 9 had simply lived in the household of an asbestos worker. These were women often who had washed their husbands' clothes when they came home from work. And of the others, 11 had merely lived within a half mile of one of the asbestos plants in London. The work of Dr. Wagner and Dr. Newhouse raised the question that in addition to a large number of workers being exposed, there was perhaps even a larger number of family contacts and others who might have been exposed, albeit to less intense levels, as a result of environmental exposure.

Dr. Anderson will speak to you later of careful cohort studies of family contacts. And he will tell you what quantitative information is beginning to become available concerning the risk of asbestos disease among them. I would merely point out at this time, to highlight what he is going to say, that of one group of asbes-

Selikoff - I

to work, and he sits on his porch in Fort Lauderdale and watches the world go by.

We knew this too in populations. For example, among the insulation workers, when over 1,000 were X-rayed, of the 725 with less than 20 years from onset of exposure, most had normal X-rays. It was only after the 20-year point that most X-rays became abnormal, not infrequently extensively so. It's the 20-year rule.

(FIGURES 1-2-3)

With the large group of 17,800 men, we were now able to calculate something about the latency of cancer. Here for example, (Figure 1) are deaths of asbestosis in this group of 17,800 men. Virtually no deaths in less than 15 years from onset, and then at 30, 35, 40 years the graph goes up. Looking at the differences between expected and observed rates for lung cancer, (Figure 2) again nothing much is seen in the first 15 years, and then the sharp increase that you find.

For mesothelioma, (Figure 3) it is exactly the same. Nothing much is seen in the first 20 years, and then the striking rise as the years go by. These people begin work when they are 17, 18, 20, and they don't die until they are 55, 60 years old. The importance then of clinical latency.

(SLIDE)

Here, for example, is Mr. Weirt, a very nice man, a naval aviator, who developed mesothelioma in 1977, and I was asked to see him.

An operation had been done - a biopsy - and sure enough as expected, the fibres of asbestos were found in the lungs. When we took his history, he had retired from the Navy in 1966, living in Florida. He had been in the Navy as a test pilot from '39 to '66. He entered the Navy when he graduated from Rutgers in 1939. He told us that while he was going to school, at college, for six weeks he had worked while a student in an asbestos factory. And then, 40 years later the mesothelioma struck.

The import of this: what we have been seeing in the 1950's, the 1960's and the 1970's is related to the asbestos use until around 1930 and 1940. In the United States, we used altogether only 3.5 million tons of asbestos during the entire period up to 1930. In the decade of the 1960's, we used twice as much as that, in that one ten-year period. For the world as a whole, what we have seen in the last 40 years is related to the production of asbestos from the beginning, in 1880. Until 1945, we had less than a million tons produced each year. And yet the disease that we're seeing

now is related to this very small production during that period of time. The future is still ahead of us.

We can translate the scientific concept of latency into the social, political, economic problems of this meeting by saying that the disease that we are seeing now is the result of past exposure, but that exposure, now, will result in future disease.

Now, how much asbestos will produce this disease. That was another question that was posed in 1964. Dr. Wagner had given us some hint of this in his animal studies, when he showed with chrysotile that both lung cancer and mesothelioma were sharply related to the amount of asbestos used. For human beings, we have begun to agree with him. Lung cancer generally requires a moderate amount of asbestos, asbestosis a large amount, peritoneal mesothelioma a fair amount, pleural mesothelioma comparatively little.

The problem has come up of family contact disease, because that tells us something of how much asbestos is needed to cause disease.

(SLIDE OF X-RAY)

Here for example is Barbara Gourie's X-ray which in 1974 was normal. It was taken because her father died of lung cancer and her mother died of mesothelioma and the whole family was then X-rayed. In 1977 however, she began to get pleural disease and, by 1978, a mesothelioma was present. She came to see us. She was 35 years old, she didn't want to die, she had two children. We couldn't help her. She developed tracheal compression and did die. She told us that when she was a child, her father would come home from the shipyard in Quincey, Massachusetts. Her mother would take his clothes and shake them out while the kids were playing on the floor nearby.

Therefore, with regard to dose-response, how much asbestos does it take? We can translate this, also, from the science to the public policy by saying what we now know - we'll have lots of debate during this meeting on exactly what this means in fibres per millilitre - which is: in general, the more asbestos, the more disease; the less asbestos, the less disease.

Dr. Higginson will discuss the problem of thresholds with us. Is there a threshold for asbestos, that is a level that will not result in disease? Not that we know of. But, I don't think that is the right question, because is there a level of asbestos exposure in which we will not be able to detect increased risk? Yes, there probably is for practical purposes.

What is that level? We know it. How low must asbestos exposure be to avoid increased risk? It's got to be below the levels that are found in the households of asbestos workers. Now, we missed the boat in 1964, because we knew by then, by Dr. Newhouse's studies, by Dr. Wagner's studies, that those levels would produce disease. There were literally hundreds of thousands of households of asbestos workers. Unfortunately, there was no study done of what these levels were. Otherwise we would now know exactly what it would be.

Now, when Dr. Murray in 1899 observed the case of asbestosis - this was recorded in 1906 - this information could not have been widely known. It was buried in a parliamentary report. However, it would have been difficult to overlook the serious potential of the dust after the careful clinical studies and surveys from 1924 to 1931. Despite this, in the 1920's, 1930's and 1940's, there were few precautions in the trades in which there was asbestos exposure. Nor did the increasing scientific knowledge concerning the cancer potential of asbestos exposure increase protective measures until the 1960's and 1970's.

In the next days, we will be asked whether levels of 0.01 or 0.2 or 2 (fibres per millilitre) will protect people in the future. We will not be able to confidently answer these questions, because few measurements were made years ago to correlate with current cancer experience. Still, we'll be able to give you some general guidance that there is a dose-response to asbestos: the more asbestos, the more risk; the less asbestos, the less risk.

But this discussion will not be able to answer the critical question that Dr. Atherley placed before you - "should the use of asbestos be continued" - if evidence is also not available that it can be safely used, that there will be vigorous insistence on all feasible safety measures; not minimal controls but maximum capabilities. Would this prevent all asbestos disease? No, but it will avoid all that can be avoided, at least at this time. It may well be that to do less than we can will be unacceptable. Therefore, one perspective by which to judge this symposium is that it has as its task the unique opportunity of deciding who will live, and who will die. It is this decision which will answer the question as to whether or not asbestos will continue to be used.

- - - - -

FIGURE 1

Deaths of asbestosis

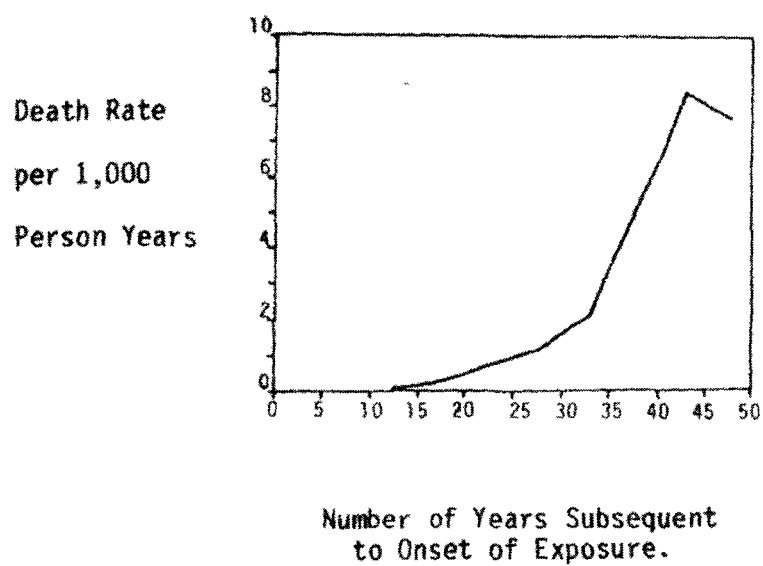


FIGURE 2

Deaths of lung cancer

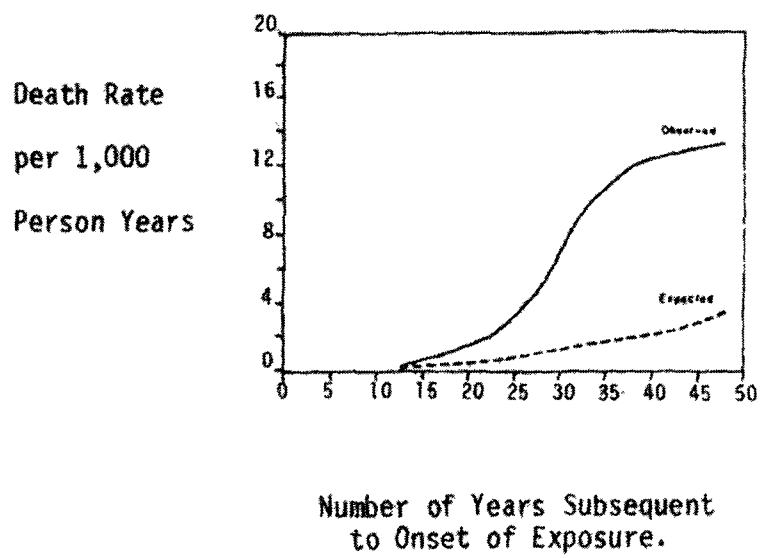
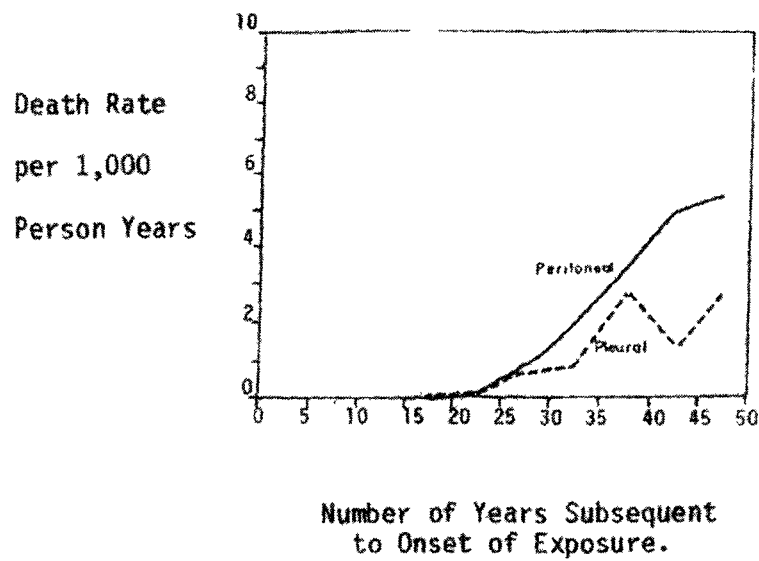


FIGURE 3

Deaths of mesothelioma



SESSION III

INDUSTRY'S VIEWPOINT

VAN DER REST, Etienne (Belgium)

The general theme of the introductory exposé was "Asbestos: a controversial issue".

There is certainly no shortage of controversial subjects in the world today, but if we want this world to progress, it is our most basic duty to resolve these controversies whatever they may be. This means above all that each one of us must make an effort to understand the point of view of others in order to arrive at agreement acceptable to all those involved.

This is the reason why, far from wishing to "clash" with governmental, trade union, medical and industrial delegates, consumers and others, we must be convinced that we are in fact all "in the same boat". If we were to adopt an antagonistic, conflicting attitude - which happily has not been the case up to now - during these working days and the period that follows, we would be responsible for having rendered this conference useless. Quite to the contrary, it is together that we must seek the solution to a problem which could moreover set a precedent for other similar problems if it is settled with good common sense, that basic virtue which seems to be wrongly pushed to the back of our minds nowadays.

Therefore, from the very outset, let us seek a "starting point" accepted by everyone on which we could then base our arguments.

This starting point is the following: yes, industry recognizes unequivocally and unhesitatingly that asbestos may present a health risk if it is not used correctly, in the same way moreover as the majority of other raw materials. This point of view, which has not always been adopted by industry when, very many years ago, it was insufficiently informed medically and technically, is now accepted by everyone, and we have taken steps to have this known publicly in 1979 in a document called "INDUSTRY'S VIEWPOINT CONCERNING ASBESTOS".

That is therefore an openly negative characteristic of this natural raw material, but it must not close our eyes to the posi-

tive aspects: resistance to fire, wear and tear, long service life, mechanical resistance ... and I shall stop there because I am not here to carry out a publicity campaign.

If, in our modern world, we were to take "the easy way out", that is prohibiting a product because, if it is incorrectly used, it may present a certain health risk, we would return in less time than it takes to say it to the age of the caveman, or perhaps even further back in time since, by way of example, I read recently a study which suggests that wood itself may be carcinogenic.

In fact, by banning a substance, one is not only removing the disadvantages, but also depriving society of its advantages. Controlled use seeks to remove the disadvantages but at the same time preserve the advantages.

Having said this, let us delve into the subject of the exposé which I have been asked to present: What are industry's rights and responsibilities in the field of asbestos?

I would be inclined to reverse the question by saying: its duties first and then its rights, because we live in an era which is becoming stranger and stranger where everyone speaks of "their rights", whilst forgetting to speak of their duties!

Therefore, I would first like to enumerate the industry's duties:

1. To take all necessary precautions so that, at the stage of extraction of fibres from the mines, of manufacture of products using asbestos as a raw material and, finally, of utilization of the finished products likely to release the fibres, there is no socially unacceptable risk. I have intentionally not used the term "no risk" which, as all here know infinitely better than I do, is an aberration because we cannot speak of "absolutely no risk".

In the light of current knowledge, industry is working on the basis that there is no socially unacceptable risk when the fibre level is kept below 2 fibres per cubic centimetre, a level currently adopted in most countries. This figure must be compared with the excessively high readings which existed 20 or 30 years ago, when the danger was not correctly appreciated and where it was possible for levels to reach several hundreds of fibres per cubic centimetre.

Of course, this figure of 2 fibres per cubic centimetre is a maximum limit and industry considers that it is its duty continuously to strive to obtain the lowest dust level technically and economically possible. This has already been achieved in many factories.

2. These dust levels being accepted, it is industry's official policy to recommend in countries where there are no regulations that regulations be officially published as soon as possible.

3. Industry is strictly in favour of prohibiting uses of asbestos for which a controlled use is practically impossible. We are thinking, amongst other things, of the flocking of asbestos, that well-known work of the insulation workers.

4. Industry feels that it is one of its duties to keep an open, objective and constructive discussion going with governmental, trade union, medical, scientific and consumer interest circles and to seek with them suitable solutions which are acceptable to everyone, and apt to ensure the safe use of asbestos.

5. Industry is conscious of its duty to provide accurate information to persons likely to be exposed to a risk, of the danger which they might face if the desired precautions are not taken. {

6. This inevitably implies that industry is completely in favour of regular measurements of asbestos dust levels, and that it is also in favour of a continuous medical check on personnel likely to be exposed. }

7. Finally, industry has already spent considerable effort, time and financial resources on research related to health. It is very conscious of its responsibilities and will undertake or continue the research needed to ensure that the well-controlled low levels of exposure already reached will have no ill effects on workers' health.

What is the best way of fulfilling this duty to take precautions, which are simpler to list than to execute? It was to reach this goal more rapidly and in a coordinated manner and to make use of everybody's experience that the AIA (Asbestos International Association in English - Association internationale de l'amiante in French) was set up a few years ago.

This Association consists of 31 countries, of which the national associations themselves bring together both the mines and those manufacturers who use asbestos as a raw material, such as the manufacturers of brake linings, textiles, asbestos-cement, etc.

Its work is based principally on the activities of various work groups which we call "Advisory Panels". As time is short, I will not go into the details concerning these panels. A written description can be obtained on request.

The AIA is therefore an almost unique organization of its kind on account of the considerable number of companies which are members and on account of the simplicity of its running. This provides it with the influence necessary to impose upon its members, under penalty of expulsion, compliance with what it considers to be precautions which are absolutely necessary for a safe use of asbestos and products containing asbestos.

Thus, for example, the member mines of the AIA recently published a "Code of Good Practice", under the terms of which they refuse to supply asbestos to consumer companies which do not comply with the precautions laid down.

This pooling of technical information and experience between the members at the AIA is completely free of charge and over the last few years it has allowed progress to be made in the study of the reduction of concentrations of asbestos fibres in working premises which I would, in all modesty, qualify as considerable.

It is very often thanks to the spirit of a mutual understanding which exists within the Works Committees (trade union delegates working in the factory concerned) and the Health and Safety Committees that it has been possible to make such progress. In fact, without the close cooperation of the staff, investments alone would not be enough.

At this point, industry must acknowledge the extent of the work carried out by numerous doctors who have studied the "asbestos" problems and who have made industry aware of the precautions to be taken.

But we must take care not to confuse the past and the future. During the war, for example, when it was necessary to produce a maximum number of ships in the shortest time possible, insulation with asbestos sprayed onto metal structures exposed the worker to excessively high concentrations which caused the numerous cases recorded at the present time by medical research and which, among

other things, were referred to this morning by Dr. Selikoff in his well-made presentation. //

But this does not concern the shipyards alone. 25 to 30 years ago, through ignorance, a great number of industries operated in working conditions which are now considered as unacceptable and rightly so. Moreover, industry cannot allow data relating to old dusty factories to be extrapolated to today's modern factories.

The considerable investments which have been made in the field of dust removal and control convince me, on the basis of the discussions I have been able to hold with numerous doctors who specialize in this field, that in the future we shall see a progressive and dramatic recession of illnesses connected with asbestos and shall finally arrive at a figure which equates to that accepted for any other material.

I would be particularly grateful if those who question the extent of these investments - and it is their right until they have verified the fact on site - would take time to visit, from amongst the member companies of the AIA, mines or factories producing asbestos-cement, brake linings or other products. They should visit these factories to see how much has been done and they would realize that the situation is in fact very different from what was shown in photos presented this morning.

Industry is now taking on these heavy responsibilities both on the level of factory investments and in the field of medical checks and information to the persons concerned. So perhaps it is entitled to wonder if, having fulfilled its duties, it is not entitled to certain rights too!

To start with, it feels it has the right to be treated with respect as a vital committed participant in the discussions and not as an exploiter working only for his own interests without consideration for workers, customers or the rest of society.

It feels that it is also entitled to reasonable legislation on the matter. It has not been proved that there is an unacceptable social risk when working in conditions as they are today in modern mines, mills and factories. We therefore ask that regulations should not be imposed on us which are not technically or economically feasible or medically justified.

Finally, we ask for complete information on a complex problem. In many cases industry itself must be held to blame because it has perhaps not supplied sufficient information to the media con-

cerning the seriousness of the problem. Therefore, it has only itself to blame if today some newspapers or television programs sometimes give only an emotional view of the problem.

Of course, this remark is not aimed at the media representatives who are taking part in the work of this symposium, since their very presence is proof of their concern for full information.

I could continue for a long time on this subject, but I think that the important thing in a meeting such as this is the exchange of views which follows the speeches. I will not therefore dwell any longer on the developments which you are familiar with and which might risk being a repetition of what has been said by previous speakers, but I would like to emphasize the following once again:

1. A controlled use of asbestos is possible, both in the factory and on the part of the end user. Thanks to everyone's efforts, the present working conditions are no longer those of the past;

2. The products containing asbestos are unique products of their kind, constituted at the outset by a natural raw material which has been available to us since time began so that we can make good use of it.

Thanks to the technical excellence of asbestos, I would like to remind you of how many lives have been saved by brake linings based on asbestos; how many others have been saved by anti-fire products based on asbestos and correctly used; and how many more could yet be saved in countries where there is water shortage and where water supply networks produced with economical pipes could most often appropriately solve the problem.

I would like to finish by expressing the desire that together we should set up a means for supervising the strict observance of regulations which will allow us to continue to use, under control, a raw material which contributes and will continue to contribute such a great deal to our well-being and our safety.

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