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The World Asbestos-Cement Industry: Moving Forward

The First International Conference on Asbestos-Cement highlighted the dynamism of an industry which is successfully meeting the challenges of technological innovation and new market demands.

Some 260 industrialists, researchers, architects, producers and public works officials from 45 countries met May 4 to 7 in Cannes, France, for the First International Conference on Asbestos-Cement where they reviewed the latest developments and new applications of asbestos-cement products, as well as recent technological innovations aimed at improving the performance and properties of this material.

The technical program consisted of six plenary sessions. A total of 34 experts from 19 different countries delivered papers on topics ranging from installation, new applications and material properties to the socio-economic impact of manufacturing asbestos-cement products.

A Well-Adapted Material

"This conference will have furnished proof," said Alain de Metz, vice-chairman of the Syndicat des Industries Françaises du Fibre-Ciment, "that, asbestos-cement has perfectly adapted itself to recent trends, which see every country, on the basis of its needs, searching for the material that best satisfies its concerns for economy, aesthetics, durability, ease of application and quality."

Sponsored by the Asbestos Institute in cooperation with the Association Française de l'Amiante, the Canadian Centre for Mineral and Energy Technology and the Centre de recherches minérales du Québec, this first conference was so successful that many participants expressed the desire that it should be the first of a series of meetings



aimed at promoting the worldwide exchange of information and transfer of technologies related to asbestos, and especially asbestos-cement.

The Industry's Dynamism and Vigour

"The interest that this conference generated among the world asbestos-cement industry," said Gary Nash, president of the Asbestos Institute, "the number of participants who came from around the world and the quality and diversity of the papers presented make us realize that such an initiative was long overdue. The conference, moreover, provided an opportu-

nity to confirm the vigour and dynamism of the asbestos-cement industry, which is very active in the field of research and innovation and which has an outstanding potential for growth in many parts of the world."

The Cannes sessions showed that asbestos-cement is a material that is evolving in terms of its form, composition and applications in order to adapt to new conditions for its use as well as to the demands of both the market and general public for economy and safety. The conference also confirmed the importance of the industry's role and asbestos-cement products in developing countries.

Major Role in the Third World

The international panel focusing on socio-economic questions, which brought together representatives from China, India, Mexico, Senegal and the Philippines, highlighted the place and value of the asbestos-cement industry in the national economies of Third-World nations.

The international panel indeed illustrated the enormous needs of Africa, Asia and Latin America for a material such as asbestos-cement in order to solve problems with housing, the transportation of drinking water, irrigation and drainage, as well as for the construction of adequate sewage systems and other infrastructures.

As one participant put it: "While in some quarters the controversy over asbestos has a tendency to drag on endlessly, asbestos, as the Cannes conference showed, continues in all four corners of the globe to be a force for social progress and a vehicle for economic development." ■

The Scientific Community Severely Judges the EPA Document

See pages 2, 3, 4 and 5

The Scientific Community Severely Judges the EPA Document

A group of international experts has judged rather severely the scientific reasoning set forth by the U.S. Environmental Protection Agency (EPA) to justify its proposal to ban asbestos in the United States. Seemingly, the Agency has based its recommendation on data of often doubtful quality, on a model of analysis which is rejected by part of the scientific community and on incomplete documentation.

These conclusions can be derived from independent assessment reports prepared by experts from Canada, the United States, France and Great Britain. Among the authors are several scientists renowned for the studies they have published on asbestos over the past 20 years. These specialists agreed to convey their observations to the Asbestos Institute which made these public recently, in Montréal, during an information briefing attended by some of them.

Questionable Scientific Basis

The experts showed an unusual unanimity in their conclusions, especially on two major points. All questioned some elements of the scientific basis used by the EPA, particularly the fact that the Agency assessed all fibres equally, without distinction between type or biological effects. All are also worried about the risk related to the uncontrolled use of substitutes which would not have been subjected to the same tests and standards as asbestos.

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This publication appears in French, English and Spanish.



Drs. J.M.G. Davis, J. Dunnigan, A. Langer and R. Bégin at the information briefing on the EPA proposal.

One of the scientists who attended the briefing, Professor Arthur M. Langer, Associate Director of the Environmental Sciences Laboratory of the Mount Sinai Medical Center, appropriately summed up the feelings of the experts consulted when he explained the circumstances that led him to comment on the EPA proposal: "When one generates a data base and claims to have hard numbers to support this, if those hard numbers are based on assumptions or guesses and on a framework that is not scientific, then, as a scientist, I must respond to it."

Major Deficiencies

Most of the experts consider that the report of the American agency contains major deficiencies from both the scientific and methodological viewpoints.

Thus, Professor Alain-Jacques Valeron and Dr. Guy Thomas say that the EPA report does not meet any of the universally recognized scientific standards and that "using the conclusions of this type of report for regulation purposes would seem to be abusive".

For his part, Professor Jack Siemiatycki asserts that "the estimate of risk by the EPA is based on crude guestimates". In this light, the Montréal epidemiologist feels that "the proposed ban on asbestos would be something of an expensive gamble".

Professor Arthur M. Langer points out that the environmental data used to support the Agency's position "are not that good". Notes Dr. Langer: "The statement that asbestos has been studied most

often and thoroughly for its effect on humans suggests to the reader that these data are unassailable. This is simply not the case."

Dr. John C. Gilson believes that "the EPA has not made a convincing case for banning all asbestos". Finally, professor Patrick Sébastien agrees with virtually all of the specialists consulted, who have pointed out that the report of the American agency contradicts the majority of the most extensive studies carried out on this subject around the world. He deplores the fact that the scientific references in the document "come from obscure studies".

Different Types of Asbestos

In their evaluation of the EPA report, the experts are unanimous in criticizing the EPA for not making a distinction between the various types of asbestos.

For Dr. J.M.G. Davis, this approach "ignores a vast amount of epidemiological evidence that chrysotile is a much safer material than the amphiboles".

Professor Langer, who also disagrees with the EPA's attempt to group all types of asbestos together, believes that "chrysotile asbestos should be permitted in the manufacture of vinyl-asbestos tiles, friction products and asbestos-cement pipe". The New York scientist, who emphasizes that the use of chrysotile asbestos must be subject to rigorous controls in the work environment, is nonetheless in favour of banning crocidolite and amosite.

The Dangers of Substitution

The EPA proposal to systematically replace asbestos with various substitute products is unanimously criticized by the experts consulted.

For example, Professor Siemiatycki feels that the theory that substitute products would pose less risk than asbestos "may not stand up to scrutiny". Professor Siemiatycki points out that "studies of workers exposed to man-made mineral fibres in the U.S. and in Europe may be interpreted as showing risks of lung cancer comparable to those seen with asbestos".

Dr. Raymond Bégin points out that the biological effects of the substitutes proposed by the EPA have not yet been adequately evaluated and that "several of these materials may well be at least as biologically active as asbestos".

According to Dr. Davis, "present knowledge suggests that any fibrous product that has fibres of the same dimensions as asbestos and the same fibre durability in lung tissue will be equally hazardous".

Potentially Carcinogenic Products

Professor Langer, who has analyzed the preliminary tests carried out on a half-dozen products proposed as replacements for asbestos, points out that these tests have shown that the products in question are potentially carcinogenic.

Professor Sébastien believes that "it is unwise in terms of public health to propose several mineral fibres to replace asbestos in its multiple uses. In fact, that would only compound a variety of uses with a

A Proposal That Should Be Drastically Amended

— Dr. Arthur M. Langer

variety of pollutants, making the situation even more difficult to control, both on the level of industrial hygiene and of the environment".

Because of the many uncertainties involved in the use of substitute products, the experts recommend that these products be subject to regulations and standards that are as strict as those imposed on asbestos.

A Questionable Cost/Benefit Ratio

Although not all of the experts touched on the EPA's analysis of the cost/benefit ratio in banning asbestos, those who have examined it generally tend to question its validity. Dr. Gilson feels that the EPA has not provided sufficient information to establish the cost elements: "The EPA give us no information on the reliance to be placed on the cost figures."

For his part, Professor Siemiatycki feels that the price the Agency wants the American public to pay is disproportionate to the results it hopes to achieve: "From a public health viewpoint, more lives and years might be saved by investing in anti-smoking campaigns, anti-alcohol campaigns, transportation safety or other public measures."

Controlled Use of Asbestos

Along with many of his colleagues, Professor Langer rejects the notion of banning asbestos as proposed by the EPA: "Can a resolution be achieved to protect the general population and still use asbestos safely? I think yes. By elimination of amphibole asbestos, banning of cigarette smoking in specified buildings, structures and workplaces, workplace controls and work practices, and use of safe substitutes, this can be achieved."

Dr. Robert Murray finds that the EPA proposal is an unjustified action "which borders on almost obsessive paranoia". Noting that society has learned how to control many dangerous industrial substances such as phosphorous and carbon bisulphite without having to ban them, Dr. Murray suggests adopting a similar approach to asbestos, "whose risks can be controlled". ■

Professor Arthur M. Langer approves of the EPA's goal. He is asking the Agency, however, to drastically amend its regulatory proposal to allow for the controlled use of chrysotile asbestos.

The New York researcher starts off by saying that a total ban on asbestos cannot be logically justified solely on the basis of an assessment of the risks this product poses to the health of the general public. He explains that the data from which the risk can be extrapolated to the population as a whole is too scanty to arrive at precise, numerical conclusions. Professor Langer asks the EPA to stop evaluating the number of deaths that might be caused by asbestos.

Keep Chrysotile for Specific Uses

Professor Langer formulates several specific recommendations including banning crocidolite and amosite as quickly as possible. On the other hand, he recommends that chrysotile continue to be used in the manufacture of vinyl tiles and asbestos-cement pipes. He states that there is no solid evidence leading to the conclusion that these products are hazardous to health.

In the case of friction products, the American researcher recommends that the use of chrysotile continue to be authorized. He notes that it would take several years before substitute products could be adequately tested.

Professor Langer proposes the establishment of a special inter-agency committee to regulate the use of all inorganic fibres. He underlines that certain mineral fibres, whether natural or synthetic, create problems similar to asbestos and should be regulated in the same way. The author mentions half a dozen substitutes which studies have shown can be carcinogenic.

A Social Problem

The New York researcher severely criticizes the studies which the American agency uses as the basis for its statement that short exposures to asbestos fibres can perceptibly increase the risk of cancer. He also rejects the notion, put forth by the EPA, that many cases of mesothelioma can be linked to the presence of asbestos in the environment. He thinks that these cancer cases are more likely related to the workplace.

In concluding, Professor Langer considers it socially prudent to reduce the public's exposure to asbestos fibres. In this regard he asks: "Can a resolution be achieved to protect the general population and still use asbestos 'safely'? I think yes. By elimination of amphibole asbestos, banning of cigarette smoking in specified buildings, structures, workplaces, workplace controls and work practices, and use of substitutes, this can be achieved."



Dr. Arthur M. Langer

Associate Professor and Associate Director, Environmental Sciences Laboratory, Mount Sinai Medical Center, New York, U.S.A.

Weak Cost/Benefit Analysis

— Dr. John C. Gilson

Dr. John C. Gilson believes that the cost/benefit analysis on which the EPA bases its recommended ban on asbestos lays itself wide open to criticism. He particularly deplores the lack of a detailed breakdown of the two billion dollar figure cited by the Agency.

The British physician also notes that if substitutes prove less effective than asbestos, they may cause deaths whose cost has not been estimated by the American agency. He mentions three types of uses for which this calculation should have been made: fireproof construction materials, asbestos friction materials and asbestos clothing.

Uncertain Benefits

Dr. Gilson questions the logic of banning asbestos and asks whether a ban is the most effective and

economical means of reducing the number of cancer cases.

On this point, he writes: "If the proposed ban on asbestos went into effect today, there would be no impact on the number of deaths caused by asbestos until the year 2000. And it is difficult to assess, for cancers occurring after the year 2000, what proportion can be linked to exposure prior to the ban."

Dr. Gilson, in fact, believes that it is difficult to determine what proportion of cancers can be avoided in the workplace and environment by banning asbestos.

Methodological Flaws

In addition, the British researcher sees several methodological errors in the EPA's analysis. He notes first

that the Agency makes no distinction between the various types of fibre, which runs counter to most recent research on the harmful effects of asbestos.

Dr. Gilson also points out that, in attempting to predict the number of possible cancers using the number of fibres inhaled per year as the criterion is a delicate matter. He points out that this would require combining several variables such as the dimensions of the fibres, their distribution in the air, the degree of aggregation, the type of fibres and maybe even the particular blend of different types of fibres.

Dr. Gilson concludes that the EPA has not assembled a convincing case for banning all forms of asbestos. ■

Dr. John C. Gilson

Former Director of the Medical Research Council, Pneumoconiosis Unit, Penarth, United Kingdom.

A Document Lacking in Accuracy and Perception

— Dr. J.M.G. Davis

Dr. J.M.G. Davis believes that the EPA's calculations are frequently based on studies which are not accurate enough to justify banning asbestos. He especially denounces the use which is made of data collected before 1960.

The British physician explains that the techniques available at the time did not permit an accurate count of the number of airborne dust particles. At best, one could define three levels of exposure: high, medium and low. Dr. Davis believes that, given these conditions, one cannot determine the health risk, the way the EPA does, with very much precision.

Dr. Davis also notes that the linear non-threshold dose/response model which the EPA used is far from gaining the unanimous approval of the scientific community. The main problem, according to him, stems from the lack of data on exposure to extremely low doses so that one must content oneself with extrapolations such as those which the EPA employs. Under these conditions, Dr. Davis thinks that the model used may over-estimate the risk of cancer from exposure to carcinogens.

Chrysotile and Substitution Products

Dr. Davis is also very surprised that the EPA makes no distinction between chrysotile and other asbestos fibres. In his view, this attitude runs counter to several epidemiological studies which show that chrysotile is much safer than other types of fibre.

The British physician is equally surprised that the American agency also draws no distinction between fibres of different dimensions. He points out that current studies indicate that long and thin fibres are much more carcinogenic than short and thick ones.

As for substitute products, Dr. Davis notes that any product containing fibres with the same dimensions as asbestos and the same durability in lung tissue are just as hazardous. He states the problem in these terms: "Does an industrial society need products made of fine and durable fibres? If so, then fibres with a high degree of durability in the environment and little durability in lung tissue would be the ideal material. In that case, it may prove difficult to find one better than chrysotile." ■



Dr. J.M.G. Davis
Head of the Pathology Unit, Institute of Occupational Medicine, Edinburgh, United Kingdom.

the diversity of pollutants and make the situation even more difficult to control.

A Lack of Scientific Rigor

In addition to this basic criticism, Professor Sébastien thinks that the American agency argues its case with a great deal of clumsiness. He accuses it of frequently basing its recommendations on obscure scientific references. Also open to criticism, according to him, are the basic data on pollution levels in the environment, which were obtained by different methods. He maintains that some techniques of measuring fibres in the air were even abused. Mr. Sébastien states that "such practices are morally questionable, contribute nothing to science, and offer no solutions to social problems".

Professor Sébastien concludes: "It is understandable that an agency

such as the EPA should propose a ban on asbestos, even if it argues its case clumsily. However, the agency can be criticized for recommending that asbestos be replaced by several man-made mineral fibres." ■



Dr. Patrick Sébastien
Professor, School of Occupational Health, McGill University, Montréal, Canada.

A Questionable Analytical Model

— Dr. Jack Siemiatycki

Professor Jack Siemiatycki criticizes the mathematical model of the "linear non-threshold dose/response" type used by the EPA. He thinks that the American agency never proved that this was the most coherent model available.

The Montreal researcher criticizes the specific parameters of the model selected because they are based on measurements conducted among a single group of workers in the 1960s. Since the data used contain no individual measurements and are based on an identical average exposure for all workers, Professor Siemiatycki concludes that the basic parameters of the model constitute only crude approximations.

Moreover, the researcher thinks that the fact of selecting a single model and a single study seems to give the EPA estimates a degree of accuracy which they do not deserve. According to him, a credible model would express the calculations of risk in terms of orders of magnitude.

The Risks of Synthetic Fibres

Professor Siemiatycki blames the EPA for considering that all types of asbestos are equally harmful. He also feels that banning asbestos would be a costly speculation. He thinks that the thesis stating that substitute products are less hazardous would not stand up to an in-depth study. On this matter, he

points out that American and European studies of workers exposed to synthetic fibres show risks of lung cancer comparable to those of asbestos.

Professor Siemiatycki calculates that the price to be paid is disproportionate with the results one could hope to obtain. "From the point of view of public health, it would be much more profitable to invest in anti-smoking and anti-drinking campaigns, in transportation safety and other community health measures." ■



Dr. Jack Siemiatycki
Professor, Epidemiology and Preventive Medicine Research Center, Institut Armand-Frappier, Montréal, Canada.

Morally Questionable Practices

— Dr. Patrick Sébastien

Professor Patrick Sébastien deplores the EPA's scientific clumsiness and rejects its proposals for substitutes.

On this subject he writes that he has "doubts about the harmlessness of substitute mineral fibres, especially rock wool, for which there is epidemiological evidence of carcinogenic action, and ceramic fibres, which have produced cancers in laboratory ani-

mals through inhalation. If the EPA wants to ban asbestos in the United States, it should find technological solutions that do not involve other mineral fibres".

Moreover, the idea that several new fibres could be called upon to replace asbestos strikes this French specialist, currently working in Montréal, as a lack of wisdom. He believes that multiplying the substitute products would only add to

Using Such a Report for Regulation Seems Abusive

— Dr. Alain-Jacques Valleron and Dr. Guy Thomas

Professor Alain-Jacques Valleron and Dr. Guy Thomas criticize the EPA study for breaking universally-recognized scientific rules. After an assessment of the methodology used by the American agency, they conclude that using the conclusions of this kind of report for regulatory purposes seems abusive.

Professor Valleron and Dr. Thomas challenge the estimated cost of substituting new materials for asbestos as arrived at by the EPA. They specifically note the fact that the health risks of substitute products are not taken into account. The French researchers also take issue with the EPA's evaluation of the benefits for public health that could result from a ban on asbestos.

An Uncertain Scientific Procedure

They explain that the problem stems from a lack of uniformity in the methods used to collect data, with some old studies measuring solid airborne particles while more recent studies directly count the fibres. The authors think therefore that the results should be expressed in terms of order of magnitude or large confidence intervals rather than in precise figures.

Professor Valleron and Dr. Thomas emphasize that the EPA's approach involves a number of scientific uncertainties. They especially challenge the parameters of the risk/exposure equations used by the Agency because these are calcu-

lated on the basis of insufficient data and crudely estimated. Another of their criticisms is that the American analysis does not take the physical characteristics of fibres into account. They also fear that the models used and simplification hypotheses which they contain can sometimes be incompatible with the basic data available.

Professor Valleron and Dr. Thomas conclude: "The major deficiencies of the EPA report are its complete failure to discuss the results in terms of their uncertain nature and its failure to synthesize published works." ■



Dr. Alain-Jacques Valleron
Professor of Biomathematics and of Biostatistics, Université de Paris VII; Unit Director, National Institute for Health and Medical Research (INSERM), France.

Dr. Guy Thomas
Centre Anti-Poison, Hôpital universitaire Lariboisière-St-Louis, Université de Paris VII, France.

Conclusions Based on Doubtful Assessments

— Dr. Raymond Bégin

Dr. Raymond Bégin severely criticizes the analytical methods used by the EPA and disagrees with the Agency's conclusions, commenting especially on the relationship between certain types of cancer and asbestos.

In the case of pulmonary carcinoma, Dr. Bégin notes that cigarettes are by far the decisive factor and once this factor is eliminated, this type of cancer is rarely seen. As for mesothelioma, Dr. Bégin points out that this disease is very rare and

that half of all cases have no connection with asbestos. He further specifies that this pulmonary lesion occurs no more frequently in the Eastern Townships asbestos mining towns than in any large city.

The University of Sherbrooke professor also disagrees with the EPA's conclusions on the risks related to brake maintenance and other asbestos-based friction products. He says that there is only one study on the subject and the data which it contains are unconvincing.

A Questionable Theoretical Model

Dr. Bégin also questions the theoretical model which the EPA used for its analyses. It strikes him as particularly inadmissible that this model has no threshold. The fact that many workers exposed to asbestos have never contracted illnesses related to exposure to asbestos dust seems to prove, he says, the existence of definite thresholds in the development of asbestosis.

He also challenges the linearity of the model used, on the basis of recent studies which indicate that exposure to low doses of chrysotile results in no excessive incidence of lung disease. Dr. Bégin therefore thinks it unfair that a regulation aimed at banning asbestos should be based on that type of model.

The Sherbrooke physician also questions the safety of the substitute products which the EPA proposes. He says that the biological activity of these substitutes has not

yet been sufficiently assessed and that some appear to be just as harmful as asbestos.

Dr. Bégin therefore recommends that all fibrous materials be subject to the same regulatory control as asbestos and that the labelling requirements for all fibrous materials be similar. ■



Dr. Raymond Bégin
Head of the Chest Clinic, Sherbrooke University Hospital, Canada.

An Unwarranted Act and Flawed Arguments

— Dr. Robert Murray

Dr. Robert Murray thinks that a ban on asbestos such as the EPA proposes is an unwarranted act that stems from an almost obsessive paranoia. He notes three flaws in the American agency's argument.

First, according to Dr. Murray, comes the Agency's failure to ignore the threats posed by other mineral fibres mentioned as possible substitutes for asbestos. He maintains that these fibres, whether natural or synthetic, are as hazardous as asbestos. As a result, if regulations governing asbestos are to be adopted, he hopes that they will also extend to substitute fibres.

A Defective Methodology

The second flaw in the EPA study, according to Dr. Murray, is attributing instances of death to a single cause: asbestos. He argues that the Agency systematically ignores other possible contributing factors and thinks that the importance placed in asbestos is out of proportion.

Thirdly, Dr. Murray rejects the assertion that "a single fibre can be lethal". He notes that the risks are a function of the type of asbestos fibre and its physical dimensions. Moreover, he maintains that these

risks can be controlled. As for the threats posed by asbestos in buildings, the British expert says that he has not found a shred of evidence in the EPA documents to allow that danger to be scientifically defined.

Dr. Murray points out that man has learned to control a number of hazardous industrial substances such as phosphorous or carbon disulfide without having to ban them. He recommends adopting the same positive attitude towards asbestos. ■



Dr. Robert Murray
Professor, London School of Hygiene and Tropical Medicine; President of the International Occupational Medicine Association, London, United Kingdom.

The Pan American Health Organization Rejects



Thanks to the numerous interventions which were medically, scientifically and technically well documented, the participants at a meeting held in Mexico City and organized by the Pan American Health Organization (PAHO) adopted recommendations in favour of the controlled use of asbestos. This signalled a clear rejection of the original demands for banning advanced at the beginning of the meeting.

This position was adopted at this important meeting of experts sponsored by the PAHO, which is the regional office of the World Health Organization (WHO), in order to take a position on the health problems related to the production and use of asbestos in Latin America.

The group of experts, whose recommendations have since been published, consisted of 24 participants and 35 observers, representing governments, university institutions, scientific organizations, industry and consumer organizations from nine countries of the American continent, as well as of representatives of international organizations.

The meeting began with a survey

of the asbestos mining and manufacturing industry in the industrialized and developing countries of the American continent. The following session focused on the health problems related to exposure at the workplace and in the environment.

Lively Discussions

Some of the presentations at this session, in particular those dealing with assessment of risks related to asbestos exposure, gave rise to lively discussions.

Thus, Dr. J. Corbett McDonald, a well-known epidemiologist, and Dr. Jacques Dunnigan, research director of the Asbestos Institute, in particular challenged the alarmist predictions of Dr. William J. Nicholson of the Mount Sinai School of Medicine concerning asbestos-related cancer deaths in the United States. They pointed out that the figures had been considerably reduced since 1978, when the Califano report predicted 64,000 deaths a year. The following year, Dr. Irving Selikoff brought the number down to 40,000 at the OSHA hearings, to lower it again to 10,000 in 1981, in a study made for the U.S. Department of Labor.

Finally, in a study for the U.S. Congress, Drs Richard Doll and Julian Peto estimated the number of asbestos-related deaths to be between 2,000 and 4,000 a year. Also refuted in Mexico were the statements of Dr. Arturo Lomeli, the representative of Latin American consumer associations, in which he claimed that lung cancer was the cause of death for 20% of asbestos workers.

Appeal for Cooperation

In the group's view, the control of the use of asbestos in Latin America should be based first of all on a more accurate assessment of the hazards involved, which would permit the implementation of a plan of action for risk reduction.

From the discussions in Mexico City, it also appeared that only through concerted action would it be possible for all parties concerned, namely the workers, industry and governments in each country, to introduce a policy for comprehensive monitoring of all asbestos use.

It was also stressed that the countries which already have adequate regulations and technology should assist in improving the working

conditions in the industrializing countries by way of training programmes on control techniques and industrial health as well as through transfer of technology.

This type of cooperation, which should be coordinated by international organizations such as the World Health Organization, the Pan American Health Organization and the International Labour Office, would enable industry in the developing countries to implement the recommendations adopted at the Mexico City meeting and thus would promote a generalized control effort in the use of asbestos.

Assistance by the Institute

For its part, the Asbestos Institute has been invited to assist in the organization of training sessions in monitoring for industrial hygienists and in the detection of health problems at the workplace for physicians.

The Institute also intends to make available to the governments concerned the scientific and technical information required to establish control standards for the asbestos industry. ■

the Banning Approach

Recommendations of the Study Group on "Asbestos and Health in Latin America"

The experts who participated in the Mexico meeting feel that two steps must be taken concurrently in order to deal with the problems posed by asbestos use and to propose measures to protect the health of workers and the community at large:

1. Identification and evaluation of the hazards
2. Control of the risk factors

Identification and Evaluation of the Hazards

The data on hand are incomplete and originate mainly from limited studies without any follow-up. Consequently, it is necessary to insist on the development of systems for ongoing epidemiological observation of groups exposed to asbestos in the workplace and elsewhere. To this end, it is proposed to:

- a) Create a register of all companies involved in the mining and industrial use of asbestos, detailing the amount consumed and the type of fibre used.
- b) Establish a program of regular medical examinations of workers exposed to asbestos.
- c) Conduct studies of the working environments by using uniform sampling techniques and methods of analysis.
- d) Study work practices and identify high-risk operations.
- e) Identify the industrial processes where asbestos could be replaced immediately by proven non-toxic substitutes as, for example, in the case of heat insulators and other products using loose fibre.
- f) Evaluate the hazards to communities, particularly those situated close to companies which produce and/or use asbestos products or to asbestos waste dump sites.

The launching of these activities will provide information which in turn will allow the development of efficient hazard control programs.

Controls of the Risk Factors

Scientific evidence suggests that all control efforts must be geared towards reducing exposure to the lowest possible level. Control measures must be taken immediately in those areas where exposure to asbestos is known to exist.

Workers handling asbestos are the population group most at risk; priority must be given to lowering the level of exposure of that group, thereby reducing the rate of morbidity and resulting mortality.

It is suggested that each country set up its own plan of action which could be developed by multi-disciplinary groups consisting of representatives from government departments (labour, environment, health, social welfare, etc.), industry, unions, consumer associations and scientific institutions.

Such a plan of action should include:

- a) Establishing asbestos exposure limits and sampling and analysis standards, with emphasis on uniform sampling techniques and methods of analysis.
- b) Establishing standards with regards to asbestos imports, transport, manufacture, marketing and waste and to asbestos-containing products, with a view to lowering the hazards to workers and the population at large, and with emphasis on the use of the best industrial techniques available.
- c) Formulating and implementing an educational program directed at employers and workers on hazard prevention and control, hygiene and security at the workplace.
- d) Disseminating to the community at large the existing scientific knowledge on asbestos exposure hazards and the preventive measures.
- e) Searching for, developing and using asbestos substitutes which have been proven to be less toxic.
- f) Establishing a system for reporting and recording asbestos-related diseases.
- g) Establishing a system to inform workers on the results of their periodic medical examinations.
- h) Strengthening the learning process of medical students, at the graduate and post-graduate level, to enable them to diagnose asbestos-related diseases.
- i) Improving the professional training, at the graduate and post-graduate level, of engineers and industrial hygienists involved in the asbestos industry. ■

Argentina and Brazil go for Controlled Use



Asbestos-cement is a building material especially well suited to the needs and means of Latin American countries, from pipes of various sizes to individual pre-fabricated dwellings such as the one shown here.

Argentina

The Argentinian authorities responsible for Environment and for Occupational Safety and Health have agreed that it would be advisable for Argentina to have strict and efficient regulations for the controlled use of asbestos.

Such was the conclusion reached by representatives of the Argentinian administration at the end of a symposium on the most recent developments in the knowledge of asbestos-related risks. Held early this year in Buenos Aires at the initiative of the Asbestos Association of Rio de la Plata, the symposium was held under the auspices of the National Administration for Environment Quality, of the Foundation for Education, Science and Culture and of the Argentinian Society of Ecotoxicology.

The Argentinian authorities had invited international asbestos experts at this meeting, to review the dust measurement methods used in the workplace and in the environment, the most recent medical and scientific data on asbestos and the regulations and standards currently applied in European user countries, and more particularly in France.

The French experience with pollution prevention in the asbestos industry was a major focus of this meeting to which the Argentinians had invited a large delegation from France.

Concerned about the international controversy on asbestos and the contradictory answers it sometimes leads to, the organizers of the symposium wanted to hear about the multidisciplinary approach adopted in France to ensure the controlled use of asbestos, through both regulation and the implementation of permanent consultation mechanisms between all parties involved. They also wanted

to be enlightened on the approach advocated by the Commission of the European Communities.

At the end of the symposium, which was also attended by doctors, lawmakers, civil servants, industrialists and unionists from Paraguay, Uruguay and Brazil, the National Director of Occupational Safety and Health and the Director of Environment Quality of Argentina concluded that their country should adopt "modern standards and a national program for the controlled use of asbestos, along the European pattern".

Brazil

"There is no question of the Brazil government planning to ban asbestos products, which ranks among the most widely used construction materials throughout the country, especially for asbestos-cement roofing and water reservoirs."

That was how the director of Brazil's Federal Environment Agency, Mr. Paulo Nogueira Netto, put it during the Sao Paulo International Conference on "Asbestos Exposure in the Environment and Workplace". Organized by Funda Centro, the Institute for Safety and Health in the Workplace attached to the Department of Labour, the conference last April brought together some 250 asbestos experts from around the world.

In light of the papers delivered, Mr. Nogueira Netto launched an appeal to asbestos manufacturing companies, asking them to establish very strict controls, especially for ventilation and air filtration, so that asbestos could continue to be used without sacrificing worker safety. ■

An Asbestos Mission Visits Eight Latin American Countries

A Canadian mission undertaken on the initiative of the Asbestos Institute has just completed its tour of eight Latin American countries. Its object was to emphasize the importance of the active collaboration of these countries in the development and implementation of standards which would allow the controlled use of asbestos.

The mission included government representatives, advisors and technical experts of the Institute, as well as the director of the Association Française de l'Amiante (French Asbestos Association) who joined the delegation in order to contribute to the viewpoint of asbestos users and to specify the orientations accepted by the European Community.

Thanks to the good offices of the Canadian Embassies and Québec Delegations, the mission had the opportunity to meet most of the government officials directly concerned with issues relating to worker protection.

Information and Pooling of Efforts

The eight countries visited during the months of February and March, namely, Ecuador, Colombia, Venezuela, Mexico, Brazil, Uruguay, Chile and Peru, welcomed the delegation with great interest. The mission prompted numerous requests for information on available safety technology and on the research and technical assistance programs of the Institute.

Discussions were initiated on the importance of setting up national associations of manufacturers of asbestos products, where they do not already exist. Such associations enable small companies in particular to have access to the technology of the larger industry at reduced cost. They also allow the pooling of efforts aimed at establishing and implementing safety standards in each country.

The creation of national associations moreover facilitates the organization and follow-up of training and educational programs for personnel and gives more weight to representations made to individual governments. Finally, given the increasing internationalization of all the issues relating to the health and safety of industrial activities, only structured national associations can ensure the affiliation of members with international associations capable of lobbying



Asbestos-cement water reservoirs represent an important part of the production of Colombit, a company located in Manisales, Colombia, which was visited by the asbestos mission.

efficiently both regulating agencies and organizations as well as individual governments.

A Useful and Economical Material

The Canadian delegation had the opportunity to note that asbestos-based products, and more particularly building materials, meet perfectly some vital development requirements of that geographic region while offering definite economic advantages in comparison with other materials.

The members of the delegation visited important asbestos-cement plants in Colombia, Mexico, Brazil and Peru. During these visits they found that the safety measures concerning asbestos dust are comparable to those in force in much more industrialized countries. The delegation also inquired about the working conditions prevailing in smaller production units of sundry materials (textiles, brake linings), about which there seems to be much less information available. It is indeed appropriate that the issue of asbestos be considered with equal efficiency at all levels. This is what the delegation pointed out to their counterparts while inviting them to call upon the Asbestos Institute and the Association Française de l'Amiante for any matters dealing with workplace prevention and controls.

Reactions to the EPA Proposal

Some concern was voiced to the delegation about the announce-

ment of the project to ban asbestos proposed by the EPA in the United States. However, the delegation had an opportunity to explain the context surrounding the steps taken by the EPA, which had already been rejected once in 1984, following strong international reaction.

The Latin American industrialists, who were largely unaware of the procedures which must be followed in the United States with regard to any proposals concerning regulation, were afraid of finding themselves faced with a *fait accompli*. The negative publicity surrounding the EPA proposal has already affected certain deliveries and several orders for asbestos products destined for the United States have been cancelled.

It certainly appears that the information widely disseminated in the Latin American countries has been very incomplete and biased. Several businessmen complained to members of the delegation that they had been flooded with unsolicited material put out by U.S. and other companies manufacturing asbestos substitutes who have taken it upon themselves to publicize the EPA proposal. Furthermore, this same approach seems to have been adopted by some American embassies and consulates which have been disseminating systematically, and for some time already, any negative information on asbestos.

In all likelihood, such strategy is partly responsible for the many questions brought to the attention of the Canadian mission concerning the possible use of substitute fibres and the work and research pursued by the Institute in this field.

Interest in the Controlled Use

Although the commotion caused by the EPA proposal has contributed generally to greater interest of governments and labour movements in the controlled use of asbestos, the degree of awareness of the issue varies considerably from one country to the other.

Brazil, for example, has recently given clear priority to asbestos, as evidenced by the Sao Paulo conference which took place at the end of April and brought together the leading international scientists in the field of asbestos-related health issues in the workplace and in the environment.

During the meetings with representatives of governments, unions and industry, great interest was expressed in obtaining the co-operation of the Institute for technical training programs aimed at ensuring the controlled use of asbestos. Moreover, as a result of this mission a closer collaboration with Canadian diplomats abroad has been established and this will ensure an efficient follow-up of the programs and actions undertaken by the Institute in the course of the next few months.

The visits of the asbestos mission were made by two distinct delegations comprising the following members: Jean-Pierre Chevalier-Bultel, delegation head and director of Latin American Relations, The Asbestos Institute; Dr. Michel Lesage, medical advisor, The Asbestos Institute; Jacques Dunnigan, director general, Research and Development Division, The Asbestos Institute; Henry Martin, Task Force on Asbestos, Energy, Mines and Resources Canada; Denis Hamel, economist, Québec Department of Energy and Resources; Jean-Yves Tremblay, director, Industrial Minerals Division, Energy, Mines and Resources Canada; Jacques Roberge, director, Parado Departmental Affairs, Québec Department of Labour, Manpower and Income Security. ■

Asbestos Production in 1985

Western World demand for all groups of asbestos fibres rose slightly in 1985. It went up to 1.84 million tonnes from 1.78 million in 1984, according to preliminary statistics published by Energy, Mines and Resources Canada.

However, fibre shipments by Canadian producers dropped to 743,700 tonnes from 836,654 tonnes in the previous year. These shipments were valued at 352.3 million dollars, compared to 379.3 million dollars in 1984.

Canadian mines last year supplied 40% of Western World demand. Until 1982, that percentage had ranged between 50 and 60%. This loss of market share by Canadian producers is due mainly to a decline in sales to the United States, more intense competition from some producers and the aggressive pricing policies of others.

According to the preliminary estimates, world production including the USSR totalled 4.1 million tonnes, about the same as the year before. Canada, with 743,700 tonnes of shipments remained the world's leading exporter of asbestos fibres.

While dropping in Canada and South Africa, production increased in several other countries. The USSR boosted production by 50,000 tonnes, Zimbabwe by 15,000 tonnes, Greece by 10,000 tonnes, Eastern Bloc countries by 29,000 tonnes and various other producers by 142,000 tonnes.

About 80% of Canadian shipments in 1985, or 608,000 tonnes, came from Québec mines. The estimated value of those deliveries was 224 million dollars. In 1984, Québec shipments totalled 691,000 tonnes valued at 279 million dollars.

The decline in Canadian asbestos deliveries stems mainly from an 11% drop in demand for the product in the United States. Fibre consumption totalled 207,000 tonnes in 1985 compared to 226,000 tonnes the year before. Canadian exports to the United States totalled 133,000 tonnes valued at 53.7 million dollars as against 185,000 tonnes worth 77.1 million dollars in 1984. Two thirds of these exports consisted of fibres in groups 6 and 7.

World Production of Asbestos

	1980	1981	1982	1983	1984	1985 (E)
URSS	2,000,000	2,000,000	2,000,000	2,200,000	2,250,000	2,300,000
Canada	1,323,053	1,121,845	834,249	857,404	836,655	744,000
Zimbabwe	250,900	247,600	194,400	153,000	160,000	175,000
South Africa	277,734	235,943	211,860	221,000	167,390	160,000
China	131,700	140,000	140,000	160,000	160,000	160,000
Brazil	170,403	138,417	144,832	149,612	136,080	148,300
Italy	157,794	137,086	116,410	139,000	147,280	135,000
United States	80,079	75,618	63,515	69,900	57,420	61,000
Greece	—	30	17,500	32,000	45,000	55,000
Other countries	200,270	145,919	145,551	108,132	107,315	109,600
World production	4,591,933	4,242,458	3,868,317	4,090,048	4,067,140	4,047,900

The Trends in Demand

U.S. demand for asbestos fibre is at its lowest level since 1938. The 207,000 tonnes used in 1985 represent a mere 25% of the record consumption reached in 1973. American users imported 28% less fibres in 1985 than in 1983. However, analysts expect demand to begin climbing at a rate of 4.4% this year and foresee this trend continuing until 1990. Consumption this year is expected to total 230,000 tonnes.

Japan is the second largest customer, after the United States, of Canadian asbestos producers. Japan's imports in 1985 remained at 100,000 tonnes valued at 46 million dollars. A year earlier, Canadian deliveries to Japan totalled 101,000 tonnes with a value of 46.3 million dollars. Two thirds of sales to Japan consisted of fibres in groups 6 and 7.

Exports of Canadian fibre to Common Market countries dropped to 131,000 tonnes valued at 100.1 million dollars from 154,000 tonnes worth 115.1 million dollars in 1984. Two thirds of these deliveries consisted of fibres in groups 4 and 5. Exports to developing nations remained at about the same level as in previous years. ■

TO READ AND TO SEE



Chrysotile Asbestos: A Material For Today And Tomorrow

A 35 page colour brochure on the major applications of asbestos, the safe and unsafe uses of this natural fibre and the risks inherent to the use of various substitutes.

Available at:
The Asbestos Institute or
Ministère de l'Énergie et
des Ressources du Québec
Service de l'économie minérale
1620, boul. de l'Entente
Québec Canada G1S 4N6



Asbestos

A review of chrysotile asbestos uses, of the health problems associated with exposure to asbestos dust and of the application of regulatory standards and practices needed to ensure the safe use of this material. The document also underlines the responsibilities of

those involved in establishing an acceptable level of risk and presents the recommended regulations as well as Canada's position on the controlled use of asbestos. (64 pages, colour photos)

Available at:
The Asbestos Institute or
Energy, Mines and Resources
Canada
580 Booth Street
Ottawa Canada K1A 0E4

Living with Asbestos

A 17-minute video produced by the Ministère de l'Énergie et des Ressources du Québec, in co-operation with The Asbestos Institute and Energy, Mines and Resources Canada.

In addition to explaining the current conditions of the mining and processing of asbestos in Canada, the document presents several interviews with representatives of the workers, the industry and the governments on problems related to the use of asbestos and the possible solutions. The video is available in Beta and VHS 1/2 inch and in 1/4 inch professional format.

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Asbestos in Drinking Water: "No Assessable Risk," WHO Concludes

On the basis of scientific studies whose results have been published since 1981, there seems to be a growing consensus to the effect that the ingestion of asbestos in drinking water poses no assessable risk to the health of the consumer. This being the case, until scientific research proves the contrary, it is unlikely that the World Health Organisation (WHO) will consider it necessary to modify the advice it gave on this matter in its 1980-82 Guidelines for Drinking-Water Quality.

It was in these terms that J.I. Waddington, director of the Environmental Health Service of WHO's Regional Office for Europe, stated the views of his organization on the issue of ingesting asbestos in drinking water. In a recent letter to Sir Neville Stack, Director General of the Asbestos International Association (AIA), Mr. Waddington in fact simply reiterated WHO's previous positions on the issue. These were formulated in 1980-82 on the basis of the scientific results and data available at the time, which aimed at determining whether variable concentrations of asbestos in drinking water might have carcinogenic effects.

It is a fact that tens of thousands of kilometers of asbestos-cement piping supply drinking water to millions of people around the world. Furthermore, drinking water springs are in permanent contact with natural deposits of asbestos, both underground and on the surface. Sometimes as well, mine tailings containing asbestos have been dumped into reservoir lakes.

An Impressive Number of Studies

In the United States, as early as 1974 the American Water Works Association Research Foundation commissioned a major review of the studies done on the issue up to that time. Conducted by a multidisciplinary scientific team including members of the Environmental Protection Agency (EPA), the study concluded that, regarding asbestos-cement pipes, "the probability of risk to health from the use of such systems is small - approaching zero."

Three years later, a special committee of the United States National Academy of Sciences arrived at these same conclusions, as did,

among others, a commission of the European Communities and a British advisory committee on the issue. A number of experts, however, recommended that new epidemiological and ingestion studies be undertaken.

On the basis of this early research, the EPA itself organized an extensive program to investigate every aspect of the issue. Some projects were undertaken in collaboration with the National Institute of Environmental Health Sciences. It has been estimated that these organizations invested at least 30 million dollars in various studies over a ten year period.

No Link Between Ingestion and Cancer

In his letter to the AIA, Mr. Waddington refers to a report that

appeared in the May 1984 issue of The New Scientist. According to this report, of seven major studies carried out in the United States, Canada, the United Kingdom and Italy, five show no relationship between ingested asbestos fibres and gastrointestinal cancer. Dr. Selikoff's study of insulation workers claims that such a link exists, but adds the rider that "no evidence exists to show that drinking water from pipes made of asbestos-cement is hazardous". Only one of these studies, which was conducted between 1978 and 1981 on the drinking water of five California counties in the San Francisco Bay area, found a relationship between this kind of piping and the incidence of cancers of the esophagus, stomach and pancreas; however, it has been recognized

that various methodological weaknesses and gaps considerably reduce the value of these results.

Along with this impressive array of epidemiological studies, since 196 numerous ingestion studies have been successfully carried out on over 10,000 animals (rats, hamster baboons, etc.) The quantities absorbed were considerably more than a human being could ingest. In this regard, a round table convened by the EPA in 1982 declared that, in animals, ingested asbestos proved to be essentially non-carcinogenic.

The EPA Contradicts Itself

Again, as recently as August 1985 the EPA concluded through one of its committees that the scientific evidence currently available both from epidemiological and animal studies does not support the view that asbestos ingested in water causes organ-specific cancers.

One is therefore entitled to ask why, in November of the same year, the EPA announced its intention to propose a regulation limiting the maximum fibre content to seven million fibres per litre of fibres longer than 10 microns. To support such an option, the Agency appears to be counting on the eventual possibility of establishing a relationship between the ingestion of fibres longer than 10 microns and the incidence of gastrointestinal cancer. It even goes so far as to see risks inherent in inhaling fibres present in the water and sprayed into the air by humidifiers and showers! It admits, nonetheless, that the data on this question is limited! ■



Asbestos-cement is essential to water supply in most of the industrializing countries. For instance, each house in Mexico City must be equipped with its own asbestos-cement reservoir for drinking water.

DATES TO REMEMBER

Course on Health Effects of Asbestos, Fundamentals and Controversies

Dates: July 22-24, 1986
Place: Harvard School of Public Health, Boston, U.S.A.
Information: Secretariat Office Continuing Education Department Harvard School of Public Health 677 Huntington Avenue Boston, Massachusetts 02115 U.S.A.

14th International Cancer Congress

Dates: August 21-27, 1986
Place: Budapest, Hungary
Information: Congress Bureau MOTESZ P.O. Box 32 Budapest, H-1361 Hungary
Tel.: 224-204 EVM/MOTESZ

Fifth International Symposium: Epidemiology in Occupational Health

Dates: September 9-11, 1986
Place: UCLA Campus, Los Angeles, California, U.S.A.
Information: Dr. David Wegman, Secretary Southern California Occupational Health Centre School of Public Health Los Angeles, CA 90024 U.S.A.

A Swedish Study Confirms the Dose-Response Theory

A study (1) conducted in Sweden by Drs C. G. Ohlson (2) and G. Hogstedt (3) on a cohort of 1176 workers of an asbestos-cement plant did not indicate any asbestos-related excess mortality or increased risk of lung cancer.

In their discussion, the authors suggest as a possible explanation for such results the relatively low levels of cumulative exposure and the predominant use of chrysotile in the plant's production. Their suggestion was supported by a comparison of their results with those of five other studies on asbestos-cement workers that report considerable differences in relative risks for lung cancer. The Swedish authors feel that, indeed, these differences could be explained by varying degrees of cumulative exposure, the amount of amphiboles used in the manufacturing process, and finally methodological shortcomings.

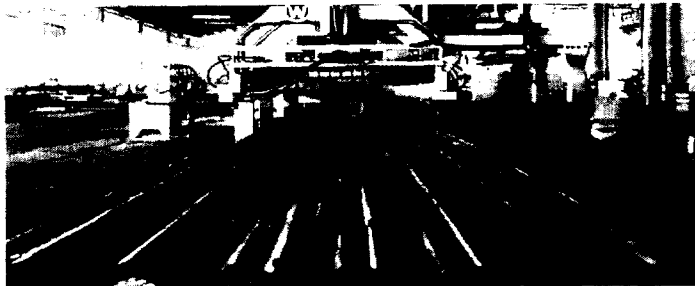
Study Group and Period

The Swedish cohort comprised all men workers employed at the plant for more than three months between 1943 and 1976. Originally this group totalled 1216 workers, but it was subsequently reduced to 1176, since 36 workers had emigrated from Sweden and four others had died before the period chosen for the observation of deaths.

This period started in 1951, the year when the World Health Organisation's classification for death causes was adopted in Sweden, and lasted until 1982. The cancer morbidity was checked through the National Cancer Registry which, however, covered only the period of 1958 to 1979 at the time of the study.

Exposure to Asbestos Fibre

The authors note that the data on asbestos exposure for the plant in question were rather scanty for the 1950s and 1960s. The few measurements available indicated that during those decades the dust level was about 10 mg/m³ and half that amount after 1970. Based on several hundred samples collected during five investigations made between 1970 and 1976, the average fibre concentration was estimated at 1 f/ml for that period. Even though the manufacturing and handling of the asbestos-cement products were the same in the preceding decades, the authors



An asbestos-cement plant where the production of corrugated sheets is completely automated.

estimate the concentration to have been twice that level, or 2 f/ml, before 1970 because plant ventilation was then inferior.

The asbestos used in the plant was mostly of the chrysotile variety, but it was found that 630 tons of amosite were also used between 1949 and 1951, as well as 400 tons of crocidolite in 1962. The authors consider that these quantities of amphiboles represent less than one percent of the asbestos used during the period covered by their study.

Even though no personal exposure data were available for all cohort members, the authors did estimate the average cumulative exposure to be about 18 fibre-years for a subcohort of 125 workers with at least 10 years of employment who participated in a voluntary health examination in 1976.

Similarly, smoking habits were not known for the entire group. However, a voluntary health survey made in 1980 among a sub-group of workers showed the smoker and non-smoker distribution to be closed to the national average.

Results Related to Employment Time

When the authors analysed the lung cancer mortality for various lengths of employment, with a 20 year latency time, they found excess mortality among workers employed less than two years (5 cases observed against 1.8 expected). A look into the previous work of the deceased revealed that two of them had worked on the docks, unloading bags of asbestos to be sent to the plant. According to the authors, such additional source of exposure could explain the high incidence

of lung cancer in the less exposed group.

What Drs Ohlson and Hogstedt cannot explain, however, is the reduced mortality from lung cancer among workers employed longer than five years (1 case observed against 2.6 expected). They feel that further follow up time may be of value in clearing up this point.

A similar phenomenon of excess mortality among short term employees showed up in the analysis of deaths from virtually all causes (malignant tumours, diseases of circulation, diseases of the respiratory tract and violent deaths), independent of latency time. The authors note that such a pattern has also been observed in other cohort studies and suggest that it may be conditioned by individual risk factors, such as high consumption of tobacco and alcohol, which tend to be more common among short term employees in some industries.

Non-Significant SMRs

For the entire cohort, the study showed 220 deaths under the age of 80 against an expected total of 214, giving a standardized mortality ratio (SMR) of 103. It was observed that malignant tumours caused 44 deaths against 50 expected (SMR 88) and that lung cancer caused 11 deaths against 9 expected (SMR 123). With a latency requirement of 20 years, the standardized mortality ratio for lung cancer was 158, which is statistically non-significant.

According to the authors, the absence of work-related excess mortality and the relatively low risk of lung cancer shown by these SMRs could be explained by the

low level of cumulative exposure of the cohort (estimated average of 10 fibre-years) and by nearly exclusive use of white asbestos in the plant's production.

When comparing their results with those of five other studies (4) of asbestos-cement workers, Drs Ohlson and Hogstedt were able to ascertain that where the average levels of cumulative exposure were high or where amphiboles were used, the SMRs usually indicated increased risk of lung cancer.

From this review, Drs Ohlson and Hogstedt conclude that long term employment in high concentrations of asbestos fibres, giving a median cumulative exposure of 70 to 100 fibre-years, increases the risk of lung cancer considerably, whereas this risk does not increase with a median cumulative exposure of about 10 to 20 fibre-years. They also stress the fact that the lung cancer risk is relatively low when only chrysotile is used. ■

(1) Lung cancer among asbestos cement workers. A Swedish cohort study and a review. *Br J Ind Med* 1985; 42: 397-402.

(2) From the Department of Occupational Medicine, Medical Center Hospital, Örebro.

(3) From the Departments of Occupational Medicine, National Board of Occupational Safety and Health and Karolinska Hospital, Stockholm.

(4) The five studies are:

Weill H, Hughes J, Waggenpack, C. "Influence of dose and fiber type on respiratory malignancy risk in asbestos-cement manufacturing." *Am Rev Respir Dis* 1979; 120: 345-54.

Finkelstein MM. Mortality among long term employees of an Ontario asbestos cement factory. *Br J Ind Med* 1983; 40: 138-44.

Thomas HF, Benjamin IT, Elwood PC, Sweetnam PM. Further follow up study of workers from an asbestos cement factory. *Br J Ind Med* 1982; 39: 273-6.

Lacquet LM, van der Linden L, Lepoutre J. Roentgenographic lung changes, asbestosis and mortality in a Belgian asbestos-cement factory. In Wagner JC, ed. *Biological effects of mineral fibres*. Lyon: IARC 1980. (Scientific publications No 30).

Haider M, Neuberger M. Comparison of lung cancer risks for dust workers, asbestos cement workers and control groups. *Biological effects of mineral fibres*. Lyon: IARC 1980. (Scientific publications No 30).

Thetford Mines Asbestos Mining Activities Now Pooled

Since April 1st, the three mining companies in the Thetford Mines region are combined within a limited partnership whose name has not yet been determined. This new venture is the product of almost a full year of study and negotiation.

Objectives

The president of the new company, Jean Dupéré, currently president and chief executive officer of Lac d'Amiante du Québec (LAQ), explained that it was "essential for the Québec asbestos industry to adjust rapidly to the new market conditions that have developed in recent years".

More specifically, the president of the limited partnership explained that this move would allow for "maximum use of ore processing plants and substantial cuts in production costs". Mr. Dupéré is also convinced that this reorganization will contribute to the long-term preservation of the 1,500 jobs in the mines and processing plants in the

Thetford Mines area. Moreover, asbestos buyers will benefit from improved service and increased security of supply.

Structure

The new limited partnership, which consists of three partners, is governed by a nine-member Board of Directors. Lac d'Amiante du Québec has a 55% share and four seats on the Board. Asbestos Corp Ltd. and Bell Ltd., both subsidiaries of the Société Nationale de l'Amiante, have a 22.5% share each and are represented by three members on the Board. Camchib Mines, part-owner of LAQ mining rights, can appoint one director. The ninth member of the Board will be chosen by unanimous consent of the partners.

Mr. Dupéré said that the new organization will operate all mines and facilities belonging to the three partners without legally assuming ownership. The new company will also market all of the combined companies' production.



One of the mines in the Thetford Mines area.

Current managements will be merged, but will remain decentralized so that each facility stays under local management.

Mr. Dupéré underscored the strength and financial stability which this merger will give the partners. The three companies combined will produce 300,000 tonnes of asbestos fibre per year, equivalent to one-half of total Québec production. In spite of the forthcoming shutdown of some facilities, the limited partnership

will continue to offer customers all grades of chrysotile asbestos.

Mr. Dupéré said that this reorganization "has the advantage of stabilizing the mining business in the Thetford Mines region by allowing a healthy level of activity and profitability to be maintained". He added that "now is the time to apply the pragmatism and logic which will enable us to make the most of a unique product, a unique situation and a unique region".

Canada and Québec Intensify Their Effort to Promote the Controlled Use of Asbestos

The Canadian and Québec governments have decided to intensify their efforts aimed at internationally promoting the controlled use of asbestos. The broad outlines of their program, geared first towards the EPA proposal and the ILO convention in June, were recently unveiled by representatives of the two governments.

Canada's Minister of Mines, Robert E.J. Layton, and the Québec Minister of State for Mines, Raymond

Savoie, said on that occasion that they were encouraged by the conclusions reached by scientists consulted about the EPA proposal. Mr. Layton in particular repeated his conviction that the Agency's proposal "is useless and unjustified from a medical, scientific or economic point of view". He noted that in recent months the Canadian government had held official discussions with representatives of several countries about the regula-

tions designed to restrict the use of asbestos and said that a second round of diplomatic initiatives was about to begin.

Mr. Savoie in turn questioned "the rationale behind the relentless barrage of anti-asbestos publicity and the motives of some groups in the American administration for continuing to launch a regulatory process whose thrust was not always based on scientific fact". Citing recent studies on the hazards of asbestos, the Minister said that the Québec government remained "convinced that adherence to current standards provides

adequate protection for the physical integrity of workers".

The two ministers announced that the Asbestos Institute had been granted special subsidies to support the planned action. Each of the two governments would provide one million dollars in immediate assistance, with the asbestos industry contributing in 500,000 dollars for a total of 2.5 million dollars. It was also indicated that this extraordinary aid would be extended in the next three years and could, if necessary, reach as high as 10 million dollars. ■

ASBESTOS

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